PUB. 159

SAILING DIRECTIONS (ENROUTE)

★

JAPAN VOLUME II

★

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Pub. 159, Sailing Directions (Enroute) Japan, Volume II, Eighteenth Edition, 2022, is issued for use in conjunction with Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia. Companion volumes are Pubs. 153, 154, 155, 157, and 158.

Digital Nautical Charts 12, 23, and 24 provide electronic chart coverage for the area covered by this publication.

This publication has been corrected to 24 December 2022, including Notice to Mariners No. 52 of 2022. Subsequent updates have corrected this publication to 27 April 2024 including Notice to Mariners No. 17 of 2024.

Explanatory Remarks

Sailing Directions are published by the National Geospatial-Intelligence Agency (NGA) under the authority of Department of Defense Directive 5105.60, dated 29 July 2009, and pursuant to the authority contained in U. S. Code Title 10, Chapter 22, Section 451 and Title 44, Section 1336. Sailing Directions, covering the harbors, coasts, and waters of the world, provide information that cannot be shown graphically on nautical charts and is not readily available elsewhere.

Sailing Directions (Enroute) include detailed coastal and port approach information which supplements the largest scale chart produced by the National Geospatial-Intelligence Agency. This publication is divided into geographic areas called "Sectors."

Bearings.—Bearings are true, and are expressed in degrees from 000° (north) to 360°, measured clockwise. General bearings are expressed by the initial letters of the points of the compass (e.g. N, NNE, NE, etc.). Adjective and adverb endings have been discarded. Wherever precise bearings are intended, degrees are used.

Charts.—Reference to charts made throughout this publication refers to hard copy paper charts and electronic charts.

As the maritime community moves towards electronic navigation, the Maritime Safety Office will begin reducing NGA's Standard Nautical Chart portfolio. Further information can be found in the "What's New" section of the NGA Maritime Safety Information web site (https://msi.nga.mil).

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Toll free	1-800-362-6289
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DSN	547-5455
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Maritime Safety Office	
DNC web site	https://dnc.nga.mil

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Maritime Domain web site	https://msi.nga.mil
E-mail	MarHelp@nga.mil
Maritime Quality Feedback System (MQFS)	https://marhelp.nga.mil
Mailing address	Maritime Safety Office National Geospatial-Intelligence Agency Mail Stop N64-SFH 7500 Geoint Drive Springfield VA 22150-7500

New editions of Sailing Directions are corrected through the date of publication shown above. Important information to amend material in the publication is updated as needed and available as a downloadable corrected publication from the NGA Maritime Domain web site.

NGA Maritime Safety Office Web Site
https://msi.nga.mil

Courses.—Courses are true, and are expressed in the same manner as bearings. The directives "steer" and "make good" a course mean, without exception, to proceed from a point of origin along a track having the identical meridional angle as the designated course. Vessels following the directives must allow for every influence tending to cause deviation from such track, and navigate so that the designated course is continuously being made good.

Currents.—Current directions are the true directions toward which currents set.

Distances.—Distances are expressed in nautical miles of 1 minute of latitude. Distances of less than 1 mile are expressed in meters, or tenths of miles.

Geographic Names.—Geographic names are generally those used by the nation having sovereignty. Names in parentheses following another name are alternate names that may appear on some charts. In general, alternate names are quoted only in the principal description of the place. Diacritical marks, such as accents, cedillas, and circumflexes, which are related to specific letters in certain foreign languages, are not used in the interest of typographical simplicity.

Wherever possible, names used on NGA charts and in NGA publications are in the form approved by the United States Board on Geographic Names (BGN). Generally, local official spellings are used for those features entirely within a single sovereignty, names of countries and those features which are common to two or more countries or which lie beyond a single sovereignty may carry Board-approved conventional spellings (i.e., names in common English language usage). When alternate names would be of value to the user, they may be shown for information purposes within parentheses. Important indi-

vidual name changes are made to all revised charts as the opportunity permits.

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BGN approved names may be found at https://geonames.nga.mil/geonames/GNSHome/welcome.html.

Heights.—Heights are referred to the plane of reference used for that purpose on the charts and are expressed in meters.

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International Ship and Port Facility Security (ISPS) Code.—The ISPS Code is a comprehensive set of measures to enhance the security of ships and port facilities developed in response to the perceived threats to ships and port facilities in the wake of the 9/11 attacks in the United States. Information on the ISPS Code can be found at the International Maritime Organization web site:

International Maritime Organization Home Page
http://www.imo.org

Lights and Fog Signals.—Lights and fog signals are not described, and light sectors are not usually defined. The Light Lists should be consulted for complete information.

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1. A requirement by a state for advance permission or notification for innocent passage of warships in the territorial sea.
2. Straight baseline, internal waters, or historic waters claims.
3. The establishment of a security zone, where a state claims to control activity beyond its territorial sea for security reasons unrelated to that state's police powers in its territory, including its territorial sea.

Radio Navigational Aids.—Radio navigational aids and radio weather services are not described in detail. Publication No. 117 Radio Navigational Aids and NOAA Publication, Selected Worldwide Marine Weather Broadcasts, should be consulted.

Soundings.—Soundings are referred to the datum of the charts and are expressed in meters.

Telephone and Facsimile Numbers.—Within this publication, the international telephone and facsimile numbers provided as contact information contain the minimum digits necessary to dial. Please note that these contact numbers do not include additional digits or special characters, such as (0) or (+), which may be required when dialing. The necessity of such digits and characters depend upon numerous factors and conditions, such as the user's geolocation and service provider. Mariners are advised to consult their communications equipment and service provider manuals for guidance.

Time.—Time is normally expressed as local time unless specifically designated as Universal Coordinated Time (UTC).

Standard Time Zone of the World Chart
https://www.cia.gov/the-world-factbook/maps/world-regional

Time Zone.—The Time Zone description(s), as well as information concerning the use of Daylight Savings Time, are included. The World Time Zone Chart is available on the Internet at the web site given below.

U.S. Maritime Advisory System.—The U.S. Maritime Advisory System is a streamlined inter-agency approach to identifying and promulgating maritime security threats. The system replaces Special Warnings to Mariners (State Department), MARAD Advisories (Maritime Administration), and Marine Safety Information Bulletins (U.S. Coast Guard) and consists of the following items:

1. U.S. Maritime Alert—Provides basic information (location, incident, type, date/time) on reported maritime security threats to U.S. maritime industry interests. U.S. Maritime alerts do not contain policy or recommendations for specific courses of information.
2. U.S. Maritime Advisory—Provides more detailed information, when appropriate, through a "whole-of-government" response to an identified maritime threat.

Maritime Administration (MARAD)—U.S. Maritime Advisory System
https://www.maritime.dot.gov/msci-advisories

Winds.—Wind directions are the true directions from which winds blow.

Reference List

The principal sources examined in the preparation of this publication were:

British Hydrographic Department Sailing Directions.

Various port handbooks.

Reports from United States Naval and merchant vessels and various shipping companies.

Other U.S. Government publications, reports, and documents.

Charts, light lists, tide and current tables, and other documents in possession of the Agency.

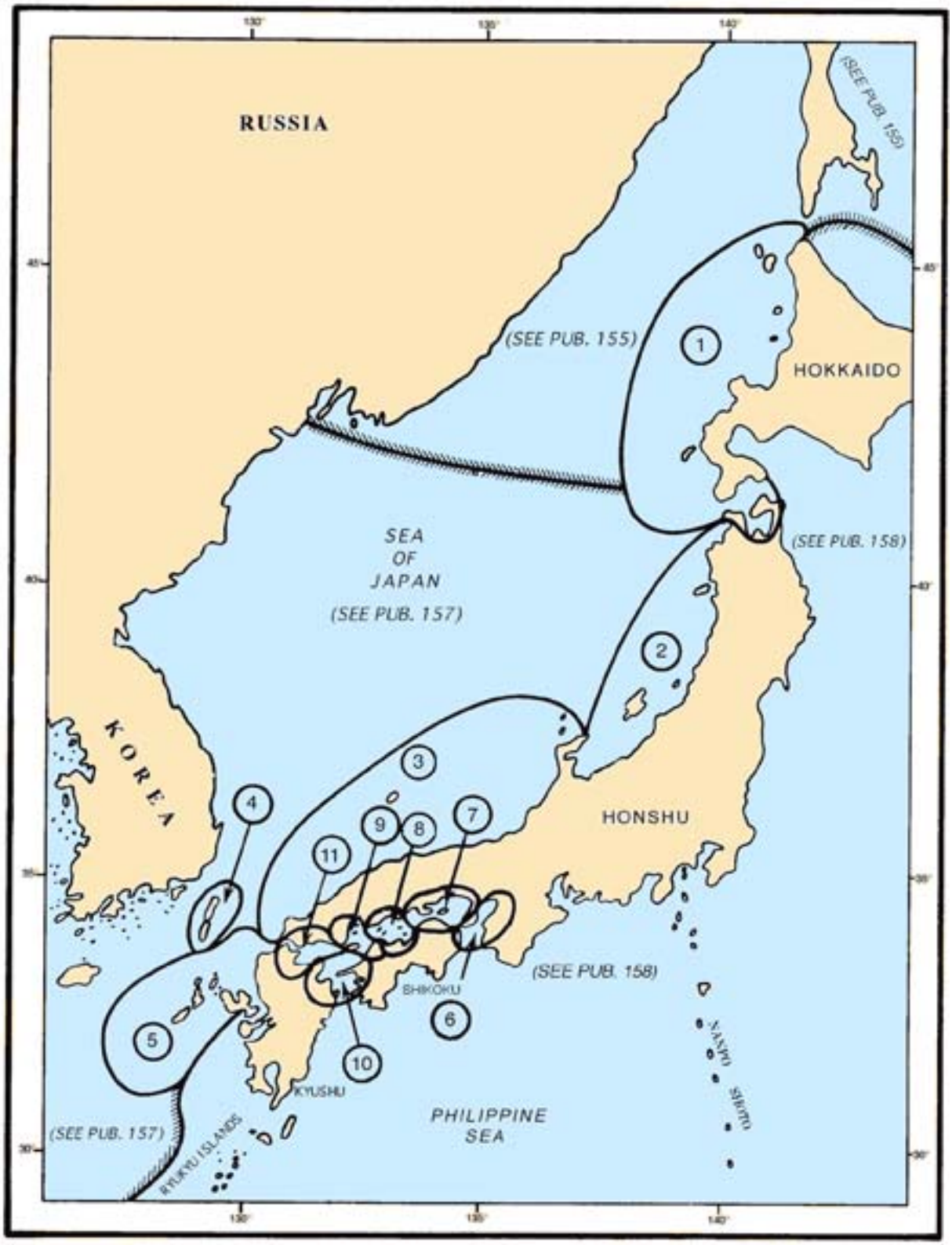
Date of Change: 27 April 2024	
Notice to Mariners: 17/2024	
Sector	**Paragraphs**
Sector 1	Paragraphs 1.14, 1.18, and 1.35
Sector 2	Paragraphs 2.28 and 3.36
Sector 3	Paragraphs 3.12, 3.28, and 3.35
Sector 6	Paragraphs 6.5 and 6.24
Sector 7	Paragraph 7.37
Sector 10	Paragraph 10.10 and 10.25

Date of Change: 13 January 2024	
Notice to Mariners: 2/2024	
Sector	**Paragraphs**
Sector 1	Paragraphs 1.4, 1.10, and 1.14
Sector 7	Paragraphs 7.34 and 7.37

Date of Change: 14 October 2023	
Notice to Mariners: 41/2023	
Sector	**Paragraphs**
Sector 1	Paragraphs 1.10 and 1.35
Sector 2	Paragraph 2.8
Sector 5	Paragraphs 5.6, 5.31, and 5.41
Sector 7	Paragraphs 7.34 and 7.47
Sector 9	Paragraphs 9.7 and 9.26
Sector 10	Paragraph 10.19

Date of Change: 10 June 2023	
Notice to Mariners: 23/2023	
Sector	**Paragraphs**
Sector 1	Paragraphs 1.4, 1.10, 1.14, and 1.18
Sector 2	Paragraphs 2.8 and 2.36
Sector 3	Paragraph 3.35

Date of Change: 11 March 2023	
Notice to Mariners: 10/2023	
Sector	**Paragraphs**
Sector 1	Paragraphs 1.4, 1.10, 1.14, and 1.35
Sector 2	Paragraph 2.17
Sector 5	Paragraph 5.6
Sector 6	Paragraphs 6.5, 6.21, and 6.24
Sector 11	Paragraph 11.10



SECTOR LIMITS — PUB. **159**

Feet to Meters

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

Fathoms to Meters

Fathoms	0	1	2	3	4	5	6	7	8	9
0	0.00	1.83	3.66	5.49	7.32	9.14	10.97	12.80	14.63	16.46
10	18.29	20.12	21.95	23.77	25.60	27.43	29.26	31.09	32.92	34.75
20	36.58	38.40	40.23	42.06	43.89	45.72	47.55	49.38	51.21	53.03
30	54.86	56.69	58.52	60.35	62.18	64.01	65.84	67.67	69.49	71.32
40	73.15	74.98	76.81	78.64	80.47	82.30	84.12	85.95	87.78	89.61
50	91.44	93.27	95.10	96.93	98.75	100.58	102.41	104.24	106.07	107.90
60	109.73	111.56	113.39	115.21	117.04	118.87	120.70	122.53	124.36	126.19
70	128.02	129.85	131.67	133.50	135.33	137.16	138.99	140.82	142.65	144.47
80	146.30	148.13	149.96	151.79	153.62	155.45	157.28	159.11	160.93	162.76
90	164.59	166.42	168.25	170.08	171.91	173.74	175.56	177.39	179.22	181.05

Meters to Feet

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

Meters to Fathoms

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	0.55	1.09	1.64	2.19	2.73	3.28	3.83	4.37	4.92
10	5.47	6.01	6.56	7.11	7.66	8.20	8.75	9.30	9.84	10.39
20	10.94	11.48	12.03	12.58	13.12	13.67	14.22	14.76	15.31	15.86
30	16.40	16.95	17.50	18.04	18.59	19.14	19.68	20.23	20.78	21.33
40	21.87	22.42	22.97	23.51	24.06	24.61	25.15	25.70	26.25	26.79
50	27.34	27.89	28.43	28.98	29.53	30.07	30.62	31.17	31.71	32.26
60	32.81	33.36	33.90	34.45	35.00	35.54	36.09	36.64	37.18	37.73
70	38.28	38.82	39.37	39.92	40.46	41.01	41.56	42.10	42.65	43.20
80	43.74	44.29	44.84	45.38	45.93	46.48	47.03	47.57	48.12	48.67
90	49.21	49.76	50.31	50.85	51.40	51.95	52.49	53.04	53.59	54.13

The following abbreviations may be used in the text:

Units

°C	degree(s) Centigrade	km	kilometer(s)
cm	centimeter(s)	m	meter(s)
cu.m.	cubic meter(s)	mb	millibars
dwt	deadweight tons	MHz	megahertz
FEU	forty-foot equivalent units	mm	millimeter(s)
gt	gross tons	nt	net tons
kHz	kilohertz	TEU	twenty-foot equivalent units

Directions

N	north	S	south
NNE	northnortheast	SSW	southsouthwest
NE	northeast	SW	southwest
ENE	eastnortheast	WSW	westsouthwest
E	east	W	west
ESE	eastsoutheast	WNW	westnorthwest
SE	southeast	NW	northwest
SSE	southsoutheast	NNW	northnorthwest

Vessel types

LASH	Lighter Aboard Ship	Ro-ro	Roll-on Roll-off
LNG	Liquified Natural Gas	ULCC	Ultra Large Crude Carrier
LPG	Liquified Petroleum Gas	VLCC	Very Large Crude Carrier
OBO	Ore/Bulk/Oil	VLOC	Very Large Ore Carrier
Lo-lo	Lift-on Lift-off	FSO	Floating Storage and Offloading
NGL	Natural Gas Liquids	FSU	Floating Storage Unit
FSRU	Floating Storage and Regasification Unit	FPSO	Floating Production Storage and Offloading

Time

ETA	estimated time of arrival	GMT	Greenwich Mean Time
ETD	estimated time of departure	UTC	Coordinated Universal Time

Water level

MSL	mean sea level	LWS	low water springs
HW	high water	MHWN	mean high water neaps
LW	low water	MHWS	mean high water springs
MHW	mean high water	MLWN	mean low water neaps
MLW	mean low water	MLWS	mean low water springs
HWN	high water neaps	TFW	Tropical Fresh Water
HWS	high water springs	HAT	highest astronomical tide
LWN	low water neaps	LAT	lowest astronomical tide

Communications

D/F	direction finder	MF	medium frequency
R/T	radiotelephone	HF	high frequency
GMDSS	Global Maritime Distress and Safety System	VHF	very high frequency
LF	low frequency	UHF	ultra high frequency

Navigation

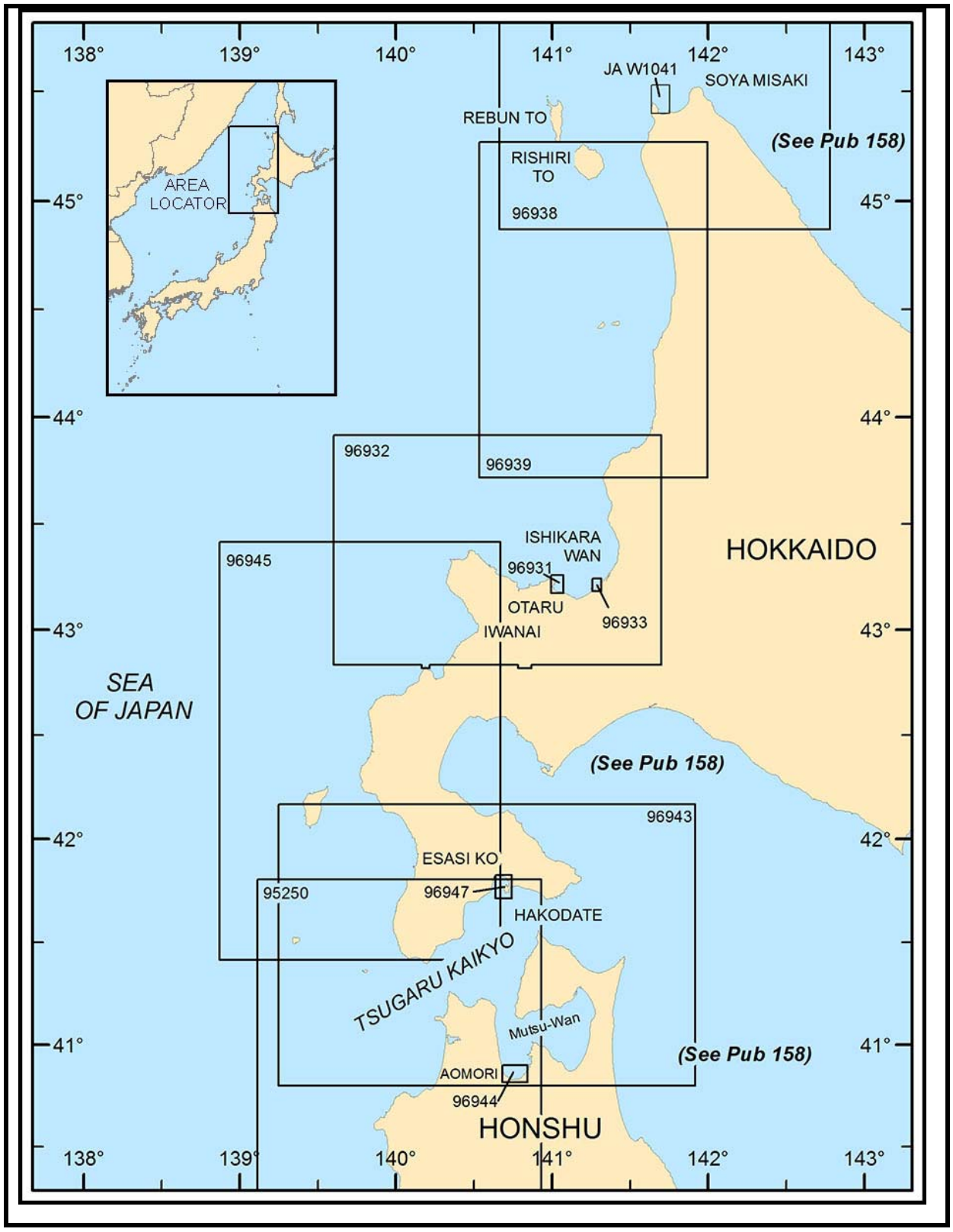
LANBY	Large Automatic Navigation Buoy	SBM	Single Buoy Mooring
NAVSAT	Navigation Satellite	SPM	Single Point Mooring
ODAS	Ocean Data Acquisition System	TSS	Traffic Separation Scheme
CBM	Conventional Buoy Mooring System	VTC	Vessel Traffic Center
MBM	Multi-Buoy Mooring System	VTS	Vessel Traffic Service
CALM	Catenary Anchor Leg Mooring		

The following abbreviations may be used in the text:

Miscellaneous

AIS	Automatic Identification System	MMSI	Maritime Mobile Service Identity Code
COLREGS	Collision Regulations	No./Nos.	Number/Numbers
IALA	International Association of Lighthouse Authorities	PA	Position approximate
		PD	Position doubtful
IHO	International Hydrographic Organization	Pub.	Publication
IMO	International Maritime Organization	SOLAS	International Convention for Safety of Life at Sea
IMDG	International Maritime Dangerous Goods Code		
LOA	length overall	St./Ste.	Saint/Sainte
UKC	Under keel clearance	ISPS	International Ship and Port facility Security
ITC	International Convention on the Tonnage Measurement of Ships (1969)	ECDIS	Electronic Chart Display and Information System

Contents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HONSHU

SECTOR 1

HOKKAIDO—WEST COAST AND TSUGARU KAIKYO

Plan.—This sector describes the W coast of Hokkaido from Soya Misaki, the N extremity of Hokkaido, to Orido Saki, its SW extremity; the arrangement of this part is from N to S. Tsugaru Kaikyo, the deep strait between Hokkaido and Honshu, connecting the Pacific Ocean to the Sea of Japan, is then described; the arrangement of this part is from E to W, and includes Mutsu Wan along the S coast of Tsugaru Kaikyo.

General Remarks

1.1 Japan consists of four large and many small islands. The four large islands are named from NE to SW, respectively, Hokkaido, Honshu, Shikoku, and Kyushu. The islands are mountainous and there are many volcanoes forming distinct volcanic chains. Earthquakes occur frequently in different parts of Japan. The rivers of Japan are comparatively short, their flow rapid, and none are navigable by large ocean-going vessels. Large plains are few in Japan, but there are a number of small alluvial plains, and the valleys of the larger rivers are especially fertile.

The Naikai, or Inland Sea, bounded N by Honshu and S by Shikoku and Kyushu, constitutes an important passage for vessels, foreign and domestic, between the large ports of Kobe and Osaka at its E end and Moji, Shimonoseki, and Wakamatsu at its W end, and numerous other harbors in between. The Naikai, which contains an immense number of islands and islets, is famous for its scenery. Many of the channels are narrow and the tidal currents in them are strong, but heavy seas are seldom experienced.

Winds—Weather.—The climate along the W coast of Hokkaido is influenced by the Tsushima Current, which gives its relatively warm temperatures. In winter, however, it bears the full impact of the Northwest Monsoon, with the heaviest snowfall, a low percentage of days with sunshine, and extremely cold temperatures. In summer since the Southeast Monsoon is blocked by mountains, there is relatively little rainfall, and the climate is characterized by stretches of good weather and moderate land and sea breezes.

The Northwest Monsoon prevails in winter and the South east Monsoon prevails in summer. The winter wind is generally strong, and the summer wind relatively weak. The cold Northwest Monsoon from the Continental High dominates the winter climate, but these strong winds are not necessarily continuous. Periods of weak and strong currents generally alternate at intervals of 5 to 10 days. As one low pressure system moves E and out to sea the weather moderates until another storm moves in from the Sea of Japan. Winds are not very strong until the low pressure system passes through, and a cold front brings the monsoon winds in its wake. These strong winds may persist for several days until the low pressure system moves E out to sea and relatively calm weather is once again restored.

The Northwest Monsoon gradually begins to weaken in March, and by April, S winds become dominant.

During the summer season, an E wind is sometimes generated in June, the Sea of Okhotsk High. Generally, the Pacific Ocean High dominates and a mild Southeast Monsoon prevails.

The winter Northwest Monsoon winds tend to persist for long periods over a wide area, and generally attain velocities of 19 knots or more; since they are usually accompanied by snow, most are blizzards. Like heavy fogs, blizzards obstruct visibility, but they are much more dangerous to navigation due to the extremely cold and strong winds that accompany them. It appears that snowfall generally drops sharply beyond a distance of 10 miles from shore.

On the W and S coasts of Hokkaido, fog occurs on the average of less than 1 day per month from about September to April, increasing in the summer months to a maximum of 5 days per month in July. It is most frequent in the vicinity of Rashiri Suido and Okushiri Kaikyo.

In the Sea of Japan during the winter months, the Northwest Monsoon normally ensures that the air temperature is below that of the sea surface, a condition which discourages fog formation.

Ice.—Drift ice passing through La Perouse Strait from the E does not usually extend farther SW than the vicinity of Rishiri To, where it disappears. Most of this ice is brought from the Sea of Okhotsk by NE winds, but some occasionally arrives from the W coast of Ostrov Sakhalin. Winds from between the S and W tend to clear the ice way.

The harbor of Wakkanai is occasionally frozen over. There are occasional years in which neither fast ice nor drift ice appears on this part of the W coast of Hokkaido. There is practically no fast ice along the mainland coast S of Rishiri To.

Tides—Currents.—Tides along the W coast of Hokkaido are very small. The maximum daily tidal range does not exceed 0.3m. Diurnal inequality is marked all along the coast, with often only one HW and one LW per day.

The tidal currents of the W coast of Hokkaido are generally weak and irregular. They are influenced by the ocean currents that set N along the coast.

The Tsushima Current, a branch of the warm Kuroshio current, flows in a N direction off the W coasts of Honshu and Hokkaido, and branches of this ocean current set E through Tsugaru Kaikyo and La Perouse Strait. In summer, the time of greatest strength, the velocity is generally less than 0.5 knot, may reach a maximum of 3 knots in the summer and has much greater strength in the straits. The Tsushima Current is extremely weak in winter.

Regulations.—The Japanese Coast Guard has instituted the Japanese Ship Reporting System (JASREP). Purpose and participation in this system is similar in intent and format to the AMVER system. Any vessel desiring to participate in both JASREP and AMVER may do so by sending notice of dual participation to the appropriate coastal station. The service area of the JASREP system is the area N of latitude 17°N and W of longitude 165°E.

The Maritime Traffic Safety Law established traffic routes in Tokyo Wan, Ise Wan, and the Naikai. Waters along the coast of Japan are congested with vessels, especially in the above-men-

tioned areas which are extremely crowded with large and small vessels. In order to maintain safety of traffic, the Maritime Safety Law establishes special rules to regulate shipping traffic in these traffic congested areas. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for Maritime Traffic Safety Law; also see appropriate sectors of this publication for rules and signals of Maritime Traffic Safety Law.

Pub. 158, Sailing Directions (Enroute) Japan, Volume I describes the coasts of Japan which border the Sea of Okhotsk, the Pacific Ocean, and the Philippine Sea; it also includes Nanpo Shoto and Nansei Shoto (Ryukyu Islands).

Caution.—Fish havens, which may be on the seabed, at intermediate mid-layer depths, or floating on the surface, are numerous in Japanese waters and are continually being augmented. Concentrations of fishing vessels can be expected in their vicinity. The traffic is high in volume and ocean currents and tidal currents are strong. There are counter currents along the coasts and tidal races around Shiokubi Misaki. The visibility often worsens due to dense fog in spring to summer, and snowstorms in winter. Caution should be exercised as the placement of fish havens may well precede their inclusion in the Notice to Mariners.

Hokkaido—West Coast

1.2 Soya Misaki (45°31'N., 141°56'E.), the N extremity of Hokkaido, is grass-covered and 50m high. It rises about 2 miles inland to the summit of Maru Yama, a rounded hill, 168m high, which can sometimes be seen when the cape itself is obscured by fog. A light, 17m high, is shown from a tower on the cape. Benten Shima, a light brown rock, 11m high, stands about 0.8 mile W of Soya Misaki, on a reef.

The cape is fringed by rocky ledges and the bottom is uneven in the vicinity. Depths of less than 20.1m extend up to about 2 miles off the cape, which should be given a wide berth due to the currents.

Caution.—Large vessels approaching from the E should avoid a reef, with depth of 15.8m, about 13 miles E of the cape. Due to the dangers in the vicinity of Soya Misaki the tidal currents in La Perouse Strait, Soya Misaki should at all times be passed at a distance of at least 5 miles.

La Perouse Strait, known to the Japanese as Soya Kaikyo and to the Russians as Proliv Laperuza, separates Hokkaido from Sakhalin, and is described in Pub. 155, Sailing Directions (Enroute) East Coast of Russia. The passage is about 23 miles wide between Soya Misaki and Mys Kril'on (Nisi-Notoro Misaki), the S extremity of Sakhalin. Ostrov Kamen Opasnosti (Nizyo Gan) (Nijo Gan), an isolated rock, lies in the N part of the strait, about 8.5 miles SE of Mys Kril'on. The strait joins the Sea of Japan and the Gulf of Tartary, to the W, and the Sea of Okhotsk, to the E.

Soya Wan is entered between Soya Misaki and Noshappu Misaki (Nosyappu Misaki), about 12 miles WSW. The bay is divided into two parts. Koetoi Saki projects N from the head of the bay. Wakkanoi Ko occupies the SW part of the bay. Wakkanoi Ko is suitable for vessels of up to 5,000 dwt.

Anchorage.—The bottom of Soya Wan is either rock or sand and affords such poor holding ground that dragging is likely in strong winds.

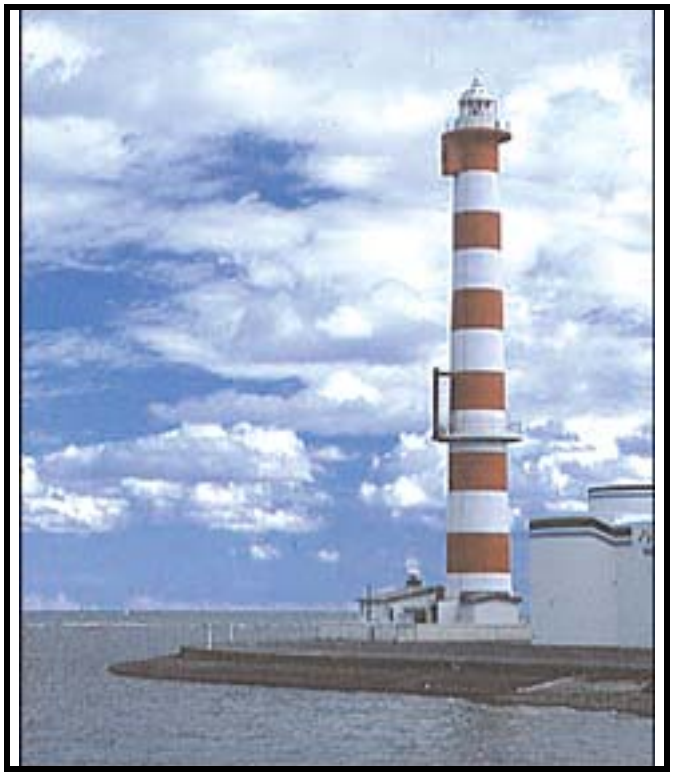
1.3 Noshappu Misaki (45°27'N., 141°39'E.), the NW extremity of Hokkaido, is the N extremity of a peninsula connected to the mainland of Hokkaido by a low isthmus. The peninsula appears as an island from a distance; its central range of hills rises to an elevation of 211m and falls sharply to a tongue of low land at its N end. A light is shown from Noshappu Misaki. Houses about 0.5 mile S of the light structure are brightly illuminated and can be seen over 20 miles offshore, and are visible before Noshappu Misaki Light.

Esandomari Gyoko, protected by breakwaters, from one of which a light is shown, is situated close S of Noshappu Misaki. The light is shown from a red tower, 11m high. A radio tower, 220m high, is conspicuous about 2.5 miles SSE of Noshappu Misaki. Several white domes and blue domes are conspicuous about 0.8 mile to 2 miles S of the point.

Rocks and shoals, with depths of less than 4.9m, extend up to about 0.7 mile off Noshappu Misaki. The point should be given a berth of at least 1 mile.

Koetoi Saki (45°25'N., 141°45'E.) can be identified by the houses on it and by a flat treeless hillock behind them. A spit, on which there are several rocks with depths of less than 1.8m, extends about 1.5 miles N of Koetoi Saki. A light is shown nearly 1 mile N of the point.

Caution.—Fish traps are laid (August to December) from 0.8 to 1.5 miles seaward of the E side of Koetoi Saki and the SE side of Noshappu Misaki. Seaweed farms lie within 0.8 mile of the shores of Koetoi Saki and Noshappu Misaki.



Wakkanai Light

Wakkanai Ko (45°25'N., 141°41'E.)

World Port Index No. 61260

1.4 Wakkanai Ko, the northernmost port in Japan, handles oil, cement, vehicles and general cargo. There is a terminal for the ferry service from Hokkaido to Rebun-jima and Rishiri To. Domestic and foreign vessels enter and cargo volume is increasing steadily as port facilities are expanded.

The port is sheltered by North Breakwater extending 1 mile ESE from the shore. A light is shown on its head from a red round tower, 14m high. East Breakwater, detached, lies with its NW head 0.2 mile SSE of the head of North Breakwater. It extends SE and then E. A light is shown at its NW end.

A detached breakwater, 0.35 mile long, is situated 0.2 mile N of the head of North Breakwater. A light is shown from its E end.

North Wharf, Central Wharf, and Hokuyo Wharf, N to S respectively, lie on the W side of the harbor. Tenpoku Wharf extends N from the shore S of the head of North Breakwater.

Winds—Weather.—West and NW winds are most frequent in winter; sea conditions are most frequent in winter; sea conditions are particularly poor from September to April. In the prolonged westerlies of winter, large swells sweep around Noshappu Misaki and penetrate the harbor. North to NE winds quickly generate high seas in the anchorage, and seas and swell penetrate the harbor through the large opening to the E.

Spring and summer winds are generally from SSW and E.

Fog forms from mid-June to early August. Their frequency is low and average about 6 or 7 times per month in June and July. The visibility in fog is about 0.2 mile. No fog forms in March. Fog forms in April around sunrise and after May, from 0300 to 0800 and from 1600 to 2100.

Fog often follows misty rain and disappears within 1 to 2 hours. It also forms frequently in light easterlies and dissipates with an increase in wind velocity or a change of wind direction. The visibility in fog is at times about 0.1 mile.

Fog in this area persists for 2 to 3 hours and rarely lasts for more than 10 hours. Fog, which forms with Southwesters, is said to persist for a long time. The port nay be ice bound between December through April.

Tides—Currents.—The tidal rise at Wakkanai is 0.3m at MHHW.

Depths—Limitations.—The fairway and the approach to Tenpoku No. 1 Wharf has been dredged to a depth of 10m. The draft limit is approximately 9m.

The principal berthing facilities are described in the table titled **Wakkanai Ko—Berth Information**.

Aspect.—Cranes and white oil tanks are conspicuous on Hokuyo Wharf.

The Combined Port Affairs Building, a four-story building with a radio tower and yellow dome on the roof and with radio towers in the compound, lies at the foot of Central Wharf.

Pilotage.—Pilots are not compulsory but are available at Rumoi and can be contacted on VHF channel 16.

Contact Information.—The port can be contacted on VHF channel 16 or by telephone (81-162-236-483), facsimile (81-162-242-719), or e-mail (kouwan@city.wakkana.hokkaido.jp).

Anchorage.—The best anchorage for large vessels, in about 14m, sand, lies about 0.6 mile ENE of the head of North Breakwater. The bottom is a thin layer of sand over rock; there is risk of dragging with strong winds or swell. The anchorage is susceptible to winds from the NW to NE.

Wakkanai Ko—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Kita Wharf						
Upper Quay	140m	—	—	5.0m	—	Ferries.
Middle Quay	109m	—	—	5.0m	—	Ferries.
South Quay	109m	—	—	5.0m	—	Ferries.
Central Wharf						
Upper North	150m	5.0-7.5m	115m	—	781 dwt	Ferries and cement.
Middle North	135m	5.0-7.5m	—	—	—	Cruise vessels and ro-ro.
Outer North	170m	7.5m	—	—	—	Cruise vessels and ro-ro.
Outer South	134m	7.5m	—	—	—	Ro-ro.
Middle South	135m	5.0-7.5m	55.0m	—	700 dwt	Cruise vessels and ro-ro.
Upper South	120m	5.0-7.5m	—	—	—	Ro-ro.
Hokuyo Wharf						
Fishing	140m	—	—	—	—	Fishing vessels.
Shuehiro Wharf						
East Upper	240m	12.0m	—	—	—	General cargo, passengers, and containers.

Wakkanai Ko—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
East Lower	260m	4.0m	—	—	—	Closed
West Quay	260m	5.0m	—	—	—	General cargo.
Tempoku Wharf 1						
West Upper Quay	185m	10.0m	101m	—	15,000 dwt	Bulk cargo and passengers.
West Lower Quay	165m	4.0m	—	—	—	Bulk cargo.
North Quay	185m	10.0m	166m	—	4,800 dwt	Dolphins.
East Quay	260m	6.0-7.5m	—	—	5,000 dwt	Bulk cargo.
Tempoku Wharf 2						
West	270m	7.5m	—	—	5,000 dwt	Bulk cargo.
East	180m	5.5m	—	—	2,000 dwt	Bulk cargo.
Tanker Berths						
Central Wharf						
North Tanker	133m	—	43.0m	—	358 dwt	Petroleum products.
Middle North Tanker	135m	5.0-7.0m	—	—	—	Ro-ro and bunkers.
Middle South Tanker	135m	5.0-7.0m	—	—	—	Ro-ro and bunkers.
Outer North	170m	7.5m	—	—	—	Ro-ro and bunkers.
Outer South	134m	7.5m	—	—	—	Ro-ro and bunkers.
Upper North	150m	5.0-7.5m	115m	—	7,831 dwt	Cement, fast ferries, and bunkers. Maximum beam of 18.5m.
Upper South	120m	—	—	—	—	Ro-ro and bunkers.
Hokuyo Wharf Tanker	140m	—	—	—	—	Petroleum products.
Fishing	140m	—	—	—	—	Fishing vessels, breakbulk, and bunkers.
Tanker	140m	—	105m	—	5,650 dwt	Chemicals, CPP, and LPG. Maximum beam of 17.2m.

The quarantine anchorage is centered about 0.8 mile N of the head of North Breakwater.

Directions.—Entry is made between the head of the N breakwater and the NW end of East Breakwater. The fairway leading to the entrance at the breakwaters has been dredged to a depth of 12.8m; from the entrance to Tenpoku Wharf, the fairway has been dredged to a depth of 11.9m. Irregular seas occur at the entrance with prolonged NW to N winds.

Islands and Dangers Off the Northwest End of Hokkaido

1.5 Rebun To (Ruben Shima) (45°22'N., 141°01'E.), about 25 miles W of Noshappu Misaki, rises to an elevation of 490m at Rebun Take, near the center of the island. The top of Rebun Take is covered with pine trees, and appears conical from the N or S, but the descent on the N side is gradual.

The E coast consists of a sand and shingle beach; the W side consists of eroded cliffs, 100 to 200m high.

Todo Shima, an islet 43m high, lies about 0.8 mile N of Sukoton Misaki, the N extremity of Rebun To. A light is shown from the W side of the islet. Todo Shima lies on the foul ground extending N of Sukoton To. A bare rock, 3.4m high, lies about 1.5 miles N of Todo Shima, and a rock, Oki-no Syo, with a depth of 1.2m, lies about 0.5 mile farther N.

Gorota Yama, a hill, 179m high, lies about 1.5 miles S of Sukoton Misaki.

Kanedano Misaki, the NE extremity of Rebun To, and marked by a light, has depths of less than 4.9m extending about 0.4 mile N. An isolated rock, with a least depth of 0.1m and surrounded by deep water, lies about 1.5 miles N of Kanedano Misaki; it is constantly awash and easy to identify by day. A shoal having a least depth of 7.4m lies about 2.3 miles NE of Kanedano Misaki.

Funadomari Wan, entered between Sukoton Misaki and Kanedano Misaki, has depths of 20.1m in the entrance, gradually

Kanedano Misaki Light

shoaling to 4.9m about 0.3 mile off the head. There is good anchorage, sheltered from the S winds, in 14m, with Kanedano Misaki bearing 032°, and with Oshonnai Yama, a 171m high hill, about 2 miles SSE of the point, bearing 119°.

Funadomari Ko, a small harbor, sheltered by breakwaters, lies on the E side of Funadomari Wan. A berth, 100m in length, with a depth of 4.9m alongside, lies on the S side of the S breakwater.

Uedomari Saki, the E extremity of Rebun To, and about 2.8 miles SSE of Kanedano Misaki, is marked by a light.

1.6 Kafukai Byoshi (Kahukai Byoti) (45°20'N., 141°03'E.) is an open roadstead formed by a slight indentation on the W side of Rebun To. Komayano Saki, the N entrance point, is a red cliffy headland. A fishing harbor, formed by breakwaters, with an entrance in its NE corner, lies in the S part of the roadstead. A rock, with a depth of 6.4m, lies about 0.3 mile NE of the fishing harbor entrance. The best anchorage, sheltered from W winds, is in about 14m, sand, about 0.2 mile NE of the fishing harbor entrance, clear of the above-mentioned rock. Caution is also necessary as the bottom is rocky in places.

Anchorage, in about 33m, sand, good holding ground, lies farther offshore.

Stationary fish traps extend about 1 mile off the N and S sides of Kafukai Byoshi from March to November on the N side and from March to July on the S side.

Kafuka Ko (Kahuka Ko) is a small port about 2 miles S of Kafukai Byoshi. Karrannai Misaki is situated 4 miles SSW of Kafukai Byoshi.

The entrance to Kafuka Ko, which faces SE, lies between two detached breakwaters and the heads of the North Breakwater and South Breakwater. A light is shown on the South Breakwater.

The E detached breakwater extends about 0.2 mile S from a position 0.15 mile S of the head of South Breakwater. South Outer Breakwater extends 0.25 mile WSW from a position 0.4 mile S of the head of South Breakwater. All breakwaters are lit.

Uedomari Saki Light

Anchorage, sheltered from W winds, can be taken, in 10.1m or more, outside of the breakwaters at Kafuka Ko.

Kufuka Ko and Funadomari Ko are terminals for the ferries to Hokkaido.

Nairo Ko Light is shown from the head of a breakwater 7 miles N of Karannai Misaki.

Rebun Suido, 5 miles wide between Rebun To and Rishiri To, is deep and free of dangers. The currents set NE.

1.7 Rishiri To (Rishiri Shima) (45°11'N., 141°15'E.) is a volcanic island, rising to Rishiri San, a conical mountain, 1,719m high, at its center. The summit of the mountain is usually in clouds or mist, but with NE winds or after a heavy rain it is visible for about 80 miles.

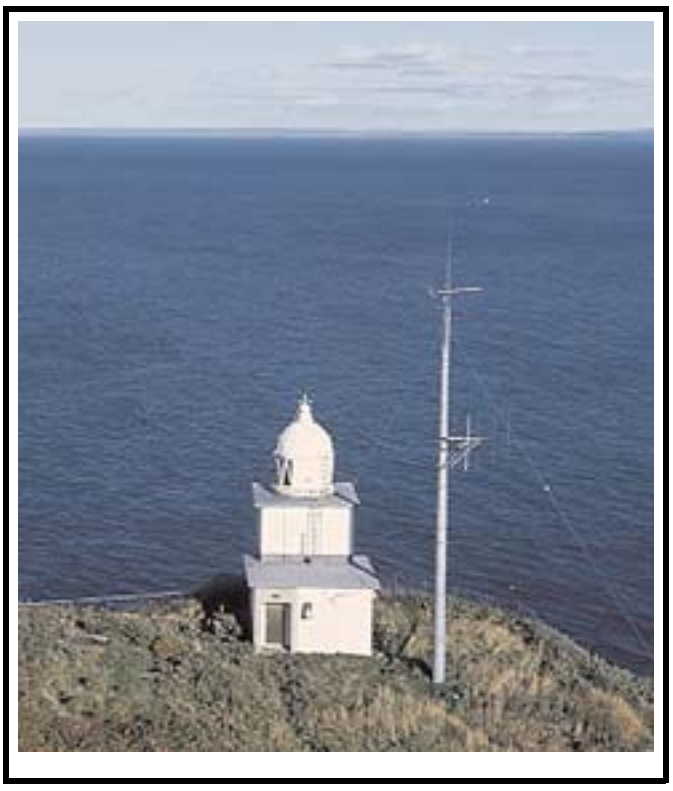
The coasts of the island are mostly low and backed by dense woods. The NW side of the island facing Rishiri Suido has depths of less than 10.1m extending about 0.3 to 0.5 mile offshore. The remainder of the island has no dangers less than 10.1m beyond 0.25 mile offshore.

Beshi Misaki (45°15'N., 141°14'E.), a small peninsula with a steep outer cliff and a sharp summit, 93m high, lies about 1.5 miles ESE of Hontomari Misaki (Motodomari Misaki), the N extremity of Rishiri To. Oshidomari Light is shown on Beshi Misaki. Oshidomari Ko (Osidomari Ko), a small port, lies close S of Beshi Misaki.

Oshidomari Wan, entered between Beshi Misaki and Notsuka Misaki (Nozuka Misaki), about 1.8 miles ESE, is sheltered from winds from the SE through S to NW, and partially sheltered from winds between E and SE by the mainland; at times

Kafuka Light

Ishi Saki Light



Oshidomari Light

there are strong winds from Rishiri San. The holding ground in most places is good. Depths of less than 10.1m extend about 0.2 to 0.4 mile offshore.

Ishi Saki (Isi Saki), the E extremity of Rishiri To, is marked by a light shown from a round tower, 32m high.

Oniwaki Ko (45°09'N., 141°19'E.), a small port, lies about 1.5 miles SW of Ishi Saki.

The harbor, in which there are general depths from 3 to 5m, is entered from the NNE between the N breakwater and the W head of the S breakwater, which is Y-shaped.

A light is shown from the W head of the S breakwater and on a beacon on the head of the N breakwater.

A light is shown on the N head of a detached breakwater, 0.2 mile ENE of the W head of the S breakwater.

The best anchorage off Oniwaki Ko, in about 13m, sand, lies about 0.3 mile E of the S breakwater head. During winds from the W, anchorage should be obtained as close inshore as possible.

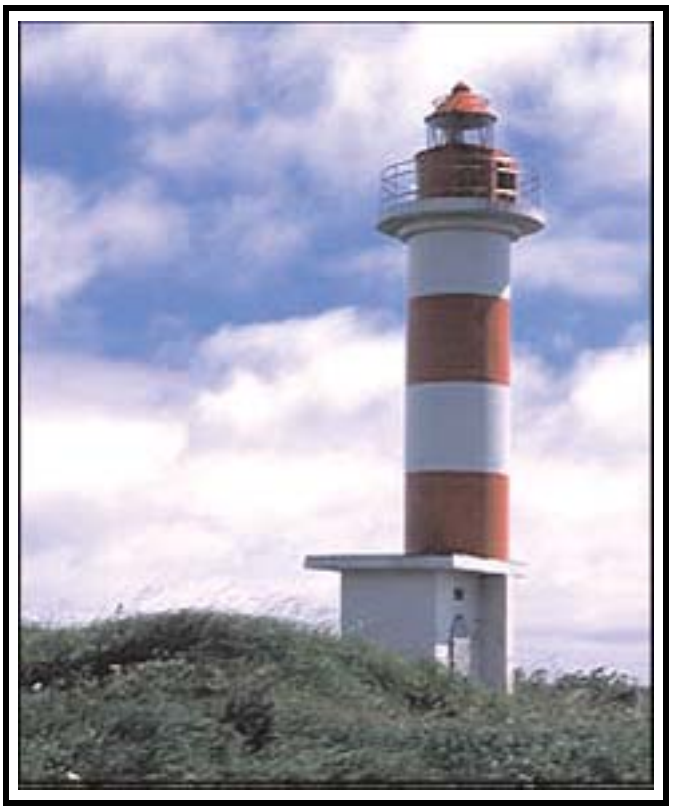
Caution.—Submarine cables extend from the foot of the E breakwater at Oshidomari Ko. Three detached breakwaters are constructed 0.15 mile S and SE of the head of the E breakwater. A light is shown from its N head.

Senhoshi Saki (Senposi Saki), the S extremity of Rishiri To, is marked by a light. Senposhipon Yama, a hill, 320m high, is conspicuous with its barren top, about 1.8 miles NNE of Senhoshi Saki. Oniwakipon Yama, 411m high, about 1.8 miles farther NE, has a prominent wooded summit, which from the S appears as two.

Senhoshi Ko, a fishing port, lies 1.5 miles NW of Senhoshi Saki. The lighthouse on the E breakwater is an excellent landmark when approaching Rishiri To from the S.

Senhoshi Tai (Senposi Tai), SW of Rishiri To, consists of two parts, with a deep trough between Rishiri Ne (Risiri Ne), with a least depth of 56m, lies about 10 miles SW of Senhoshi Saki. Orikomino Ne, with a least depth of 42m, lies about 7 miles WNW of Rishiri Ne.

Musashi Tai is an extensive bank, with its least depths in position 44°46'N, 140°21'E, about 46 miles WSW of Rishiri San.



Senhoshi Saki Light

This shoal area has four shoals, with depths of 4.9 to 34m, within a radius of 1.75 miles. On the NE side of this shoal area there is a shoal 10.1m deep, 180m long, and 18m wide. The shoal area has a thick growth of seaweed and is surrounded by deep water. The remainder of Musashi Tai, with depths of less than 200m, extends about 20 miles NW and 30 miles SE of the shoal area, and is about 20 miles wide.

Rishiri Suido (Risiri Suido), between Rishiri To and Hokkaido, is 10 miles wide, deep, and free of dangers. Conspicuous landmarks on Rebun To and Rishiri To make navigation easy; however, Rishiri Suido is relatively shallow on the mainland side, where depths of less than 10.1m extend from 1 to 1.5 miles offshore. There are no conspicuous landmarks on the mainland side and it is advisable to navigate nearer to Rishiri To.

The current sets NE in Rishiri Suido, attaining velocities of 1 to 1.5 knots in summer, and increasing markedly with strong SW winds.

Noshappu Misaki to Tampake Misaki

1.8 The coast from **Noshappu Misaki** (45°27'N., 141°39'E.) to Tampake Misaki, about 68 miles S, is generally low, with very few conspicuous landmarks. Depths of over 19.8m lie from 1 to 2 miles offshore, except off Haboro. where depths over 19.8m lie 3 miles offshore; there are no detached off-lying dangers. There are no harbors suitable for large vessels. However, with E winds, temporary anchorage can be obtained in suitable depths, sand or mud, nearly anywhere along this coast.

Bakkai Misaki, about 8 miles S of Noshappu Misaki, is a small projection, 1m high, with a village on it, providing an excellent radar target. A rock, with a depth of 10.1m, lies about 1.3 miles NW of Bakkai Misaki.

The mouth of Teshio Gawa (Teshio Kawa) lies about 26 miles farther S; a light is shown near the entrance. A white chimney, 38m high, is conspicuous about 0.5 mile N of the light. The town of Teshio (Tesio), E of the river mouth, is an excellent landmark day or night. There are low tablelands and plains N of the Teshio Gawa estuary, while S of the estuary is a series of low hills. Owing to the fluctuating depths in the entrance, the port is used by vessels of not more than 150 gt.

The coast for about 15 miles S of Teshio Gawa consists of low, flat, sandy beach, then changes to brown sea-eroded cliffs, 30 to 50m high, for about 4 miles to Toyosaki Misaki.

At Embetsu (Onbetsu), about 10 miles S of Teshio Gawa, a railway bridge, painted green and crossing a river, is conspicuous. A radio tower, 135m high and marked by red lights, is visible from 10 miles offshore.

The coast between Toyosaki Misaki and Tomamae Saki, about 16 miles SSW, consists of intermittent light brown cliffs, 20 to 30m high, backed by plateau-like hills. Inland there is dense, dark forest.

Tomamae Saki (44°19'N., 141°39'E.) is a headland with a small bare hill, 64m high; there are cliffs on its seaward side, with houses at the foot of the cliff.

Tomamae Saki is foul on its W and N sides; from it a reef extends about 0.9 mile NNW. The bottom in the vicinity is rocky and very uneven; depths of about 5m are found up to 1 mile NNW of the point.

Pisshiri Yama (Pissiri San), a mountain, 1,032m high, is conspicuous about 17 miles E of Tomamae Saki. Maru Yama, a small wooded hill, 179m high, lies about 5 miles SSE of Tomamae Saki and 1.75 miles inland; its round black summit forms a good landmark, but from a distance, especially from the N, it is difficult to distinguish it from the mountains behind.

Haboro Syo (Haporo Sho) lies with its least depth of 5.4m about 3.5 miles N of Tomamae Saki, and about 2.5 miles offshore. The shoal extends about 1.3 miles in a N-S direction.

1.9 **Yangeshiri Shima** (44°26'N., 141°25'E.) lies about 12 miles NW of Tomamae Saki and rises to an elevation of 93m at its W end. The island is bordered by rocks and reefs. A light is shown from the SE end of the island. Kamoi Iwa, a rock, 4.9m high and marked by a beacon, lies about 0.5 mile E of the SE end of Yagishiri-jima; it is illuminated by an auxiliary light at the lighthouse. A reef, awash in any sea, extends about 0.1 mile E of Kamai Iwa, and a rock, with a depth of 5.7m, lies about 91m farther E. Higano Se, with a depth of 4.8m at its outer end, extends about 0.3 mile W from the W end of the island.

Teuri-jima (Teuri To) (Teure Shima), about 2 miles W of Yagishiri-jima, rises to an elevation of 185m near its SW end. Teuri-jima Light is shown about 0.4 mile SW of Gome Saki, the N extremity of the island. Gome Iwa, a jagged rock 2.5m high and marked by a light, lies on a reef extending nearly 0.5 mile N of Gome Saki; the reef is usually marked by breakers. A light is shown from Akaiwa Saki, the SW end of Teuri-jima.

Courtesy Japan Coast Guard

Rumoi Ko

A light is shown from a white tower, 9m high, on the head of a breakwater at **Maehama Ko** (44°25'N., 141°20'E.) on the E side of the island.

Nishino Se, a ridge with a depth of 4.5m at its outer end, extends nearly 0.5 mile E from the E extremity of Teuri-jima. Na-kano Se, a detached rock with a depth of 3.5m, lies about 1 mile ESE of the same extremity.

Musashi Suido (Musasi Suido), the channel between the islands, has a navigable width of 1 mile, with depths over 10.1m, between Higano Se to the E, and Nishino Se and Na-kano Se to the W. The N current in Musashi Suido is very weak with a velocity of less than 0.5 knot. Strong N winds may cause a S set in the passage.

Caution.—Vessels without radar should not attempt the passage in low visibility, as it is difficult to determine the position by soundings.

Rumoi Ko (43°57'N., 141°38'E.)

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1.10 Rumoi Ko, an artificial harbor, lies E of Rumoi Saki and W of the mouth of Rumoi Gawa. South Breakwater extends N from Rumoi Saki, while North Breakwater extends W from the training wall on the W side of the mouth of Rumoi Gawa. West Breakwater, detached and lying in a NE-SW direction, is situated about 0.3 mile W of the head of South Breakwater. The harbor is divided into four areas, as follows:

Rumoi Ko—Berth Information

Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Kotanhama Wharf							
North	240m	10.0m	113m	9.0m	19.2m	11,354 dwt	Logs, coal, and sand.
West	260m	7.5m	139m	7.3m	21.0m	12,672 dwt	Ferries and coal.
NorthWharf							
No. 01	—	8.0m	117m	7.3m	19.4m	8,898 dwt	Coal, logs, and cement.
No. 02	—	8.0m	111m	7.3m	18.0m	6,910 dwt	Coal, logs, and cement.
No. 03	—	8.0m	108m	7.3m	18.5m	7,310 dwt	Coal, logs, and cement.

Rumoi Ko—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Sandomari Wharf							
Coal	292m	12.0m	170m	7.3m	19.0m	29,256 dwt	Coal.
South Wharf							
No. 1	150m	8.0m	115m	7.0m	19.0m	8,898dwt	Cement.
No. 2	150m	8.0m	115m	7.0m	19.0m	8,898 dwt	Cement.
No. 3	292m	7.0m	77m	6.4m	13.5m	1,448 dwt	General cargo.
No. 4	293m	7.0m	98m	6.4m	16.0,	5,461 dwt	General cargo.
Tanker Berths							
JX Nippon and Oil Depot							
North Dolphin	10.0m	7.0m	—	6.4m	17.20	6,852 dwt	Clean products.

Winds—Weather.—The sea around Rumoi Ko is usually calm from late April to early August, becoming stormy from late August to late March. The prevailing winds are from the ESE. Rumoi Ko is noted for its strong winds, particularly in winter when W to N winds sometimes accompany blizzards; waves over 5.8m high batter the breakwaters, sometimes penetrating the Inner Harbor. A fierce winter storm lasting 10 days has been recorded for this area. Rainfall is heaviest from August to December. Snowfall in the area is also heavy.

Depths—Limitations.—The channel leading to the Inner Harbor has been dredged to 8m; however, shoaling up to 3.5m has been reported at the entrance 0.2 mile either side of the North Breakwater. Vessels tend to remain seaward of the 10m line in Area No. 4.

The principal berthing facilities are described in the table titled **Rumoi Ko—Berth Information**.

Aspect.—The coast from Rumoi Ko to Tomamae Saki, about 22 miles N, is a straight, sandy beach with low, rolling hills inland. **Rumoi Saki** (43°57'N., 141°38'E.) is the N extremity of a plateau, about 20m high, which is conspicuous due to the houses on it. A group of oil tanks about 0.4 mile S of Rumoi Saki is conspicuous. Rumoi Light is shown about 0.8 mile NE of Rumoi Saki. Two white concrete masts, the highest 67m high with triangular topmark, are conspicuous nearly 1.5 miles N of Rumoi Light. Lights mark the SW end of the W breakwater, and the head of the E breakwater, which extends 0.8 mile N from Rumoi Saki. A breakwater extends W from a position on the shore about 0.9 mile N of Rumoi Light; a light is shown from its head.

Pilotage.—Pilotage is not compulsory, but is recommended. Requests for pilotage should be sent 24 hours in advance. Pilots board in the quarantine anchorage in summer and in Area No. 3 in winter.

The pilots may be contacted on VHF channel 16, or telephone (81-164-424-128), or facsimile (81-164-424-128).

Anchorage.—The quarantine anchorage, centered about 0.5 mile NNW of Rumoi Saki, has depths of 13 to 20.1m. There is risk of dragging in strong W to N winds.

Area No. 3 has a sand bottom, with poor holding ground, with risk of dragging in strong W to N winds. There are depths of 5.2 to 10.4m in the W part of Area No. 3; obstructions, with depths of 9.8m and 10.1m, lie in this part of the area.

Caution.—To ensure the passage between the outer and inner port is not obstructed, anchorage is prohibited within an area approximately 300m N of the W side of the entrance of the inner port.

Rumoi Ko to Ishikari Wan

1.11 The coast from Rumoi Ko to Notsuka Saki, about 7 miles SW, is bordered by cliffs about 40m high, with low hills covered with grass inland. Notsuka Saki is the N extremity of a relatively flat headland; the town of Mashike on the headland and Mashike Ko Light on its E side are conspicuous from a distance.

Mashike Ko (43°51'N., 141°32'E.) lies E of the headland. The harbor provides berths with a total length in excess of 600m, with depths of up to 5.6m alongside. Reclamation is in progress in the S part of the harbor.

Anchorage.—Local vessels generally anchor, in 8 to 11m, gravel over soft bedrock, poor holding ground, with Mashike Light bearing between 225° and 270°, distant about 0.5 mile. The anchorage is exposed to winds from the N to E, but sheltered from W to NW winds. There is risk of dragging with strong SE winds.

1.12 The coast from Notsuka Saki to Ofuyu Misaki, about 12 miles SW, consists of a low sandy beach on the shores of a shallow bay for about 3 miles, then a high mountain range backs the coast, descending abruptly seaward with cliffs, 100m high. Futatsu Iwa, two rocks 1.4m high, lie about 0.5 mile offshore, about 2.5 miles WSW of Notsuka Saki.

Ofuyu Misaki (Ohuyu Misaki) (43°43'N., 141°20'E.) is a cliffy headland, 90m high. Ofuyu Misaki Light is shown from a hill, 235m high, about 0.3 mile E, and is conspicuous day or night; the light structure is difficult to distinguish when snow accumulates. A waterfall on the N side of the headland is conspicuous when viewed from the W. Ofuyu Yama, 1,198m high, about 2.5 miles ENE of Ofuyu Misaki, is conspicuous from a distance, and Shokambetsu Dake (Syokambetu Take), 1,491m high, about

Ishikari Bay New Port

5.3 miles farther ESE, is the highest mountain in the vicinity and also conspicuous. The summits of both mountains are often hidden in clouds or mist. Tengu Dake, a mountain 983m high, about 5 miles NW of Ofuyu Misaki, has a bare ridge sloping NW, flanked by wooded slopes, and ending in a gray cliff, 494m high, conspicuous from the NE or SW.

Okino Se, with a depth of 3.7m, lies about 1.5 miles offshore at the outer end of foul ground extending NNW of Ofuyu Misaki. Chino Se, with a least depth of 1.3m, and Todo Shima, a large boulder 2m high, lie between Okino Se and the shore to its SE.

Tides—Currents.—The currents in the vicinity of Ofuyu Misaki are generally weak. From late March to early May, a strong current flows N with velocities of 2 to 6 knots; it is believed this current is influenced by the discharge of spring flood waters from Ishikari Gawa.

Caution.—Ofuyu Misaki should be given a berth of at least 3 miles to ensure clearing Okino Se, 2 miles NNW of Ofuyu Misaki. This shoal is the outermost of several dangers, above and below-water, which lie on foul ground NNW of Ofuyu Misaki.

Ofuyu Misaki to Otaru Ko

1.13 Aikappu Misaki (43°31'N., 141°22'E.), about 13 miles S of Ofuyu Misaki, is a cliffy headland; the elevated outer tip of the headland appears like a detached island when viewed from the N or S. A flat-topped mountain, 486m high, on top of the headland, is radar conspicuous. The coast recedes between the two headlands to sand and gravel beaches. Kogane Yama, a cone-shaped mountain, 740m high, is conspicuous about 9 miles SE of Ofuyu Misaki.

An open bay lies between Aikappu Misaki and Takashima Misaki, about 23 miles SW. Otaru Ko lies S of Takashima Misaki.

The coast between Aikappu Misaki and Atsuta, about 8 miles SSE, is bordered by cliffs and backed by a range of steep, densely wooded mountains. From there to the mouth of Ishikari Gawa, the coast consists of gravel beaches backed by a series of low treeless hills. Asoiwa Yama, 418m high, with a dome at its summit, lies about 7 miles ENE of the mouth of Ishikari Gawa, and is conspicuous as it is surrounded by low, bare hills.

Ishikari Gawa, the largest river in Hokkaido, is accessible only to boats. The small port of Ishikari Ko lies in the mouth of the river. The bar at the river mouth is constantly changing, and the river is tidal for about 8 miles upstream.

A submarine cable runs in a NW direction close N of Ishikari Gawa.

Depths—Limitations.—A T-shaped pier, East Wharf, lies on the SW side of East Breakwater. There is a lumber quay on the SW side of East Wharf, with an alongside depth of 10.1m. The fairway to the lumber quay is being dredged to 10.1m. One tug of 2,500 hp is available. Additional tugs are available from Otaru, if required.

Aspect.—The coast from the mouth of Ishikari Gawa to Zenibako, about 12 miles SW, is a series of low sandy beaches. The land W of Zenibako consists of plateau-type hills, the coastline alternating between stretches of cliffs and gravel beaches.

Anchorage.—Temporary exposed anchorage can be taken, in 11 to 12.8m, mud bottom, about 1 mile off the mouth of the river.

1.14 Ishikari Bay New Port (43°13'N., 141°17'E.), an artificial harbor on reclaimed land about 4.5 miles SW of the mouth of Ishikari Kawa, is a principal port. It was built to support the Sapporo area and Hokkaido as a whole.

Ishikari Bay Home Page
http://www.ishikari-bay-newport.jp

Depths—Limitations.—The entrance channel, marked by buoys, is dredged to 10m.

Tarukawa Wharf has five berths, two with a total length of 370m and a 10m depth alongside.For further berthing information refer to the table titled **Ishikariwan Shinko—Berth Information.**

Aspect.—Range lights bearing 167.75° lead to Bannaguro Wharf and Tarukawa Wharf. The harbor is protected by artificial breakwaters. The E breakwater extends 0.5 mile NW from the shore, about 4.25 miles SW of the entrance to Ishikari Kawa. A detached breakwater extends 0.75 mile WNW close off the head of the E breakwater. The N breakwater, also detached, extends 2 miles SW from a position 0.3 mile NNW of the W end of the detached breakwater.

A light is shown from each end of the N breakwater. Another light is shown from the W head of the detached breakwater. The harbor is the focal point for the distribution of commodities in the central region of Hokkaido.

A light has been established 5.5 miles NE from the mouth of Ishikari Kawa.

Ishikariwan Shinko—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			Draft	Size	Beam	
Bannaguro Wharf						
BT-1	185m	10.0m	—	15,000 dwt	25.0m	Containers and reefer.
BT-2	185m	10.0m	—	15,000 dwt	25.0m	Containers and reefer.
BT-3	170m	10.0m	—	10,000 dwt	17.5m	Containers and reefer.
BT-4	220m	7.5m	—	10,000 dwt	16.5m	Cement.
East Wharf						
Cargo Quay	200m	—	—	—	15.0m	Aggregates and scrap metal.
ET-1	200m	10.0m	—	15,000 dwt	28.4m	Aggregates and scrap metal.
ET-2	130m	7.5m	—	10,000 dwt	17.0m	Limestone and scrap metal.
ET-3	130m	7.5m	—	10,000 dwt	20.0m	Limestone and scrap metal.
Tarukawa Wharf						
TT-1	185m	10.0m	7.0m	15,000 dwt	25.2m	Cement.
TT-2	185m	10.0m	7.0m	15,000 dwt	22.4m	Cement.
TT-3	130m	7.5m	6.4m	10,000 dwt	17.0m	General cargo.
TT-4	130m	7.5m	6.4m	10,000 dwt	17.0m	General cargo.
TT-5	130m	7.5m	—	10,000 dwt	15.0m	Aggregates and steel products.
West Wharf						
WT-1	280m	14.0m	—	50,000 dwt	32.2m	Wood chips.
Tanker Berths						
Center Wharf						
CT-1	148m	7.5m	—	—	17.2m	LNG and LPG.
CT-2	148m	7.5m	—	—	12.5m	LPG.
CT-3	148m	7.5m	—	—	12.5m	CCP.
CT-4	140m	7.5m	—	—	18.2m	CPP.
CT-5	140m	7.5m	—	5,000 dwt	18.2m	CPP.

Ishikariwan Shinko—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			Draft	Size	Beam	
CT-6	140m	7.5m	—	—	18.2m	—
Ishikari LNG Terminal						
CT-7	115m	—	—	—	49.0m	LNG.

Ishikari Bay New Port—East Wharf

Pilotage.—Pilotage is not compulsory, but is recommended for arrival. Pilots are available at the Otaru quarantine anchorage during daylight hours only.

Contact Information.—See the table titled **Ishikari Port—Contact Information**.

Ishikari Port—Contact Information	
Pilots	
VHF	VHF channels 16, 11, 12, and 14
Port	
Call sign	Ishikari Port Radio
VHF	VHF channels 11, 12, 14, and 16
Telephone	81-134-315-635
Facsimile	81-134-315-667
E-mail	gzz03721@nifty.ne.jp

Anchorage.—In fine weather, anchorage may be obtained 4.5 miles NE of the mouth of Ishikari, in about 11m, mud bottom. This anchorage is exposed.

Ishikari Wan

1.15 Ishikari Wan (Isikari Wan), a large bay, is entered between **Ofuyu Misaki** (43°43'N., 141°20'E.) and Shakotan Misaki, about 43 miles WSW. The E side of the bay is backed by mountains, and the S side of the bay is backed by the volcanic plateau of Shakotan Hanto (Syakotan Hanto). Therefore, there are no significant coastal plains on the E and S sides of the bay, which are almost entirely bordered by sea-eroded cliffs.At the head of the bay is a low sandy beach, behind which is the Ishikari Plain, where Ishikari Gawa flows into the sea.

At the head of the bay, depths of less than 20.1m extend from 2 to 3.5 miles offshore. The E and S sides of the bay are relatively steep-to, with depths of less than 20.1m no more than 1 mile offshore. There are no detached islands or dangerous reefs farther offshore.

Landmarks visible from outside the bay are Ofuyu Yama (previously described in paragraph 1.12), on the E side of the bay, and, on the S side of the bay, Shakotan Dake (Syakotan Take), 1,255m high, about 6 miles S of Shakotan Misaki, and Yobetsu Dake, 1,299m high, about 1 mile farther SW.

Ishikari Light

The important port of Otaru Ko is situated on the S side of the bay.

Shakotan Misaki to Benkei Misaki

1.16 **Kamui Misaki** (Kamoi Misaki) (43°20'N., 140°21'E.), the NW extremity of Shakotan Hanto, lies about 5.5 miles WSW of Shakotan Misaki; it is a narrow gray treeless point, 83m high, and strewn with boulders. A light is shown from the point from a round tower, 11m high. A rocky ridge extends about 0.6 mile NW of Kamui Misak. Several pointed rocks lie on this ridge, and extend about 0.4 mile NW of the point.

Kamui Iwa, 41m high, the middle rock, is easily recognized by its sharply pointed top. Menoka Iwa, 9.2m high, the outermost rock, is low and flat. A sunken rock, at the outer edge of the ridge, lies about 0.2 mile NW of Menoka Iwa.

Yobetsu Ko, a small fishing harbor, lies about 1.5 miles E of Kamui Misaki.

Yobetsu Take (Yobetu Take), 1,299m high, about 6.5 miles SE of Kamui Misaki, and Shakotan Dake (Syakotan Take), 1,260m high, about 1 mile NE of Yobetsu Take, are the two highest mountains of Shakotan Hanto.

A rocky bank, with a least depth of 96m about 8 miles NW of Kamui Misaki, might prove useful in determining a vessel's position in dense fogs or blizzards; that part of this bank with depths of less than 120m is 1 mile wide.

The coast between Kamui Misaki and Kawashiri Misaki, about 7 miles S, consists of sandy beaches backed by hills rising so steeply as to give the appearance of cliffs. It is comparatively steep-to, with no off-lying dangers, but there are rocks within 0.4 mile of the coast.

A large bay is formed between Kawashiri Misaki and Benkei Misaki, about 24 miles SSW. Iwanai Ko lies at the head of the bay; Suttsu Wan, a smaller bay, lies on the S side of the bay.

Kamui Misaki Light

The coast between Kawashira Misaki and the mouth of Horikappu Gawa, at the head of the bay, forms the SW side of Shakotan Hanto. The coast is cliffy for about 4 miles SE of Kawashira Misaki, then the terrain lowers gradually and becomes a series of pebbly beaches. The vicinity of Iwanai Ko, at the head of the bay, consists of low, sandy beaches, backed by low, flat country.

Kamuenai Ko, a small fishing harbor, lies about 6.5 miles SE of Kawashira Misaki. Kabuto Misaki, a headland about 3.5 miles farther SE, is conspicuous from the NW. Tomari Ko, a small fishing harbor, lies about 1.5 miles SE of Kabuto Misaki.

Takashima Misaki to Shakotan Misaki

1.17 The coast between **Takashima Misaki** (43°14'N., 141°01'E.) and Shakotan Misaki, about 26 miles WNW, consists of precipitous cliffs, some over 150m high, rising from the sea. The shoreline is irregular and deeply indented by many bays and inlets, alternating with cliffy headlands. The heads of the bays are generally shallow, but the coast in general is steep-to, with deep water close offshore. There are no detached dangers, with depths of less than 10.1m, lying over 0.5 mile offshore.

Madoiwa Hana, about 4 miles W of Takashima Misaki, rises to an elevation of 182m; its seaward side is a precipitous cliff with a window-like cave in its lower part. Maru Yama, 629m high, has a sharp grass-covered peak and is easily identified about 2.8 miles farther S.

A peninsula, about 3 miles W of Madoiwa Hana, has a hill, 88m high, covered with trees and grass on its E side. A helmet-shaped rock, 38m high, lies at the NW extremity of the peninsula.

Yoichi Wan is entered between the above peninsula and **Shiriba Saki** (43°13'N., 140°47'E.), about 3.5 miles to the W. Shiriba Saki rises to a thickly-wooded and pointed summit, 296m high; it is faced by a steep cliff, and slopes gently on its

landward side. Daikoku Yama, 725m high, the W of twin thickly-wooded peaks, lies about 7 miles S of Shiriba Saki; the land slopes gently from these peaks to the head of Yoichi Wan. Tengu Yama, 876m high, about 5.5 miles WSW of Shiribi Saki, is the highest mountain in the vicinity.

Yoichi Wan has depths of 29m in the middle of its entrance, and shoals gradually to the head of the bay. The bottom is sand and free of obstructions. The bay is not suitable for anchorage with winds from the NW through N to E, when swells penetrate the bay. Yoichi Ko, a fishing harbor, lies on the W side of the bay. Anchorage can be taken, in about 14m, about 0.3 mile SE of the head of the N breakwater at Yoichi Ko; the bottom is sand, good holding ground, and the anchorage was reported satisfactory even in winter in strong Northwest Monsoon winds.

Shakotan Misaki (Syakotan Misaki) (43°22'N., 140°28'E.) is faced by a cliff, 120m high. A light is shown at an elevation of 143m on De Misaki.

Maruyama Misaki (43°17'N., 140°39'E.), about 7 miles WNW of Shiriba Saki, has a steep black cliff on its N side and rises to a pointed summit, 195m high, covered with trees. The headland is fringed with rocks; the outermost rock, with a depth of 2.7m, lies about 0.2 mile N of the headland. Furubira Ko, a small fishing harbor, lies SW of the headland.

Three fish havens lie within 1.5 miles of the coast between Furubira Wan and Yochi Wan.

Atsutoma Misaki, a black headland, 84m high, lies about 1 mile NW of Maruyama Misaki; a rock, 3.1m high, lies about 0.2 mile N of the headland.

Bikuni Wan lies between Atsutoma Misaki and Kogane Misaki, about 1.3 miles farther WNW. Takara-jima, an island 104m high, lies about 0.2 mile N of Kogane Misaki.

Makka Misaki (Makkano Misaki), a cliffy headland, 166m high and covered with grass, lies about 4.8 miles NW of Kogane Misaki; two pinnacle rocks, 105m and 80m high, respectively, close off the headland, are conspicuous from the SE or NW.

De Misaki, the N extremity of Shakotan Hanto (Syakotan Hanto), lies about 2.3 miles WNW of Makka Misaki; Shakotan Misaki lies about 1 mile farther WSW.

Otaru Ko (43°12'N., 141°01'E.)

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1.18 Otaru Ko is entered between Kayashiba Misaki, about 1 mile S of **Takashima Misaki** (43°14'N., 141°01'E.), and Haraiso Misaki, about 2.8 miles farther SSE. The harbor is formed by a N breakwater and a S breakwater, with a detached breakwater at the N end of the S breakwater. A small detached breakwater extends about 0.2 mile seaward of the S end of the N breakwater. A short detached breakwater extend from the N end of the S breakwater.

Lights are shown marking the harbor entrance. The harbor is surrounded by hills on its N, W, and S sides, and is well-sheltered. The city of Otaru, W of the harbor, has many hilly streets due to the mountainous terrain close to the shore. Benten Shima, 17m high, about 0.5 mile SSW of Kayashiba Misaki, has breakwaters extending N and S of it, forming a fishing harbor.

Winds—Weather.—At Otaru, SW to W winds predominate for most of the year, though in June, E winds slightly exceed those from the SW, and in July E winds roughly equal those from SW. Snowstorms may delay cargo operations during the winter.

Otaru—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Central Wharf					
No. 1	130m	7.50m	—	3,000 dwt	Cement.
No. 2	182m	10.0m	—	10,000 dwt	Cement.
No. 3	185m	10.0m	—	10,000 dwt	Fishing vessels.
No. 4	247m	12.0m	—	20,000 dwt	General cargo.
No. 5	130m	7.5m	—	3,000 dwt	Fishing.
Katsunai Wharf					
No. 1	260m	13.0m	12.4m	25,000 dwt	Grain.
No. 2	185m	10.0m	—	10,000 dwt	Cruise vessels.
No. 3	185m	10.0m	—	10,000 dwt	Cruise vessels.
No. 4	185m	10.0m	—	20,000 dwt	—
No. 5	251m	9.0m	—	20,000 dwt	Cruise vessels.
Minato Machi Wharf					
No. 1	130m	7.5m	—	30,000 dwt	Aggregates, ro-ro/lo-lo, and fishing vessels.
No. 2	240m	7.5m	—	30,000 dwt	Containers.

Otaru—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
No. 1 Wharf					
No. 3	280m	14.0m	—	55,000 dwt	Ro-ro, passengers, and vehicles.
No. 4	147m	9.0m	—	10,000 dwt	General cargo.
No. 5	147m	9.0m	—	10,000 dwt	General cargo.
No. 6	128m	4.0m	4.0-7.0m	1,000 dwt	—
No. 2 Wharf					
No. 7	—	7.5-12.0m	—	6,000 dwt	Fishing vessels.
No. 8	—	—	—	—	Fishing vessels.
No. 9	126m	7.5-8.5m	—	3,000 dwt	Aggregates.
No. 10	146m	9.0m	—	10,000 dwt	Fishing vessels.
No. 11	147m	9.0m	—	10,000 dwt	Aggregates.
No. 12	128m	7.0m	—	3,000 dwt	Closed.
No. 3 Wharf					
No. 13	157m	9.0m	—	10,000 dwt	Ro-ro and passengers.
No. 14	187m	9.0m	—	10,000 dwt	Cruise vessels
No. 15	97m	9.0m	—	—	Fishing vessels.
No. 16	194m	10.0m	—	10,000 dwt	Closed.
No. 17	168m	9.0m	—	10,000 dwt	—
No. 18	128m	5.0m	—	—	—
Umay-machi Wharf					
No. 1	—	7.5m	—	3,000 dwt	Aggregates.
No. 2	—	7.5m	—	3,000 dwt	—
No. 3		7.5m	—	3,000 dwt	Clean products.

From November to March the sea is usually rough, but from April to October, it is generally calm. When strong N winds persist for 4 or 5 hours, swells tend to penetrate into the harbor.

Sea fog forms in the vicinity of Otaru Ko from early April to late August. The peak season is June and July. Fogs usually start to form about 1400, reach maximum density from 1600 to 1700, and dissipate by 1900. The incidence of fog is low, and the moisture content is barely enough to dampen one's clothes. In winter, Otaru is sometimes covered with haze.

Depths—Limitations.—Outside the breakwaters, the depths are generally over 14.9m. The fairway into the harbor has least a depth of about 14.0m.

The principal berthing facilities are described in the table titled **Otaru Ko—Berth Information**.

Aspect.—Takashima Misaki (43°14'N., 141°01'E.) rises to Hiyori Yama, a hill 44m high, from which a light is shown. A white building, on the E slope of a hill, is conspicuous nearly 0.5 mile W of the light structure; the building, which is illuminated by mercury lights at night (usually until midnight), and being higher and brighter than Hiyori Yama Light, should not be mistaken for the light. Todo Iwa, a black rock, 22m high, lies about 0.4 mile NW of Takashima Misaki.

Akaiwa Yama, a hill, 371m high, with a conspicuous cliff on its seaward side, lies about 1.5 miles WSW of Takashima Misaki.

Kayashiba Misaki is a useful landmark for vessels approaching from the N, as the headland is silhouetted against the city lights in the background.

Haraiso Misaki, at the S end of the port, has a cliff at its outer end, which is easy to identify even in poor visibility; a building on the headland is conspicuous day or night.

Teine Yama, 1,024m high, with a TV relay station near its summit, lies about 9.5 miles SE of Haraiso Misaki. The mercury lights of the station are visible from off Shakotan Misaki, distant 40 miles. Six TV relay towers are conspicuous. Another tower is reported conspicuous 2.5 miles W of the summit.

Tengu Yama, 533m high, and Maru Yama, 629m high, lie about 3 miles WSW and 5 miles W, respectively, of Haraiso Misaki, and are excellent landmarks when approaching Otaru Ko.

The Combined Port Affairs Office Building, an eight-story

Benkei Misaki Light

Hiyori Yama Light

building with radio masts on the roof, is situated on the W side of the area between Wharf No. 2 and Wharf No. 3, about 1 mile W of harbor entrance.

Ishi Yama, 145m high, with a cliffy, pointed summit and a round glass-walled building, is conspicuous about 0.8 mile farther WNW.

Fish traps may be laid within 1 mile of the shore from August to November. A fish haven lies 5 miles WNW of Ishikari Ko.

Pilotage.—Pilotage is not compulsory, but pilots are available and may be requested between 0500 (sunrise) and 2200 (sunset). The pilot boards about 1 mile NE of the harbor entrance. In rough weather, pilots board and disembark near the harbor entrance.

Contact Information.—The Otaru pilots can be contacted on VHF channels 11, 12, 14, and 16 and by telephone (81-134-225-3830) and facsimile (81-134-330-228).

The harbormaster can be contacted by telegraph or VHF radio (call sign: Otaru-ho-an) on VHF channels 12 and 16.

Anchorage.—Anchorage is available within the breakwaters, in 9.1 to 12.8m; the holding ground is generally poor. The bottom in the N part of the harbor is sand and mud, while in the S part of the harbor the bottom is often bare bedrock. A dangerous cargo anchorage lies W of the S part of the detached breakwater.

A quarantine anchorage is established 1 mile SSE of Kayashiba Misaki, as indicated on the chart.

Caution.—At night, the lights at the heads of the breakwaters are not easily distinguished due to the city lights in the background.

Vessels should not approach the coast within 0.75 mile between Takashima Misaki and Kayashiba Misaki from March to November, due to the possible presence of fish traps, marked by towers, 3.1m high, and red lights. Additionally, it has been reported (2018) that many small fishing traps are concentrated near the entrance of the harbor, up to a range of 5 miles out to sea. The traps are identified by small buoys with red, black, orange, and white flags.

Iwanai Ko

1.19 Iwanai Ko (42°59'N., 140°31'E.) is a fishing harbor and small port at the head of the bay. The harbor is sheltered by West Breakwater extending N from Iwanai, and East Breakwater extending W from the mainland. A detached breakwater extends 0.2 mile NNE from a position 183m WNW of West Breakwater Light. A light is shown at both ends. Both detached breakwaters are being extended. An inner port for fishing vessels and sheltered by breakwaters, occupies the S part of the harbor. Central Wharf, extending NW, occupies the SE part of the harbor. A boat basin, NE of Central Wharf and sheltered by a breakwater, occupies the E side of the harbor.

Winds—Weather.—Winds from the W and WNW predominate from November through February, and SSE winds predominate from March through October. Fog occurs about 2 days per month in June and July. Snow falls about 26 days per month in December and February, 30 days in January, and 22 days in March.

Tides—Currents.—Weak tidal currents set SW on the flood and NE on the ebb.

Depths—Limitations.—The NW section of the W side of Central Wharf has depths of 4 to 7.5m and a length of 240m. Fisheries Wharf, situated 183m SW of Central Wharf, has a length of 275m, with an alongside depth of 3 to 5m on its N side. East Wharf is 328m long, with 8m alongside.

Aspect.—Iwanai Take (Poronupuri Yama), 1,086m high, lies about 3.5 miles S of Iwanai Ko. Shiribeshi Yama, 1,893m high, lies about 16 miles SE of Iwanai Ko. Both are conspicuous in the approach.

A white oil tank is conspicuous at the root of Central Wharf.

Anchorage.—Open anchorage can be taken, in 11.9m, about 0.4 mile NNE of the head of W breakwater; care should be taken to avoid obstructing the fairway into the harbor. Small vessels can anchor in the outer harbor with the head of W breakwater bearing 340°, distant about 0.2 mile.

The bottom inside the harbor is sand, with relatively good holding ground. The bottom in the harbor approach is fouled. There is a risk of dragging with strong W winds.

Anchorage within the breakwater becomes impossible with strong Northwest Monsoon winds, which cause waves to pass over West Breakwater and combine with the seas entering from the N. Small vessels may then seek shelter in Suttsu Wan.

Caution.—It is reported that a dangerous obstruction exist approximately 940m W of West Breakwater Light. The inner port is heavily congested with fishing vessels in the fishing season (June to August).

1.20 **Raiden Misaki** (42°55'N., 140°24'E.), about 7 miles SW of Iwanai Ko, is a headland flanked by a black cliff connecting it to another headland about 2.5 miles NE; steep cliffs between the headlands are conspicuous from seaward. Several buildings of a hot springs resort are conspicuous day or night, E of Raiden Misaki.The mouth of Shiribetsu Gawa, about 3 miles SSW of Raiden Misaki, is bordered by low, sandy beaches. A reef, with a depth of 1.5m, lies about 0.5 mile NW of the river mouth.

A light is shown on the coast about 2 miles farther SSW; it illuminates a white beacon about 0.3 mile W of it.

Biyano Misaki (Biyano Saki) lies about 2 miles farther SSW. Suttsu Wan is entered between Biyano Misaki and Benkei Misaki, about 5.3 miles W.

Benkei Misaki (42°49'N., 140°12'E.), a low black rocky point, rises to a thickly-wooded summit and is marked at its N end by a light. Horozuki Yama, 504m high, lies about 3 miles SSE of the point. A drying reef extends about 0.2 mile N from the W side of the point.

Suttsu Wan (Suttu Wan) (Sutsu Wan), open N, has shores lined with fishing villages, except along the sandy beach at its head. Shubuto Gawa (Shuputo Kawa) enters the SW corner of the bay, near the W end of the beach. Daimaru Iso, a dangerous reef about 2 miles SE of Benkei Misaki, is marked by a light.

1.21 **Suttsu Ko** (Sutsu) (42°47'N., 140°14'E.), a small fishing harbor, lies about 1 mile farther SSE; the port is congested with fishing boats during the fishing season (June to September).

The outer harbor is protected by the N breakwater which extends about 400m in a generally ESE direction from the N side of the harbor; a light is shown near the head of this breakwater.

The harbor entrance, which faces E, lies between the head of the N breakwater and a detached breakwater extending NNE from near the rocky side of Iwa Saki. A light is shown from the detached breakwater.

Wind—Weather.—Winter winds generally are out of the W or NW, with S winds prevailing during the remainder of the year. A local wind, the Dashi, blows out of the S from the valley of Shubuto Gawa. Average maximum velocities range from 25 to 32 knots, with gusts up to 38 knots. The Dashi is particularly strong during May and June; it blows more during the night than the day, and is strongest at 0600 and 2200. The effects of this local wind are felt in the anchorage and up to 4 or 5 miles offshore. Its impact is greater on the W shore of Suttsu Wan than on the E shore, and it is not felt W of Benkei Misaki.

Fogs are infrequent in this vicinity.

Anchorage.—Fair anchorage can be taken, in 18.3m, about 1 mile N of the mouth of Shubuto Gawa.

Caution.—Fish traps extend 1 mile W of Biyano Misaki from April to December. Fish traps extend about 1.4 miles NE of Suttsu Ko, and up to 1 mile offshore in the inner part of the bay from June to December. Mariculture farms for seaweed and scallops are situated in the S part of the bay. Red flags and lights mark the scallop farms E of Suttsu Ko.

Benkei Misaki to Hogoshi Misaki

1.22 The coast between Benkei Misaki and Shiraito Misaki, about 17 miles SW, is mostly sandy beach, backed by high land. Then to Motsuta Misaki, about 3.5 miles farther SE, the coast consists of precipitous cliffs.

Honme Misaki, a low point marked by a light, lies about 6 miles SW of Benkei Misaki. Kimaki Misaki, about 9 miles farther WSW, is also marked by a light.

Shiraito Misaki (42°40'N., 139°52'E.) is faced by a black cliff, 46m high, and is thickly wooded above the cliff. A waterfall drops from the top of the cliff, E of the headland. The headland is difficult to identify from a distance.

Motsuta Misaki, a headland with a steep red cliff, is conspicuous from a distance. Its summit is a plateau, 200 to 300m high. A light is shown on its N side. Kariba Yama, a wooded mountain,

Honme Misaki Light

Kimaki Misaki Light

1,515m high, lies about 5 miles E of the headland. Kasube Take, a pyramid-shaped mountain, 1,049m high, about 8 miles SE of Motsuta Misaki, is conspicuous from the SW.

Setana (Setanai), surmounted by a 95m hill, lies about 10 miles S of Motsuta Misaki. Rosuka Iwa, 28m high and connected to the mainland by a causeway, is the largest of numerous rocks on the coastal bank abreast the town.

Three vertical rocks, the N and highest being 39m high, lie close NE of Rosuka Iwa.

1.23 Setana Ko (Setanai Ko) (42°27.5'N., 139°50.5'E.), a small harbor between Rosuka Iwa and the mainland, is sheltered N by the causeway and entered S between breakwaters. Detached breakwaters lie 0.2 mile SW of the harbor entrance. The detached breakwaters have been extended.

A reef, with a depth of less than 1m, lies about 1.3 miles SSW of Setana Ko, and about 0.5 mile offshore; it is the outermost reef in the vicinity.

Midare Misaki Light

A stretch of sandy beach, backed by low land, lies S of Setana Ko.

Midare Misaki (Mitare Misaki), marked by a light, lies about 6.5 miles SSE of Setana Ko. Obana Misaki, about 3 miles farther S, is a steep-to red cliffy headland; it is very conspicuous from the SW. Matsukura Yama, 805m high, about 2 miles E of Obana Misaki, is densely wooded, with a sharp peak; its summit is deep green in summer. Kenashi Yama, 816m high and round-topped, lies about 2 miles S of Matsukura Yama; its summit is light green in summer.

Hogoshi Misaki (Hokoshi Saki) (42°16'N., 139°47'E.), about 2.5 miles S of Obana Misaki, is a low headland rising to

a cone-shaped hill, 318m high; it is steep-to and a good landmark from the N or S. Hogoshi Misaki is also known as Ota Misaki. Ota Yama, 483m high, about 1 mile NE of Hogoshi Misaki, has a red cliff near its summit that is very conspicuous from the SW.

Okushiri To

1.24 Okushiri To (Okushiri Shima) (Okusiri To) attains an elevation of 584m at **Kamui San** (Kamui Yama) (42°09'N., 139°27'E.), slightly W of the center of the island. Depths over 20m lie within 0.5 mile of the island, except for the shoal area at the S end of the island.

Inaho Misaki (42°15'N., 139°34'E.), the N end of the island, lies about 10 miles W of Hogoshi Misaki and is marked by a light from which a ramark transmits. It rises to a round hill, 71m high, conspicuous from the NW or SE, about 137m S of the light structure. A rock, 22m high, lies about 0.1 mile N of the light structure. A steep-to reef, on which there are several above-water rocks, extends about 0.4 mile N of the point. Anchorage, sheltered from S winds, can be taken on the W side of Inaho Misaki, in a depth of about 17.1m, with the light structure bearing 068°, distant about 1 mile.

Okushiri Ko (42°11'N., 139°31'E.), a small port, lies about 5 miles SSE of Inaho Misaki. This small harbor is enclosed by South Breakwater, which extends 150m E from the shore at the S end of the harbor, and by East Breakwater, which extends 800m NNE from the outer end of South Breakwater.

A detached breakwater lies with its S extremity close SE of the head of East Breakwater and extends about 0.2 mile NE. A light is shown from this breakwater.

A light is shown about 0.5 mile SE of Okishiri Ko, close off Akaishi Misaki.

Murotsu Shima (Murotu Shima), about 2.3 miles S of Aonae Misaki, is a group of large, black rocks, lying on a drying ridge. Moriiso Shima, 7.9m high, adjoins the largest rock, 6.3m high, close E, on which there are over a dozen houses. A light is shown from the latter rock. A rock, 0.8m high, and a rock, with a depth of 3.6m, lie nearly 1 mile ENE and about 0.3 mile W, respectively, of Moriiso Shima.

Aonae Misaki (42°03'N., 139°27'E.), the S extremity of Okushiri To, is a low spit with a monument, 17m high, at its extremity. A light is shown from the point. A reef, with a depth of 3.6m at its outer end, extends about 1 mile S of the point.

The passage between Murotsu Shima and the reef extending S of Aonai Misaki is about 0.8 mile wide with depths of about 14.9m, but it should not be attempted by large vessels.

Aonae Wan, a sandy bay, is entered between Aonae Misaki, and a point about 1.8 miles NE. Aonae Ko, a fishing harbor, lies on the W shore of the bay. It is enclosed by two breakwaters.

Anchorage.—Aonae Wan affords the best anchorage on Okushiri To in winds from the W to N. However, a heavy swell enters the bay with winds from the NE to SW, making anchorage impossible. Good anchorage can be taken, in 15m, sand, with the S extremity of the N breakwater at Aonae Ko bearing 255°, distant about 0.5 mile. The holding ground is fair.

Kuki Misaki (Gunrai Misaki), about 2 miles NW of Aonae Misaki, is bordered by numerous rocks; Todo Shima, 8.1m high, is a steep-to detached rock, about 0.7 mile W of Kuki Misaki. Two rocks, each about 1.4m high, lie about 1 mile farther N and about 0.4 mile offshore.

Mui Shima, about 2.5 miles N of Kuki Misaki, is a conical islet, 65m high, with a smaller islet close N; it is conspicuous from the N or S.

Kamuiwaki Ko, a small fishing port, lies about 3.5 miles N of Mui Shima.

A reef, with a rock, 4.2m high at its outer end, extends nearly 0.5 mile NNW of Isoya Misaki, the NW extremity of Okushiri To.

Okushiri Kaikyo

1.25 Okushiri Kaikyo (Okusiri Kaikyo), the deep strait between Okushiri To and the W coast of Hokkaido, is the usual route for passing up or down the coast. It is about 9.5 miles wide at its narrow end between Inaho Misaki and Hogoshi Misaki. Both sides of the strait are steep-to with no detached dangers beyond 1 mile offshore, except for the reefs extending S of Anoae Misaki.

Currents are erratic in the N part of Okushiri Kaikyo. During the summer, the N current has velocities of 0.5 to 1.5 knots, and the S current has velocities of 0.3 to 0.5 knot.

Hogoshi Misaki to Shirikami Saki

1.26 The coast between **Hogoshi Misaki** (42°16'N., 139°47'E.) and Shirikami Misaki, about 55 miles SSE, consists mainly of sand or gravel beaches interspersed with stretches of low cliffs. The land inland consists of relatively high terrain, with very little flat country. This coast, bordered by many rocks and reefs, is relatively steep-to with depths of over 20m from 0.5 to 1 mile offshore, except in the vicinity of Esashi Ko.

Kouta Misaki, a low headland marked by a light, lies about 3 miles SE of Hogoshi Misaki. Kuda Ko, a small fishing harbor, lies about 1 mile farther E.

Shakotan Misaki Light

A submarine cable from Aonai Ko is landed in the vicinity of

Kouta Misaki.

Usubetsu Take, 1,236m high, and Yurabu Take (Yurappu Take), 1,276m high, are very conspicuous about 8.5 miles E of Kouto Misaki.

Kudo Wan is entered between Kouta Misaki and Yoriki Misaki, about 3.5 miles SE. Anchorage, sheltered from N and E winds, can be taken by large vessels, in 12.8 to 18.3m, sand, off the beach at the head of the bay. It is not safe with W winds. Care should be taken to avoid the submarine cable extending from the NW end of the beach to Kouta Misaki at Okushiri To.

1.27 Pommoshiri Misaki (Ponmoshiri Saki) (42°08'N., 139°55'E.), a low dark rocky headland marked by a light, is very conspicuous nearly 7.5 miles SE of Kouta Misaki, and is the SE entrance point of Okushiri Kaikyo. A white tower, 504m high, is very conspicuous atop Anama Yama, about 2 miles N of Pommoshiri Misaki. A radio tower, 115m high, is conspicuous nearly 0.5 mile NE of the same point. Reefs and rocks extend about 0.3 mile offshore in the vicinity of the point.

Pommoshiri Misaki Light

Kumaishi Ko, a small fishing harbor, lies about 2.5 miles E of Pommoshiri Misaki. It consists of a camber with depths of 3 to 4m, within two breakwaters, each marked by a light. A light is also shown from a round tower, 6m high.

Between Kumaishi Ko and Ponmoshiri Misaki, numerous houses stand on the coast.

Otobe Ko (41°58'N., 140°08'E.), a small fishing harbor, lies about 13.5 miles SE of Pommishori Misaki. It is close N of Otobe Hana, a headland with a white cliff. Another headland, Tateno Misaki, about 1.3 miles N of Otobe Hana, has a white cliff, 60 to 100m high, on its N side; it is very conspicuous and visible 15 miles from seaward, even when the surroundings are snow-covered. Two television towers, with elevations of 175m and marked by red lights, stand on a 157m hill about 1 mile SE of Otobe Ko. They are visible 7 miles offshore by day and 25 miles offshore at night.

1.28 Esasi Ko (Esashi Ko) (41°52'N., 140°07'E.) (World Port Index No. 61205), fronted by Kamome Shima, consists of two parts connected by a low neck of land and appears as two islands from W. The N part of the island is 26.8m high. The island is connected to the mainland E by a breakwater, with South Wharf on its N side.

Esasi Ko is formed by the W breakwater extending ENE from the N end of Kamome Shima, and a breakwater extending W from the mainland. A boat harbor lies on the S side of the harbor, E of South Wharf. North Wharf, extending NNW, lies on the E side of the breakwater which forms the E side of the harbor.

West Outer Breakwater extends 60m N from a position 60m N of West Breakwater Light; a light is shown from its head.

Depths—Limitations.—North Wharf has alongside depths of 4.7 to 5.1m; North Quay has alongside depths of 3.6 to 5.4m. Central Wharf has alongside depths of 4.7 to 5.2m on its E side and 3.1 to 4.8m on its W side. South Wharf has alongside depths of 1.4 to 4m.

Awabisori, with a depth of 2.4m, lies about 0.7 mile NE of the harbor entrance and about 0.2 mile offshore.

Aspect.—Kamome Shima Light is shown from the N part of the island. A shrine, with a red roof, lies about 0.1 mile farther NNE. Moto Yama, a mountain 522m high, light green, and with a bare summit, is very conspicuous about 3.5 miles E of Esasi Ko.

Anchorage.—Good anchorage can be taken, in 14.9 to 15.8m, fine sand, about 0.2 mile NW of the head of W breakwater. Strong winds from the SSW through W to N, set up a heavy sea in the anchorage.

Fair anchorage, sheltered from the N and E, can be obtained S of Kuzure Hana, the SW extremity of Kamome Shima, in depths of about 14m, having regard to a fish haven which lies 1 mile SSW of Kuzure Hana. Another fish haven lies 1 mile W of Kamome Shima.

Caution.—A wreck is reported to lie 2 miles WNW of Esashi Ko West Breakwater Light.

1.29 Sunego Misaki (Suneko Misaki) (O Saki) (41°48'N., 140°05'E.), about 4.5 miles SSW of Kamome Shima, is a very conspicuous dark rocky headland, 33m high, and covered with grass. Io Yama, 159m high, about 1.3 miles E of Sunego Misaki, appears as a sharp peak from the N.

Anchorage.—Temporary anchorage can be taken off Kaminokuni, a small village about 1.5 miles E of Sunego Misaki. It is comparatively safe in all winds except those from the W and N; with SW winds, strong squalls sometimes blow down from the hills. The recommended anchorage, in 12.3 to 14.6m, sand, lies about 0.5 mile NE of Omana Hana, a point about 1.3 miles ENE of Sunego Misaki.

The coast between Sunego Misaki and the mouth of Ishizaki Kawa, about 6 miles SSW, consists of sandy beach, then to Eramachi, about 10 miles farther S, it is cliffy coast. Between Eramachi and Shirikami Saki, about 13 miles SE, the coast is mainly gravel beach. The terrain inland is mountainous. Rocks and reefs extend 0.5 mile offshore along this coast, then the water deepens abruptly.

Sankaku Yama, 652m high, with a pointed top, lies about 2.5 miles ENE of the river mouth, and is a good landmark from the NW.

Hatsukami Yama, a twin-peaked mountain, 567m high, lies about 1.8 miles S of the river mouth; it is hard to distinguish from the background, but is a good landmark for coasting vessels.

Hikatatomari Misaki (Higatatomari Misaki), a cliffy headland, 35m high and marked by a light, lies about 3.5 miles SSE of

Ishizaki Kawa; detached rocks lie close off the headland.

Sasa Yama, 583m high, with a bare round summit, appears isolated and is fairly conspicuous about 7.5 miles SSE of Hikatatomari Misaki.

Yoshiga-jima (Yoshi Shima), about 12.5 miles S of Hikatatomari Misaki, is a rock, 6.1m high, and almost joined to the coast by reefs; a light is shown from its summit. Yoshiga-jima fronts Tatehama Ko, a small fishing harbor.

Orido Saki, about 2.3 miles SE of Yoshiga-jima, rises to a conspicuous rock, 42m high, about 0.3 mile NE. A radio tower stands about 0.2 mile NE of the headland, and another radio tower, 130m high and marked by red lights, stands about 0.3 mile farther NE.

Mitsu Ishi, three rocks, 0.8m high, lie about 0.5 mile offshore, midway between Yoshiga-jima and Orido Saki.

1.30 Benten Shima (41°25'N., 140°06'E.), about 0.8 mile WNW of Orido Saki, is a small island, 18.9m high, connected to the mainland. Matsumae Light is shown from the island. Two radio masts are conspicuous about 0.3 mile N of the light structure. Reefs and foul ground extend about 0.3 mile S of Benten Shima, and it should be given a wide berth. Benten Shima and the surrounding rocks are reported difficult to detect on radar except when the sea is calm. A light is shown on the coast, 3.8 miles ESE of Benten Shima.

Matsumae Wan (Fukuyama Wan) indents the coast between Benten Shima and Shirikami Saki, about 5 miles ESE. The depths in the bay are irregular, and reefs and shoals extend up to 0.3 mile from the shores of the bay. Matsumae Ko, a small port, lies on the W side of Matsumae Wan, close N of Benten Shima. The town of Matsumae has many temples and shrines, with Hokkeji, the most conspicuous temple, about 1.3 miles ENE of Benten Shima; Matsumae Castle, with a tower, 45m high, lies about 0.2 mile WNW of Hokkeji.

A small detached breakwater lies on a NW-SE axis in the harbor entrance, 100m NW of the breakwater projecting from Benten Shima. A light is shown from its SE end.

Anchorage.—Large vessels can obtain good anchorage, sheltered from NW to NE winds, in about 22m, with Hokkeji bearing 014°, and with Matsumae Light bearing 267°, distant 1 mile. The bottom consists of a layer of sand and shells over rock, and there is danger of dragging in heavy seas. Anchorage can also be taken, in about 27m, sand and shells, with Matsumae Light bearing 277°, distant about 0.5 mile.

Tidal currents are variable; in the anchorages there appears to be a strong SW current.

Caution.—A wave meter is laid on the sea bed 0.5 mile SE of Benten Shima, and is connected with the shore NW by a submarine cable.

1.31 Ko Shima (Ko-Jima) (41°22'N., 139°49'E.), a volcanic island, lies about 13 miles SW of Benten Shima, and is commonly known as Matsumae-Ko Shima. It has three peaks of almost identical height on the W, N, and E sides of a crater in the middle of the island; the W peak, 306m high, is slightly higher than the others. The coasts of the island are precipitous and the only landing place is a gravel beach at the NE end of the island. Depths of over 20m lie 0.5 mile offshore. A cylindrical rock, 152m high, lies about 0.4 mile WNW of the W end of the island. Two above-water rocks, 46m and 34m high, respectively, lie between the rock and the island.

Ko Shima Light is shown from a white tower, 24m high. The light is shown from the NE end of the island. It is obscured from the W and S of the island.

O Shima (41°31'N., 139°22'E.), a volcanic island, lies about 21 miles WNW of Ko Shima, and is commonly known as Matsumae Oshima. It has two peaks, about 0.5 mile apart on an E-W axis, rising from the center of the island. The E peak is 755m high and cone-shaped. The W peak is 708m high and has a crater fringed with brown lava and rocky outcrops; in summer, small amounts of white smoke may be emitted from the crater.

The island is steep-to, with depths of over 200m close off the N shore, and with depths of 200m lying 0.5 to 1 mile offshore elsewhere. The island is uninhabited, but sometimes visited by fisherman who land, in calm weather only, at places on the E, S, and W sides.

Tsugaru Kaikyo

1.32 Tsugaru Kaikyo is the deep strait separating Hokkaido from Honshu, and joining the Pacific Ocean and the Sea of Japan. The strait is considered a junction point in Pub. 151, Distances Between Ports. It is entered from the E between **Shiriya Saki** (41°26'N., 141°28'E.) and Esan Saki, about 26 miles NW, and from the W between **Tappi Saki** (41°15'N., 140°21'E.) and Shirakami Saki, about 10 miles NW. The strait is roughly about 50 miles long, and has a least width of about 10 miles at its W end, and between Oma Saki and Shiokubi Saki.

The only ports which can be used by large vessels are Hakodate Ko, on the N side of Tsugaru Kaikyo, and Aomori Ko and Ominato Ko, both of which are situated in Mutsu Wan, on the S side of the straits.

The N side of the strait is generally deep inshore, with no dangers beyond 1 mile offshore, except where there are bays or indentations. The S side is similar, but there are reefs in the vicinities of Shiriya Saki and Oma Saki.

Winds—Weather.—Sea fog in Tsugaru Kaikyo is rare from November through February, occasional between late spring and summer, and most frequent in June and July. In July and August, heavy fog may completely cover the entire strait, but is generally localized. Fog occurrence is more frequent towards the E rather than the W end, and along the N side rather than the S side of the strait. Sea fogs usually form at sunrise and last 1 to 3 hours. Incisive fogs are often long-lasting; the longest ones occur mostly in July and occasionally last for several days, even during rainy days.

Tides—Currents.—The diurnal inequality of the tides in Tsugaru Kaikyo are fairly marked. There is rarely only one tide per day. Along the N side of the strait the inequalities of period and range are roughly equal at both HW and LW. Higher HW is directly followed by LLW, and HHW usually occurs in the morning in the spring and summer, and in the afternoon in the fall and winter.

The MHW interval is 4 to 4.5 hours, and the spring rise ranges from about 0.6m in the W part to 1.3m in the E part.

A major branch of the Tsushima Current, which flows N along the W coast of Honshu, flows in a NE and E direction through Tsugaru Kaikyo. There are fairly strong tidal currents

in Tsugaru Kaikyo as the tides in the Sea of Japan and the Pacific Ocean are different. The current in the strait is a combination of the ocean and tidal currents. However, since the ocean current is normally stronger than the tidal current, the general set of the ocean current governs, and the flow is always E. The effect of the tides merely increases or decreases the velocity of the ocean current. The mainstream of the ocean current flows through the center of the strait, creating countercurrents along the shores.

The width of the mainstream varies somewhat with the strength of the current. The net current flow in the strait, since the E ocean current is stronger overall than the tidal currents, it is always E at velocities which may exceed 6 knots. The resultant E flow has one maximum and one minimum each day, except when the moon's declination is low there are two maximums and two minimums. On rare occasions a reversal flow to the W may occur for a short period. Strong, prolonged E winds reduce the flow of the current, while strong W winds increase the flow, but rarely more than 1 knot.

There are countercurrents on both sides of the strait, but there are no clear boundaries between the main E current and the countercurrents. The latter are greatly influenced by the fluctuations in the velocity of the main current and secondary tidal influences. Some of the principal countercurrents are:

1. Between Shirikami Saki and Yagoshi Saki, the countercurrent is not very strong when the main current is weak, but has a substantial W set when the main current is strong.
2. Between Yagoshi Saki and Shiokubi Saki, when the main current is weak, the countercurrent increases and a S current develops off Yagoshi Saki; the flow is shoreward in the remainder of the area. When the main current is strong the countercurrent decreases and there is only a faint countercurrent. In winter there is a marked W flow along the coast.
3. Between Shiokubi Saki and Esan Saki, two ocean currents join and the countercurrent area is clearly defined. The W flow along the coast increases and diminishes under the influence of the Oyashio.
4. The countercurrents S of a line connecting Tappi Saki and Oma Saki diminish when the main current is weak. It is a weak but wide countercurrent that includes the W flow hugging the shore from Takano Saki to Tappi Saki. When the main current is strong, the countercurrent increases and there are at least two countercurrents, one on each side of Takano Saki. A S inshore current develops between Oma Saki and Fukuura Saki. Tappi Saki-Tappano Saki, the W shore current, becomes especially strong, occasionally attaining a velocity of 3 knots. The set of the currents in the extensive central part of this area is indeterminate.
5. The currents between Oma Saki and Shiriya Saki is extremely indeterminate. The currents in the vicinity of Shiriya Saki are extremely unstable.

Oyashio, a cool current, flows SW along the SE side of the Kuril Islands, then continues along the SE side of Hokkaido and the E coast of Honshu.

Near Shiokubi Saki, the main current approaches the shore and frequently causes tide rips that extend S of Muino Shima, and sometimes over 2 miles offshore.

The tidal currents between Shiokubi Saki and Esan Saki are noticeable only near the shore, but near Esan Saki they extend about 3 miles offshore. They set W at flood and E at ebb, occasionally reaching a velocity of 2 knots.

Directions.—Westbound vessels, by keeping within the countercurrent areas, are able to avoid the strong E main current, but this is recommended only with good visibility. The N track outside the main current leads about 3 miles offshore from Esan Saki to Shiokubi Saki, then N of a line approximately joining Shiokubi Saki and Yagoshi Saki to Shirakami Saki. A course should then be steered midway between Benten Shima and Ko Shima.

Vessels running through the N side of the entrance, and bound W through the S side of the strait, should proceed through the N track described above until they are SE of Shiokubi Saki. They should then make good a course across the strait until a position about 3 miles NW of Oma Saki is reached, after which they should steer 230° for Tappi Saki, and in a position 5 or 6 miles NE of that cape, a W course should be shaped to clear the entrance.

Eastbound vessels, by keeping mid-channel, can take advantage of the E current setting through the strait. After passing Shirakami Saki at a distance of more than 3 miles, vessels should steer for Shiokubi Saki, and when Oma Saki is abaft the beam, course should be altered E and the N shore should not be approached within 3 miles.

Caution.—Passage through the strait presents no difficulties by day or at night in clear weather. Vessels proceeding E should keep in the main E current. Vessels proceeding W in clear weather should take advantage of the eddies and countercurrents on either side of the main E current. However, there are complex currents caused by the interaction of the ocean and tidal currents, and considerable cross traffic as well as through strait traffic. Cross traffic includes the Japan National Railways Aomari-Hakodate rail, auto, and passenger ferries, with speeds of 15 to 21 knots, as well as numerous other vessels plying between the N and S sides of the strait. Caution is especially necessary in bad visibility during heavy summer fogs or winter blizzards.

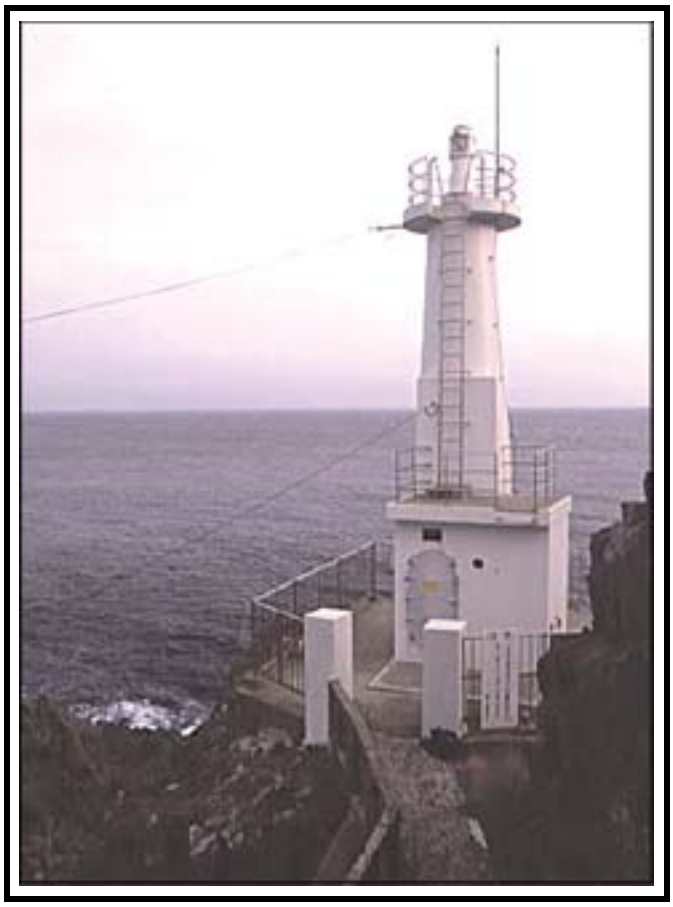
The vessel's position should be accurately fixed before navigating the strait in low visibility. Varying depths in the strait, and the configuration of the 200m curve facilitate navigation by depth finder, and soundings can be combined with radar bearings. Care must be taken to avoid collision with squid fishing boats which fish at night off Hakodate and Esan Misaki during the summer to winter squid fishing season, as well as the fishing fleets that work by day all year round near Muina Shima and Hiura Misaki.

North Side of Tsugaru Kaikyo—Esan Saki to Hakodate Wan

1.33 Esan Saki (Esan Misaki) (41°49'N., 141°11'E.), the NE entrance point of Tsugaru Kaikyo, is a steep headland, 260m high; Esan Misaki Light stands on a low flat ground on the NE side of the promontory.

E San, an active volcano, 618m high, lies about 1 mile SW of Esan Saki; it constantly emits sulfurous fumes, and its summit is occasionally enveloped in clouds. The E side of the summit is covered with red boulders, and on the W side there are patches of sulfur resembling clouds from a distance. Todo Yama, a round-topped mountain, 570m high, lies about 1.5 miles WNW

Esan Saki Light



Hiura Misaki Light

of E San; it is shaped like E San, but is entirely green in color. There is flat terrain between E San and Todo Yama.

The coast between Esan Saki and Shiokubi Saki, about 12 miles WSW, is mostly steep cliffs, with mountains near the coast. Then it curves to Ohana Zaki, about 12 miles farther W, and consists mainly of a sandy beach, except for the ends of the curve. There are drying and sunken rocks near the shore, but no dangers lie beyond 0.25 mile offshore. Depths over 20.1m lie close off the capes and headlands.

Seven large rocks, the outermost 6.9m high, lie about 0.1 mile off Nanatsuiwa Hana, about 2 miles SW of Esan Saki.

Hiura Misaki, about 6 miles farther SW, is a bold headland, rising to an elevation of 220m. Three pyramidal boulders, the largest 20.1m high, stand on the extremity of the point.

Muino Shima, a cone-shaped islet, 57m high, lies about 1 mile WSW of Hiura Misaki; it is covered with guano, and is conspicuous from the E or W. Toi Ko, a small fishing harbor, lies close N of the islet.

Shiokubi Saki (Shiokubi Misaki) (41°43'N., 140°58'E.), about 3 miles farther W, is a high, cliffy headland, with a light on its summit. Two radio towers are conspicuous from a distance on a 292m hill, about 0.5 mile NNW of the light structure. Kinasi Yama rises to an elevation of 415m about 3 miles N of Shiokubi Saki.

Hakodate Wan

1.34 Hakodate Wan is entered between **Ohana Zaki** (41°44'N., 140°43'E.) and Kattoshi Misaki, about 4.5 miles W. Ohana Zaki is the S extremity of Hakodate Hanto, which is connected to the mainland by a low isthmus, on which stands the city of Hakodate.

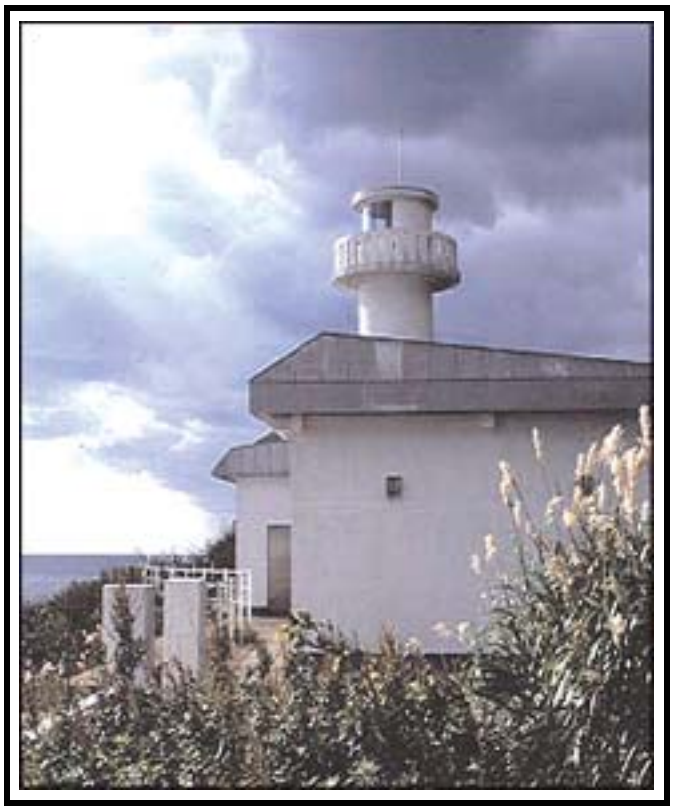
Aspect.—Four radio towers, painted white and showing white obstruction lights, are situated about 0.5 mile NE of Ohana Zaki. Hakodate Yama rises near the middle of Hakodate Hanto; its highest part, known as Goten Yama, rises to an elevation of 335m, about 1 mile N of Ohana Zaki. Three TV relay towers, marked by red obstruction lights, stand on the summit of Goten Yama. Two radio towers, with an elevation of 85m, are conspicuous about 1 mile E of Goten Yama.

Kattoshi Misaki, the W entrance point of Hakodate Wan, is marked by a light. Maru Yama, a cone-shaped mountain, 482m high and thickly wooded on its E side, lies about 2 miles W of Kattoshi Misaki, and is a good landmark from the S.

Seven gray chimneys of the Nihon Cement Company stand about 4.8 miles NNE of Kattoshi Misaki, and about 0.8 mile WSW of the mouth of Ari Gawa; the constant smoke emissions are visible from a distance, and the plant lights are excellent landmarks at night.

The Nihon Cement Company Pier (Taiheiyosemento Sea

Kattoshi Misaki Light



Shiokubi Saki Light

Berth), marked by a light at its extremity, extends about 1.1 miles from a point on the shore, 3.5 miles NNE of Moheji Ko (41°46'N., 140°37'E.), and is connected to the plant NW by a belt conveyor.

Three aluminum-colored radio masts, the S mast marked by a red light, are conspicuous about 1 mile ENE of the mouth of Ari Gawa.

Hakodate Wan has depths of 50 to 60m in the middle of the bay entrance, gradually decreasing shoreward. Depths of over 10.1m lie about 0.5 mile offshore, except in its NW part, where they lie about 1 mile offshore.

Anchorage.—When entry into Hakodate Ko is delayed, anchorage can be taken, in 18m, sand, about 0.8 mile SE of the head of Nihon Cement Company Pier.

Hakodate Ko (41°47'N., 140°43'E.)

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1.35 Hakodate Ko occupies the E side of Hakodate Wan and is composed of six sections. It is sheltered W by breakwaters, and is the best harbor in Hokkaido. It is used by ferries of the Japan National Railways plying between Aomari Ko and Hakodate Ko, car ferries, and very large numbers of fishing vessels.

Winds from the NW to N raise some sea in the harbor, but this rarely interferes with harbor traffic.

Tides—Currents.—The tidal rise at Hakodate Ko is 0.9m at MHHW, and 0.8m at MLHW.

Winds—Weather.—At Hakodate, WNW and W winds predominate from October to April, and S from May to September. The mean wind speed is about 7.5 knots from November through April, and about 6 knots from June through October. Winds of 19 knots and above occur about 3 days per month in the summer months, increasing to about 11 days per month in March and April. There are about 23 days per month, with snow from December to March.

Depths—Limitations.—The greater part of the port area has depths of 10.1m or more.

Hakodate—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Bandai Pier					
Front side	185m	10.0m	9.0m	10,750 dwt	Steel products
North side No. 1 (inner)	120m	5.5m	—	2,500 dwt	Steel products

Hakodate—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
North side No. 1 (outer)	130m	7.5m	—	2,500 dwt	Steel products
South side No. 1 (inner)	120m	5.5m	—	8,667dwt	Steel products
South side No. 1 (outer)	130m	7.5m	6.5m	8,86 dwt	Steel products
Chuo Pier					
No. 1	171m	9.0m	8.0m	11,310 dwt	Cement.
No. 2	165m	9.0m	8.0m	10,000 dwt	Cement
Outer Berth	158m	5.5m	—	6,686 dwt	Cement
South Berth	133m	8.0m	7.0m	5,820 dwt	Cement
Hokodate Terminal					
Ro-Ro Inner (E)	100m	5.0m	—	—	Ro-ro, passengers, and vehicles.
Ro-Ro Inner (W)	135m	6.0m	—	—	Ro-ro, passengers, and vehicles.
Ro-Ro Outer (E)	145m	6.5m	—	—	Ro-ro, passengers, and vehicles.
Ro-Ro Outer (W)	161m	6.5m	—	—	Ro-ro, passengers, and vehicles.
Kita Pier					
Cement.	330m	5.5m	—	—	Cement.
General	120m	5.5m	—	—	General cargo.
Kita Pier (N)	130m	7.5m	6.5m	5,000 dwt	General cargo.
Ro-Ro	160m	6.5m	—	—	Ro-ro, passengers, and vehicles.
Minatocho Piers					
Pier A	280m	14.0m	12.0m	50,000 dwt	Cruise vessels.
Pier B	240m	12.0m	10.0m	30,000 dwt	Containers.
Nishi Pier					
Outer	181m	9.0m	8.0m	30,000 dwt	Cruise vessels and cement.
Taiheiyo Cement Terminal					
Inner (W)	220m	11.0m	—	6,000 dwt	Cement.
Inner (E)	—	11.0m	—	24,345 dwt	Cement
Outer (E)	237m	12.5m	13.1m	60,000 dwt	Cement.
Outer (W)	237m	12.5m	—	60,000 dwt	Cement.
Nishi Pier					
Inner Berth	156m	6.5m	—	2,566 dwt	DPP
Outer Berth	181m	6.5m	—	37,084 dwt	Aggregates
Tanker Terminals					
Cosmo Oil Terminal					
Oil Quay	55m	7.5m	—	6,000 dwt	Petroleum products. Maximum loa of 108m.
Oil SBM	—	15.5m	14.5m	80,000 dwt	Crude.
ENEOS Terminal					
Tanker	32m	—	—	2,414 dwt	Clean products.

Hakodate—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Hakogasu Terminal					
LPG Terminal	6m	6.0m	—	1,498 dwt	LPG.
Idemitsu Tanker Terminal					
Tanker	39m	7.5m	—	5,729 dwt	Chemicals.
Kitagas LNG Terminal					
LNG	244m	7.5m	—	2,582 dwt	Clean products.

The principal berthing facilities are described in the table titled **Hakodate Ko—Berth Information**.

Aspect.—A tank farm, within the Asia Oil Company refinery, is conspicuous at the N end of the harbor, about 5 miles N of Ohana Zaki. A chimney, 56m high, with red and white stripes, is very conspicuous.

The Combined Port Affairs Building, an eight-story building, stands on Central Wharf, about 1.5 miles SE of the S entrance to the harbor; a signal mast and 4 radio towers stand on the roof.

Two gantry cranes, 70m high, with red and white stripes, are very conspicuous at Drydock No. 4; they are marked by red lights on top on both ends and white lights below.

Pilotage.—Pilotage is not compulsory. Pilots board 1.5 miles SW of the S harbor entrance; in rough weather they board nearer the entrance. Tankers berthing at the sea berth board a pilot at the lighted buoy in position 41°48'17"N, 140°40'43"E.

Vessels may contact the pilots on VHF channel 16 or telephone (81-138-408-435).

Regulations.—Berths and anchorages are assigned by the harbormaster, and the signals designating them are shown from the signal station. The signal station is situated on the roof of the Combined Port Affairs Building.

Vessels should retain on board the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate answering signals, and other local or specific regulations.

Vessels of 500 gt and over may not enter the harbor at night.

Vessels of 500 gt and over intending to anchor inside the harbor should request an assignment from the harbormaster while still outside the breakwaters.

Hakodate Ko—Course and Destination Signals		
Signal	AIS Symbol	Meaning
Second Substitute, Flag 1	1	Proceeding to facilities in Section 1.
Second Substitute, Flag 2	2	Proceeding to facilities in Section 2.
Second Substitute, Flag 3	3	Proceeding to facilities in Section 3.
Second Substitute, Flag 4	4	Proceeding to facilities in Section 4.

Vessels proceeding to an assigned anchorage or berth should indicate their intention by the appropriate signals.

Signals.—See the tale titled **Hakodate Ko—Course and Destination Signals**.

Contact Information.—See the table titled **Hakodate—Contact Information**.

Hakodate—Contact Information	
Hakodate Pilots	
VHF	VHF channel 16
Telephone	81-138-408-435
Facsimile	81-138-408-435
Port Authority	
Telephone	81-138-213-488
Facsimile	81-138-262-656
Coast Guard Office	81-138-462-658
E-mail	port-dev@city.hakodate.hokkaido.jp

Anchorage.—Depths inside and outside the harbor provide excellent anchorage.

The quarantine anchorage lies W of the W breakwater; the holding ground is reported good.

The mooring buoys in the S portion of the harbor provide anchorage, in 6.1 to 12.2m, good holding ground.

A good berth for temporary anchorage, in a depth of 18m, sand, lies 2.8 miles SSE of the mouth of **Ari Kari** (41°49'N., 140°39'E.).

Caution.—When a winter NW wind brings snow to the Kamiiso area, vessels are occasionally caught in snowstorms when approaching the inner harbor. Careful attention should be paid to weather conditions and entrance into the harbor should be delayed when the smoke or flames emitted by the Nihon Cement Company chimneys cannot be seen.

Between September and December, stationery fish traps are

set up within 1 mile of the coast between Kattoshi Misaki and the N shore of Hakodate Wan.

Departing Japan National Railway ferries and car ferries frequently meet incoming vessels starboard-to-starboard so that they can make a sharp turn to port as soon as they clear Passage 1 to take up their prescribed course.

Hakodate Wan to Shirakami Saki

1.36 Saraki Misaki (41°42'N., 140°32'E.) is a sandy point about 4 miles SW of Kattoshi Misaki. A reef, with a depth of 4.6m near its outer end, extends about 0.8 mile SE of Saraki Misaki. A light is shown on the coast about 2 miles W of Saraki Misaki.

Kikonai Wan is entered between Saraki Misaki and Kitsunegoe Saki, a rocky headland 25.9m high, about 9.5 miles SW. A rounded hill, 214m high, is conspicuous about 0.4 mile WNW of Kitsunego Saki. Three above-water rocks, the outermost 17.1m high, extend about 0.2 mile off Takasu Misaki, about 1.3 miles SW of Kitsunegoe Saki.

Yagoshi Saki (Yakoshi Zaki), about 1.5 miles farther SW, is a cliffy steep-to point, with two thickly-wooded hills on its summit; the outer hill, 121m high, is marked by a light on its side. Okumaru Yama (Maru Yama), a densely-wooded mountain, 826m high, lies about 2 miles NW of Yagoshi Saki, and is the highest peak in the vicinity; its summit is frequently enveloped in clouds during the summer.

Anchorage.—Kikonai Wan provides anchorage for large vessels; the mountains behind the bay offer shelter from W to N winds. Excellent anchorage can be taken E of Kikonai and S of Satsukari, in 12.8 to 15.8m, sand, keeping clear of the submarine cables extending E and SE from the mouth of Kikonai Kawa; this anchorage is sheltered from strong currents.

Good anchorage can be taken off Wakimoto in deep water, good holding ground. The high ground W of Kitsunegoe Saki offers protection from SW to W winds. This is the best shelter area in Tsugaru Kaikyo during strong W winds, when it is used by numerous vessels.

1.37 The coast between Yagoshi Saki and Shirakami Saki, about 12 miles SW, is backed by mountains forming cliffs and rocky shores. The coast is comparatively steep-to, except in the vicinity of **Fukushima Ko** (41°28'N., 140°16'E.), midway along this stretch, where the depths are shallow enough to provide anchorage for large vessels. Mo Yama, a cone-shaped peak, 526m high and sparsely wooded, is conspicuous about 2 miles NNE of Fukushima. Maru Yama, a 308m peak, lies near the coast, about 1.4 miles NE of Fukushima Ko.

The best anchorage, in 12m, sand, lies about 0.5 mile offshore, with Maru Yama bearing 030°. This anchorage is sheltered from W to N winds, but is sometimes affected by large swells coming from the W end of Tsugaru Kaikyo.

Shirakami Saki (Shirakami Misaki) (41°24'N., 140°12'E.), the S extremity of Hokkaido, is faced with a high cliff, rising to a hill, 179m high, about 0.4 mile N. Shirikami Take, a grass-covered mountain, 352m high, is conspicuous about 1.3 miles NNE of Shirakami Saki. A light is shown on the point from a white square structure, 17m high.

Rocks and reefs extend up to about 0.3 mile for about 1 mile on either side of Shirakami Saki. The currents in the vicinity are very strong, and the point should be given a berth of at least 0.5 mile. Strong W winds raise a heavy sea off the point.

Shirakami Saki

South Side of Tsugaru Kaikyo—Shiriya Saki to Mutsu Wan

1.38 Shiriya Saki (Shiriya Zaki) (41°26'N., 141°28'E.), the NE extremity of Honshu, is the SE entrance point of Tsugaru Kaikyo. It is the termination of a promontory, which for the first mile inland is level, then rises to Hitogata Yama, 166m high, with odd-shaped rocks on its summit, about 1.5 miles SW of the point, then to Kuwabata Yama, 400m high, with twin peaks, about 1.3 miles farther S.

An orange observation buoy lies 58 miles E of Shiriya Saki.

Todo Shima, a black islet, 15.8m high, is conspicuous about 0.3 mile NNE of Shiriya Saki, near the extremity of rocks and reefs extending NNE of the point. O Ne, with a least depth of 0.3m, lies nearly 1 mile ENE of Shiriya Saki; it is covered with seaweed and the sea in the vicinity sometimes appears reddish in color. O Ne is marked by breakers in rough weather, but at other times it is difficult to distinguish. A rock, with a depth of 1.8m, lies about 0.2 mile W of O Ne. Tide rips and whirlpools are formed up to 2 miles NNE of Shiriya Saki.

Benten Shima, an islet, 21m high and joined to the coast by an embankment, lies about 1.5 miles SW of Shiriya Saki. Shiriyamisaki Ko is formed by a detached breakwater extending WSW from Benten Shima and a pier extending NW from the

coast S of the islet. A dolphin pier, on the inner side and near the foot of the breakwater, has depths of 6 to 7.9m alongside. An elevated conveyor, which loads limestone, extends to Benten Shima, then SE to the coast. There are depths of 6 to 10.1m inside the breakwater; the holding ground is reported good.

Another breakwater extends NW from the shore, 0.3 mile S of the root of Shiriyamisaki Ko.

The coast between Shiriya Saki and Iwaya, about 3.5 miles SW, consists of steep cliffs terminating with sandy beaches, and bordered by reefs. Continuing to Ohata Ko, a small fishing port at the mouth of Ohata Kawa, about 11 miles farther W, the coast consists of sandy beaches and earthen cliffs, backed by a plain; many rivers, accessible only to boats, enter the sea along the latter section of coast. Lights are shown from the breakwaters at Ohata Ko.

The coast from Ohata Ko to Oma Saki, about 14 miles NW, is bordered by reefs and rocks. It is backed by densely-wooded mountains, culminating in Hiuchi Dake, 781m high, and Metakisawa Yama, 618m high, about 9 miles SE and 7 miles SSE, respectively, of Oma Saki.

Kabuto Saki, about 4 miles NW of Ohata Ko, is faced by a red cliff. Sankaku Yama, a pyramidal hill, rises to an elevation of 292m, about 0.7 mile WSW of Kabuto Saki, and is conspicuous from the NW.

Oma Saki (Oma Zaki) (41°33'N., 140°55'E.), the N extremity of Honshu, is a low sandy spit on which stand some farm buildings. Oma Saki Light is shown on the summit of Benten Shima from a round tower.

Oma Se, with a depth of 2.6m, and a rock, with a depth of 7.7m, lie about 1 mile N and 1.3 miles NNW of Benten Shima, at the outer end of a rocky ridge, with depths of less than 20m extending N of Oma Saki. The edges of the reef are steep-to, and strong E currents flowing over the ridge may generate whirlpools, tide rips, and overfalls. Wakazekara Se and Kaigara Se, with depths of 4.4m, lie on this ridge, about 0.8 mile NE and NW, respectively, of Benten Shima.

Anchorage.—Temporary anchorage can be taken, in 18.3 to 36m, about 1 mile E of Oma Saki to avoid the ocean and tidal currents, but the bottom is rocky.

Oma Ko, a small harbor sheltered by breakwaters, lies about 1 mile S of Oma Saki. Rocks, with depths of less than 9.2m, lie within 0.5 mile of the coast in the approach to the harbor. Anchorage can be taken about 1 mile W of the harbor by vessels awaiting favorable tides to enter Tsugaru Kaikyo.

1.39 The land in the vicinity of Oma Saki is low; farther S the coast is backed by mountains which gradually approach the coast. From Yagosi Saki to **Yakeyama Zaki** (Yakeyama Misaki) (41°15'N., 140°47'E.), the coast consists of steep cliffs, backed by wooded mountains. The cliffs between **Fukuura Saki** (41°19'N., 140°48'E.) and Yakeyama Zaki are especially steep and reflect various colors of light. Many large and small odd-shaped rocks lie along this coast.

A light stands on the head of a breakwater, protecting Ushitaki Ko, a small harbor 2.5 miles N of Yakeyama Zaki.

The coast between Oma Saki and Yakeyama Zaki is mostly steep and deep except in the vicinity of Oma Saki. Oyo Shima and Tate Ishi are the only off-lying dangers.

Tsubana Zaki (Zaimoku Hana) (41°28'N., 140°53'E.), about 5 miles SSW of Oma Saki, consists of columnar rocks and rises to Hatsumori Yama, a conspicuous hill, 67m high on its summit. Kuraiwa Hana, about 0.7 mile NE, has a black, steep-to rock close off it.

Sai Ko, a small fishing harbor, lies about 2.3 miles SSW of Tsubana Zaki.

Yagosi Saki (41°25'N., 140°51'E.), about 1.5 miles farther SW, is a conspicuous cliffy point, with a small shrine on its summit. Kankake Iwa, two odd-shaped rocks, lie off the point.

Oyo-jima, a black rock, 11.9m high, and marked by a light at its summit, lies about 1.7 miles SW of Yagosi Saki. Tate Ishi, a rock 0.6m high, on which the sea breaks, lies about 0.3 mile N of Oyo-jima.

Ozukuri Yama (41°19'N., 140°52'E.), 776m high, lies about 3 miles E of Fukuura Saki, and is the highest peak in the vicinity. Nuidoshi Yama, 628m high, about 1 mile SW of Ozukuri Yama, has a large rock on its summit.

Nii Yama, 483m high, pointed, and with a red cliff on its side, is conspicuous about 1 mile NE of Yakeyama Zaki. A red clay cliff, S of Yakeyama Zaki, is the most conspicuous in the area.

Mutsu Wan

1.40 Mutsu Wan (Mutsa Wan) is entered between Yakeyama Zaki and **Takano Zaki** (41°14'N., 140°33'E.), about 10.5 miles W, via Tairadate Kaikyo. The shores of the bay have depths of 10.1m close offshore to within 1 mile offshore. Depths in the middle of the bay are over 40m. A sharp peninsula projects into the center of the bay from the S side and divides the bay into E and W parts. Aomori Ko lies in the W part, and Nobeji Ko and Ominato Ko lie in E part.

Scallop beds, seaweed beds, and fixed fishing nets are laid up to 4 miles offshore in the bay throughout the year. Mariners are also advised that shellfish culture equipment may be found as far as 3 miles offshore along the coast of Muta Wan.

Tairadate Kaikyo, the deep entrance into Mutsu Wan, has fairway depths of 50 to 90m in the fairway. It has a least width of 5.5 miles, providing easy passage in general. However, thick fog in summer and snow in the winter may render passage somewhat difficult. Fog, especially frequent in June and July, tends to envelop the mountains on the W side of the strait, rather than those on the E side.

Tides—Currents.—Tidal currents in Tairadate Kaikyo seldom exceed velocities over 1 knot. The directions are not quite regular, but in general the flood tidal current sets S and the ebb tidal current sets N. The directions are particularly irregular in the N part of the strait, where the strait meets the area of circular currents of Tsugaru Kaikyo. Off Takano Zaki, the N current, which may attain a velocity of 2.5 knots, ordinarily flows longer and with greater strength than the S current, there occasionally being no S flood for an entire day. In the vicinity of Yakeyama Zaki the S current usually flows longer than the N current and with greater velocity, a rate of 1.5 knots sometimes being attained. At the inner end of the strait, the velocity is somewhat greater on the E side than on the W.

The flood tidal current sets into the bay and the ebb tidal current sets out of the bay, neither current attaining any great rate. The tide turns soon after HW and LW.

Tairadate Kaikyo—East and West Sides

1.41 The E side of Tairadate Kaikyo is steep-to and consists mainly of steep cliffs backed by wooded mountains. From Yakeyama Zaki the coast extends about 3.5 miles SSW to O Saki, then 3 miles S to **Kai Saki** (Kai Zaki) (41°09'N., 140°46'E.). Kai Saki, steep-to, is conspicuous from the N or S; fishing nets are sometimes laid off this point.

Iboiwa Saki, about 1.3 miles SE of Kai Saki, has a nipple-shaped rock at its extremity, which is conspicuous when viewed from the W.

Ushikubi Saki, a low rocky point, lies about 1.4 miles E of Kai Saki. Shiroiwa Saki, a steep-to rocky point, lies midway between the latter two points.

Tai-jima (Benten-jima), about 0.5 mile S of Ushikubi Saki, is 27.1m high and marked by a light; it is precipitous on its N side and has a small shrine on its summit. Another rocky islet, 31m high, lies close by. Todo Shima, which dries 0.6m, lies about 0.2 mile S of Tai-jima. Asa Ne, with a depth of 0.6m, lies midway between Ushikubi Saki and Tai-jima, and passage between the islet and the point should not be attempted.

Takano Zaki (41°14'N., 140°34'E.), the W entrance point of Tairadate Kaikyo, is a low, rocky point, marked by a light. Bozu Dake (Boju Yama), 498m high, pointed and wooded, lies about 2.5 miles S of Takano Zaki, and is conspicuous from a distance. O Ne, a rock with a depth of 14.9m, lies about 0.7 mile NE of Takano Zaki, and is marked by tide rips at times.

The coast between Takano Zaki and Ishi Saki, about 4.5 miles ESE, slopes gently, is fringed with reefs and rocks, and is backed by mountains.

Between Ishi Saki and Myojin Saki, about 1 mile SSE, the coast is densely wooded by pine trees and backed by a flat rice field. Tairadate Light is shown from Myojin Saki. Hakamagoshi Take, a flat-topped mountain, 707m high, is very conspicuous about 3 miles W of Myojin Saki. Maruyagata Take, 718m high, the highest mountain in the vicinity, lies about 1 mile SSE of Hakamagoshi Take.

Tairadate Ko, a small fishing harbor, lies nearly 1 mile S of Myojin Saki. Anchorage, sheltered from W winds, can be taken off the breakwaters at Tairadate Ko. It is reported that winds and seas are less here than at other locations in the vicinity, even when there is a NE wind, locally called the “yamase.”

Aomori Wan

1.42 Aomori Wan, in the W part of Mutsu Wan, is entered between **Kanita Gawa** (Kanida Gawa) (41°03'N., 140°39'E.) and O Shima, about 10.5 miles ESE. Aomori Ko is situated at the head of the bay. Fishing nets are laid 1 to 2 miles off the W shore of the bay during the summer.

The W shore of Aomori Wan consists of a pebble beach, backed by well-cultivated land for 3 miles S of Kanita Gawa; there are a number of villages and many small rivers.

A light is shown from the head of a breakwater at Kanita Gawa. A port hand lighted buoy is moored 2.25 miles E of Kanita Gawa.

A light is shown from a breakwater 7 miles S of Kanita Gawa.

A light is shown from the head of a breakwater, protecting a small harbor (Okunai Ko), 9.5 miles S of Kanita Gawa.

A white building is conspicuous on the summit of a hill N of the mouth of Kanita Gawa. Okura Dake (Okura Take), 678m high, lies about 6 miles SW of the mouth of Kanita Gawa, and is the highest peak on the W side of Aomori Wan.

O Shima, the E entrance point of Aomori Wan, is 72m high and marked by a light at its N end; it is joined to the peninsula SE by a sandspit and rocks awash.

A light is shown from the head of a breakwater, protecting a small harbor, 2 miles S of O Shima.

Futago Hana, about 4 miles SSW of O Shima, is the W extremity of a promontory, rising about 0.2 mile SE to a wooded hill, 109m high. Futago Iwa (Futago Shima), 11m high, close WNW of the point, is steep-to on its W side.

Mora-jima (Moura Shima), about 1.3 miles SE of Futago Hana, is 106m high; it is cliffy on its W side, and has a shingle spit on its E side.

Mora Ko (Moura Ko), NNE of Mora-jima, is sheltered from N, E, and S winds. Large vessels can anchor, in 14.6 to 16.5m, mud, in the central part of Mora Ko. Kamome-jima (Gomi Shima), about 1.3 miles S of Mora-jima, is 106m high; its W side is cliffy, and its E side consists of a shingle beach.

Yuno Shima, about 0.7 mile farther S, is 123m high to the tops of the trees; its E side is cliffy, and it is almost joined to the mainland E by a sandy spit. O Se, with a least depth of 8.2m, lies about 0.7 mile W of Yuno Shima.

Aomori Ko (40°50'N., 140°45'E.)

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1.43 Aomori Ko, at the S end of Aomori Wan, consists of an outer harbor and an inner harbor. The inner harbor is sheltered by detached N and E breakwaters.

Aomori Ko is the gateway of traffic between Honshu and Hokkaido, and ferries of Japan National Railways and car ferries, plying between Hakodate Ko and Aomori Ko, arrive and depart from Ferry Wharf.

Aomori—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Aomori Ferry Terminal					
Berth No. 1	170m	7.5m	—	6,000 dwt	Ro-ro and cruise vessels.
Ferry Pier (N)	145m	6.0m	—	3,500 dwt	Ro-ro and cruise vessels.
Ferry Pier (S)	145m	6.0m	—	3,500 dwt	Ro-ro and cruise vessels.

Aomori—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Chuo Pier					
Chuo	125m	7.5m	—	5,000 dwt	Cement.
Hamamachi Pier					
(E) Pier	179m	9.0m	—	—	General cargo.
(N) Pier	154m	7.5m	7.0m	7,000 dwt	—
(S) Pier	160m	5.5m	—	5,000 dwt	Aggregates.
Okidate Pier					
Pier A	270m	7.5m	—	5,000 dwt	Aggregates.
Pier B	180m	10.0m	—	10,000 dwt	Aggregates.
Pier C	270m	13.0m	—	40,000 dwt	Aggregates.
Ferry Quay	155m	7.5m	—	7,000 dwt	Cruise vessels.
Shin-Chuo Pier					
Pier	280m	10.0m	—	30,000 dwt	Cruise vessels.
Tsutsumi Pier					
(N) Pier	185m	10.0m	—	15,000 dwt	Cruise vessels.
(S) Pier	263m	7.5m	—	5,000 dwt	General cargo.
Tanker Terminals					
LPG Terminal					
LGT Aomori (No. 1, Pier 25)	312m	13.1m	11.9m	60,000 dwt	LPG. Maximum loa of 250m.
No. 2	132m	6.9m	—	1,000 dwt	LPG.
Nonai Terminal					
Tanker	147m	10.5m	—	5,000 dwt	Clean products.
Tozai Oil Terminal					
A Jetty	43m	7.5m	—	5,000 dwt	Clean products.
B Jetty	40m	7.5m	—	5,000 dwt	Clean products.

East Passage and West Passage, providing access to the harbor, are entered about 1.3 miles NNE, and 1 mile N, respectively, of North Breakwater.

Winds—Weather.—Snow begins to fall in the latter part of November, and snow storms may be encountered until the end of March. The severe blizzards of December, January, and February may interrupt shipping operations. In May and June during the prevailing SW winds the visibility may be lowered by a thin haze. Dense fog may be encountered between June and August, with port operations being suspended as a result.

Tides—Currents.—The tidal rise at Aomori Ko is 0.6m at MHWS, and 0.5m at MHWN. Tidal currents are generally insignificant.

Depths—Limitations.—There are depths in the entrance channel of 17 to 27m. The principal berthing facilities are described in the table titled **Aomori Ko—Berth Information**.

Aspect.—Hanakuri Zaki (Hanaguri Zaki) (40°59'N., 140°57'E.) is an odd-looking point about 3 miles ESE of O Shima. A sand spit, thickly covered by pine trees, lies about 0.5 mile farther ESE.

Yasui Saki, about 2.5 miles farther SE, rises to a hill about 15m high, and is marked by a light.

Kominato Wan, entered S of Yasu Saki, dries out at its head.

The coast between Kominato Wan and Nobeji Ko is backed by gently rising land.

Nobeji Ko (Noheji Ko), a small port, lies at the mouth of a river, at the head of Noheji Wan; breakwaters project from the mouth of the river, and lighted buoys mark the approach.

The E shore of Nobeji Wan from Nobeji Ko to Yokohama, about 14 miles NNE, consists of sandy beach backed by grassy land rising to low hills about 2 miles inland.

Fukikoshi Eboshi, 508m high, and Kanatsu Yama (Kanetsu Yama), 520m high, are two peaks about 4 miles ESE and E, respectively, of Mihokawajiri Misaki.

Aomori Ko

Nakanosawa Saki, the E entrance point of Ominato Ko, lies about 2.8 miles NNE of Mihokawajiri Misaki.

A light is shown from the head of a breakwater, protecting a small harbor, 4.5 miles N of Nakanosawa Saki.

A breakwater extends close NW of the head of Okidate East Breakwater. A light is shown from the head of the breakwater.

Hanaguri Saki (40°52'N., 140°50'E.), about 1.5 miles SSW of Yuno Shima, is 141m high to the tops of the trees, and has a small shrine and pine trees on its summit; the harbor limit extends W from Hanaguri Saki. A hill, 132m high, with an odd-shaped peak (quarry site), lies about 0.5 mile SW of Hanaguri Saki. Bakkono Saki, about 0.5 mile farther SW, is 86m high, and steep-sided. A sandy beach extends SW of Bakkono Saki to the city of Aomori.

The city of Aomori extends from the root of West Breakwater to Tutsumi Kawa, about 1 mile E, and beyond.

Three radio towers, 60m high, lie about 1 mile WNW of the head of West Breakwater.

A radio tower, marked by red lights, lies about 0.8 mile SSE of North Breakwater. It was reported (1998) the tower may no longer be conspicuous.

The Aomori Bay Bridge is situated S of Hachikoda Maru; its E and W pillars are marked by flashing lights.

Lighted buoys mark the entrances to East Passage and West Passage.

Pilotage.—Pilotage is available. Pilots board at the quarantine anchorage. Pilots can be contacted on VHF channels 12 and 16.

Contact Information.—See the table titled **Amori—Contact Information**.

Anchorage.—Good anchorage for large vessels can be taken, in 18m, sand and mud, good holding ground, NNW of W breakwater.

Amori—Contact Information	
Pilots	
Telephone	81-17-7425026
Facsimile	81-17-7425026
Port Authority	
Telephone	81-17-7349676
Facsimile	81-17-7348194
E-mail	kowan@pref.aomori.lg.jp

Anchorage can be taken in Nobeji Wan, in 9.2 to 15.8m, shingle, about 0.8 mile offshore. The holding ground is moderate and the bay is open N.

A circular quarantine anchorage, with a radius of 0.25 mile, is centered about 2 miles bearing 012° from the mouth of Tsutsumi Kawa, and about 1 mile NNE of the entrance to East Passage.

Caution.—East Passage and West Passage have been replaced by new passages marked by lighted buoys. The breakwater lights, being low, are reported difficult to distinguish from a distance against the lights of the shore.

Vessels should approach Aomori Ko with the radio tower, about 0.8 mile SSE of N breakwater, bearing 180°. Then alter course left to approach the entrance to East Passage. Then a course of about 200° is steered through the passage.

Some ferries enter through East Passage and depart via West Passage.

Depths of up to 7m less than charted may exist S of Kita Breakwater within Section I and Section II.

In order to prevent accidents vessels, other than tankers, are prohibited from entering a sea area within 30m of any tanker berthed at Bridgestone Liquid Gas Terminal or Aomori Plant Private Jetty

A wave meter, marked by a lighted buoy, is laid on the sea bed 0.2 mile N of the head of the W breakwater and is connected to shore SW by a submarine cable.

Aomori Wan to Ominato Ko

1.44 Hanakuri Zaki (Hanaguri Zaki) (40°59'N., 140°57'E.) is an odd-looking point, about 3 miles ESE of O Shima. A sand spit, thickly covered by pine trees, lies about 0.5 mile farther ESE.

Yasui Saki, about 2.5 miles farther SE, rises to a hill about 15.2m high, and is marked by a light.

Kominato Wan, entered S of Yasu Saki, dries out at its head.

The coast between Kominato Wan and Nobeji Ko is backed by gently rising land.

Nobeji Ko (Noheji Ko), a small port, lies at the mouth of a river, at the head of Noheji Wan; breakwaters project from the mouth of the river and lighted buoys mark the approach. Anchorage can be taken in Nobeji Wan, in 9.2 to 15.8m, shingle, about 0.8 mile offshore. The holding ground is moderate and the bay is open N.

The E shore of Nobeji Wan from Nobeji Ko to Yokohama, about 14 miles NNE, consists of sandy beach backed by grassy

land rising to low hills about 2 miles inland.

Fukikoshi Eboshi, 508m high, and Kanatsu Yama (Kanetsu Yama), 520m high, are two peaks about 4 miles ESE and E, respectively, of Yokohama.

Nakanosawa Saki, the E entrance point of Ominato Ko, lies about 2.8 miles NNE of Yokohama.

A light is shown from the head of a breakwater, protecting a small harbor, 4.5 miles N of Nakanosawa Saki.

Ominato Ko (41°15'N., 141°09'E.)

1.45 Ominato Ko is entered between **Kuro Saki** (41°11'N., 141°05'E.) and Nakanosawa Saki, about 9.8 miles ESE. The E shore of Ominato Ko consists of low sandy beaches, backed by marshland or low wooded plains.

The W side of the port is backed by high mountains. Tanabu Kawa flows into the head of Ominato Ko, and a sand spit, with Ashi Saki at its N extremity, extends about 2 miles NNE from the W shore. An airfield is situated near the root of the sand spit. A breakwater extends SW from the SE side of the mouth of Tanabu Kawa.

The principal facilities are situated in the mouth of Tanabu Kawa and in the inner bay formed by the sand spit.

Tides—Currents.—The tidal rise at Ominato Ko is 0.7m at MHWS and 0.5m at MHWN.

Depths—Limitations.—A wharf on the SE side of the mouth of Tanabu Kawa has a berth on its SW end, with a length of 178m and depths of 6.9 to 7.9m alongside.

The inner bay has general depths of 7 to 8m, and its entrance is about 0.2 mile wide. The SE side of the inner bay dries out about 0.2 mile.

Jetty No. 5, on the NW side of the inner bay, has a berthing length of 130m and depths of 4.9 to 7.9m alongside its NE side.

A pier on the SE side of the inner bay has a dolphin off its end and a depth of 5.5m alongside.

Aspect.—There are four mooring buoys in the inner bay.

A light is shown from Kuro Saki; a lighted buoy is moored NW of Ashi Saki.

Kamafusa Yama, 878m high, with twin summits, is conspicuous about 6.5 miles NNE of Kuro Saki. It can be recognized from any location in Mutsu Wan.

Anchorage.—Ominato Ko affords anchorage, in 7.3 to 9.2m, near its head. There are suitable anchorage depths throughout the bay. The bottom is generally mud with shells.

Ominato Ko to Benten Shima

1.46 Kawauchi Wan, with Kawauchi Ko at its head, lies between Kuro Saki and Shukunobe Saki, about 5 miles W. The latter point is a sandspit with pine trees, 26m high, near its extremity. Asa Se, with a depth of 8.6m, lies about 0.5 mile SE of Kuro Saki.

Tono Saki, a sandy projection, about 2.5 miles WSW of Shukunobe Saki, has two conspicuous clumps of pine trees on it, one of which is on a small hill.

Wakinosawa Ko, a small port, lies about 1.5 miles NNE of Benten Shima. It consists of a basin protected by three breakwaters. A light is shown from a square metal framework tower, 8m high, on the head of one breakwater.

Takano Zaki to Tappi Saki

1.47 Minmaya Wan (Mimmaya Wan) is entered between **Takano Zaki** (41°14'N., 140°33'E.) and Tappi Saki, about 9.5 miles WNW. Takano Zaki was previously described with Mutsu Wan in paragraph 1.40.

Reefs lie along the shores of the bay; however, depths of over 20.1m lie from 0.2 to 0.8 mile offshore.

Minmaya Wan is an area of countercurrents caused by the ocean currents running through Tsugaru Kaikyo. The directions of the currents are unpredictable, but seldom exceed a velocity of two knots.

Minmaya Ko (Mimmaya Ko), a small port sheltered by a breakwater, lies about 5.5 miles WSW of Takano Zaki. The black chimney of a saw mill in Masukawa is conspicuous about 0.8 mile SE of Minmaya Ko. Anchorage, sheltered from W winds, can be taken, in 12m, about 0.5 mile offshore, off the breakwater at Minmaya; the holding ground is poor with rocky bottom in places.

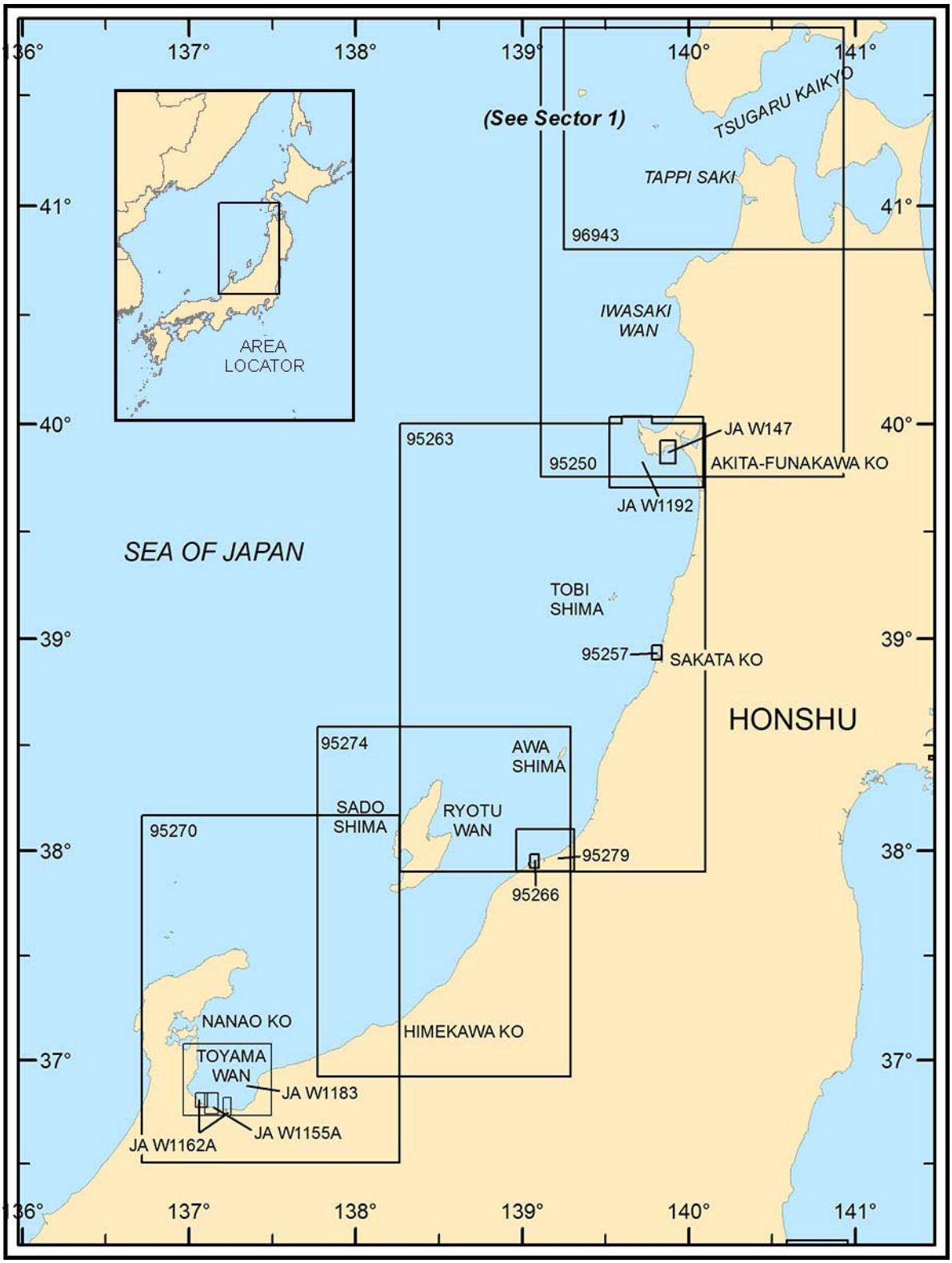
Kabuto Iwa, a rock, 8.9m high, with a round reddish top, lies about 135m offshore, about 0.3 mile N of Minmaya Ko.

Misago-jima, consisting of several dark, pointed rocks, the highest of which is 11.9m, is conspicuous about 3 miles NW of Minmaya Ko.

Tappi Saki (Tappi Zaki) (41°15'N., 140°21'E.), about 2.8 miles farther NW, lies on the S side of the W entrance to Tsugaru Kaikyo. A light is shown on the summit of the point. Obi Shima, a rocky islet, 35m high, is the outermost of two islets extending about 0.2 mile NE of the point. Rocks, some which dry, and some awash, extend up to 0.2 mile N of the point.

There is a harbor for small craft, protected by breakwaters, situated between Obi Shima and Tappi Saki.

Strong tide rips and eddies are formed in the vicinity of Tappi Saki, which should be given a berth of at least 2 miles.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **2** — CHART INFORMATION

SECTOR 2

HONSHU—NORTHWEST COAST—TAPPI SAKI TO ROKUGO SAKI (INCLUDING OFF-LYING ISLANDS)

Plan.—This sector describes the NE part of the NW coast of Honshu, from Tappi Saki, at the W entrance of Tsugaru Kaikyo, to Rokugo Saki, about 266 miles SW. The sector includes Akita-Funakawa Ko, Sakata Ko, Niigato Ko, Naoetsu Ko, Fushiki-Toyama Ku, and Nanao Ko, which can accommodate large vessels. The islands of Kyuroku-jima, Tobi Shima, Awa Shima, and Sado Shima, which lie off the coast, are also described. The arrangement of the sector is from NE to SW.

General Remarks

2.1 Winds—Weather.—The winds on the NW coast of Honshu, from Roguko Zaki to Tappi Saki, are generally calm from April to August, but from September to March, strong winds and rough seas are common. During the good weather season, clear days may be expected when the wind is between the N and W, while rain or fog usually accompanies an extended period with the wind between NE and SE. During July and August, E winds early in the morning followed by winds from the N after 1000 indicate good weather. Around the end of August, there may be a period of E winds which lasts for several days.

Tides—Currents.—The mean tidal rise of the ports in this sector is 0.3m at MHWS, and 0.2m at MHWN. The tidal currents are generally weak.

Tappi Saki to Henashi Saki

2.2 Tappi Saki (41°15'N., 140°21'E.) was previously described with Tsugaru Kaikyo in paragraph 1.47.

The coast from Tappi Saki to Kodomari Misaki, about 8 miles SSW, is backed by high land. Kodomari Misaki is a bold promontory, faced on its W side by a red cliff, and rising to a densely-wooded hill, 230m high. Lights are shown from the NW and SW extremities of the promontory.

A rock, with a depth of 8.5m, lies nearly 1 mile ENE of the NW end of Kodomari Misaki, and about 0.3 mile offshore.

Kodomari Ko, open NW, is entered between Benten Saki, about 1.3 miles E of Kodomari Misaki, and Nanatsuishi Saki, about 1.3 miles farther ENE. Benten Saki is the extremity of a peninsula, 52m high. Nanatsuishi Saki rises to a pointed hill, 79m high, close SE; rocky shoals, on which there are above-water rocks, up to 1.2m high, extend about 0.5 mile W of the point.

A small fishing harbor lies on the SW corner of Kodomari Ko and is protected by North Breakwater and No. 2 East Breakwater. A light is shown from the head of each breakwater. An outer detached breakwater lies 0.15 mile E of No. 2 East Breakwater. There are depths of 11.9m in the harbor entrance, shoaling gradually to 4.9m, about 0.3 mile offshore.

Anchorage.—The harbor affords temporary anchorage for vessels which cannot proceed through Tsugaru Kaikyo due to strong E winds. Temporary anchorage to avoid winds from the E to S, can be taken about 1.5 miles N of Nanatsuishi Saki and 1 mile offshore.

The coast between Kominato Misaki and Otose Saki, about 24 miles SSW, forms an open bay with sandy beaches. Depths of over 20m lie about 1 mile offshore. Jusan Ko, about 6 miles SE of Kominato Misaki, lies at the entrance of a large shallow lagoon. In severe winter weather, the lagoon freezes over completely.

2.3 Otose Saki (Odose Saki)(40°46'N., 140°03'E.), bordered by sunken rocks, is marked by a light. A peak, 359m high, and Masugata Yama, 820m high, rise about 2 miles SE and 5.5 miles S, respectively, of the point. A light is shown about 1.5 miles NE of the 359m peak.

Otose Saki Light

Ajigasawa Ko (Azigasawa Ko), a small fishing harbor, lies about 7 miles ENE of Otose Saki. Iwaki Yama rises to an elevation of 1,624m, about 9 miles SSE of Ajigasawa Ko; its summit has three peaks, the center one is highest.

The coast between Otose Saki and Fukaura Ko, about 9.5 miles SW, is bordered by many rocks and dangers, and should not be approached within 1 mile.

Torii Saki, about 2.8 miles WSW of Otose Saki, is 18m high and conspicuous; two islets lie off the point. Torii Saki Light is shown from a round tower, 10m high. An auxiliary light,

Torii Saki Light

shown from the same position, illuminates reefs 0.15 mile NNW.

Fukaura Ko (Hukaura Ko), a small port, is open NW and has many dangerous rocks and shoals in its approach.

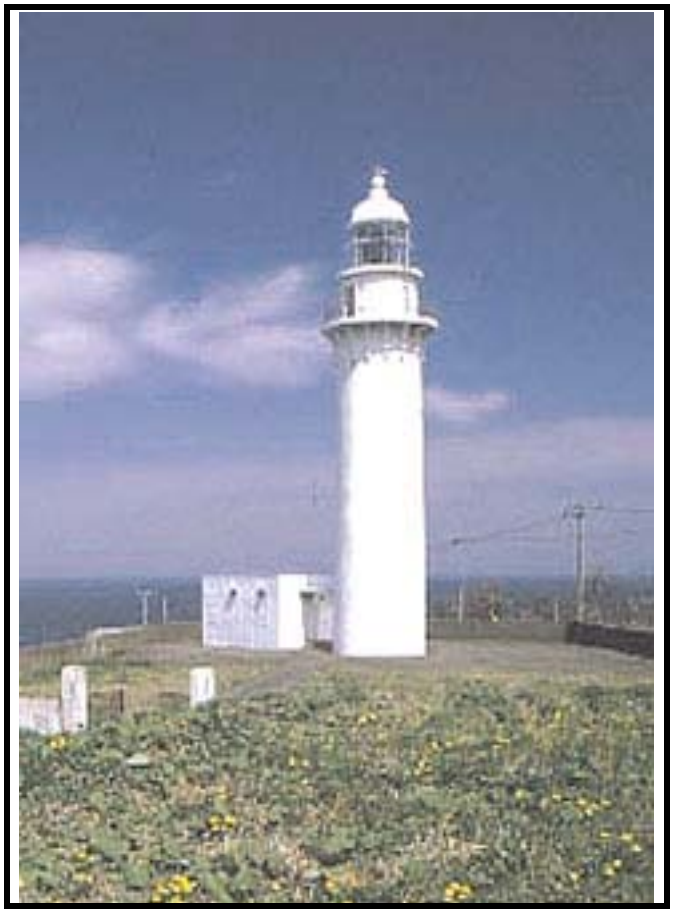
Henashi Saki (Henasi Saki) (40°37'N., 139°52'E.), about 3.5 miles farther WSW, is the W extremity of Fukaura Hanto and is marked by a light. Tsubaki San, a 60m hill at the point, appears as an islet from a distance and is very conspicuous from N or S.

Caution.—Kyuroku-jima (Kyuroku Shima) (40°32'N., 139°30'E.) consists of three above-water rocks, about 17 miles WSW of Henashi Saki, with other awash or sunken rocks in the vicinity. The W and largest rock, marked by a light, is about 57m long and 12.8m wide; it has two knobs, 6m high, and resembles a vessel from a distance. The other two above-water rocks lie about 0.1 mile ENE of the largest rock, and are 2m and 4m high, respectively.

A pinnacle rock, awash, and a rock with a depth of 1.8m, lie about 0.2 mile SE and 0.3 mile NE, respectively, of the largest rock. The sea breaks on the sunken rock.

A rock, with a depth of 5.2m, lies about 1 mile W of the largest rock of Kyuroku-jima, and a rock, with a depth of 4.1m, lies about 0.3 mile NE of the above 5.4m rock.

The bank, on which all of the above dangers lie, has irregular depths and vessels should avoid the area. The edges of the bank fall suddenly to depths of over 200m.



Henashi Saki Light

Henashi Saki to Nyudo Saki

2.4 Iwasaki Wan (40°34'N., 139°55'E.), on the S side of Fukaura Hanto, is open SW. Okino Se, with a depth of 7.3m, lies in the bay entrance. Iwasaki Ko, a fishing harbor, lies at the head of the bay.

Anchorage.—This bay affords the best temporary anchor-

Iwasaki Ko Light

age in the area, sheltered from N through E winds by the high land on its N and E sides.

Sugo Saki (40°26'N., 139°56'E.) rises about 1.3 miles inland to Ohachinagare Yama, a dark densely-wooded mountain, 638m high. A light is shown at Chigogi Saki, about 1 mile SSE of Sugo Saki.

The fishing harbors of Iwadate Ko and Hachimori Ko lie about 2.5 and 4.5 miles SW, respectively, of Sugo Saki.

O Shima, an islet, 10m high, lies near the coast about 0.8 mile SE of Hachimori Ko. The chimney of a steel plant is conspicuous on the coast close SE of O Shima.

2.5 **Nosiro Ko** (Noshiro Ko) (40°13'N., 140°01'E.), about 9.5 miles SSE of Sugo Saki, lies close S of the mouth of Yoneshiro Gawa (Yonesiro Kawa). The town of Nosiro (Noshiro) is situated on the S side of the harbor. A light is shown from the S side of the harbor, E of the harbor entrance. North and S breakwaters extend from the harbor entrance. Another light is shown close SW of the E harbor entrance.

The fairway to the harbor is marked by lighted buoys and is dredged to a depth of 15m.

Depths—Limitations.—The public wharf has a length of 185m, a depth of 10m, and a 15,000 dwt capacity. Nakajima Pier No. 1 and Nakajima Pier No. 2 both have a length of 130m, a depth alongside of 7.5m, and a 5,000 dwt capacity. Omori Quay has a length of 260m, a depth of 13m and can accommodate vessels up to 40,000 dwt.

Aspect.—The sandy coast from Nosiro Ko to Kitaura Ko, about 18.5 miles SSW, has depths of 20m between 1 and 2 miles offshore, shoaling gradually shoreward. The coast for about 8 miles NNE of Kitaura Ko consists of crumbling black cliffs not exceeding 61m in height. Then for about 4 miles farther NNE a strip of level sand hills separates the reclaimed N part of Hachiro Gato from the sea. Fixed fishing nets are laid in depths of up to 20m.

Pilotage.—Pilotage is not compulsory, but strongly recommended. Pilots are available at position 40°11.5'N, 139°58.0'E. Vessels should wait or take shelter off **Funakawa** (39°51'N., 139°53'E.) anchorage if the weather is rough from the NW. Berthing and unberthing during daylight hours only. Three tugs are normally stationed at the port.

Additional tugs will be brought from Akita when required, or hired from a construction company when available at Noshiro.

Anchorage.—Temporary anchorage can be taken off this coast, over a bottom, generally composed of sand. Caution is necessary to avoid the fishing nets.

Kitaura Ko (39°57'N., 139°47'E.) is a small fishing harbor. The depths off the coast between Kitaura Ko and Nyudo Saki, about 5 miles WNW, are irregular and the bottom is foul for some distance offshore.

Temporary anchorage during winds between the S and E can be obtained outside the line of the breakwater heads, in depths of 4 to 11m, sand, taking care to avoid fishing nets.

Oga Hanto

2.6 Oga Hanto, with **Nyudo Saki** (40°00'N., 139°42'E.) at its NW extremity, is a remarkable mountainous peninsula. From a distance it appears as an island due to the low land and Hachiro Gata to the E of it. Hachiro Gata was the second largest lake in Japan, but 65 per cent of the original area has been reclaimed for rice cultivation. Hon Zan (Hon San), the highest and most conspicuous peak of the peninsula, attains an elevation of 731m, about 6.5 miles SSE of Nyudo Saki, and 1 mile inland; two white domes stand on its summit. The W side of Hon Zan is steep and appears copper-colored at a distance, but its E slope is gradual. Kampu Zan, with an elevation of 355m, lies about 6 miles ENE of Hon Zan, at the E end of Oga Hanto; it rises gradually from Hachiro Gata to three peaks, the E peak being the highest.

Nyudo Saki rises to an elevation of 76m, about 0.5 mile S, then rises gently to Bangoyanomori, a conspicuous pointed peak, 149m high, about 1.5 miles farther S. A light is shown from the point.

Mizu Shima, a reef awash, on which there are rocks 3.7m high, lies at the extremity of foul ground extending about 0.7 mile N of Nyudo Saki; a beacon on Mizu Shima is illuminated by an auxiliary light on Nyudo Saki. The sea breaks heavily on Mizu Shima during strong W winds; the current always sets N in the vicinity, and the sea also breaks with prevailing N winds. A boat channel, 7.9m deep, between Mizu Shima and Nyudo Saki, should not be attempted without local knowledge.

From April to November, fixed fishing nets which extend nearly 2 miles are laid off the E side of Mizu Shima.

Anchorage.—Small vessels can obtain temporary anchorage on the E side of Nyudo Saki, sheltered from winds between the S and W, off the village of Hatake, which lies about 0.5 mile SSE of the point. A good anchorage, in 11 to 22m, mud and sand, lies with Nyudo Saki bearing 298°, distant nearly 0.8 mile. The anchorage is difficult to reach due to fixed fishing nets.

2.7 The W side of Oga Hanto is bordered by many above-water rocks and is relatively steep-to, with depths of less than

Nyudo Saki Light

30m no more than 0.5 mile offshore.

Toga Ko, entered about 3 miles S of Nyudo Saki, provides shelter for small vessels with local knowledge. Nebuto Shima, 31m high, lies about 0.5 mile WNW of the N entrance point, and has the appearance of a peach from the N or S. Miya Shima, about 0.2 mile NW of the S entrance point, is 12.8m high and marked by a light; a flat rock, 7.3m high, lies close NW of Miya Shima.

Kamoasa Wan, about 3 miles SSE of Toga Ko, provides temporary shelter to small vessels from N to E winds; a rock, 5.2m high, lies about 0.2 mile offshore near the head of the bay.

Shioga Misaki (Shiose Saki) (39°51'N., 139°45'E.), the SW extremity of Oga Hanto, is flat-topped, conspicuous, and marked by a light. Hokake Shima, a rocky islet, 30m high, lies close E of Shioga Misaki; it resembles the sail of a local sailing boat when viewed from the E or W.

Mikuri-jima consists of three rocks, about 1 mile E of Shioga Misaki; the outermost rock is 1.8m high and marked by a beacon, which is illuminated from a light on Tateyama Zaki, about 0.5 mile NW. Tsubaki Ko, a small fishing harbor, lies close NE of the latter point.

Uno Saki, flat-topped, cultivated, and 32m high, lies about 3 miles E of Shioga Misaki; rocks, some above-water, extend about 0.2 mile SSE of the point.

Minami Hirasawa lies about 1 mile ENE of Uno Saki. Neno Saki, a crumbling cliff, 40m high, lies 0.3 mile farther NE.

Akita-Funakawa Ko (39°50'N., 140°00'E.)

World Port Index No. 61910

2.8 Akita-Funakawa Ko, SE of Oga Hanto, consists of two districts, **Funakawa Ku** (formally Funakawa Ko) (39°53'N., 139°51'E.) (World Port Index No. 61920) to the NW, and **Akita Ku** (formally Akita Ko)(39°45'N., 140°04'E.) (World Port Index No. 61910) to the SE. The port is frequented by large tankers and lumber vessels. Funakawa Ku, open E to SW, affords the best shelter between Sado Shima and Tsugaru Kaikyo, when the Northwest Monsoon prevails. The waters of the inner harbor of Akita Ku are safe in winds from any direction, but entry is difficult for medium and large vessels in winter.

The inner harbor of Akita Ku lies inside the former mouth of Omono Kawa. The latter river enters the sea through a channel, about 4 miles S of Akita Ku, constructed to divert the flow of the river.

Winds—Weather.—Typhoons strike this area in summer and fall, and winter monsoons are violent. Typhoons, however, pass more rapidly and the strong winds are of short duration; whereas, winter monsoons frequently prevail for 3 or 4 days.

The prevailing winds are ESE and SE from April to December, and NW and WNW in January and February. The mean wind velocity ranges from about 10 knots in January to about 6 knots in August.

Tides—Currents.—The tidal rise at Akita is 0.3m at MHWS and 0.2m at MHWN.

The flood tidal current off Akita Ku sets NNW; the ebb tidal current sets SSE. Under the strong influence of the diurnal tide, the tide often changes only once a day, with a velocity of less than 0.5 knot.

After a heavy rain, an outgoing current, with a velocity of about 2 knots, may occur at the entrance to the inner harbor at Akita Ku.

Depths—Limitations.—At Akita Ku, there are dredged depths of 13m in the approach channel, from between the heads of the N and S breakwaters to about 230m N of Old South Breakwater. From this point to about 0.2 mile NE of the root of Old South Breakwater, a depth of 10.6m can be carried.

There are dredged depths of 12.8m alongside the S end of the reclaimed land S of the N breakwater.

The channel leading to Nakashima Quay has a dredged depth of 11m.

There is a minimum depth of 19m in the channel to the Funakawa dolphin berth (39°51'N., 139°52'E.)

The principal berthing facilities are described in the table titled **Akita-Funikawa Ko—Berth Information**.

Aspect.—Aka Ne, a rock with a depth of 2.6m, lies nearly 1 mile S of **Minami Hirasawa** (39°52'N., 139°51'E.). **Aka Ne** (39°51'N., 139°51'E.) is the S of several dangers which lie S of the oil refinery. These dangers, over which the sea breaks during SW winds, are covered by the red sector of Uno Saki Light. Aka Ne Nampo Lighted Buoy is moored 0.3 mile S of Aka Ne.

Several wind turbines exist within the port area; many are conspicuous.

A power cable, with a vertical clearance of 9m, crosses Akita-Funagawa Ko in position 39°52'N, 139°51'E.

A lighted buoy is moored 0.2 mile NNE of Funakawa Breakwater Light, on the S side of shoal water.

The tank farm at Funakawa is reported (2011) conspicuous. Two red and white chimneys, 101m and 189m high, stand at the Akita paper mill and the power plant. Both are conspicuous from sea.

Minawa-Hirasawa Breakwater extends 0.8 mile ESE and SE from a position 1.1 miles SW from the head of Funakawa Breakwater.

Akita Sea Berth Light, 31m high, is situated close E of Mi-

nawa-Hirasawa Breakwater. A submersible oil boom is situated at the berth; the berth is connected to the reclaimed land NW by a submarine oil pipeline. Lighted beacons are situated 183m NNW and 183m S of the sea berth light. A fog signal is sounded from the S lighted beacon.

A conspicuous tower, 143m in height, stands W of the harbor office, in position 39°44'N., 149°04'E.

A wave recorder lies about 0.5 mile S of the sea berth to which it is connected by a submarine cable.

Ne Shima, 0.3m high, lies between Aka Ne and the point. Numerous other rocky patches lie between Aka Ne and the breakwater at Funakawa Ku.

A white five-story office block, situated 1.1 miles NW of Funakawa Breakwater Light, is conspicuous.

A harbor for small vessels, having depths of 2 to 3m, and a timber basin, lie farther N along the coast.

Akita-Funakawa Ko—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Gaiko Container Terminal						
Gaiko Pier No. 1	320m	13.0m	200m	11.8m	50,000 dwt	Bunkers.
Gaiko Pier No. 2	300m	13.0m	200m	11.8m	40,000 dwt	Containers and bunkers.
Mukaihana Terminal						
Mukaihama ‘A”	240m	12.0m	200m	10.9m	30,000 dwt	Bunkers.
Mukaihama No. 1	130m	7.5m	100m	6.8m	5,000 dwt	Bunkers.
Mukaihama No. 2	130m	7.5m	210m	6.8m	5,000 dwt	Bunkers.
Mukaihama No. 3	185m	10.0m	175m	6.8m	5,000 dwt	Bunkers.
Mukaihama No. 4	185m	10.0m	175m	9.5m	15,000 dwt	Bunkers.
Mukaihama No. 5	185m	10.0m	175m	8.9m	15,000 dwt	Bunkers.
Nakajima Terminal						
Nakajima No. 1	161m	9.0m	175m	7.2m	10,000 dwt	Bunkers, ro-ro, and passengers.
Nakajima No. 2	185m	10.0m	175m	9.0m	15,000 dwt	Bunkers, cement, and cruise vessels.
Nakajima No. 3	185m	10.0m	175m	9.0m	15,000 dwt	Bunkers, cement, and cruise vessels.
Nippon Paper Terminal						
Dry cargo berth	40m	11.0m	210m	—	51,000 dwt	Wood chips.
North Pier						
Berth A	122m	7.5m	—	6.8m	5,000 dwt	Cruise vessels, ro-ro, and bunkers.
Berth B	155m	7.5m	—	6.8m	5,000 dwt	Cruise vessels, ro-ro, and bunkers.
Ohama Terminal						
Ohama No. 1	216m	10.0m	150m	9.0m	2,000 dwt	Bunkers.
Ohama No. 2	240m	10.0m	175m	9.0m	2,000 dwt	Bunkers.
Ohama No. 3	185m	10.0m	160m	9.0m	5,000 dwt	Bunkers.
South Pier						
Berth C	155m	5.5m	—	5.0m	2,000 dwt	Bunkers.
Berth D	90m	5.5m	—	5.0m	2,000 dwt	Bunkers.
Shimohama						
Shimohama Wharf	345m	5.0m	—	—	1,000 dwt	Bunkers.

Akita-Funakawa Ko—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Terauchi Pier	200m	7.5m	110m	6.8m	5,000 dwt	Bunkers.
Tankers						
Akita Seiren Terminal						
Akita Seiren Terminal	45m	6.5m	135m	—	3,000 dwt	Chemicals.
Idemitsu Oil & Gas Terminal						
Idemitsu Dolphin	—	7.5m	110m	—	5,900 dwt	Bunkers.
Iwati Terminal						
Iwatani Sanngyou Dolphin	—	5.5m	105m	—	2,400 dwt	Bunkers.
JX Nippon Oil & Energy Terminal						
JX Dolphin	159m	8.0m	107m	—	6,578 dwt	Crude and LPG.
Syouyuu Terminal						
Syouyuu Dolphin	17m	7.5m	89m	—	5,000 dwt	Bunkers.
Tobu Gas Terminal						
Dolphin Berth	130m	6.6m	—	—	2,528 dwt	Bunkers.
Tohoku Electric Power Terminal						
Dolphin No. 1	10m	8.0m	105m	—	—	Bunkers.
Dolphin No. 2	10m	8.0m	115m	—	5,800 dwt	Bunkers.
Dolphin No. 3	28m	13.0m	236m	—	71,000 dwt	Crude and DPP.
Tozai Oil Terminal						
Tozai Dolphin Oil Berth	9.0m	6.5m	105m	—	3,000 dwt	Bunkers.

Oibana Saki (39°54'N., 139°54'E.), about 2.5 miles NE of the oil refinery, is faced with a remarkable white cliff, 40m high, from which the land rises to Kampu Zan, about 2.3 miles NNW.

The coast from Oibana Saki to Akita Ku, about 10 miles SE, consists of sandy beach free from dangers. It is backed by sand hills covered by grass and pine trees, inland of which arable land stretches to the foothills of the distant mountains, where Taihei San, the highest peak, reaches an altitude of 1,179m, about 12.5 miles E of Akita Ku.

Three chimneys, the E and highest, with an elevation of 185m, are painted red and white and are conspicuous about 1.3 miles NE of the harbor entrance of Akita Ku.

Three radio towers of the Harbor Office are conspicuous about 1.3 miles ESE of the head of Old South Breakwater.

Omori Yama, 124m high, lies close to the coast, about 6 miles S of the entrance to Akita Ku, and is surmounted by four TV towers, marked by red lights.

Pilotage.—Pilotage is not compulsory, but is recommended. Pilots for Akita Ku board in position 39°47.5'N, 139°58.3'E and are not available after sunset. Pilots are stationed at Akita Ku and can be contacted on VHF channel 16.

Pilotage for Funakawa Ku is not compulsory. The pilot boards in position 39°48.0'N, 139°58.0'E.

A vessel underway within the port will be instructed by the pilot to display certain flags of the International Code of signals to indicate the section of the port it is proceeding. See table titled **Akita Ko—Course and Destination Signals** for a list of these displays.

Signals.—See the table titled **Akita Ko—Course and Destination Signals**.

Akita Ko—Course and Destination Signals		
Signal	AIS Symbol	Meaning
Second Substitute, Flag N	N	Proceeding to facilities N of Akita N breakwater light and the Old N breakwater
Second Substitute, Flag E	E	Proceeding to facilities N of the Old N breakwater to shore on a bearing of 099°

Akita Ko—Course and Destination Signals		
Signal	**AIS Symbol**	**Meaning**
Second Substitute, Flag E and N	E + N	Proceeding to the JX Pier
Second Substitute, Flag E and C	E + C	Proceeding to facilities between Nakajima Quay and Shimo-hama Wharf on the E side of Kyu Omona Kawa
Second Substitute, Flag E and S	E + S	Proceeding to facilities on the E side of Kyu Omona Kawa and S of Terauchi Wharf
Second Substitute, Flag W	W	Proceeding to facilities on the W side of Kyu Omono Kawa

Contact Information.—See the table titled **Akita—Contact Information**.

Akita—Contact Information	
Pilots	
Telephone	81-18-843-5178
Facsimile	81-18-845-7661
Port Authority	
Telephone	81-188-602-541
Facsimile	81-188-603-804
E-mail	http://www.pref.akita.lg.jp

Anchorage.—The quarantine anchorage for Akita Funakawa Ko is situated about 1.5 miles SE of the head of the breakwater at Funakawa Ku.

Good anchorage can be taken in Funakawa Ku, in 8m, mud, with the head of the breakwater bearing 177°, distant about 0.3 mile.

Large vessels can obtain anchorage off Akita Ku, in 12.8m, fine sand, with the previously-described radio towers bearing 100°, distant about 1.8 miles. Anchorage in greater depths can be taken farther offshore. Good anchorage for vessels under 1,000 gt can be taken, in 8m, with the head of Old South Breakwater bearing 350°, distant about 0.2 mile.

Anchorage for vessels with dangerous cargo will be designated in the outer harbor.

Directions.—Vessels bound for Funakawa Ku from the N round Oga Hanto at a safe distance, then pass SE of the lighted buoy moored S of Aka Ne, and E of the lighted buoy moored SE of the breakwater head.

Approaching Akita Ku from the N, from a position about 2 miles S of Shioga Misaki, steer a course of 100° for the three chimneys of a power plant N of Akita. When a chimney, painted in red and white bands, and about 0.5 mile farther S, is sighted, steer for it.

Approaching Akita Ku from the S, steer for Kampu Zan, bearing 000°, until a chimney of a power plant at Akitu Ku is sighted. Alter course E when the chimney is abeam.

Entry into Akita Ku is dangerous with prevailing NW winds. The end of the breakwater is difficult to see until close to it.

Caution.— An area prohibited to entry lies in the area S of the reclaimed land to the S of the refinery, extending 0.5 mile inside the harbor limit. Reference should be made to the appropriate chart.

Two large fish havens lie 2.5 miles and 4.5 miles W of the entrance to Akita Ku.

A submerged pipeline extends about 1 mile offshore from a position about 1.3 miles NW of Omori Yama; four framework towers, marked by red lights, lie at the seaward end of the pipeline.

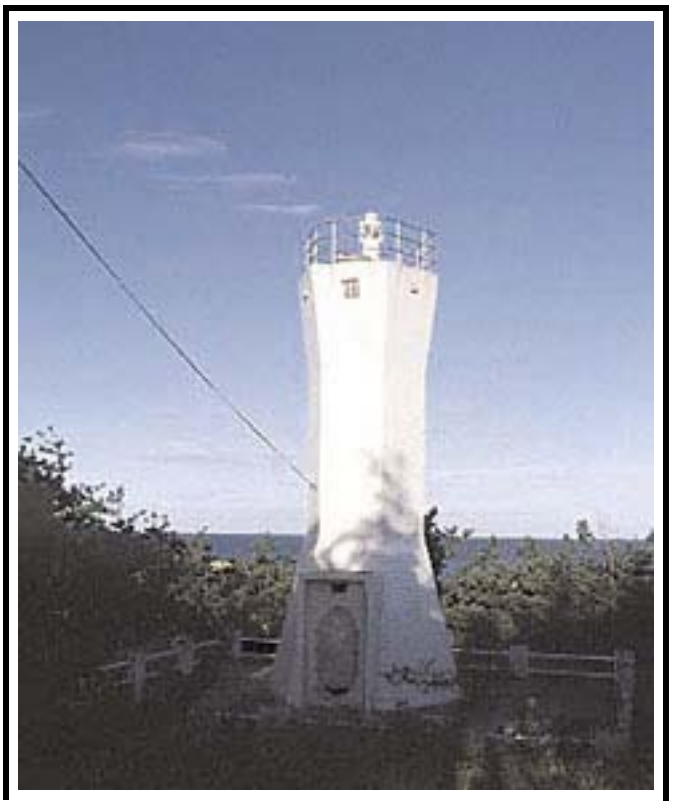
Akita-Funakawa Ko to Sakata Ko

2.9 The coast between Akita-Funakawa Ko and Sakata Ko, about 51 miles SSW, has depths of over 20m about 1.5 miles offshore.

Matsuga Saki Light (39°30'N., 140°03'E.) is shown about 15 miles S of Akita-Funakawa Ko.

Honjo Ko (Honzyo Ko), about 7 miles farther S, lies in the mouth of Koyoshi Kawa; the river is only accessible to small boats. Honjo Light is shown from a hexagonal tower, 11m high, which stands 1 mile NNE of the river mouth. A light is also shown on the head of a breakwater on the N entrance point of the river.

Matsuga Saki Light



Honjo Ko Light

Sasamori Yama, surmounted by a clump of trees, rises to an elevation of 550m about 7 miles E of Honjo Ko.

Hirasawa Ko, a small fishing harbor, sheltered by breakwaters, lies about 6.5 miles SSW of Honjo Ko. Lights are shown on the heads of the E breakwater and of the jetty.

Anchorage.—Temporary anchorage, sheltered from winds between the NE and SSW, can be taken, in depths of 7.3 to 10.1m, sand, about 0.5 mile offshore, abreast Hirasawa Ko.

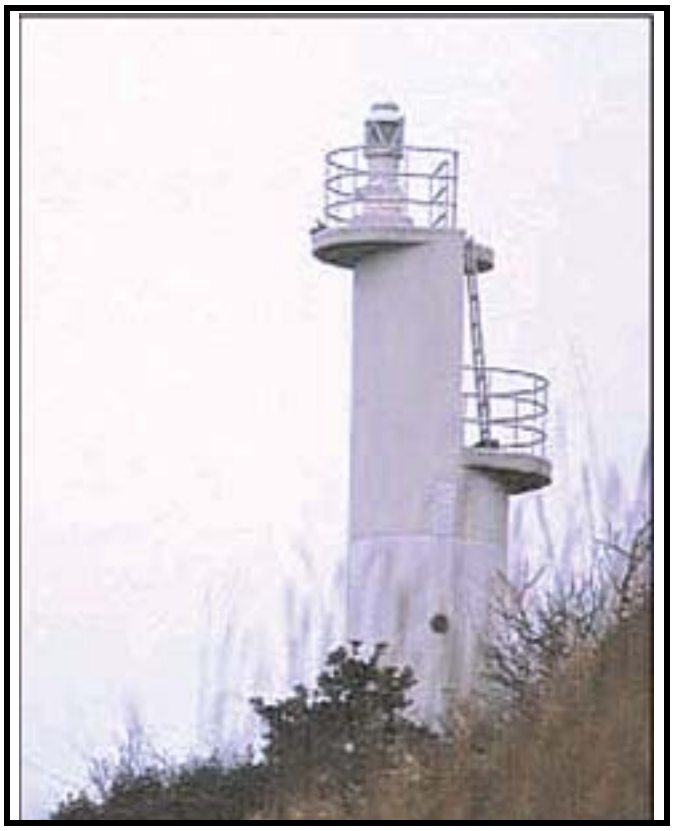
Konoura Ko, a small fishing harbor, lies about 3.3 miles SW of Hirasawa Ko. Konoura Ko Light is shown from a square tower, 11m high.

The town of Kisakata, about 3 miles farther S, lies on Shikoshi Hana, a low, sparsely wooded headland, rising to a hill, 11m high at its NW end. Kisikata Ko lies between the NW and SW extremities of the headland, and consists of a N and S cove for fishing vessels. A light is shown on the S end of the S breakwater.

Mi Saki (39°07'N., 139°52'E.), about 5.5 miles S of Shiokoshi Hana, is 106m high and densely wooded. Ugo Mi Saki Light is shown from Mi Saki. It is the extremity of a spur extending from Chokai San, about 8.5 miles E.

Aspect.—Two radio towers, both fitted with parabolic antennae, stand 0.15 mile and 1.5 miles E, respectively, of Mi Saki. The W tower is reported conspicuous.

2.10 Chokai San (39°06'N., 140°04'E.), a conical mountain, 2,236m high, is snow-capped, except in August and September; its peak is often hidden by clouds. It can be seen for a great distance, and appears to have two peaks when viewed



Ugo Mi Saki Light

Tobi Shima Light

from the N and three peaks when viewed from S.

Tobi Shima (39°12'N., 139°33'E.), a relatively flat-topped island, lies about 15 miles WNW of Mi Saki. There are three hills of almost equal height; the S hill is 71m high to the tops of the trees and Tobi Shima Light is shown from the N hill. The shore of the island consists of beaches of sand and shingle, fringed by drying rocks. The island is surrounded by rocky shoals, except off its SE side.

Oshaku Shima, 76m high, is the N and largest of a group of rocks and islets about 1 mile W of the S extremity of Tobi Shima. The group is almost joined to Tobi Shima by rocky shoals.

A reef, with a depth of 8.2m, lies at the N end of foul ground extending about 0.8 mile N of Tobi Shima. Futamata Shima, 5.6m high, and Okami Shima, 6.3m high, lie on this foul ground, about 0.4 mile NNE and N, respectively, of the N end of Tobi Shima. A rock, with a depth of 2.1m, lies about 0.2 mile NE of Futamata Shima, and a rock, with a depth of 4.5m, lies about 0.4 mile W of Okami Shima.

Tobishima Hakuchi, the open bay on the SE side of Tobi Shima, has depths of over 20m about 0.2 to 0.25 mile offshore, and is sheltered from S to NW winds. Ebisumaisaki Hanto, a small peninsula, forms the SW part of the bay; a fishing harbor, formed by breakwaters, lies close NNW of the peninsula.

Anchorage.—Good anchorage can be taken, in 35m, sand, with the E extremity of Ebisumaisaki Hanto bearing 219°, distant 0.35 mile. Small vessels with local knowledge can anchor closer in off the breakwaters of the fishing harbor.

Caution.—A large part of the bay consists of a rock bottom, covered with sand, which is not suitable for anchorage.

2.11 **Ara Saki** (39°04'N., 139°52'E.), about 3 miles S of Mi Saki, is the N entrance point of Fukura Kawa, and is 19.5m high and grassy. A light, mounted on a white tower, 8m in height, is shown on the head of a small breakwater at the entrance point of the river.

The coast from the mouth of Fukura Kawa to Sakata Ko, about 9 miles SSW, consists of a straight, sandy beach, backed by extensive undulating plains, with mountains rising about 13 miles inland.

Sakata Ko (38°56'N., 139°49'E.)

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2.12 Sakata Ko, at the mouth of Mogami Gawa, is an important port for the distribution of rice, and the transshipment of lumber. The downtown area of Sakata, a commercial and industrial city, lies E of the port; there are numerous chimneys in and NW of the city.

The port consists of a S part, at the mouth of Mogami Gawa, and a N part, about 2 miles NNE. The S, or main harbor, is separated from the river by training walls; the head of this harbor is connected to the river by a small lock. Breakwaters shelter the entrance which is open NNW. The N part is a basin sheltered by Kitako North Breakwater extending SW from reclaimed land, and another breakwater extending WNW from the coast. A dredged approach channel leads to a berth in its NE part.

Winds—Weather.—The winter monsoon frequently turns into a snow storm blowing for days. There are 140 to 150 stormy days per year, 60 per cent of which occur from November through March.

When a growing low pressure system originating in the sea of Japan moves to the Pacific Ocean across Honshu, the wind may abruptly shift from the E through SE to W through NW, causing a strong storm around Sakata Ko during the period from March through May. Fog seldom forms, and even when it does form, it usually lasts for only 4 or 5 hours.

Tides—Currents.—The tidal rise at Sakata is 0.3m at MHWS and MHWN.

Tidal currents attain a maximum velocity of 1 knot. A noticeable N coastal current develops when SW winds prevail from the end of April through May.

Depths—Limitations.—The principal berthing facilities are described in the table titled **Sakata Ko—Berth Information**.

Sakata Ko—Berth Information

Name		Position	Length	Depth	Maximum Vessel	
					Beam	Size
Ohama Wharf	No. 1 Quay	About 0.6 mile ESE of North Breakwater Light	330m	8.0m	20.0m	10,000 dwt
	No. 2 Quay	Immediately NE of Ohama Wharf—No. 1 Quay	90m	1.7m	12.2m	2,000 dwt
			305m	1.7m	12.2m	700 dwt
West Wharf	No. 1 Quay	Southeast opposite shore of Ohama Wharf—No. 1 Quay	185m	10.0m	—	15,000 dwt
	No. 2 Quay	Immediately NE of West Wharf—No. 1 Quay	53m	4.5m	—	700 dwt
	-5.5m Quay	Immediately W of West Wharf—No. 2 Quay	180m	3.5-4.0m	—	2,000 dwt

Sakata Ko—Berth Information							
Name		Position		Length	Depth	Maximum Vessel	
						Beam	Size
East Wharf	Shin Machi Quay	Frontal area of the W part of Hiwa Yama		260m	6.0-7.0m	—	5,000 dwt
	No. 1 Funaba Cho Quay	Immediately SE of Shin Machi Quay (in order from N to S)		360m	4.5-5.5m	—	2,000 dwt
	No. 2 Funaba Cho Quay			195m	4.5m	—	700 dwt
Suisan Quay	No. 1 Quay	Immediately SE of East Wharf		140m	4.0m	—	—
	No. 2 Quay	Southwest opposite shore of Suisan Quay—No. 1 Quay		196m	5.5m	—	—
				180m	4.5m	—	—
Sodeoka Wharf Quay		Immediately NW of Suisan Quay—No. 2 Quay		390m	7.5m	16.5m	5,000 dwt
Takasago No. 2 Quay		Sakata-Kita Ko	About 0.3 mile NNE of Sakata Light	280m	13.0m	—	50,000 dwt
Kominato Wharf	No. 1 Quay		South side shore of the head of the port (in order from W to E)	270m	13.0m	37.9m	50,000 dwt
	No. 2 Quay			185m	10.0m	37.5m	15,000 dwt
	No. 3 Quay			185m	9.5m	25.0m	15,000 dwt
Kominato Mooring Pillar			East side of Kominato Wharf	—	9.3m	—	15,000 dwt
Miyaumi Wharf	No. 2 Quay		East side shore of the head of the port (in order from S to N)	130-170m	7.5m	17.8m	5,000 dwt
	No. 3 Quay				7.5m	16.5m	
	No. 4 Quay				7.0m	16.5m	

Aspect.—Sakata Ko Light (38°57'N., 139°49'E.) is shown about 1.3 miles NE of the entrance to Sakata Ko (S part). A radio tower, 60m high, with a parabolic antenna, is conspicuous about 2 miles SE of the above light.

A light is shown on the head of N breakwater. Near the head of the S breakwater a light is shown from a tower. Hiwa San, a hill 32m high with a monument on its W part, is conspicuous about 1.5 miles ESE of the above-mentioned harbor entrance.

Lighted buoys mark the entrance to the dredged channel in the N basin.

The port administration is increasing the facilities available by constructing new berths and warehouses as part of the public port development.

The anchorage has been extended to allow vessels over 7m draft to berth.

Pilotage.—Pilotage is not compulsory. Pilots are available and board in two locations. For vessels of 30,000 gt and over the pilot boards 2 miles W of the S breakwater. For vessels under 30,000 the pilot boards 0.8 mile W of the S breakwater. It is recommended that large vessels use a pilot when entering or leaving port.

Pilots are available at the quarantine anchorage from sunrise to sunset, for vessels requiring pilot services and can be contacted on VHF channels 12 and 16 (call sign: Sakata-ho-an) The Combined Port Affairs Building is situated close S of Hiwa San.

Regulations.—Vessels should send their ETA 24 hours in advance. When entering the port, vessels shall submit an entry notification to Port Control. This message shall include the following:

1. Vessel's name, call sign, type, nationality and registry.
2. Draft, loa, gt, and speed.
3. Vessel owner details.
4. Port of departure and/or last port.
5. ETA, reason for arrival, and intended berth.
6. Cargo type and amount.
7. Accidents during voyage or issued affecting navigation

Contact Information.—See the table titled **Sakata—Contact Information**.

Sakata—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	81-234-438-306
Facsimile	91-234-438-309
Port Authority	
Telephone	81-234-26-5635
Facsimile	81-234-22-5216
E-mail	port@port-of-sakata.jp

Anchorage.—The quarantine anchorage, with a radius of 0.27 mile, is centered about 1 mile NW of the head of North Breakwater at Sakata Ko (S part). This is a poor anchorage due to the continuous swell.

Vessels usually berth, but when the sea is calm, good anchorage, sand bottom, can be obtained by 1,500 dwt vessels with drafts up to 4.6m inside the N breakwater of the S harbor.

In bad weather, shelter can be taken in Tobishima Hakuchi, about 20 miles NW.

Caution.—Entry into the S harbor is difficult with large swells caused by prevailing W through NW winds.

A sizable area, specified for the setting of fish havens, has been established.

Sakata Ko—Old Port

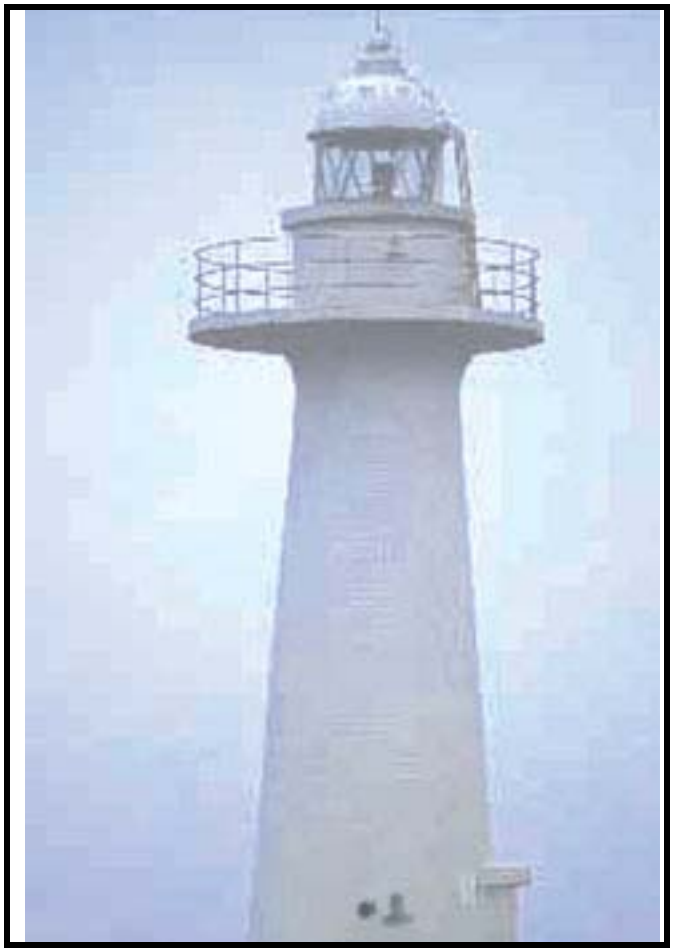
Sakata Ko—Approaches

Sakata Ko to Niigata Ko

2.13 The coast from Sakata Ko to **Kamo Ko** (38°46'N., 139°44'E.), about 10.5 miles SSW, consists of a straight, sandy beach, backed by extensive undulating plains, with mountains rising about 13 miles inland. Kamo Ko is a small inlet sheltered by breakwaters. Ara Saki, 22m high, the W entrance point of Kamo Ko, is marked by a light. Three radio towers, marked by red lights, are conspicuous on the summit of a hill, about 1 mile E of Ara Saki.

An aero light is shown between 0800 and 1930, at an elevation of 52m, from a position 5 miles NE of Kamo Ko. A fish haven is reported about 2 miles SW of the aero light.

A hill, 307m high, is conspicuous about 0.5 mile inland, midway between Kamo Ko and Yura Ko, about 3.5 miles SW. Aneji Guri, a rock awash and steep-to, lies about 0.4 mile offshore, about 1.3 miles SW of Ara Saki. It is easily identified as the sea usually breaks on it.



Sakata Ko Light

Yura Ko (38°43'N., 139°41'E.), 3.5 miles NE of Hato Saki, is a small fishing harbor protected by a breakwater, on the head of which a light is shown. Hakusan To, an islet rising to a conical hill, is 70m high, and connected to the coast SE by a bridge. Kuraizumi Iwa, a rock, 4.6m high, lies nearly 0.5 mile W of Hakusan To, off the harbor entrance.

Obato Wan, about 3 miles SW of Yura Ko, provides temporary anchorage, sheltered from E through S winds, to vessels with local knowledge. Hato Saki, the W entrance point of the bay, is marked by a light and bordered by shoals. Ryutoan Shima, 3.7m high and marked by a light, lies nearly 0.5 mile W of Hato Saki. The channel between the islet and the coast has depths over 11m and is used by small local vessels.

2.14 The coast from Obato Wan to the mouth of **Miomote Kawa** (38°14'N., 139°27'E.), about 28 miles SSW, is backed by mountains and mainly rocky and steep-to, with some above-water rocks lying close inshore. A railway runs along this coast at a short distance inland.

Two radio towers, marked by red obstruction lights, stand about 4.5 miles SSW of Obato Wan. Atumi Take, 736m high and pointed, is conspicuous about 2 miles E of the N radio tow-

Hato Saki Light

Ryutoan Shima Light

er.

Nezugaseki, a small artificial harbor, lies about 8.5 miles SSW of Obato Wan. Benton Shima, a dark rocky islet connected to the SW side of the harbor by reclaimed land, is 45m high to the top of a radio tower on its summit, and shows up well from the N or S. The islet is connected to the coast ESE by a breakwater; a light is shown from its SW end. A reef, with a rock, 1.5m high, at its W end, extends about 0.1 mile W of Benton Shima.

The harbor is sheltered N by a W breakwater and rocks ex-

Nezugaseki Light

tending N from Benten Shima, and by an E breakwater extending SW from reclaimed land in the NE part of the harbor. The navigable channel between the heads of the breakwaters is about 45m wide and open N. In winter, heavy seas penetrate the harbor and make entry difficult.

A detached breakwater protects the harbor entrance. The general depths in the harbor are about 4.9m, with sandy bottom, providing good anchorage. A pier, on the NE side of the harbor, has a berth 145m long, with depths of 2.6 to 3.6m alongside.

Gas San rises to an elevation of 1,980m, about 22 miles E of Nezugaseki Ko.

Hokotate Iwa, a steep-sided rock, 68m high, lies about 4.5 miles SSW of Nezugaseki Ko.

2.15 Oshima Saki (38°23'N., 139°27'E.), about 6 miles farther SSW, rises to a steep hillock. O Shima, a brown, rocky islet, 11.9m high, lies off the point.

Budo Yama, 795m high, and Shimbo Dake, 852m high, are conspicuous about 4 miles E and 3.5 miles SE, respectively, of Oshima Saki.

O-Asahi Dake (38°15'N., 139°56'E.) rises to an elevation of 1,870m, about 22 miles E of the mouth of Miomote Kawa.

The coast from the mouth of **Miomote Kawa** (38°14'N., 139°27'E.) to Niigata Ko (East Harbor), about 18 miles SW, consists of sandy beach, broken by rivers, and backed by hills about 5 miles inland.

Senami Hakuchi, off the entrance to Miomote Kawa, provides good anchorage, in 5.5 to 9m, mud, within 0.5 mile offshore.

Iwafune Ko, a small port, lies about 3 miles farther SSW. Iwafune Ko Light is shown about 0.4 mile N of the port, and a round hill, 74m high, is conspicuous nearly 0.5 mile N of the port.

The harbor consists of a basin protected by the West Break-

water, which extends 0.5 mile SW from the W side of the entrance to Ishi Kawa. A light is shown from East Groyne, which extends WNW from the shore 0.2 mile S of Ishi Kawa entrance.

A detached No. 2 West Breakwater extends 0.2 mile SW from a position 183m SW of West Breakwater and No. 2 East Groyne extends 0.25 mile WNW from the shore, 0.25 mile S of East Groyne. A light is shown from its head. Other lights are also shown from the head of West Breakwater and from both ends of No. 2 West Breakwater.

Gagyu San, a round densely-wooded hill, 135m high and isolated, lies about 3 miles NE of Iwafune Ko, and is conspicuous from the SW.

Kosagi San, 966m high, rises about 10 miles ESE of Iwafune Ko. Washigasu Yama, 1,093m high, about 5 miles NNE of Kosagi San, has twin summits, one pointed and the other round.

Ninoji Dake (Ninozi Take) (37°54'N., 139°30'E.) rises to an elevation of 1,421m, about 15 miles ESE of Niigata Ko (East Harbor).

2.16 **Awa Shima** (38°27'N., 139°15'E.) lies about 10 miles WNW of Oshima Saki. Koshiba Yama, 265m high, the summit of the island, rises a little S of the center of the island; a light is shown from Koshiba Yama. Detached reefs lie within 0.4 mile of the W coast, but the E coast is almost clear of dangers.

Tori Saki, the NE end of the island, is 58m high. A reef, with a depth of 6.7m, lies about 0.5 mile N of Tori Saki, and Tode Guri, with a depth of 1.8m, lies about 0.2 mile WSW of the reef. Engaiyama, a rock 0.5m high, lies about 0.4 mile NW of the N end of the island. Many rocks lie within 0.5 mile of the N end of the island.

Hachiman Hana, the SW extremity of Awa Shima, is 75m high. It is bordered by foul ground; the outermost danger is a reef, with a depth of 5.8m, about 0.4 mile SSW of the point.

Awashima Hakuchi is an open roadstead in the N part of the E side of Awa Shima; it is sheltered from W winds and is a better anchorage than Tobishima Hakuchi. Okinohata Saki, an islet, 12.8m high, lies close offshore, about 1 mile SSW of Tori Saki. Uchiura, about 0.5 mile farther SSW, is fronted by a fishing harbor, sheltered by breakwaters, in the SW part of Awashima Hakuchi.

Anchorage.—Good anchorage can be taken, in 14 to 21m, with Okinohata Saki bearing 354°, and with the N end of the outer breakwater at Uchiura bearing about 255°. Small vessels with local knowledge can anchor inside the line between the E end of Tori Saki and Okinohata Saki.

Niigata Ko (37°55'N., 139°03'E.)

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2.17 Niigata Ko consists of two sections. Nishi Ku is located at the mouth of Shinano Gawa (Sinano Kawa) and Higashi Ku, an artificial inlet, lies about 8 miles ESE. Breakwaters shelter the entrances to both harbors. The city of Niigata is built on either side of the mouth of Shinano Gawa; many factories are situated on the E side of the river, and government and business offices are situated on the W side. Agano Gawa enters the sea about 3 miles E of Nishi Ku. A light is shown from a round tower, 15.8m high, on the E side of the entrance to Agano Kawa. An area in which fishing nets are set is situated 1.75 miles NE of the mouth of Agano Kawa.

Shinano Gawa is the largest river in Japan, and its basin is mostly flat plain, which has flooded regularly in the past. Nishi Ku is subject to silting. Depths at the mouth of the river are subject to silting, due to the Northwest Monsoon and the flood period.

Several small breakwaters are constructed near the mouth of Shinano Gawa.

Winds—Weather.—Northwesterly winds prevail during the winter in the vicinity of Niigata. From April through October, S winds are frequent, gradually shifting to W in November. The mean maximum velocity is about 10.5 knots in January, and the mean minimum velocity is about 6 knots in July.

Winter is cloudy and snowy, with monsoons. The monsoons occur in 3 to 6 day cycles. From late winter to early spring, there are strong SW to W winds caused by a low originating in the South China Sea and developing in the Sea of Japan. The period from May to October is relatively calm, although a typhoon may occur from July through December.

Niigata Ko

Tides—Currents.—The tidal rise at Niigata is 0.3m at MHWS, and 0.2m at MHWN.

The tidal currents at Niigata set NE-SW at a velocity of less than 0.5 knot. The velocity is generally higher near the river mouth, attaining a velocity of 1 knot; it attains a velocity of 1.75 knots at the surface, and 0.2 knot at 4 to 6m below the surface.

A current sets E from the end of the East Breakwater.

Depths—Limitations.—The channel to Niigata Ko inner harbor is maintained to a least depth of 10.5m for a distance of about 2.5 miles from the outer harbor.

The principal berthing facilities are described in the table titled **Niigata Ko—Berth Information**.

A chimney, painted in red and white bands and marked by

red obstruction lights, is conspicuous at an elevation of 208m, about 0.8 mile ESE of the head of East Breakwater. A similar chimney, with an elevation of 165m, lies about 0.2 mile farther SW.

Niigata Ko—Signals			
Designation	**Day signal**	**Night signal**	**Meaning**
Entering signal	One black cone (point up)	One white flashing every 2 seconds	Inbound vessels may enter. Outbound vessels of 500 gt or more (in the case of oil tankers, 300 gt or more) shall not leave but wait.
Leaving signal	One black square	One red flash every 2 seconds	Outbound vessels may leave. Inbound vessels of 500 gt or more (in the case of oil tankers, 300 gt or more) shall wait outside Nishi Ku.
Free signal	Two black cones, points together.	One red flash and one white flash every 3 seconds	Inbound vessels of 500 gt or more (in the case of oil tankers, 300 gt or more) shall wait outside Nishi Ku. Outbound vessels of the same shall not move but wait.
Prohibition signal	The combination of two black cones (points together) and one red flag	Three red flashes and three white flashes every 6 seconds	The traffic is prohibited except for vessels permitted by the Captain of the Port

Akita-Funakawa Ko—Berth Information					
Berth	**Length**	**Depth**	**Maximum Vessel**		**Remarks**
			Draft	**Size**	
Bandaiijma Ferry Terminal					
No. 01	165m	7.5m	—	—	Fast ferries and ro-ro.
No. 02	165m	7.5m	—	—	Aggregates, fast ferries, and ro-ro.
Jetfoil Depot	92m	—	—	—	Aggregates, fast ferries, and ro-ro.
Bandaiijima Wharf					
No. 01	30m	7.0m	—	2,000 dwt	Passengers and breakbulk.
No. 02 North	200m	—	—	—	Aggregates and breakbulk.
No. 02 South	200m	—	—	—	Aggregates and breakbulk.
No. 03	—	—	—	—	Aggregates and breakbulk.
Central Wharf East (Higashi)					
No. 01	265m	13.0m	11.0m	55,000 dwt	Aggregates and breakbulk.
No. 02	260m	13.0m	11.8m	55,000 dwt	Aggregates and breakbulk.
Central Wharf West (Higashi)					
Central Wharf	232m	13.0m	11.8m	55,000 dwt	Grain and breakbulk.
East Wharf (Higashi)					
No. 01	360m	13.0m	11.8m	55,000 dwt	Grain and breakbulk.
Niigata World Trade Terminal (N-WTT)					
No. 01	130m	7.5m	9.0m	15,000 dwt	Containers and reefers.
No. 02	185m	10.0m	—	—	Containers and reefers.
No. 03	350m	12.0m	—	—	Containers and reefers.
No. 04	250m	12.0m	—	—	Containers and reefers.

Akita-Funakawa Ko—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Shin-Nittetsu					
No. 01	125m	7.5m	—	—	Steel products.
No. 02	125m	7.5m	—	—	Steel products.
South Timber Terminal (Higashi)					
No. 01	144m	7.5m	—	—	Scrap metal and breakbulk.
No. 02	144m	7.5m	—	—	Scrap metal and breakbulk.
South Wharf (Nishi)					
South Berth No. 01	144m	7.5m	—	—	Scrap metal and breakbulk.
South Berth No. 01	144m	7.5m	—	—	Scrap metal and breakbulk.
Zen-Noh East Terminal (Higashi)					
Silo Berth	100m	6.0m	—	—	Grain and breakbulk.
Central Wharf (Nishi)					
End Berth	137m	7.5m	—	—	Cement and breakbulk.
North Berth 01	147m	9.5m	—	—	Cement and breakbulk.
North Berth 02	147m	9.5m	—	—	Chemicals and breakbulk.
South Berth 01	153m	7.5m	—	—	Breakbulk.
South Berth 02	153m	7.5m	—	—	Breakbulk.
East Wharf (Nishi)					
East 01	115m	7.5m	—	—	Chemicals and breakbulk.
East 02	115m	7.5m	—	—	Cement and breakbulk.
North Wharf (Nishi)					
Municipal Pier	—	10.0m	—	37,000 dwt	Passengers and breakbulk.
North 01	142m	9.5m	—	—	Passengers and breakbulk.
North 02	142m	9.5m	—	—	Passengers and breakbulk.
North 03	142m	9.5m	—	—	Passengers and breakbulk.
Rinko Harbour Terminal					
A1	110m	11.0m	—	—	Scrap metal and breakbulk.
A2	110m	11.0m	—	—	Scrap metal and breakbulk.
A3	110m	11.0m	—	—	Scrap metal and breakbulk.
B2	115m	11.0m	—	60,000 dwt	Scrap metal and breakbulk.
B3	115m	11.0m	10.0m	60,000 dwt	Scrap metal and breakbulk.
C1	66m	11.0m	—	—	Breakbulk.
C2	66m	11.0m	—	60,000 dwt	Cement and breakbulk.
C3	68m	11.0m	—	—	Cement and breakbulk.
D1	160m	16.0m	—	—	Cement and breakbulk.
D2	122m	11.0m	—	—	CPP, DPP, and breakbulk.
D3	122m	11.0m	—	—	CPP, DPP, and breakbulk.
E1	8m	8.0m	—	—	CPP and DPP.

Akita-Funakawa Ko—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
E2	—	—	—	5,000 dwt	CPP and LPG.
E3	—	—	—	3,500 dwt	CPP and DPP.
Yamanoshita West Terminal					
Yamanoshita North 01	180m	9.0m	7.0m	10,000 dwt	DPP, steel, and breakbulk.
Yamanoshita North 02	180m	9.0m	—	—	DPP, steel, and breakbulk.
Yamanoshita South 01	145m	7.5m	—	—	Ro-ro, passengers, and breakbulk.
Yamanoshita North 02	145m	7.5m	—	—	Ro-ro, passengers, and breakbulk.
Zen-Noh West Terminal (Higashi)					
No. 1	228m	13.0m	12.0m	55,000 dwt	Multipurpose.
No. 2	228m	13.0m	12.0m	55,000 dwt	Multipurpose.
Tankers					
KU Ocean Transport Terminal					
AKaiyo Unyu Quay	225m	12.0m	10.5m	35,000 dwt	Chemicals. Maximum loa of 175m.
Niigata					
Niigata Berth A	150m	6.0m	5.5m	3,000 dwt	LPG.
Niigata LNG Terminal					
LNG	40.0m	14.0m	12.5m	72,000 dwt	LNG.
Niigata Power Station.					
East No. 01	23m	13.0m	11.8m	66,000 dwt	Crude and DPP.
Nokyobi Oil Terminal					
East No. 03	35m	13.0m	—	102,000 dwt	Crude and DPP.
West Wharf Oil Terminal					
No. 01 South.	18m	7.5m	6.3m	5,000 dwt	Chemicals, CPP, and LPG.
No. 01 West	18m	7.5m	6.3m	—	Chemicals, CPP, and LPG.
No. 02 North	27m	10.0m	9.0m	5,000 dwt	Chemicals and CPP.
No. 03 South	27m	10.0m	9.0m	15,000 dwt	Chemicals and CPP.
Zennoh Energy Terminal					
Tanker	20.0m	—	—	—	DPP.

Aspect.—An oil production platform lies 14 miles NE from Agano Kawa and is connected by a pipeline to the shore close WSW of Higashi Ku.

Oil tanks are conspicuous on either side of the outer basin.

An oil-drilling platform, marked by lights, lies about 6.5 miles WNW of the entrance to East Harbor.

An aviation light at Niigata Airport, about 1 mile WSW of the mouth of **Agano Gawa** (37°58'N., 139°08'E.), is visible for a great distance.

Agano Gawa Light and Matsuga Sakihama Light are shown on the E side of the mouth of Agano Gawa.

West Breakwater No. 1 projects 2 miles NNE from the N corner of reclaimed land. A light is shown near the breakwater head. A detached breakwater lies close-to and parallel to the coast SW. East Breakwater No. 2 extends 0.4 mile NW from a position 0.75 mile NE of the root of East Breakwater No. 1.

Pilotage.—Pilotage is not compulsory, but is advisable for vessels berthing. Pilots are available in daylight hours only and board in the following positions:

1. For Nishi Ku—Position 37°57'57.6"N, 139°01'55.2"E and position 37°58'21.0"N, 139°02'31.8”E.
2. For Higashi Ku—Position 38°02'12.0"N, 139°14'18.0"E and position 38°00'40.8"N, 139°11'42.0"E.

A berthing master boards vessels berthing at the offshore pipeline berth NE; the pilot remains on board during the vessel’s stay. The Niigata Pilots may be contacted via VHF chan-

nels 6 and 16 and by telephone (1-25-244-2320).

Niigata Ko—Contact Information	
Pilots	
VHF	VHF channels 6, 8, and 16
Telephone	81-25-244-2320
Facsimile	91-25-244-9551

Signals.—Vessel movements in Niigata Ko are controlled by signals shown from the signal station. The light signals are shown day and night; by day, the alternative signal may be used.

The signal station, near the root of West Breakwater, displays navigation, anchoring, berthing, and weather signals. Vessels should retain on board the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate signals, and other local or specific regulations.

The Combined Port Affairs Building is situated near the foot of Central Wharf.

See the table titled **Niigata Ko—Signals** for signals that are to be displayed by vessels entering, departing, as well as other operations in the harbor. For other signals, see the table titled **Niigata Ko—Course and Destination Signals**.

No movements of vessels are permitted in the harbor between sunset and sunrise without special authorization from the Captain of the Port.

Anchorage.—The Quarantine Anchorage, centered in position 37°58'04.8"N, 139°03'19.2"E, is WNW of Nishi Ku harbor entrance. Vessels waiting for a berth should anchor in an area W of the breakwaters, in 20m or more, sand. The area E of the breakwater should not be used as an anchorage. The holding ground off Niigata is bad, and there is a high risk of dragging anchor in bad weather. Attention should be made to the obstruction in position 37°58'04.8"N, 139°03'24.0"E.

Vessels carrying dangerous cargo are required to report their anchorage positions to the harbormaster immediately. Vessels at anchor in the roadstead are required to maintain either a visual watch or a radio watch is to be set, with main engine on standby.

Anchorage also can be taken, in about 30m, about 1 mile N of the entrance to Higashi Ku.

Vessels waiting to enter port in a heavy sea should be careful not to drag their anchors, and should keep their engines on standby. In weather, vessels should leave the anchorage early and seek shelter in the lee of Sado Shima.

Directions.—Entry and departure routes at Nishi Ku are one way; vessels must enter quickly. Vessels should weigh anchor for immediate entry as soon as the pilot boat is seen.

A vessel entering Nishi Ku in winter should approach from the NNW of West Breakwater, remaining clear of the detached breakwater. With an approach from the NNE of West Breakwater, strong NW winds and the river current may set the vessel toward East Breakwater and the shoal water on the E side of the entrance.

Caution.—The harbor is subject to silting, and constant dredging is necessary. The fairway has been dredged, but the depth is liable to change, and a pilot should be taken.

A dangerous wreck exists about 4 miles NW of the W end of the airport.

Sado Shima

2.18 Sado Shima (Sado Shima) (38°00'N., 138°25'E.) lies W of Niigata Ko and is separated from the mainland by Sado Kaikyo, a deep strait, with a least width of about 17 miles. The S and E sides of the island are comparatively steep-to and there are no dangers beyond about 0.5 mile offshore. The W side is backed by eroded cliffs, and fringed by reefs extending up to 1 mile offshore in places.

Two ranges of mountains run parallel with and a short distance from the SE and NW coasts of the island, respectively, with a cultivated valley between them. Viewed at a distance from the NE or SW, Sado Shima appears to be two islands. Sado Shima is reported to be a good radar target at 18 miles. **Kimpoku San** (Kinpoku San) (38°06'N., 138°21'E.), 1,173m high, lies about 16 miles SSW of Haziki Saki (Hajiki Sake), the N extremity of the island, and is the highest peak in the NW range. Ochi Yama, 646m high, about 2.5 miles NNW of **Konose Hana** (37°55'N., 138°30'E.), is the highest peak in the SE range.

Ryotu Wan, in the NE part of the island, and Mano Wan, in the SW part of the island, provide good shelter.

Sado Shima—East Side

2.19 Haziki Saki (38°20'N., 138°31'E.), the N extremity of Sado Shima, is marked by a light; foul ground extends about 0.5 mile N of the point. Washizaki Ko, a small fishing harbor, lies close S of the point.

A light is shown from Miyano Saki, about 7 miles farther S.

Niigata Ko—Course and Destination Signals		
Signal	**AIS Symbol**	**Meaning**
Second Substitute, Flag W	W	Proceeding at facilities of Nishi Ko, Shinano Kawa W bank.
Second Substitute, Flag W and B	WB	Proceeding to facilities at Bandaijima Wharf of Nishi Ko, Shinano Ko E bank.
Second Substitute, Flag W and D	WD	Proceeding to facilities at Nishi Ko, E of the training wall forming Shinano Kawa E side.

Niigata Ko—Course and Destination Signals		
Signal	**AIS Symbol**	**Meaning**
Second Substitute, Flag W and T	WT	Proceeding to facilities at Nishi Ko along Tsusen Kawa or Yamanoshita N side Quay.
Second Substitute, Flag W and R	WR	Proceeding to facilities at Rinko Wharf in Nishi Ko.
Second Substitute, Flag E	E	Proceeding to facilities on E side of Higashi Ko.
Second Substitute, Flag EW	EW	Proceeding to facilities on W side of Higashi Ko.

Ryotu Wan

2.20 Ryotu Wan (Ryotsu Wan) is entered between **Hime Saki** (38°05'N., 138°34'E.) and Wakino Misaki, about 6.5 miles NW. Hime Saki, marked by a light, is bordered by above-water and sunken rocks extending about 0.2 mile offshore; Ryuo Shima, 21m high, lies about 0.5 mile E of the point. The shores of the bay are obstructed by a large number of fish traps and fish farm installations extending up to 1 mile offshore; these are unlit at night, poorly marked by day, and afford only weak radar responses.

Ryotu Ko (38°05'N., 138°34'E.) (World Port Index No. 61890) lies at the head of Ryotsu Wan, at the entrance to Kamo Ko, a saltwater lagoon.

Ryotu Ko is protected by North Breakwater, which extends 0.35 mile SE from a position nearly 0.6 mile N of the entrance to Kamo Ko, and by South Breakwater, which extends 0.8 mile SE from near the head of North Breakwater and from a white tower, 9m high, at the head of South Breakwater. A short detached breakwater lies 100m E of the head of North Breakwater; a light is shown from each.

During strong NE winds, the swell penetrates the harbor.

Depths—Limitations.—Most of the harbor installations lie on each side of the entrance to Kamo Ko, which is spanned by three bridges.

Berths in the harbor are, as follows: North Wharf, close N of the entrance to Kamo Ko, comprises Berth No. 1 and Berth No. 2, with depths from 3.6 to 5.4m alongside. South Wharf, the principal commercial wharf, close S of the entrance to Kamo Ko, comprises Berth No. 2 to Berth No. 8, 49m to 200m in length, with depths of 3 to 7m.

Aspect.—The reclamation extends NE from the shore to within 0.1 mile of South Breakwater. A light is shown on a short breakwater at the NE corner.

A tower, which marks the intake of a water pipeline, stands 0.2 mile S of the S end of South Breakwater; a light is shown from the tower.

Conspicuous at the wharf off the S side of the entrance to Kamo Ko is a four-story yellow building, 21m high.

A pier for tankers and several buoys lie about 2 miles N of the harbor.

Anchorage.—Ryotu Ko provides safe anchorage, sheltered from all winds except those between the N and E. Anchorage can be taken, in about 20m, fine sand, in the area NNE to E of the head of the breakwater, distant about 0.5 mile. Large vessels can anchor, in depths of 25 to 45m, sand and shell, with the head of the breakwater bearing between 220° and 260°, distant between 1 and 1.5 miles. Approaching the anchorage between these bearings will ensure clearing the fishing nets and other obstructions.

Vessels of medium size can anchor within 0.5 mile of the detached breakwater light, between the bearings of 195° and 270°, in depths of 14 to 27m, fine sand, good holding ground.

Lights are shown from Joga Hana and Konose Bana, about 4 and 10 miles SSW, respectively, of Hime Saki. A radio tower, painted silver, with an altitude of 605m, stands on the summit of Ogami Yama, about 2 miles WNW of Konose Bana.

Akadomori Ko, a small port, protected by breakwaters, lies about 5 miles SW of Konose Bana. Good anchorage, sheltered from NNW winds, can be taken, in 7m, fine sand, good holding ground, about 0.2 mile offshore. A fish haven is reported close NE of the port.

Ogi Ko, about 7 miles farther WSW, is divided into two parts by a peninsula surmounted by Shiro Yama, a small hill. A breakwater extends SE from the peninsula; rocky reefs lie E of the breakwater. The W part of the harbor is a fishing zone, and the E part is only available to small vessels with local knowledge.

Sado Shima—West Side

2.21 **Sawazaki Bana** (Sawa Saki) (37°49'N., 138°13'E.), the SW extremity of Sado Shima, is marked by a light. The coast for about 2.5 miles NE of Sawazaki Bana is bordered by rocks extending up to 0.4 mile offshore.

Mano Wan is entered between Tagirisu Bana, about 6 miles NE of Sawazaki Bana, and Daiga Hana, about 3.8 miles farther NNW. Depths in the entrance to the bay are 40m, shoaling towards its head. The bottom is mostly sand. Mano Wan provides good anchorage in NE winds; during SW winds, heavy seas run into the bay.

Daiga Hana (37°58'N., 138°15'E.), the NW entrance point of Mano Wan, is marked by a light. Okinoe Guri, a pinnacle rock, with a depth of 2.5m, lies at the outer end of foul ground extending about 0.5 mile SSW of the point. Futamata Iwa, two rocks, the highest 17.1m high, lies on this foul ground, about 0.3 mile SW of Daiga Hana.

Futami Ko (Hutami Ko), about 0.8 mile NNE of Daiga Hana, is sheltered by a breakwater extending E, and marked by a light.

Sawane Ko, situated in the NW corner of Mano Wan, 1.75 miles N of Futami Ko, is a small harbor protected by a breakwater. A light is shown from the breakwater head.

A light is shown from the head of a breakwater, on the E side

of Mano Wan, 4 miles E of Daiga Hana.

Gakeno Hana, a white cliff, 33m high, is conspicuous about 1 mile farther N. A bank, with depths of less than 4.9m, extends up to 0.8 mile W of Gakeno Hana. A detached breakwater, marked by a light at its E end, extends to about 0.7 mile E of Gakeno Hana.

Daijoji Se, with a depth of 2.2m and marked by a beacon, lies on the N part of the above bank, about 0.8 mile NE of Gakeno Hana.

2.22 The village of **Sawane** (38°00'N., 138°17'E.) lies near the shore farther N.

The village of Kawaharada, about 4 miles NE of Daiga Hana, has a white monument, a large factory, and a white chimney in the area.

The red roof of a factory building lies in the village of Shimmachi, about 4 miles E of Daiga Hana. Shioyano Se, with a least depth of 1.3m near its outer edge, extends about 0.8 mile W of a point lying close SW of the village.

Anchorage.—Anchorage can be taken in the following places: Off Futami Ko, in 10.1m, sand, E of the breakwater head. Off Sawane, in 9.2m, sand, with the beacon on Daijoji Se bearing 305°, distant about 0.6 mile.Off Kawarada, in 14 to 15m, sand, with the monument at Kawaharada bearing 035°, distant about 0.8 mile. Off Shimmachi and N of Shioyani Se, in 11 to 11.9m, sand, with the chimney at Shimmachi bearing 115°, distant about 0.7 mile

2.23 Ao Shima, 10.1m high, lies about 0.7 mile WNW of Daiga Hana. Inakuziro Ko lies about 0.5 mile farther NW.

Nagate Misaki, about 1.8 miles NW of Daiga Hana, is marked by a light. The coast between Nagate Misaki and Kasuga Saki, about 2.5 miles N, is bordered by dangers extending up to 0.5 mile offshore. Shiro Shima, 11.9m high, lies about 0.5 mile N of Nagate Misaki.

Aikawa Wan, entered between Kasuga Saki and a point about 1.5 miles NNW, is open W, has bad holding ground, and is suited only for small vessels. Ichiri Shima, a black rock, 2.6m high and marked by a light, lies on the N side of the entrance, about 1 mile N of Kasuga Saki. Gasa Guri, a rock with less than 2m, lies nearly 0.5 mile N of Ichiri Shima.

O Saki, about 4.5 miles NNE of Kasuga Saki, is marked by a light; O Shima, an islet, 11m high, lies about 0.2 mile off the point. Himezu Ko lies about 1 mile SSW of O Saki.

Nyu Saki (38°12'N., 138°20'E.), about 7 miles NNE of O Saki, is marked by a light about 0.3 mile SE of the point. Takati Ko lies about 0.7 mile E of the point. A fish haven is reported to lie about 1 mile N of the point.

Seki Misaki, about 5 miles NE of Nyu Saki, rises to an elevation of 137m; a light is shown on its summit.

Ono-Kame Hana (38°19'N., 138°28'E.), about 5 miles farther NE, rises precipitously to an elevation of 167m; from a distance NE or SW, it appears as a detached rock.

Foul ground extends up to 0.7 mile offshore between Ono-Kame Hana and Haziki Saki, about 2.5 miles ENE. Futatsugame, an islet 67m high, lies close offshore, midway between the points. Todo Shima, 4.6m high, lies about 0.8 mile NE of the islet.

Niigata Ko to Naoetsu Ko

2.24 The coast between Niigata Ko and **Kakuda Misaki** (37°47'N., 138°49'E.), about 15 miles SW, consists of sandy beach, backed by hills, about 30m high and covered with pine trees. Four Loran towers are conspicuous about 4 miles SW of the entrance to Niigata Ko. A light is shown about 5.5 miles SW of these towers. A submarine cable projecting NNE lies about 1 mile SW of the light.

Kakuda Misaki, marked by a light, is a spur of Kakuda Yama, 482m high and conical, about 1 mile ESE. The coast between Kakuda Misaki and the mouth of Shin-Shinano Gawa, about 8 miles SSW, is backed by mountains. Due to the large quantities of silt which are brought down, the sea is discolored in the vicinity of the mouth of Shin-Shinano Gawa, and depths are liable to change, especially in winter and when the river is in spate. Yahiko Yama, 586m high, lies about 5 miles SSW of Kakuda Yama; it has two conical peaks, which appear as one from the N. Mizo Ko, a fishing harbor, lies about 3 miles SSW of Kakuda Saki.

Teradomari Ko, a small harbor, lies about 1.5 miles S of the mouth of Shin-Shinano Gawa. A channel dredged to 4.9m leads from the harbor entrance to a cargo pier.

The coast from Teradomari Ko to Shiiya Hana, about 11.5 miles SW, is mostly sand and shingle beach, and is foul up to nearly 0.5 mile offshore. Izumosaki Ko, a small fishing harbor, lies about 7 miles SW of Teradomari Ko; a light is shown about 0.4 mile NW. A fish haven lies 2 miles NW of Izumosaski Ko.

Siiya Hana (Shiiya Hana) (37°29'N., 138°37'E.) is faced with a reddish cliff, and has a wooded summit; a light is shown from the point. A wooded summit, 357m high, is conspicuous about 5 miles E of Siiya Hana, in a range of hills, which lie parallel to the coast. Reefs extend about 0.4 mile off Siiya Hana. A tower, 87m high, painted in red and white bands and marked by red obstruction lights, lies about 3 miles S of Siiya Hana.

The coast between Siiya Hana and Kashiwazaki Ko, about 8 miles SSE, consists of sand and shingle beach, backed by wooded hills, 120 to 150m high.

2.25 **Kashiwazaki Ko** (37°22'N., 138°32'E.) is protected by West Breakwater extending NE then NNE, and by a groin extending NNW from the E side of the harbor. Kashiwazaki is a mining and industrial city.

The fairway from the harbor entrance to the N side of Nakahama Wharf has been dredged to 10.1m, although depths in the fairway may be unreliable. Depths of 5.6 to 11.1m lie alongside Nakahama Wharf. East Wharf, West Wharf, and Central Wharf have alongside depths of 6 to 8m, 3 to 5.5m, and 4.3m, respectively.

The coast between Kashiwazaki Ko and Yoneyama Saki, about 5 miles WSW, consists of steep cliffs of red clay; reefs extend up to 0.3 mile offshore.

Yoneyama Saki (37°19'N., 138°26'E.) is conspicuous with its dark, black, rocky cliff contrasting with the red cliffs NE. It is a spur of Yone Yama, about 3 miles SE, which rises to an elevation of 993m, and is the highest peak in the vicinity. Yoneyama Saki is a good radar target at 20 miles.

The coast from Yoneyama Saki to Naoetsu Ko, about 12 miles SW, consists mainly of sandy beach, backed by sand

dunes about 30m high, with pine woods behind them in places. From seaward, this stretch of coast, which is steep-to except at either end, appears green in its upper part, and gray in its lower part; the mountains in the background appear light blue.

Naoetsu Ko (37°11'N., 138°15'E.)

World Port Index No. 61865

2.26 Naoetsu Ko (Naoetu Ko) is a specified port situated close E of the mouth of Seki Kawa (Ara Kawa). Naoetu Ko is protected by breakwaters. West Breakwater extends 0.3 mile NNE from the E side of the mouth of the Seki Kawa, then 1.5 miles NE. A light is shown from close to its head. A training wall extends a short distance NNE from the W entrance point of the river. Another training wall extends 0.15 mile NNE from a position 91m SW of the W entrance point of the river; a light is shown from its head.

Tides—Currents.—The tidal rise at Naoetu Ko is 0.3m at MHWS and 0.2m at MHWN.

Depths—Limitations.—A detached breakwater extends 0.25 mile seaward from near the shore 1 mile ENE of the harbor entrance; a light is shown from its head.

East Breakwater, which is detached, extends 0.4 mile NE from a position 0.6 mile S of the head of West Breakwater; it is marked by a light at each end.

A LNG thermal power station has recently been built on the reclaimed land at the E section of the port. LNG vessels of up to 70,000 dwt can be accommodated at the new terminal.

The harbor consists of two outer basins and an inner basin. West Wharf, at the root of West Breakwater, forms the SW side of the W basin. Central Wharf, farther NE, separates the W basin from the E basin. East Wharf lies farther NE.

A light is shown on a short spur at the SW end of Central Wharf.

The principal berthing facilities are described in the table titled **Naoetsu Ko—Berth Information**.

Aspect.—Five tanks stand near the root of West Breakwater. Six aluminum silos, close S of West Wharf, at the root of W breakwater, are conspicuous from a distance. An unloader is conspicuous on the wharf.

Naoetsu Ko from SE

There are numerous chimneys standing SE of the harbor. The highest chimney stands close E of the port and is 156m high. Another chimney, with an elevation of 123m and painted in red and white bands, lies about 1 mile ESE of West Wharf.

A power plant chimney, with an elevation of 35m, lies about 0.8 mile ENE of West Wharf; the power plant burns waste gas and sometimes emits flames.

A radio tower, 71m high and painted red and white, stands on the roof of a building, 2 miles SSW of West Breakwater Light. The tower is marked by a red light.

Beacons, showing blue, white, and yellow lights, about 1.3 miles SW of the mouth of Seki Kawa, mark a submarine cable landing; the lights can be seen from 8 miles offshore.

Naoetsu Ko—Berth Information

Name		Position	Length	Depth	Vessel Size
Kikenbutsu No. 3 Quay		Southeast opposite shore of East Breakwater	130m	7.5m	5,000 dwt
East Wharf No. 5 Quay		Southwest of Kikenbutsu No. 3 Quay	130m	7.5m	5,000 dwt
Dangerous Cargo No. 2 Quay		Southeast opposite shore of East Breakwater (downward from NE to SW)	130m	7.5m	5,000 dwt
Dangerous Cargo No. 1 Quay			130m	7.5m	5,000 dwt
East Wharf	No. 4 Quay		170m	10.0m	12,000 dwt
	No. 3 Quay		185m	9.5-10.0m	15,000 dwt
	No. 2 Quay	South of East Wharf No. 3 Quay	240m	8.0-10.0m	15,000 dwt
	No. 1 Quay	South of East Wharf No. 2 Quay	130m	7.5m	5,000 dwt
Central Wharf	Mokuzai Quay	Opposite shore of East Wharf No. 1 Quay	185m	10.0m	15,000 dwt
	Kosanhin Quay	North of Lumber Quay	270m	13.0m	50,000 dwt
	No. 2 Quay	North end of SW side of Central Wharf	185m	10.0m	15,000 dwt
	No. 1 Quay	South of Central Wharf No. 2 Quay	130m	7.5m	5,000 dwt

Naoetsu Ko—Berth Information

Name		Position	Length	Depth	Vessel Size
Uchibo Wharf North Quay	No. 2	SE side of Central Wharf No. 1 Quay	60m	4.0m	700 dwt
	No. 3	Northeast of Uchibo Wharf North Quay No. 2	120m	2.5m	700 dwt
Uchibo Wharf South Quay	No. 5	South opposite shore of Central Wharf No. 1 Quay (downward from E to W)	60m	2.5m	700 dwt
	No. 4		120m	3.0-3.5m	700 dwt
	No. 3		72m	4.5m	700 dwt
	No. 1		170m	7.5m	6,000 dwt
West Wharf	No. 1	Northwest of Uchibo Wharf South Quay No. 1	174m	9.0-10.0m	15,000 dwt
	No. 2	North of West Wharf No. 1	185m	9.0-10.0m	15,000 dwt

Pilotage.—Pilotage is not compulsory but is available. the pilot boards near the quarantine anchorage and can be contacted on VHF channel 16. A tugboat or work boat is used as a pilot boat. Pilotage is available during daylight hours only.

The harbor office is situated on the S side of the inner harbor.

Anchorage.—Large vessels anchor outside of West Breakwater. The quarantine anchorage, with a radius of about 0.4 mile, is centered about 1.3 miles NW of the mouth of Seki Kawa; it has depths of 15.7 to 25m, sand, good holding ground. Small vessels can anchor, in a depth of about 9.2m, on the inner side of East Breakwater. A fish haven lies 1 mile N of West Breakwater Light.

Directions.—Naoetu Ko is entered between West Breakwater and the W end of East Breakwater. The head of West Breakwater should be given a wide berth.

Naoetsu Ko to Yama Wan

2.27 The coast between Naoetsu Ko and the mouth of Hime Kawa, about 22 miles WSW, is low and backed by densely-wooded mountains. Rocks lie up to 0.5 mile offshore along this coast.

Mushiu Hana, about 2.8 miles WSW of Naoetu Ko, is bordered by reefs, the outermost danger being Fufu Iwa, consisting of two rocks, the N rock, 1.9m high, about 0.5 mile.

A radio tower, with an elevation of 300m and silver-colored, lies about 3.5 miles WSW of Naoetsu Ko.

Torigakubi Saki (37°10'N., 138°06'E.), about 7.5 miles W of Naoetu Ko, is marked by a light and rises to a hill, 314m high, about 1 mile SE. Nadachi, a small fishing harbor, lies on the W side of the point. Me Guri, a rock with a depth of 1.5m, lies about 0.2 mile N of Torigakubi Saki.

The mountains backing this coast are densely wooded and of a uniform color. Clouds and fog occasionally cover parts of the mountains in May and June, and white clouds hide the peaks in summer; however, clouds and fog usually dissipate towards sunset. Hiuchi Yama (Hiuti Yama), 2,462m high, lying about 15 miles S of Torigakubi Saki, with Myoko San and Yake Yama, are the highest mountains in the area.

Caution is necessary to avoid fishing nets which are laid up to 2 and 3 miles offshore between Torigakubi Saki and Ikuji Hana, the E entrance point of Toyama Wan.

Tsutsuishi Ko and Nou Ko (No Ko) are small fishing harbors, about 3 and 6 miles SW, respectively, of Torigakubi Saki.

2.28 Himekawa Ko (37°02'N., 137°51'E.) (World Port Index No. 61862), protected by breakwaters, lies about 0.4 mile E of the mouth of Hime Kawa, and is a local port. A shingle bar obstructs the mouth of Hime Kawa and can only be crossed by small vessels in good weather. The depth in the channel is 9m; the draft limitation is 8.2m.

Depths—Limitations.—The principal berthing facilities are described in the table titled **Himekawa Ko—Berth Information**.

Pilotage.—Pilots are available from Naoetsu and Niigata upon request. The pilot will board at the harbor entrance. Vessels may berth during daylight hours only. No tugs are stationed at the port.

Himekawa Ko—Berth Information

Name	Position	Length	Depth	Vessel Size
East Wharf Quay	About 100m SSE of the root of East Breakwater	60m	3.5m	700 dwt
South Wharf	South side of the basin	90m	7.5m	2,000 dwt

Himekawa Ko—Berth Information

Name		Position	Length	Depth	Vessel Size
Central Wharf	No. 5 Quay	East side of the basin (numbered from N to S)	165m	9.0m	10,000 dwt
	No. 4 Quay		130m	7.5m	5,000 dwt
	No. 3 Quay	West side of the basin (numbered from N to S)	130m	7.5m	5,000 dwt
	No. 2 Quay		130m	7.5m	5,000 dwt
	No. 1 Quay		130m	7.5m	5,000 dwt
West Wharf	No. 2 Quay	Northwest of Central Wharf No. 1 Quay	130m	10.0m	5,000 dwt
	No. 1 Quay	West of West Wharf No. 2 Quay	90m	10.0m	2,000 dwt
North Wharf	No. 1 Pier	North opposite shore of West Wharf No. 2 Quay	38m	7.5m	5,000 dwt

Contact Information.—The port can be contacted by telephone (81-25-280-5466).

Anchorage.—Anchorage may be taken about 0.5 mile NNE of the E breakwater light, in depths of 22 to 23.8m.

2.29 The coast between the mouth of Hime Kawa and Miyazaki, about 12 miles WSW, is low, steep-to, and backed by mountains. Kurohime Yama, conical and rising to an elevation of 1,222m, is somewhat conspicuous about 4.5 miles SW of the mouth of Hime Kawa.

Miyazaki Hana (36°58'N., 137°35'E.) is easily recognized, as the land rises gradually from it to the mountains inland, and it lies at the E end of the delta of Kurobe Kawa. A light is shown from the point and from the head of a breakwater close NW. An illuminated radio tower, with an elevation of 310m, stands about 0.8 mile SSW of the point.

Okino Shima, 0.8m high, is the outermost of three rocks extending nearly 0.5 mile N of Miyazaki Hana; a rock, drying 0.3m, lies about 0.1 mile NNE of Okino Shima, and a depth of 5.5m lies about 137m farther NNE.

The coast between Miyazaki Hana and Ikuji Hana, about 10 miles WSW, is the delta of Kurobe Kawa. It is fringed with beaches of shingle and scattered boulders, backed by villages and pine woods, with cultivated land behind. Kurobe Kawa has a shifting bar, on which the sea breaks with onshore winds; it is accessible to boats only in good weather.

Toyama Wan

2.30 Toyama Wan is entered between Ikuji Hana (Ikuzi Hana) (36°54'N., 137°25'E.) and Otomari Hana, about 17.5 miles WNW. The bay lies SE of Noto Hanto, a large peninsula. Fushiki-Toyama Ku occupies most of the S shore of the bay.

The coast of the bay east of **Fushiki** (Husiki) (36°47'N., 137°04'E.) consists of sand and pebble beach, deepening rapidly to depths of 100 to 200m, about 1 mile to 2 miles offshore. Several rapid rivers flow into the bay along this coast. There are sand bars at the mouths of these rivers, but in their approaches there are deep submarine gullies. The positions of these gullies can be identified by the deep blue color of the sea, except when the rivers are in flood, when the sea becomes muddy; the muddy water extends up to 8 miles offshore when the rivers are in flood and the deeps may not be easily detected. There are suitable depths for anchoring on both sides of the deep gullies.

Many fixed fishing nets lie within depths of 200m in the bay. Vessels planning to stop at various ports in the bay should first proceed out beyond the area of fishing nets and turn toward shore only after arriving directly off the next port. The water may turn yellow in spring during the thaw and make it difficult to see the fishing net buoys.

East of Fushiki there are numerous towns and villages separated by stretches of pine forests; there are also many small fishing ports. The coast is backed by fertile land extending some distance inland. From the middle of the bay entrance, undulating mountain ranges appear to border the bay entrance.

A light is shown on Ikuji Hana.

Four chimneys of a power plant are conspicuous nearly 0.5 mile WSW of the mouth of **Jinzu Gawa** (36°45'N., 137°13'E.); the chimneys are 162m high, painted in red and white horizontal bands, and marked by red lights. A chimney, 102m high, also painted in red and white horizontal bands and marked by red lights, is conspicuous about 0.2 mile farther WSW. A chimney, 75m high, painted in red and white bands and marked by red lights, is conspicuous about 1 mile ESE of the entrance to Toyama Ku.

Shiro Yama (Siro Yama), a hill, 145m high, is conspicuous nearly 5 miles SW of the mouth of Jinzu Gawa.

Numerous chimneys surround Shimminato Ku, some exhibiting red obstruction lights. The highest are two chimneys of a power plant, about 1.3 miles SSE of the head of E breakwater; the chimneys have elevations of 223 and 163m.

The chimney of a steel plant is conspicuous about 0.5 mile SSW of the entrance to Fushiki Ku; the chimney is 25m high, and belches white and black smoke.

Numerous oil tanks stand on the reclaimed land between the mouth of Oyabe Gawa and the root of the E breakwater at Kokubu Ko, about 0.5 mile NW.

Hachibuse Yama, 211m high and surmounted by a Buddhist shrine, lies about 1.5 miles W of Fushiki. Futagami Yama (Hutagami Yama), 273m high, lies about 0.5 mile farther SW.

Iwasakino Hana, a conspicuous headland, is located on the coast NE of Hachibuse Yama; a light is shown nearly 0.5 mile SE of the headland.

Sekido San, 565m high and cone-shaped, is very conspicuous about 4 miles W of Otomari Hanto, and is the highest mountain on the W side of Toyama Wan.

Lighted buoys mark Kokubo Passage, Fushiki Passage,

Shimminato Passage, and the W side of Toyama Passage.

Kurobe Ko, a small fishing harbor, lies about 0.5 mile SE of Ikuji Hana. Kyoden Ko, another small fishing harbor, lies about 2.5 miles farther S.

Uozo Ko, a small local port, lies about 2 miles SSW of Koyden Ko; its auxiliary port lies about 0.5 mile farther S.

Namerikawa Ko and Mizuhashi Ko, small fishing harbors, lie about 3.5 and 6 miles SW, respectively, of Uozu Ko.

Fushiki-Toyama Ku (36°46'N., 137°08'E.)

World Port Index No. 61850

2.31 Fushiki-Toyama Ku, one of the most important trading and industrial ports on the NW side of Honshu, consists of an outer harbor and an inner harbor. Four passages (Toyama, Shimminato, Fushiki, and Kokubo) lead through the outer harbor. The inner harbor consists of Toyama Ku, close E of the mouth of Jinzu Gawa (Zinzu Kawa); Shinminato Ku, about 5 miles W; Fushiku Ku, about 2.5 miles farther WNW, in the mouth of Oyabe Kawa; and the fishing harbors of Shimminato, and Kokubu Ku, lying E and W, respectively, of Fushiki Ku. The harbor fronts the cities of Toyama, Shimminato (Sinminato), and Takaoka. The town of Higashi-Iwase lies on the E side of Toyama Ku, and is connected by a barge canal to the city of Toyama.

Winds—Weather.—The weather is typical of the NW side of Honshu, with 25 rainy days per month from December through February. The winter monsoons are somewhat weakened by the protection of Noto Hanto.

At Fushiki, the prevailing winds are SW from October to March; they diminish somewhat in April and May. In June, winds between the N and NE prevail. From July to September, SW winds are dominant, with a lesser number from the NE. The average wind speed is about 5.3 knots. Land and sea breezes are prominent, especially in the summer.

Tides—Currents.—The tidal rise at Fushiki is 0.3m at MHWS, and 0.2m at MHWN.

Heavy swells penetrate Fushiki-Toyama with strong N and NE winds; it is very calm with winds from other directions.

In winter on a fairly calm day, a sudden onset of high waves, with heights of 3.1 to 4.9m and intervals of 10 to 12 seconds, has occurred, and continuing for over a half day, caused damage along the coast at the head of Toyama Wan. These waves often appear after a low pressure system passes from W to E in the N part of the Sea of Japan (or S of Sakhalin), or moves N along the S coast of the Japanese islands. The phenomenon takes place because even after a low pressure system passes through and Toyama Wan is no longer in the area of strong winds, it is affected by the aftermath in the form of storm swells, which are amplified as they near the head of the bay, due to the topography of the bay bottom and by the cur-rents in the area.

Depths—Limitations.—Banks, with depths of less than 10m, separated by a deep submarine gully, lie on each side of the harbor entrance.

An offshore pipeline berth, consisting of a large lighted mooring buoy, painted in red and white stripes, is moored about 1.5 miles N of the entrance to Toyama Ku; it can accommodate tankers up to 200,000 dwt in a depth of 27.1m.

Fushiki-Toyama Ku—Berth Information

Name		Position	Length	Depth	Vessel Size
Fushiki Ku					
Left Bank	No. 1-2 Quays	Left bank of Oyabe Kawa (numerical order from the mouth to upstream)	310m	8.0m	10,000 dwt
	No. 3-4 Quays		370m	8.0m	15,000 dwt
	No. 5 Quay		90m	4.5m	1,000 dwt
Right Bank	No. 1-2 Quays	Right bank of Oyabe Kawa (numerical order from the mouth to upstream)	440m	5.0m	5,000 dwt
	No. 3-4 Quays		370m	6.5-7.5m	15,000 dwt
	No. 5 Quay		130m	4.5m	5,000 dwt
Manyo	No. 1 Quay	Southwest opposite shore of North Breakwater	130m	6.5m	5,000 dwt
	No. 2 Quay	West of Manyo No. 1 Quay	190m	9.5m	15,000 dwt
Shinminato Ko					
Public Wharf	No. 1 Quay	South side of the Nishi-Suiro (numbered from E to W)	280m	14.0m	50,000 dwt
	No. 2-4 Quays		555m	10.0m	15,000 dwt
	No. 5-6 Quays		260m	7.5m	5,000 dwt
	No. 7-8 Quays		120m	4.0m	700 dwt
North No. 1 Quay		North opposite shore of Public Wharf No. 6 Quay (numbered from E to W)	280m	13.0m	30,000 dwt
			185m	10.0m	15,000 dwt
North Wharf			60m	5.5m	700 dwt
Minami-Suiro Pier		South side of the E end of No. 1 Quay	36m	6.0m	3,000 dwt

Fushiki-Toyama Ku—Berth Information

Name		Position	Length	Depth	Vessel Size
East No. 1-2 Quays		South shore of the dead end of Higashi-Suiro	370m	8.0-8.5m	15,000 dwt
Kaio Quay		The opposite shore of Kaiwomaru Park	220m	7.5m	15,000 dwt
Toyama Ko					
No. 10 Quay	East side	From the root of East Breakwater (No. 10 Quay is the northernmost; the others are numbered from N to S)	130m	7.5m	5,000 dwt
No. 1 Quay			185m	10.0m	15,000 dwt
No. 2 Quay			185m	9.5-10.0m	15,000 dwt
No. 3 Quay			185m	9.0-10.0m	15,000 dwt
No. 4 Quay			160m	9.0m	10,000 dwt
No. 5 Quay			180m	7.5m	5,000 dwt
No. 6 Quay	West side	The area projecting to the E (numbered from S to N)	90m	5.0m	3,000 dwt
No. 7 Quay			130m	6.5m	5,000 dwt
No. 8 Quay			185m	10.0m	15,000 dwt
No. 9 Quay			90m	< 5.0m	1,000 dwt
No. 1 Dolphin		North of No. 9 Quay	21m	4.5m	1,000 dwt
No. 2 Dolphin		About 0.15 mile N of No. 1 Dolphin	12m	8.0m	3,000 dwt
No. 3 Dolphin		The root of West Breakwater	21m	5.0m	1,000 dwt
Nihonkai Sekiyu SBM		—	340m	27.0m	268,893 dwt

Shinminato Ku (Sinminato Ku), the entrance channel, sheltered by breakwaters, has dredged depths of 11.9 to 12.8m. The port is used principally by large timber ships.

A bridge, with a vertical clearance of 45m, crosses the channel inside the breakwaters, leading to Fushiki-Toyama Ko and Shinminato Ku.

The largest drydock at Toyama Ku has a length of 192m, a width of 34.1m, and a depth of 7.9m; it can accommodate vessels up to 48,000 dwt.

Continuous dredging is necessary to maintain depths in the harbor due to silting and the sediment discharged by the pulp mill. Depths of up to 3m less than charted are reported (2007). Depths should be obtained from the port authorities prior to arrival.

The principal berthing facilities are in the table titled **Fushiki-Toyama Ku—Berth Information**.

Aspect.—The harbor consists of four interconnecting basins. Lights are shown from octagonal towers, 10m high, at the head of West Breakwater, and at each end of East Breakwater. A light, 0.35 mile E of East Breakwater, marks the W end of a breakwater and complex of jetties and quays extending from Shimanto Ku.

A light is shown from the end of a spur which extends 91m W from the root of East Breakwater.

Several chimneys, some marked by obstruction lights, stand in the vicinity of the harbor.

Pilotage.—Pilotage is not compulsory. Pilots are available and should be used by vessels without local knowledge.

Pilots for Toyama Ku board approximately 1 mile NNE of Toyama Ku East Breakwater Light. Pilots for Shimminato Ku and Fushiki Ku board about 2.5 miles NE of Manyo North Detached Breakwater Light.

Contact Information.—See the table titled **Fushiki-Toyama Ku—Contact Information**.

Fushiki-Toyama Ku—Contact Information	
Pilots	
Call sign	Fushiki Pilot Tsurugi
VHF	VHF channels 6, 15, 16, and 17
Telephone	81-76-644-0173
Facsimile	81-76-644-3391
Port Authority	
Telephone	81-76-444-9690
Facsimile	81-76-444-4419

Anchorage.—Anchorage can be taken in suitable depths, mud bottom, off Toyama Ku, with offshore winds; however, caution is required when anchoring to avoid the fishing nets and the submarine gullies. The quarantine anchorage lies about 0.5 mile NE of the harbor entrance.

North winds raise a heavy swell in the outer harbor.

Good anchorage can be taken N of the front range light at Fushiki Ku, and W of Fushiki Passage, in 7.9 to 11.9m, fine sand, from 0.5 to 1 mile off the coast, near the quarantine anchorage. The area E of Fushiki Passage does not afford anchorage due to fishing nets and the deep submarine gully.

Directions.—In the approach to Fushiku Ku, Hachibuse Yama and Futagama Yama are good marks until the range lights

can be made out, when they should be kept in line bearing 201° through Fushiki Passage, to clear the fishing nets. When about 0.5 mile from the front range light, course should be altered as appropriate to enter the harbor. Currents in the inner harbor may attain velocities of 3 to 4 knots when the river is flooded or during the spring thaw.

Fixed fishing nets lie on both sides of all passages.

Toyama Ku is entered on a heading of 180°, steering for the center of E and W breakwaters, care being taken to avoid being set by the river current.

2.32 Fushiku Ku is situated in the mouth of Oyabe Kawa. Short breakwaters extend from each side of the entrance; lights are shown from the head of the W breakwater and from the E head of the E breakwater, which is T-shaped.

A detached breakwater, 0.15 mile long, lies on a NW-SE axis, 0.6 mile NNE of the W breakwater; a light is shown from each end.

Himi Ko (36°52'N., 137°00'E.), a small fishing harbor, lies about 5.5 miles NW of Fushiki Ku. Kara Shima, an islet, 11.9m high and marked by a light, lies about 0.2 mile E of the head of the N breakwater at Himi Ko; rocks, awash and sunken, extend about 0.2 mile NE and SE of the islet.

Fixed fishing nets are in the vicinity of Kara Shima, and extend up to 2.8 miles E of the islet.

Yabuto Ko, Ettyu Tomari Ko, and Unami Ko, small fishing harbors, lie about 1.5, 2, and 3 miles NNE, respectively, of Kara Shima.

Mera Ko, a small fishing harbor marked by a light, lies about 1 mile SW of Otomari Hana. About 2 miles SSW, another light is shown at the point. Abu Shima, an islet, 12.8m high, lies about 0.5 mile offshore, about 1 mile S of Mera Ko.

Toyama Wan to Nanao Wan

2.33 **Sasanami Saki** (36°59'N., 137°03'E.), on which stands the village of Kurosaki, lies about 1.5 miles N of Otomari Hana. A spit, with depths of 4.8m, extends from the coastal bank, about 1.3 miles N of Sasanami Hana.

The small harbors of Iori Ko and Enotomari Ko lie about 2.5 and 4.5 miles N, respectively, of Sasanami Hana.

The dangers E and SE of **Kannon Zaki** (37°06'N., 137°04'E.) will be described with Nanao Wan beginning in paragraph 2.34.

Nanao Wan

2.34 Nanao Wan, on the E side of Noto Hanto, is entered between Kannon Zaki and **Ebisu Zaki** (Okinami Hana) (37°11'N., 137°01'E.), about 6 miles N. Noto-jima, occupying the center of the large bay, divides it into three parts, Nanao-hoku Wan (Kita Wan), Nanao-nan Wan (Minami Wan), and Nanao-sei Wan (Nishi Wan), on the N, S, and SW sides, respectively, of the island. Nanao-hoku Wan provides good anchorage for large vessels. Nanao Ko lies in the S part of Nanao-nan Wan; its harbor occupies the major part of it. Nanao-sei Wan provides safe anchorage for small vessels; however, there are fish havens in the bay, and Nisi Guri, a reef with a depth of 2.6m, lies in the SE part of Nanao-sei Wan.

Aspect.—Kannon Zaki, the S entrance point, is wooded, rises to an elevation of 28m, and is marked by a light.

Futago Yama, 182m high, is very conspicuous about 3 miles NW of Ebisu Zaki; from the E, one summit is visible, but from the S, two summits are visible.

Maru Yama, a rounded hill, 67m high, surmounts a peninsula, nearly 1.5 miles SW of Ebisu Zaki.

Besshoga Take (Beesho Take) (37°11'N., 136°51'E.), 358m high, is conspicuous about 2 miles W of the head of Nanao-hoku Wan. Mushaga Mine, 304m high, is conspicuous about 4 miles farther SW.

Nanao-Nan Wan

2.35 Ko-Guchi Seto (Koguchi Seto), the entrance to Nanao-nan Wan, is entered between Kannon Zaki and Matsu Hana, about 1 mile NNW. A directional light showing a white sector stands 1.5 miles WSW of Matsu Hana. Lighted buoys mark the entrance channel. Three television towers are conspicuous near the summit of Yomurazuka Yama, about 1.3 miles N of Miya Saki.

Kannon Zaki is bordered by foul ground. Me Guri, lying in a N-S direction, has a least depth of 1.3m at its N end, about 0.8 mile E of the point. A detached 4.3m patch lies about 1.3 miles SE of the point. Depths of 8.7m lie about 1 mile ESE of Kannon Zaki.

Sohama Dashi, with a least depth of 3.8m, extends to about 0.5 mile NNW of Kannon Zaki. Morita Guri, with a least depth of 1.1m, lies on the S side of the fairway, about 0.8 mile farther W, and about 0.4 mile offshore.

O Guri, with a least depth of 3.7m, lies about 0.7 mile ENE of Matsu Hana, and is the outermost danger on the N side of the entrance. Naga Guri, with a least depth of 4.2m, lies about 0.3 mile E of Matsu Hana. Shichiko Sho fringes the N shore of Ko-Guchi Seto, and extends up to 0.1 mile offshore, with a depth of 3.6m at the shallowest outer end.

Suzuki Sho (Suzuki Guri), with depths of less than 4.9m, extends about 0.4 mile SW of Koizumi Saki; a lighted buoy marks its SW side. Depths of less than 10.1m extend nearly 0.5 mile SW of Koizumi Saki.

Shin Saki lies about 0.5 mile SE of Koizumi Saki, and has depths of less than 5.5m extending about 0.2 mile N and W of the point.

Tera-jima, an islet 29m high, lies about 1.5 miles WSW of Koizumi Saki. Kamiya Dashi, with a depth of 5.2m, lies about 0.5 mile S of Tera Shima.

Asa Guri, with a least depth of 3.7m and marked N by a lighted buoy, lies on the S side of the fairway, about 1 mile SE of Miya Saki.

O Se, with a least depth of 3.7m, lies about 0.7 mile S of Miya Saki; a lighted buoy is moored about 0.3 mile W of the shoal.

Waka Dashi, with a least depth of 4.9m, lies about 1 mile S of Miya Saki, and is marked W by a lighted buoy.

Is Saki, the S entrance point of Nanao-se Wan, lies about 1.8 miles WSW of Miya Saki.

Me Shima, an islet 3.4m high, lies in the SE part of Nanao-nan Wan, about 2 miles S of Tera Shima; it lies near the W end of a bank with depths of less than 4.9m.

Nanao Ko (37°03'N., 136°59'E.)

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2.36 Nanao Ko occupies the major part of Nanaonan Wan; although there are a number of reefs, it provides good anchorage for large vessels. Extensive reclamation have been undertaken about 0.7 mile NE of Ota Wharf. The port is divided into three sections.

Winds—Weather.—There are few clear days throughout the year, and in January and February it rains or snows almost every day. The air temperature seldom drops below -5°C, even during the winter. The winter monsoons have little effect on the port, which is sheltered by Noto Hanto and Noto-jima. Fog tends to form in spring and fall when there is no wind, but it dissipates quickly.

Tides—Currents.—The tidal rise at Nanao is 0.3m at MHWS, and 0.2m at MHWN.

The flood tidal current sets W and the ebb tidal current sets E in Ko-Guchi Seto, with maximum velocities of 0.3 knot about 3 hours after lower HW.

Depths—Limitations.—The draft limitation in the channel is 9.8m.

Bridgestone Company Liquefied Gas Pier, a T-head pier with dolphins, lies about 0.4 mile SW of Shin Saki and can accommodate 60,000 gt vessels in a depth of 14m. Small tankers are accommodated at Kyoritsy Jetty, with a depth alongside of 6.2m.

The principal berthing facilities are described in the table titled **Nanao Ko—Berth Information**.

Nanao Ko—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	81-767-531-192
Facsimile	81-767-769-932
Port Authority	
Telephone	81-76-767-538-5656
	81-767-537-118 (Coast Guard)

Pilotage.—Pilotage is compulsory for vessels over 10,000 gt; send a request for pilots via agent. Vessels can contact the pilot 1 hour before berthing on VHF channel 16. Pilots board 2 miles from Harbor Entrance Lighted Buoy No. 1 on a line bearing about 259° from Kojin Hang Directional Light. The Combined Port Affairs Building is situated near the root of Wharf No. 1.

Contact Information.—See the table titled **Nanao Ko—Contact Information** .

Anchorage.—The quarantine anchorage, centered about 0.5 mile E of Miya Saki, has a depth of about 17.1m, sand, and is sheltered from NW winds.

Good anchorage can be taken, in a depth of about 7.9m, sand, good holding ground, between Waka Dashi and Wharf No. 1.

Directions.—Vessels should approach Ko Guchi Seto, remaining at least 3 miles off the E coast of Noto Hanto to avoid fixed fishing nets.

Vessels bound W of Wharf No. 1 enter Ko-Guchi Seto on the entrance range. When the W extremity of Shin Saki bears 200°, alter course to 233°, passing SE of Suzuki Sho. When the summit of Tera Shima bears 336°, the N extremity of Is Saki should be steered for, bearing 259°, passing between Kamiya Dashi and Asa Guri. After rounding the lighted buoy moored W of O Se, alter course S, passing W of the lighted buoy marking Waka Dashi, then proceed to the anchorage.

Vessels bound for Bussein Wharf proceed as directed above, and after passing between Kamiya Dashi and Asa Guri, alter course SSE, passing well W of Asa Guri and E of Me Shima, then proceed to Bussein Wharf.

Nanao-Hoku Wan

2.37 O-Guchi Seto (Okuchi Seto), the entrance to Nanao-hoku Wan, has its least width between Bagaura Saki (37°10'N., 137°02'E.) and Hiuchi Saki (Hechiwa Saki), about 1.3 miles NNW. Maru Yama lies about 0.5 mile NE off Hiuchi Saki. Ebisu Zaki lies about 1.5 miles farther NE. The fishing harbors of Enome Ko and Bagaura Ko lie about 1 mile SE and close W, respectively, of Bagaura Saki.

Anchorage.—Nanao-hoku Wan affords anchorage to large vessels, in 20 to 40m, as convenient. Small vessels, with local knowledge, can obtain sheltered anchorage in the coves and inlets of the bay according to the direction of the wind.

Anamizu Iri affords anchorage to small vessels, in depths of 11 or 12.8m, mud. Nakai Iri also affords anchorage, but difficulty may be experienced in its entrance.

Fixed fishing nets are set in the entrance to Nanao-hoku Wan, and within the entrance off the N shore, from October to July.

Nanao Ko—Berth Information

Name	Position	Length	Depth	Vessel Size
Ota Wharf	East part of the S shore of Section 1	370m	9.5m	15,000 dwt
Ota Wharf No. 3	Close W of Ota Wharf	260m	12.0m	12,000 dwt
Ota Mooring Post	Northeast side of Ota Wharf	200m	10.0m	15,000 dwt
No. 2 Wharf (E side of quay)	Middle of the S shore of Section 1	165m	9.0m	10,000 dwt
No. 1 Wharf	E side of pier	222m	4.5m	2,000 dwt
	W side of pier	135m	6.5m	5,000 dwt

Directions.—From well outside the dangers at the E end of O-Guchi Seto, steer for Sode Saki on a bearing of 272°. When Enomo Ko Breakwater Light is abeam, bearing 182°, alter course to 253°, steering for the N extremity of O Shima. When Bagaura Ko E Breakwater Light is abeam, bearing 163°, alter course to 270°. After passing Futo Se and Bando Se, course may be altered as requisite to an anchorage in the bay.

Vessels bound for Animizu Ko continue steering course 270° until O Shima is abeam, bearing 180°, when course is altered to 309°, steering for the harbor entrance, with Animizu Light on the starboard bow. Steer a mid-channel course NE of Okinu Guri.

There are two navigable channels into Nanao-hoku Wan, each about 0.4 mile wide, with depths of over 10.1m. The N channel lies between Maeno Se and the N shore. The S channel, the recommended passage, passes S of Okino Se.

Caution.—A bank, with depths of less than 10.1m, extends up to about 1 mile NE of Bagaura Saki. Toda Guri, with a depth of less than 1.8m, and Kasagi Guri, with a least depth of 4m, lie near the NE ends of the bank.

Maeno Se, with a depth of 4.9m, lies nearly 1 mile S of Ebisu Zaki. Nakano Se, with a depth of 6.4m, lies about 0.4 mile farther SE. Okino Se, with a depth of 10.5m, lies about 0.3 mile ESE of Nakano Se.

Sode Zaki and Kagata Hana lie about 0.8 and 1 mile WSW, respectively, of Hiuchi Saki. Futo Se, with a depth of 3.1m, lies about 0.2 mile S of Kagata Hana, at the outer end of foul ground extending off the points.

Man Zaki lies about 2.3 miles SSW of Kagata Hana. Bando Se, with a least depth of 5.8m, is the outermost of the reefs extending about 1.8 miles NE of Man Zaki. O Shima, 6.4m high, about 0.8 mile N of Man Zaki, is the northernmost of a group of islets lying off the point. A light is shown on the point, about 3.3 miles SW of O Shima.

Okino Guri, with a least depth of 8.2m, lies about 1 mile ESE of **Kaimochi Hana** (37°12'N., 136°55'E.), the W entrance point of the common approach to Anamizu Iri and Nakai Iri, two coves at the N end of Nanao-hoku Wan.

Fishing nets are set in the area extending 0.5 mile S of Ebisu Zaki. Additional fishing nets are set along the N shore of the bay and near the bay entrance from October to July.

Nanao Wan to Rokugo Saki

2.38 **Ukawa Ko** (37°15'N., 137°05'E.), a small fishing harbor, lies about 3 miles NNE of Ebisu Zaki.

During certain seasons, fishing nets are laid along the E coast of Noto Hanto and along the shores of Toyama Wan; since some extend 2 to 3 miles from shore, they are considered obstructions to navigation. The fish trap is situated farthest offshore, and its net is set at right angles to the coast. During the day, location of the nets are easily identified due to the wooden and other floats used; however, at night, special caution is necessary as there are nets not equipped with lights. At night, the coast should be given a berth of at least 4 miles.

Caution.—Fishing traps are set near the entrances to harbors; these make navigation difficult. From the beginning of August through the middle of October, there are fewer nets; however, since this is the season for dolphin, dolphin traps can be seen in the entrances to the harbors and in the offing.

2.39 **Usetsu Ko** (37°18'N., 137°09'E.) lies about 4.3 miles NE of Ukawa Ko; a light is shown from the W entrance point of the harbor. The port is protected by breakwaters, and sheltered from all but S winds. It is most frequented by fishing vessels.

Ikari Shima (Benten-jima), about 2.8 miles E of Usetso Ko, is marked by a light.

Ogi Ko, about 1 mile farther E, is entered N of Inuyama, which is marked by a light. A breakwater extends E of Inuyama; a fisheries dock, with depths of 3.5m alongside, lies on the NW side of the breakwater. Myogi Guri, marked by a light, lies in the middle of the entrance to the harbor. Two TV towers, marked by red and white lights, lie nearly 1.5 miles NNW of Inuyama. A small boat harbor lies close SW of Inuyama.

Tsukumo Wan is entered close NE of Ogi Ko, between Hiyoriyama Hana and Joga Hana, about 0.2 mile NE. Reefs extend from both entrance points, on which breakwaters have been built. Joga Hana Light stands on rocks close to the breakwaters. Another light marks the breakwater on the W side of the entrance. Anchorage can be taken by vessels of less than 1,000 dwt, in 23m, about 0.2 mile NNE of Hiyoriyama Hana. Small craft can anchor, in depths of 11 to 15.8m, in the W arm of Tsukumo Wan.

During bad weather, Tsukumo Wan is liable to be crowded with local fishing craft, and better anchorage can be obtained in either Tsuruga Wan, 110 miles SSW, or Nanao Wan, 15 miles SW.

Aka Saki (37°21'N., 137°16'E.), marked by a light, lies about 3.5 miles NNE of Joga Hana. Kawajiri Wan, about 1 mile S of the point, provides shelter for small craft with local knowledge from W winds.

Iidai Wan

2.40 Iidai Wan, an open bay, is entered between Aka Saki and **Nagate Saki** (37°27'N., 137°22'E.), about 7 miles NE. The fishing harbors of Matsunami Ko, Ukai Ko, Iida Ko, and Takojima Ko, each sheltered by breakwaters, border the shores of the bay. The bay is bordered by sandy beaches, with many shoal areas of less than 4.9m extending up to 0.5 mile offshore.

The bay provides good protection from W to N winds. However, in winter there are times when low pressure frontal systems pass E over the Sea of Japan producing NW winds N of Noto Hanto, while at the same time generating S and SW winds in the bay; these winds are strong and may blow continuously for half a day according to local reports.

Nagate Saki is a low headland marked by a light; a pine-covered hill, 63m high, lies about 0.8 mile W of the point.

In addition to the lights of the fishing ports, the Buddhist temple, with an elevation of 42m, W of Matsunami Ko; Mitsuko Shima, an islet, 28m high, about 0.5 mile S of Ukai Ko; and a white cliff, 252m high, about 2.3 miles W of Iida Ko, are conspicuous.

Caution.—Tempo Guri, a reef with depths of 11.5 to 14.9m, lies about 1 mile E of Mitsuko Shima. Foul ground extends about 0.4 mile E of the islet.

A reef, with depths of 3.3 and 4.2m, lies about 0.6 mile offshore, about 1.4 miles NNE of Mitsuko Shima. Other shoal reefs lie close SW.

2.41 Iida Ko (37°26'N., 137°16'E.) has a berth that is 149m long and has an alongside depth of 4.6m.

Anchorage.—With offshore winds, good anchorage can be taken in suitable depths, mud, E of Ukai Ko, and E of Sogen, farther S.

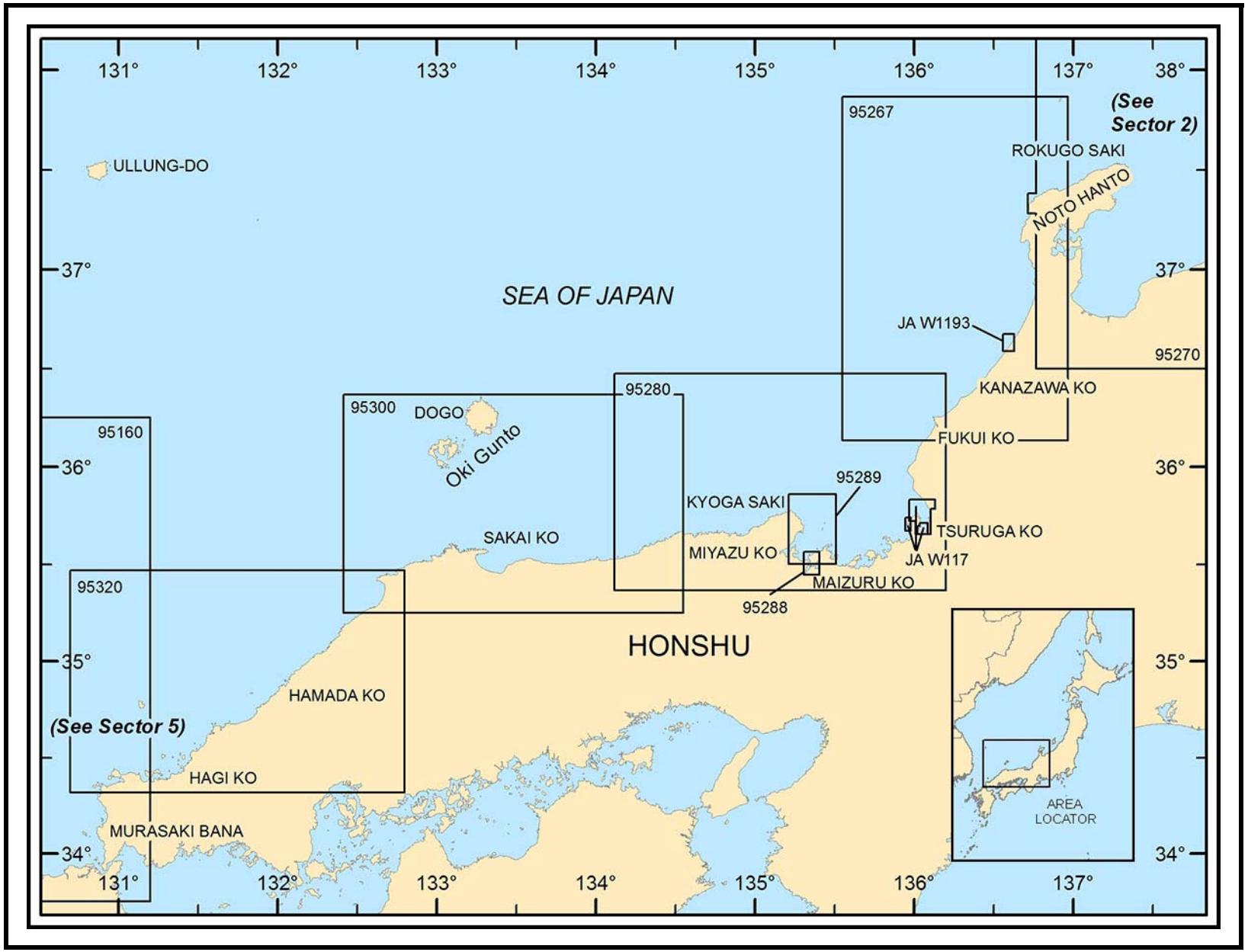
Caution.—There are a large number of fishing nets in the bay, particularly in the period from autumn to spring. Some nets extend 3 miles from shore.

2.42 Ai Saki (37°30'N., 137°21'E.), about 3 miles N of Nagate Saki, has a conspicuous reddish cliff S of it, near Jike; a light on Ai Saki illuminates Gyozya Guri, a rock, about 0.3 mile E. Himeshima Guri, parts of which are above water, extends about 0.8 mile NE of Ai Saki, to which it is almost connected by rocky ridges; a light is shown on the reef.

Kurisaba Guri, a rocky bank, with a least depth of 14.9m, lies about 1.8 miles SE of Himeshima Guri.

Kongo Saki, about 0.8 mile NNW of Ai Saki, rises to Yamabushi Yama, a well-defined conical hill, 201m high, about 0.8 mile W.

Rokugo Saki, about 1.3 miles farther NW, and its off-lying dangers will be described in paragraph 3.2. Norosi Ko (Norochi Ko), a small fishing harbor, lies close S of Rokugo Saki. The NE end of Noto Hanto, between Rokugo Saki and Ai Saki, is generally called Suzo Misaki.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **3** — CHART INFORMATION

SECTOR 3

HONSHU—NORTHWEST COAST—ROKUGO SAKI TO MURASAKI BANA (INCLUDING OFF-LYING ISLANDS)

Plan.—This sector describes the SW part of the NW coast of Honshu from Rokugo Saki to Murasaki Bana. The coast in this area extends in a SW direction for a distance of about 400 miles. It forms the S shore of the Sea of Japan.

Oki Gunto and Take Shima, along with other off-lying islands, are also described in this sector.

General Remarks

3.1 Winds—Weather.—The highest development of the winter Northwest Monsoon for Japan's land area is on the NW coast, against much of which the wind strikes freely from the open Sea of Japan to the N of Tsushima Kaikyo. South winds, nevertheless, may be expected. Only in a few of the bays like Toyama, sheltered by the Noto Hanto and in the Niigata region, where the island of Sado acts as a wind shield, is the coast particularly protected. In summer, SE to SW winds are mostly prevalent, but local conditions may cause much change.

On the part of the coast dominated by Tsushima Kaikyo, W winds are in the majority in December and January at Hamada, but thereafter, N to E winds are most common even in summer, due to local conditions in the strait where the lay of the channel and the land and sea breezes combine to back the Southeast Monsoon to the N and to the E. Nevertheless, SW winds occur in summer, though SE winds are very rare. The average annual wind speed is 7 knots, with means of 9 knots in December and January and 5 knots in June.

In the vicinity of Miho Wan, the winds are comparatively steady, sometimes blowing from one direction for two or three weeks at a time. Northwest winds are strongest and most frequent in winter, but cease in April. Light S winds prevail in summer, gradually changing to E in late August, then backing toward the N with the coming of bad weather in October.

At Tsuruga, N winds predominate in autumn and winter and S winds in spring and summer. East winds are noticeably absent. Winter gales in the bay, owing to the land configuration, are N or S.

At Mikuni, December to February is the period of strong NW winds and rough seas. North winds continue until June, but are interrupted by S to W winds in spring. Light S winds prevail in summer, with some squally weather.

South of the Nanto Hanto, at Kanazawa, while strong winds may be expected in winter, the mean December velocity is only 6 knots, the average for the year is 5 knots, and from July to September, 4 knots. On the E side of the peninsula, at Ogi, N and W winds are strong in winter, through the harbor, protected by the land, is seldom rough.

Tides—Currents.—The Tsushima Current flows in a NW direction off the NW coast of Honshu. In summer, after entering the Sea of Japan, its general velocity is 0.5 to 1 knot. In winter, the current is weaker, through near the islands and headlands it may attain a velocity exceeding 1 knot, especially after NW gales.

The Tsushima Current often influences the weak tidal currents off the NW coast of Honshu. The resultant set may attain considerable strength in the direction of the ocean current, with one tidal current nearly obliterated and the other greatly augmented in both velocity and length of flow.

Tides in the Sea of Japan are largely the effect of the inflow of the tidal wave which passes through Tsushima Kaikyo, the large strait at the W end of Honshu. On the NW coast of Honshu, the tides have an extremely pronounced diurnal inequality, and diurnal tides occur. The two successive low waters show the greatest difference in height. Lower low water follows higher high water. The springs rise is small, the mean varying to a maximum of 1.2m.

Off this coast the tidal currents are generally weak. Irregular sets may result from winds and other influences. Complications are also caused by the Tsushima Current, stated to be a branch of the warm Kuroshio Current, which flows along the coast in a NE direction. Though the Tsushima Current does not attain great strength, resultant sets of ocean and tidal currents may flow with considerable velocity, the augmented tidal current running nearly throughout the 12-hour period.

Rokugo Saki to Wa-jima Ko

3.2 Rokugo Saki (37°32'N., 137°20'E.) is the NE point of Noto Hanto. A light is shown from a round white tower on the point. A rocky spit, with depths of less than 9.2m, extends NE from the point for about 0.5 mile.

From Rokugo Saki the coast trends WSW for a distance of 21.5 miles to Wa-jima Ko. The coast is fringed with reefs and shoals, extending as much as 0.5 mile offshore in places. Toro Guri, the outermost reef, has a depth of 2.7m and lies about 0.9 mile offshore, midway between Rokugo Saki and Kashima Zaki.

Kura Saki (37°30'N., 137°09'E.) is located about 8.5 miles WSW of Rokugo Saki. A light is shown from the point. Kurataubo Dake, 366m high, lies 2 miles SE of the point.

Shira Saki, about 5 miles SW of Kura Saki, is faced with a red cliff. Iwakura Yama rises near the coast, about 2 miles further E, to an elevation of 356m; it has a red cliff on its N side and is a good landmark.

Koshu Zan (Takasu Yama) (37°23'N., 136°57'E.), located 6 miles SW of Shira Saki, attains an elevation of 567m, 1.25 miles inland. It is easy to identify as it is the highest mountain in the vicinity. Two green domes, showing lights, are situated on the summit.

3.3 Wa-jima Ko (37°24'N., 136°54'E.) is a small port situated on the E side of Tatsuga Saki, which has a remarkable white cliff on its seaward face. A light is shown near the summit of Tatsuga Saki.

Wa-jima Ko is the only sheltered port on the N shore of Noto Hanto. The port is protected by three breakwaters, from each head of which a light is shown. No. 1 Breakwater protects an

outer basin. No. 2 Breakwater and No. 3 Breakwater enclose an inner basin. A spur projecting NE from No. 3 Breakwater protects a second inner basin. The harbor has charted depths of 0.6 to 4.6m.

Vessels in the 500 gt class can anchor in the harbor. Larger vessels should anchor E of the breakwater, in a depth of 11.9m, sand. The harbor affords good shelter from winds blowing out of the S and W. Anchorage is difficult and dangerous with NW winds.

Caution.—Daija Guri is the general name for the several reefs lying within 0.4 mile NNE of Tatsuga Saki. The 20m curve is about 0.3 mile N of Daija Guri. In bad weather, the sea breaks over the reefs and rocks of Daija Guri. Stationary fishing nets are set from the S shore of the harbor up to 0.2 mile offshore. Tawara Se, a shoal, with a least depth of 7m, lies 1.75 miles E of Tatsuga Saki.

Off-lying Dangers

3.4 Nanatu Shima (Nanatsu Shima) (37°36'N., 136°53'E.), two small groups of rocky islets, lie from 11 to 13 miles N of Tatsuga Saki. The deep passage separating the two groups is over 1 mile wide, with a single rocky depth of less than 18.2m in mid-channel.

O Shima, 62m high, is the largest and highest islet in the N group. A light is shown from the islet.

Mikuriya Shima, 39m high, is the westernmost of the S group; Aramiko Shima, 43m high, is the easternmost of the S group. A detached shoal of 5.2m lies 0.5 mile E of Aramiko Shima.

Hegura Shima (Hekura-jima) (37°51'N., 136°55'E.), lying 14 miles N of Nanatu Shima, is a low flat island, 11.9m high. Rocks fringe the island to a distance of 0.3 mile, and depths of less than 5.4m extend S for more than 1 mile. A light is shown from the island.

Yome Guri (37°40'N., 137°12'E.) is a shoal area about 1 mile in diameter, with depths of less than 18.2m, the least depth being 3.4m. Breakers usually mark the drying and sunken rocks during heavy weather. A light is shown from the E side of the shoal.

Tatsuga Saki to Kanazawa Ko

3.5 Kouire Se and Daruma Se are rocks with depths of 2.7m and 6.1m, respectively, lying within a 0.5 mile of the coast, about 3 and 1.5 miles W of Tatsuga Saki. The coast inshore of the latter rock, and E of it, is foul.

Saruyama Zaki (37°20'N., 136°44'E.) is the NW extremity of Noto Hanto. A light equipped with a ramark is shown from the point.

Annyomon Guri (37°11'N., 136°38'E.), a rocky depth of 9.4m, is the outermost of a number of dangers lying within a 5 mile radius NW of Ama Saki, located 11 miles SSW of Saruyama Zaki.

Matsugashita Byochi is a small open bay lying 2 miles SE of Ama Saki. Togi Ko, a small artificial harbor, is located in the NW part of the bay. The harbor is protected by breakwaters. There are depths in the harbor of 2.7 to 4.3m. Exposed anchorage, open from the W to S, is available in 12.8m, poor holding ground. The best berth is reported to be with Takaiwa Saki bearing about 275°, distant 1 mile.

Fukuura Ko (37°05'N., 136°44'E.), a small port situated 4 miles S of Togi Ko, serves as a base for a large fishing fleet from September through May. The harbor is divided into N and S bays and affords anchorage for small vessels. A light is shown from the S end of the port. Range lights on a bearing of 090° lead into the harbor. Rocky reefs fringe the nearby coast.

Takahama Ko, a small fishing village, is situated about 5 miles SSE of Fukuura Ko. The village is protected by a breakwater from which a light is shown.

Abuia Gyoko, 1.25 miles WNW of Takahama Gyoko, is a small fishing harbor; a light is shown on the head of the breakwater. A tower stands at an elevation of 186m, 2.5 miles NNW of Abuia Gyoko.

A fish haven lies 2 miles WSW of Abuia Gyoko. A light is shown from a white tower, 6m high, at the head of a breakwater 2.5 miles NNW of Abuia Gyoko.

Taki Saki (Taki Zaki) (36°55'N., 136°45'E.) is a rounded point at the N end of a long stretch of sandy beach. Taki Ko, a small artificial harbor, is situated on the S side of the point. The harbor is protected by inner and outer breakwaters, marked by lights. According to reports, the harbor tends to be shallow due to drifting sands.

Inner breakwaters protect an inner harbor with two cambers. A lighted beacon, 7m high, stands at the root of the inner E breakwater; another light is shown from the head of this breakwater.

3.6 Kanazawa Ko (36°37'N., 136°36'E.) (World Port Index No. 61822) is a newer harbor that replaces Kanaiwa Ko as the port for Kanazawa. The port lies at the mouth of Ono Gawa, about 1.3 miles NNE of Kaniwa Ko.

Depths—Limitations.—The approach to the basin, and the basin itself, have been dredged to 9.7 and 10m.

Oil Quay, on the NE side of the basin close within its entrance, is 620m long, with depths of 5.4 to 7.1m alongside. It is used by tankers and is divided into six berths, numbered from the SE to NW.

Goro Shima Wharf, immediately SE of Oil Quay, is 240m in length, with a depth of 6m alongside.

Gokuden Wharf, Tomizu Wharf, and Muryogi Wharf, which are separated by Tomizu Basin, occupy the head of the harbor.

Gokuden Wharf, the E wharf, is about 540m in length, with a minimum depth alongside of 9m.

Tomizu Wharf is 370m long, with depths of 8.5m alongside.

Muryogi Wharf is 390m long, with depths of 4.5m alongside.

Muryoji Pier projects N from the W end of Muryoji Wharf. Its E side is 270m in length and has a permissible depth of 5.5m alongside. The head of the pier and the basin on its W side are used mainly by fishing vessels.

Ohama Wharf, accommodating containers, is 263m long, with depths of 13m alongside.

Aspect.—The harbor is entered between the E and W breakwaters.; a light is shown near the head of the W breakwater.

Pilotage.—Pilotage is not compulsory. Pilots are available only during the daytime and normally board vessels in position 36°38'N, 136°35'E.

Anchorage.—Except in winter, open anchorage can be obtained 1 mile W of the mouth of Sai Kawa, in depths of 11 to

Kanazawa Ko

15.8m, but NW winds raise a heavy sea. The bottom is mainly fine sand, and depths decrease regularly to the shore.

The quarantine anchorage is a circle of 500m radius centered 1.5 miles NW of Ono Kawa Light; there are depths of 17.1 to 26m, mud and fine sand, but in strong NW winds vessels may experience difficulty in anchoring.

Caution.—Depths of 2 to 4m less than charted exist in the entrance to the harbor.

Kanazawa Ko to Echizen Misaki

3.7 From Kanazawa Ko to Anto Saki, 32 miles SW, the coast is unbroken by sandy beaches. The 9.2m curve lies from 0.6 to 0.7 mile offshore. Gales raise a heavy sea along this coast, which offers no shelter to shipping.

Between Anto Saki and Echizen Misaki, 18 miles distant, the S half is cliffs backed by mountains with rocks up to 0.5 mile offshore. Sandy beaches with pine trees comprise the N section.

Mikawa (36°29'N., 136°29'E.) is a small port situated at the mouth of Tetori Kawa. A light is shown from the NE side of the mouth of the river. There is suitable anchorage for small boats 1 mile offshore, with good holding ground.

Hasitate Ko (Hashitate Ko) is a small fishing harbor situated 11 miles SW of Mikawa. The harbor is protected by three breakwaters. Because of the reefs in the area of the harbor, it should not be approached without local knowledge.

Shioya Ko is a small village on the N bank of Daishoji Kawa, near its mouth. A red hill, 61m high and surmounted by a clump of pine trees, is located near the coast, SW of the village.

Kasano Misaki (36°21'N., 136°18'E.) is a rocky densely-wooded point, which is conspicuous from the SW. The point is entirely surrounded by foul ground. A detached 14.9m depth lies nearly 1 mile N of the point; another similar depth lies 1.5 miles NE of the point.

The harbor entrance is protected by East Breakwater, West Breakwater, and the detached North Breakwater. Old Breakwater protects the inner basin. Lights are shown on the breakwater heads. There is good holding ground, in depths of 14.9m, outside the harbor.

Anto Saki (36°15'N., 136°07'E.), a wooded point, lies 6.5 miles SW of Shioya Ko. A bridge connects the close-lying islet O Shima to the mainland. Numerous dwellings are situated on the point; a light is shown from the islet.

Gentatu Se (Gentatsu Se) (36°13'N., 135°45'E.), a shoal area, with a least depth of about 10.4m, lies 19 miles offshore W of Mikuni Ko.

Fujiutsushiga Take, 942m high, located 11 miles E of Mikuni Ko, appears to have three sharp peaks when seen from the W and a single peak when viewed from the N.

Fukui Ko (36°11'N., 136°06'E.)

World Port Index No. 61820

3.8 Fukui Ko is comprised of two sections. Mikuni Ku (formerly Mikuni Ko) is located at the mouth of Kuzuryu Kawa while Kukui Ku lies S of Mikuni Ku.

The port is being developed as the core of Fukui Industrial Zone and is a major oil importing and storage center. There are large numbers of oil storage tanks, which constitute the Fukui Oil Stockpiling Base, situated on reclaimed land SW of the root of South Breakwater.

Winds—Weather.—From April to June, the wind is from the N; July to November finds winds from the S but very changeable. December to March has strong NW winds and rough seas.

Depths—Limitations.—The draft limit in the fairway of Fukui Ku is 9m. Mikuni Ku can be entered by vessels with a draft of 4.6m or less.

When entering Mikuni Ku under conditions of strong NW

winds, the triangular waves around the river mouth badly affect the steerage of vessels. Deep-draft vessels bound for Fukui Ku are advised to navigate closer to South Breakwater as far as possible due to the depths near the end of North Breakwater being possibly shallower than charted.

Incoming vessels from the W, when passing off Maizuru Ko, are recommended to contact Nihonkai-Seibu Communications Center (VHF channel16) and inquire about weather conditions in Kukui Ko. If the port is not practical for entry, then shelter can be taken in Miyazu, located in the W part of Wakasa Wan.

A sea berth for the Fukui Oil Stockpile Base is located about 2.2 miles SW of Fukui South Breakwater Light. An area within a circle of about 350m centered at the sea berth is allocated for a floating hose. Caution must be paid to the hose as it is always swinging due to the wind and waves. For further berthing information refer to the table titled **Fukui Ko—Berth Information.**

Aspect.—Fukui Ku, the S harbor of Fukui Ko, is protected by two breakwaters. The N breakwater extends 0.15 mile WSW from a position on the shore 1.25 miles SSW of the mouth of Kuzuryu Kawa. A light stands at the head of the breakwater. The S breakwater extends 0.75 mile NNW from a position 0.6 mile SSW of the root of the N breakwater. A light stands at the head of the breakwater.

Mikuni Ko, the N harbor of Fukui Ko, is situated at the mouth of Kuzuryu Kawa and is protected by a low breakwater which extends 0.4 mile WSW from the N side of the mouth of Kuzuryu Kawa. A light stands at the head of the breakwater.

Pilotage.—Pilotage is not compulsory, but pilots are available. The Port can be contacted via telephone (81-776-821120) or facsimile (81-776-821129).

Anchorage.—Anchorage is available off Fukui Ko, in 12 to 17m, sand, about 0.8 mile WNW of the mouth of Kuzuryu Kawa. Smaller vessels may anchor, in 8m, about 0.15 mile NNW of the head of Mikuni Ko Breakwater. The small bay close N of Mikuni Ko Breakwater should be avoided as the bottom is sand and rock, bad holding ground.

O Shima (36°15'N., 136°07'E.), an islet marked with a light, 42m high, lies close offshore two miles N of Kuzuryu Kawa.

Kame Shima (36°07'N., 136°03'E.), a flat wooded islet, 45m high, lies close offshore with a rocky depth of 4m close N.

Echizen Misaki (35°59'N., 135°58'E.) is a cliff faced point, fringed by rocks, extending close offshore. From the point to Oka Zaki, 16 miles SSE, the coast is mainly rocky cliffs fringed with reefs and backed by ranges of wooded hills. A light is shown from Echizen Misaki.

Tsuruga Wan

3.9 Tsuruga Wan (Tsuruga Wan) is a large protected bay entered between Oka Zaki and Tateishi Saki. From the entrance, the inlet extends S about 6 miles, with a general width of about 2 miles. High hills protect the bay on all sides, except the N, which is open and exposed to winter gales from that quarter. During this weather, a heavy swell sets into the bay. The bay is divided into five sections, which are clearly marked on the charts. There is good anchorage in the bay, particularly in Section 3 and Section 5. Several charted fish havens lie in Tsuruga Wan.

Fukui Ko—Berth Information

Name	Length	Depth	Maximum Vessel Size	Remarks
North Wharf				
No. 1	185m	10.0m	15,000 dwt	Ro-ro/lo-lo, general cargo, and bulk cargo.
No. 2	185m	10.0m	15,000 dwt	Ro-ro/lo-lo, general cargo, and bulk cargo.
No. 3	185m	10.0m	15,000 dwt	General and bulk cargo.
No. 4	130m	7.5m	5,000 gt	Cement.
No. 5	130m	7.5m	5,000 dwt	General and bulk cargo.
No. 6	130m	7.5m	5,000 dwt	Steel products.
No. 7	130m	7.5m	5,000 dwt	Steel products.
No. 8	130m	7.5m	5,000 dwt	Steel products.
No. 10	130m	7.5m	5,000 dwt	—
Tanker Terminals				
Fukui Oil Terminal SBM	—	45.5m	300,000 dwt	Crude.
Fukui Petrochemical No. 1	138m	7.5m	6,000 dwt	Clean products.
Public Oil Dolphin	188m	7.5m	6,000 dwt	Clean products.
Fukui Thermal Power Plant				
No. 1	133m	7.5m	6,000 dwt	Oil.
No. 2	157m	7.5m	6,000 dwt	Clean products.

Tsuruga Ko (35°39'N., 136°04'E.)

World Port Index No. 61810

3.10 Tsuruga Ko, a port of entry, is one of the principal ports on the NW coast of Honshu and lies at the head of Tsuruga Wan. The harbor is protected by a breakwater, with a length of 1,105m, and by a detached breakwater.

Winds—Weather.—During winter and autumn, the prevailing winds are N; in spring and summer, the S wind predominates. Storms occur mostly in winter.

Owing to the topography in the vicinity of the bay, the winds blow strongest from the N and S.

Depths—Limitations.—The approach to the port is via a 6 mile long passage from the entrance to Wakasa Bay. The maximum depth of water in Outer Harbor is 22m and 10m in the inner harbor.

The maximum permissible draft in the channel is 15m.

The principal berths are described in the table titled **Tsuruga Ko—Berth Information**.

Aspect.—A breakwater extends 0.35 mile W from Tayu Saki, a headland 1.5 miles S of **Matsuga Saki** (35°40'N., 136°05'E.). A light stands at the head of the breakwater. The breakwater has been extended. The area between the root of the above breakwater and a position close E of Kanega Saki has been reclaimed and quayed.

Pilotage.—Pilots are available, but pilotage is not compulsory. Pilots board by arrangement at the quarantine anchorage during daylight hours only. Pilots can be contacted by telephone (81-770-223-111).

Anchorage.—A circular quarantine anchorage, 0.25 mile in radius, with a depth of 20.1m, mud, is situated in Jogu Wan, on the W shore of Tsuruga Wan. Care must be used to avoid fishing nets in the bay.

Anchorage, in 20m, mud, is available for large vessels NW of the end of the breakwater. There are two mooring buoys for vessels up to 10,000 gt on the W side of the quarantine anchorage. Vessels carrying dangerous cargo should not anchor in Area No. 1 or Area No. 5.

Tsuruga—Berth Information

Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Horai Wharf						
G	130m	7.5m	—	6.8m	6,000 dwt	Cement and breakbulk.
H	130m	7.5m	—	6.8m	6,000 dwt	Cement and breakbulk.
I	130m	7.5m	—	6.8m	6,000 dwt	Cement and breakbulk.
Kawasaki-Matsue Wharf						
A	200m	7.5m	—	—	10,000 gt	Tugs.
B	200m	10.0m	—	—	15,000 dwt	Gypsum and sand.
C	220m	10.0m	—	—	15,000 dwt	Gypsum.
Mariyama-Kita Wharf						
A	130m	8.8m	—	7.2m	5,000 dwt	Containers.
B	240m	12.0m	—	11.0m	30,000 dwt	—
C	240m	12.0m	—	11.0m	30,000 dwt	Containers.
D	240m	9.0m	—	—	—	Ro-ro and passengers.
International Terminal						
A	310m	14.0m	—	—	—	Ro-ro, containers, and reefer.
Private Wharf						
Hokiriku Denryoku	280m	14.0m	230m	12.7m	60,000 dwt	Coal.
Tsuruga Cement	250m	10.0m	—	—	15,000 dwt	Cement and limestone.
Sakura Wharf						
E	100m	5.5m	—	—	2,000 dwt	General cargo.
F	130m	5.5m	—	—	2,000 dwt	General cargo.
Kanagasaki Wharf						
C	170m	10.0m	180m	9.0m	10,000 dwt	Chemicals.

Tsuruga—Berth Information						
Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
D	130m	7.5m	—	6.8m	5,000 dwt	Chemicals.

Two buoys, with depths alongside of 17 and 20m, exist for vessels of 10,000 gt and 20,000 gt.

Caution.—Depths at Horai Wharf (Berth H and Berth I) are up to 1.5m shallower than charted. Depths at Kawasaki Matsui Wharf (Berth A through Berth D) are up to 1.6m shallower than charted.

Pearl rafts are set from April through December on the W side of Nago Saki. There are numerous fish nets and pearl rafts on both sides of Urazoko Wan.

During strong NW winds, a swell sometimes sets into the inner harbor making it necessary for vessels lying alongside to breast-off to avoid damage.

Tateishi Saki to Bakuchi Misaki

3.11 Tateishi Saki (Tateisi Saki) (35°46'N., 136°01'E.), the N end of Tateishi Hanto, is the W entrance point to Tsuruga Wan. The reddish headland is 161m high. A light is shown from the point.

A breakwater extends about 0.4 mile SW from the shore, about 1.5 miles SW of Tateishi Saki.

Nyu Ura, a small cove in the lee of a hook-shaped peninsula, is located 5 miles SSW of Tateishi Saki. Depths in the cove, which opens to the S and is narrow, range from 2 to 4m at the entrance. Depths inside the cove range from 7 to 13m. The entrance is spanned by a bridge, with a vertical clearance of 14.9m and a fairway width of 79m.

Funatoshi Saki Light is shown on the W extremity of the point; an auxiliary light, shown from the same position, illuminates a drying reef 0.2 mile W. A light is shown about 0.7 mile SSE of Funatoshi Saki Light.

Kabutoga Saki (35°38'N., 135°54'E.), a headland, lies 5 miles SW of Nyu Ura. A rocky depth of 4.6m lies 0.6 mile NW of the point. Four lagoons lie within 4 miles S of the point. Two of the lagoons are deep, but the entrances of all of them are narrow and only small craft can safely enter them.

3.12 Tunekami Saki (Tsunekami Saki) (35°38'N., 135°49'E.) is about 239m high and lies about 5 miles WNW of Kabutoga Saki. The NW side of the point is surrounded by rocks and reefs. South of the point, the irregular shoreline is broken by Yashiro Wan and Sekumi Wan; these two small bays are separated by Kuro Zaki, a promontory extending 2 miles NW from the middle of an open bight. These open bays are too exposed for anchorage.

Ogami Shima, a conspicuous high islet with a thickly-wooded summit, lies 0.25 mile W of Tunekami Saki. There is a sharp peak, 196m high at its N end, that is prominent. The deep channel between the islet and the mainland is reduced to a width of about 0.1 mile by reefs that should not be attempted without local knowledge.

Okino Ishi (35°35'N., 135°47'E.), 6.4m high, lies in the approach to Yashiro Wan, about 1.3 miles WNW of Kuro Saki. Foul ground extends 0.5 mile NE of the islet.

Chi Shima, 36.9m high, lies in the approach to Sekumi Wan, about 1.5 mile NNE of Okino Ishi. Shoal banks extend about 0.3 mile N and S of the islet.

Kusuyaga Take (35°33'N., 135°44'E.), 619m high, rises 2.75 miles WSW of Okino Ishi. The E slope gradually descends to the isthmus of a peninsula. The N side is a sharply-declining cliff, with several waterfalls. The mountain is prominent as a landmark for identifying Obama Wan. In clear weather, the mountain is visible over 25 miles.

Matsuga Saki, the NE entrance point of Obama Wan, is a cliffy point with a high, rocky projection extending from its N side. Reefs fringe the point up to 0.1 mile.

Obama Wan is entered between Matsuga Saki and Nokogiri Zaki, about 1.3 miles W. Obama Ko is located on the SE shore of the bay. The bay affords good anchorage to vessels with local knowledge.

3.13 Obama Ko (35°30'N., 135°45'E.) is a fishing harbor located on the SE shore of the bay at the mouths of Minami Gawa and Kita Gawa. Two breakwaters, situated on the N and S side of the entrance, protect the harbor.

Depths—Limitations.—The fairway depths in the entrance to the bay are not less than 25.6m, and there are general depths of more than 9.2m throughout most of the bay. Depths in the E and W arms shoal gradually to 3.6m and 5.4m. There is a channel depth of 2.5m at the river entrance and 2m inside the basin.

Depths in the harbor and vicinity are subject to change due to silting.

Anchorage.—Vessels anchor off Obama Ko, in 6.4m, mud and sand. Larger vessels are advised to anchor in the W end of the bay, according to draft, keeping clear of the cable area. Temporary anchorage may be taken in Katsumi Ura.

3.14 Nokogiri Zaki (35°33'N., 135°40'E.), the E entrance point to Takahama Wan, is also the W entrance point to Obama Wan. Sunken and above-water rocks extend 0.15 mile from the point. The ruins of a fort stand at the foot of a conical hill near the point. A light is shown from the point.

Takahama Wan, a relatively large open bay, lies between Nokogiri Zaki and Imado Hana. The shores of the bay are fringed with islets and sunken rocks to a distance of 0.5 mile in places. Fuku Guri, an isolated, rocky depth of 6.2m, lying 0.8 mile off the SW shore of the bay, is the only off-lying danger. During N gales, a heavy swell sets into the bay making it unsuitable as an anchorage. Takahama, a fishing harbor, is located near the center of the head of the bay. Takate Guri, a rocky depth of 10.7m, lies 3 miles offshore in the approach to Takahama Wan.

3.15 Uchiura Wan (35°33'N., 135°29'E.), an inlet with six

coves, is entered between Kabuto Zaki and Oshimawari Saki. The depths in this inlet decrease from about 42.1m in the entrance; the bottom is mostly mud or fine sand.

Uchiura Ko Tsuruga, a local port, occupies the central and E coves at the head of Uchiura Wan.

Depths—Limitations.—A short breakwater is situated on the SW side of the S cove of Uchiura Ko; it protects a quay, 80m long.

A large factory is situated on the E side of the head of the harbor. It is served by quays, 160m long, with a reported depth of 10m alongside, and 140m long, with a depth of 4.5m alongside.

Pilotage.—Pilotage is not compulsory. If required, a pilot will come from Maizuru, 10 miles WSW, and will board at the quarantine anchorage between sunrise and sunset.

Anchorage.—Anchorage is very secure, in depths of 14.9 to 25m. During strong onshore winds, the likelihood of dragging is remote.

3.16 Ke Shima, faced with cliffs, has a conspicuous high, sharp summit near the S end. Above-water rocks extend N for 0.15 mile off the N end of the island. From October to March and during June and July, large fishnets are laid in the vicinity of the island.

Naryu Zaki (35°36'N., 135°28'E.) is a cliffy steep-to headland with close-lying, unusual rock formations. Two grass covered hills on the cape are prominent from a distance. Between this headland and Bakuchi Misaki, 6.75 miles SW, the rugged coast is fringed with dangers which extend in places more than 1 mile offshore. Naryu Saki Light is shown on the headland from a tower, 9.2m high.

Oki-Kazura Shima is the N islet in a group lying on a spit of foul ground which extends over 1 mile N from the coast, midway between Naryu Zaki and Bakuchi Misaki.

Bakuchi Misaki (35°33'N., 135°21'E.), the E entrance point to Maizuru Wan, is a densely-wooded headland faced with reddish cliffs on the N side. Kabura Guri, a rock 1m high, lies 0.1 mile N of the point, and the 18.2m curve lies 90m N of the rock. A light is shown from the point.

Maizuru Wan (35°22'N., 135°20'E.) is entered between Bakuchi Misaki and Kanega Saki. The inlet extends SSE for 2 miles, with a least width of 0.2 mile between the two 18.2m curves and then divides into two branches. The W branch continues 3 miles SSW and the other branch extends 3 miles to the E. The fairways are marked by buoys and lights.

Maizuru Ko (35°31'N., 135°20'E.)

World Port Index No. 61800

3.17 Maizuru Ko, a port of entry, includes all of Maizuru W and inshore of a line extending N from Kanega Saki to the intersection of a line extending W from Bakuchi Misaki. The port specializes in logs, lumber, and textiles as well as having ferry terminals and shipyards with drydocks, Maizuru is also home to a base for the Japanese Maritime Self Defense Forces (JMSDF).

Tides—Currents.—The maximum tidal range is 0.3m with the mean spring range of 0.1m and the mean neap range of 0.2m. Tidal currents within the port area are quite variable but do not exceed 0.25 knots, except in the harbor entrance where they can reach a strength of one knot. Maximum tidal currents are achieved about 2 hours after HW and LW.

Depths—Limitations.—The port is approached through Maizuru Wan through a channel, 11,300m in length with depths ranging from 9.3 to 27m. The limiting draft within this channel is 12m. The port is divided into three sections. It has been reported (2017) that the channel is narrow and passes a blind bend with a 90°turn.

Section I, known as West Harbor, is the commercial port and comprises that area lying S of a line extending W from Nio Saki to the opposite shore. Section I has a dredged channel leading to the berths; the outer portion is dredged to 12m, while the inner portion is dredged to 10m. The berths are situated in the S and SE area where Takano Gawa and Isatu Kawa flow into the bay. facilities of the commercial port are concentrated along the S shore; fishing harbor facilities are along the E shore. Timber storage areas are situated in Section I at Kita

Section II, known as East Harbor, formerly a military harbor, is used mainly as a port for government vessels. This section comprises that area S of a line W from Matsuga Saki to Sii Saki on the opposite shore.

Section III includes all areas within the harbor limits not included in Section I and II. The Maizuru Crane Bridge, with a vertical clearance of 24m, spans a portion of the harbor in Section III. Timber storage areas are situated in Section III at Okimi, Yoshida and Katsura.

The principal berthing facilities are described in the table titled **Maizuru Ko—Berth Information**.

Maizuru Ko—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Kansai Electric Power Plant Terminal					
East Berth	—	15.0m	—	—	Coal.
West Berth	—	15.0m	—	—	Coal.
Kita District					
Wharf No. 1	130m	7.5m	7.0m	5,000 dwt	—
Wharf No. 2	240m	12.0m	11.7m	30,000 dwt	—

Maizuru Ko—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			Draft	Size	
Pier No. 2 Wharf District.					
Wharf No. 1	130m	7.5m	—	5,000 dwt	Ro-ro and passengers.
Wharf No. 2	185m	10.0m	—	10,000 dwt	Ro-ro and passengers.
Wharf No. 3	145m	9.0m	8.5m	15,000 dwt	Ro-ro and lo-lo.
Wharf No. 4	165m	9.0m	8.8m	10,000 dwt	Ro-ro and lo-lo.
Kita Pier					
Wharf No. 1	130m	7.5m	7.0m	5,000 dwt	—
Wharf No. 2	240m	12.0m	11.7m	30,000 dwt	—
Ohgimi Dolphin	—	9.5m	9.5m	15,000 dwt	Maximum loa of 220m
Maizuru International Wharf					
Wharf No. 1	326m	14.0m	—	5,000 dwt	Containers and breakbulk.
Katsura Buoys					
No. 2	—	11.5m	—	15,000 dwt	—

Pilotage.—Pilotage is not compulsory, unless vessels wish to proceed to the Oghimi Dolphin or the Taira Dolphin, Pilots will board vessels in position 35°33.11'N, 135°19.41'E. Temporary anchorage while awaiting pilots is available one W of Kanegasaki, in depths of 15m, mud.

Contact Information.—See the table titled **Maizuru—Contact Information**.

Maizuru—Contact Information	
Pilots	
Telephone	81-733-775-587
Facsimile	81-773-764-828
Port Authority	
Telephone	81-733-757184
Facsimile	81-733-757198
E-mail	info@port.maizuru.kyoto.jp
Harbormaster	
Telephone	81-733-764120

Anchorage.—There are two quarantine anchorages located as follows:

1. Near the port entrance (35°31.1'N, 135°20.5'E.) for vessels proceeding to the main harbor or Higashi Ko.
2. S of To Shima (35°29.9'N, 135°22.4'E.) for vessels entering Nishi Ko.

It has been reported (2017) that there are no significant anchorages within the harbor.

Kanega Saki to Miyazu Ko

3.18 Kanega Saki (35°31'N., 135°20'E.), situated about 1.8 miles NE of the mouth of the Yura Gawa, is the SW entrance point of Maizuru Wan. A prominent hill, 215m high, rises 0.3 mile SW of the point.

Yura Gawa flows into Wakasa Wan, between Kunda Wan and Maizuru Wan. A shallow, shifting bar, less than 1m deep, encumbers the river mouth, which is less than 90m wide; a bridge spans the channel 0.3 mile within the entrance.

Mamo Shima (35°32'N., 135°16'E.) is a small, wooded, rocky islet, 24m high, lying close off a small point, located 2.5 miles WNW of Kanega Saki. A rocky, shoal spit extends 0.15 mile NE of the point, and an isolated rocky patch, 12.2m deep, lies 0.25 mile NW of the islet.

Kunda Wan lies between Musoga Hana and Mamo Shima. The bay is about 1.5 miles in width and indentation. The bay shoals from 30m at its entrance to 10.1m within 0.17 mile of the shore in the S end of the bay. The NE shore of the bay is cliffy and fringed with rocks.

A small harbor, protected from the E by an angled breakwater, lies at the head of the bay.

Aspect.—Shiro Yama, 1.25 miles W of Musoga Hana, is 78m high, the prominent wooded summit of a small peninsula.

Two berths, with depths from 6 to 8m alongside, have been constructed on reclaimed land on the N side of an inlet, situated 1 mile WSW of Musoga Hana. A chimney, with an elevation of 198m, and four tanks stand close N of these berths. Two mooring buoys lie close together, 0.2 mile S of these berths.

Anchorage.—Vessels anchor as convenient in the bay, mud bottom, good holding ground. A cove in the lee of the peninsula affords sheltered anchorage, in 14.6m, protected from all but S winds.

Musoga Hana separates Shimakage Wan on the N from Kunda Wan on the S. Rocks and reefs extend seaward, almost 0.3 mile off the point. A fish haven lies 0.4 mile N of Musoga Hana.

Caution.—An underwater obstruction lies 0.6 mile SW of Shiro Yama; a fish haven, with a depth of 17.2m, lies 0.6 mile

SSE of the same summit. A wave meter, marked by a lighted buoy, lies about 0.9 mile ENE of Momo Shima.

3.19 Shimakage Wan (Shimakage Wan) (35°34'N., 135°16'E.), a bight between Kuro Saki and Musoga Hana, is open to the N. The shoreline is mostly cliffs, fringed with rocky reefs, and stationary fish nets are set at various places within 0.75 mile offshore.

Miyazu Wan is an inlet entered between Hami Saki and Kuro Saki, about 1.3 miles SSE. A light is shown from Kuro Saki. Its W side is mostly sandy beach, fringed by a shallow bank, extending as much as 0.3 mile offshore in places. The E side is indented, most of the points terminating in cliffs. The bay is about 1.4 miles wide and 5 miles long. The port of Miyazu Ko covers most of the S end of the bay.

Aso Kai, a lagoon off the W shore of the bay, is separated from the bay by Amano Hashidate, a narrow pine covered spit of white sand almost 2 miles long. Monju Suido, the channel which connects the bay and lagoon, is located at the S end of the spit. This passage is about 840m long, 27m wide, and from 2 to 3m deep.

Tides—Currents.—The tidal currents in the bay move parallel to the shore. Rising and falling tides move SW and NE, respectively, with a maximum rate of 0.75 knot.

Depths—Limitations.—Depths in the bay decrease gradually from 27.4m in the entrance; the 9.2m curve lies close to shore in most places. The middle part of the bay, generally used by traffic, has depths exceeding 14.9m. Dangers in the bay are best located by chart observation.

Aspect.—A conspicuous cable railway runs up the slope of a hill at the NE end of Aso Kai. A light is shown from the top.

A conspicuous white chimney, 41m high, is situated about 350m E of the railway station; a radio tower, 74m high, stands 600m NE of the station.

Pilotage.—Pilotage is not compulsory, however, harbor pilots are available at Kurosaki Anchorage. Berthing is done during daylight hours only; unberthing may be done any time subject to adequate notice and approval from the pilot.

3.20 Miyazu Ko (35°32'N., 135°12'E.) (World Port Index No. 61790), a port of entry, is situated at the mouth of Ote Kawa, which flows into the head of Miyazu Wan. It is divided into four sections, the limits of which are shown on the chart.

Depths—Limitations.—The principal berthing facilities are described in the table titled **Miyazu Ko—Berth Information**.

The largest vessel accommodated was reported to be 30,053 dwt, with a draft of 12.5m.

Miyazu Ko—Berth Information

Name	Length	Depth	Vessel size
Tsuruga No. 1 Wharf	148m	5.0m	1,000 dwt
Tsuruga No. 2 Wharf	242m	4.0m	1,000 dwt
Municipal floating pier	25m	—	450 dwt

Pilotage.—Pilotage is not compulsory. Harbor pilots are available at Kurosaki Anchorage. Berthing is performed during daylight hours only; unberthing can be done at any time subject to adequate notice and approval from the pilot.

Anchorage.—Vessels anchor as convenient inside the harbor limits, except during strong N winds. The most sheltered anchorage is S of the parallel of Shishi Zaki in 14m, mud. Large vessels anchor about 0.5 mile off the dock area; small vessels anchor closer inshore. During strong N winds, some sea and swell sets into the bay.

Vessels carrying dangerous cargo must anchor in Section 1.

Hami Saki to Kyoga Saki

3.21 Hami Saki (35°37'N., 135°15'E.), the N entrance point to Miyazu Wan, is fringed by reefs for 0.1 mile offshore. A clump of pines on the point makes a good target from the N or S.

Ine Ko is a small cove, 3.5 miles NNE of Hami Saki, that affords sheltered anchorage to small vessels, in 23m, mud and sand. The main channel into the cove is 0.1 mile wide between the 18.2m curves. Lights mark the entrance to the cove.

Wasi Saki (Washi Zaki) (35°40'N., 135°18'E.), a cliffy headland, is marked by a rock, 2m high, lying close off the SE end of the point. The currents in the vicinity of Wasi Saki are generally weak, but during N winds, a SE set with a velocity of 1 knot has been experienced 3 miles ENE of the point. Fishing nets may be encountered up to 0.75 mile offshore in this vicinity.

Nii Saki is a low, rocky point located 2 miles N of Wasi Saki. Vessels should steer clear of the point during strong winter gales from the NW, because of heavy seas off the point. There is a cove at Odomari, about 1 mile NW of the point, but due to rocks at the entrance, is only available to small boats.

Between Nii Saki and Kyoga Saki, the coast is steep-to and faced with cliffs. Taitsuri Shima, a conspicuous pointed rock, 17.9m high, lies 2.75 miles NNW of Nii Saki. Kabuto Saki is a densely wooded, cliffy headland about 2 miles SE of Kyoga Saki. A fish haven lies about 1 mile offshore ENE of Kabuto Saki. Honjo Ko is situated in a small bay close to the S of Kabuto Saki. A light is shown from the breakwater protecting Honjo Ko.

Kyoga Saki (35°46'N., 135°14'E.) is a rounded headland fringed with rocks for a short distance seaward. The point is the W entrance point of Wakasa Wan. There are no harbors of any consequences and no dangers more than 0.25 mile offshore between Kyoga Saki and Taiza Kaku. There is an isolated rock, 3.1m high, about 2 miles W of the point.

Kyoga Misaki Light is shown from a round tower, 11.9m high, standing on the NE slope.

Two radio towers and a radar dome stand on a summit, 1 mile S of Kyoga Misaki; from the E, the towers are obscured by the dome.

Wakasa Wan

3.22 Wakasa Wan is a large open bay lying between Kyoga Saki and Echizen Misaki, a distance of 38 miles. The harbors are Miyazu Ko (previously described in paragraph 3.20) and Maizuru Ko (previously described in paragraph 3.17), located in the W part of the bay; Obama Ko (previously described in paragraph 3.13), located in the central part of the bay; and Tsuruga Ko (previously described in paragraph 3.10), located in the E part of the bay.

On a line from Kyoga Saki to Tateishi Saki, on the E side of the bay, depths range from 36.5m to 183m. Depths decrease toward the head of the bay, but in general the headlands along the S shore are steep-to.

Caution.—Fishing buoys, made of bundles of bamboo, may be encountered in the approaches to Wakasa Wan as far as 20 miles NE of Kyoga Saki from July through October.

A group of islets and rocks, some 3 miles long, N and S, are centered 5.5 miles E of Nii Zaki. Kammuri-jima, the largest and southernmost, is cliffy with a thickly-wooded summit, 170m high. Reefs and breaking rocks extend 137m SSE from the islet. Kutsu-jima, the N islet, consists of two rocky, close-lying islets. The S and largest is sparsely wooded and cliffy on the E side, with a sharp summit, 74m high, at the N end. The N islet is a bare cylindrical rock with a blunt summit, 92m high. Reefs extend S for 0.2 mile from the S islet, and O Guri, an isolated, steep-to, and rocky depth, lies 0.6 mile N of the N islet. The sea breaks over the patch from heavy swells. A number of fish havens lie up to 4.5 miles W of the islets.

Asa Guri (35°37'N., 135°35'E.), an isolated group of rocks 5.75 miles E of Naryu Saki, has a least depth of 5.2m. Takate Guri, a rocky depth of 10.6m, lies about 2 miles SSE of Asa Guri.

Kyoga Saki to Kasumi Ko

3.23 Nishi Saki (35°45'N., 135°11'E.), about 2.5 miles WSW of Kyoga Saki, has the fishing village of Nakahama Ko close on its E shore. The approach to the village is difficult because of the many rocks and shoals. There is a small dock in the port, protected by a breakwater. The port is mainly used by small craft with local knowledge. A light is shown from the breakwater.

Inu Zaki (Inuga Zaki), about 2 miles W of Nishi Saki, has a remarkable rounded summit, 260m high. A conspicuous, upright, and pointed rock lies close off the point.

Taiza Ko (35°44'N., 135°05'E.) is located on a cliffy headland, fringed with foul ground up to 0.3 mile. Shiro Shima, an islet, lies close off the point. The small port is protected by a breakwater.

Ana Saki, a bold headland faced with cliffs on its W side, is 84m high, and is located about 6 miles SW of Taiza Ko. Ashiura Yama, about 9 miles SSE of Ana Saki, is a prominent barren plateau, 661m high.

A shoal, with a depth of 6.3m, was reported (1998) in position 35°44'.7N, 135°06'.0E close off Taiza Ko.

Kumihama Wan (35°38'N., 134°55'E.) is a rather extensive saltwater lagoon, separated from the sea by a sandy spit. The approach to the lagoon is encumbered with sunken and above-water rocks, and a heavy sea runs in on the coast, particularly in winter.

Two artificial channels lead into the lagoon. Currents in the channels reach a velocity of 3 knots. An overhead cable, with a vertical clearance of 24m, spans the main channel. The town of Kumihama is situated at the head of the lagoon. Kumihama Wan provides safe anchorage for small craft, in depths of up to 18m.

Takeno Guri is a rocky depth of 3.1m, located 1.75 miles NNW of Kumihana Wan entrance. It is the outermost danger on this part of the coast.

3.24 Tsuiyama Ko (35°39'N., 134°51'E.), located 3 miles W of Kumihama Wan, is 0.5 mile wide and indents the coast for about 1 mile. Maruyama Kawa flows into the SW corner of the harbor and affords good shelter for small craft. Tsuiyama Shima, separated from the coast by a narrow shallow channel, only used by small craft with local knowledge, lies on the W side of the entrance to Tsuiyama Ko. Lights are shown from the NE point of the island and the N side of the entrance to Tsuiyama Ko.

Pilotage.—Pilotage is not compulsory. Pilots are available at Maizuru, 26 miles ESE. Entry and departure are permitted during daylight hours only.

Anchorage.—Anchorage is available W of the harbor breakwater, in 4 to 4.9m, mud. Vessels of 500 gt anchor outside the basin, in 7 to 15m, sand. With winds from the W through N, the swell makes the bay untenable, except inside the basin.

Oto Guri, a rocky depth of 4.6m, lies 0.5 mile offshore in the center of the approach.

Neko Saki (35°40'N., 134°46'E.), a narrow thickly-wooded peninsula, is located 4 miles WNW of Tsuiyama Ko. The summit attains an elevation of 141m and is connected to the coast by a sandy isthmus. From a distance the peninsula appears as an island. A detached rocky patch, with a depth of 12.3m, lies about 0.4 mile N of the point. A light is shown from the point.

Shibayama Ko, located about 4.5 miles W of Neko Saki, is a narrow inlet, with depths ranging from 20.1m in the entrance to 3.6m at the S end. Several villages are situated around the shores of the bay, which affords anchorage only to small vessels. The bay is open to the N and when a swell sets in, the whole bay becomes untenable.

3.25 Kasumi Ko (35°39'N., 134°38'E.) is a fishing port situated 2.5 miles SW of Shiba-yama Ko. The bay, about 2 miles wide at the entrance, is divided into two parts by a peninsula. Nishi Hama lies to the W and Higashi Hama to the E. Commercially, the basin on the W side of the peninsula is the most important, while the E side serves as a fishing harbor. The harbor is protected by breakwaters.

Anchorage.—Vessels anchor in the middle of the inlet, in a depth of 9.2m, sand. Small vessels anchor inside the breakwaters, in depths of 3.1 to 4.9m.

Shiraishi Shima, a wooded islet, and Kuro Shima, with a pointed summit, lie in the E approach to Kasumi Ko. Numerous rocks fringe the islets and a depth of about 1m lies midway between Shiraishi Shima and the peninsula.

Caution.—Depths of 1 to 3m less than charted may be found in Kasumi Ko.

Amarube Saki to Sakai Ko

3.26 Amarube Saki (35°40'N., 134°32'E.) is a steep-to prominent headland located 4.5 miles WNW of Kasumi Ko. The point is densely wooded and faced by cliffs that rise to a height of 270m. A bare, rounded hill, 551m high, stands 1.5 miles SSW of the point. When seen from the N, the hill appears to have two summits. Two miles SE of the point, the triangular white cliff at Matsuga Saki is conspicuous, especially from the NE.

Amarube Saki Light is shown on the middle slopes of the headland, 0.25 mile SSE of the extremity. A second light is shown on the point from a framework structure, 6m high.

Moroyose Ko (35°37'N., 134°26'E.), a small cove at the head of a larger bay, is located about 6 miles WSW of Amarube Saki. The port is considered the best natural fishing harbor on this part of the coast. A light is shown from the SE corner of the port. West of the fishing harbor is a marina, with depths of less than 3.1m, protected by breakwaters. Anchorage depths in the bay range from 4.9 to 10.1m. Taziri Ko, a fishing harbor protected by breakwaters, lies 1.25 miles ENE of Ajiro Saki.

Ajiro Saki is a reddish-colored rocky point, located about 1 mile W of a thickly-wooded summit, 203m high. Ajiro Ko is a fishing harbor, protected by breakwaters, on the S side of Ajiro Saki. The depths in the harbor are less than 3.1m. Drifting sands from the Kamo Kawa make the narrow harbor entrance shallower at times.

3.27 Shichiyama Saki (35°34'N., 134°17'E.) is a steep grassy point which rises at the summit of Shichiyama to a height of 314m, and lies about 1.5 miles SW of Ajiro Saki.

Shichiyama Saki marks the boundary between sandy beaches and low dunes to the W, and the steep and rugged coastline, backed by mountains, to the E.

Amo Shima, an islet 21m high, lies 0.75 mile offshore, about 2 miles W of Shichiyama Saki.

Tottori Ko (35°32'N., 134°11'E.), a small harbor at the mouth of Sendai Kawa, is located about 5 miles WSW of Shichiyama Saki. The harbor is a fishing port, protected by breakwaters. North winds raise a heavy sea at the harbor entrance, making entry dangerous. The channel from the harbor entrance to the main pier has a depth of 5.5m during good weather. Toriga Shima, an islet 27m high, lies close N of the river entrance.

Nagao Hana (35°32'N., 134°00'E.), a rugged wooded cape, 81m high, lies 8.5 miles W of Karo Ko. About 7 miles SSE of the cape stands Jubo San, 921m high. The summit of this mountain forms a prominent landmark.

Tomari Ko, a small fishing harbor, lies 3.5 miles WSW of Nagao Hana. The harbor, with depths of 1 to 3m, is protected by three breakwaters. During strong W winds, heavy seas enter the harbor. The coast W of this area is mainly sandy beaches and alternating high cliffs. A number of small fishing harbors lie between Tomari Ko and Mi Saki, 17 miles farther W.

Mikuriya Saki (35°30'N., 133°30'E.), a low shingle-fringed point, is located 4.75 miles WSW of Mi Saki. The point marks the E entrance side of Miho Wan.

Miho Wan, a bight open to the NE, is entered between Jizo Saki and Mikuriya Saki. Depths in the bay decrease gradually from 31m at the entrance, to the sandy beaches of the shore. Several charted fish havens exist throughout Miho Wan. The bottom in most parts of the bay is mud and sand. The Hino Gawa flows into the head of Miho Wan on its S shore. Sakai Ko, a port of entry, lies on the NW shore of the bay.

Naka Umi (35°28'N., 133°12'E.) is a large saltwater lagoon W of Miho Wan. The central part of the lagoon has a flat bottom with depths of 5.8 to 8.9m. Two islands, Daikon Shima and E Shima, lie in the N end of the lagoon. Nakaeno Seto, the narrow passage from Miho Wan into Naka Umi, is marked by buoys and lighted ranges.

Sinzi Ko (Shinji Ko) is a large freshwater lake W of Naka Umi, to which it is connected by the Okyo Gawa. The lake is 9 miles long and 3 miles wide. Depths in its center range from 4.9 to 5.8m.

Sakai Ko—Berth Information

Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Isaka Flour Milling Terminal						
Isaka Pier	193m	14.5m	274m	6.8m	70,000 dwt	Grain. Pier length includes dolphins.
Pacific Cement Terminal						
Cement Berth	5m	—	—	—	—	Cement.
Sakai Section 3						
JEF Logistics Quay	340m	5.6-5.8m	—	—	30,000 dwt	Breakbulk.
Sukematsu Wharf International Container Terminal						
Berth 1-2 (Quay 8)	490m	12.0m	—	—	30,000 dwt	Containers.
Sukematsu Wharf International Vehicle Terminal						
Quay (Area A)	330m	14.0m	—	—	50,000 dwt	Vehicles, reefer, and containers.
Sakai Section 2						
Export Quay	428m	9.0m	—	—	50,000 dwt	Breakbulk.
Omama No, 1	190m	4.4m	—	—	—	Breakbulk.
Omama No. 2	190m	5.6m	—	—	—	Breakbulk.
Omama No. 3	190m	—	—	—	—	Breakbulk.

Sakai Ko—Berth Information						
Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Omama No. 4	190m	8.0m	—	—	—	Breakbulk.
Omama No. 5	400m	10.7m	—	—	—	General cargo.
Omama No.6	230m	6.8m	—	—	—	General cargo.
Product Quay	—	6.4-8.2m	—	—	—	Breakbulk.
Shiohama No. 1 Quay	395m	5.4-6.9m	—	—	—	Breakbulk.
Sumkin Wharf	290m	5.2-6.0m	—	—	—	Breakbulk.
Senboku Section 5						
Komatsu Quay 1 Berth A	97m	5.3-6.6m	—	—	—	Chemicals and breakbulk.
Komatsu Quay 1 Berth B	97m	5.3-6.4m	—	—	—	Chemicals and breakbulk.
Komatsu Quay 1 Berth C	97m	—	—	—	—	Chemicals and breakbulk.
Komatsu Quay 1 Berth D	97m	5.3-6.4m	—	—	—	Chemicals and breakbulk.
Komatsu Quay 2 Berth A	126m	7.7-7.2m	—	—	—	Chemicals and breakbulk.
Komatsu Quay 2 Berth B	126m	7.1-7.2m	—	—	—	Chemicals and breakbulk.
Komatsu Quay 2 Berth C	126m	7.1-7.2m	—	—	—	Chemicals and breakbulk.
Komatsu Quay 3 Berth A	130m	6.9m	—	—	—	Breakbulk.
Komatsu Quay 3 Berth B	130m	5.4m	—	—	—	Breakbulk.
Matsunohama Quay 1 Berth B	96m	5.1-5.6m	—	—	—	Breakbulk.
Matsunohama Quay 1 Berth C	96m	5.2-5.6m	—	—	—	Breakbulk.
Matsunohama Quay 1 Berth D	—	5.1-5.6m	—	—	—	Breakbulk.
Matsunohama Quay 1 Berth E	96m	5.1-5.6m	—	—	—	Breakbulk.
Matsunohama Quay 1 Berth F	96m	5.1-5.6m	—	—	—	Breakbulk.
Matsunohama Quay 2 Berth A	110m	5.9m	—	—	—	Breakbulk.
Matsunohama Quay 2 Berth B	110m	5.9m	—	—	—	Breakbulk.
Matsunohama Quay 2 Berth B	110m	5.0m	—	—	—	Breakbulk.
Matsunohama Quay 2 Berth C	110m	5.0m	—	—	—	Breakbulk.
Matsunohama Quay 2 Berth D	110m	5.0m	—	—	—	Breakbulk.
Matsunohama Quay 2 Berth E	110m	5.0m	—	—	—	Breakbulk.
Shiomi Quay 1 Berth A	58m	—	—	—	—	—
Shiomi Quay 1 Berth B	58m	3.9-4.9m	—	—	—	—
Shiomi Quay 1 Berth C	58m	3.9-4.9m	—	—	—	—
Shiomi Quay 1 Berth D	59m	3.9-4.9m	—	—	—	General cargo.
Shiomi Quay 1 Berth E	58m	—	—	—	—	General cargo.
Shiomi Quay 1 Berth F	59m	3.9-4.9m	—	—	—	General cargo.
Shiomi Quay 1 Berth G	59m	3.9-4.9m	—	—	—	General cargo.
Shiomi Quay1 Berth H	—	—	—	—	—	General cargo.
Shiomi Quay 2 Berth A	191m	10.3-10.6m	—	—	—	Breakbulk.
Shiomi Quay 2 Berth B	192m	10.3-10.6m	—	—	—	Ro-ro and passengers.

Sakai Ko—Berth Information						
Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Shiomi Quay 2 Berth C	58m	10.3-10.6m	—	—	—	—
Shiomi Quay 3 Berth A	193m	10.0-10.3m	—	—	—	—
Shiomi Quay 3 Berth B	—	—	—	—	—	—
Shiomi Quay 3 Berth C	194m	10.0-10.3m	—	—	—	Breakbulk.
Shiomi Quay 4 Berth A	140m	7.3-7.9m	—	—	—	Breakbulk.
Shiomi Quay 4 Berth B	140m	7.3-7.9m	—	—	—	Breakbulk.
Shiomi Quay 5 Berth A	247m	12.0m	—	—	—	Ro-ro and passengers.
Shiomi Quay 5 Berth B	246m	12.0m	—	—	—	Ro-ro and passengers.
Shiomi Quay 5 Berth C	247m	12.0m	—	—	—	Ro-ro and passengers.
Sukematsu Quay 1	230m	9.3-9.4m	—	—	—	Ro-ro and passengers.
Sukematsu Quay 2 Berth A	126m	7.4m	—	—	—	Ro-ro and breakbulk.
Sukematsu Quay 2 Berth B	127m	7.4m	—	—	—	Ro-ro and breakbulk.
Sukematsu Quay 2 Berth C	127m	7.4m	—	—	—	Ro-ro and bBreakbulk.
Sukematsu Quay 3 Berth A	126m	7.6m	—	—	—	Breakbulk and aggregates.
Sukematsu Quay 3 Berth B	127m	7.6m	—	—	—	Breakbulk and aggregates.
Sukematsu Quay 3 Berth C	127m	7.6m	—	—	—	Breakbulk and aggregates.
Sukematsu Quay 4 Berth A	126m	7.6m	—	—	—	Breakbulk.
Sukematsu Quay 4 Berth B	127m	7.6m	—	—	—	Breakbulk.
Sukematsu Quay 4 Berth C	127m	7.6m	—	—	—	Breakbulk.
Sukematsu Quay 5 Berth A	105m	7.5-7.8m	—	—	—	Breakbulk.
Sukematsu Quay 5 Berth B	105m	7.5-7.8m	—	—	—	Breakbulk.
Sukematsu Quay 5 Berth C	105m	7.5-7.8m	—	—	—	Breakbulk.
Sukematsa Quay 6	300m	5.8m	—	—	—	Breakbulk.
Sukematsa Quay 7	410m	—	—	—	—	Breakbulk and containers.
Tanker Terminals						
Cosmo Oil Pier						
Cosmo North	32m	—	—	14.0m	195,120 dwt	Aviation fuel.
Iwatani Terminal						
Iwatani Sangyo	27m	14.5m	246m	13.0m	66,000 dwt	LPG and chemicals. Maximum beam of 39.9m.
Japan VAM and Poval (JVP)						
JVP Pier	—	5.5m	72.7m	5.0m	2,000 dwt	Chemicals.
JXTG Nippon Oil & Energy Terminal						
General Sekiyu B0 7	45m	—	—	—	—	Clean products.
General Sekiyu B0 8	35m	—	—	—	—	Clean products.
General Sekiyu B0 9	50m	—	—	—	—	Clean products.
General Sekiyu B0 1-2	25m	—	—	—	—	Clean products.

Sakai Ko—Berth Information						
Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
General Sekiyu B0 10	49m	—	—	—	—	Clean products.
General Sekiyu B0 11	50m	—	—	—	—	Clean products.
General Sekiyu B0 12	50m	—	—	—	—	Clean products.
General Sekiyu B0 15	25m	—	—	—	—	Vegetable oils.
Tonen General Sekiyu	42m	16.5m	330m	14.5m	314,250 dwt	Clean products. Maximum beam of 60m.
Marubeni-Ennex-Sakai Terminal						
Center	18m	14.0m	249m	—	113,000 dwt	Clean products. Maximum beam of 44.0m.
No. 1	14m	—	—	—	9,500 dwt	Clean products.
No. 2	95m	—	—	—	9,500 dwt	Clean products.
Small Pier	9m	—	65m	—	1,302 dwt	Clean products.
Mitsui Chemical, Osaka Factory						
Factory Berth	—	16.0m	270m	14.5m	99,999 dwt	Clean products.
Nippon Petroleum Refining Company						
Oil Dolphin Berth	18m	8.5m	145m	7.65m	6,750 dwt	Clean products.
NPRC Berth A	28m	16.4m	276m	14.0m	141,672 dwt	Clean products. Maximum beam of 44.0m.
NPRC Berth B	29m	16.0m	255m	14.5m	66,769 dwt	LPG. Maximum beam of 38.0m.
Osaka International Refining Terminal (OIREC)						
No. 1	10m	6.0m	75m	—	—	—
No. 2	6m	6.0m	75m	—	—	—
No. 3	6m	6.0m	75m	—	—	—
No. 4 E	32m	4.5m	—	—	—	—
No. 4 W	32m	4.5m	—	—	—	—
No. 5	40m	7.5m	—	—	—	—
No. 8	41m	7.5m	—	—	—	—
No. 9	40m	7.5m	—	—	—	—
No. 10	40m	7.5m	—	—	—	—
Sakai Cosmo LPG Terminal Co. Ltd.						
Cosmo South	25m	20.0m	333m	14.5m	259,999 dwt	Aviation fuel. Maximum beam of 60m.
Sakai LNG Terminal						
LNG	40m	14.0m	333m	12.2m	101,000 dwt	LNG.
Senboku I LNG Terminal						
LNG	33m	15.1m	110m	13.5m	—	LNG.
LNG South	34m	12.0m	190m	10.0m	57,000 dwt	LNG and LPG. Maximum beam of 35.0m.

Sakai Ko—Berth Information						
Name	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Senboku II LNG Terminal						
No. 1	41m	14.0m	—	12.0m	73,000 dwt	LNG.
No. 2	40m	14.0m	—	12.0m	79,000 dwt	LNG.
Supplemental	53m	14.0m	125m	—	—	LPG.
Takashi Chemical Terminal						
Pier	120m	13.5m	180m	7.4m	8,500 dwt	Chemicals.

Sakai Ko (35°33'N., 133°15'E.)

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3.28 Sakai Ko is a port of entry, located in the NW part of Miho Wan, on the S side of the E end of Nakaeno Seto. Sakai Ko is entered S of Sakai breakwater (35°32'N., 133°16'E.). The port consists of Section 2, Section 1, and Section 3 in order from the port entrance to the N part of Naka Umi.

Winds—Weather.—Strong NW winds prevail during the winter months. The E wind predominates in March. Light S winds are common in summer and by October, bad weather sets in again. Fog accompanies E winds in early summer, but usually dissipates within 2 to 3 hours. Winds will frequently blow from one direction for extended periods, sometimes as long as 20 days.

Tides—Currents.—The rising tide sets into Nakano Seto from 3 hours after LW until 3 hours after HW; the falling tide sets seaward for the remainder of the cycle. Tidal currents are weak inside the harbor.

Depths—Limitations.—The draft limitation in North Passage is 14m; a maximum draft of 10.1m is permitted in South Passage.

Nakaura Suido, dredged to a depth of 7m (2007), leads to Section 3. A bridge, with a vertical clearance of 33m, crosses the channel close N of Nakaura Suimon pier.

The principal berthing facilities are described in the table titled **Sakai Ko—Berth Information**.

Piers No. 1-4 are established in front of a petroleum terminal located about 0.5 mile SW of Sakai Ko breakwater light. Four mooring buoys are laid W of the root of Sakai-Suido O Hashi; another mooring buoy is located near Eshima Quay.

Pilotage.—Pilots are available but are not compulsory. Pilots are available during daylight hours only and board 1.5 miles E of Sakai Ko Breakwater Light.

Contact Information.—See the table titled **Sakai Ko—Contact Information**.

Sakai Ko—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	81-859-302-124
Facsimile	81-859-302-128
Port Authority	
Telephone	81-859-42-3705
Facsimile	81-859-42-3735
E-mail	sakai-port@sakai-port.com

Anchorage.—Good anchorage is available outside the harbor breakwater, in 10.9 to 12m, sand and mud, good holding ground.

A circular quarantine anchorage, about 0.5 mile in diameter, is centered about 0.6 mile SSE of the end of the breakwater entrance.

However, the quarantine anchorage is not suitable for large vessels, which should anchor 2 miles ESE of Sakai Breakwater Light.

Zizo Saki (Jizo Saki) to Hinomi Saki

3.29 From Zizo Saki, the coast trends WSW for 36 miles to Hinomi Saki. The coast is rocky and generally steep-to, with no dangers more than a mile offshore. The W half of this section of coast is comparatively regular, but the E part is broken by numerous small inlets. A range of hills backs the entire length of this section of coast.

Oki Gunto, a group of islands, lies 25 miles N of the coast. The E current between the islands and the mainland runs strong during periods of SW winds. The islands are described in paragraph 3.32.

Zizo Saki (35°34'N., 133°20'E.) is the E end of a rugged peninsula that forms the N side of Miho Wan. Chinogozen-jima, a group of four above-water rocks, lie 0.15 mile NE of the point.

Okinogosen-jima, a rock 6m high, lies 1.75 miles NE of Zizo Saki. Jiura Guri, a rocky depth of 0.9m, lies close NE of Okinogosen-jima.

Mihonoseki Ko (35°34'N., 133°19'E.), protected by a breakwater, lies about 1 mile SW of Zizo Saki.

Takao Yama (35°33'N., 133°14'E.), 328m high, is located 4 miles W of Zizo Saki. The summit is marked by a conspicuous green-domed radar station.

Chikumi Wan (Kasa Ura), a small bay, located 4.5 miles W

of Takao Yama, affords shelter to small vessels from all but the E winds. The small village of Chikumi lies at the head of the bay.

3.30 Uomi Hana (35°36'N., 133°06'E.), the N headland between Hinomi Saki and Jizo Saki, is a barren reddish promontory fringed with reefs. Saza Guri, a steep-to rocky depth of 9.2m, lies 0.75 mile N of Tako Hana, the N point of Uomi Hana. A light is shown from Tako Hana.

Etomo Ko (35°31'N., 132°58'E.) is a fishing harbor located at the head of the bay on the mouth of the Sada Kawa. Small vessels can navigate the river which is connected to Sinzi Ko.

The harbor of Etomo Ko is enclosed by two breakwaters. The entrance between them is partially protected by a third detached breakwater. The harbor is used mainly by fishing boats.

Lights are shown at the head of the S breakwater, and at the SW end of the detached breakwater.

An overhead cable, with a vertical clearance of 8.2m, extends between the N breakwater head and the detached breakwater. Anchorage is available, in depths of 6 to 7m, S of the offshore breakwater. Depths in the anchorage inside the breakwater range from 3.1 to 4m.

Between Etomo Ko and Uppurui Wan, 12 miles W, the coast is rocky and should not be approached closer than 0.5 mile. A number of small villages lie on this stretch of the coast.

Uppurui Wan (35°28'N., 132°45'E.) lies on the S side of the promontory which terminates in Uppurui Hana. Uppurai Hana Light is shown from a round tower, 5.8m high. The bay is 2 miles wide at its mouth and runs E and W for 2 miles. The bay affords good shelter from all winds except from those in the W to N.

Anchorage.—Anchorage is obtainable by small vessels in Uppurui Wan on sand or rock, good holding ground, but is not recommended as the bay is completely open W and N, and due to the funneling effect of the hinterland, E winds raise a sea.

3.31 Hinomi Saki, a high, cliffy point fringed by foul ground, lies 5 miles WSW of Uppurui Hana. The point forms the NW extremity of a promontory of which Oishi Bana is the SW extremity. Hino Misaki Light is shown from a round stone tower, 44m high. An auxiliary light, shown from a round concrete tower 13.1m high, is situated close NE of the main light.

Caution.—Large fishing buoys made of bamboo or logs are set 10 to 50 miles off this coast from spring through autumn. From November through February, large fish nets are set N of Hinomi Saki; the N and W ends of the nets may be marked with lights.

Off-lying Islands

3.32 Oki Gunto (36°10'N., 133°10'E.), an island group consisting of Dogo, the NE island, and Dozen, three smaller islands with numerous rocks and islets to the SW, is located 25 miles N of Uomi Hana. Dogo and Dozen are separated by a channel almost 6 miles wide. The islands are comparatively high and rugged; the land used mostly for farming. Tidal currents in the area are weak and irregular.

Dozen consists of three main islands, so disposed that they nearly enclose a water area that can be approached by any one of the three channels leading between them. Ciburi Shima is the S island; Nisino Shima, the largest, is the NW island; and Nakano Shima is the NE island.

Nisino Shima consists of two sections joined by a narrow isthmus. Takuhi Yama, the highest peak in Dozen, 452m high, rises near the S end of the NE section which places it nearly in the center of the group.

Nakai Kuchi, the passage separating Nishino Shima and Nakano Shima, has a navigable width of 0.25 mile. A depth of 20.1m can be carried through the middle. Two small islets, 1 mile offshore, obstruct the N approach, and a rocky depth of 17m lies in mid-channel just inside the N entrance. Tidal currents in the passage set S with a rising tide at a maximum of 0.75 knot and N with falling tide at 1.5 knots.

Nakano Shima is indented by several coves which afford shelter to small vessels. Atodo Yama, the island's highest peak, is 246m high.

O Guchi (Kiro Kuchi), the channel between Nakano Shima and Chiburi Shima, has depths in excess of 36.5m for a width of over 1 mile, except for a rocky depth of 32.9m near midchannel, close W of the entrance.

Chiburi Shima is the S island of the group. Chibu Wan, on the S shore, affords shelter for small vessels. Kurii Ko is a small harbor, protected by breakwaters, on the NE side of the island. Akahage Yama, 325m high, is the highest peak.

Meguri, a rock lying in the W approach to the cove W of Chiburi Wan, is illuminated at night by a light shown on Mikoshi Hana, the W entrance point to this cove. Another light stands close N of the one on Mikoshi Hana.

Akanadano Seto (Akanada Kuchi) separates the NW end of Chiburi Shima from the S point of Nishino Shima. An overhead cable, with vertical clearance of 40m, spans the fairway which has a depth of 34.7m and a channel width of 0.25 mile.

Tidal currents of up to 1 knot set E with the rising tide and W with the falling tide. Because of the E ocean current, the rising tide is usually stronger and longer lasting. During rough weather, the current may set W all day.

Urago Wan, an inlet on the S side of Nishino Shima, affords anchorage, in 20.1m to 32.9m, mud and sand, good holding ground. A submarine cable is laid from the point of the small peninsula, located due W of Takuhi Yama, SSE to a point on the N shore of Chibura Shima. Urago village is situated at the head of the bay.

Directions.—Vessels proceeding to the Urago Wan anchorage by way of O Guchi should approach the passage with Kuroshima Bana in line bearing 283° with Tawara Shima. When abeam of Kiroga Saki, alter course to 307° to steer for the 258m hill near the head of the SW cove. When abeam of Okatsura Shima, distant 0.7 mile, alter course to 326° to steer for the 85m hill on Shimane Saki. Then proceed to the anchorage.

Dogo Suido, the channel separating Dozen and Dogo, is 6 miles wide; however, rocks and reefs reduce the fairway to about 2.5 miles between Omori Shima and Onbe Shima. It has a least depth of 31m in mid-channel.

Omori Shima is a steep, grassy islet with a sharp conspicuous peak, 155m high, near the NE end. A number of dangers lie within the area, 0.5 mile SE of the islet. Sakai Guri, a group of four low above-water rocks, lies on the outer end of a bank which extends about 4 miles S from Omori Shima.

Onbe Shima, a group of four rocks, the highest being 23m

high, lie 2.5 miles NNE of Omori Shima. The rocks are the outermost danger fringing the SW coast of Dogo.

3.33 **Dogo** (36°15'N., 133°17'E.), the largest of the islands, is about 10 miles in diameter. The island is cliffy and fringed with numerous islets and rocks that extend up to 0.5 mile offshore. Daimanji Yama, 608m high, the highest peak, is a good landmark.

Saigo Ko (36°12'N., 133°20'E.), the capital and principal town in Oki Gunto, lies on the SE coast of Dogo. This town also comprises a small port and is home to fishing harbor. The port specializes in the export of timber, rice and fish.

Depths—Limitations.—Within the entrance, the harbor branches off to the N and W, forming two coves. The entrance to the harbor is narrow, but free of danger except for a rock, 1m high, on the E side of the entrance. The port is protected by a detached breakwater, marked by lights at both ends. There are numerous berths in the harbor with depths alongside as deep as 6.5m.

Pilotage.—Pilots are not available.

Anchorage.—Vessels generally anchor in the N cove. The W cove has a narrow shoaled entrance making it unsuitable as an anchorage. The N cove anchorage has depths of 18.2 to 32.9m, mud. A small rocky area, 12.8m deep, lies near the center of the cove.

Taisha Ko to Hamada Ko

3.34 From Taisha Ko, the coast trends SW for 44 miles to Hamada Ko, a port of entry. The coast is rocky and generally steep-to with no dangers more than 1 mile offshore. A range of hills backs the entire length of coast in this vicinity and numerous small coves indent the shore.

Taisha Ko (35°24'N., 132°40'E.) is a small artificial fishing harbor located 2.5 miles SE of Hinomi Saki. Sheltered anchorage is available off the port, in 9.2m, sand. The anchorage is protected from N and E winds. The harbor is protected by two breakwaters and a breakwater in ruins (2007). A wave meter lies 1.3 miles SSW of the entrance to Taisha Ko.

Oura Hana, thickly wooded with pine trees, is prominent from the N and W. Several rocks fringe the NE side of the headland. The harbor of Oura is protected by breakwaters.

Nima Ko (35°09'N., 132°25'E.) is a small fishing harbor located about 2 miles SSW of Oura Hana. Maetaka Guri, a rocky depth of 8.7m, lies 0.75 mile NW of the harbor entrance.

Yunotsu Ko, a small harbor, opened to the NW, lies 4.5 miles SSW of Nima Ko. The town of Yunotsu is situated on the N side of the harbor. Oetaka Yama, a conspicuous peak 808m high, lies 4.5 miles ESE of the town.

Gotsu Ko (35°01'N., 132°14'E.) is a small harbor at the mouth of the Go Kawa. There is usually a heavy sea off the entrance to the port. When in freshlets, the river current is reported to reach a rate of 10 knots. Vessels of less than 100 gt frequent the harbor.

Aka Hana, about 8 miles SW of Gotsu Ko, is a red cliff fringed with a rocky shoal. There is a large sand hill about 2.5 miles NE of the cliff which is very prominent from the SW and W.

Hamada Ko (34°53'N., 132°04'E.)

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3.35 Hamada Ko, a port of entry, is divided into two sectors; commercial trade is handled in the S sector, while the N sector is used as the fishing port. Both the N and S sectors are protected by breakwaters. A number of islands, scattered along the N edge of the harbor, also provide good shelter to the port.

Depths—Limitations.—Nagahama Ko, the commercial center of the port, is protected by reclaimed land and the W breakwater. The draft limitations in the channel are 9m at Nagahama Wharf No. 2 and 7m at Nagahama Wharf No. 1.

Larger vessels handle cargo offshore according to their draft.

Isaki Se, a rocky shoal having a least depth of 12.2m, lies in the approach to the port, about 0.8 mile W of the breakwater.

Hamada Ko, the fishing center of the port, is protected by breakwaters. Depths in the harbor range up to 4m. Vessels of up to 300 gt can enter the fishing port.

Matsuhara Ura, in which the depths are less than 5.5m, is situated in the NE corner of the harbor. Hamada Kawa flows into the S side of the inlet.

The principal berthing facilities are described in the table titled **Hamada Ko—Berthing Facilities**.

Pilotage.—Pilots are available at the quarantine anchorage during daylight hours only.

Contact Information.—See the table titled **Hamada Ko—Contact Information**.

Hamada Ko—Contact Information	
Port Authority	
Telephone	81-855-247-733
Facsimile	81-855-274-411
Pilots	
Telephone	81-855-270-072

Anchorage.—The best anchorage available is off the fishing harbor, in 12.8m, mud bottom. With strong W winds, vessels anchor, in 12.8m, off the commercial harbor, 0.25 mile SE of O Shima. A lighted buoy marks shoal water about 0.5 mile ENE of O Shima.

A rectangular quarantine anchorage, 430m by 795m, lying NE-SW, is centered 0.67 mile E of Shakkuri. Pilots board at the quarantine anchorage.

Hamada Ko—Berthing Facilities

Name	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
Fukui Wharf					

Hamada Ko—Berthing Facilities

Name	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
No. 1	130m	7.5m	130m	5,000 dwt	Cement
No. 2	90m	5.5m	90m	2,000 dwt	Cement.
No. 3	280m	14.0m	280m	5,500 dwt	Cruise vessels, wood chips, and containers.
No. 4	130m	8.5m	130m	5,000 dwt	Coal, wood, ro-ro, and lo-lo.
Nagahama Wharf					
No. 1	186m	10.0m	186m	15,000 dwt	Cement and wood chips,
No. 2	131m	7.5m	131m	5,000 dwt	Cement and wood chips.
No. 3	71m	7.1m	—	1,000 dwt	Wood chips.
No. 4	175m	17.5m	—	2,000 dwt	Wood chips.

Small vessels anchor E of Setoga Shima or in Tono Ura, in 3.1 to 4.6m, mud.

Hamada Ko to Koyama Misaki

3.36 From Hamada Ko the coast, generally steep-to, trends SW for about 24 miles to Koyama Misaki. Except for Esaki Ko, the shoreline is regular and with the exception of Taka Shima all inlets and known dangers lie within 1 mile of the coast. Several small fishing villages lie on this section of the coast.

Taima Yama (34°49'N., 132°01'E.), a prominent peak with an elevation of 609m, is located 4 miles SSW of Hamada Ko. Taima Yama is surmounted by five radio towers marked by obstruction lights.

Kannon Saki is a cliffy headland located about 5.5 miles SW of Taima San. The small port of Sutsu lies 1 mile E of the point.

Taka Shima (34°50'N., 131°50'E.), a high steep-to island, lies almost 5 miles NW of Kannon Saki. It is 0.5 mile in length and 117m high. The island provides a good landmark for shipping along the coast. Taka Shima Light is shown from a concrete tower, 14.9m high, standing on the summit of the island. Maeno Se, an isolated depth of 15.8m, is located 1 mile E of the island.

Esaki Ko (34°39'N., 131°39'E.) is a narrow L-shaped inlet with a minimum navigable width of 0.1 mile and a depth of 5.5m. The port is used mainly by fishing vessels. At the entrance to the port, flood current sets onshore and the ebb current sets offshore.

Aspect.—The port is best identified by **Ko Yama** (34°39'N., 131°37'E.), a mountain 533m high, located 0.75 mile S of Koyama Misaki. A second peak, close E, is 478m high. From the W they appear as one rounded summit.

Shiritaka Yama, 0.25 mile SE of Ryujin Saki, is 174m high.

Saidoji, a hexagonal temple, is a prominent mark at the head of the harbor.

Directions.—From a position 1 mile off the harbor mouth, the approach is indicated by the alignment (202°) of leading lights. The front light (34°39'N., 131°39'E.) is shown from a round concrete tower, 4.9m high, with an arrowhead daymark. The rear light is shown from a similar daymark, situated 120m SSW of the front light. These towers show up well and lead through the harbor entrance, with rocks on the W side and deep water close inshore on the E side.

About 1.5 miles within the entrance, two breakwaters afford protection to the anchorage and port.

Anchorage.—Anchorage, in depths of 4.9 to 7m, in Esaki Ko is only suitable for vessels up to 1,000 dwt. It is well-sheltered, but the mud bottom is reported to be very soft.

Koyama Misaki, a conspicuous and salient headland, is the termination of the N slope of Ko Yama. Shiro Se, a chain of rocks, some above-water, extends NW for 0.4 mile from the NW side of Koyama Misaki. A light is shown from the point. Nanatsu Shima is a group of rocky islets lying 1 mile to the NW of Koyama Misaki.

Susa Ko to Hagi Ko

3.37 **Susa Ko** (34°38'N., 131°36'E.) is entered between Kotohirage Hana and Kamega Kubi. The entrance is encumbered by a group of islets and rocks lying almost in mid-channel, and by foul ground extending N for 0.15 mile from Kotohirage Hana. Breakwaters protect the fishing harbor at the head of the inlet. A light is shown from Tenjin Shima.

The preferred channel to Susa Ko is between Tenjin Shima, the largest islet, and Kuro Shima. Depths shoal gradually from 31m in the entrance, with general depths of 9 to 18.2m in the central part of the harbor.

Tidal currents at the entrance to Susa Ko are weak, with the NE current reaching a maximum about 1 to 2 hours before local HW and the SW current reaching its maximum at about the same interval before local LW.

Anchorage is available, in 14m, mud, 0.1 mile S of Benten Shima, a small islet marked by a shrine, lying off the N shore of the harbor. Limited swinging room restricts the two N coves to vessels of less than 100 gt.

Uta Shima (34°34'N., 131°29'E.), a flat-topped pine-covered islet, lies 2.5 miles offshore, 6 miles SW of Susa Ko. Futajima Guri, with a depth of 11.6m, lies 2 miles NW of Uta Shima. Hime Shima, 92m high, lies 2 miles ESE of Uta Shima. The channel between these two islets is deep and free of dangers.

Modoro Misaki (34°32'N., 131°28'E.), a high point faced with rounded cliffs, lies about 3 miles SSW of Uta Shima. The point rises to Todake Yame, thickly wooded and 416m high. It is prominent, especially when viewed from N. A light is shown on the SW side of the cape.

O Shima (34°30'N., 131°25'E.), 90m high, lies about 3 miles SW of Modoro Misaki. A village is situated on the S shore. A light is shown from the SE corner of the island.

A submarine cable lies about 0.8 mile SW of the light and proceeds in a NW direction to the island, about 20 miles distant.

Hagi Ko (34°25'N., 131°24'E.)

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3.38 Hagi Ko is a port of entry and a fishing center. Hagi, the principal city of Yamaguti, is an important industrial center. A group of six islands lies up to 5 miles offshore on the approach to the harbor. The islands are mostly flat-topped and marked by steep cliffs. The city of Hagi is situated in the delta area between the two branches of Abu Kawa. The port is entered between Ose Hana and the SW side of Koshigahama Hanto.

Winds—Weather.—During the winter months, the prevailing winds are from the W. From March through November, NE winds are the most frequent; SE winds are rare. Fog seldom occurs in this vicinity.

Tides—Currents.—Tidal currents are weak and the slight ocean current off the harbor sets NE. The current sets NE with a rising tide, attaining maximum strength at HW. With a falling tide, the current sets SW and is strongest at LW.

Depths—Limitations.—Depths in the harbor shoal gradually from 23.7m in the entrance. Kata Ko, the commercial port at the head of the N cove, has depths of 2 to 6.5m at the dock. According to reports, vessels of up to 2,700 gt, with maximum drafts of 6.7m, can be accommodated.

Pilotage.—A pilot is available, but arrangements must be made well in advance. The pilot boards 1.1 miles SW of Kasa Yama, where quarantine clearance is conducted.

Anchorage.—Anchorage is available, in 18.2m, mud and fine sand, S of Kasa Yama. The roadstead is open to the NW and vessels frequently drag anchor when winds from that quarter exceed 15 knots.

Caution.—Fish havens have been set in the harbor and its approaches.

Hagi Ko to Tsuno Shima and Mi Shima

3.39 From Hagi Ko, the coast trends W for 21 miles to Kawashiri Misaki, then SW for 9 miles to Tsuno Shima. The mountains in this vicinity rise abruptly from the coast, which is broken by numerous bays and inlets. Mi Shima is located 22 miles N of the mainland.

Ai Shima (34°30'N., 131°17'E.), 157m high, is located 7 miles NW of Hagi Ko. It is the largest and outermost island in the approach to Senzaki Wan. A light is shown from the NW side of the island.

O Shima (34°25'N., 131°16'E.), 115m high, located 5.5 miles S of Ai Shima, lies in the entrance to Senzaki Wan. Foul ground fringes the entire E side from N to S, extending out to 1 mile. A light is shown from the N tip of the island.

Kabe Iwa, 33m high, is located 1.5 miles NE of O Shima, the outlying danger on the E side of the main approach channel to Senzaki Wan. Shojin Guri, a rocky depth of 4.9m, lies 0.6 mile ENE of Kabe Iwa.

Senzaki Wan, about 4 miles long and 2 miles wide, is located 7 miles W of Hogi Ko. Numerous islets and dangers lie in the approach and entrance to the bay, but the bay and harbor are relatively unencumbered. Depths shoal from 36.5m in the entrance of the bay to 18.2m off the entrance to Senzaki Ko.

3.40 **Senzaki Ko** (34°23'N., 131°12'E.), a fishing harbor in the SW part of Senzaki Wan, is sheltered from all winds; breakwaters protect the harbor basin. Depths within the basin range from 2 to 6m. A shoal, less than 4.9m deep, extends for about 0.5 mile on the E side of the fishing port breakwater.

Depths—Limitations.—A pier at the cement factory, S of the fishing harbor, has a depth of 8.9m alongside. It has been reported that vessels up to 8,500 gt use the berth.

Anchorage.—Vessels anchor, in depths of 8 to 14.9m, mud and sand. Vessels of 5,000 gt anchor here. Weather and tidal conditions are similar to those at Hagi Ko.

Senzaki Seto is a narrow channel, used by small vessels drawing up to 3.1m, that connects Senzaki Wan to Fukawa Wan. It is free of dangers, but the shoals in the W approach are dangerous in a heavy sea. An overhead cable, with a vertical clearance of 22.9m, and a bridge, with a vertical clearance of 12.9m, span the passage.

The E tidal current flows through Senzaki Seto from 4 hours before until 2 hours after high tide at Odomari, with a maximum velocity of 2 knots. The W current may run at a rate of 1 knot. At the turn the currents may be irregular for 1 or 2 hours, sometimes with a slack period of 15 minutes.

3.41 **Omi Shima** (34°25'N., 131°12'E.) consists of two parts connected by a narrow isthmus, 200m wide. The W side of the island forms the E shore of Fukawa Wan; the S side forms the N shore of Senzaki Wan. Taka Yama, a conspicuous, conical mountain, 320m high, rises near the NW end of the island. The N and E coasts of Omi Shima are fringed with foul ground to a distance of 0.2 mile.

Fukawa Wan, a bay, entered between Ima Misaki and Takenoko Bana, is located 3.5 miles W of Senzaki Wan. The bay affords sheltered anchorage from all winds except from the N, good holding ground with a sandy bottom. Depths recede gradually from 40m at the entrance to foul ground at the head of the bay. A light is shown from Ima Misaki.

Mi Shima (34°46'N., 131°09'E.) appears long and undulating from the NW. The island is 2.75 miles in length and 1.75 miles wide. The highest point is 182m and located near the middle of the W side of the island. There are no dangers other than rocks scattered along the coast. Local fishermen anchor off Utsu Ko, a small fishing village at the head of a bight on the E side of the island, in 7.3 to 20.1m, rock and gravel.

The current in the vicinity of the island sets E with a velocity sometimes as high as 2.5 knots. It is particularly strong off the N side of the island.

3.42 **Kawashiri Misaki** (34°26'N., 130°59'E.), a cliffy and

thickly-wooded projection, 60m high, is located 7.5 miles W of Ima Misaki. The ocean current flows close off the point and causes tide rips which are very heavy during the summer months. A light is shown from the point.

Yuya Wan is entered between Orikama Hana and the SW extremity of Yuya Hanto, about 2.25 miles to the NE. Depths range from 45.7m in the middle of the entrance approach to 9.2m less than 1 mile from the head of the bay. The N shore is relatively steep-to, but the E end of the S shore is fringed with shoal water and sunken rocks up to 0.5 mile offshore. The bay is considered a good harbor of refuge.

Oura Byochi is the most sheltered cove in Yuya Wan and affords good anchorage, in 14.6 to 23.7m, mud, good holding ground. The cove gives good protection during the Northwest Monsoons.

Caution.—A large number of fishing boats operate within Yuya Wan and several fish havens lie in the approaches and entrance to Yuya Wan.

3.43 **Tsuno Shima** (34°21'N., 130°51'E.), about 2.3 miles long, is separated from the mainland by Amaga Seto, a shallow and dangerous passage, which has a least width of 0.75 mile. The buoyed channel through Amaga Seto has been dredged to 3.1m and is 50m wide. Vessels up to 200 gt use the channel. A bridge, with a vertical clearance of about 18m, spans Amaga Seto close NE of Hato Shima.

Shoals and drying rocks fringe the E and W ends of the island and extend to the 20m curve, which lies up to 0.75 mile offshore.

Anchorage, sheltered from W winds, is available off Oyama, on the SE side of the island.

Shiomaki (34°25'N., 130°48'E.), located 5 miles NW of Tsuno Shima, is a detached reef, 11m deep; it is marked by tide rips which are heaviest in summer. Strong NW winds raise a sea over the reef.

Tidal currents in the vicinity of Shiomaki are greatly altered by the Tsushima Current. The flood current sets SSW for about 1 hour at the maximum rate of 0.75 knot; the ebb current sets NNE for 11 hours at a maximum rate of 2.25 knots.

Tsuno Shima to Murasaki Bana

3.44 From Tsuno Shima, the coast trends S for 20 miles to Murasaki Bana. The coast from Tsuno Shima to Kannon Zaki is rocky and steep. From Kannon Zaki to Murasaki Bana, the coast is mostly sandy beach backed by low hills. In general, the 20m curve lies less than 1 mile offshore. Numerous fish havens exist along this part of the coast.

Futago Shima (34°20'N., 130°53'E.) consists of two rocky islets surrounded by a reef and located 1.5 miles SE of Tsuno Shima. The N islet is the higher, reaching a height of 42m. The summits of the islets are thickly wooded. The passage between the islets and the mainland is mostly foul.

Kottoi Ko, a small harbor located about 1.3 miles SE of Futago Shima, lies in a small inlet. The SW side of the entrance is encumbered by reefs and foul ground. The inlet affords good anchorage, in 7m, mud, good holding ground. Small vessels take shelter here during bad weather. A light is shown from the N entrance point.

Kottoi Light

Kanda Misaki is a low wooded point located about 2 miles SSW of Kottoi Ko. The point is fringed by sunken and drying rocks. Nezumi Shima, a small islet fringed with foul ground, lies 1 mile N of Kanda Misaki.

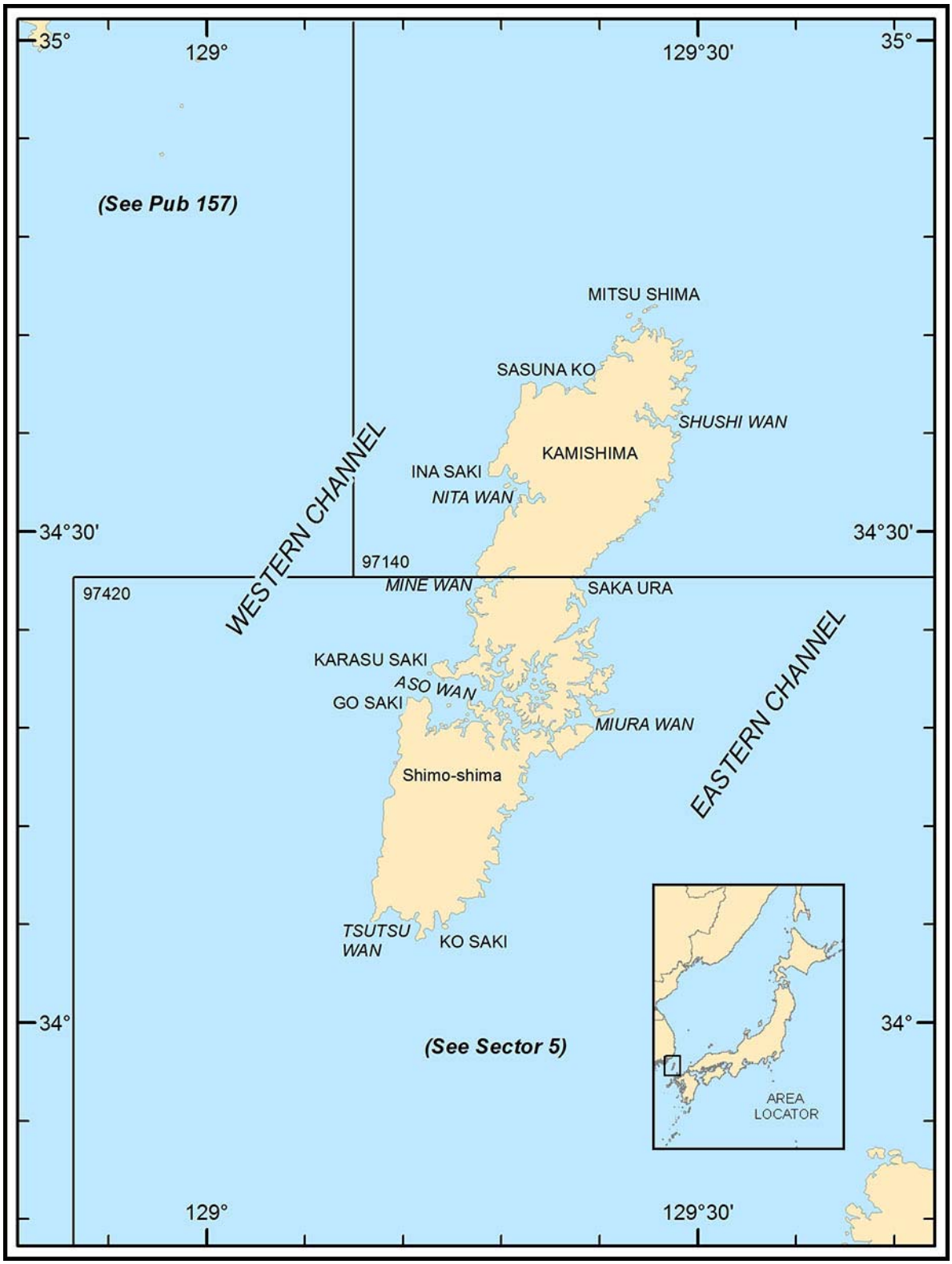
Osaki Bana (34°13'N., 130°55'E.), fringed with reefs, rises to Sabatsuri Yama, 190m high, and surmounted by a clump of pine trees. Ryugu Iwa, 18.9m high, lies 0.5 mile NW of the point.

Atsu Shima consists of two large islands in a group of islets and rocks, lying 1 mile offshore, located 2.5 miles SSE of Osaki Bana. The N island is Me Shima and the S island, the larger, is O Shima. Both the islands are thickly wooded. Kabe Shima, a rock 10.1m high, is the northernmost danger in the group. Maru Se, a rock awash, reduces the fairway to less than 0.2 mile.

3.45 **Futaoi-jima** (34°06'N., 130°47'E.) lies about 7 miles SW of Atsu Shima and 3 miles off the mainland. The shoreline of the island is steep and cliffy, especially on its W side. The NW part of the island consists of three peaks, the highest with an elevation of 250m. A light is shown from Kanega Saki, located on the SW side of the island. Mizu Shima, a rock 3.7m high, lies 1 mile SE of Futaoi-jima. A buoy marks the E side of the foul ground off the rock.

Murasaki Bana (34°01'N., 130°54'E.) is a low, flat, salient point covered with pine trees. The town of Yasuokamachi lies close E of the point.

Kurumi Se, a gravel bank, lies near the NW end of the shoal area extending 1.5 miles NW from the point. A light is shown from Kurumi Se.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **4** — CHART INFORMATION

SECTOR 4

TSUSHIMA

Plan.—The front of this sector contains general information regarding Shimo-shima (Simo Shima) and Kamishima, the two main islands that comprise Tsushima. The S and W sides of Shimo-shima, Aso Wan, and the W and N sides of Kamishima are then described in that order from S to N. Finally, the E side of Shimo-shima and the E side of Kamishima are described in that order from S to N.

General Remarks

4.1 Tsushima consists of two large islands and several smaller ones lying in Korea Strait between the NW coast of Kyushu and the S end of Korea. The two large islands are separated by a narrow channel, the E entrance of which is only available to small craft. Tsushima is mainly known for its fishing industry.

Shimo-shima and Kamishima, the two main islands of Tsushima, are both mountainous. Shimo-shima, the S island, attains an elevation of 662m at Yatate Yama, a wooded mountain with a flat summit, about 5.8 miles from the S extremity of the island. Kamishima, the N island, is lower in height and appears comparatively level. The islands are separated by Aso Wan, which is very shallow at its E end. The coastline of both islands is indented with many coves and bays.

Winds—Weather.—Strong NW winds prevail during the winter and raise heavy seas off the W coast of Tsushima. In some parts of Tsushima, a peculiar cold wind known as "Kankeburi" blows seaward from inland and causes thick fog on the sea. The temperature within the fog is usually 6 degrees lower than outside.

North or NE winds prevail during September and October; in the former month their strong velocity may hinder navigation near the E coast of Tsushima. It is usually sunny, the exception being a few rainfalls.

Southwesterly winds generally prevail during the summer. Land and sea breezes are prevalent during the summer, resulting in the temperature being lower than along the NW coast of Kyushu.

Tides—Currents.—The tidal currents set W along the S coast of Tsushima, with the rising tide at a rate of from 2 to 3 knots.

Along the W coast, the tidal currents set in a S direction, with the rising tide at a rate of 1.5 knots, and in a N direction, with the falling tide at a rate of 2 to 3 knots. During N winds, there are tide rips on the ebb current. The N tidal current along the W coast is stronger than the S current, as the general N set increases the former but decreases the latter.

Along the E coast, the tidal current sets S during the rising tide at a rate of 0.5 to 2 knots, and N during the falling tide at a rate of 0.75 to 1.75 knots.

The tidal currents are not felt beyond a distance of 5 miles offshore; outside this distance the set is always N.

Caution.—There is considerable diurnal inequality in the tidal range during summer and winter; the resulting variation in strength of successive tidal currents may also be considered.

Shimo-shima—South and West Coasts

4.2 **Ko Saki** (34°05'N., 129°13'E.), the S extremity of Shimo-shima, is also the S extremity of a small peninsula which rises to Ko Yama, a prominent pointed thickly-wooded summit, 233m high. Hoshinoko Shima, a peculiar shaped rocky islet, 47m high, lies about 0.5 mile NE of Ko Saki. A lighthouse, which is prominent from a distance, stands on Ko Saki. A light is shown about 1.5 miles N of the lighthouse.

Tsutsu Wan (Tutu Wan) is an open bay entered between Ko Saki and Tsutsu Saki, 2.5 miles to the WNW. The shores of the bay are mostly rocky. The village of Tsutsu is situated at the head of the bay. Anchorage for vessels up to 3,000 gt is afforded, in depths of over 10m, in a position close S of the breakwaters during N winds. Winds from the S cause a heavy sea and the anchorage cannot be used. Vessels anchor, in 12.8 to 16.5m, about 0.5 mile off the W side of the bay, S of Tsutsu.

Kono Se is a drying reef extending 0.75 mile in a SSW direction from Tsutsu Zaki. The reef is 4.6m high and prominent from the E and W. A light marks the S end of the reef.

Komatsu Se (34°05'N., 129°09'E.), a rocky patch with a depth of 7.8m, is located 0.75 mile SE of Kono Se Light.

From Tsutsu Zaki to Go Sake, 14 miles to the N, the coastline runs S to N in a fairly straight line. Outside the 20m curve, 0.5 mile offshore, the coast is free of dangers. The shore is indented by coves and small bays on which a few small villages stand. A light is shown 0.5 mile W of the village of Komoda.

Aso Wan

4.3 **Aso Wan** (34°20'N., 129°18'E.) is entered between Go Saki to the S and Karasu Saki, 2 miles to the NNE. Both entrance points are fringed by foul ground, shoals, and rocks, leaving a fairway of about 1 mile in width. Depths in the fairway range from 20.1 to 86m. The shores of Aso Wan are indented by many bays, some of which penetrate nearly to the E coast. The most important bays are Nii Byochi and Nobu Wan, on the N side, and Takeshiki Ko, on the S side

Imo Saki, about 3 miles E of Go Saki, is the N termination of a long, narrow, and sparsely-wooded peninsula, 90m high. From the W, it has the appearance of a reddish cliff.

Osaki Wan (34°19'N., 129°15'E.) is entered between Imo Saki and Utsuno Saki, 2.25 miles to the E. Anchorage is afforded to small vessels with local knowledge on the W side of the bay off Osaki village, about 1.3 miles S of Utsuno Saki, in a depth of 25.6m. Strong winds from the N cause a considerable sea in this area.

Small vessels can also anchor in Mikata Ura or Kurose Wan, but not without local knowledge. Vessels entering these anchorages should pass NE of Okino Shima (Myoban-jima). Kurose Wan is sheltered from winds from any direction.

Takeshiki Ko (34°18'N., 129°19'E.), the SE branch of Aso

Wan, is entered through Jyogo Guchi (Rotono Kuchi), which is located 1 mile E of Imo Saki. There is a well-sheltered anchorage for ships up to 2,000 gt, in a depth of 30m, off the harbor. A submarine cable has been laid in the middle of the interior of the anchorage. The town of Takeshiki, where there is a naval station, stands on the W side of Takeshiki Ko.

Ujigami Bana consists of conspicuous low cliffs covered with giant pine trees, and is located about 1 mile N of Takeshiki Ko. A hill, 72m high, about 0.4 mile NNE of the cape, is a good landmark. Yojaku Yama, about 0.4 mile E of Ujigami Bana, is also a good landmark for the approach to Takeshiki Ko.

Anchorage.—Small vessels can take anchorage, in a depth of about 30m, SW of Nezumi Shima, which is located almost 0.8 mile W of Ujigami Bana.

Vessels can also anchor, in a depth of about 30m, S of Ujigami Bana; however, caution is necessary because of traffic bound for the E coast of Tsushima through the E arm of Takeshiki Ko.

The N side of Aso Wan Nii Byochi, entered between Hitoe Saki, about 3.3 miles ESE of **Karasu Saki** (34°22'N., 129°14'E.), and Kaifuna Saki, about 1 mile farther E, extends about 2.3 miles N and then divides into two arms, each about 1 mile long. The inlet is mostly deep, and the best anchorage for small vessels with local knowledge is near the middle of the inlet, 0.5 mile NW of Uki Se, a gray rock, awash, marked by a lighted beacon, in depths of 29.3 to 31.1m. Several villages lie on the shores of the inlet.

4.4 **Uki Se** (34°21'N., 129°18'E.), a low dark gray rock that covers during higher HW, lies in mid-channel about 1.3 miles NNE of Hitoe Saki. Vessels entering or leaving Nii Byochi can pass E or W of Uki Se; however, the channel W of this danger is recommended.

Nobu Wan (34°21'N., 129°20'E.) is entered between Kaifuna Saki and a promontory about 0.4 mile to the S. The inlet is indented with many small coves and bays. Nobu Wan is only suitable as an anchorage for small vessels with local knowledge, because of the numerous islets and shoals. The anchorage areas are sheltered by the surrounding hills.

Kamishima—West Side

4.5 **Tsuna Shima** (34°25'N., 129°16'E.) consists of six thickly-wooded islands, connected to each other by a rocky reef, and lying about 0.3 mile offshore. Enoki Shima, the S island, lies about 4 miles NNE of Karasu Saki and is 48m high. Its S side has steep cliffs; from its S end, a reef with two islets extends about 0.2 mile SW. The middle and smallest of these islands is Nakano Shima, 51m high. Ko Shima, the N and largest island, is 64m high and is easily identified.

Tsuna Wan, entered by a channel E of Tsuna Shima, with depths of 5 to 32.9m, is used mainly by small vessels with local knowledge. The inlet is used as a fishing base during the summer. The S entrance point is fringed by a reef extending about 135m NW, the fairway of Tsuna Wan is free of dangers.

Anchorage.—Tsuna Wan affords anchorage to small vessels, in 7 to 20m, mud and sand. Heavy seas run into the inlet during strong W winds.

4.6 **Mine Wan** (34°27'N., 129°17'E.) is located about 1.5 miles NNE of Tsuna Shima and is entered between Kurumagono Hana and Shin Zaki. From the entrance, the inlet runs E for about 0.5 mile and then divides into two arms, one extending about 1.8 miles to the NE and the other about 0.8 mile SSE. Maru Shima, 40m high, on the S side of the inlet about 0.4 mile inside the entrance, is densely wooded, round-topped, and easily identified. Yo Se, located at the entrance to the NE arm, is conspicuous by its reddish brown color. Mine Wan affords good anchorage, in depths of 31 to 42m, sand and mud.

Tono Saki (34°31'N., 129°19'E.), located 5 miles NNE of Mine Wan, has a prominent cliff on its W side and forms the S entrance point to Nita Wan. Meyano Dan, 0.5 mile S of Tono Saki, 207m high, is a prominent landmark.

Nita Wan (34°32'N., 129°19'E.) is entered between Tono Saki and Ina Saki, which is about 2 miles SSE. Inside of the bay there are several inlets. The middle of the interior of the bay generally has soundings of over 30m, however, there are several dangers and the bay is completely exposed to the W. A number of villages are situated along the shore of the bay, which is indented by small coves and inlets. Shishimi Ko, located on the S shore of the bay, affords good anchorage for small vessels in moderate depths. A light is shown from Ina Saki.

Between Ina Saki and So Zaki, about 5.8 miles to the N, the coast trends in a NNE direction. The coast in this vicinity is free from dangers close offshore. A light is shown from So Zaki.

Sago Wan (34°39'N., 129°20'E.), located about 1 mile E of So Zaki, extends in a S direction for about 0.5 mile to the mouth of Sago Gawa, the largest river in Tsushima. The village of Minato is situated at the entrance to the river.

Anchorage.—Sago Wan affords good anchorage to vessels with local knowledge, in depths of 5 to 14m, except during strong N winds which cause a heavy sea. When anchoring, vessels should use caution to avoid the submarine cable indicated on the chart. A shrine at the mouth of the river is a good landmark for entering Sago Wan.

Senbyomaki Yaka (34°39'N., 129°21'E.), a grassy hill, 290m high, is located close E of Sago Wan. A radio tower, marked by lights, stands about 265m SSW of Senbyomaki Yama. The tower is a conspicuous landmark during the day or night.

4.7 **Sasuna Ko** (34°38'N., 129°23'E.) is located about 2 miles E of Sago Wan and is entered between Toroku Zaki (Toroku Saki) and Tateba Zaki (Tachibu Saki). Sasuna, a small port, is situated at the head of Sasuna Ko.

There is a landing quay, with a total length of 897m and alongside depths of 2.5 to 3m, along the whole of the inner end of the harbor. The S shore landing quay is for shipping timber and the N shore landing quay is for berthing fishing boats. Ships of 300 gt can berth at the quay in the central part. The length of the quay is 60m.

On the S shore of the inner end of the harbor there are private company berthing dolphins, with a reported alongside depth of 7.5m. Ships of 500 gt can berth alongside the dolphins.

There is a breakwater about 250m S of the harbor entrance lighted buoy.

Sasuna Ko affords anchorage for small vessels, in depths of 14 to 18m, sand and mud, good shelter except from NW winds.

Aspect.—Tateba Zaki, the E arm of the harbor entrance, and Mitsuse Yama, a sharp peak which is about 0.3 mile to its E, are both conspicuous. Toroku Saki, the W arm of the harbor, has a cliff on its W side.

Okawachi Wan is located about 2.5 miles NNE of Sasuna Ko and is entered between Saba Saki (Saman Saki) and Shirahama Saki. The villages of Oura and Kawachi are located at the head of the inlet. Korei San, a hill 193m high, and located about 1.3 miles ESE of Shirahama Saki, is prominent as a landmark for entering Okawachi Wan. The inlet affords good anchorage in moderate depths, good shelter and mud bottom. When anchoring, caution should be taken to avoid the submarine cable indicated on the chart. Except for the fairway leading to the inner end of the bay, there are facilities for fish and pearls along the shore.

The tidal current at the entrance to Okawachi Wan is S with the rising tide and N with the falling tide. The spring rate is 1 knot.

Kamishima—North Side

4.8 Wani Ura (34°42'N., 129°26'E.) is located about 1.5 miles NNE of Okawaci Wan, and is entered between Oni Saki and the SW extremity of Uni Shima. The shores of Wani Ura are fringed with rocks and shoals that extend as far as 0.15 mile offshore. The charted depths in the entrance are from 20 to 49m. Within the bay the depths are from 10.1 to 38m. During the summer, a large number of fishnets are laid across Wani Ura.

Korei San (34°41'N., 129°26'E.) rises close S of Wani Ura; it is the only good landmark at the N end of Tsushima and is very conspicuous from the N.

Uni Shima, 50m high and wooded, is only inhabited during the fishing season. A number of metal pylons stand on the island. Kotaro Shima and Hadaka Shima, each 14m high, lie on a reef about 90m N and 230m NE, respectively, of the NE extremity of Uni Shima. The reef extends about 0.4 mile N from Hadaka Shima. Okinoebi Shima, 17.1m high, and Jinoebi Shima, 32m high, are two islets connected with each other by drying reefs that lie between the E end of Uni Shima and Kunoshita Zaki, the N extremity of Tsushima, nearly 0.5 mile E.

The channels between Okinoebi Shima and the E extremity of Uni Shima, and between Jinoebi Shima and Kunoshita Zaki, are very narrow and tortuous, and the tidal currents run strongly through them; they should not be attempted. An overhead cable spans the channel between Uni Shima and the shore.

A submarine cable leads from about the middle of the S side of Uni Shima to a position on the E side of the bay, N of the village of Waniura.

The village of Waniura is situated at the head of a cove on the E side of Wani Ura, about 1 mile SSW of Kunoshita Zaki. The village is difficult to identify from the entrance of the bay.

Vessels with local knowledge can obtain anchorage in Wani Ura. During NW winds, vessels should anchor off the S side of Uni Shima, careful to avoid the submarine cable in the vicinity. A vessel approaching from the NW should give a wide berth to Haennoba Se. A light is shown from Waniura Ko.

4.9 Kunoshita Zaki (33°43'N., 129°27'E.), the N extremity of Tsushima, attains an elevation of 39m. Igai Se, which dries 0.9m, lies 0.3 mile NNW of Kunoshita Zaki; there are numerous rocks above and below-water in this vicinity, and it should be avoided.

Otedo Ura, an inlet on the E side of Kunoshita Zaki, is approached from the E because of the previously-mentioned dangers; it indents the coast for about 0.6 mile. This inlet is badly restricted by reefs and detached rocks, and at its head are two coves, divided by a small peninsula. The village of Otedo is situated at the head of the W cove.

Saichose Saki, about 0.5 mile ESE of Kunoshita Zaki, is a low, flat, wooded point and is the extremity of the peninsula on the E side of Otedo Ura. A reef extends about 0.4 mile N from the N side of Saichose Saki, and on the reef about 140m offshore are two treeless islets; the W, Tera Shima, 14m high, and the E, Moto Shima, 14.9m high.

4.10 Torazu Yama (34°42'N., 129°28'E.), thickly wooded and very conspicuous, is 18.9m high and lies close off the E side of the entrance of Toyo Ura, about 0.3 mile E of Saichose Saki; at LW it is connected with the peninsula by a chain of rocks.

Okinoshine Shima, a bare round-topped islet, 11m high, and Jinoshine Shima, a similar islet, 14.9m high, lie on a reef extending N for nearly 0.8 mile from the E side of the entrance of Toyo Ura. A light is shown from Okinoshine Shima. A shoal, with depths of from 3.1 to 4.9m, lies about 0.2 mile N of Okinoshine Shima. Mi Se, a detached rocky patch with a depth of 4.9m, lies about 0.5 mile E of Okinoshine Shima. A reef, with depths of less than 10m, extends about 500m NE of **Mi Se** (34°42'N., 129°29'E.). A rock, with a depth of 5.8m, lies on this reef. These dangers should be given a wide berth by vessels approaching Toyo Ura from the E.

Toyo Ura, an inlet less restricted than Otedo Ura, indents the coast for about 0.5 mile and is backed by low wooded hills. Ko Shima, 29m high, wooded and conspicuous, lies close off the W shore of Toyo Ura, about 0.3 mile SSW of Saichose Saki. A shrine, situated at the head of the inlet, is a good landmark.

Toyo Ura affords anchorage to small vessels with local knowledge, in 9 to 14m, mud, good holding ground, but strong N winds cause a heavy sea. Vessels up to 500 tons can use the harbor.

4.11 Mitsu Shima (34°43'N., 129°27'E.), lying about 1 mile NNW of the N extremity of Uni Shima, consists of three islets lying close together and joined by drying reefs. O Shima, the SW islet, is the largest at 13.1m high. Naka Shima, the middle islet, is 14m high; Taka Shima, the NE islet, is 17.1m high.

Between Uni Shima and Mitsu Shima are numerous rocks, above and below-water. During heavy weather, the sea breaks over the whole of this area. During N or NE winds, there is a confused sea which makes the area dangerous, even to vessels with local knowledge. Large vessels must navigate around the outside of the islets, however, smaller ships of up to 100 gt can sail E-W through the narrow channel on the S side of Mitsu Shima. The tidal currents here may attain a rate of 3.25 knots. A light is shown from the S side of Mitsu Shima.

Haenoha Se, a reef with several above-water rocks, lies with O Shima, the highest rock, 9.8m high, about 0.8 mile WSW of Mitsu Shima Light. The reef extends about 0.4 mile SW and 0.3 mile NE from O Shima. A shoal, with a depth of less than 1.8m, lies midway between Mitsu Shima and Shirodo Se, a rock 1.2m high, on the NE end of Haenoha Se. The channels

through this area have irregular depths of less than 5m, and should be used with caution even by small vessels with local knowledge.

Kita Se is a group of above-water rocks lying about 0.3 mile NNE of Taka Shima. The rocks are from 1.2 to 2.1m high and difficult to identify from a distance.

Karasaki Se (34°44'N., 129°28'E.), lying about 0.8 mile ENE of Mitsu Shima Light, is a group of several above-water rocks, the highest of which attains an elevation of 3.1m. Foul ground lies between Mitsa Shima and Karasaki Se.

Caution.—Vessels rounding Mitsu Shima Light should give a wide berth to both Kita Se and Karasaki Se.

Shimo-shima—East Side

4.12 Naiin Wan (34°06'N., 129°14'E.) is located about 1.5 miles NE of Ko Saki. The inlet runs in a N and S direction for a distance of about 1 mile. The village of Tsutsu Naiin (Tsutsunain) lies at the head of the inlet. Naiin Shima (Nainjima), close S of the E entrance point of Naiin Wan, to which it is connected by a drying reef, is a densely-wooded islet, 162m high.

Naiin Wan affords anchorage to small vessels with local knowledge during N or NW winds, in 12 to 18m, sand, in the middle of the inlet. Anchoring during S or E winds is not advisable.

Tatsuno Zaki (34°08'N., 129°17'E.) is 135m high and located about 2.8 miles NE of Naiin Shima. The point is densely wooded, black in appearance, and very conspicuous from the SW or NE.

Kuwa Ura and Agami Ura, close SW and N of Tatsuno Zaki, afford anchorage to small vessels with local knowledge only during W winds. Kuwa Ura is the larger and better sheltered of the two bays.

Izuhara (34°12'N., 129°18'E.)

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4.13 Izuhara is a port of entry and the largest port in Tsushima. It is situated about 7.5 miles NNE of Ko Saki. The port occupies an important position as the main entrance to Tsu-shima, which is at the international boundary. There are car ferries operating between this harbor and mainland Japan. It consists of a small natural harbor with anchorage and berthing facilities for small vessels. A detached breakwater is situated about 0.2 mile SE of Yari Sake. The harbor extends 70m ENE from Yari Sake, then 550m SSE, then 560m SW to the shore.

Winds—Weather.—North winds prevail throughout most of the year, but the harbor remains relatively calm because of the high hills surrounding it. Strong winds blow down from the hills during the winter season. Anchorage in the harbor is poor during strong E winds.

Depths—Limitations.—The charted depths in the entrance of Izuhara Ko are from 14.6 to 25.6m; in the anchorage area in the central part of the harbor the charted depths are from 11 to 14.6m. The quarantine anchorage has charted depths of 11.9 to 18.3m.

Izuhara Quay, situated close W of Yara Saki Light, has alongside depths of 3.5 to 6.5m. Naka Yarai Landing Quay, on the N side, has a berthing length of 135m, with an alongside depth of 3m. On the E side, No. 2 Quay has a berthing length of 210m and an alongside depth of 5m. Kuta Quay, on the S side, has a berthing length of 280m and an alongside depth of 5.5m. Kuta 4M Landing Quay, on the E side of Kuta Ura, has a berthing length of 340m and alongside depths of 3.5 to 5.5m.

Aspect.—Marukuma Yama, a hill with a wooded summit, rises to a height of 276m about 1.8 miles WNW of Tora Saki. Two radio masts stand on the summit of Gongen Yama, 419m high, located about 1 mile NNW of Yara Zaki. Both masts show lights and are conspicuous by day and night. Six radio towers on the NE side of the harbor are also conspicuous.

Four beacons are situated on the NE side of the harbor from about 0.2 to 0.3 mile NW of Yara Zaki. A light is shown from Yara Zaki.

Contact Information.—The Izuhara Port Authority can be contacted via telephone at 81-827-22-2271

Anchorage.—Vessels can obtain good anchorage, sheltered from all but E winds, in the middle of the harbor, in 11.5m, with the light on Yara Zaki bearing 082°, and a distance of about 595m.

A quarantine anchorage, in a circular area about 0.2 mile in diameter, with charted depths of 11.9 to 18.3m, lies with its center about 0.3 mile NNW of Tora Saki.

Anchorage is prohibited in the vicinity of the submarine cables, and an area between the E side of the Nakayaki Landing Quay, at the inner end of the N part of the bay, and the coast opposite to its E side.

Caution.—When the winds blow from the S at a rate of more than 40 knots, it is very dangerous to enter or leave the harbor. When a typhoon passes along the E coast of Tsushima, strong winds and heavy swells enter the harbor and cause considerable damage to the port. At such times, vessels seek shelter in Aso Wan or Miura Wan.

4.14 Azu Ko (34°13'N., 129°18'E.) is a small harbor, the entrance of which lies between Tsurumo Saki, about 1 mile N of Yara Saki, and Magari Saki, about 0.4 mile farther N.

The navigable width of the channel into the harbor between charted dangers is about 0.1 mile. The charted depths in its entrance are from 20 to 29m; there are depths of 12.8 to 18.3m in the middle part of the harbor.

Good anchorage can be obtained in the middle of the harbor, in 12.8 to 18.3m, but it is only sheltered from winds blowing from the SW through N, to NE.

Small vessels can obtain shelter, even when it is blowing from the SE, between Magari village and Namuro Shima, in 10.1 to 12.8m, sand.

Okaji Zaki (Okaji Saki) (34°13'N., 129°20'E.), cliffy and steep-to on its E side, rises to Okaji Dake, 146m high. The village of Yabusame lies in a small cove, about 0.3 mile W of Okaji Zake. There are strong tidal currents in the vicinity of Okaji Zake and tide rips occur in strong NE winds.

Kechi Wan is entered between Okaji Zake and Tsunakake Zaki, about 3.3 miles to the NNE. The shores of the bay are mostly cliffy and are slightly indented. The interior of the bay has depths of 8 to 45m. East or S winds cause a heavy sea in the bay, which is otherwise generally calm.

Ofunakoshi Seto has its S entrance about 0.5 mile NNW of Tsunakake Zaki. The channel is 0.15 mile long, 15m wide, and reported to be dredged to 1.5m.

A breakwater, with a lighted tower at its end, is situated on the W side of the S entrance to the channel. A detached breakwater lies 91m S of the above; a lighted tower stands at its E end.

4.15 Kamabuta Se (34°14'N., 129°20'E.) is a small rock which dries 1.8m, and is located about 0.2 mile NNE of Okaji Zaki. Aka Saki is a reddish, cliffy point lying about 0.5 mile NNW of Okaji Zaki. Shimo Neo-jima is a wooded, cliffy islet, reddish in color, and lies about 0.8 mile N of Aka Saki. Gono Shima consists of two small islets lying close together and is located about 0.5 mile N of Shimo Neo-jima.

Takahama Ko is entered between a point about 0.4 mile N of Gono Shima, and Neso Saki, about 0.3 mile to the NNE. Small vessels entering the harbor can clear the dangers by keeping range lights shown from a wharf at the head of the bay and the rear light on a hill NW of the wharf in line bearing 305°. A light is shown near the S entrance point to Takahama Ko.

Anchorage.—Okaji Ura affords anchorage to small vessels, except during E winds, in about 9.2m.

Takahama Ko is sheltered from all winds, except E or SE, and affords anchorage to small vessels with local knowledge, in 3.7 to 16.5m.

Ota Ura, located about 1 mile N of Takahama Ko, affords sheltered from all winds except those from the S, and offers anchorage to small vessels with local knowledge, in 6.4 to 10.5m. Vessels must use caution to avoid a submarine cable.

There is shelter from N winds between Ota Saki and Tsunakake Zaki, about 0.1 mile offshore, in 8.2 to 18.3m.

4.16 Miura Wan (34°19'N., 129°23'E.) is located about 3 miles NE of Kechi Wan and is entered between **Orise Hana** (34°18'N., 129°24'E.) and Kuroshima Saki, a very conspicuous headland, 1.5 miles to the NE. Lights are shown from both entrance points. Miura Wan is divided into two arms, one extending to the W and then SW, and the other arm extends to the N.

The SW arm leads into Kusubo Ura, which is about 1 mile W of Orise Hana. Ogata Ura extends to the SSE. The N arm leads into Kamoise Hakuchi, with depths from 18 to 33m in the fairway. Two oil tanks standing on a wharf at Kamoise Gyoko are prominent. Niyo Shima, an islet with steep cliffs on its SE side, lies in the middle of Kamoise Hakuchi. The village of Kamoise lies at the head of this arm.

Anchorage.—Miura Wan affords anchorage to large vessels in the entrance area, with shelter from all but E and SE winds. The anchorage is known to have good holding ground.

Kusubo Ura affords anchorage to small vessels, in about 20m, in its central part. Ogata Ura has anchorage for small vessels, in depths of 12 to 16m, in its middle part.

Kamoise Hakuchi affords anchorage, in about 20.1m, mud. The recommended position lies with the SW extremity of Niyo Shima bearing 299°, and a conspicuous oil tank at Kamoise bearing 357°.

Kamishima—East Side

4.17 From Kuro Shima to Naga Saki, about 5.5 miles to the N, the coast is indented and affronted by several islands. **Kanon Yama** (34°24'N., 129°23'E.) is a rocky rounded summit, 140m high, grass covered and conspicuous from the N and S.

Naga Saki (34°25'N., 129°24'E.) is the NE extremity of a peninsula. A rocky ledge, 4.6m high, extends about 230m NE from the point. Depths of 14.6m extend about 0.5 mile ENE from the rocky ledge. A light is shown from Naga Saki.

Oroshika Wan is located about 6 miles N of Kuro Shima and is entered between Naga Saki and Zeni Shima, an islet 11.9m high, lying close off the promontory about 1 mile to the NW. Oroshika Wan has two arms, the fairways of both are deep. Yoko Ura, the SW arm, is open to the NE; Kushi Wan is the NW arm. The fairway leading into Oroshika Wan is narrowed to about 0.4 mile by shoals on either side.

Nanahiro Se, on the N side of the entrance of Oroshika Wan, about 0.6 mile E of Zeni Shima, has a depth of 8.6m. Manaita Se, about 0.4 mile E of the same islet, has a depth of 1.3m. Between Manaita Se and Zeni Shima is a reef with depths of less than 1.8m. A rock, with a depth of 5.9m, lies about 500m SE of Zeni Shima. Fuka Se, on the S side of the entrance of Oroshika Wan, about 0.2 mile WNW of Naga Saki, has a depth of less than 1.8m.

An islet, 5.2m high, lies close off the NW side of Yoko Ura, about 1 mile WSW of Naga Saki. Sazal Sho, awash, lies about 0.1 mile from the NW side, about 0.4 mile SW of the 5.2m islet. An islet, 37m high, lies close N of Tateishi Saki, on the SE side of Yoko Ura, about 1.3 miles SW of Naga Saki. Okino Shima, an islet 17.1m high, lies at the head of Yoko Ura. A vessel proceeding to the anchorage at the head of Yoko Ura should favor the SE side of the fairway.

The W side of the entrance of Kushi Wan is fringed by a bank, with depths of 0.9 to 5.5m. A 10.1m patch lies about 0.2 mile NE of Senbon Saki, the SW entrance point of Kushi Wan. Small vessels berth at a pier at the head of this arm.

Anchorage.—Vessels up to 500 gt can anchor, in a depth of 20m, mud, in the inner part of Oroshika Wan. The head of the bay is narrow, but serves as a well-sheltered anchorage.

4.18 Saka Ura (34°27'N., 129°23'E.) is located about 2.5 miles NNW of Naga Saki and is entered between Chi Saki (Ti Saki) and Okaigo Hana, about 1 mile to the N. Kamabuta Se, about 0.5 mile NE of Chi Saki, is a black rock, 1.5m high, and marked by a light. Kai Se, about 0.2 mile N of Chi Saki, appears as two heads, of which the one to the N dries. This area is mostly foul ground. Vessels entering Saka Ura should keep a good lookout for Kamabuta Se and Kai Se, and keep on the N side of the entrance to the inlet.

The town of Saka lies at the head of the inlet. Large numbers of fishing vessels use the town during autumn and winter. The town is protected by a breakwater from which a light is shown.

Anchorage.—Saka Ura is suitable only for small vessels with local knowledge, which anchor at the head of the bay off the breakwater. There are depths of 7 to 24m in Saka Ura, but there are several dangers which restrict the anchorage, and E winds cause a heavy sea.

4.19 From Okaigo Hana, the coast trends in a NNE direction for about 7.5 miles to the S entrance point of Kin Wan. Numerous islets lie close off the coast. Hills, about 152m high, slope down to the shoreline and are thickly wooded. A detached shoal, with a depth of 1.8m, lies about 0.8 mile NE of Okaigo Hana and 0.25 mile offshore.

Shitaka Ura (34°29'N., 129°24'E.) is a small shallow cove lying about 1 mile NE of Okaigo Hana. The NE entrance point of the cove is fringed by rocks, awash, and vessels approaching from the N should be careful to give it a wide berth. A lighted buoy is moored close to the S of the NE entrance point of Shitaka Ura.

Hadaka-jima (34°30'N., 129°25'E.), an islet 18.6m high, is located about 1.5 miles NE of Shitaka Ura. The islet is cone-shaped and rocky. Kuro Shima, close NE, is a small rocky islet with a clump of trees on its summit.

Oshika Wan is located about 1.3 miles NE of Kuro Shima and entered between Matsuno Saki and Koya Saki. The shores are high, steep, and generally wooded. The village of Oshika stands at the head of the bay. Matsu Shima, a wooded islet, lies about 90m SE of Koya Saki. Manaita Se, awash, lies in the middle of Oshika Wan. Vessels entering the bay should pass NE of Manaita Se.

Anchorage.—Oshika Wan affords anchorage to vessels with local knowledge, in depths of 5.5 to 12.8m, but the anchorage is restricted by the shoals lying in the middle of the bay. Vessels should pass NE of Manaita Se, awash, located about 0.2 mile SW of Koya Saki.

4.20 Kin Wan (34°33'N., 129°28'E.), located about 2.5 miles NE of Oshika Wan, is entered between Asagi Saki and Eboshi Saki, about 0.5 mile to the NE. The shores of the bay are mostly high, with dense dark woods, especially on its NE side. Fishing vessels anchor here during the autumn and winter. Kin, a village protected by breakwaters, stands at the head of the bay.

Eboshi Saki is rocky and rises abruptly to Eboshi Yama, a densely-wooded hill. Eboshi Iwa, a black rock 5.5m high, lies on the reef that extends SSE from Eboshi Saki. A light is shown from the breakwater in Kin and also from Eboshi Saki.

Anchorage.—The bay affords anchorage to small vessels with local knowledge, except during E winds, in depths of 5.5 to 20.1m.

Between Kin Wan and Shushi Wan, about 4 miles to the N, the coast is indented and fringed by a reef, which extends in places about 0.3 mile offshore.

4.21 Shushi Wan (34°37'N., 129°28'E.) is entered between Usu Saki and Saginokubi Saki, about 1.5 miles to the N. Hamakusu Ura and Shushi Ura are the N and S arms of Shushi Wan. The village of Shushi is situated at the head of Shushi Ura, and the village of Hamakusu at the head of Hamakusu Ura. Shushi Wan is about 0.5 mile wide at its entrance, but reefs which extend on either side of the entrance reduce the width of the navigable channel to about 600m abreast Aka Saki, a salient point on the S side of Shushi Wan. A lighted beacon stands on the N edge of the fringing reef, 183m N of Aka Saki.

Anchorage.—Vessels of about 3,000 gt anchor NW of Aka Saki, in depths of 28 to 36m, except during E winds. Small vessels anchor in Hamakusu Ura and Shushi Ura, in depths of 11 to 31m, good holding ground and well-sheltered.

Tsuwa Ura, a small bay, close N of the entrance to Shushi Wan, affords temporary anchorage to small vessels with local knowledge, except during E winds, in depths of 6.4 to 10.5m.

4.22 Nishidomari Wan (34°39'N., 129°29'E.), located about 3 miles N of Shushi Wan, is entered between Tono Saki and Jodo Saki, on which stands a lighted tower, 1.5 miles SSW. The bay is free of dangers in the fairway and affords good and safe anchorage in its inner part. Tono Saki should not be approached within a distance of about 0.8 mile.

Gongen Yama, about 1.3 miles WSW of Toni Sake, and Tomi Yama, about 0.2 mile NE of Gongen Yama, are both good landmarks for entering the inlet. Tomi Yama can be identified by a radio tower on its SW slope. Range lights are shown from a slope of a hill at the head of inlet.

Ikazuchi Zaki (Ikatsuti Saki) is a salient point on the N side of Nishidomari Wan, about 1.3 miles SW of Tono Saki. A light is shown from the point. Ko-jima lies on the same side of the inlet, about 410m ENE of Ikazuchi Zaki. A beacon stands near the outer end of the reef.

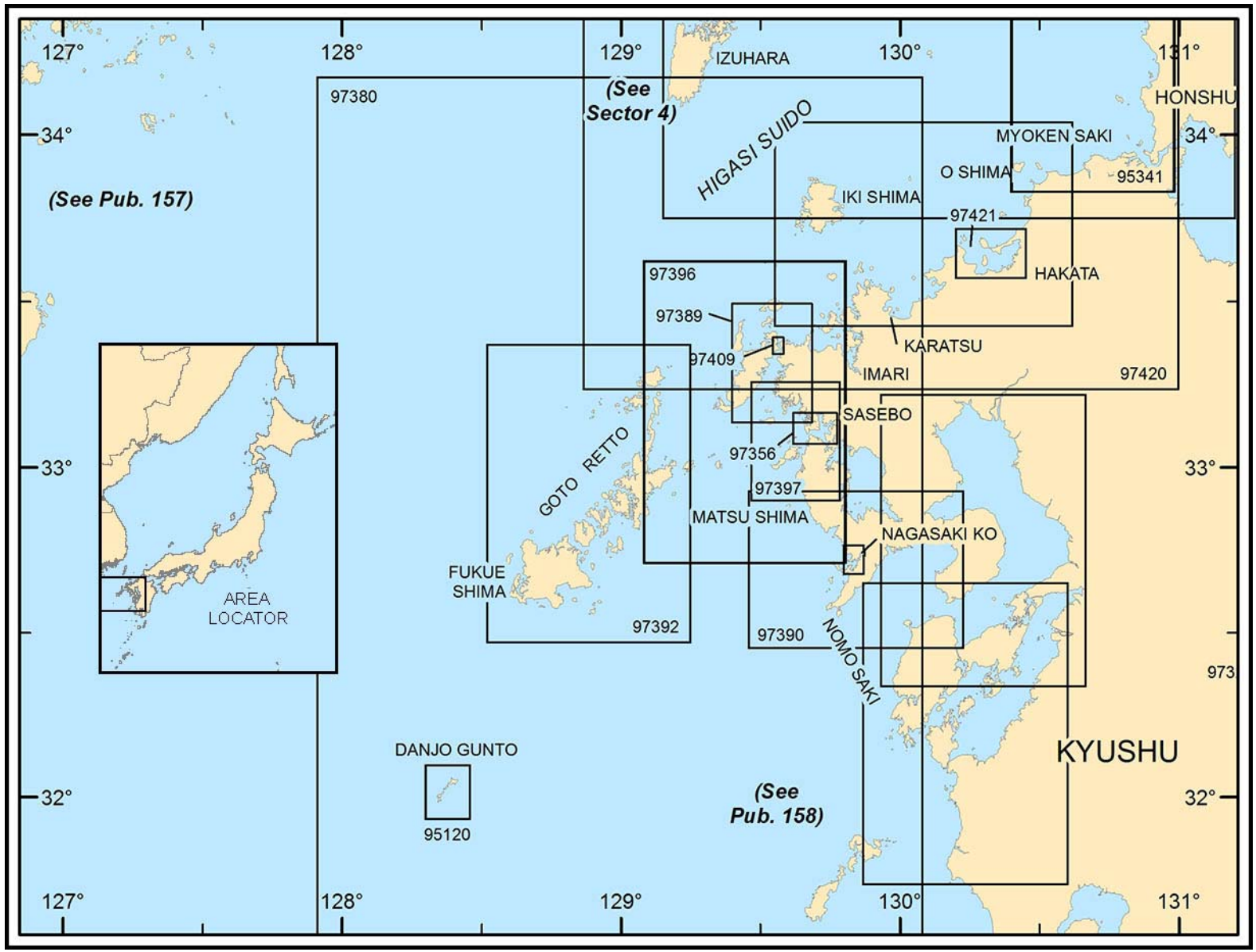
Furusato Ura and Hitakatsu Ura are two coves lying on the N and W sides of the head of Nishidomari Wan. The town of Hitakatsu lies at the head of Hitakatsu Ura. Hitakatsu Ko is the trading center of Kamishima and has ferry service to Japan and Korea.

Anchorage.—The best anchorage in Nishidomari Wan is about 0.3 mile WNW of Ikazuchi Zake, in depths of 16 to 18.3m, mud. The anchorage is well-sheltered from all winds.

4.23 Miuda Ura (34°40'N., 129°30'E.), about 1.3 miles N of Nishidomari Wan, is entered between Tono Saki and Ko Shima, about 0.5 mile N. This small open bay is unsuitable as an anchorage on account of the many reefs that fringe its shores.

Izumi Wan lies about 1 mile NW of Miuda Ura and is entered between Shita Zaki and Atsu Zaki, nearly 1 mile to the NW. Shiko-jima, in the middle of the bay, is flat and wooded, and appears to be part of the mainland because of the high hills behind it. Numerous rocks fringe the shore of the bay and vessels should not use the channel E of Shiko-jima because of reefs. The harbor is protected by a breakwater a light is shown from the head of the breakwater.

Anchorage.—Small vessels may obtain anchorage off Izumi village, in depths of 10.1 to 15.5m, mud, and good shelter from all winds.


127°
128°
129°
130°
131°
34°
33°
32°
IZUHARA
HONSHU
(See Sector 4)
97380
HIGASI SUIDO
MYOKEN SAKI
O SHIMA
95341
IKI SHIMA
97421
HAKATA
97396
97389
KARATSU
97409
IMARI
97420
SASEBO
97356
97397
GOTO RETTO
MATSU SHIMA
NAGASAKI KO
FUKUE SHIMA
97392
97390
NOMO SAKI
973
KYUSHU
(See Pub. 157)
AREA LOCATOR
DANJO GUNTO
95120
(See Pub. 158)

SECTOR 5

KYUSHU—NORTHWEST COAST (INCLUDING OFF-LYING ISLANDS)

Plan.—This sector describes the NW coast of Kyushu from Tomino Hana (Myoken Saki), on the S side of the W approach to Kanmon Kaikyo, then SW to Ushigakubi; then S to Nomo Saki and the off-lying islands of Okino Shima, Iki Shima, Goto Retto, and Danjo Gunto.

General Remarks

5.1 The NW coast of Kyushu extends SW from Tomino Hana (Myoken Saki) for about 66 miles to Ushigakubi, on the E side of Hirado Seto, and then S for 51 miles to Nomo Saki. A number of islands and islets lie within 30 miles of its N part and within 85 miles of its S part. The coast line is mountainous and indented with many bays and inlets. The two major ports of Sasebo and Nagasaki are described in this sector.

Tomino Hana to Nishiura Saki

5.2 **Myoken Saki** (Tomino Hana) (33°56'N., 130°41'E.), on the S side of the approach to Kanmon Kaikyo, lies about 2 miles NE of Kario Hana. It is 25.3m high, and its upper part consists of a conspicuous brown cliff. Manako Sone, with a depth of 1.8m, lies about 0.5 mile NW of Tomino Hana. A lighted tower is situated on the NE side of the headland.

Myoken Saki Light

Ashiya Ura is located at the mouth of the Onga Kawa, about 3 miles SW of Tomino Hana. The bay is protected on its N side by a chain of reefs that extends about 1 mile to the NW. Two small islets lie on the S side of the reefs. The town of Ashiya lies on the SW side of the Onga Kawa, near its mouth.

Hatsu Saki (33°53'N., 130°34'E.) lies about 6.5 miles SW of Tomino Hana and consists of high cliffs of volcanic rock. Hatsushiro Se (Hatu Siro Se) is a detached rocky shoal with a depth of 1.2m, and lies 2.25 miles N of Hatsu Saki. A light is shown from the point.

Kaneno Misaki is a prominent point lying 2 miles E of Hatsu Saki. An isolated rounded hill, 51.5m high and thickly wooded, is located on the point. Kanesaki Ko, a small fishing harbor protected by breakwaters, is located about 0.8 mile S of the point. A light is shown from the head of the N breakwater. Two lighted buoys are moored 0.25 mile and 0.15 mile NNE, respectively, of the head of the breakwater.

5.3 **Konominato Ura** (33°52'N., 130°30'E.) is entered between Kaneno Misaki and Ku Saki, 3 miles to the SW. The bay is protected from the N by the island of Jino Shima and from the NW by O Shima. The holding ground in the bay is considered poor, and because of the dangers in its approach, it should be avoided except in an emergency. A submarine cable is laid from the coast, close E of the entrance to Turi Gawa, to O Sima.

Jino Shima is located with its SE extremity about 1 mile NW of Kaneno Misaki. A very shoal spit of gravel extends SSE from the SE extremity of the island, almost to the mainland, and is usually marked by breakers. Submarine cables are laid at Jimo Shima, from Oshima and the mainland, as indicated on the chart. Foul ground off the NW side of the island is marked by navigational aids. Several fish havens lie within a radius of 2 miles from NNW to ESE of the N point of Jino Shima.

O Shima (33°54'N., 130°26'E.), the summit of which attains an elevation of 217m, is located about 3 miles W of Jino Shima. The island is a good landmark for vessels approaching Kanmon Kaikyo from the W. When wind and tidal currents are in opposition, there are heavy seas off the NW extremity of the island. The entrances to the harbor are protected by detached breakwaters. A fishing village is situated in a cove on the E side of the island. A light is shown from the NW side of the island.

Kurara Seto, the channel between O Shima and the mainland, is encumbered with shoals and should not be used except by vessels with local knowledge entering Konominato Ura. A number of underwater cables cross Kurara Seto. Buoys mark only a part of the foul ground in the channel.

Caution.—A dangerous wreck has been reported in position 33°52'48"N, 130°26'24"E.

5.4 **Tsuyasaki Hana** (33°48'N., 130°27'E.) and Tate Saki, about 2 miles N, are the SW and NW extremities, respectively, of a small conspicuous peninsula, located about 5 miles SSW of Konominato Ura. A light is shown from Tsuyasaki Hana. The town of Tsuyasaki lies close NE from the point.

Aino Shima, 76m high and flat, lies about 4.5 miles WSW of Tsuyasaki Hana. The island is wooded and its NW side consists of steep cliffs. There are two islets which are connected to it by a rock ledge at LW. It has been reported to be a good radar mark. A submarine cable is laid between the SE side of the island and the mainland. Hanguri Se, a rock, 22m high, lies close off the E extremity of the island. Temporary anchorage can be obtained by vessels with local knowledge in a bight on the S side of the island. Lights are shown from the NW and SE sides of Aino Shima.

Fish havens are situated within 1.75 miles NW and NE of the

N side of Shika Shima, and within about 4 miles of Aino Shima.

Numerous fish havens lie up to 2 miles offshore between Shika Shima and Tsuyasaki Hana, 9.5 miles NE.

A small harbor, which is protected by breakwaters, is situated 5 miles ENE of the summit of Shika Shima.

Kurinokami Sho (33°48'N., 130°16'E.), about 5.5 miles NW of the summit of Aino Shima, is a group of rocks, some of which dry from 0.5 to 1.7m. There is a lighted beacon in the middle of the reef. It has been reported that there are wrecks about 3 miles SE, 4.75 miles S, and 5 miles W of Kurinokami Sho Lighted Beacon.

Fukuoka Wan

5.5 Fukuoka Wan is entered between **Nishiura Saki** (33°40'N., 130°13'E.) and Myojin Hana, the NW extremity of Shikano Shima. The entrance is divided into three channels by a number of islands and dangers, but only the easternmost is recommended for ocean-going vessels.

Aspect.—Genkai-jima lies about 1.5 miles NE of Nishiura Saki. Lights are shown from its NE side and from a breakwater standing on its S coast. The coastline of the island is mostly cliffy. Hashira-jima, a pointed pillar-shaped rock, lies about 0.4 mile NW of Genkai-jima, with shoal water between the two. Ino Se, a detached shoal, with a depth of 9.8m, lies about 1 mile N of Hashira-jima. Kuro Se consists of three above-water rocks which lie in close proximity N of Genkai-jima. The depth of water within the bay is deep to the W of Noko-no-Shima and it is suitable as an anchorage for large vessels; however, the majority of the area within Hakata Ko to the E is shallower than 10m.

Ko-tsukue Shima (33°40'N., 130°13'E.) and O-tsukue, close N, lie about 0.8 mile SW of Genkai-jima. The islets lie on the NW edge of a shoal, which is located in the NW entrance to Fukuoka Wan. A buoy marks the S end of the shoal.

Shikano Shima lies about 3 miles ESE of Genkai-jima, on the E side of the main entrance to Fukuoka Wan. The SE extremity of the island is connected to a narrow sandy isthmus forming the N side of Hakata Ko. Shoal water extending out 1.25 miles from the NW coast of the island is marked by a buoy.

There is a small harbor, protected by breakwaters, on the W side of Shika Shima. A light is shown from the head of each breakwater. A detached breakwater lies close S of the harbor entrance; a light is shown at each end.

Hakata (33°36'N., 130°24'E.)

World Port Index No. 62430

5.6 The Port of Hakata, a major specified port of entry, is located in the E part of Fukuoka Wan. It consists of a natural outer harbor and an artificial inner harbor, with berthing for large vessels. The harbor area occupies the greater part of Fukuoka Wan. The harbor is further divided into Harbor District No. 1 to Harbor District No. 4 and a fairway.

The entrances to the harbor are on the N and S sides of Nokono-Shima. The entrance on the N side is the main one and has soundings of 14 to 20m. The depths are shallower closer in. In the center part of the harbor there are many depths of 7m. The largest ship to have entered the harbor was 94,489 gt.

Hakata Home Page
http://www.port-of-hakata.city.fukuoka.lg.jp/english/index.php

Winds—Weather.—The W part of Fukuoka Wan is protected from W winds, but N winds send in a heavy sea. When cold fronts pass during the winter, strong NW winds develop.

Local storm signals are shown at the meteorological observatory, about 0.8 mile S of the mouth of the Naka Gawa, also on the E side of the entrance of the boat basin.

Weather signals, by flashing light, are displayed from the roof of the Port Authorities Building, at the root of Middle Wharf.

Tides—Currents.—The MHW interval in Hakata Ko is 9 hours 40 minutes. Spring tides rise 1.9m; neap tides rise 1.4m.

The flood current sets SE in the entrance of Fukuoka Wan and in the vicinity of Nokono Shima; the ebb current sets nearly in the opposite direction. The tidal current turns 1 hour before HW and LW, and both currents attain a rate of about 1 knot. Within the harbor the tidal currents are weak and the rate does not exceed 0.5 knot.

Hakata—Hakata Pier

Depths—Limitations.—Central Passage, the channel leading to the entrance at the breakwaters and continuing N to Hakozaki Wharf, has depths of 12 to 15m.

The Middle Wharf projects NW from the shore on the W side of the mouth of Mikasa Kawa and functions as an international passenger terminal. Hakozaki Wharf lies on reclaimed land in the N part of the inner harbor and functions as an international trade hub. Higashihima Wharf lies close S of the S side of Hakozaki Wharf and is used for the transfer of LNG and construction materials. Suzaki Wharf projects NW from the shore on the W side of the mouth of Naka Kawa and is used mainly for grain distribution.

Hakata Pier serves as a domestic services and ferry terminal. Two berths at Kashii Park Port, along with one berth at Hakozaki Wharf, serve as the main container terminals. For more detailed berthing information in Hakata, see table titled **Haka-**

Hakata—Hakozaki Wharf

Hakata—Middle Wharf

Hakata—Higashihama Wharf

Hakata—Suzaki Wharf

ta—Berth Information.

A bridge, with a vertical clearance of about 3.8m and marked by lights, connects Suzaki Wharf and Aratsu Oil Center, and spans the entrance to Hakata Fishing Harbor.

Aspect.—Abura Yama (33°30'N., 130°22'E.), a good landmark, rising about 7 miles SSE of the summit of Nokono Shima, is located in Fukuoka Wan, 1 mile S of Shikano Shima.

Bishamon Yama, a conspicuous wooded hill with a sharp summit, rises in a position about 2 miles WSW of the summit of Nokono Shima; it is a useful mark for vessels entering Imazu Wan.

Hakata—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Chu (Central) Wharf						
No. 3	180m	7.5m	30.3m	8.5m	—	Fast ferries, steel, and bunkers.
No. 4	123m	10.0m	76m	12.5m	1,600 dwt	Fast ferries, steel, and bunkers.
No. 5	350m	10.1m	334m	41.5m	14,600 dwt	Cruise vessels, containers, and reefer.

Hakata—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
No. 7	180m	5.5m	347m	41.5m	13,400 dwt	Breakbulk and bunkers.
No. 8	180m	5.5m	70m	11.0m	1,250 dwt	Breakbulk.
No. 9	193m	7.5m	184m	24.0m	4,840 dwt	Cruise vessels, breakbulk, and bunkers.
No. 10	193m	7.5m	184m	24.0m	4,840 dwt	Breakbulk and bunkers.
No. 11	193m	7.5m	184m	24.0m	4,840 dwt	Breakbulk and bunkers.
No. 12	215m	6.5m	64m	10.2m	950 dwt	Breakbulk and bunkers.
Hakata Pier						
No. 1	88m	7.5m	105m	16.0m	5,650 dwt	Grain, PCC, and steel.
No. 2	130m	7.5m	105m	16.0m	5,650 dwt	Grain, PCC, and steel.
No. 3	130m	7.5m	105m	16.0m	5,560 dwt	Grain, PCC, and steel.
No. 4	185m	10.0m	150m	22.0m	17,620 dwt	Grain, steel, and bunkers.
No. 5	270m	12,0m	333m	38.0m	36,320 dwt	Ro-ro, passengers, and lo-lo
No. 6	130m	7.5m	167m	27.0m	14,280 dwt	Ro-ro, steel, and bunkers.
No. 7	130m	7.5m	167m	27.0m	14,280 dwt	Ro-ro, containers, and bunkers.
No. 8	130m	7.5m	167m	27.0m	14,280 dwt	Ro-ro, containers, and bunkers.
No. 9	130m	7.5m	180m	27.0m	14,280 dwt	Grain, ro-ro, containers, steel, and bunkers.
No. 10	130m	7.5m	167m	27.0m	14,280 dwt	Grain, ro-ro, containers, steel, and bunkers.
No. 11	230m	7.5m	168m	24.0m	6,210 dwt	Grain, ro-ro, containers, steel, and bunkers.
No. 12	265m	12.0m	230m	32.2m	84,800 dwt	Grain, ro-ro, containers, steel, and bunkers.
No. 13	265m	12.0m	230m	32.2m	84,800 dwt	Grain, containers, and steel.
Higashihama Wharf						
No. 1	200m	4.5m	76m	13.3m	2,398 dwt	Aggregates, cement, limestone, steel, and bunkers.
No. 2	80m	5.5m	75m	12.3m	1,845 dwt	Aggregates, cement, limestone, steel, and bunkers.
No. 3	430m	5.5m	100m	18.6m	5,090 dwt	Aggregates, cement, limestone, steel, and bunkers.
No. 4	390m	7.5m	120m	18.6m	8,112 dwt	Aggregates, cement, limestone, steel, and bunkers.
No. 5	310m	7.5m	91m	15.6m	3,078 dwt	Aggregates, cement, limestone, steel, and bunkers.
Island City Container Terminal (ICCT)						
No. 1	214m	7.5m	142m	22.4m	4,500 dwt	Ro-ro, containers, and bunkers.
No. 2	135m	7.5m	99.5m	14.2m	2,114 dwt	Containers and bunkers.
No. 3	135m	7.5m	99.5m	14.2m	32,114 dwt	Ro-ro, passengers, vehicles/rail, and containers.
No. 4	140m	11.0m	190m	—	—	Containers, PCC, and bunkers.
No. 5	200m	14.0m	200m	35.4m	22,098 dwt	Containers and bunkers.
No. 6	330m	14.0m	260m	37.5m	595,000 dwt	Containers and bunkers.
No. 7	350m	15.0m	300m	48.2m	110,482 dwt	Containers and bunkers.

Hakata—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Kashil Park Port						
No. 1	133m	7.5m	172m	25.0m	9,653 dwt	Bunkers.
No. 2	133m	7.5m	172m	25.0m	9.653 dwt	Bunkers.
No. 3	134m	7.5m	200m	32.2m	15,154 dwt	PCC and bunkers.
No. 6	190m	11.0m	150m	22.5m	14,953 dwt	Containers, breakbulk, and bunkers.
No. 7	120m	7.5m	132m	20.0m	3,294 dwt	Containers, breakbulk, and bunkers.
No. 8	130m	7.5m	168m	26.0m	6,890 dwt	Containers, breakbulk, and bunkers.
No. 9	130m	7.5m	168m	26.0m	6,890 dwt	Ro-ro/lo-lo, containers, and breakbulk.
Kashii Park Port Container Terminal						
No. 4	300m	11.0m	260m	32.2m	52,357dwt	Containers and bunkers.
No. 5	300m	13.0m	260m	32.2m	52,357dwt	Containers and bunkers.
Suzaki Wharf						
Nagahama No. 1	360m	11.0m	260m	32.2m	52,357 dwt	Bunkers.
Nagahama No. 2	360m	5.5m	75m	12.0m	1,951 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 1	130m	7.5m	141m	21.0m	8,800 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 2	184m	12.0m	229m	32.2m	83,494 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 3	184m	12.0m	229m	32.2m	83,494 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 4	184m	12.0m	229m	32.2m	83,494 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 5	130m	11.0m	90m	14.0m	2,330 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 6	130m	7.5m	90m	14.0m	2,330 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 7	112m	5.5m	90m	14.0m	2,330 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 8	112m	5.5m	90m	14.0m	2,330 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 9	112m	5.5m	90m	14.0m	2,330 dwt	Animal feeds, fertilizer, grain, and bunkers.
No. 10	112m	5.5m	90m	14.0m	2,330 dwt	Animal feeds, fertilizer, grain, and bunkers.
Tanker Terminals						
Arasta Wharf						
No. 1	30m	5.5m	—	—	—	CCP.
No. 2	12m	5.5m	—	—	—	—
No. 3	10m	6.0m	—	—	—	—
No. 4	13m	—	106m	16.0m	5,000 dwt	—
No. 5	24m	6.0m	—	—	—	—
No. 6	24m	4.5m	—	—	—	CCP and DPP.
No. 7	7m	5.5m	75m	13.3m	2,400 dwt	—
No. 8	7m	5.5m	75m	13.3m	2,400 dwt	—
No. 9	10m	5.0m	75m	12.0m	1,800 dwt	CCP and DPP.
No. 10	130m	5.5m	74m	11.4m	1,950 dwt	CCP.
Fukuoka LNG Terminal						
East Berth	14m	6.5m	72m	12.5m	1,220 dwt	LNG and LPG.

Hakata—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
LNG Berth	45m	7.5m	130m	25.7m	16,399 dwt	LNG.
West Berth	14m	6.5m	105m	16.0m	5,760 dwt	LNG.
Uyeno Terminal						
Uyeno Berth	130m	6.5m	105m	16.0m	5,916 dwt	CPP.

Hakata Ko—Signals		
Flag Signal	**AIS symbol**	**Meaning**
2nd Substitute, C	C	Vessels should navigate for Section 1 facilities between Higashihama Wharf Quay 4 and Susaki Wharf Quay 4 unless passing a line from the N end of N breakwater to the S end of Hakozaki breakwater.
2nd Substitute, P	P	Vessels should navigate for Section 1 facilities between Hakozaki Wharf and Higashihama Wharf Quay 5 unless passing a line from the N end of N breakwater to the S end of Hakozaki breakwater.
2nd Substitute, S	S	Vessels should navigate for Section 1 facilities between the N sea wall at Hakozaki Wharf and Nishi Koen Shita Breakwater unless passing a line from the N end of N breakwater to the S end of Hakozaki breakwater.
2nd Substitute, E1	E1	Vessels should navigate for Section 1 facilities, passing a line from the N end of N breakwater to the S end of Hakozaki breakwater.
2nd Substitute, E2	E2	Vessels should navigate for facilities in Section 2.

A tower, 102m high, stands close NE of the bridge spanning Susaki and Hakata Wharves. Four white chimneys on the E side of Hakata Ko, on the N side of the mouth of the Tatara Gawa, are conspicuous.

Pilotage.—Pilots are not compulsory, but recommended and can be contacted on VHF channels 12 and 16 (call sign: Hakata-ho-an). Pilots are available 24 hours, and board 0.5 mile N of Nokonoshima Light.

Hakata Pilot Association	
Telephone	81-92-291-4494
Facsimile	81-92-271-3373
Boarding Point	On the harbor limit line, 014°, 820m from Nokoshima Light (33°38.7'N., 130°18.4'E.).
Remarks	Vessels equipped with VHF should give notification of arrival time schedule at the pilot boarding point via “Hakata Port Radio.”

Regulations.—A pier for the sole use of vessels discharging liquefied petroleum gas is situated on the S side of Saito Saki, situated about 1 mile E of Ha Shima. When such a vessel is moored or mooring alongside the pier, no other vessel may approach within a distance of 50m. In addition, a red flag will be displayed at the pier. Three lighted buoys, each exhibiting a red light, mark the restricted area.

Any vessel without a funnel net to prevent fire or one with insufficient fire control should not enter the area.

Hakata—Aratsu Oil Center

Contact Information.—See the table titled **Hakata—Contact Information**.

Anchorage.—Anchorage, sheltered from N winds, can be obtained in Fukuoka Wan off the S side of Shikano Shima; protection from the W winds can be obtained in the lee of the pen-

insula that forms the W side of Fukuoka Wan.

Hakata—Contact Information	
Pilots	
Telephone	81-92-291-4494
Facsimile	81-92-271-3373
Hakata Port Radio	
Call sign	Hakata Port Radio
VHF	VHF channels 11, 12, 16, and 18
Telephone	81-92-272-0577
Facsimile	81-92-272-0578

Anchorage, limited by draft, can be had practically anywhere in Hakata Ko, but a position SW of Saito Saki is recommended during strong N winds, and off the E side of Nokono Shima when W winds prevail.

An area of prohibited anchorage, as delineated on the chart, lies in the SW section of the harbor.

The quarantine anchorage is situated on the NE side of Nokono Shima. The anchorage is marked by a buoy.

Nishiura Saki to Hotoke Saki

5.7 The coast between Nishiura Saki and Hotoke Saki, about 8 miles SW, is backed by a number of conspicuous detached pointed hills, the summits of which are thickly wooded. **Kaya San** (33°34'N., 130°10'E.), the most conspicuous of these hills, is 379m high. From the N, this hill appears flat-topped, but from the E or W, it appears pointed.

Nishiura Saki (33°40'N., 130°13'E.) is a well-defined point rising to an elevation of 156m close within the headland. A light is shown from the point. Nagama Se dries 0.6m and lies about 4 miles NW of Nishiura Saki.

Nogita-Todai Se (33°39'N., 130°07'E.) is a group of rocks located 4.5 miles W of Nishiura Saki. The highest rock reaches an elevation of 1.9m and forms a good radar target up to 5 miles. A light is shown from the N side of the rocks. A wreck lies about 1.5 miles E of the light. A fish haven is also situated about 0.7 mile SSW of Nogita-Todi Se.

Oto Saki, a precipitous headland consisting of black rocks in the form of square columns, is located about 6.5 miles SW of Nishiura Saki.

Hotoke Saki (33°34'N., 130°05'E.) is the E entrance point of Karatsu Wan. The point is cliffy and located about 1 mile SW of Oto Saki, and is dominated by Tateishi Yama, a prominent brown hill, 208m high. A light is shown from No Se, about 0.8 mile S of Hotoke Saki, marking the edge of foul ground.

Karatsu Wan

5.8 Karatsu Wan is entered between Hotoke Saki and Kawaraki Saki, located about 8 miles to the WSW of Hotoke Saki. The bay extends for about 6 miles N and S, and about 11 miles E and W. The shores of the bay are generally sandy beaches; rocky headlands jut out and the mountains to the S of the bay are extremely steep. The bay is capable of providing sheltered anchorage to ocean-going vessels. Kashiwa Shima and Hime Shima lie in the entrance of the bay, dividing it into three channels, the middle being better. The port of Karatsu, in the SW part of the bay, is a busy coal port.

Karatsu (33°29'N., 129°58'E.)

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5.9 The port of Karatsu is approached between Oka Saki and Kushi Saki and stands in the extreme SW corner of Karatsu Wan. The harbor is divided into Nishi Ko (West Harbor) and Higashi Ko (East Harbor). The harbors are separated by O Shima, which has a lighthouse and four tanks on its N side, and is connected to the mainland at its SW end by an area of reclaimed land.

The W sector is more active commercially. Depths range from 7 to 11.9m. Anchorage exists for over 100 vessels, including those of 30 to 5,000 gt capacity.

Winds—Weather.—During the summer, SE winds predominate; during the winter, NW or SW are prevalent.

Conditions are usually calm within the harbor throughout the year; however, since the harbor is open to the NE, large waves enter during strong N winds, which occur mostly during the winter months.

Tides—Currents.—The MHW interval is 9 hours 26 minutes; spring tides rise 2m and neap tides rise 1.5m.

The tidal currents flow ENE during the flood and WSW during the ebb. The rate seldom exceeds 1 knot.

Depths—Limitations.—A depth of 7.6m is maintained in the approach channel to the main pier in Nishi Ko (West Harbor). There is a least depth of 5.8m in the approach channel to the main pier in Higashi Ko (East Harbor).

Karatsu—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Karatsu Bay Sand Terminal			
Dry cargo berth	362m	—	Sand.
Karatsu Ferry Terminal			
Ferry Berth	88m	—	Ro-ro and passengers.
Fisheries Wharf			
No. 1	49m	5.1m	Fish.

Karatsu—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
No. 2	89m	4.5m	Fish.
No. 3	164m	4.5m	Fish.
No. 4	109m	7.0m	Fish.
No. 5	260m	7.5m	Fish.
Myoken Wharf			
No. 2	—	—	General cargo.
No. 3	270m	—	General cargo and cement.
No. 4	—	12.0m	General cargo.
No. 5	—	—	General cargo.
No. 6	—	—	General cargo.
Oshimar Quay			
S. Pier	342m	5.4m	4 x 3,000 gt
East Harbor			
Commerce Pier	199m	4.5m	2 x 800 gt
Tanker Berths			
Karastu Terminal	350m	13.0m	LPG. Maximum draft of 12.9m. Maximum size of 60,000 dwt.
Gas Berth	8m	—	LPG.
Oshima Quay			
Quay No. 1	—	—	—
Quay No. 2	—	—	—
Kyushu Electric Power Terminal			
Dolphin berth	99m	—	—

The depths in Higashi Ko (East Harbor) are inclined to decrease because of the outflow of mud from the Matsuura Gawa.

Extensive berthing for vessels up to 3,000 gt is available for handling general and bulk cargo, such as coal in Nishi Ko (West Harbor) and Higashi Ko (East Harbor). Liquefied gas is handled at the ENEOS Dolphin Jetty by vessels up to 60,000 dwt.

There are two embankments for loading coal, their depth alongside being 5.5m. Three mooring buoys also exist, two to take one vessel each of 1,000 to 2,000 gt, and one to take one vessel of 3,000 to 4,000 gt.

A broad area of reclaimed land extends 0.5 mile NNW from Myoken to form Myoken Wharf, 600m long. There are five berths, with depths of 2 to 12m alongside.

Aspect.—Ukidake Yama is very conspicuous among the mountains at the head of Karatsu Wan; it rises 805m, about 3 miles ESE of Kushi Saki.

Taka Shima, at the NE end of Karatsu Ko, is surmounted by a 170m conical hill; it is a good landmark for entering the harbor.

There is a conspicuous white building at the quarantine station at **Myoken** (33°28'N., 129°57'E.) which is situated on the mainland SW of O Shima.

6otage is not compulsory. Pilot boards off Kashiwa Shima, if required.

Anchorage.—It is possible to avoid the N winds to some extent by the shelter afforded by Oka Saki in a position where the depths within Nishi Ko are about 7m. Depths within the anchorage on the W side of O Shima are from 7 to 10.1m. It has been reported that Higashi Ko is a better anchorage than Nishi Ko during NW winds, in a position between O Shima and Torijima, where the depths are from 7 to 9m.

The quarantine anchorage is situated about 0.8 mile NNW of O Shima.

Contact Information.—See the table titled **Karatsu—Contact Information**.

Karatsu—Contact Information	
Port Authority	
Telephone	81-952-257-163
Facsimile	81-952-275-315
E-mail	kouwan@pref.saga.lg.jp

Caution.—Caution is necessary as a foul area and a fish haven are situated in the N corner of the anchorage.

Kashiwa Shima to Hado Misaki

5.10 Kashiwa Shima (33°32'N., 129°58'E.) is located 1.25 miles N of Oka Saki. On the W side of the island, there is a cove formed by a narrow spit of sand and gravel, but the depths in it are shoal. The channel between the island and the mainland is about 0.3 mile wide, with depths of less than 7.3m, and is only available to small craft with local knowledge. A light is shown from the W end of the island.

Nanatsugama lies about 2 miles WNW of Kashiwa Shima and is a natural monument. It consists of angular pillars of eroded basalt with seven caves below the pillars.

Tomo Saki (33°33'N., 129°55'E.), a precipitous headland, from which a shoal extends about 0.2 mile N, is located 1.25 miles W of Nanatsugama. The town of Komoto lies on the W side of the point. Submarine cables are landed in the bays on either side of the point.

Taka Shima is a rocky densely-wooded islet, 48m high, located about 0.8 mile NNW of Tomo Saki. The N side of the island forms a steep cliff, and a light is shown from its summit. A small boat harbor, protected by a breakwater on which stands a light, lies on the SW extremity of the island.

A tower 70m high stands 183m N of the breakwater light. A small harbor protected by two breakwaters lies close E of the small harbor on the S side of Taka Shima.

Submarine cables are laid from Taka Shima and Tori Shima, S to the coast. A submarine cable is laid between Taka Shima and O Shima.

Usu Shima (33°34'N., 129°54'E.), lying on detached shoals in the main approach to Yobuko Ko, is located 0.5 mile NW of Taka Shima. The islet is flat and marked by a conspicuous stone wall, 7.9m high. A light is shown from the islet. A fish haven is situated close N.

Maru Sone, a detached 8.2m rocky patch, lies about 0.3 mile SE of Taka Shima. It is sometimes marked by tide rips.

5.11 Kabe Shima (33°33'N., 129°53'E.) lies on the NW side of Yobuko Ko and about 1 mile W of Taka Shima. The S and SW extremities of the island are fringed with shoal banks extending about 0.2 mile offshore. Benten Seto is a narrow channel between the S end of Kabe Shima and the mainland, and used only by local small craft. A light is shown from the N extremity of Kabe Shima.

Yobuko Ko is located off the SE side of Kabe Shima and about 0.8 mile W of Tomo Saki. The inlet is open to the NE, but is protected by the islets off its entrance. Anchorage can be taken, in 20.1 to 23.8m, gravel. Two breakwaters protect the NE entrance to the inlet. The town of Yobuko lies in the SE corner of Yobuko Ko.

Nagoya Ura (33°32'N., 129°53'E.) lies off the S coast of Kabe Shima, about 0.8 mile SW of Yobuko Ko. There is good anchorage, in 22m, gravel, with the lighthouse on Taka Shima in line with the NW islet of Futako Shima bearing 048.5°. The town of Nagoya lies on the W side of the inlet. Nagoya Gyoko, protected by two breakwaters, lies close within the W entrance point of the inlet; a light stands on the N breakwater. These breakwaters were extended.

Hado Misaki (33°33'N., 129°51'E.), lying about 1.8 miles W of Kabe Shima, is a rocky peninsula, and from the SW or W appears as a low islet. The peninsula should not be approached within 0.5 mile as it is fringed with reefs on all sides. A light is shown from the point and a lighted buoy marks the reef on the W side of Hado Misaki.

Off-lying Islands

5.12 Futagami Shima (33°36'N., 129°33'E.) is located about 15 miles WNW of Hado Misaki. The islet is 98m high and lies on the W end of Iki Suido. It is saddle shaped and there are no dangers more than 0.2 mile from its coasts. A light is shown from the SW side of the islet. Ko Futagami Shima is 57m high and lies about 1.8 miles WNW of Futagami Shima. Karato Sho, a steep-to rock, 3.3m high, lies about 0.6 mile NE of Ko Futagami. Breakwaters protect the outer part of Yobuko Ko from the N.

Madara Shima lies on the S side of the main fairway through Iki Suido, and is located about 4 miles WNW of Hado Misaki. The island rises to a round flat-topped hill on its E side, but on the W side there is a row of sharp peaks dominated by Banshono Tsuju, 238m high. Northwest of this peak and connected with it by a ridge is O Yama, a wooded peak that rises abruptly from the cliffy NW extremity of the island. Both peaks are conspicuous and can be seen a good distance. A light is shown from the SSE corner of the island.

Matsu Shima (33°35'N., 129°50'E.), 138m high, lies about 2 miles N of Hado Misaki. The SW end of the island is foul for about 0.2 mile offshore; on this foul ground are several above-water rocks, the largest of which are Take Se and Komatsu Shima, which are 16.5m and 26m high, respectively. Open anchorage can be obtained off the E side of the island.

Kakara Shima, which rises to a height of 123m, lies about 0.5 mile NE of Matsu Shima. The islands are separated by a channel 0.3 mile wide. Futame Se dries 2.7m and lies on the NE part of a small shoal, about 0.3 mile off the S extremity of the island. Kuro Se, a flat rock 7.3m high, lies close off the SE coast of the island. Lights are shown from the N and S ends of Kakara Shima.

5.13 Ogawa Shima (33°36'N., 129°54'E.) lies about 1.3 miles E of Kakara Shima; at its S end are two prominent hills. Me Se, close off the SW extremity of Ogawa Shima, is 7.3m high, and in its vicinity are a number of rocks that dry. Submarine cables run from the S coast of Ogawa Shima to Kakara Shima and to the coast of Kyushu. They also run from Madara Shima to Kyushu.

Amashiri Se lies about 1 mile SSE of the SE extremity of Ogawa Shima and has a depth of 6.7m. From N to S between Amashiri Se and Ogawa Shima lie Hira Se, from which a light is shown; Yakata Se, a black rock, 7m high; and Ori Se, a rock that dries 0.9m.

Iki Suido is the W entrance channel of Genkai Nada, and lies between the NW coast of Kyushu and Iki Shima. It is about 11 miles wide; in it there are a number of islets and shoals with deep navigable channels between them.

Iki Shima

5.14 Iki Shima (33°47'N., 129°43'E.) lies on the NW side of Iki Suido and is located about 10 miles NNE of Futagami Shima. It consists mostly of sand, rock, or lava, and its surface

is mainly tableland. Takeno Tsuji, the summit of the island, is in the S part, and rises to a height of 212m. On Take is near the NE extremity of the island and is 156m high. The summit of Tsunokami Yama, 134m high, lies about 2.3 miles NNW of Takeno Tsuji. These three peaks are all good landmarks for approaching the island.

On the SE side of Iki Shima, Iruka Saki, the S extremity of the island, is low, flat, barren, and easily identified. A light stands on the point.

Kagamidake Hana, about 0.5 mile NE of Iruka Saki, is a steep, wooded point, with a pointed summit, 85m high, which is a prominent feature.

Indoji Ura is a cove located about 3 miles NE of Iruka Saki, and affords anchorage, sheltered from the N winds, to small vessels with local knowledge.

Kanajairo Iwa, 11.6m high and white with guano, lies about 1 mile ENE of **Gongen Hana** (33°46'N., 129°48'E.).

On the NE side of Iki Shima, **Ashibe Ura** (33°48'N., 129°46'E.) is a shallow inlet with the village of Ashibe on its S side and the village of Seto on its N side. A light is shown from the S entrance of the inlet. Ashibe Ura affords anchorage to small craft with local knowledge.

5.15 **Uotsuri Sake** (33°51'N., 129°46'E.) is located about 2 miles N of Ashibe Ura. A light is shown from the point.

On the SW side of Iki Shima, **Hozo Saki** (33°44'N., 129°41'E.), the E entrance point of Gonoura Ko, lies about 2.5 miles NW of Iruka Saki. The point is wooded and makes a good landmark.

Kanajiro Iwa, a black rock, 9.8m high, lies on the W side of the approach to Gonoura Ko, about 1.5 miles SW of Hozo Saki.

Sora Sone and Mottaro Se, with depths of 5.8 and 7.6m, rock, lie about 0.5 and 0.75 mile NNE, respectively of Kanajiro Iwa.

Hira Shima (33°42'N., 129°38'E.) lies on the W side of the approach to Gonoura Ko, and about 1.8 miles WSW of Kanajiro Iwa. Its summit is bare and its sides consist of steep black cliffs. Tsuri Sone, a detached rocky shoal with a depth of 2.1m, lies about 0.5 mile SE of Hira Shima.

Haru Shima and Naga Shima, both of which are flat and thickly wooded, lie about 1.75 miles NE and 1.5 miles N, respectively, of Hira Shima.

5.16 **O Shima** (33°44'N., 129°38'E.), close N of Naga Shima, is separated from Iki Shima by Oshima Seto, a narrow channel, encumbered by shoals, and only used by small craft with local knowledge. A light is shown from the E side of O Shima. A bridge, reported to be 30m in height, with an unknown safe vertical clearance, also spans Oshima Seto in position 38°52'43.8"N, 141°36”21.6’’E.

Eboshi Saki lies about 0.8 mile ESE of the NE extremity of O Shima. Hie Sone, with a depth of 3.1m, lies within 0.3 mile S of Eboshi Saki.

5.17 **Gonoura Ko** (33°44'N., 129°41'E.), the principal port on Iki Shima, is entered between Eboshi Saki and Hozo Saki. The port is opened to the S, but affords anchorage sheltered from all other directions. A moderate-size vessel can anchor, in a depth of 22m, with the NW side of Hira Shima bearing 228°, and the summit of O Shima bearing 265°. Gono Se is black and 7m high, upon which stands a light. It is situated 1.25 miles W of Iruka Saki.

The inner harbor is narrow and suitable only for small vessels. A vessel of 600 gt is the largest that can be accommodated alongside in the inner harbor. Submarine cables are landed in Gonoura Ko, W of Eboshi Saki.

On the NW side of Iki Shima, Hansei Ura, located about 2.5 miles NE of O Shima, is exposed to the NW and cannot be recommended as an anchorage. The inlet has a number of shoals, with depths of less than 9.2m, and at times is exposed to heavy swells.

Yunomoto Wan (33°50'N., 129°40'E.) lies about 2.5 miles N of Hansei Ura and is only suitable for small vessels with local knowledge. Tenaga Shima, the W entrance point of the inlet, shows a light. The inlet is exposed to heavy swells when NE gales sweep around the NW end of Iki Shima.

Katsumoto Ko lies between the NW end of Iki Shima and several islets close offshore. The largest of the islets is Wakamiya Shima, which shows a light. The islets afford very little shelter to Katsumoto Ko, but on its S side is a cove, protected by breakwaters, which allows shelter to small vessels. The town of Katsumoto lies in this cove. In good weather, vessels anchor outside the breakwaters, in 5.8 to 18m, good holding ground.

Outer Islands

5.18 **Na Shima** (33°44'N., 129°52'E.) is a group of islets lying on a rocky shoal, on which are numerous above-water and submerged rocks lying about 8 miles N of Kakara Shima, about 3.5 miles ESE of Gongen Hana on the E side of Iki Shima. The largest islet is Mae Shima, flat-topped and 17.7m high. A number of rocks and foul patches lie up to 2.5 miles off the E and S sides of Na Shima. A light is shown from the S islet.

A small harbor, which is protected by two breakwaters, is situated on the NE side of Haru Shima.

Eboshi-jima (33°41'N., 129°59'E.), lying 7 miles ESE of Na Shima, is 43m high and is steep-to on all sides. From the NW and N, it has a rugged appearance and from the E, it presents a pointed summit. A light is shown from the summit of the islet.

Orono Shima (33°52'N., 130°02'E.), an island with two peaks, the S one of which is 109m high, lies 11 miles NNE of Eboshi-jima. Close off its N extremity are two above-water rocks, but the island can be approached to within 0.75 mile on all sides. Two fish havens are situated within 0.75 mile W of the W side of Orono Shima. There is a small settlement and a breakwater on the S end of the island. A light is shown from the S end of Orono Shima.

Okino Shima (34°14'N., 130°06'E.), steep-sided and densely wooded, lies about 23 miles NNE of Orono Shima. Its summit is 244m high and lies almost in the center of the island. Shoal water with above-water rocks extend out 0.75 mile from the S side of the island. A light is shown from the summit of Okino Shima. A small settlement is situated on the S side of the island.

Nada Saki is a rocky point located about 0.8 mile S of Hado Misaki. Close S of the point is a cove, of which both entrance points are foul. Kuro Se, a rock 3.4m high, is joined to the S entrance point of the cove by a shoal that dries.

5.19 **Kushino Ura** (33°31'N., 129°51'E.), a narrow inlet on

the NE side of the peninsula that terminates in Kushi Saki, is located about 1 mile S of Nada Saki. The inlet is sheltered, except from the NW, but its head is shoal and only available to small vessels with local knowledge.

Hokawazu Ura. a narrow inlet that is entered between Chika Saki and Kushi Saki, is located about 0.5 mile S of Kushino Ura. The inlet is free of dangers, but only used by small vessels with local knowledge. A bridge, with a vertical clearance of 19m, spans the channel at its narrowest part. The town of Hokasu lies midway in the inlet on the W side.

Chika Saki (33°31'N., 129°50'E.) is a low, flat, rocky cape, about 0.5 mile W of the mouth of Hokawazu Ura. The cape is green and very conspicuous from a distance. A submerged rock, with a depth of 4.1m, extends for about 0.4 mile NW from the end of the point. A light is shown from Chika Saki.

Wakudo Se (33°29'N., 129°50'E.), 11.6m high, lies on the S end of a patch of foul ground, about 2 miles S of Chika Saki. The N end of the foul patch is marked by Hira Se, an above-water rock. A light is shown from Wakudo Se.

Kariya Wan is entered between Miya Saki and Takaiwa Hana, about 0.8 mile S of Wakudo Se. The inlet affords almost landlocked anchorage, in depths of 9.2 to 21.9m, soft mud. There is good anchorage for small vessels in most parts of the inlet. Several small towns lie within the bay. A light is shown from Takaiwa Hana.

O Saki (33°29'N., 129°49'E.) is a steep point surmounted by a grassy hill, 86.6m high, and located about 1.3 miles W of Wakudo Se. A reef extends from the point in a NW direction for a distance of about 0.4 mile. Osakino Se, a 4m rocky patch, forms the offshore extremity of the reef.

O Saki to Tsusakino Hana

5.20 **Muku Shima** (33°29'N., 129°47'E.) lies in the approach to Hibi Suido, and about 1.5 miles W of O Saki. The summit of the island is partly wooded and lies on its S end. The island is surrounded by foul ground and above-water rocks. Aka Se, a reddish brown islet, 11m high, lies about 0.8 mile SSE of Muku Shima. A detached rock, with a depth of 1.8m, lies 0.1 mile ENE of Aka Se.

Ki Se, about 0.3m high, lies about 0.5 mile ENE of Aka Se and is usually marked by breakers. The rock is marked on its W side by a lighted buoy. A light is also shown from the summit of Muku Shima. Submarine cables are landed on the SE side of Muku Shima.

Hibi Suido lies between the NE side of Taka Shima and the mainland, and is approached between Ao Saki and O Saki, about 2 miles to the NE. Several points on either side of the channel are fringed with reefs that dry out. Owing to the dangers between Muku Shima and the mainland, vessels using this channel should pass between Muku Shima and Taka Shima. Daziku Ura, on the E side of the N end of Hibi Suido, is entered S of Kondomari Hana, a point about 1 mile S of O Saki. Mo Se, a rocky spit on which lies a rock, awash, extends about 0.3 mile SW from Kondomari Hana. A bridge, with a vertical clearance of 27m, crosses Hibi Suido; bridge lights are exhibited.

Daziku Ura affords anchorage, sheltered from all except NW winds, in depths of 10.1 to 18.3m, mud.

The depths in Hibi Suido are sufficient to accommodate deep-draft vessels, but passage should not be attempted without local knowledge.

5.21 **Taka Shima** (33°26'N., 129°45'E.) is the largest of the islands in the entrance of Imari Wan; Ao Saki, its N extremity, is located about 1.5 miles SW of the light on Muku Shima. The island is fringed by shoals and foul ground, and is indented with a number of bays and inlets.

Kuro Shima lies about 1.5 miles WSW of Ao Saki. The island is flat-topped, its summit is 95m high, and wooded. The island is fringed with foul ground, close offshore, except from the N to E, which is clear of danger. Hitotsu Se, marking the E extremity of the island, is a rock that dries 2.7m. Kuroshima Seto, the channel between Kuro Shima and Taka Shima, is mostly foul and not recommended without local knowledge.

Submarine cables are laid from Taka Shima to Kuro Shima. Special lighted buoys are located 0.75 mile E and 0.75 mile SE of the S extremity of the island.

Uokono Shima (33°25'N., 129°43'E.), lying close off the SW corner of Taka Shima, is fringed by a shoal bank extending about 0.1 mile offshore. A light is shown from its summit.

Izu Shima, 31m high and wooded, lies about 1 mile NW of Uokono Shima. The islet is fringed by a shoal bank and spit, with a depth of 3.1m over its extremity, and extends about 0.2 mile E from its E end.

Ao Shima (33°25'N., 129°41'E.), the W island in the approach to Imari Wan, is located about 0.5 mile S of Izu Shima. Its summit, 58m high, is at its S end. The island is rugged, thickly wooded, and foul on its W side for 0.15 mile offshore. The NE side of the island is foul offshore for almost 0.5 mile.

Tsusakino Hana, the N extremity of the Hoshika peninsula, lies on the S side of Tsusaki Suido, and about 1 mile SW of the summit on Ao Shima. A light is shown from the point.

Imari Wan

5.22 **Imari Gaiwan** (33°23'N., 129°44'E.) is the outer and larger part of Imari Wan. The safest channels to enter the bay are Ao Shima Suido and Tsusaki Suido. The bay is indented with a number of inlets and coves. Small towns and villages situated throughout the shores of Imari Gaiwan. The bay is deep and fairly free of dangers.

Futa Shima, the W islet, is in two parts, connected by a bank of gravel and sand that dries. Both parts are thickly covered with trees and lie about 1.3 miles SE from the S end of Taka Shima.

Tobi Shima (33°24'N., 129°47'E.) is the E and largest of the islets, and lies about 1 mile E of Futa Shima. It has two summits, the higher, with an elevation of 84m, stands on the SE side of the islet.

Two submarine cables and a submarine water pipeline cross the fairway between Tobi Shima and the mainland S.

Ko-Tobi Shima is the S islet of the group and lies close S of Tobi Shima. The channel between the two islets is shoal.

Yama Shima (33°24'N., 129°47'E.) is the N islet and lies almost 0.5 mile NNW of Tobi Shima. Rocky shoals extend about 230m to the N and SE of the islet.

Fuku Shima, a large island, separated from the mainland by a tortuous channel on its E side, lies about 1 mile E of Tobi Shima. The coves on the NE and SE sides of the island are obstructed by islets, reefs, and shoals, and are only used by small

craft with local knowledge.

Imari Ko is entered between Kanai Hana, on the mainland, and the W side of Fuku Shima, and lies in the S part of Imari Wan. A shoal bank extends, in places, about 0.3 mile from the W side of the harbor, and on the E side of the central part of the harbor there are a number of islets and rocks. The head of the harbor is shoal.

5.23 Imari (33°17'N., 129°53'E.) (World Port Index No. 62400) contains three offshore mooring buoy berths, with depths of 10.1 to 14m; the greatest capacity is at Buoy No. 3.

Depths—Limitations.—The controlling depth in the channel is 14m.

Vessels with a draft of 12m and up to 60,000 dwt have moored in Imari Ko.

Kubara North Quay, on the SE side of reclaimed land S of the basin, has depths of 7.1 to 10.1m alongside.

A small basin lies between Kubara North Quay and Kubara South Quay. There are three berths, with depths of 5.5 to 10m alongside, at Kubara South Quay.

The Kyushu LPG Terminal has a depth alongside of 14m; vessels of up to 70,000 dwt can be accommodated.

An overhead power cable, with a vertical clearance of about 52m, spans the water W of the reclaimed area.

Pilotage.—Pilots are compulsory for vessels over 10,000 gt and board in position 33°26.5'N, 129°42.7'E and at the quarantine anchorage. Pilots can be contacted on VHF channel 16.

Anchorage.—Imari Wan affords good anchorage to a large number of vessels, in depths of 14.6 to 36.6m, as convenient. The bottom is mostly mud, and the tidal currents do not exceed 0.5 knot.

The quarantine anchorage lies on the W side of Imari Ko. The harbor affords good anchorage, in depths of 9.2 to 18.3m, mud.

Caution.—A wreck lies about 0.5 mile S of Siraiwa Hana.

Tsusakino Hana to Ushigakubi

5.24 Nagato Saki (33°22'N., 129°37'E.) is located 3 miles SW of Tsusakino Hana and forms the W entrance point to Kamada Ura. The point is steep-to and backed by high hills; its shores are fringed by shoal water, close offshore.

Kamada Ura is entered between Nagato Saki and Magari Saki, the SE extremity of Yoko Shima, about 0.8 mile WNW. Shoal spits, with depths of less than 5.5m, extend about 0.2 mile SE from Magari Saki and ENE from Nagato Saki.

Kamada Ura affords good anchorage, sheltered from all winds, in depths of 9.2 to 12.8m. A vessel entering must keep in mid-channel between Magari Saki and the shore SE of it to avoid the shoal spits extending offshore on either side of the entrance. This anchorage is suitable for vessels awaiting the tide in Hirado Seto, or arriving from N too late to complete the passage of that strait in daylight hours.

Yoko Shima (33°22'N., 129°36'E.), a flat islet, 19m high, lies about 1 mile WSW of Nagato Saki. The channel between the islet and the mainland is very shoal.

Ose Saki is a prominent hill located about 1 mile WSW of Yoko Shima. The bay on its E side is foul and unsuitable as an anchorage.

Ushigakubi (33°22'N., 129°34'E.) is 42m high, wooded, and lies about 0.5 mile WSW of Ose Saki. The point is fringed by foul ground close to shore. A lighted buoy marks the W side of the foul ground. During the S tidal current, tide rips are usually formed close N of the point. Kamo Se, marked by a lighted buoy, dries 1.2m, and lies on a shoal spit that extends about 320m NE from Ushigakubi.

Hiro Se (33°23'N., 129°34'E.), a rocky islet, 7.6m high, lies about 0.2 mile N of Ushigakubi. A training wall extends for about 160m from the SW point of the islet and is marked by a light. A light is also shown from the center of Hiro Se.

Caution.—A restricted area 0.7 mile WNW of Hiro Se Light extends about 3 miles NNW; its exact boundary may best be seen on the chart.

Hirado Seto

5.25 Hirado Seto lies between the island of Hirado Shima, on the W side, and the coast of Kyushu, on the E side. It is recommended that vessels without local knowledge navigate the straits during daylight hours. The N end of the straits is very narrow, only 0.1 mile wide near Hiro Se. The tidal currents in this area are very strong and reach up to 6 knots or more at times.

Pilotage.—A number of unlicensed pilots, who have a good knowledge of the tidal currents, are based at **Hinoura** (33°22'N., 129°35'E.), situated on the E side of the strait near its narrowest part.

On the N part of Hirado Seto, **Kuroko Shima** (33°22'N., 129°34'E.), a dark wooded islet, 47m high, lies in the middle of the strait, close off the entrance to the port of Hirado. Manaita Se, with depths of 3.7 to 5.5m, extends about 0.1 mile NE from the islet.

Hirado Ko is a small cove on the W side of the strait and entered between Kanae Saki and Zyotono Hana (Jotono Hana), about 320m to the N. A wharf, which extends about 90m NW from the shore, with depths of 2.1 to 3m alongside its outer face, is situated on the S shore of the cove. There is a small harbor protected by N and S breakwaters S of Kanae Saki. Reclamation was being carried out inshore of these breakwaters. Two small piers project from the N side of the cove. The town of Hirado is situated at the head of the harbor.

Nanryu Saki (33°21'N., 129°34'E.) lies on the W side of the strait, about 1 mile SE of Hirado Ko. Two overhead cables, with a vertical clearance of 26m, cross the straits from the point. A bridge, with a vertical clearance of 30m, spans the strait close S of the cable crossings.

Asama, a sand bank with a depth of 2.1m, lies in mid-channel, about 0.8 mile SSW of Nanryu Saki. There is a deep channel on either side of Asama. A lighted buoy marks the N end of the bank.

Caution.—A rocky reef, with a least charted depth of 9m, lies near the middle of Hirado Seto, approximately 0.2 miles N of Nanryu Saki.

5.26 Osaki Hana (33°20'N., 129°33'E.) lies on the W side of the strait, about 2 miles SSW of Nanryu Saki. The point rises to a hill, 53m high, the summit of which is densely-covered with trees and is very prominent.

Aosa Saki lies on the mainland and is 0.5 mile directly E of Osaki Hana. The point rises to a plateau and is marked by a light. The village of Hokahira lies close S of the light.

Kawachi Wan (33°19'N., 129°32'E.) lies on the W side of the strait and is entered between Osaki Hana and Magari Saki, about 0.5 mile SSW. The bay affords anchorage, in 12.3 to 27.4m. This anchorage is specially suited to vessels waiting for the tide in the N narrows or seeking temporary shelter.

A breakwater, on which there is a light, is situated in the NW part of Kawachi Wan.

On the S part of Hirado Seto, Hoki Ura and Kigatsu Ura, 1 mile to the S, are two bays on the W side. Kantori Hana, 118m high, separates the two bays. Two islets, No Shima and Kuro Shima, lie close S and E, respectively, from Kantori Hana. Small vessels with local knowledge can obtain anchorage, in depths of 7.8 to 10.1m, mud, near the head of Kigatsu Ura.

Emukae Wan (33°18'N., 129°36'E.) lies on the mainland about 3 miles E of Hoki Wan. The bay affords anchorage to vessels with local knowledge, in depths of 10.1 to 18.3m, mud, good holding ground. The anchorage is sheltered from all winds except those from the W.

Between Emukae Wan and Taka Shima, about 8 miles to the S, the E shore of Hirado Seto is fringed with a large number of islets, off and between which are numerous dangerous rocky patches. The whole area should be avoided while navigating the strait.

Between Kigatsu Ura and Shijiki Saki, about 10 miles to the SW, the W shore of Hirado Seto is fairly free of dangers. There are a number of small coves, but none are suitable as anchorages.

5.27 Otona Se (33°13'N., 129°31'E.), a rock, awash, lies about 3 miles SSE of Kigatsu Ura in the middle of Hirado Seto. A lighted buoy marks the N end of Otona Se. Kami Kareki Shima, an islet, lies about 0.5 mile S of Otona Se. Shimo Kareki Shima, a larger islet, lies 0.5 mile SSW of Kami Kareki Shima. Both islets are fringed by shoals and rocks. Passage between the two islets should be avoided. A light is shown from the S end of Shimo Kareki Shima.

Kome Se (33°11'N., 129°29'E.) lies about 1.3 miles SW of the light on Shimo Kareki Shima and has a depth of less than 0.3m. Kome Se is marked by a lighted buoy moored close S. A 10.6m rocky shoal lies about 0.3 mile WSW of Kome Se; depths of as little as 7.5m extend 0.5 mile NE of Kome Se.

Hoageno Se (33°07'N., 129°25'E.), a detached rock, which from a distance resembles a boat under sail, is 25.9m high and lies about 3.5 miles SE of Shijiki Zake. It is steep-to, except on its NW and SW sides, where a shoal bank extends out from the rock for about 0.1 mile.

Kuro Shima lies about 2.3 miles SW of the S end of Taka Shima. Mezeno Hana is a prominent bluff that is connected with the W end of the island. I Shima lies 2 miles NNE of Mezeno Hana. A number of rocks and shoals lie between the two places. Konoko-jima lies about 0.5 mile E of I Shima, with shoal water between the two islets. A light is shown from the NW side of Kuro Shima.

Ogami Shima, Taka Shima, Nakano Shima, and Kashiraga Shima are a chain of islets lying close offshore from the SW coast of Hirado Shima. At times, heavy rip tides are formed in the vicinity of the islets. A light is shown from Ogami Shima.

Shijiki Wan (33°12'N., 129°23'E.) is entered between Meshika Saki and Aiba Saki, and lies 1 mile SE of Kashiraga Shima. The bay affords good shelter, except from winds between the WNW and NW; in winter the bay is unsuitable as an anchorage. Vessels with local knowledge can obtain fairly good anchorage, in a depth of 7.3m, sand, at the head of the bay.

Shimo-Ajika-jima and Kami-Ajika-jima are two prominent, rocky islets lying off the approach to Shijiki Wan. A rock, 22.9m high, lies close off the W side of Shimo-Ajika-jima. There are no known dangers more than 0.1 mile off either islet.

5.28 Hayafuku Se (33°14'N., 129°23'E.), a group of above-water and sunken rocks, the highest above-water rocks being 2.4m high, lies on a shoal about 1.8 miles ESE of Shimo-Ajika-jima.

Tateba-jima, a comparatively steep-to islet, 67m high, lies about 4.5 miles NE of Kami-Ajika-jima. Betto Se, in the approach to Neshiko Wan, is a steep-to rock, with a depth of 8.5m, and lies about 1 mile NW of Tateba-jima.

Neshiko Wan (33°18'N., 129°26'E.) lies about 1 mile ENE from Tateba-jima, and is exposed to the W, but with offshore winds it affords anchorage, in depths of 9.2 to 18.3m.

Along the NW side of Hirado Shima lies Yobu Saki, located about 3.3 miles NE of Betto Se. The point is dominated by Yasuman Dake, a densely-wooded hill with a black appearance.

Tatsuno Seto (Ikitsuki Seto) (33°21'N., 129°26'E.) is frequently used in preference to Hirado Seto. Yobu Saki, on the E side of the channel, is comparatively steep-to, but the shoal water extending from Shiomi Saki, on the W side of the channel, reduces the navigable width of the channel to about 0.3 mile. A bridge, with a vertical clearance of 29m, crosses the narrowest part of Ikitsuki Seto.

Juga Zone, with a depth of 9.2m, rocks, lies 0.5 mile offshore, about 2 miles ENE of Yobu Saki. Zuda Sone, with a depth of 11.6, lies about 0.3 mile NE of Juga Zone.

Hira Se (33°22'N., 129°30'E.), 1m high, is the outermost of a chain of rocks that extends about 0.3 mile NW from the coast to a position about 0.5 mile SW of Kaise Saki. A submarine water pipeline extends 0.8 mile W from the coast, about 7.5 miles SSW of Kaise Saki. Bishago Iwa, 9.8m high, lies in the SW part of this chain.

Usuka Wan is entered between Nagasaki Hana and Kaise Sake, about 0.5 mile NE of Hira Se. A lighted buoy marks a dangerous rock 0.6 mile SE of Nagasaki Hana. Another lighted buoy is moored close SW of a 4.5m patch, 0.25 mile E of the above. Ebukuro Wan (Furue Wan), the S branch of the bay, is entered between a point about 0.5 mile ESE of Kaise Sake and Sakiyama Saki, about 0.3 mile farther ENE. Usuka Wan affords shelter to small vessels with local knowledge near its head. The bay has a number of shoals, rocks, and patches of foul ground that can best be seen on the charts. Ebukuro Wan affords good anchorage, in depths of 18.3 to 27.4m, good holding ground, and free of off-lying dangers.

5.29 Tsuba Saki (33°24'N., 129°33'E.), the N point of Hirado Shima, lies about 1.5 miles NNE of Usuka Wan. The point is backed by Shira Take, a hill with two summits; the higher is 259m.

Aspect.—Ikitsuki Shima is a hilly island with Shiomi Saki, its SE extremity, about 0.3 mile NW of Yobu Saki, and between these two points is Tatsuno Seto. Ban Take, the summit of the island, lies near its center and is 288m high, steep-to, and prominent. Lights are shown from Shiomi Sake on the SE coast, Ichibi Ura Breakwater on the E coast, and from Otaka on

Sasebo

the N end of the island.

Nakaeno Shima (33°22'N., 129°28'E.) is a rocky islet, 35m high, lying about 1.8 miles NE of Yobu Saki. Hira Se, 5.8m high, lies 0.25 mile N of the islet's NW point; midway between this rock and the point is Kui Se, a rock that dries 1.2m.

Taku Shima lies with Sakiseno Hana, its E extremity, about 2 miles NNW of Tsuba Saki. The island is hilly, with a few scattered trees on its slopes. The NE and NW sides of the island are comparatively free of off-lying dangers, but from the E to SE, it is mostly foul. Yoko Shima lies about 0.8 mile off the SE side of the islet. A light is shown from the S end of Yoko Shima.

O Shima (33°29'N., 129°33'E.) is mostly a cliffy island and lies about 1.5 miles to the N of Taku Shima. A submarine cable is laid from O Shima to the NE coast of Taku Shima. The highest hill, Hirano Tsuji, rises to a height of 216m, and is located near the NW coast of O Shima. O Shima is generally free of offshore dangers, except for a rock, Kai Se, lying about 0.5 mile off the NW coast, and Tako Se, with a depth of 4.9m, lying about 0.5 mile off Tsurunosagari Hana Light, on the SE side of the island. Lights are also shown from Umanokashira Saki, Nagasaki Hana, and Magari Saki.

Gono Ura, on the NE side of the island, affords sheltered anchorage in moderate depths to vessels with local knowledge, except during N winds. Azuchi Ura, on the SW side of the island, also affords shelter to small vessels.

Amoura Wan to Sasebo Wan

5.30 Amoura Wan (Aiura Wan) (33°10'N., 129°38'E.) is entered between Tatseishi Saki, about 2.8 miles NE of Ushigakubi Saki, and O Saki, about 1.3 miles SSE. The approach to the harbor is marked by lighted buoys. The harbor stands on the E side of the head of the bay with six berths for vessels of 100 to 2,000 gt and with depths of 3.1 to 7.5m. There is sheltered anchorage, in a depth of 10.1m, in the middle of the bay. No pilots are available. A charted submarine water pipeline is laid W from Amoura Ko to Taka Shima.

Kujukushima Wan lies about 1 mile SE of Amoura Wan. The narrow channels in the bay are marked by beacons, but only vessels with local knowledge should enter Kujukushima Wan. A submarine cable from Okinawa lands in the N part of Kujukushima Wan, 0.6 mile E of O Saki. Uki Se, 13.7m high, lies on a shoal marked by a beacon, and stands 1.25 miles W of the entrance to Kujukushima Wan.

Tategami Piers No. 1 and No. 2

Nakano-Kajikaki (33°07'N., 129°39'E.), with a depth of less than 1.8m, lies about 2.3 miles S of the entrance to Kujukushima Wan, and about 0.1 mile to the SW of it lies Okino-kajikaki, with a depth of 4m. A buoy is moored off the W side of these dangers.

Kogo Saki (33°06'N., 129°40'E.) is the W entrance point to Sasebo Wan, and lies about 0.8 mile SSE of Nakano-Kajikaki. A light is shown from the point and buoys mark the shoal area, close off the point. The harbor entrance control post and signal station stands on Kogo Saki.

Shira Se is a group of above-water and sunken rocks lying about 2 miles WSW of Kogo Saki. A light is shown from the N rock of the group.

Nakano Se (33°05'N., 129°39'E.), a detached rock with a depth of 2.1m, lies at the SE end of a rocky patch which lies 0.6 mile SE of Shira Se. A buoy marks the SE end of Nakano Se.

Araidashino Se, with a depth of 12.8m, lies in the fairway entrance to Sasebo Wan, about 0.4 mile SSW of Kogo Saki. A buoy marks the W side of Araidashino Se.

Sasebo (33°10'N., 129°43'E.)

World Port Index No. 62380

5.31 The port of Sasebo is a large, nearly landlocked, deep water harbor, entered between Kogo Saki and Yorifune Bana, about 0.5 mile to the ESE. The harbor affords anchoring and berthing facilities for vessels of almost any size.

Sasebo—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Maebata Terminal			
No. 1	312m	—	Sand and bunkers.
No. 2	—	—	Animal feed and grain.
No. 3	—	13.0m	Animal feed and grain. Maximum size of 40,000 dwt.

Sasebo—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
No. 4	—	13.0m	Cruise vessels and project cargo.
Sasebo International Passenger Terminal			
Muira Berth	286m	10.0m	Cruise vessels and bunkers.
New Minato Berth	220m	7.5m	Cruise vessels and bunkers.
Tategami			
No. 3	182m	11.3m	Project cargo and bunkers. Combined use by US Navy and heavy industry.
No. 4	192m	11.4m	
No. 5	192m	10.7m	
Sasebo U.S. Military Oil Storage Terminal			
Yokose	80m	13.7m	Aviation fuel, DDP, and bunkers.
U.S. Navy Azaki Terminal			
Iorizaki	81m	14.5m	Aviation fuel and DPP. Maximum draft of 9.7m. Maximum loa of 250m.
US Navy Fuel Center Akasaki Terminal			
Akasaki -1	176m	11.6m	Aviation fuel, DDP, and bunkers.
Akasaki -2	176m	11.4m	CPP.
Akasaki -3	176m	12.2m	CPP.
Motofune	80m	10.5m	Aviation fuel, CPP, DPP, and bunkers. Maximum loa of 183m.
Motofune	80m	9.8m	Aviation fuel, CPP, DPP, and bunkers.

Winds—Weather.—North winds prevail throughout the year however, S winds occur during the summer. High and low temperatures occur in August and January. Precipitation, which may restrict visibility, is reported year round, however, it has a higher rate of incidence during June and July, with over 350mm recorded in the latter month. Fog seldom occurs in Sasebo Wan, but light snow may fall during winter months.

Weather signals, by given by light, are shown continuously from the radio tower of the Maritime Safety Office on the E side of the head of the harbor.

Vessels equipped with radiotelephones will guard voice radio circuit 2716 kHz continuously when winds of more than 30 knots are experienced.

Tides—Currents.—The MHW interval at Sasebo Wan is 8 hours 21 minutes; spring tides rise 2.9m and neap tides rise 2m.

The flood tidal current off **Io Saki** (33°07'N., 129°43'E.) sets toward the head of the harbor, and the ebb tidal current sets toward the entrance; the flow begins from 1 to 2 hours after HW or LW, and the rate does not exceed 0.5 knots. Off Kuchiki Saki, a SE current flows from 2 to 3 hours after LW, to 2 to 3 hours after HW, and a NW current flows from 2 to 3 hours after HW, to 2 to 3 hours after LW. The rate of the SE current seldom exceeds 0.5 knot, but the NW current sometimes attains a rate of more than 1 knot.

Depths—Limitations.—Vessels having a deep draft of up to 11.5m can be berthed alongside. Vessels with drafts up to 12.8m can be accommodated at the mooring buoys and dolphin berths. The length of a vessel is not a controlling factor at most moorings; however, the largest vessel accommodated had a length of 341m.

For detailed berthing information see table titled **Sasebo—Berth Information.**

Aspect.—Kompira Yama, a 101m summit above Yorifune Bana, the S entrance point of Sasebo Wan, is conspicuous from a W approach. Shokan Dake, a mountain peak, 443m high, lies 1.75 miles N of the city. Kokuzo Yama, a conspicuous peak, 307m high, lies about 3 miles SSE of Kompira Yama.

Benten Shima (33°09'N., 129°43'E.), a rocky islet, rises from a drying reef lying about 0.5 mile W of the entrance to Maehata Ura. Benten Shima is marked at its S end by a light.

Navigation aids mark the fairway from the entrance and the channel leading to the port. Most shoals and dangers are marked by beacons and lighted buoys.

A tower, 170m high, stands at the summit of Tenzin (33°09'N., 129°44'E.), which rises to an elevation of 120m between Sasebo and Nagasaki.

Pilotage.—Pilotage is compulsory for vessels over 300 gt. Vessels should notify the pilot station of their ETA at least 24 hours prior to arrival and of any subsequent change. The pilots board vessels 2 miles WNW of Kogo Saki Light. Pilots may also be dispatched from Akasaki helicopter pad.

Sasebo Pilot Association	
Telephone	81-956-22-9059
	81-956-22-9068
Facsimile	81-956-25-1508

Sasebo Pilot Association	
Boarding Point	2 miles WNW of Kogi Saki Light. The pilot may get on board around the entrance of the port when the weather is stormy. In this case, vessel will be notified by VHF.
Remarks	1. The pilot gets on board at the lee side of the vessel. 2. Pay attention to the signals provided by Koga Saki Signal Station and lower the speed in advance upon receiving a signal about leaving a port.

It has been reported pilots will only board during daylight hours, except during an emergency. Entry and departure for all vessels, except U.S. Navy vessels, is from sunrise to sunset, except during an emergency. Pilots board inbound vessels 2 miles WNW of Kogo Saki. During stormy weather, there are occasions when permission is granted through the Kogo Saki Signal Station to proceed into the harbor without a pilot.

Regulations.—In addition to the regulations governing all Japanese ports, the following are excerpts from those applying particularly to Sasebo Wan:

1. Vessels must not exceed a speed of 10 knots in the vicinity of Sasebo Wan, within a line of bearing joining Bansho Wan, about 0.5 miles S of Kogo Saki, with Shira Se Light and Hichiro Bana, a rounded point lying 1.75 miles NNW of Kogo Saki.
2. Vessels are to await instructions from the harbormaster outside Kogo Saki, clear of the fairway. Kogo Saki Signal Station acknowledges a vessel's distinguishing signal in the International Code.
3. Vessels of 500 gt or more will use two anchors when anchoring in Area No. 1 of the harbor.

Signals.—The harbor control post and signal station are situated on Kogo Saki. Vessels entering Sasebo Wan must request permission prior to entry. The signal station will relay the instructions of the harbormaster as to anchoring, berthing, and movements of vessels in and out of port. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate answering signals, and other local or specific regulations.

The following traffic control signals are shown from the signal station on Kogo Saki, as follows:

1. A white flashing light every 2 seconds—
   a. Inbound traffic permitted.
   b. Outbound traffic of less than 500 gt permitted.
   c. Outbound traffic of more than 500 gt must wait, clear of the fairway.
2. A red flashing light every 2 seconds—
   a. Outbound traffic permitted.
   b. Inbound traffic of less than 500 gt permitted.
   c. Inbound traffic of more than 500 gt must wait, clear of the fairway.
3. A white flashing light, alternating with a red flashing light every 3 seconds—
   a. Inbound and outbound traffic of less than 500 gt permitted.
   b. Inbound and outbound traffic of over 500 gt must wait, clear of the fairway.
4. Three red flashing lights, alternating with three white flashing lights every 6 seconds—
   a. Only ships directed by the harbormaster may enter or leave the harbor.
   b. All other vessels must wait, clear of the fairway.

Kogo Saki Signal Station	
E	Anchor W of Kuchiki Saki.
F	Anchor in Ebisu Wan.
G	Anchor near Taka Shima.
H	Wait near Kogo Saki or anchor 3 miles off Kogo Saki to wait for a berthing signal or orders.
Q	Anchor in Quarantine Anchorage.

Berthing signals, consisting of the Designation flag and alphabetical flags of the International Code of Signals are displayed at Kogo Saki Signal Station, as follows:

The ship's reply is the Answering Pennant above the alphabetical flag for the berth.

Contact Information.—See the table titled **Sasebo Pilots—Contact Information**.

Sasebo Pilots—Contact Information	
Pilots	
VHF	VHF channels 14 and 16
Telephone	81-956-22-9059
Facsimile	81-956-25-1508
Port	
Telephone	81-956-226-127
Facsimile	81-956-232-370
E-mail	kookanri@city.sasebo.lg.jp

Anchorage.—Anchorages comprise 11 mooring buoys for commercial shipping and 109 buoys used by the U.S. Navy.

The outer harbor is the principal anchorage. It affords protected anchorage, in 9.2 to 50m, mud and shells, good holding ground. The inner harbor affords safe anchorage for large vessels. There are depths of 51m at the harbor entrance, 22.9 to 54m in the passage, 10 to 37m in the anchorage, and 11m at the berthing spaces. Apart from anchorage areas controlled by the U.S. Navy, there is anchorage for four 10,000 gt commercial ships in Section No. 3, in a depth of 10.1m. A large number of vessels can be berthed at anchor, and at fixed or free swinging moorings. For further U.S. Navy Anchorage information refer to DNC H2362380.

Ebisu Wan affords good anchorage, in 10m, mud and shells. Akuno Ura and Ushino Ura afford anchorage to small vessels.

The anchorage is situated on the S side of Sasebo Wan, close E of Yorifune Saki. Inbound vessels, subject to quarantine, will remain in the anchorage and are forbidden to disembark passengers

Sasebo Kawa, Kujirase, and Hirase Wharves

or crew or to load or discharge cargo. Vessels will shift to the general anchorage immediately after pratique is granted. Only vessels seeking quarantine shall use this anchorage.

An anchorage for carrying explosives is situated about 0.8 mile SSE of Iori Saki, and a mooring buoy for their use is situated 1.1 miles E of the point.

A prohibited anchorage and restricted area, where vessels with a draft of 10m or more may not navigate, lies within a radius of 250m of a dangerous wreck which lies 1.5 miles E of Yorifune Saki on the S side of the fairway. The wreck is marked on its E side by a buoy.

Directions.—It is recommended that large vessels pass to the S of Aradshino Se on entering Sasebo Wan and to the N of Aradshino Se on their exit.

Caution.—It has been reported that when rounding Iorizaki Wharf and proceeding to anchorage, extreme caution needs to be taken because numerous ferry boats transit the area.

Omura Wan and Approaches

5.32 Omura Wan, a landlocked gulf, lies SE of Sasebo Wan and can only be entered through that port.

Hario Seto and Haiki Seto, SW and NE, respectively of Hario Shima, are the channels leading to Omura Wan, but the latter is only a small craft channel. Hario Seto is deep, but is tortuous and barely more than 0.1 mile wide; the tidal currents in it are strong and it should only be used by moderate size vessels with local knowledge.

An overhead cable, with a vertical clearance of 20.1m and a bridge, with a vertical clearance of 21.3m, cross Hario Seto near its S end.

Omura Wan affords anchorage, in 12.8 to 20.1m, mud, over the greater part of its length and breadth.

Kogo Saki to Kabuto Shima

5.33 Omodaka Ko (33°04'N., 129°40'E.) is entered between Bansho Hana and Matsuyama Saki, and lies about 1.5 miles S of Kogo Saki. The inlet affords anchorage to small vessels, in depths of 7.3 to 20.1m, mud and good holding ground, but local knowledge is essential. The town of Omodaka lies on the N side of the head of the inlet.

Kuroguchi Ura, close S of Omodaka Ko, affords temporary anchorage to small vessels, in depths from 7.3 to 20.1m, mud, but the shelter afforded is inferior to that of Omodaka Ko.

Yobukono Seto (Terashima Suido), a strait about 3.5 miles long and about 0.4 mile wide, is entered between Matsuyama Saki and Kiano Se on its N end. The S end of the strait is entered between Kabuto Shima and Nanatsugama Ko. A depth of 14.6m can be carried through Yobukono Seto. In its narrowest part the fairway is about 0.1 mile wide. A bridge with a vertical clearance of 32m crosses the strait.

Tenzin Tower

Otawa Wan lies about the middle of the E side of Yobukono Seto, 1 mile ESE of Kurose Wan. The bay affords good anchorage, in depths from 8.2 to 17.4m.

Kurose Wan (33°03'N., 129°38'E.) lies on the W side of Yobukono Seto, about 1.5 miles SW of Kuroguchi Ura. The small coaling harbor of Magome Ko lies in the SW part of Kurose Wan. Two small piers in Magome Ko have depths of 6.1 and 7m alongside, respectively; they can accommodate vessels of about 2,000 gt. Buoys and beacons mark the fairway and dangers to the harbor.

5.34 Tera Shima (33°02'N., 129°38'E.), on the W side of Yobukono Seto, lies close off the E side of O Shima, and a narrow channel between them is obstructed by reefs; it is spanned by two overhead cables, with a minimum vertical clearance of 10m. A bridge, with a vertical clearance of 14m, spans the channel close S of the S cable. A lighted beacon is shown at the NE end of the reef.

Kabuto Shima, a prominent round-topped rock, 14.6m high, lies about 0.8 mile S of the S end of Tera Shima. A shoal bank extends 0.1 mile E and 0.15 mile N of the rock. A light is shown from Kabuto Shima.

O Shima (33°02'N., 129°37'E.) lies close W of Tera Shima and is separated by a narrow channel, used only by small craft with local knowledge. Sunken rocks fringe both the N and S coasts of the island and should be given a wide berth. The E coast is indented and on this side lies Tokuman Wan and Kurose Wan, on its S and N parts, respectively. On the W side of the island is Oshima Ura. Uri Dake, almost in the middle of the island, attains a height of 209m and is prominent.

Oshima Shipbuilding (33°03'N., 129°38'E.), with four prominent orange gantry cranes, is a medium-size shipyard on the E side of O Shima. This yard specializes in dry bulk vessels. Vessels nearing completion moor on the SE side of the facility, with 534m of berthing.

Kakinoura Shima lies close SW of O Shima and is connected by a causeway. The island is fringed by foul ground and indented with a number of small coves and inlets. The town of Sakito stands in the middle of the island.

5.35 Sakito Ko (33°01'N., 129°34'E.) is a local port on the W coast of Kakinoura Shima, about 7 miles SW of Sasebo Ko. Sakito Ko was developed as a coal shipping port, but the Sakito coal mine has since been closed down. Vessels of about 2,000 gt now call at the port's cement and salt factories. The inner harbor splits into three branch bays; these are called, from the W, Kaki-no-Ura, Fuku Ura, and Mizu-no-Ura.

Depths—Limitations.—Sakito Ko has five berths and three pontoons for coal cargo. The five berths have a total length of 728m, with depths alongside of 6 to 8.2m. The three pontoon berths have a total length of 73m for lighters and barges with drafts of up to 4.3m. Berth 2, Berth 3, and Berth 4 are equipped with conveyors.

Aspect.—The National Hostel, which is near the mountain summit in the W part of Sakito Shima, which also has a large white painted chimney, and three black painted tanks which are on the summit of the mountain, are all good landmarks.

Pilotage.—Pilotage is available and can be contacted on VHF channels 12 and 16 (call sign: Sakito-ho-an).

Anchorage.—Anchorage can be obtained in the outer harbor, in about 18.3m, SW of Mutashima and N of the fairway indicated by the Hukuura Range Lights. A better position, in about 25.6m, sand, lies close N of the fairway indicated by the Hakuura Range Lights and E of a line of bearings between Mitokono Hana and Tsuru Saki. Caution is needed in the latter position because of strong S ebb tidal currents. In the autumn, it would probably be advantageous to anchor farther E.

Anchorage, sheltered from the strong NW winds in winter, can be obtained, in about 32.9m, E of Imo Shima and S of the above mentioned 88.1m chimney. Imo Shima is a group of rocky islets, the highest of which is 9.8m high, that lie on foul ground within a 0.5 mile S of the SW extremity of Kakinoura Shima.

5.36 Sakito Shima (33°00'N., 129°33'E.), 76m high, with Mitoko Shima, 48m high, W of it, lies on a shoal that extends about 1.3 miles WNW from the SW end of Kakinoura Shima. Close to the SW end of Sakito Shima stand three radio towers and a light is shown from the W side of Mitoko Shima.

Kata Shima, about 1.5 miles off the middle of the NW coast of O Shima, is 99m high, and has a steep cliff on its S side, about 0.1 mile from the foot of which is a rock, 2.1m high. Sunken rocks lie within 0.1 mile of the SE and NE sides of the islet.

Kanise Shosho (33°05'N., 129°36'E.) are extensive reefs lying NE of Kata Shima. The reefs lie within 1.5 miles of the NW extremity of O Shima. Kanise Shosho is marked by buoys on its E and S sides.

Coastal Features

5.37 Nanatsugama Ura (33°00'N., 129°39'E.) lies about 0.3 mile E of the S entrance to Yobukono Seto. The inlet is entered between Egawano Hana and Nagushi Sake, the N extremity of a narrow island forming the W side of the inlet, about 0.5 mile to the S. Small vessels, with local knowledge, can obtain excellent sheltered anchorage, in depths of 5.5 to 14.6m, in the N part of Nanatsugama Ura. A submarine cable is landed on the E shore of the inlet near the entrance.

Ko-jima, an islet 22.9m high, lies about 1 mile S of the entrance to Nanatsugama Ura. Ono Hana rises steeply to Taka-bo

Yama, a prominent 232m conical hill, 0.75 mile SSW of Ko-jima. Futatsu-Ko-Shima and Bakuwae Shima, both 12.8m high, lie about 1.3 miles S of Ono Hana.

Kurokama Saki (32°57'N., 129°38'E.) lies 0.75 mile S of Bakuwae Shima. The point forms the NE side of Matsushima Suido.

Matsushima Suido lies between the island of Matsu Shima, on the W side and Fuku Shima, Yaki Shima, and the mainland, on the E side. The strait is narrow and tortuous and not recommended; however, vessels finding it necessary to pass through the straits should refer to the courses and ranges indicated on the chart. It has been reported the largest vessel to transit the straits was about 800 gt.

An overhead cable, with a vertical clearance of about 38m, spans Matsushima Suido between the E extremity of Matsu Shima and the W shore of Fuku Shima.

5.38 **Matsu Shima** (32°56'N., 129°37'E.) is flat-topped, well-cultivated, and rises to Tomi Yama, 218m high, in the center of the island. Its S and W coasts are mostly gravel; its several points are fringed by reefs, and within 0.2 mile of its W and S sides are rocks with depths of less than 9.2m. Matsushimano Se, a 2.1m patch, lies close WNW of Matsu Shima.

Matsushima Ko (32°56.2'N., 129°36.5'E.) is a coal harbor on the N shore of Matsu Shima. The harbor entrance is protected on its NW side by an angled breakwater extending 0.4 mile NE from the N extremity of Kushi Shima; a lighted tower stands at its head.

A jetty for the import of coal to the power station is situated S of the angled breakwater. Vessels of up to 60,000 dwt, with a maximum draft of 14m, may berth. The unloading rate is 1,600 tons per hour.

Pilotage.—Pilotage and the use of tugs are compulsory for vessels over 10,000 dwt. The pilot boards in position 32°58.0'N, 129°34.1'E. For vessels of 60,000 dwt and over, three tugs are required; for smaller vessels, two tugs are required.

A signal station is situated about 0.2 mile S of the root of the angled breakwater. There is a mooring buoy in the harbor, about 90m E of the pier head.

Fuku Shima (32°55'N., 129°38'E.) lies on the E side of Matsushima Suido. Yaki Shima lies close off the N end of Fuku Shima; Kashira Shima lies 0.25 mile off the island's S extremity. A light is shown from Kashira Shima. The three islands are all fringed with foul ground and rocks.

Ike Shima, about 2 miles S of Matsu Shima, is a flat-topped island with two high hills on its W side. The N hill is 123m high and forms the summit of the island. A saltwater lagoon lies on the NE side of the island. Four buoys are moored off the lagoon and lead to a small harbor, protected by breakwaters.

Ohiki Shima (32°52'N., 129°34'E.), about 1.3 miles SW of Iki Shima, is 76.5m high, and thickly wooded. About 0.5 mile NE of the islet lies Aino Se, a detached reef with a depth of less than 1.8m over its N end. The channel between Iki Shima and Ohiki Shima is not recommended. O Se, on which are a number of above-water rocks and which is surrounded by sunken rocks, is a ledge that dries and lies within 1 mile NW of the W end of Ohiki Shima. A light is shown from O Se.

Hako Shima, about 1.5 miles SE of Iki Shima, is 52m high, and on its SW side, and separated from it by shoal water, is Ozumo Iwa, a steep, pointed rock, 79m high.

5.39 **Kozumo Iwa** (32°51'N., 129°40'E.), a square rock, 50.5m high, lies about 1.5 miles ESE of Hako Shima.

Konoura Ura, a small bay on the mainland, lies about 2.5 miles ENE of Hako Shima. A long narrow shoal, with depths from 7.3 to 9.2m, lies in the center of the bay. The village of Konoura stands at the head of the bay and is protected by a breakwater.

Shiro Hana (32°50'N., 129°42'E.) is a somewhat salient point that lies 3 miles SSE of Konoura. Hashira Sone, a steep-to detached rock, with a depth of 2.1m, lies about 0.8 mile SE of Shiro Hana.

No Se, a rock 0.6m high, lies about 2.3 miles SE of Shiro Hana. A light is shown from the rock. Mie Ura is entered between No Se and Kagura Shima, 1.5 miles to the SE. The bay has a number of shoals and reefs, therefore, it should not be entered without local knowledge.

Shikimi Ko (Mie-Shikimi) (32°47'N., 129°46'E.), a small fishing harbor protected by a breakwater, lies about 1.5 miles ESE of Kagura Shima. A light is shown from the head of the breakwater. A submarine cable is landed 1 mile SE of Shikimi light.

Fukuda Saki (Hukuda Saki), on the N side of the main approach to Nagasaki Ko, is located about 2.5 miles SSE of Shikimi Ko, and is a precipitous headland faced with a remarkable white cliff.

Fukuda Ura (Hukuda Ura), about 1 mile E of Fukuda Saki, affords good temporary anchorage, in 9.2 to 20.1m, mud, with protection from N and E winds. A pier at the head of the bay has depths of 5.5m alongside its head.

Approaches to Nagasaki Ko

5.40 On the N side of the approach to Nagasaki Ko is Matsu Shima, a small islet, 27 high, which lies about 1.3 miles S of Fukuda Saki. Nakano Shima, 17.1m high, lies about 0.4 mile SE of Matsu Shima, and Shiroga Shima, lies 0.25 mile ESE of Nakano Shima, and is connected to the mainland by a stone embankment.

Kazikake, a reef that dries 0.6m, lies almost 0.5 mile ESE of Shiroga Shima. A lighted buoy is moored about 90m S of Kazikake. Takaboko Shima, 72m high and prominent, lies about 0.4 mile E of Kajikake. Hando Se lies on a small shoal, midway between Takaboko Shima and KoSaki Hana, the N entrance point to Nagasaki Ko. A buoy is moored close S of Hando Se.

Io Shima, Okino Shima, and Koyagi Shima lie, in that order from the W to E, on the S side of the main approach to Nagasaki Ko. A light is shown from the N end of Io Shima. Okino Shima and Io Shima are connected by two bridges. A light is shown from the SE end of Okino Shima.

Onaka Seto separates Okino Shima from Koyagi Shima. An overhead cable, with a vertical clearance of 28m, crosses the strait between the two islands. A bridge with a vertical clearance of about 25m connects Okino Shima and Koyagi Shima. A light is shown from Naginata Saki, the N extremity of Koyagi Kagenoo Shima.

Nagasaki Ko (32°43'N., 129°51'E.)

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5.41 Nagasaki Ko, which is a principal port, is entered between the NW extremity of Koyagi Shima and Kagura Shima. The harbor is large and well-sheltered by mountains; it is comprised of the inner and outer harbors, with berthing and mooring facilities for vessels of almost any size.

Winds—Weather.—With the exception of winds from the S, the harbor is protected from all other winds. The weather does not generally interfere with cargo operations, except during the rainy season.

Tides—Currents.—The MHW interval of Nagasaki Ko is 7 hours 54 minutes; spring tides rise 2.7m and neap tides rise 2.1m.

The height of the water level is affected to a marked degree by seiches, which sometimes cause a variation of as much as 0.9m. A variation of about 2.7m in 20 minutes has been recorded. These phenomena usually occur from late autumn to early spring, but seldom in summer. The most pronounced of these oscillations usually occur when there are two localized areas of low pressure in the vicinity. The periods vary from about 10 to 40 minutes. Prior notifications is not possible at present.

The tidal currents in the entrance and within Nagasaki Ko set inward on the flood and outward on the ebb, turning at the times of HW and LW; the rate does not exceed 0.5 knot.

Depths—Limitations.—The largest quay in the harbor is Matsugae Wharf.

Motofuna Pier, with a lighted tower at its head, extends nearly 0.2 mile W from the shore at the N end of Dejima Wharf. There are berths on the W and S sides of this pier with depths of 5-6m alongside.

Nagasaki—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Kaminoshima Kogojima Terminal						
Kogojima Wharf	275m	7.5m	100m	18.6m	5,092 dwt	Aggregates, sand, and bunkers.
Kogakura Yanagi						
Eastern Berth	—	7.5m	105m	16.0m	5,465 dwt	Breakbulk and bunkers.
No. 1B	270m	12.0m	—	—	30,000 dwt	Containers and bunkers.
No. 2B	185m	10.0m	170m	27.0m	28,208 dwt	Breakbulk and bunkers.
Southern Berth	368m	10.0m	84m	15.0m	3,078 dwt	Aggregates and breakbulk.
Matsugae International Cruise Ship Terminal						
Matsugae Wharf	360m	12.0m	348m	41.0m	14,601 dwt	Cruise vessels and bunkers.
Tokiwa-Dejima Terminal						
Tokiwa Wharf	225m	10.0m	183m	25.0m	4,840 dwt	Cruise vessels and bunkers.
Tanker Terminals						
Daitoh Terminals						
No. 1	—	4.0m	107m	17.0m	6,802 dwt	CPP.
No. 2	—	4.0m	107m	17.0m	6,802 dwt	CPP.
Itochu Enex Terminal						
Itochu Berth	25m	—	75m	12.0m	1,906 dwt	LPG.
Nagasaki						
Hayashikane Oil East	10m	7.0m	106m	17.0m	5,631 dwt	Bunkers and CPP.
Hayashikane Oil West	30m	3.0m	—	—	—	CPP.
Saibu Gas Koe Sanbas Terminal Terminal						
Dolphin Berth	25m	10.0m	—	—	15,000 dwt	LNG. 2 x 15,000 dwt.
Tozia Terminal						
North Berth	10m	3.0m	92m	14.0m	3,508 dwt	CPP.
South Berth	35m	3.0m	92m	14.0m	3,508 dwt	CPP.

The maximum permissible size of a vessel entering the harbor is 366m long, 36.6m breadth, and a draft of 15m. For further berthing information see the table titled **Nagasaki Ko—Berth Information**.

Aspect.—At times, the islands in the approach to Nagasaki Ko do not show up against the background of the mainland and the position of the harbor is not easily made out, but on near approach no difficulty should be experienced.

Hachiro Take (32°40'N., 129°51'E.) is the highest peak on Nagasaki Hanto.

Iwasimi Take, a thickly-wooded hill, rises 167m about 0.3 mile N of KoSaki Bana, the W entrance point of the inner harbor. The hill is conspicuous from a distance.

The flagstaff of a signal station on the E side of the entrance to the inner harbor is marked by a light at night, and forms a good mark for vessels entering or leaving the harbor.

A vessel reported that a chimney near the S end of **Futago Shima** (32°39'N., 129°45'E.) is a good landmark when approaching Nagasaki Ko from the SW.

Pilotage.—Pilotage is not compulsory, but necessary, unless the master is well acquainted with the locality.

The pilot is available at any time, subject to adequate notice; VHF radio contact is not available. All communications with the pilot should be made through agents.

Nagasaki Pilot Association	
Call sign	Nagasaki Pilots
VHF	VHF channels 15 and 16
Telephone	81-95-823-6465
Facsimile	8 l-95-823-3071
Boarding Point	1 mile N of Ioshima Light (32°43.8'N., 129°45.7'E.), for large vessels, bearing 300° at 1.5 miles (32°43.6'N., 129°44.2'E.) from the same light.
Remarks	The pilot ladder should be on the lee side of the vessel and placed 1m above sea level.

The pilot boat carries International signals. The International Code flag G flag, in daytime and Morse signals, at night, are used to call the pilot.

Regulations.—Vessels carrying ammunition are not allowed to enter the port.

In addition, full precautions are required to prevent fires within the harbor due to the presence of a large number of petroleum tanks in the Second District and the Third District.

Signals.—The arrival of vessels is reported by telegraph to Nagasaki from the flagstaff close to the lighthouse on Shin Bana.

A signal station is situated on the E side of the entrance of the inner harbor in a position about 320m SSW of Megami Hana. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate answering signals, and other local or specific regulations.

For more detailed signal information in Nagasaki, see the table titled **Nagasaki Ko—Signals.**

Anchorage.—Large vessels can obtain safe, sheltered anchorage during strong SW winds in the Third District and the Fourth District of the outer harbor.

Anchorage can be taken in almost any part of the inner harbor, as designated by the port authorities, in 6.4 to 27.4m, mud, good holding ground. Vessels of more than 500 gt are required to use two anchors. Vessels are prohibited to anchor in the fairways.

The quarantine anchorage lies in District Three, on the SE side of the fairway, S of KoSaki Hana.

Directions.—Vessels can approach Nagasaki Ko from the SW by keeping Io Shima Light bearing not less than 040° in order to clear dangers lying off the S side of Taka Shima. When W of Taka Shima, course should be shaped to round Shin Bana at a distance of about 1 mile to a position with Io Shima Light bearing 180° and a distance of 1 mile.

Approaching from the NW, from a position about 3 miles SW of Ohiki Shima, a vessel should steer for Io Shima in line with Hachiro Take, bearing about 119°.

Kayaki Wan to Nomo Saki

5.42 On the NW side of Nagasaki Hanto is Kayaki Wan, a small cove, which lies 2 miles SSE of Koyagi Shima. The cove affords anchorage to small vessels, in depths of 12.3 to 18.3m. The village of Kayaki lies at the head of the cove.

Yoko Shima, Kuro Shima, and No Shima are a group of islets, surrounded by reefs and rocks, lying to the W of Kayaki Wan. Otono Se, a reef with depths of less than 1.8m, lies about 0.5 mile SW of No Shima.

Taka Shima (32°40'N., 129°45'E.) lies about 2 miles W of Kuro Shima. Futago Shima, the S part of Taka Shima, is the site of a colliery, the high buildings of which are conspicuous from a distance. Two chimneys stand at the S end; from a quay on the E side, a pier with depths of 7 to 7.9m at its head, projects E. Two mooring buoys and a breakwater lie off the head of the pier. The pier is exposed to winds from between the E and S. A light is shown in position 32°39'15"N, 129°45'41"E.

The flood tidal current sets N at a maximum rate of 3 knots in the area. A large number of submarine cables are landed on the NE and S coasts of Taka Shima.

Nagasaki Ko—Signals		
Flag Signal	**AIS Symbol**	**Meaning**
2nd Substitute, F	F	Vessels should navigate towards mooring facilities at Nagasaki Gyoko.
2nd Substitute, 1E	1E	Vessels should navigate towards mooring facilities on the E side of Section 1.
2nd Substitute, 1W	1W	Vessels should navigate towards mooring facilities on the W side of Section 1.

Nagasaki Ko—Signals		
Flag Signal	**AIS Symbol**	**Meaning**
2nd Substitute, 1B	1B	Vessels should navigate towards mooring buoys in Section 1.
2nd Substitute, 2E	2E	Vessels should navigate towards mooring facilities on the E side of Section 2.
2nd Substitute, 2W	2W	Vessels should navigate towards mooring facilities on the W side of Section 2.
2nd Substitute, 3N	3N	Vessels should navigate towards mooring facilities on the N side of Section 3 or Section 5.
2nd Substitute, 3E	3E	Vessels should navigate towards mooring facilities on the E side of Section 3, Kogakura Yanagi wharf in Section 4, or Doinnokubi inlet.
2nd Substitute, 4E	4E	Vessels should navigate towards mooring facilities between Kyushu Steel Center Co. and Nakata Mac Co in Section 4.
2nd Substitute, 4W	4W	Vessels should navigate towards mooring facilities at Mitsubishi Heavy Industries Shipyard or the public quay at Section 4.

Nakano Shima lies about 1.5 miles S of Taka Shima, and is a grassy, uninhabited island, 45m high. The N and S end of the island is fringed by reefs extending out about 0.2 mile.

5.43 **Ha Shima** (32°37'N., 129°44'E.), about 0.5 mile SW of Nakano Shima, can be identified by the tall structures of a colliery. The island is completely encircled by an artificial embankment, on the E side of which is a pier and two mooring buoys. There are depths of 4.9 to 10.1m at the pier. A light is shown from Ha Shima.

Mitsu Se, 1.75 miles SW of Ha Shima, is a patch of foul ground and is the SW danger on the E side of the approach from the S to Nagasaki Ko. It consists of a group of above-water and sunken rocks. Nakano Sone, about 0.8 mile E of Mitsu Se, is a steep-to detached rock, with a depth of 6.7m. A light is shown from Mitsu Se.

Namokita Ura, a narrow inlet, is only available to small craft with local knowledge, and lies on the SW end of Nagasaki Hanto. The E entrance point is surmounted by a dense growth of trees and is prominent. Lights are shown from the entrance points to the inlet.

Nomo Saki (32°34'N., 129°45'E.) is the SW extremity of Nagasaki Hanto. It is rocky and fringed with reefs that dry, which in places, extend 0.25 mile offshore. Otategami is a rock lying on a reef about 0.2 mile S of Nomo Saki. A light is shown from the rock.

Danjo Gunto and Goto Retto

5.44 Danjo Gunto is a group of islands lying in the SW approach to Nagasake Ko, between 72 and 80 miles WSW of Nomo Saki. It consists of two main islands and a number of islets and rocks, mainly of basal formation. The coasts of the islands are cliffy and landing places few. With the exception of the lighthouse keepers, the group is uninhabited, but during the fishing season, large numbers of fishing vessels frequent the vicinity.

Me Shima (31°59'N., 128°21'E.), the SW and highest island, is covered with stunted trees. There is a sharp peak, 281m high, near its N end; the S slope is wooded while the E slope is bare and cliffy. A light stands on the summit. Same Se, above-water rocks, lie about 1.5 miles S of the light.

Hanaguri Shima lies about 1.3 miles NNE of Me Shima, and separated by Hanaguri Seto, with a navigable width of only 0.1 mile. The islet is steep-sided and 141m high. It is fringed with rocks extending about 90m offshore.

Yori Shima (32°01'N., 128°22'E.), about 0.8 mile NNE of Hanaguri Shima, has two sharp peaks on its E side. Several above-water rocks lie within 0.25 mile W and S of the SW extremity of the island.

Kuroki Shima, 104m high, is located about 0.5 mile NNE of Yori Shima. The islet is cliffy on all sides and is fringed with rocks. Nabe Seto, the channel between Kuroki Shima and Yori Shima, is foul and dangerous.

5.45 **O Shima** (32°03'N., 128°24'E.) lies about 0.3 mile NE of Kuroki Shima and is separated from it by Magome Seto. The coastline of the island is rocky and rises precipitously from the water's edge to plateaus, about 91m high. There are many detached rocks off the several headlands of the island, but none is at a greater distance than 0.35 mile offshore.

Hatake Sone (32°04'N., 128°26'E.), with a least depth of 0.9m, is a steep-to pinnacle rock that lies about 1.3 miles NE of Nokogiri Saki, the NE extremity of O Shima. A 1.8m shoal lies about 0.3 mile SSW of this rock. Tide rips mark these dangers, except at SW. The channel between the rocks is deep, but not recommended because of the tidal currents.

Tori Shima (32°14'N., 128°06'E.) consists of three above-water rocks lying about 19 miles NW of O Shima. The largest and S of these rocks is 17.4m high and has the appearance of a pyramid when seen from the S, but from the N it appears as a sharp ridge.

Goto Retto

5.46 The Goto Retto consists of six principal islands; from S to N they are Fukue Shima, Hisaka Shima, Naru Shima, Wakamatsu Shima, Nakadori Shima, and Uku Shima, together with a number of small islands, islets, and rocks. There are six navigable channels through the islands, but the tidal currents in them are very strong, attaining at times a rate of 6.5 knots.

Fukue Shima

5.47 Fukue Shima, the largest in Goto Retto, is mountainous. Its coasts are considerably indented and the coastal hills are grassy, but the mountains in the interior are rugged; the valleys between are fertile.

Ose Saki (32°37'N., 128°36'E.) is the SW extremity of the island. The point is steep-to, rocky, and marked by a light.

Daiho Ura lies 3 miles ESE of Ose Saki and affords anchorage, sheltered from the N wind, in depths of 14.6 to 18.3m, sand and shells. A light is shown from the head of the breakwater extending NE from the shore at Daiho.

Kurose Wan (32°36'N., 128°44'E.) lies close E of Daiho Ura and affords anchorage, sheltered from N and E winds, to vessels with local knowledge. Futago Se is a rocky islet near the center of the bay. Tsutara-jima, a second islet, lies about 1 mile S of Futago Se. A light is shown from the head of the breakwater at Kurose.

Kasayama Saki, the S extremity of Fukue Shima, is located about 2.5 miles SE of Kurose. It is rocky and shelving, and from it cultivated land rises to an elevation of 68m. A light is shown from the point.

Kuro Shima, 98m high, lies 1.75 miles off the SE shore, about 3 miles NE of Kasayama Saki. It is steep and rocky on its SW and N sides.

O Shima (32°34'N., 128°54'E.), the largest, highest, and southernmost of the islands, lies about 3.5 miles SE of Kuro Shima. Its summit is located towards its E side and attains a height of 92m. A light is shown from its SE point.

O-Itabe-jima consists of two islets about 1 mile N of O Shima. Both are fringed with reefs and the channel between them and O Shima is foul.

Aka Shima (32°36'N., 128°55'E.), the NE island of the group, lies about 2 miles NNE of O Shima. It is 54m high and fringed with reefs. Hana Se, about 0.5 mile to the N, is a reef that dries in places.

Tomie Wan (32°38'N., 128°48'E.) lies about 2.5 miles NW of Kuro Shima and is entered between Nagasaki Bana and Kasura Bana. The entrance is about 2 miles wide, but its navigable width is considerably reduced by shoals on its S side.

5.48 The port of **Tomie** (32°37'N., 128°46'E.) lies in the SW corner of the bay. A light is shown from the W end of a breakwater protecting the port.

Large vessels can anchor in Tomie Wan, in depths of 16.5 to 18.3m, sand, about midway between Kasura Bana and O-jira Se, with the latter in line with a rocky cape at the head of the bay, bearing 270°. Small vessels can anchor, in 11m, sand, with O-jira Se in line with Kasura Bana, bearing 090°, at a distance of about 1 mile from the former.

Submarine cables, including a power cable, are laid between Kuro Shima and the coast of Fukue Shima, to the W, and from O Shima and Aka Shima, an island 1.5 miles NE, to the coast of Fukue Shima NNW.

Directions.—Vessels approaching from the E should pass N of Kuro Shima, taking care to avoid Motsu Se and the reef extending N from Aka Shima. After reaching the position WSW of Karasu Sone, they should follow the directions for vessels approaching from the SW.

Sakiyama Hana, on the NE side of Fukue Shima, is the extremity of a rounded promontory, on which there is a group of grassy hills. A light is shown from a small cove close W of the point; a buoy marks Sembai Se.

5.49 **Fukue Ko** (32°42'N., 128°52'E.) lies about 3.5 miles NW of Sakiyama Hana. The port is protected by breakwaters; a light stands at the SE head of the N breakwater and another light near the N head of the S breakwater, which is detached. Another detached breakwater lies close E of the N end of the S breakwater.

A light is also shown from the head of another breakwater, 0.35 mile S of the N breakwater head. The port is used mainly by small craft. Vessels with local knowledge can obtain anchorage off Fukue, in depths of 14.6 to 16.5m, but caution is necessary because of submarine cables in the vicinity.

Fukuro Suido lies on the W side of Fukue Shima about 2 miles N of Ose Saki. The strait is obstructed by a reef and care must be taken not to mistake it for the entrance to Tamanoura Wan, which is 2.5 miles farther N. A light is shown from the NW entrance to Fukuro Suido.

Tamanoura Wan (32°41'N., 128°38'E.) affords excellent shelter, but the depths in most parts are considerable. Anchorage, sheltered from the NE and E winds, can be obtained, in depths of less than 18.3m, sand and shells, just outside the entrance to Arakawa Wan, on a spit that extends NE from Ko Shima to the mainland; the holding ground is not good and the position is exposed to the NW.

The best anchorage is 0.2 to 0.3 mile off the head of Tamanoura Wan, S of the entrance of Nakasu Ura, in about 20.1m, mud, though the position is somewhat exposed to SE winds which blow across the low land between the head of the bay and Daiho Ura.

Vessels of moderate size can obtain sheltered anchorage, in 11 to 12.8m, mud, in Nakasu Ura, but local knowledge is essential. The harbor is protected by a breakwater which has a light shown from the head of the breakwater.

5.50 **Sagano Shima** (32°44'N., 128°36'E.) appears as two islets from a W direction. Vessels with local knowledge can obtain anchorage, sheltered from W winds, in about 15.5m, in a bay on the E side of Sagano Shima. Caution is necessary because of submarine cables.

Hime Shima lies about 1.5 miles NNE of Kashiwa Saki, the NW extremity of Fukue Shima. The NW side of the island consists of overhanging cliffs, but the rest of the island is wooded or cultivated. A light is shown from Kashiwa Saki.

Nishi Sone, with a depth of 11m, rock, lies 3.5 miles NW of Hime Shima. Kami Sone, a reef with two heads, lies about 2 miles E of Nishi Sone, and Shin Sone, with a depth of 7.3m, lies 0.5 mile N of Kami Sone.

Hamanokuri Wan (32°45'N., 128°42'E.) is entered about 2.5 miles SE of Kashiwa Saki. The bay affords safe anchorage, except from winds between the N and E, in a depth of 11m, good holding ground. The village of Hamanokuri lies on the NW side of the bay and is protected by two breakwaters. A light is shown from the head of the N breakwater.

Mizuno Ura is entered about 1.8 miles ENE of the E entrance point of Hamanokuri Wan. Vessels of moderate size can anchor in Mizuno Ura, in depths of 14.6 to 18.3m, mud. A light is shown on the NE side of Mizuno Ura.

Kishuku Ura (32°46'N., 128°46'E.) is entered about 1.8 miles NE of Mizuno Ura. The bay affords anchorage to small vessels with local knowledge.

Leading lights, shown from columns with white rectangular topmarks, are situated within the entrance on the S shore of the inlet; the lights in line bear 196°.

A short breakwater is situated 0.2 mile N of the front leading light. A light is shown from the E end of the breakwater.

Kamo Se, a group of rocky islets, lie about 0.8 mile W of Ikokushi Bana, the N extremity of Fukue Shima. The highest rock is about 37m high, and is the northernmost of the group. A light is shown from Ikokushi Bana.

Tanoura Seto is located between Fukue Shima and Hisaka-jima, and is about 1 mile wide except at its S end; the fairway is 0.5 mile wide. The shores of the strait are free from off-lying dangers and can be approached to a distance of 0.25 mile. Toki Wan, on the SW side of the strait, is available to small craft with local knowledge. Kashino Ura is entered close SE of Toki Wan and affords anchorage to small vessels.

Tatara Shima, 166m high, is located in the SE entrance to Tanoura Seto; a lighted tower stands on the N extremity of the island. A lighted buoy is moored 0.4 mile N of Tatara Shima Light.

Hisaka-Jima

5.51 **Hisaka-jima** (32°48'N., 128°52'E.) is a hilly island with rocky shores; its W side rises steeply to a summit of hills from 244 to 343m high.

Hisaka Wan, an inlet that almost divides the island into two parts, is entered from the N side of the island. The entrance channel is tortuous and in places not more than 0.1 mile wide, but it gives access to a completely landlocked basin. The village of Hisaka, at the S end of the inlet, has a small pier, 107m long.

Vessels with local knowledge can obtain good anchorage, in 14.6 to 18.3m, mud, in the main basin or, in 9.2 to 11m, in the inner basin of Hisaka Wan. Entry in bad weather is difficult.

Naru Seto

5.52 This strait lies between Hisaka Shima and Naru Shima and its fairway is not less than 0.5 mile wide. The shores on each side consist of steep rocky headlands, fringed with sunken rocks extending a short distance offshore. Kurosaki Bana, the W extremity of Naru Shima, forms the N entrance point at the NW end of the strait. A light is shown from Kurosaki Bana.

Okushi Wan, on the NE side of the strait, is well-sheltered, and can be used as an anchorage by vessels with local knowledge, in depths of 18.3 to 20.1m, sand.

Suzuno Ura (32°50'N., 128°55'E.) lies on the E side of the strait, about 2 miles SE of Okushi Wan. The bay is mostly foul and a light is shown from a point W of the bay.

Ura Ko lies on the E side of the strait, close S of Suzuno Ura. Anchorage is available, in about 18.3m, in the middle of Ura Ko, about 0.4 mile within the entrance. A floating pier at the village of Ura is about 39.6m long, with depths of 4 to 6.1m alongside.

Naru Shima

5.53 Ainoura Wan, a long narrow inlet which penetrates the N coast of Naru Shima for a distance of nearly 2.8 miles, is entered between Unoko Shima and No Se, about 0.5 mile to the E.

Vessels with local knowledge can obtain anchorage in depths of 14.6 to 16.5m, sand, about 0.8 mile from the head of Ainoura Wan.

Takigawara Seto

5.54 This strait separates Wakamatsu-jima from Naru Shima. The fairway of the strait is deep and free of dangers.

Arifuku Shima (32°56'N., 128°56'E.) lies on the NE side of the NW end of the strait. It is 234m high, wooded, and cultivated. There are no dangers more than 0.1 mile from its SW coast. A light is shown from the W extremity of the island.

Takigawara Ura is entered between Kan Saki Bana and Takasaki Bana, nearly 1 mile to the SE. Vessels with local knowledge can obtain anchorage near the head of the bay, clear of the strong tidal currents at the entrance. Takasaki Bana forms a good landmark for vessels entering the strait from the SE.

Hebo Shima (32°50'N., 129°00'E.), a prominent islet, 73.5m high, lies in the SW approach to the strait, about 2.3 miles SSE of Takasaki Bana.

Directions.—A vessel approaching the strait from the W should make Arifuku Shima, which is a good landmark, and on nearer approach, Aino Shima will be easily identified. Approaching from the SE, Hebo Shima is prominent, as is Takasaki Bana.

Wakamatsu-Jima

5.55 This rugged island lies between Takigawara Seto, on its W side and Wakamatsu Seto, on its E side. The island is nearly divided into two parts by an inlet on its NW side that terminates in three narrow creeks.

Hino Shima (32°55'N., 128°58'E.) is located about 0.5 mile ENE of Arifuku Shima, on the W side of the entrance to Wakamatsu Seto. The island is high, well-wooded, and conspicuous. Close off its N extremity is a doubled headed rock, close offshore. Ko-jima, a pointed islet covered with pine trees, lies off the NE side of the island. A rock, with a depth of less than 1.8m, lies close off the SE extremity of Hino Shima.

Miyano Seto, a narrow channel only available to small vessels with local knowledge, separates Hino Shima from Arifuku Shima. In the N approach to the channel, about 137m N of the NE extremity of Arifuku Shima, there is a double-headed rock, 0.6m high.

Ryosei Shima (32°55'N., 128°58'E.), close S of Hino Shima, is partly wooded and has three summits. The middle summit is the highest; the N summit the sharpest.

Anchorage.—Vessels can obtain anchorages, outside the tidal currents, between Hino Shima and Ryosei Shima, with shelter from all winds, except those between the E and S.

Small vessels can obtain anchorage, between Ryosei Shima and Tenjin Shima, close E, with sand bottom, and clear of the tidal current.

Anchorage can be obtained, in 32.9 to 36.6m, sand, off the entrance of the three arms at the head of the unnamed inlet on

the NW side of Wakamatsu-jima.

Local knowledge is essential in all the above areas.

Wakamatsu Seto

5.56 This strait lies between Wakamatsu Shima and Nakadori Shima. Its S half is very narrow and obstructed by islets and reefs. The tidal current is very strong and no attempt should be made to use it without local knowledge.

Kushi-jima (32°57'N., 128°59'E.), on the N side of the NW end of the strait, is thickly wooded and high; its coasts are rocky and its several points are fringed with above-water rocks; close off its SW extremity is a rocky islet, 30.5m high. A light is shown from the NW extremity of the island.

Oura Uchi, midway in the strait on the E side, has several arms suitable for small vessels with local knowledge. Anchorage can be obtained, in a depth of about 27.4m, in the middle of Oura Uchi or, in a depth of about 22.9m, in Arakawa Ura, the NE of the coves in Oura Uchi, but local knowledge is essential.

Wakamatsu Ura (32°53'N., 129°01'E.) lies on the W side of the strait, about 2 miles SW of Oura Uchi. Anchorage can be obtained in the middle of the inlet, in depths of 21 to 22.9m, sand. The village of Wakamatsu lies at the head of the inlet.

Nakadori Shima

5.57 Ore Shima, an islet 87m high near its N end, is located about 2.5 miles NE of Kushi-jima Light, on the W side of Nakadori Shima. Shugen-jima, about 1 mile N of Ore Shima, is 154m high, with foul ground on its N and E sides. Two beacons, situated 1.25 miles NE of Ore Shima, in line bearing 070.5°, lead between lighted buoys marking shoal water extending NE from Ore Shima and S from Shugen-jima.

Aokata Wan (32°59'N., 129°02'E.) affords anchorage to vessels with local knowledge, in depths of 16.5 to 18.3m, off the entrances of the inlets in its SE part. Special care is necessary as there are submarine cables in the central part of the bay. A light is shown from Hitutu Se, on the E side of Aokata Wan. Anchorage can be taken, in depths of 16 to 24m, close off the entrances to the inlets at the inner end.

Aokata Ko (32°59'N., 129°03'E.) (World Port Index No. 62340)**,** situated at the head of Aokata Wan, is an oil terminal protected by two breakwaters. Lights are shown from the head of each breakwater, and from a sea berth on the E side of Ore Shima. The harbor limits for Aokata Ko are drawn SSE from the W end of Shugen-jima and ENE from the E end.

Several basins are located in the inner part of the harbor; these basins contain several wharves and berths. The most significant of these is the Kami-Goto Oil Storage Sea Berth, with a length of 350m and depths alongside of 22.4m, which can accommodate vessels as large as 300,000 dwt. A submarine pipeline is laid from the vicinity of the sea berth E across Aokata Wan. There are five floating oil tanks on the S side of the longer breakwater.

Pilotage.—Pilotage is available from the Nagasaki Pilot Association. Pilots will board approximately 3 miles SW of Shugen Shima. Vessels may enter and depart the harbor only during daylight hours.

Contact Information.—See the table titled **Nagasaki—Contact Information**.

Nagasaki—Contact Information	
Port Authority	
Telephone	81-95-823-6465
Facsimile	81-95-823-3071

Nama Wan is entered NE of Yakatame Saki, a remarkable rock, 96m high, lying about 2.5 miles NE of Shugen-jima. The E entrance of the bay is fringed with rocks that dry, and foul ground extending 0.2 mile offshore in places. The village of Nama is situated on the W side of the head of the bay. A light is shown from Yakatame Saki.

Nama Wan affords good sheltered anchorage, in depths of 14.6 to 20.1m. The best anchorage for large vessels, in 20.1m, lies about 500m offshore at the head of the bay, with the summit of O Shima bearing 342° and just open E of Yagatameo Hana, and a red cliff, on the W side of the bay close N of the village of Nama, bearing 252°.

Small vessels can anchor, in 14.6m, farther E, with **Tsuboke Se** (33°05'N., 129°04'E.) and the extremity of the land on the E side of the bay, in line bearing about 343°.

5.58 **Sao Bana** (32°49'N., 129°04'E.), the S extremity of Nakadori Shima, is located about 2.5 miles SE of Shiro Saki, the S extremity of Wakamatsu Shima. Mitsu Se, a group of rocks, lies about 0.5 mile W of Sao Bana. A light is shown from Sao Bana.

Otona Se (32°49'N., 129°05'E.) is a steep rock, 0.9m high, and lies about 1.5 miles ENE of Sao Bana. A light is shown from the rock.

Narao Ko is a fishing harbor situated about 1.5 miles N of Sao Bana. A floating pier within the harbor is reported to have a depth of 6.1m alongside. Lights are shown from the harbor entrance.

Taino Ura (32°56'N., 129°07'E.), the largest of several inlets on the SE side of Nakadori Shima, is located about 8 miles NNE of Sao Bana. Kaneko Shima, lying in the entrance of the inlet, is almost connected to the E point of the inlet by a reef. Small vessels with local knowledge can obtain anchorage, in about 10.1m. A light is shown from Kaneko Shima and from the head of the inlet.

Aino Shima, 108m high, lies 3.5 miles ESE of Kaneko Shima. A light is shown from the SW side of the island.

Naka Sone and Benkei Sone, with depths of 14.6m, rock, are sometimes marked by tide rips. The former lies about 2 miles NNE of Aino Shima, and the latter about 1 mile farther N.

5.59 **Nanori Se** (32°59'N., 129°14'E.), a rock 23.8m high, about 4 miles NNE of Aino Shima, has foul ground extending about 0.2 mile to the N and S.

Hira Shima, rising to an elevation of 207m in its center, is located about 1 mile N of Nanori Se. The N and W sides of the hill slope gradually to the sea, but on the S side there is a precipitous ridge. On the NE side of the island there is a hill, 101m high, that rises vertically from the waters edge.

Kamoda Wan indents the SW side of Hira Shima. Small vessels with local knowledge can obtain anchorage, sheltered from

the N and E winds, but exposed to the S and W, near the head of the bay. A light is shown from the NW extremity of Hira Shima and from the head of Kamoda Wan.

Eno Shima (33°00'N., 129°21'E.) lies about 5 miles E of Hira Shima. The coasts of this island are foul in places for about 2.3 miles offshore. Close off its N extremity are two islets named Takenoko Shima; the larger is 30.8m high. To the N, W, and S of the island lie numerous islets, rocks, and foul patches for a distance of up to 2.5 miles and can best be seen on the charts. A lighted structure stands close offshore on the S side of the island.

O-date Shima, 83m high, on which are two round-topped hills, is located about 4 miles ENE of Eno Shima. Kodate Shima lies on a shoal about 1 mile SE of O-date Shima. A light is shown from O-date Shima.

Fuku Se (33°05'N., 129°26'E.) is an above-water rock located about 3.5 miles N of O-date Shima. A light is shown from the rock.

5.60 Rokuro Shima, Yamaanju Shima, Noanju Shima, and Kashira Shima lie off the NE extremity of Nakadori Shima.

Arikawa Wan (33°00'N., 129°07'E.) is entered W of Nokubi Saki, which lies about 2.3 miles WSW of the W extremity of Kashira Shima, and in it are a number of rocky islets and dangerous shoals. On its S side, Sakuraga Take and Takanosu Yama are prominent. The town of Arikawa lies in about the middle of the S side of the bay. A light is shown from a point close N of the town. Three lighted buoys mark dangers on the W side of the bay. The town fronts an artificial harbor, with a floating pier, 59m long, and a depth of 4m alongside.

The bay affords anchorage to large vessels with local knowledge, sheltered from all winds, except from the N and E. Caution is necessary because of the many fish nets lying in the bay.

From the head of Arikawa Wan, the coast trends about 10.8 miles N to Tsuwa Saki, the N extremity of Nakadori Shima. A light is shown from Tsuwa Saki. Mae Shima, 81m high, lies 1 mile offshore, about 2 miles SE of Tsuwa Saki.

Tan Se (33°09'N., 129°08'E.), a conical islet, lies about 0.5 mile NE of the N extremity of Mae Shima. Rocks extend about 0.1 mile out from the islet on the W side. No attempt should be made to pass between Mae Shima and Tan Se.

NoSaki Shima is located N of Nakadori Shima and the strait between its S end and Tsuwa Saki is about 0.3 mile wide. Its summit, which is 350m high and thickly wooded, lies near the N end of the island. A red scar on the W side of the summit makes the island easy to identify.

5.61 **Kebuta Se** (33°12'N., 129°09'E.) lies about 0.3 mile E of the NE extremity of NoSaki Shima. The passage between them is foul and should not be attempted.

Mu Shima is rounded and 74m high, and lies about 0.5 mile NNE of the N extremity of NoSaki Shima. The island forms the S side of Ojika Seto.

No Shima, 62m high, lies close N of Ojika Shima (33°12'N., 129°09'E.).

Ojika Seto (33°14'N., 129°06'E.) lies between No Shima and Mu Shima on its S side, and Tera Shima and Uku Shima on its N side is not less than 1 mile wide, but in its center is Ai Se, a black pointed rock, 4m high. A light is shown from the rock.

Kuromo Se, in the E approach to Ojika Seto is a steep-to group of rocks, 13.1m high, lying about 2.8 miles ENE of the summit of Mu Shima. A light is shown from Kuromo Se.

Uku Shima

5.62 **Uku Shima** (33°16'N., 129°07'E.) is the N island in Goto Retto. The coasts of the island are indented, and several of the bays afford shelter to small vessels with local knowledge. Shirono Take, in the center of the island, rises to an elevation of 259m.

Tera Shima is a rugged islet, 37m high, composed mostly of lava; its N end is a narrow peninsula, from which a light is shown. The islet lies close off the SW side of Uku Shima.

Tsushimase Hana (33°18'N., 129°08'E.) is the low N extremity of Uku Shima, and from it a steep-to reef extends about 0.3 mile to the N. A light is shown from the point.

Koshiki-jima is a group of three islets lying about 2.5 miles E of Tsushimase Hana. A light is shown from the middle islet of the group.

5.63 **Nagasaki Hana** (33°16'N., 129°10'E.), about 2.5 miles SE of Tsushimase Hana, is the low E extremity of Uku Shima, and from it foul ground extends about 0.5 mile to the E. A light is shown from the point.

Taira, a village, protected by a breakwater, lies at the head of a cove with a sandy beach, about 1 mile WSW of Nagasaki Hana. A light is shown from the head of the breakwater.

Ojika Shima (33°12'N., 129°03'E.) lies about 3 miles NW of Tsuwa Saki. A barren hill, 58m high, lies on the N end of the island. At the NE end of the island are two conical hills, N and S of each other. No Shima, 62m high, lies close off the middle of the N coast of Ojika Shima.

Kuro Shima lies close SE of the SW extremity of Ojika Shima, with a shoal between them. There are two breakwaters near the N end of the island. A light is shown from the N breakwater.

Kokuro Shima (33°11'N., 129°04'E.) is situated about 0.5 mile ENE of Kuro Shima; the narrow channel between it and the S coast of Ojika Shima is shoal.

Madara-jima lies close W of the W extremity of Ojika Shima. The summit, 126m high, lies on the E side of the island. A light is shown from the NW extremity of Madara-jima.

Koji Shima, Yaburogi Shima, Uu Shima, and O Shima lie 0.75 mile to 2.5 miles S, respectively, of Madara-jima. The passages between the islets are mostly foul and are not recommended.

5.64 **Aka Shima** (33°12'N., 128°59'E.), 103m high, lies about 1.5 miles SW of Madara-jima. Its summit rises steeply from its S side and rounded topped hills lie at the W end of the island. There are a number of above-water rocks close off its NW side.

Hoge Shima, 62m high, lies 1.25 miles S of the SE extremity of Aka Shima. Its summit, located at its S end, rises precipitously from the sea, and its N end is a hill, the two being connected by a natural arch that is prominent from the W.

O Shima, 105m high, is located 1.25 miles E of Hoge Shima and has a vertical cliff on its NW side with a clump of trees on its summit. It is prominent from the S and W.

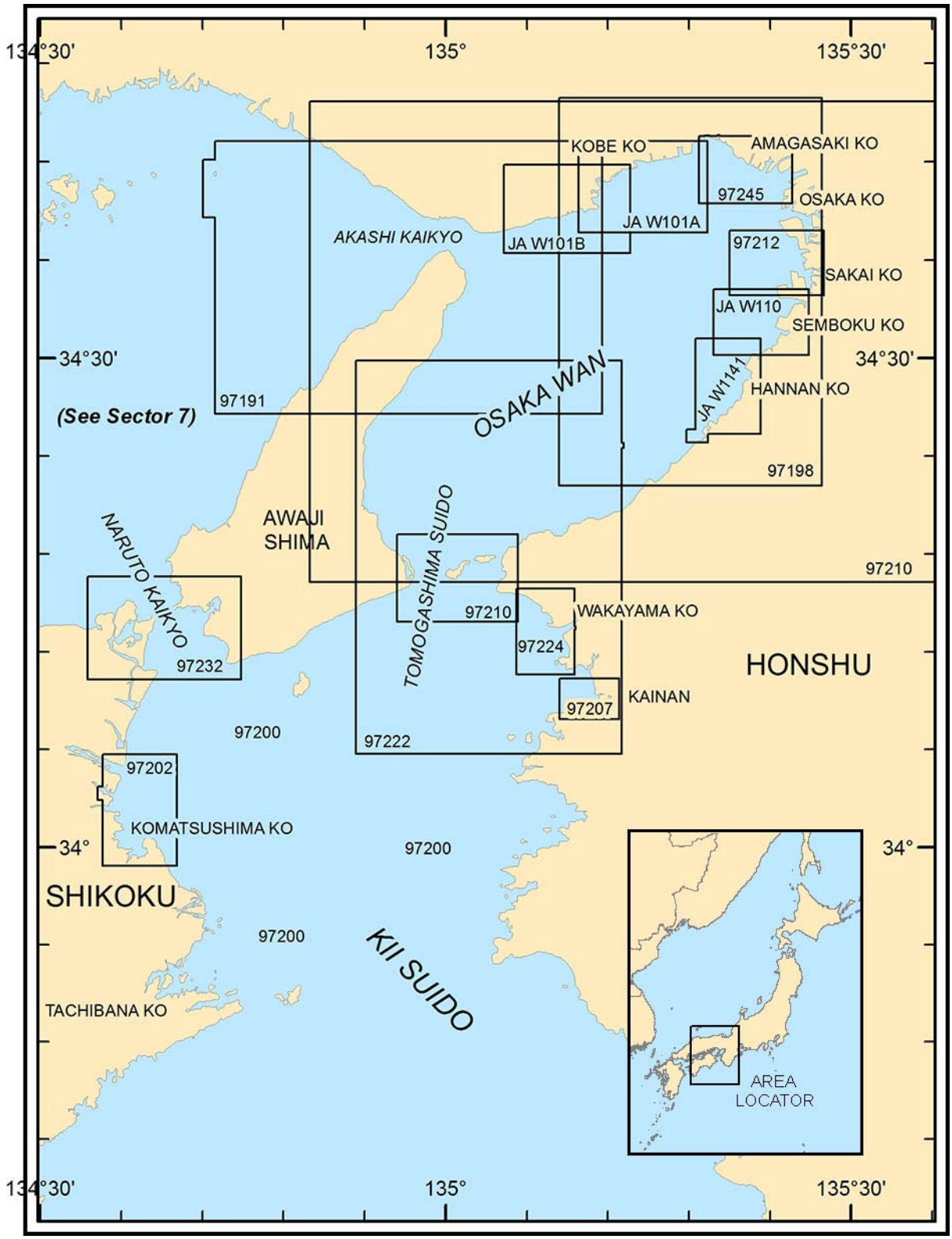
A lighted tower stands on the SW extremity of the reef extending 1 mile SW of O Shima.

Kura Shima (33°12'N., 128°55'E.) lies 3 miles W of Aka Shima. The islet rises to an elevation of 120m. Hoage Se, about 0.5 mile NW of Kura Shima, consists of two pointed islets. Shakushi, which dries, lies 0.75 mile NNE of Hoage Se and is usually marked by breakers.

Mira Shima (33°10'N., 128°54'E.), 139m high, lies about 1.8 miles SW of Kura Shima. The island consists of two summits, N and S of each other. Hira Shima lies 0.75 mile S of Mira Shima.

Shiro Se (33°11'N., 128°48'E.), the W islet in the N part of Goto Retto, lies nearly 16 miles W of Tsuwa Sakii; it appears to be split into two parts from its summit to the HW mark. Several above-water rocks lie within 0.1 mile N of it; another above-water rock is close to its S side. Shakushi Iwa, with a depth of 2.7m, rock, lies about 0.4 mile N of Shiro Se. A light is shown from Shiro Se.

Korai Sone, with a depth of 4m, rock, lies about 6 miles SW of Shiro Se; it is located near the S end of a rocky shoal, with depths of less than 18.3m.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **6** — CHART INFORMATION

SECTOR 6

KII SUIDO AND OSAKA WAN

Plan.—This sector first describes Kii Suido, the E entrance of the Naikai and its adjacent coasts, including the important ports of Wakayama and Shimotsu. Osaka Wan is then described, including the important ports of Osaka and Kobe, followed by Akashi Kaikyo.

General Remarks

6.1 The Naikai (Inland Sea) is bordered N and E by the islands of Honshu and S by the islands of Shikoku and Kyushu. It is connected to the Pacific Ocean by Kii Suido and Bungo Suido, which lie E and W, respectively, of Shikoku; it is connected to the Sea of Japan by Kanmon Kaikyo.

The Naikai extends about 240 miles from E to W and about 10 to 30 miles from N to S. There are about 3,000 islands and islets in the Naikai, and they are more numerous on the N side. The Naikai is famous for its scenery and abundance of historical landmarks; the greater part of it has been designated a national park.

The seas in the Naikai are generally calm; there is no particular difficulty in navigation in the fairways established under the Maritime Traffic Safety Law or along the recommended charted routes, even at night. However, there are many places where the channels are narrow, the tidal currents are strong, and there is heavy traffic of all types and sizes of vessels. Very large vessels and tugs with long tows may also be met, and there are places where fishing vessels congregate in certain seasons of the year. Vessels should navigate with caution to avoid collision.

Certain charts of the Naikai indicate Japanese swept areas as being safe from mines for shipping on a “risk acceptable” basis.

The boundary lines between the Naikai and other sea areas are, as follows:

1. A line between **Hino Misaki Light** (33°52'42"N., 135°03'50"E.) and **Kamoda Misaki Light** (33°49'50"N., 134°45'08"E.).
2. A line between **Sado Misaki Light** (33°20'24"N., 132°01'E.) and **Jizo Misaki Light** (33°15'48"N., 131°54'20"E.).
3. A line between Daiba Hana on **Takenoko Shima** (33°56'50"N., 130°52'27"E.) and **Wakamatu Dokai Wan Entrance Breakwater Light** (33°56'17"N., 130°51'11"E.).

The Maritime Traffic Law has been established in the Naikai (Inland Sea) and other Japanese areas to increase the safety of traffic in congested areas by prescribing special regulations and by enforcing the use of certain traffic routes. Almost all the sea areas of the Naikai, except for the harbor areas, are subject to this law. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia. The compulsory traffic routes are charted, and special regulations pertaining to each route are described in the appropriate sectors of this publication.

Pilotage.—There are currently five compulsory pilotage districts in Seto Naikai, as follows:

1. The Komatsushima area.
2. The Wakayama-Shimotsu Ko area.
3. The Kanmon Ko area and approaches.
4. The Naikai area, encompassing most of the inland sea, except Kii Suido, the approaches to Kanmon Kaikyo and Kanmon Ko.
5. The Osaka Wan district, including Tomogashima Suido and excluding Akashi Kaikyo.

Pilotage is compulsory in Kobe Ko and Kanmon Ko; however, in Kanmon Ko this applies only to the harbor areas outside the fairways and the channels through Kanmon Kaikyo.

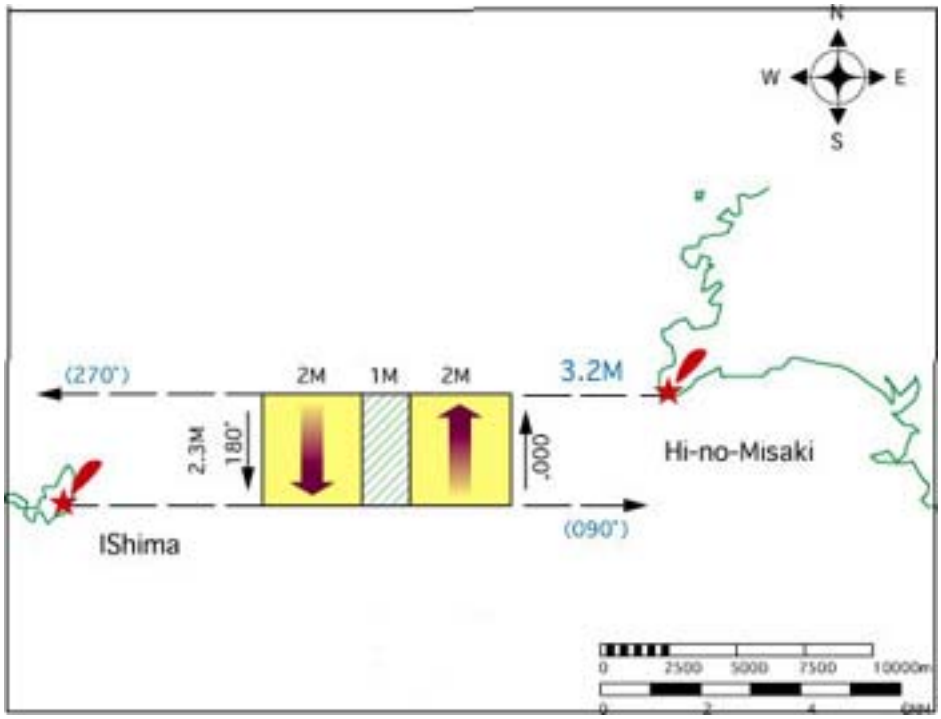
Foreign vessels intending to proceed through Bisan Seto East Fairway, Bisan Seto North Fairway, Bisan Seto South Fairway, Uko East Fairway, Uko West Fairway, Mizushima Fairway, and Kuroshima Kaikyo Fairway, which are designated by Maritime Traffic Safety Headquarters of the district concerned to embark a pilot.

Pilots are available 24 hours in the Naikai area. Pilots board vessels, as follows:

1. Vessels bound for Osaka are boarded seven miles S of Tomogashima Light in 34°10.2'N, 134°59.8'E in Kii Suido.
2. Vessels entering Seto Naikai through Kanmon Kaikyo board about 1.6 miles N of **Matsure Shima Light** (33°58'N., 130°52'E.).
3. Vessels bound through Seto Naikai board pilots, as follows:
   a. Vessels from Tomogashima to ports within Seto Naikai: near a point bearing 202° at a range of four miles from Kobe Light. Vessels from Hanshin Ko to ports within Seto Naikai: near a point bearing 180° at a range of 3.5 miles from Kobe Light.
   b. Vessels off Moji, bound from Kanmon to Seto Naikai areas: near a point 340° at a range of 0.9 mile from Hesaki Light. Vessels bound from Seto Naikai to Kanmon: near a point 120° at a range of 1.6 miles from Hesaki Light (33°58'N, 131°01'E.
   c. Vessels off Bungo Seto: in 33°14.2'N, 132°05.8'E, except vessels of 200m or more in length: in 33°13.2'N, 131°58.0'E.
4. Vessels entering Wakayama-Shimotsu area board pilots in the vicinity of each district.
5. Vessels entering Komatsushima board pilots near a point bearing 354° at a range of 0.9 mile from **Wada-no Hana Light** (34°00.6'N., 134°37.9'E.).

Requests for a pilot should be made by radio or radiotelephone 24 hours before ETA to the appropriate pilot headquarters or through the vessel’s agent. Confirmation of time of arrival should be made 6 hours before ETA; any change in ETA should be made at this time.

When vessels equipped with radiotelephone come within range of Kobe Port Radio Station, Shimonoseki Port Radio Station, or Oita Port Radio Stations, they should immediately send a message confirming their ETA, and then keep a watch on VHF channel 16.



Courtesy of Japan Captains' Association (http://www.captain.or.jp/?page_id=27).

Hino Misaki/I Shima Voluntary Traffic Separation Scheme

Vessels making use of the Osaka Wan and Seto Naikai pilot stations should hoist International Code flag G by day, and flash the Morse letter G continuously at night. In poor visibility, vessels should sound the Morse letter G by sound signal continuously.

Regulations.—Vessels of more than 150 gt carrying hazardous and noxious substances, in liquid form, as defined in MARPOL 73/78 Annex II, and calling at ports or terminals within Tokyo Wan Ise Wan, and the Naikai, must comply with regulations effective April 1, 2008. Further information can be found in Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Caution.—The Seto Naikai is host to extensive and varied fishing endeavors. Stow nets, drift nets, fish farms and boat seines may all be encountered at different times throughout the year. The peak season for Stow Net fishing is April through August and is also when fog is likely to occur; as a result vessels are advised to keep a sharp lookout.

Kii Suido

6.2 Kii Suido, the E entrance to the Naikai, is entered between **Hino Misaki** (33°53'N., 135°04'E.) and Kamoda Misaki, about 16 miles WSW.

A voluntary traffic separation scheme has been established in Kii Suido, in the vicinity of Hino Misaki and I Shima. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for further information.

The principal channel into Osaka Wan through the NE part of Kii Suido is Yura Seto in Tomogashima Suido. Naruto Kaikyo, in the NW part of Kii Suido, leads into Harima Nada, and is better avoided by large vessels and vessels without local knowledge; Naruto Kaikyo has very strong tidal currents, is narrow, and has many reefs.

Caution.—A wreck is charted in position 33°52'52"N, 134°51'51"E, approximately 3 miles NE of the N tip of I Shima, in close proximity of the voluntary traffic separation scheme.

A submarine power cable laid between Tachibana and Shira Saki, whose position is best seen on chart, may cause local magnetic compass anomalies.

Kii Suido—East Side

6.3 Hino Misaki, a steep cliffy headland, is marked by a light and ramark. Hino Yama, 202m high, is conspicuous nearly 0.5 mile NE of Hino Misaki. Okura Baye, 19.8m high, about 0.1 mile W of the cape, is the outermost of the many above-water rocks fringing the cape; a rock, with a depth of 1m, lies about 45m farther W. Kajitori Sho, which dries 0.6m, lies about 0.2 mile offshore, nearly 0.5 mile NNW of the cape.

Hasedeno Hana (33°54'N., 135°04'E.), about 1.5 miles N of Hino Misaki, rises to a pointed hill, 101m high.

Hii Wan is entered between Hasedeno Hano and Oura Saki, about 1.3 miles NNE. Naka, a group of rocks, lies in the central part of the bay; a light is shown from the highest rock. At the inner end of the bay are three coves, which provide anchorage for small vessels with local knowledge. Anchorage cannot be taken during strong W winds when seas enter the bay.

Oura Saki is a low flat cliffy projection. **Ichinoe Bae**

Hino Misaki Light

(33°56'N., 135°04'E.), 5.2m high and marked by a light, is the outermost above-water rock on a shoal spit extending about 0.4 mile NW of a point, about 0.4 mile NE of Oura Saki.

Yura Ko (33°57'N., 135°06'E.) is entered between Ichinoe Bae and Shimoyama Hana, about 1.5 miles NNE. Hijiki Shima, 35m high, lies about 0.3 mile W of Shimoyama Hana, and Kasane Yama, a rounded hill, 263m high, and surmounted by a radio tower, is conspicuous about 1 mile E of the same point. Ari Shima, 72m high, lies in the entrance to the inlet; the islet is bordered by rocks, and a 3.6m depth lies about 0.2 mile E of it. A fish haven is situated 0.5 mile W of Ari Shima in the approaches to Yura Ko.

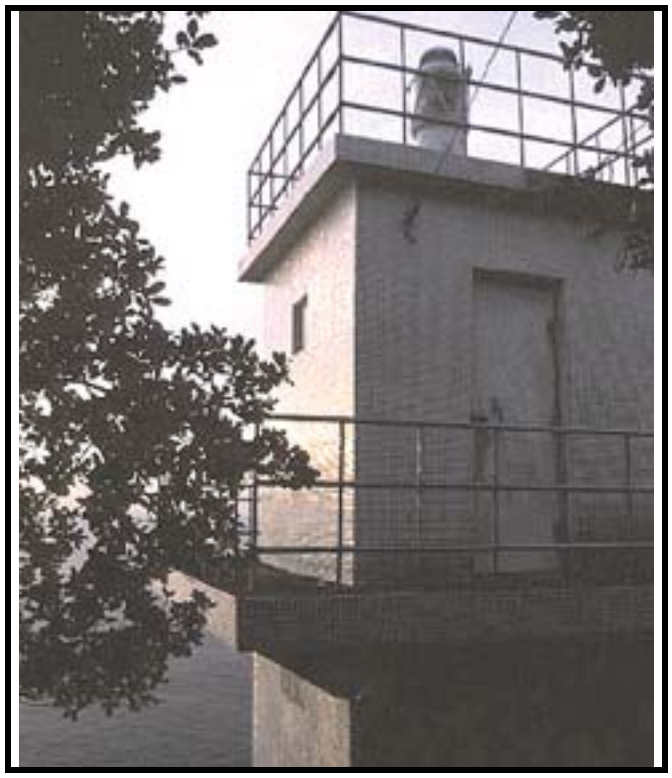
There are depths of 5 to 25m in the harbor, The mooring quay situated on the N side of the Jura Kawa estuary is limited to vessels of up to 700 dwt. There are depths of 3.5 to 8m at Sakurajima quay, however this berth is for the use of a cement company exclusively, except in an emergency.

Anchorage.—Anchorage can be taken, in 11m, mud, good holding ground, about 0.2 mile W of the head of the jetty, sheltered from all but SW winds.

6.4 **Shira Saki** (33°58'N., 135°04'E.), rising to an elevation of 57m, is a whitish gray cliff. It is prominent and rises gradually to Kuro Yama, 254m high, about 1.5 miles E.

Ashika Shima, 4.8m high, steep-to on its W side, and usually marked by breakers, lies about 0.4 mile W of Shira Saki. A light is shown from a round concrete tower standing on the rock. Okura Bae, a black rock, 7.5m high, lies about 0.2 mile N of Shira Saki, with other rocks between.

Yuasa Wan is entered between Shira Saki and Miyasakino Hana, about 6 miles N. The latter point is steep and covered with pine trees; a light is shown from the point, and pine trees are conspicuous on a hill, 90m high, about 0.4 mile SE of the point. A measured distance of about 2,118m lies to the W of Miyasakino Hana and is indicated by the light structure and three beacons. Ogono Se, with a depth of 3.1m, and steep-to, lies about 0.4 mile S of Miyasakino Hana. There are several islets and numerous fish havens in Yuasa Wan. Yuasahiro Ko lies



Miyasakino Hana Light

Oba Se, a rock with a depth of 0.3m, and Sono Se, a rock, with a depth of 7.3m, lie in the central part of the bay, about 1.5 miles NW and 0.8 mile NW, respectively, of the W extremity of **Taka Shima** (34°01'N., 135°07'E.). Karumo-jima, about 1 mile NNE of Taka Shima, has above-water rocks extending about 0.2 mile N of the W islet. Kenashi To, two steep-to brown rocks, 21m high, lie about 0.5 mile ENE of Karumo-jima. Sogami Se, a rock awash, lies about 1.3 miles NW of Kenashi To.

Anchorage.—Good anchorage, sheltered from all but W winds, can be taken, in 11.9 to 14.9m, mud, SE of Kenashi To, in the outer part of Yuasahiro Ko.

Temporary anchorage can be taken by small vessels of 500 gt off a bight on the SE side of Taka Shima, in depths of 11.9 to 14.9m, mud, good holding ground. Care must be taken to avoid the reefs about 0.2 mile SSE of Taka Shima, and the seas become heavy with strong S to NW winds.

Wakayama-Shimotsu Ko (34°12'N., 135°08'E.)

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6.5 Wakayama-Shimotsu Ko occupies the N part of the E side of Kii Suido, and extends between **Miyasakino Hana** (34°05'N., 135°05'E.) and Takura Saki, about 11.5 miles N. The harbor is divided from the S to N into the harbor areas of Arida Ku, Shimotsu Ku, Kainan Ku, and Wakayama Ku. The three cities of Arida, Kainan and Wakayama and the town of Shimotsu lie on its shores.

Arida Ku and Shimotsu Ku are petrochemical factory zones

with large refineries in the area. An industrial area has been constructed in Kainan-Ku, in the SE part of Wakanoura Wan. Wakayama Ku is further divided into Minami Ku (South District) and Kita Ku (North District), located S and N, respectively, of the mouth of Kina Kawa.

Winds—Weather.—In winter, the swell enters all the harbor areas when strong monsoon winds are blowing. Shimotsu Ku is well-sheltered from S winds, but tankers berthed at Toa Fuel Jetty E-1, on the S side of the harbor, must beware of SE gusts blowing down from the mountains behind. Caution is advised in Minami Ku (South District) of Wakayama Ku, when strong SW to WNW winds and seas cause heavy seas to enter the harbor.

When the center of a typhoon passes W of the harbor, S to SW winds are strong, and caution is also necessary with regard to W winds after passage of the typhoon. In a typhoon it is recommended locally that large vessels in Arida Ku, Shimotso Ku, and Kainan Ku should seek shelter in Wakanoura Wan, and large vessels in Wakayama Ku should seek shelter off Kishiwada (Hannon Ko) in Osaka Wan; small vessels should seek shelter inside each harbor area.

Tides—Currents.—The tidal rise at Wakayama is 1.8m at MHWS, and 1.4m at MHWN.

The tidal currents flow N and S, but have virtually no effect on shipping. However, in the vicinity of the quarantine anchorage (34°07'N., 135°07'E.), at the time of HW and LW, respectively, at Shimotsu, the N current and the S current are at their strongest, with a velocity of about 0.8 knots.

Depths—Limitations.—Jino Shima (34°07'N., 135°06'E.) is bordered by rocks and shoals extending about 0.1 mile offshore. Fish havens exist off the S coast of the island. Nabe Iso, with a depth of 0.9m and marked SW by a lighted buoy, lies about 0.3 mile S of Jino Shima, with depths of less than 10.1m extending about 0.2 mile N. Kenashi Ishi, a rock, 11m high, lies near the coast, about 0.5 mile SSE of Jino Shima; a 4.3m depth lies about 0.1 mile W of the rock.

The channel between Jino Shima and the mainland is marked by lighted buoys. A submarine water pipeline is reported to extend 100m WNW from the shore on the E side of the channel; its seaward end is marked by a lighted buoy.

Toa Fuel Jetty O-1 is on the coast E of Jino Shima. The berth can be used by tankers up to 265,000 dwt, with a draft of 18.8m. There is a submersible oil boom at the berth. Lights are shown at the pierhead and approximately 0.2 mile N and S of it. The berth is equipped with dolphins, oil fencing, and mooring buoys.

Osaki Sea Berth, close N of Tsubune Hana, has depths of 24 to 25m, and can accommodate tankers up to 260,000 dwt. A submarine pipeline extends from the berth to Tsubune Hana; a submarine power cable is laid between the dolphins at either end of the berth.

Toa Fuel Jetty E-1, on the S side of Shimotsu Ku, has depths of 13m alongside, and can accommodate tankers up to 70,000 dwt.

Kainan Ku, reached by a channel dredged to 12m, leads to the SE corner of Wakanoura Wan; the channel is marked by lighted buoys.

An overhead cable, with a vertical clearance of about 47m, spans the entrance to Kainan Ku.

A prohibited entry area exists to the N of the buoyed channel. A lighted buoy marks the seaward end of a submarine water pipeline in the N part of this area.

A jetty at the head of the harbor has depths of 13m alongside, and can accommodate tankers up to 78,000 dwt. A pier, on the N side of the harbor, has a berth with depths of 11 to 12m alongside, with a length of 360m; it can accommodate vessels up to 20,000 dwt.

Overhead power cables, with vertical clearances of 28m and 24m, respectively, span the basins at the E end and SE ends of the harbor. Another overhead power cable, with a vertical clearance of 40m, crosses the channel leading N in the E part of the harbor.

Wakayama Ku (Minami Ku), the area enclosed by breakwaters, close S of the mouth of Kino Kawa, has depths of 5.5 to 14m alongside the N side of the base of the S breakwater and can accommodate vessels up to 160,000 dwt.

There are depths of 4.5 to 13m within the area on the S side of the base of the S breakwater. Vessels up to 40,000 dwt can be accommodated.

Kita Ku harbor, with berths on the inner side of the W breakwater, has depths of 10m alongside and can accommodate vessels up to 27,000 dwt; the SE berth is for LPG vessels only.

Berths B and C, on the NE side of the main harbor, can accommodate vessels up to 160,000 gt in 9.5 to 14m depths.

Aspect.—Miyasakino Hana (34°05'N., 135°05'E.) was previously described with Yuasa Wan in paragraph 6.4. Okino Shima, about 2.3 miles farther N, is 92m high, and marked by a light in its W part.

Jino Shima, about 1 mile E of Okino Shima, rises to an elevation of 115m near its SW end and has a high cliff on its W side. Oil tanks, painted silver, are conspicuous on the mainland E and SE of Jino Shima.

A large chimney, 161m high, painted red and white and emitting flames, is conspicuous about 0.8 mile SE of the N end of Jino Shima; a three-stack chimney, 135m high, with its upper part painted black and its lower part silver, is conspicuous about 0.3 mile farther S.

Fuki Kosan Refinery, in which there are a number of chimneys and oil tanks, lies at the inner end of the harbor.

A channel, marked by lighted and unlighted buoys, leads between Jino Shima and the mainland.

Tsubune Hana, at the N entrance to Shimotsu Ku, is marked by a light. Several oil tanks, 25m high, and painted white, are conspicuous on the NE side of the headland.

Saika Saki (34°11'N., 135°08'E.), the N entrance point of Wakanoura Wan, is a steep, cliffy headland, marked by a light. Close W, there are four islets, including O Shima, 34m high.

Wakayama Castle, with its keep on the summit of a 40m hill, is conspicuous nearly 3 miles NE of Saika Saki, in the city of Wakayama.

A power station chimney is conspicuous about 0.5 mile N of the head of Kita Ku North Breakwater; the three-stack composite chimney is 80m high and painted red and white.

Takura Saki (34°16'N., 135°04'E.) rises to an elevation of 41m and is marked by a light. Hachimaki Yama rises to an elevation of 131m, about 0.5 mile ENE of the headland.

Pilotage.—Pilotage is not compulsory, but recommended for vessels under 30,000 dwt. For vessels greater than 40,000 dwt, it is compulsory for two pilots to be onboard.

Pilots board in the following positions:

Saika Saki Light

Takura Saki Light

1. Vessels entering Shimotsu Ku or Arita Ku—34°07.7'N, 135°03.3'E.
2. Vessels entering Kainan Ku—34°09.2'N, 135°06.8'E.
3. Vessels entering Wakayama Ko Section 1 or Minami Ku—34°12.5'N, 135°05.3'E.
4. Vessels entering Wakayama Ko Kita Ku—34°13.5'N, 135°03.8'E.

Contact Information.—See the table titled **Wakayama-Shimotsu—Contact Information**.

Wakayama-Shimotsu—Contact Information	
Pilots	
Telephone	81-734-318-713
Facsimile	81-734-323-438
Port	
Telephone	81-734-317-266
Facsimile	81-734-43-4839
E-mail	e0824001@pref.wakayama.lg.jp

Anchorage.—Wakanoura Wan provides anchorage, in 4.9 to 20m, soft mud, good holding ground, except during strong winds between the S and W, which send in a heavy sea.

The quarantine anchorage lies NE of Jino Shima.

Directions.—Fairways Shimotsu Fairway, which leads into Shimotsu Ku, is entered about 0.4 mile SSW of Tsubune Hana; the fairway is 0.1 mile wide and about 1.1 miles long, oriented on a heading of 123°.

Kita Ku Fairway, which leads into Wakayama Ku (Kita Ku), is about 0.2 mile wide and marked by lights and lighted buoys. Reclaimed land extends W on the seaward side of the former S breakwater and forms the S side of Kita Ku Fairway.

Passage in depths of over 10.1m can be made S of Jino Shima, but the least navigable width is about 250m. Care is necessary to clear Nabe Iso and the depth of less than 10.1m extending N.

Vessels entering Shimotsu Ku should steer for the entrance to Shimotsu Fairway on a course of 100° from a position about 1 mile N of **Shimotsu Ko Light** (34°07'N., 135°05'E.) on Okino Shima.

After entering the fairway, alter course to 123°, steering for the summit of Sotose Yama, 43m high, located about 0.3 mile WNW of the harbormaster's office. Caution is necessary due to vessels at anchor in the quarantine anchorage, which lies about 0.5 mile W of the fairway entrance.

Vessels proceeding to Wakayama Ku (Kita Ku) from the S should steer for Takura Saki Light; when W of Kita Ku Fairway, alter course as necessary for the passage.

Vessels from the N should steer for the entrance to Kita Ku Fairway from a position about 1.5 miles SW of Takura Saki Light. Caution is necessary when entering and leaving the harbor, as there are a large number of fishing boats in the harbor.

Caution.—Shimotsu Ku Kajitori Ne, a rock with a depth of 1.2m and marked by a buoy, lies about 0.2 mile SSE of **Tsubune Hana** (34°08'N., 135°08'E.), on the N side of the entrance to Shimotsu Ku.

Kii Suido—West Side

6.6 Kamoda Misaki (33°50'N., 134°45'E.), the E extremity of Shikoku, terminates in steep, dark brown cliffs, and is marked by a light. I Shima, about 3 miles ENE of Kamoda Misaki, rises to an elevation of 134m to the tops of the trees at its N end; Toni Yama, a hill, 129m high, lies in the S part of the is-

land, and is marked by a light on its summit.

Two islets lie on the W side of I Shima. Between these islets and Kamoda Misaki there are many groups of rocks, some above-water. Navigation in this area should not be attempted without local knowledge. Sirika Bae, a rock, 4.3m high, lies about 0.7 mile SE of Kamoda Misaki, and is illuminated by an auxiliary light on the headland.

Tsubakidomari Ura, a long inlet, lies N of the promontory terminating in Kamado Misaki. Maiko-jima, 85m high at its E end, lies in the entrance to the inlet, about 1 mile NW of Kamoda Misaki. The inlet affords good anchorage to small vessels with local knowledge, in depths of over 10.1m. The better entrance to the inlet lies W of Maiko-jima; there are reefs on either side of this entrance.

Tachibana Ko (33°52'N., 134°40'E.)

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6.7 Tachibana Ko lies near the head of Tachibana Ura; it is sheltered by Kamoda Misaki and I Shima from SE winds and seas during the typhoon season (August to October), and sheltered from the W to NW winds of winter by the surrounding hills. Being a natural well-sheltered harbor, it has developed into an industrial port, with an electric power station and other industries.

Winds—Weather.—Throughout the year, the most common wind direction is NW to NE. Storms are most frequent when there are N winds, followed by S winds.

When a typhoon is proceeding E along the S coast of Shikoku, caution is necessary as considerable E to SE swells enter the harbor.

Depths—Limitations.—The draft limitation in the channel is 10.2m. The pier, on the S side of the reclaimed area, has a depth of 10.7m alongside and can accommodate vessels up to 200m in length and up to 30,000 dwt. A dolphin jetty, on the NE side of the reclaimed area, the Load Line zone is Summer.

Tachibana—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Nippon Denko Wharf			
Cargo Berth	200m	11.0m	Coal.
Shikoku Electric Power, Tachibana Bay Power Station			
Cargo Berth	300m	—	Cement and various cargo.
Tachibanawan Thermal Power Station			
Coal Berth	325m	14.0m	Coal
East Berth	100m	5.5m	Cement.
South Berth No. 1	130m	7.5m	Cement.
South Berth No. 2	130m	7.5m	Limestone.
South Berth No. 3	100m	5.5m	Other cargo.
Anan Power Station			
Tanker Berth No. 1	12m	7.5m	Crude.

Tachibana—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Tanker Berth No. 2	30m	6.5m	CCP and cement.

Aspect.—Tachibana Ura has many islets and groups of rocks in its entrance. **Funo Iso** (33°53'N., 134°43'E.), on the N side of the entrance, consists of two rocks, 1.2m high; a light is shown from the N rock. Ao Shima, about 2 miles NNE of Funo Iso, is saddle-shaped; it is 55m high in its NE part and is marked by a light on a hill in its SW part. Nakatsu Shima and Maru Shima lie about 0.5 mile S and 1 mile SSW, respectively, of Ao Shima.

Hadake Shima, a rock, 7.9m high, lies about 1.4 miles SSE of Funo Iso, on the S side of the entrance to Tachibana Ura; it should not be approached closely due to dangerous rocks extending about 0.5 mile from it. Tobi Shima, 30m high, about 0.5 mile S of Hadake Shima, is joined by reefs to Nono-jima, about 0.4 mile farther SSW.

Takasaki Yama, 81m high, flat-topped, and covered with trees, lies about 1.3 miles W of Funo Iso; Urume Shima, 46m high to the tops of the trees, lies about 2 miles SW of Funo Iso.

Taka Shima, 84m high, and Kokatsu Shima, 76m high in its N part, lie about 0.5 mile and 1.5 miles W, respectively, of Urume Shima.

Okonai Yama, 138m high, lies at the head of the harbor, about 1.5 miles W of the N end of Kokatsu Shima.

The electric power station on the NE side of the reclaimed area has a conspicuous chimney, 202m high, painted red and white.

Pilotage.—Pilotage is not compulsory but recommended. Pilots are available off the entrance to Tachibana Ura during daylight. Vessels usually anchor at Shimotsu, where the authorities board and grant free pratique.

Anchorage.—Good anchorage, except during NE winds, can be taken, in 10.5m, mud, good holding ground, about midway between Taka Shima, Naga Shima, and Kokatsu Shima.

Directions.—From the N, approach with Urume Shima bearing 223° until Funo Iso Light is in line with Takasaki Yama, bearing 270°, when course is altered 242°, steering for the summit of Kokatsu Shima. When Urume Shima is abeam, bearing 152°, alter course to 262° and thereafter steer as required to enter the harbor.

From the E, approach with Funo Iso Light bearing 270° and in line with Takasaki Yama. When Ao Shima is abeam bearing N, alter course to 242° and enter the harbor as previously directed.

Caution.—Magnetic anomalies are experienced near the submarine cable lying N of Tachibana Ko and Yura Ko.

Tachibana Ura to Komatsushima Wan

6.8 **Ao Shima** (33°55'N., 134°43'E.), previously described in paragraph 6.7, lies close E of the entrance to Naka Gawa. Mitsu Ishi, a rock, 7m high, lies about 0.3 mile E of Ao Shima, near the outer end of islets and reefs fronting the river entrance.

Tomioka Ko (33°55'N., 134°42'E.) lies at the mouth of Naka

Gawa. A wharf on the S side of the river has depths of 3.5 to 5m alongside. Passage between the islets and the coast requires local knowledge.

A large chimney, 95m high and painted white, is conspicuous from a distance on the S side of Tomioka Ko.

Depths of less than 10.1m extend nearly 1 mile offshore between the mouth of Naka Gawa and Wada-no Hana, about 6 miles NW.

Pilotage.—The pilot for Tomioka Ko boards at **Komatsushima Ko** (34°02'N., 134°37'E.).

Wada-no Hana (34°00'N., 134°38'E.), a low flat wooded projection, is fringed by shoal water extending up to 0.1 mile offshore. Near the N extremity of Wada-no Hana, a light is shown. Another light is shown on the coast about 3 miles SE. The silo of an animal feed factory, about 0.8 mile S of Wada-no Hana, is the most conspicuous object in the vicinity.

Caution.—Okame Iso, a group of rocks, which dries 0.9m, lies about 1.8 miles N of Wada-no Hana; a light is shown from its central part.

Okino Se, isolated rocks, with a least depth of 3.1m, lies about 1.8 miles ENE of Okame Iso; it is marked by breakers when there is any swell.

Komatsushima Ko (34°00'N., 134°36'E.)

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6.9 Komatsushima Ko lies between Wada-no Hana and O Saki, about 2.3 miles NW. The principal harbor facilities consist of an area sheltered by breakwaters in the W part of the harbor, and Kanaiso Wharf and New Kanaiso Wharf in the S part of the harbor. Fairways, marked by buoys, lead between E and S breakwaters to the inner harbor, and to the wharves in the S part of the harbor. The tidal rise is 1.6m at MHWS.

Depths—Limitations.—Shinko channel is dredged to a depth of 9m.

A berth, on the W side of the inner harbor, is 170m in length and can accommodate vessels of 15,000 gt, with a draft of 8.5m. Kanaiso New Wharf, 210m long, has a depth alongside of 11m and can accommodate vessels of up to 20,000 tons.

Kanaiso Wharf and Kanaiso New Wharf can accommodate vessels of 15,000 and 20,000 gt, respectively, with drafts up to 8.5m. Kanaiso Wharf is 170m long.

Akaishi Quay, 260m long, has a depth alongside of 13m and can accommodate vessels of up to 40,000 dwt.

Aspect.—A white six-story building is conspicuous about 0.3 mile WSW of the S breakwater head.

Nei Hana, with a red-colored cliff close N, lies about 1.7 miles WNW of Wada-no Hana. Komatsushima Ko Light is shown from the summit of a hill, 92m high to the tops of the trees, about 0.3 mile W of Nei Hana. Shiba Yama rises to an elevation of 191m, about 0.7 mile NW of Nei Hana.

Kigisu Iwa, a group of four rocks, lies on a shoal about 0.3 mile NNE of Nei Hana; shoal water extends about 0.1 mile E of the highest rock, which is 11.9m high.

Pilotage.—Pilotage is compulsory for vessels larger than 5,000 dwt in the Tsuda area. Pilotage is also compulsory for vessels with a draft deeper than 8.5m in the Kanaiso area. Pilotage is not compulsory for vessels in the Shink area.

Pilots board in position 34°01'30"N, 134°38'30"E and at Yokushima Ko (34°02'54"N, 134°38'30"E.).

Contact Information.—See the table titled **Komatsushima Ko—Contact Information**.

Anchorage.—Good anchorage can be taken in Komatsushima Ko, in 7.3 to 11m, mud, good holding ground.

Directions.—After rounding Wada-no Hana, vessels bound for the breakwater harbor should steer for the lighted buoys moored about 1.3 miles W of Wada-no Hana, then steer for the fairway entrance, while vessels bound for Kanaiso Wharves should steer for the lighted buoys moored about 1 mile SW of Wada-no Hana and proceed through the fairway.

Komatsushima Ko—Contact Information	
Pilots	
Telephone	81-88-5324789
Facsimile	81-88-5333799
Port Authority	
Telephone	81-88-6212668
Facsimile	81-88-6212875
E-mail	unyuseisakuka@pref.tokushima.lg.jp
Harbormaster	
Telephone	81-88-5320431

Caution.—Inside the breakwaters it is considered safe except from NE winds and seas, but the anchorage is dangerous when there are heavy seas from SE. There is particular danger when the harbor is in the right hand semicircle of a typhoon. In such circumstances it is advisable to anchor SW of Wada-no Hano, in 7 to 7.9m, good holding ground; caution is advised to avoid the seaweed cultivating grounds along the shore.

Tokushima Ko

6.10 **Tokushima Ko** (34°03'N., 134°37'E.) lies just N of Komatsushima Ko, and is located at the mouth of the Shinmachi Kawa. The river provides access to the town of Tokushima. Tsuda Outer Breakwater extends from the N side of the river entrance, which is also sheltered by a detached breakwater. A light is shown on each end of Tsuda Outer Breakwater and on the head of the N breakwater. Another light is shown from the wharf, 150m SW of the N breakwater head.

Entry is prohibited into an area extending 1 mile N and NE of the N breakwater, where a large area of reclamation is taking place. Lighted buoys are moored 0.3 mile NE and 0.2 mile NW, respectively, of the N end of Tsuda Outer Breakwater. There are extensive seaweed beds on the N side of the river mouth, and timber ponds S of the river mouth.

Depths—Limitations.—The entrance to the river has been dredged to 4 to 5.8m. There are wharves, with depths of 4.5 to 5.5m alongside, in the harbor.

A submarine wave meter lies in the approach to Tokushima Ko in position 34°02'N, 134°39'E.

Pilotage.—See Komatsushima for procedures and contact details. Pilots will board in position 34°02'54"N, 134°38'30"E.

Aspect.—Tsudo Yama, a hill, 78m high, is conspicuous about 1.3 miles W of the river entrance.

Bi San, 280m high, with two radio towers and a pagoda on its summit, is conspicuous about 3 miles WNW of the river entrance; the pagoda is illuminated at night.

Yoshino Gawa (34°04'N., 134°38'E.), one of the four mouths of Yoshino Kawa, the largest river in Shikoku, enters the sea N of Tokushima Ko. The coast between Yoshina Gawa and Oiso Saki, about 7 miles NNE, is low, fringed by pine trees, and backed by the delta of Yoshina Kawa. Depths of less than 10.1m extend up to 1 mile off this coast.

Naruto Kaikyo

6.11 Naruto Kaikyo (34°14'N., 134°39'E.), connecting the NW part of Kii Suido to Harima Nada, is better avoided by large vessels and vessels without local knowledge. The strait is narrow, the tidal currents are very strong and their directions complicated, and there is heavy traffic.

Tides—Currents.—In Naruto Kaikyo, the N current flows from about 2.5 hours after LW (HW) until about 2.5 hours after HW (LW) at Fukura. The strongest currents, in excess of 8 knots, appear in areas N of a line joining Tobi Shima and To Saki during a N current. During a S current, rates tend to increase after passing a line joining Mago Zaki and To Saki.

Aspect.—The narrowest part of the strait is about 0.8 mile wide between Mago Zaki, the NE extremity of Oge Shima, and Kado Saki (To Saki), the SW extremity of Awaji Shima. Naka Se, E of the center of this part of the strait, divides it into O Naruto, the W channel, and Ko Naruto, the E channel. O Naruto is about 0.3 mile wide, but due to the whirlpools and tide rips on either side, its navigable width is only about 0.1 mile. Ko Naruto is only navigable by small craft.

Caution.—A dangerous wreck lies approximately 0.4 mile WNW of Kado Saki Light.

A bridge, with a vertical clearance of 40m, spans the strait.

6.12 Oiso Saki (34°11'N., 134°39'E.), on the W side of the S entrance to Naruto Kaikyo, is marked by a light at the E point of a line of hills extending about 1 mile W. Bora Yama, 59m high and conical, lies close SW of the light structure. Thick pine trees extend about 1 mile W from Bora Yama. Okame Iso, a detached shoal, with rocks awash, lies about 0.4 mile E of Oiso Saki, and is marked by a beacon; an auxiliary light at Oiso Saki shows over Okame Iso.

Caution.—An obstruction, marked by a lighted buoy and a fish haven, lie 0.4 mile NNW and 0.5 mile N, respectively, of Oiso Saki.

Muyano Seto, entered N of Oiso Saki, separates Oge Shima from Shikoku. Due to shoals in both entrances, and tidal currents which attain velocities up to 5 knots, passage can only be made by small vessels with local knowledge.

Oge Shima, on the W side of Naruto Kaikyo, is mostly wooded; its E coast consists of a succession of sandy beaches broken by black, rocky headlands. The coast is protected by a line of detached breakwaters lying close to and parallel to the shoreline.

Tomi Yama, 80m high, conical, with trees on its summit, lies at the S end of Oge Shima, about 1 mile WNW of Oiso Saki. Nodamaru, 203m high, about 1 mile NNW of Tomi Yama, and Shishimaino Take, 163m high, about 1 mile farther N, are conspicuous.

Mago Zaki, thickly wooded and marked by a light, is the N extremity of Oge Shima. Hadaka Shima, a rocky, wooded islet, 23m high, lies about 0.2 mile SE of Mago Zaki, to which it is joined by a reef. A shoal, with a depth of 2.7m, lies about 160m E of Hadaka Shima.

Tobi Shima, a rocky wooded islet, 36m high, lies about 0.5 mile SE of Mago Zaki; it is bordered by rocks and shoals extending about 140m offshore. Nakano Se, a detached rock, with a depth of 6.8m, lies about 0.7 mile SSW of Tobi Shima.

Omoi Zaki, about 1.7 miles WNW of Mago Zaki, lies on the W side of the N approach to Naruto Kaikyo. Kanekakematsuno Mori, 168m high, with a wooded summit, is conspicuous about 0.4 mile SW of Omoi Zaki.

6.13 Shio Saki (34°11'N., 134°44'E.), the SW extremity of Awaji Shima, is a grassy conical point with a range of hills extending E; it lies on the E side of the S approach to Naruto Kaikyo. Depths of less than 10.1m extend about 0.2 mile S and 0.4 mile W of the point. A light is shown from a white tower, 0.7 mile E of Shio Saki. Taka Zone and Chika Zone, with depths of 11.8m and 10.9m, respectively, lie nearly 0.7 mile WSW of Shio Saki; there is a heavy sea over them in bad weather.

Akaiwa Hae, a rock, with a depth of 4.9m, lies about 1 mile NW of Shio Saki.

Kourano Hana lies about 2.3 miles NW of Shio Saki; Mizutani Yama, with twin peaks, 142m and 123m high, lies close N of Kourano Hana. A light is shown from a pier head, 0.7 mile N of Kourano Hana.

Tsurushima Hana (34°14'N., 134°42'E.), the N entrance point of Fukura Ura, lies about 1.5 miles N of Kourano Hana. Gyoja Yama, 97m high, lies close NE of the point, and drying rocks extend about 0.1 mile SW of the point.

Anchorage.—Fukura Ura provides good anchorage for large vessels, in about 12.8m, mud and sand, about 0.4 mile S of Kemuri Shima, which lies about 0.5 mile NE of Tsurushima Hana. The anchorage is exposed to W winds, but heavy seas are seldom experienced.

Okikarimo Shima, about 0.5 mile W of Tsurushima Hana, is 38m high, with drying rocks extending about 0.1 mile SSE of it. Fish havens are situated 0.4 mile W and 183m SW of the N extremity of Okikarimo Shima.

6.14 Kado Saki (To Saki) (34°14'N., 134°40'E.) is the extremity of a high, narrow, cliffy projection extending about 0.8 mile SW from the coast of Awaji Shima. A light is shown from a summit near the SW end of the headland, and close NE of the light structure is a red and white tower about 120m high. A pointed rock, 7m high, lies on a rocky bank extending about 135m WSW of the point.

Naka Se, about 0.2 mile WSW of Kado Saki, consists of rocks up to 1.8m high, and extends about 0.2 mile in a NNE-SSW direction; Hitotsu Bae, a rock awash, lies close S of Naka Se, with a 4.6m depth about 90m farther SW.

Yoroi Zaki, a cliffy point, lies about 1.8 miles N of Kado Saki.

Directions.—All vessels, other than small craft, should use O Naruto. Vessels should proceed in mid-channel on a course of 352° and 172°, after ascertaining from a distance of at least

1 mile where the main current is, and whether there are vessels bound in the opposite direction.

Naka Se should first be recognized, and then navigation should not be difficult as the route is straight, and there is little danger of submerged rocks provided the tidal current is not strong and traffic is not heavy. When a vessel is proceeding against the current and another vessel is approaching from the opposite direction, the vessel proceeding against the current should wait until the other vessel is clear of the strait. Caution is also necessary due to excursion boats and ferries crossing the channel.

According to experience gained during a 15-day period in winter by a vessel with a speed of 8 to 8.5 knots, passage could be made at any time with a following current. With an opposing tidal current, passage is possible at any time for 3 days at neaps, for 1 hour on either side of the turn of the tide for a 3-day period at springs, and on other days for 1 to 3 hours after the time of the strongest tidal current.

When a 2,700 gt vessel proceeded from N to S, 20 minutes before the turn of the tide at the end of the N current, the vessel reported that response to the helm decreased somewhat in the middle of the strait and the vessel was set a little towards Hadake Shima. When this vessel proceeded from S to N, about 10 minutes before the turn of the tide at the end of the S current, there were no whirlpools, or tide rips, and the water was calm, but being the time of the turn of the tide, there were many small vessels making passage and fishing vessels had gathered in the vicinity of Naka Se.

Caution.—The passage should be avoided by large vessels, vessels without local knowledge, and in the following circumstances:

1. Around the time of strongest tidal current.
2. At night or in poor visibility.
3. In bad weather.
4. When the tidal current is opposed to a strong wind from the opposite direction, especially when there is a strong S wind in summer. In such circumstances, Naka Se may be obscured and the channel difficult to distinguish.

The S coast of Awaji Shima, from **Shio Saki** (34°11'N., 134°44'E.) to Oishi Saki, about 12 miles ENE, is bordered by flat-topped hills, 500 to 600m high; from a distance, this coast appears as a high level ridge. Yuzuruha Yama attains an elevation of 609m, about 5 miles NE of Shio Saki and 1 mile inland. Kashiwara Yama attains an elevation of 570m about 3 miles WNW of Oishi Saki. This coast is steep-to, with depths of less than 10.1m, less than 0.5 mile offshore.

Nu Shima, 118m high and thickly wooded, lies about 1.5 miles offshore, about 4.5 miles ESE of Shio Saki; there are no dangers more than 0.25 mile offshore. A light is shown from the E side of the island. A harbor, protected by two breakwaters, lies on the NW coast of Nu Shima. A light is shown on the head of each breakwater.

Nu Shima Light

Tomogashima Suido

6.15 Tomogashima Suido, the S entrance to Osaka Wan, lies between the SE extremity of Awaji Shima and the coast N of Takura Saki. It is divided into three channels, Yura Seto, Nakano Seto, and Kadano Seto by Okino Shima and Jino Shima. Tomoga Shima is the collective name for Okino Shima and Jino Shima. Yura Seto is the W and main channel.

Aspect.—Oishi no Hana (34°16'N., 134°57'E.), the SE end of Awaji Shima, is a well-wooded, cliffy headland. A light is shown from its summit; the light structure and white building are conspicuous. The headland slopes gradually N to low land planted with rows of pine trees.

Oishi Saki Light

Naruyama Shima, forming the W side of Yura Seto, lies close N of Oishi Saki, from which it is separated by the S entrance to Yura Ko. The island is long and narrow, and except for its N end, is a low sand and gravel spit with scattered trees. Lights are shown from its S and N ends, and there is a hotel on a small hill at its N end. Shoal water extends about 0.5 mile E of Naruyama Shima; a light is shown on this shoal area about 0.4 mile E of Naruyama Shima.

Yura Seto has a navigable width of about 1.5 miles, with depths of greater than 20m.

Okino Shima, on the E side of Yura Seto, is densely wooded and rises to an elevation of 120m near its W end; a light is shown from the W end of Okino Shima. Tora Shima, an islet, lies at the E end of Okino Shima, to which it is connected by a causeway.

Nakano Seto, between Tora Shima and Jino Shima, close E, is very narrow and obstructed by reefs.

Jino Shima, 93m high and densely wooded, is marked at its E end by a light.

Kadano Seto, between Jino Shima and the coast N of Takura Saki, has a navigable width of about 500m, in depths of over 20m. A fish haven lies near the midpoint of the narrowest part of the channel; several more lie in the SW approach.

Pilotage.—Pilotage in the voluntary traffic separation scheme is compulsory for vessels of 10,000 gt and greater. Pilots board about 6.5 miles S of the W end of Okino Shima. It was reported that the pilot station has been moved to a position 2 miles due S of Oishino Hana, on which there is a light.

Oishino Hana Light

The following information should be transmitted 12 hours in advance to Sumoto Pilot Base:

Vessel's name, gt, loa, maximum beam, owners name, export tax exemption status, deepest draft, speed, cargo, ETA, last port, destination, quarantine status, agent's name, and any other relevant information. ETA should be confirmed 6 hours in advance; amendments to the ETA should be passed to Bay Pilot Kobe and a listening watch set on Kobe Port Radio VHF channel 16 when within range.

Regulations.—Vessels navigating Yura Seto should keep to the starboard side of the channel and not less than 145m distant from the meridian of 134°59'E when between the parallels of 34°15.7'N and 34°17.7'N. This is part of a voluntary traffic separation scheme

Northbound vessels transiting through Osaka Wan and vessels approaching Yura Seto from N should leave **Sumoto-Oki Lighted Buoy** (34°21.1'N., 135°00.7'E.) to port.

Osaka Wan

6.16 Osaka Wan (34°30'N., 135°10'E.), at the E end of the Naikai, is free from off-lying dangers, but there are many sunken wrecks.

A large aquaculture facility, in use from September to the following May of each year, is established in the center of Osaka Wan, about 6 miles S of Wada Misaki.

Kansai International Airport (34°26'N., 135°14'E.), oriented NE-SW, is centered 3 miles off the SE shore of the bay; it is surrounded by a prohibited entry area about 0.3 mile wide. Low-flying aircraft approach sectors extend 1.5 miles NE and SW from the extremities of the airport. An approach tower stands 0.25 mile offshore at each end of the runway; a light is shown from each tower. A bridge, with a vertical clearance of 25m, connects the E corner of the airport island to the mainland SE. Vessels transiting the area are advised to give the airport a wide berth.

Awaji Shima, forming the W side of the bay, is mountainous with hills extending to the coast, which is steep-to and provides few anchorages. The E shore of the bay opens out to a plain with hills in the distance; the N half is an industrial zone, and the S half consists of sandy beaches backed by pine woods.

Open anchorage can be taken in all parts of the E side of the bay. The inner end of the bay is an industrial area, and in addition to the important harbors of Osaka and Kobe, there is an almost continuous line of harbors; there is extremely heavy traffic of all types of vessels, large and small, foreign and domestic.

In general, during typhoons, it is safer for large vessels to seek shelter outside the harbors to avoid being driven ashore, or danger of collision and grounding due to exceptional tides. Recommendations for taking refuge will be transmitted. Vessels taking refuge are requested to report their anchoring positions to the Kobe Port Captain as soon as possible. A continuous radio watch should be kept for information concerning the typhoon, and schedule and procedure for port re-entry. Since the Port Captain will not direct the sequence of vessels having taken refuge from designated anchorages, vessels should return to the same anchorages after the port re-entry vessels have returned to port.

Regulations.—Vessels should maintain continuous commu-

nication on VHF channels 13 and 16 with the Osaka Wan Vessel Traffic Service Center, when navigating the approaches to the traffic routes, adjacent sea areas, and the traffic scheme.

More information, as provided by Osaka MARTIS, may be found at the following web site:

Osaka MARTIS Home Page
http://www6.kaiho.mlit.go.jp/osakawan

The following ports lie within the Osaka Wan Traffic Advisory Service area:

1. Kakogawa.
2. Kobe.
3. Osaka.
4. Sakai-Senboku.

Pre-Entry Reports.—The following vessels intending to navigate Akashi Kaikyo must report to Osaka MARTIS by noon LT of the day before the date of entry into the traffic route:

1. Huge vessels—vessels of 200m length and more.
2. Vessels of 160m length and over, but less than 200m.
3. Vessels of 25,000 gross tons or more carrying liquefied gas.
4. Vessels engaged in towing or pushing with a surface length of 160m or more.

Pre-Entry Reports can be submitted by VHF, MF, telephone, or facsimile and should include the following information:

1. Vessel name, call sign, gross tons and loa.
2. Section of the traffic route vessel intends to navigate.
   a. ETA at the entrance of the traffic route.
   b. ETD from the traffic route.
3. Vessel contact information.
4. Port of destination.
5. Draft.
6. Dangerous goods on board.
7. Surface length of towing or pushing array.

Vessels must forward any changes to the reported information at least 3 hours prior to entering the traffic route. Changes occurring within 3 hours of entry should be reported immediately.

The following vessels, with the exception of those listed previously, intending to navigate Akashi Kaikyo are required to report to Osaka MARTIS 3 hours prior to entering the traffic route:

1. Vessels of 300 gross tons and over carrying quantities of powder as specified in the Ordinance for Enforcement of the Act on Maritime Traffic Safety.
2. Vessels of 1,000 gross tons and over carrying inflammable high pressure gas in bulk.
3. Vessels of 1,000 gross tons and over carrying inflammable liquid in bulk.
4. Vessels of 300 gross tons and over carrying 200 tons or more of organic peroxide.

Reports should include the following information:

1. Vessel name, call sign, gt, and loa.
2. Section of the traffic route the vessel intends to navigate.
   a. ETA at the entrance to the traffic scheme.
   b. ETD from the traffic scheme.
3. Vessel's contact information.
4. Port of destination.
5. Type and quantity of dangerous goods if carried.

Vessels of 50m and greater in length and vessels engaged in towing or pushing and having a surface length of 100m or more should report to Osaka MARTIS on VHF channel 16 or 13 when crossing any of the reporting lines listed in the table below.

The report should include the following:

1. Vessel name and call sign.
2. Reporting line code and time of crossing, or
3. Vessel position.

Reporting Code	Description
AH	A line joining Eigashima Ko West Breakwater Light to Harima Kita No. 10 Lighted Buoy.
AW	A line joining Harima Kita No. 10 Lighted Buoy to Murotsu Ko West Breakwater.
AN	A line bearing 090° for a distance of 9.3 km from Hira Iso Lighted Beacon to position 34°37.3'N, 135°10.1'E.
AE	A line bearing 180° for a distance of 20.9 km from Kobe Light.
AS	A line bearing 090° for a distance of 21 km from Sano Higashi Breakwater.

Vessels equipped with accurate AIS and transmitting correct data may omit sending position reports by VHF, however a continuous watch on VHF channels 13 and 16 is obligatory.

Vessels carrying dangerous cargo as designated by the Maritime Traffic Safety Law shall, when navigating in Osaka Wan, provide a fire wire and auxiliary rope on the bow and stern which fulfill the following requirements:

1. The towing rope shall be a wire rope with an eye in the end, strong enough to tow the vessel concerned. A sufficient length of it to reach down to the water surface shall be coiled on the vessel.
2. The auxiliary rope shall be strong enough to lead out the above-mentioned wire rope to the water surface. It shall have an eye at the end, and it shall be lowered down over the side as far as possible without interfering with the safety of navigation.

6.17 Yura Ko (34°17'N., 134°57'E.), on the W side of Tomoga-shima Suido, is enclosed on its E side by Naruyama Shima, which was previously described in paragraph 6.15. It is a good anchorage for small vessels, and is calm except with strong N and SSE winds. There are N and S entrances to the harbor; the N entrance is about 90m wide, with depths of about 4m. There are depths of 6.4 to 9.2m in the main part of the har-

bor.

Imakawa Kuchi, the S entrance to Yura Ko, lies close W of Taka Saki, which is the S extremity of Naruyama Shima; Taka Saki is marked by a light. It is only suitable for small craft. An overhead power cable, with a vertical clearance 14m, spans SW of Taka Saki.

Taka Saki Light

The E coast of Awaji Shima, from Yura Ko to U Zaki, about 17 miles NNE, has depths of over 20m from about 0.2 to 0.5 mile offshore.

Sumoto Ko (34°21'N., 134°54'E.), about 3.5 miles NW of Yura Ko, consists of an outer harbor and an inner harbor, sheltered by breakwaters; it lies close SE of the mouth of Sumoto Kawa. The outer harbor has depths of less than 4.9m. The wharf in the NW part of the outer harbor has depths of 4 to 4.6m alongside. A detached breakwater, extending NW-SE, has been constructed close NE of the entrance to the outer harbor.

Sen San, 448m high, is somewhat conspicuous about 3 miles WNW of Sumoto Ko. A chimney, 32m high, is conspicuous about 0.4 mile WSW of the outer harbor entrance.

Tsuna Ko (34°26'N., 134°55'E.) consists of the area from Sioda, about 4 miles N of Sumoto Ko, to Sano, about 4 miles farther NE.

Myoken Yama, 519m high, about 2 miles N of Sano, is somewhat conspicuous in the N part of Awaji Shima.

U Zaki (34°35'N., 135°02'E.) has remarkable red cliffs in its vicinity, and is fronted by an area of reclaimed land.

6.18 **Fuke Ko** (Huke Ko) (34°19'N., 135°08'E.) lies about 4 miles ENE of Kadano Seto, the E passage of Tomogashima Suido. The harbor consists of Tanagawa Hakuchi, consisting primarily of a reclaimed area, and Fuke Hakuchi, sheltered by breakwaters; a narrow man-made marina lies close W of Tanagawa Hakuchi.

Depths—Limitations.—A dolphin oil jetty, on the NE side of the reclaimed area, has depths of 8 to 8.5m alongside. An oil jetty, on the SE side of the reclaimed area, has depths of 8m alongside.

A wharf, about 198m long, with depths of 7m alongside, lies close SE of the reclaimed area.

Close E of the wharf, a spit, with depths of 1.2 to 4.3m, extends about 0.4 mile NNE from the shore, and is marked by a lighted buoy near its outer end.

Fuke Hakuchi has general depths of about 4m.

A rocky shoal, with a depth of 2.7m, lies nearly 0.5 mile N of the entrance to Fuke Hakuchi, and is marked W by a lighted buoy.

Aspect.—The chimney, 202m high and painted in red and white bands, of an electric power station, and tanks in the vicinity, are conspicuous on the reclaimed land. The chimney, 152m high, and painted in red and white bands, of another electric power station, is conspicuous about 0.35 mile farther SSE.

Naga Saki lies about 1 miles NE of Fuke Hakuchi; a white round tower lies about 0.4 mile E of the point.

In strong winds caution is necessary, as there may be a large number of vessels seeking shelter in the waters NW of the harbor.

Hannan Ko (34°28'N., 135°21'E.)

World Port Index No. 61935

6.19 Hannan Ko consists of the harbor areas fronting Izumi-Sano, Kaizuka, and Kishiwada (Kisiwada), and the Mokuzai lumber storage and timber ponds, respectively, from SW to NE. Industrial zones are being built in Kaizuka and Kishiwada, and construction of large wharves and breakwaters is underway off these cities. An area of prohibited entry, lighted around its perimeter by beacons, lies about 3 miles off Izumi-Sano.

Tides—Currents.—The tidal rise at Kishiwadi is 1.5m at springs, and 1.1m at neaps.

Depths—Limitations.—Izumi-Sano Fairway, entered about 1.5 miles N of the dredged harbor basin, leads to the basin at Izumi-Sano. It has depths of 11 to 13m, and is about 225m wide.

A berth, on the NE side of the entrance to the basin, has a depth of 11.9m alongside, and can accommodate a vessel up to 170m in length. A dolphin jetty on the SW side of the entrance has a depth of 12.5m alongside.

The dredged basin, off Tuda Kawa, has depths of 6.4m alongside the quay on its SW side.

Kishiwada Fairway is entered about 1 mile N of the entrance to the anchorage area lying S of the timber pond; it is about 250m wide, with depths of 10.8 to 12m.

Mooring buoys in the anchorage area can accommodate vessels up to 20,000 dwt, in depths of 11 to 11.9m.

A berth close SE of the timber storage area has depths of 10.1m alongside.

Aspect.—An observation tower stands about 4 miles W of the dredged basin at Izumi-Sano. The chimney of a refinery is

conspicuous S of the above-mentioned basin.

A radio tower, with an elevation of 86m, painted in red and white bands and marked by a red obstruction light, is conspicuous nearly 0.5 mile E of the mouth of Tuda Kawa; the tower of the Castle of Kishiwada, about 0.3 mile farther ENE, is also conspicuous.

A group of silver-colored oil tanks is conspicuous on the N side of the mouth of Ota Kawa, near the N limit of the harbor. An incinerator chimney is conspicuous at the N end of the timber pond area. Farther S, the chimney, 42m high, close SE of the joint harbor office, on the N side of the mouth of Haruka Kawa, is also conspicuous.

Lighted buoys mark the entrances to Izumi-Sano Fairway and Kishiwada Fairway.

Pilotage.—Pilotage is not compulsory for vessels less than 10,000 gt, but is compulsory for all others. Pilots, when requested from Osaka Wan pilots, will board in the vicinity of Kishiwada Fairway entrance or for vessels entering through the Izumi-Sano Fairway in 34°27.7'N, 135°19.6'E. For further information, see paragraph 6.1

Pilots can be contacted on VHF channels 16 and 13.

Caution.—A wreck, with a depth of 14.7m, lies 1.25 miles W of the quarantine anchorage.

A large detached area of reclaimed land is connected to the shore by two bridges on its SE side.

A breakwater extends NW and N from the N point of this area. A light is shown at its head.

Vessels should remain clear of the prohibited areas off Kaisuka and Kishiwada, where the off-lying detached breakwaters are under construction; the areas are marked by towers and lighted buoys, showing flashing orange lights.

Care is necessary in entering the anchorage area at Kishiwada, as there is a tendency to set towards the reclaimed land on the E side during strong W winds.

Sakai-Senboku Ku (34°33'N., 135°26'E.)

World Port Index No. 61547

6.20 Sakai-Senboku Ku is an important trading center, a cotton and wool center, and an industrial area for steel, oil, electricity, gas and petrochemical products. There is heavy traffic of large vessels. Sakai-Senboku Ku consists, from S to N, of Otsu Minami Hakuchi, Otsu Hakuchi, Hamadera Passage, Hamadera Hakuchi, Nishi Hakuchi, Minami Hakuchi, and Kita Hakuchi.

Hamadera Passage, entered about 3.8 miles NW of the entrance to Otsu Kawa, leads to Hamadera Hakuchi, about 3.8 miles E.

Sakai South Passage, entered about 4 miles WNW of the entrance to Yamato Kawa, leads ESE to Nishi Hakuchi and Minami Hakuchi. Sakai North Passage extends midway along Sakai South Passage and leads to Kita Hakuchi, about 2 miles E.

Depths—Limitations.—Hamadera Passage is about 300m wide, with a dredged depth of 15.8m; lesser depths than charted have been reported.

Sakai South Passage is about 0.2 mile wide, with dredged depths of 14m to its intersection with Sakai North Passage, then has depths of 9.2 to 10.4m farther ESE. Sakai North Passage has depths of 12.6 to 14.6m. The passage has a dredged depth of 14m as far as Lighted Buoy No. 5 and Lighted Buoy No. 6; lesser depths than charted have been reported E of these lighted buoys.

Section 2 of the port has 1,725m of berth space with depths alongside of 4.5 to 10.0m and can accommodate vessels up to 15,000 dwt.

Quay No. 3 in Otsu Minami Hakuchi can accommodate 18,000 dwt vessels in a depth of 10.1m.

Otsu Hakuchi has jetties with depths of 5 to 14.3m alongside.

The Cosmo crude oil dolphin jetties, N of the inner end of Hamadera Passage, have depths of 20m alongside and can accommodate vessels of up to 260,000 dwt with a maximum draft of 14m.

Hamadera Hakuchi comprises Area No. 4, the central part of Sakai-Senboku Ku, and is entered between short breakwaters. A light is shown on the head of each breakwater.

The LNG Jetty, close SE of the inner end of Hamadera Passage, can accommodate vessels up to 64,600 dwt in depths of 14.9m. Farther S, a Crude Oil Jetty can accommodate vessels of 150,000 dwt in depths of 15.8 to 17.1m. Farther E, a fertilizer pier can accommodate vessels up to 66,000 dwt in depths of 14 to 18m.

Nishi Hakuchi has an oil jetty, on its W side, which can accommodate 20,000 dwt vessels, in depths of 11 to 11.5m. Dangerous cargo jetties, with depths of 7 to 8m alongside, lie in the SE part of Nishi Hakuchi.

A jetty on the W side of the entrance to Minami Hakuchi has depths of 10.6 to 11.2m alongside and can accommodate 20,000 dwt vessels. Ohama Quay, on the NE side of Minami Hakuchi, has depths of 4.4 to 10.7m alongside.

The S side of Kita Hakuchi can accommodate 80,000 dwt vessels in a depth of 14m.

Drydock No. 2, on the W side of Minami Hakuchi, is 380m long, 63m wide, with a depth of 12.5m, and can accommodate vessels up to 400,000 dwt.

Aspect.—Lighted buoys mark both sides of Hamadera Passage and Sakai South Passage.

The **Itsumi-Otsu Oshashi Bridge** (34°31'N., 135°24'E.), in the S part of the harbor, is a yellow single arch bridge, 14.9m high, marked by green lights at its center and red lights on either side.

Six black gas tanks, 47m high, are conspicuous on the S side of the inner end of Hamadera Passage. A chimney, 163m high, painted red and white, is conspicuous about 1 mile farther S; oil tanks, painted white, are conspicuous close SW.

Three gas tanks, painted white, are conspicuous about 0.3 mile N of the inner end of Hamadera Passage.

Six chimneys (34°34'N., 135°27'E.) of an electric generating station are conspicuous close W of the S end of Minami Hakuchi. The chimneys are in line E-W; the two W chimneys are 185m high and painted red and white.

Two conspicuous gas tanks, 108m high, stand close N of the NE corner of Kita Hakuti.

Pilotage.—Pilotage is compulsory for vessels over 10,000 gt and is available during daylight hours only. Pilots board, as follows: Hamadera Fairway—Within a circle of radius 0.8 mile centered on a position 1 mile W of Hamadera Fairway Lighted Buoy No. 2. Sakai South Fairway—Within a circle of radius 0.8 mile centered on a position 3.25 miles WSW of Osaka

Osaka Ko

North Breakwater Light. Kishiwada Fairway and Izumi-Sano Fairway—Off the fairway.

Regulations.—Communications concerning harbor operations can be made by radio or radiotelephone with the harbormaster, situated at the S end of Minami Hakuchi.

Signal stations for berthing and navigational information are situated on the N side of the inner end of Hamadera Passage, and near the inner end of Sakai South Passage. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communications and their meanings, appropriate answering signals, and other local or specific regulations.

Vessels over 10,000 gt using Hamadera Passage should report in advance by noon of the previous day to the harbormaster their ETA at a position 1.5 miles W of the signal station.

Vessels over 3,000 gt using Sakai South Fairway should report in advance by noon of the previous day to the harbormaster their ETA at the entrance to that fairway.

Anchorage.—The quarantine anchorage (34°34.5'N., 135°19.2'E.) lies SW of the entrance to Sakai South Passage in a depth of 10.8m.

Caution.—A prohibited area exists SW of Senboku Otsu South Breakwater.

Osaka Ko (34°39'N., 135°26'E.)

World Port Index No. 61550

6.21 Osaka Ko, Kobe Ko and Amagasaki Ko are all part of the greater Hanshin Port complex. Osaka Ko, one of the great harbors of Japan, lies in the NE part of Osaka Wan. The harbor extends N from the mouth of **Otsu Kawa** (Otu Kawa) (34°30'N., 135°23'E.), at the N harbor limit of Hannan Ko, to N of the mouth of **Shin-Yodo Kawa** (Sin-Yodo Kawa) (34°41'N., 135°24'E.), one of the lower reaches of Yodo Kawa. The harbor, from S to N, fronts the cities of Izumi-Otsu (Izumi-Otu), Takaishi (Takaisi), Sakai, and Osaka. The harbor is divided into Sakai-Senboku Ku and Osaka-Ku, from S to N, and will be described in that order.

Osaka Ko Home Page
http://osakaharbor-info.com

Osaka Ku is the N harbor area of Osaka Ko. Naiko (Inner Harbor), consisting of Section I to Section IV, is enclosed by the entrance to North Breakwater and South Breakwater (34°38'N., 135°24'E.). South Harbor (Section V) is the area S of South Breakwater. North Harbor (Section VI) is the area on the N side of the E part of North Breakwater. Gaiko (Outer Harbor) is Section VII. A coastal industrial zone, with wharves for local and industrial traffic, is under construction in North Harbor and South Harbor. Gas, chemical, mineral, and steel factories, the foundation of Osaka's industry and economy, border the shores of the harbor.

Winds—Weather.—The wind is mostly W in the winter, and W and NE in summer. Throughout the year the most common wind is NE. In regard to wind velocity, the W winds are generally strong, and when there are sustained strong W winds in winter, these become large and make harbor operations difficult.

Fog is generated, on rare occasions in winter, from about sunrise to about 0900, but as it disperses in 2 or 3 hours, it presents no particular obstacle to navigation. It disperses with winds of over 8 knots.

Tides—Currents.—The mean tidal rise at Osaka is 1.4m at springs, and 1.1m at neaps.

In the NE part of Osaka Wan the current usually sets S and the ebb current becomes particularly strong, and caution is necessary when entering or leaving the harbor.

The tidal currents inside the breakwaters are generally weak, but at springs and after heavy rains the ebb current from the rivers can be fairly strong and there may be difficulty in securing to or departing from the berths and mooring buoys in the lower reaches of Aji Kawa and Shirinashi Kawa.

Depths—Limitations.—There are two container quays in Section I, each 350m long.

Osaka Ko—North Wharf—Quay R

Dolphin berths, close within the entrance to Inner Harbor, have depths of 10.1 to 11.9m.

Center Wharf has depths of 11m and 10.1m alongside its N and S sides, respectively.

Oil berths, about 0.5 mile W of Center Wharf,.

Lumber piers, about 0.4 mile S of Center Wharf, can accommodate vessels up to 20,000 dwt in depths of 11.5 to 13m.

Osaka Ko—Cruise Terminal

There are numerous mooring buoys and dolphin berths in the harbor, with depths of 7.5 to 10.1m, that can accommodate vessels up to 10,000 gt.

Osaka Ko—North Container Terminal

Osaka Ko—East Container Terminal

South Harbor Fairway, dredged to 11.9m, is entered about 0.8 mile WNW of the head of South Breakwater. Lighted buoys mark the S side of the channel.

Quay L and Quay R, close within South Harbor, have depths alongside of 10 to 12m, respectively.

Quay J, farther S, on the N side of Sakai North Passage. For further berthing information refer to the table titled **Osaka—Berth Information**.

Aspect.—Inner Harbor Passage, entered about 0.7 mile WSW of the N and S breakwater heads, is dredged to a depth of 14.3m. Aji Kawa Passage (Azikawa Passage), continuing from ENE to NW of the outer end of Center Wharf, has depths of 12 to 14mLighted buoys, moored about 0.7 mile WSW of the entrance to Inner Harbor, mark the entrance to Inner Harbor Passage.A bridge, with a vertical clearance of 45m, crosses Aji Kawa 0.7 mile from the river mouth.

Osaka Ko Radar Station, 51m high and painted red and

white, is conspicuous at the W end of Center Wharf.

Gas tanks, painted white, with a chimney, 82m high, close NW, lie about 1 mile N of Center Wharf.

A ferris wheel, 116m high, stands close E of Tenpozan Quay.

The bridge, about 0.7 mile ESE of Center Wharf, is marked by green lights at its center and red lights on each side.

A bridge spans North Harbor between North Port, on the W side, and Hokko Wharf, on the E side. The navigable channel is under the E part of the bridge and is indicated by bridge lights. There is a vertical clearance of 31m in the channel. A second bridge crosses the mouth of Shorenji Kawa. There is a vertical clearance of 28m under the N span and 31m under the S span.

A bridge, about 0.7 mile ENE of Center Wharf, has a vertical clearance of about 49m over a distance of 208m. The Osaka World Trade Center building, 260m high, situated on Center Wharf, is conspicuous.

The Ferry Wharf, at the inner end of South Harbor, is lighted by floodlights.

Pilotage.—Pilotage is compulsory for vessels of 10,000 gt or more and is available 24 hours. Pilots can be obtained from Hanshin Pilots in Osaka and Kobe. Osaka Pilots can be contacted vis telephone 81-6-576-1731 or by Facsimile 81-6-575-3734. Requests for pilots should be made between 0900 and 1700 the day before arrival. Pilots reportedly board vessels within a circle with a radius of 0.5 mile centered on a position 4 miles SW of Osaka North Breakwater Light.

Osaka Ko Radar Station, at the W end of Center Wharf, broadcasts weather and maritime traffic bulletins at regular intervals. Upon request, a vessel's position, movements of other vessels, and conditions inside the harbor, will be broadcast for vessels up to 1,000 gt within about 4 miles, and for vessels over 1,000 gt within about 8 miles.

Osaka—Berth Information

Berth	Length	Depth	Maximum Vessel Size	Remarks
A Wharf				
A 1	—	7.5m	3,000 gt	Breakbulk.
A 2	—	7.5m	3,000 gt	Breakbulk.
A 3	—	7.5m	3,000 gt	Breakbulk.
A 5	—	7.5m	3,000 gt	Breakbulk.
A 6	—	7.5m	3,000 gt	Breakbulk.
A 7	—	7.5m	3,000 gt	Breakbulk.
A 8	—	8.0m	3,000 gt	Breakbulk.
Aijkawa				
M7	110m	—		Steel products.
Aijkawa Wharf 1				
No. 7	320m	10.0m	3,000 gt	Cargo (other).
Aijkawa Pier				
No. 13A	312m	5.5m	1,000 gt	Breakbulk.
No. 13B	120m	5.5m	1,000 gt	Breakbulk.
No. 13C	412m	5.5m	1,700 gt	Breakbulk.
B Wharf				
No. 1	137m	7.5m	3,000 gt	Breakbulk.
No. 2	—	7.5m	3,000 gt	Breakbulk.
No. 3	—	7.5m	3,000 gt	Breakbulk.
No. 4	—	7.5m	3,000 gt	Breakbulk.
Central Pier North Wharf				
Central Pier North	182m	11.0m	—	Steel products.
D Wharf				
D 1	—	7.5m	—	Steel and bunkers.
D 2	—	7.5m	—	Steel and bunkers.

Osaka—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
D 3	—	5.5m	—	Steel and bunkers.
D 4	—	5.5m	—	Steel and bunkers.
D 5	—	5.5m	—	Steel and bunkers.
Dream Island Container Terminal				
C 10	350m	15.0m	60,000 dwt	Bunkers and reefer. Maximum draft of 13.0m.
C 11	350m	15.0m	60,000 dwt	Bunkers and reefer. Maximum draft of 13.0m.
C 12	400m	16.0m	100,000 dwt	Bunkers and reefer. Maximum draft of 13.0m.
C 12 extension	250m	16.0m	100,000 dwt	Bunkers and reefer. Maximum draft of 13.0m.
E Wharf				
E 1	—	5.5m	1,000 gt	Steel products.
E 2	—	5.5m	1,000 gt	Steel products.
E 3	—	5.5m	1,000 gt	Steel products.
E 4	—	5.5m	1,000 gt	Steel products.
E 5	—	5.5m	1,000 gt	Steel products.
E 6	175m	7.5m	3,000 gt	Steel products.
E 7	135m	7.5m	3,000 gt	Steel products.
G Wharf				
G 1	—	5.5m	1,000 gt	Steel products.
G 2	—	5.5m	1,000 gt	Steel products.
G 3	—	5.5m	1,000 gt	Steel products.
G 4	—	5.5m	1,000 gt	Steel products.
G 5	—	5.5m	1,000 gt	Steel products.
G 6	—	5.5m	1,000 gt	Steel products.
G 7	—	5.5m	1,000 gt	Steel products.
G 8	—	5.5m	1,000 gt	Steel products.
Hokko Shiratsu				
HS-1	240m	12.0m	20,000 gt	Wood chips and bunkers.
HS-2	240m	10.2m	20,000 gt	Wood chips and bunkers.
HS-3	240m	12.0m	20,000 gt	Wood chips, ro-ro, and bunkers.
HS-4	130m	7.5m	3,000 gt	Steel products and bunkers.
HS-5	130m	7.5m	3,000 gt	Wood chips, ro-ro, and bunkers.
HS-6	130m	7.5m	3,000 gt	Lo-lo, ro-ro, and bunkers.
Hokko Wharf				
51	130m	7.5m	5,000 gt	Gypsum and bunkers.
55	154m	7.5m	3,000 gt	Gypsum and bunkers.
I Wharf				
I1	—	5.5m	1,000 gt	Breakbulk and bunkers.
12	—	5.5m	1,000 gt	Breakbulk and bunkers.

Osaka—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
13	—	5.5m	1,000 gt	Breakbulk and bunkers.
14	—	5.5m	1,000 gt	Breakbulk and bunkers.
15	—	5.5m	1,000 gt	Breakbulk and bunkers.
16	—	5.5m	1,000 gt	Breakbulk and bunkers.
17	—	5.5m	1,000 gt	Breakbulk and bunkers.
18	—	5.5m	1,000 gt	Breakbulk and bunkers.
International Ferry Terminal				
KF-1	225m	10.0m	30,000 gt	Ro-ro, passengers, and containers.
KF-2	225m	10.0m	8,000 gt	Ro-ro, passengers, and containers.
J Wharf				
J 1	—	12.0m	20,000 gt	Steel and bunkers.
J 2	—	12.0m	20,000 gt	Steel and bunkers.
J 3	—	12.0m	20,000 gt	Steel and bunkers.
K Wharf				
K 1	185m	10.0m	10,000 gt	Steel.
K 2	185m	10.0m	10,000 gt	Steel.
Kuribayashi Steamship Nanko Wharf				
J 4	208m	12.0m	30,000 dwt	Ro-ro, passengers, and vehicles.
Liner Wharf				
L 1	200m	10.0m	15,000 gt	Steel.
L 2	200m	10.0m	15,000 gt	Steel.
L 3	200m	10.0m	15,000 gt	Steel.
L 4	250m	10.0m	15,000 gt	Steel.
L 5	250m	10.0m	15,000 gt	Steel.
L 6	230m	10.0m	15,000 gt	Steel.
L 7	230m	10.0m	15,000 gt	Steel.
Nakayama Steel East Wharf				
P 7	—	9.0m	7,000 gt	Steel.
P 9	—	9.0m	7,000 gt	Steel.
Nakayama Steel West Wharf				
P 1	260m	12.0m	40,000 dwt	Steel products.
Nanko Container Terminal				
C 1	350m	13.5m	40,000 dwt	Containers and reefer.
C 2	350m	13.5m	40,000 dwt	Containers and reefer.
C 3	350m	13.5m	40,000 dwt	Containers and reefer.
C 4	350m	13.5m	40,000 dwt	Containers and reefer.
C 6	300m	12.0m	35,000 dwt	Containers and reefer.
C 7	300m	12.0m	35,000 dwt	Containers and reefer.

Osaka—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
C 8	350m	14.0m	45,000 dwt	Containers and reefer.
C 9	350m	13.0m	45,000 dwt	Containers and reefer.
Nissinseiko Sakurajima				
M 13	37m	—	—	Steel products.
Osaka Gas Torishima Wharf				
Q 1	—	6.0m	3,500 dwt	Breakbulk.
Q 3	—	6.0m	3,500 dwt	Breakbulk.
Q 5	—	6.0m	3,500 dwt	Breakbulk.
Q 7	—	6.0m	3,500 dwt	Breakbulk.
Osaka Gas West Pier				
Q6	64m	6.0m	2.300 dwt	—
Osaka Gas East Pier				
Q 8	220m	7.0m	5,000 dwt	—
Osaka Nanko Ferry Terminal				
F 1	80m	7.5m	8,000 gt	Fast ferries, ro-ro, and passengers.
F 2	130m	6.0m	3,000 dwt	Ro-ro, passengers, and vehicles.
F 3	148m	6.0m	3,000 dwt	Ro-ro, passengers, and vehicles.
F 4	165m	7.5m	8,000 gt	Ro-ro, passengers, and vehicles.
F 5	100m	7.5m	8,000 gt	Ro-ro, passengers, and vehicles.
F 6	85m	6.0m	3,000 dwt	Ro-ro, passengers, and vehicles.
F 7	240m	8.5m	8,000 gt	Ro-ro, passengers, and vehicles.
F 8	250m	8.5m	5,000 dwt	Ro-ro, passengers, and vehicles.
Osaka Port Silo Wharf				
Osaka Port Silo Wharf	115m	11.0m	10,000 gt	Containers.
R 1	175m	10.0m	20,000 gt	Containers.
R 2	240m	12.0m	20,000 gt	Containers.
R 3	240m	12.0m	10,000 gt	Containers.
R 4	185m	10.0m	10,000 gt	Containers.
R 5	185m	10.0m	10,000 gt	Containers.
Sakishima Wharf				
Sakishima Wharf	350m	4.0m	700 gt	Breakbulk.
Sakurajima Wharf				
15	178m	10.0m	700 gt	Breakbulk.
17	178m	10.0m	700 gt	Breakbulk.
19	178m	10.0m	700 gt	Breakbulk.
Shimaya 2 Chrome				
Q 10	—	—	—	Steel products.
Q 12	—	—	—	Steel products.

Osaka—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
Sumitomo Cement				
M 11	—	—	—	Bunkers.
Sumitomo Corp. Nanko Wharf				
J 5	318m	12.0m	30,000 dwt	Steel products.
Summit Steel Terminal				
Q 9	100m	6.0m	3,000 dwt	Steel products.
Sunny Metal Pier				
Q11	50m	5.5m	1,500 dwt	Breakbulk.
Tempozan Passenger Terminal				
W3	230m	11.0m	11,500 gt	Cruise vessels.
W5	140m	11.0m	11,500 gt	Cruise vessels.
Tsuneyoshi Wharf				
59	—	5.5m	1,000 gt	Aggregates.
61	—	5.5m	1,000 gt	Aggregates.
63	—	5.5m	1,000 gt	Aggregates.
65	—	3.5m	1,000 gt	Aggregates.
Tsuruhama Wharf				
TH	280m	10.0m	30,000 gt	Ro-ro.
Umemachi Wharf				
21	131m	10.5m	—	Coal.
23	131m	10.0m	—	Coal.
25	131m	10.0m	—	Coal.
Wharf 1				
6	—	10.0m	10,000 gt	Breakbulk.
8	—	10.0m	10,000 gt	Breakbulk.
Wharf 10				
46	—	9.0m	7,000 gt	Steel.
48	—	7.5m	3,000 gt	Steel.
50	—	7.5m	3,000 gt	Steel.
52	—	7.5m	1,000 gt	Steel.
54	—	7.5m	1,000 gt	Steel.
Wharf 11				
56	—	5.5m	1,000 gt	Steel.
58	—	5.5m	1,000 gt	Steel.
60	—	5.5m	1,000 gt	Steel.
Wharf 2				
14	—	10.0m	10,000 gt	Sugar and steel products.
16	—	10.0m	10,000 gt	Sugar and steel products.

Osaka—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
Wharf 3				
18	—	7.5m	10,000 gt	Sugar and steel products.
20	—	7.5m	3,000 gt	Sugar and steel products.
Wharf 5				
22	—	9.0m	6,000 gt	Cement.
24	—	9.0m	6,000 gt	Cement.
26	—	9.0m	6,000 gt	Cement.
Wharf 6				
28	—	10.0m	10,000 gt	Steel.
30	—	10.0m	10,000 gt	Steel.
Wharf 7				
32	—	10.0m	—	Steel.
34	—	10.0m	10,000 gt	Steel.
36	—	10.0m	10,000 gt	Steel.
Wharf 8				
38	—	7.5m	3,000 gt	Cement.
40	—	7.5m	3,000 gt	Cement.
42	—	7.5m	3,000 gt	Cement.
Ajikawa Wharf 2				
11 A	180m	10.0m	10,000 gt	Chemicals, steel, and bulk cargo.
11 B	180m	10.0m	10,000 gt	Chemicals, steel, and bulk cargo.
Ajikawa Wharf 3				
9 B	178m	10.0m	—	Chemicals and breakbulk.
Taisho Pier 1 North Wharf				
70	—	5.5m	1,000 gt	Chemicals, steel, and bulk cargo.
72	—	5.5m	1,000 gt	Chemicals, steel, and bulk cargo.
74	—	5.5m	1,000 gt	Chemicals, steel, and bulk cargo.
76	—	5.5m	1,000 gt	Chemicals, steel, and bulk cargo.
78	—	5.5m	1,000 gt	Chemicals, steel, and bulk cargo.
Taisho Pier 1 West Wharf				
82	—	—	—	Chemicals and breakbulk.
Taisho Pier 1 South Wharf				
80	200m	—	—	Chemicals and breakbulk.
Tatsumi Ajiwaka Wharf				
M10	119m	10.0m	26,200 dwt	Chemicals and breakbulk.
Umemachi West Wharf				
39	—	10.0m	20,000 dwt	Chemicals and DPP.
41	—	10.0m	20,000 dwt	Chemicals and DPP.

Osaka—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
43	30m	10.0m	—	Chemicals and DPP.
45	—	10.0m	—	Chemicals and DPP.
47	12m	12.0m	—	Chemicals and DPP.
49	—	11.6m	45,974 dwt	Chemicals and DPP. Maximum beam of 32.0m.
Tanker Terminals				
AST-inc Hokko Terminal				
Q 2	17m	—	—	Berthing length of 140m (including dolphins).
Q 4	13m	—	—	Berthing length of 25m (including dolphins).
AST-Inc Terminal				
H2	10m	—	—	Chemicals.
Daido Sakurajima				
H4	6m	—	—	Berthing length of 95m (including dolphins).
Kansai Terminal				
M5 West 1	15m	4.5m	—	Chemicals. Berthing length of 72m (including dolphins).
M5 West 2	5m	4.5m	1,300 dwt	Chemicals. Maximum loa of 66m.
Tatsumi Hokko Futo				
H16	8m	—	—	Chemicals. Berthing length of 30m (including dolphins).
Umenachi East Wharf				
27	7m	—	—	Chemicals and petroleum products.
29	36m	—	—	Chemicals and petroleum products.
31	—	—	—	Chemicals and petroleum products.
33	13m	—	—	Chemicals and petroleum products.
35	13m	—	—	Chemicals and petroleum products.
Umenachi H10				
H10	120m	—	—	Chemicals.
Umenachi H12				
H12	13m	—	—	—

Regulations.—The harbormaster may be contacted by radio regarding harbor operations. The harbor office can be contacted 24 hours on VHF channels 12, 16, 19, and 20 for tugs, water, line handling, pilotage, and quarantine assistance.

Vessels over 5,000 gt, intending to enter or leave the harbor, should notify the harbormaster of the ETA at the W end of the fairway, or the time of departure by 1200 of the day preceding the arrival or departure. Any change in ETA should be reported to the harbormaster.

Signal stations which display anchorage and berthing signals are situated as follows:

1. At the head of N breakwater.
2. At Aji Kawa, about 0.5 mile NE of Center Wharf.
3. At Kizu Kawa, about 1.8 miles SE of Center Wharf.
4. In **South Harbor** (34°37.1'N., 135°25.5'E.).
5. Osaka Nanko signal station stands at the NW point of South Wharf (34°37.1'N., 135°24.0'E.); Nanko No. 2 signal station stands 0.14 mile E of Osaka Nanko signal station.

Vessels should retain on board the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate answering signals, and other local or specific regulations. The Port of Osaka Entrance and Departure Manual should also be retained; the most recent edition of this manual may be found at http://osakaharbor-info.com.

Signals.—Traffic through Naiko and Aji Kawa Fairways is controlled by the signal flashing letter "C," indicating that large

vessels are docking or leaving Tempozan Wharf, Ajikawaguchi Wharf, Sakurajima Wharf, or Umemachi Wharf, and all other vessels must clear the fairways.

The following regulations are in effect in the entrance fairway to South Harbor:

1. Vessels must navigate in accordance with the signals shown from South Harbor Signal Station. (See accompanying table below.)
2. Vessels entering or leaving the fairway must remain clear of vessels in the fairway.
3. Vessels must not navigate abreast each other in the fairway.
4. Vessels meeting other vessels in the fairway must navigate on the right side of the fairway.
5. Vessels may not overtake other vessels in the fairway.

A vessel underway within the port will be instructed by the pilot to display certain flags of the International Code of signals to indicate the section of the port it is proceeding.

6.22 On the N side of Osaka Wan are the important harbors of Kobe and Amagasaki. The coast E of **Hachibuse Yama** (Hatibuse Yama) (34°38'N., 135°06'E.) is backed by a range of mountains extending NE.

Rokko San (34°46'N., 135°16'E.), about 12 miles NE of Hachibuse Yama, is the highest peak in this range, and attains an elevation of 932m, with a hotel and other buildings on its summit. Kabuto Yama, 309m high, is conspicuous about 3.25 miles E of Rokko San; it is isolated, thickly covered with pine trees, very dark in appearance, and shaped like a Japanese helmet. East and SE of Kabuto Yama, there is an extensive plain.

Osaka Ko—South Harbor Signal Station—Traffic Signals

Day	Night	Meaning
A flashing white light every 2 seconds, or a black cone, point up.	A flashing white light every 2 seconds.	Vessels may enter harbor. Vessels under 500 gt may leave harbor, but vessels over 500 gt must stop and wait.
A flashing red light every 2 seconds, or a black square.	A flashing red light every 2 seconds.	Vessels may leave harbor. Vessels under 500 gt may enter harbor, but vessels over 500 gt must stop and wait.
A flashing red light and a flashing white every 3 seconds, or two black cones, points together.	A flashing red light and a flashing white light every 3 seconds.	Vessels over 5,000 gt entering the harbor must keep out of the path of vessels leaving the harbor and wait outside of the fairway. Vessels over 5,000 gt leaving the harbor must stop and wait. Vessels of less than 5,000 gt may enter and leave the harbor.
Three flashing red lights and three flashing white lights every 6 seconds, or two black cones, points together and a red square flag, displayed vertically.	Three flashing red lights and three flashing white lights every 6 seconds.	Vessels other than those specified by the harbormaster may neither enter or leave the harbor.

Osaka Ko—Course and Destination Signals

Signal	AIS Symbol	Meaning
Second Substitute, Flag H	H	Proceeding to facilities in Section 1.
Second Substitute, Flags 2 and T	2T	Proceeding to facilities W of Tenposan Ohashi in Section 2.
Second Substitute, Flags 2 and A	2A	Proceeding to facilities E of Tenposan Ohashi in Section 2.
Second Substitute, Flags 3 and W	3W	Proceeding to facilities W of Minato Ohashi in Section 3.
Second Substitute, Flags 3 and E	3E	Proceeding to either No 5-8 Quays E of Minato Ohashi in Section 3, Shirinashi Kawa or Taisho Inner Harbor.
Second Substitute, Flags 3 and C	3C	Proceeding to the Nanko Container Wharf, I Quay, or G Quay E of Minato Ohashi.
Second Substitute, Flags 3 and K	3K	Proceeding to facilities E of Minato Ohashi in Section 3.
Second Substitute, Flags 4 and N	4N	Proceeding to facilities N of a line between Nanko N Breakwater light and Nanko Signal Station in Section 4.
Second Substitute, Flags 4 and S	4S	Proceeding to facilities in Section 4 excluding areas N of a line between Nanko N Breakwater light and Nanko Signal Station in Section 4.

Osaka Ko—Course and Destination Signals		
Signal	**AIS Symbol**	**Meaning**
Second Substitute, Flag 5	5	Proceeding to facilities in Section 5.

Amagasaki Ko (34°41'N., 135°23'E.)

World Port Index No. 61555

6.23 Osaka Ko, Kobe Ko and Amagasaki Ko are all part of the greater Hanshin Port complex. Amagasaki Ko (Amagasaki Nishinomiya) (Ashiya Ko) lies in the NE part of Osaka Wan, between Osaka Ko and Kobe Ko. Amagasaki Ko, which includes Nishinomiya Ko and Ashiya Ko, is divided into three districts. Section No. 1 is an industrial harbor servicing the Hanshin belt of heavy industry. Section No. 2 lies on the W side of the harbor, adjacent to the E part of Kobe Ko, and is primarily a yacht harbor. Section No. 3 describes the area S of Nishinomaya Breakwater, although there are no harbor facilities.

Amagasaki City is an industrial city which has developed in the deltas of Muko Kawa and Kanzaki Kawa, and on the reclaimed land along their frontage. The ground here is low and marshy and as a result, bottom cave-ins or sinkholes are not unusual.

South Breakwater, which is detached, lies across the entrance to the harbor. The area extending 0.3 mile S from the breakwater has been reclaimed and works are in progress.

The harbor is entered between the W end of South Breakwater and the promontory of reclaimed land lying SW of West Breakwater. A light is shown on the head of West Breakwater. The two fairways which branch off from this area have general depths of 10m, but caution is necessary as the passages become narrow and the water is shallow on either side.

Winds—Weather.—At Amagasaki, the most frequent winds are from the NNE, NE, and W, respectively. Winds are from the NW to NE more than 50 per cent of the time. Seasonally, W to NE winds are frequent in winter, N to NE winds in spring and autumn, and SW to W winds in summer.

Depths—Limitations.—Higashikaigan, with depths alongside of 5.5 to 12m can accommodate vessels up to 30,000 dwt.

Two petroleum berths at the mouth of Nakasima Kawa, on the left bank, have depths of 10.6m alongside.

No. 1 Lock, leading to the inner part of the dikes, is 80m long and 12.5m wide, and has a depth of about 4.5m. No. 2 Lock, 62m long and 11.9m wide, has a depth of 4m.

Section No. 2, which fronts the city of Nishinomaya, has general depths alongside of 4.5 to 6m.

Aspect.—A gas tank, 97m high and painted black, and a chimney, 94m high, painted red and white, and with a mobile crane in the vicinity, are conspicuous.

Lighted buoys mark the entrance channel to Amagasaki Ko; the channel is approximately 200m wide and is entered about 2 miles SW of South Breakwater.

Kabuto Yama, previously described in paragraph 6.22, is conspicuous about 3 miles N of Nishinomiya Ko.

Four spherical gas tanks are conspicuous about 0.3 mile NE of the mouth of Higashi Kawa, at Nishinomiya.

Pilotage.—Pilotage in Amagasaki Ko is compulsory for vessels over 10,000 gt. Pilots board within a circle of radius 0.3 mile centered on a position 0.5 mile SW of Amagasaki Lighted Buoy No. 2. For further information, see paragraph 6.1

Caution.—When vessels over 5,000 gt enter Amagasaki Ko and berth alongside they normally request two or more tugs from Osaka or Kobe.

Kobe Ko (34°41'N., 135°15'E.)

World Port Index No. 61560

6.24 Osaka Ko, Kobe Ko and Amagasaki Ko are all part of the greater Hanshin Port complex. Kobe Ko occupies the N part of Osaka Wan. The harbor is divided into Sections I to Section VI; further, there are Fairway I to Fairway III, and the Higashi-Kobe Fairway.

Kobe Ko is a domestic and international trade center, and being enclosed N by mountains, is protected from the winter Northwest Monsoons. The harbor is well-protected and has numerous berthing facilities. There is sufficient depth in the anchorage, where the bottom is sand, mixed with clay, good holding ground.

Port Island, in the central part of the harbor, has piers for the exclusive use of container vessels, and for use by scheduled shipping services. A restricted area has been established off the south central portion of Port Island; entry is prohibited.

Kobe Airport is situated on reclaimed land S of Port Island.

Winds—Weather.—Throughout the year at Kobe, the most common wind is N, followed by W to NW, but the velocity of the wind is not particularly strong. From summer through autumn, except with the onset of an extremely strong typhoon, there are hardly any occasions when the working of cargo is completely impossible due to wind and seas.

Tides—Currents.—The mean tidal rise at Kobe is 1.4m at springs, and 1.1m at neaps.

The diurnal tidal irregularities are rather large, and on several days per month there is only one tidal cycle per day. At such times, the tidal currents are also irregular; at the time of LW the tidal current is N, and at HW it is S, with a maximum velocity of about 0.5 knot.

Depths—Limitations.—The maximum draft allowed in each of the fairways is, as follows:

a. 8.7m in Fairway I.
b. 11.8m in Fairway II.
c. 11.4m in Fairway III.

There are two offshore pipeline berths about 2 miles WSW of Wada Misaki. Vessels up to 70,000 dwt, with a maximum length of 250m and a maximum draft of 12.7m, can be accommodated at the W berth. Vessels with a maximum length of 236m and a maximum draft of 10.7m can be accommodated at the E berth.Rokko Island, an artificial rectangular-shaped island, extends 2 miles E of Nadahama Channel into Section VI; numerous berths are situated on each side of the island. Two bridges span the passage between the island and the industrial areas N. The W bridge, Rokko-Ohashi, has a vertical clearance

of 14m; the E bridge has a vertical clearance of 28m.

Port Island is an artificial island to the W of Rokko Island. It is connected to the N by the Kobe-Ohashi Bridge, which has a vertical clearance of 14m. Several other bridges and tunnels are in the works.

Maya Wharf is an island berth, connected to the mainland to the N by the Nadahama-Ohashi Bridge, which spans from the NE corner of the complex to No. 1 Industrial District and has a vertical clearance of 27m. The Daini Maya-Ohashi Bridge connects Maya Wharf to Shinko Higashi Wharf, to the W, and has a vertical clearance of 18m.

A number of dolphin berths lie on the N side of No. 5 Breakwater.

The largest drydock is 301.5m long and 43.7m wide; it can accommodate vessels up to 85,000 dwt. Fore further details on berthing in Kobe Ko, see the table titled **Kobe—Berth Information**.

Aspect.—Fairway I runs from between Wada Breakwater and No. 1 Breakwater to the vicinity of Central Wharf. Fairway II runs between Breakwater No. 1 and Breakwater No. 2, then W of Port Island to Shinko Pier 2 and Shinko Pier 3. Fairway III runs along the NE side of Port Island. Higashi-Kobe Fairway runs between Industrial Area No. 3 and Industrial Area No. 4 Industrial; Higashi Fairway joins this passage to Ferry Wharf, farther N. Fairway III runs SE from Breakwater No. 6 and Breakwater No. 7. The channel, extending from the N entrance of Fairway III to the berths at Kobe Steelworks, is commonly called Nadahama Channel.

Kobe—Berth Information

Berth	Length	Depth	Maximum Vessel Size	Remarks
Hashin Silo Terminal				
Wharf A	90m	7.2m	—	Fruits and vegetables.
Wharf B	90m	7.2m	—	Fruits and vegetables.
Wharf C	140m	7.2m	—	Fruits and vegetables.
Wharf D	150m	7.2m	—	Fruits and vegetables.
Wharf E	150m	7.2m	—	Fruits and vegetables.
Wharf F	210m	9.0m	—	Fruits and vegetables.
Wharf G	210m	9.0m	—	Fruits and vegetables.
Wharf H	214m	9.0m	—	Fruits and vegetables.
Wharf I	241m	9.0m	—	Fruits and vegetables.
Wharf J	170m	7.5m	—	Fruits and vegetables.
Wharf k	90m	7.5m	—	Fruits and vegetables.
No. 13C	412m	5.5m	1,700 gt	Breakbulk.
Konan Futo Terminal				
L Jetty	214m	12.0m	80,000 dwt	Grain.
Kobe Port Terminal				
0 1	206m	11.0m	—	Passengers.
Q 2	236m	10.0m	—	Passengers.
P	147m	9.0m	—	Passengers.
Q 1	203m	12.0m	—	Passengers.
Q 2	217m	12.0m	—	Passengers.
R	229m	9.3m	—	Passengers.
Maya Container Wharf				
A	185m	10.0m	—	Containers.
B	185m	10.0m	—	Containers.
C	240m	12.0m	—	Containers.
D	240m	12.0m	—	Containers.
E	240m	12.0m	—	Containers.

Kobe—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
F	240m	12.0m	—	Containers.
G	300m	12.0m	—	Containers.
H	300m	12.0m	—	Containers.
I	330m	12.0m	—	Containers.
J	334m	12.0m	—	Containers.
Naka Pier Cruise Terminal				
B	143m	9.0m	50,000 gt	Passengers.
C	143m	9.0m	50,000 gt	Passengers.
Port Island				
Kita PL-1	200m	10.0m	—	General and bulk cargo.
Kita PL-2	200m	10.0m	—	General and bulk cargo.
Kita PL-3	200m	10.0m	—	General and bulk cargo.
Kita PL-0	200m	10.0m	—	General and bulk cargo.
Kita PL-P	200m	5.5m	—	General and bulk cargo.
Kita PL-Q	200m	12.0m	25,000 dwt	General and bulk cargo.
Kita PL-R	200m	12.0m	25,000 dwt	General and bulk cargo.
Minarri PL-D	300m	12.0m	—	—
Minarri PL-E	230m	12.0m	—	—
Minarri PL-F	230m	12.0m	—	—.
Minarri PL-G	240m	12.0m	—	—.
Minarri PL-H	200m	12.0m	—	—
Minarri PL-I	240m	12.0m	—	—.
Minarri PL-J	240m	12.0m	—	—
Minarri PL-K	220m	12.0m	—	—
Minarri PL-L	130m	12.0m	—	—
Naka PL 04	250m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 05	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 06	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 07	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 08	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 09	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 10	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 11	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 12	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 13	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 14	200m	10.0m	15,000 dwt	General and bulk cargo.
Naka PL 15	200m	10.0m	15,000 dwt	General and bulk cargo.
PC 13	350m	15.0m	—	Containers.

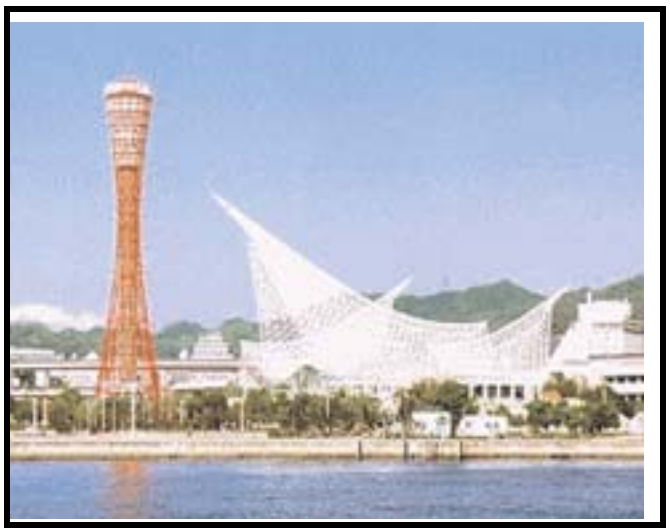
Kobe—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
PC 14	350m	15.0m	—	Containers.
PC 15	350m	15.0m	—	Containers.
PC 16	350m	15.0m	—	Containers.
Kobe International Container Terminal (KGKT)				
PC 17	350m	15.0m	—	Containers.
Kamigumi Kobe Container Ter.0minal				
PC 18	350m	15.0m	—	Containers.
PC 18 (New)	400m	16.0m	—	Containers.
Rokko Island				
A	130m	7.5m	—	Domestic feeder.
B	162m	4.0m	—	Domestic trade.
C	185m	10.0m	—	Foreign trade.
D	185m	10.0m	—	Foreign trade.
E	185m	10.0m	—	—
F	185m	10.0m	—	—
G	178m	10.0m	—	—
H	185m	10.0m	—	—
I	185m	10.0m	—	—
J	185m	10.0m	—	—
K	185m	10.0m	—	—
L	185m	10.0m	—	Domestic trade.
M	185m	7.5m	—	Domestic trade.
N	130m	10.0m	—	Coal.
O	130m	10.0m	—	Domestic trade.
P	185m	10.0m	—	Foreign trade.
Q	185m	10.0m	—	Foreign trade.
R	185m	10.0m	—	Foreign trade.
S	185m	10.0m	—	Foreign trade.
T	185m	10.0m	—	Foreign trade.
U	185m	10.0m	—	Foreign trade.
V	185m	10.0m	—	Foreign trade.
W	240m	10.0m	—	Domestic feeder.
X	240m	10.0m	—	Domestic feeder.
Y	240m	10.0m	—	Domestic feeder.
Z	240m	10.0m	—	Domestic feeder.
RC 01	350m	14.0m	—	Containers.
RC 02	350m	14.0m	—	Containers.
RF 01	193m	7.5m	—	Ro-ro and ferries.

Kobe—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
RF 02	266m	9.0m	—	Ro-ro and ferries.
RF 03	238m	8.5m	—	Ro-ro and ferries.
RL 01	300m	13.0m	—	Liners.
RL 02	300m	13.0m	—	Liners.
NYK Kobe Container Terminal (NYKT)				
RC 06	350m	14.0m	—	Containers.
RC 07	350m	14.0m	—	Containers.
APM Terminal Kobe				
RC 03	350m	14.0m	—	Containers.
RC 04	700m	14.0m	—	Containers.
RC 05	350m	14.0m	—	Containers.
K-ACT (Kobe Air Cargo Terminal)				
S-A	180m	7.5m	—	Air cargo.
S-B/C	350m	7.5m	—	Air cargo.
Shinko Ferry Terminal				
Pier No. 3	150m	9.0m	—	Passengers.
Shinko-Higashi				
S	220m	10.0m	—	Grain.
T	220m	10.0m	—	Grain.
U	170m	10.0m	—	Grain.
V	170m	10.0m	—	Grain.
W	240m	12.0m	—	Vehicles.
X	240m	—	—	Vehicles.
Y	200m	—	—	Grain.
Z	200m	—	—	Grain.
Showa Sangyo Terminal				
Dolphin Berth	—	—	—	Grain. Length with dolphins of 218m.
Sumitomo Osaka Cement Terminal				
Cement	70m	—	—	Cement.
Zen-noh Silo Terminal				
L-jetty	170m	—	—	Grain.
Kobe Transshipment Area				
Anchorage M-11	—	16.3m	—	STS operations.
Tanker Berths				
MC Terminal				
South Dolphin	—	11.8m	—	Chemicals.
Nippon Vopac				
Nippon Vopac	35m	9.2m	—	Chemicals
Anchorage M-12	—	16.2m	—	STS operations.
Anchorage M-13	—	15.4m	—	STS operations.
Anchorage M-14	—	15.4m	—	STS operations.
Anchorage M-15	—	—	—	STS operations.

Kobe—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
UEDA Oil and Fats Terminal				
T Jetty	32m	—	—	Vegetable oils.

Kobe Ko Light (34°39'N., 135°10'E.), about 1 mile W of Wada Misaki, and close E of Karuma Shima, is shown from a white cylindrical concrete tower, 29m high, and serves as a good head mark when approaching Kobe Ko from the S. Wada Misaki Signal Station, about 0.3 mile E of Kobe Ko Light, is 36m high, with a white building.

Kobe Ko Range Lights are shown from white beacons near the SW side of Port Island. When in line they bear 095.5° and lead toward the SE entrance of Fairway II.



Kobe Tower

Eight cranes, each painted red, are conspicuous on the W side of Port Island.

Port Tower, on Central Wharf, about 1 mile NW of Port Island, is a red drum-shaped structure, 103m high, and floodlit.

The **Portopia Hotel** (34°39.7'N., 135°13.0'E.) is a prominent white building, 122m high, having the elliptical shape of a vessel's funnel.

A Ferris wheel, reported to be fully illuminated and conspicuous, is easily identified standing 0.3 mile SE of the hotel.

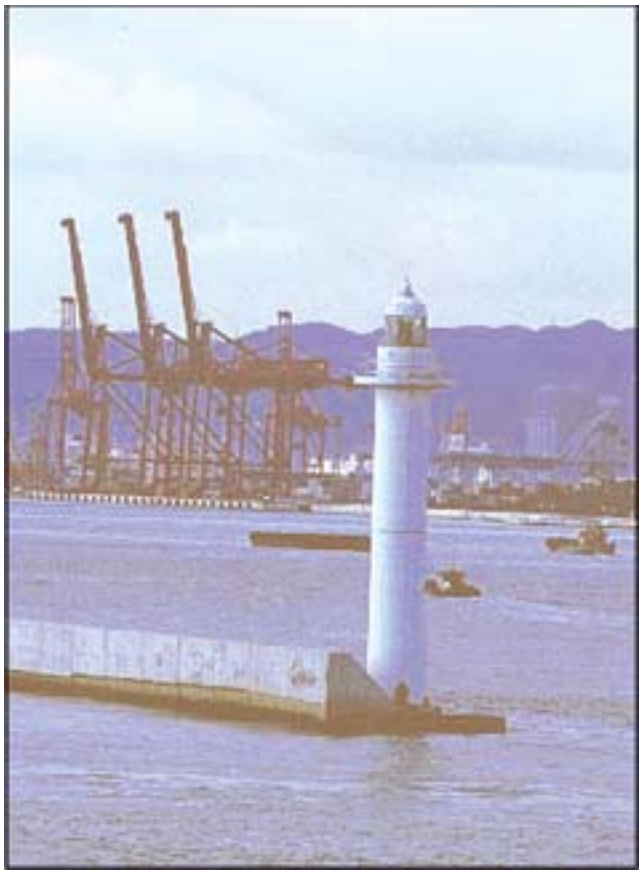
A white chimney, 100m high, is prominent on the S side of Port Island; a short distance W are three large and two small oil tanks painted white.

A light is shown at an elevation of 57m from a black tower on the Oriental Hotel, nearly 0.5 mile NE of the Port Tower. A telegraphic office radio tower, 96m high, painted red and white, is in the vicinity.

The Trade Center Building, 118m high and marked by a red obstruction light, is conspicuous about 0.4 mile further E.

Three chimneys, 120, 100, and 63m high and painted red and white, are conspicuous in Industrial District II.

A chimney, 63m high, is conspicuous in the SW part of Industrial District III.

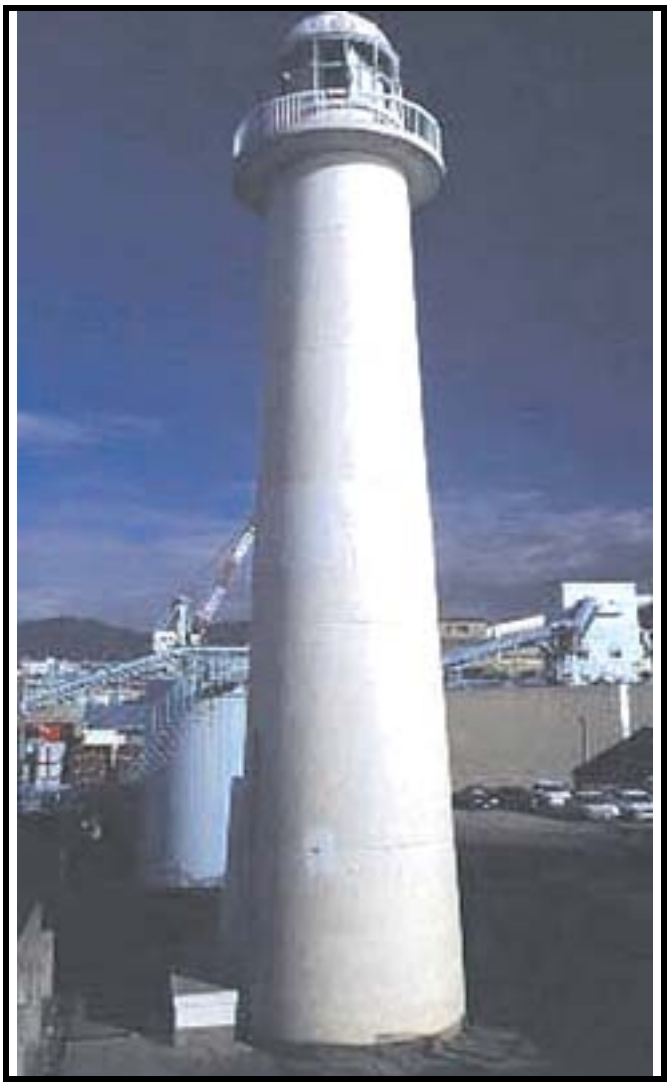


Kobe—No. 7 Breakwater East Light

Pilotage.—Pilotage is compulsory for vessels of 10,000 gt and larger, oil and chemical tankers of 3,000 gt and larger, all vessels carrying dangerous cargo except container ships, and vessels of 3,000 gt and larger which have visited the port fewer than three times in the previous year. Pilots are available until 2000 local time. Container and ro-ro vessels may berth with special permission up to 2400 local time. Pilotage is available 24 hours for vessels leaving the harbor. The vessel's ETA and other information should be sent between 0900 to 1700 local time one day prior to arrival. Pilots board as follows:

1. Within 0.5 mile of a point centered 2 miles S of Kobe Ko light.
2. Within 1 mile of a point centered 3.5 miles S of Kobe Ko light.
3. Within 0.5 mile of a point centered 6 miles SE of Kobe light.

The harbormaster may be contacted by radio or radiotele-



Kobe Ko Light

phone regarding harbor operations. Signals regarding berthing or anchoring are shown from the signal stations at Pier 5, Wadamisaki, Higashi-Kobe, and Kobe Signal Station. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communication and their meanings, appropriate answering signals, and other local or specific regulations.

Kobe—Contact Information	
Seto Naikai (Inland Sea) Pilots	
Call sign	Inland Sea Pilot Kobe
VHF	VHF channels 16 and 68
Telephone	81-78-3917-191
Facsimile	81-78-3917-180

Kobe—Contact Information	
Harbor Pilots	
Call sign	Kobe Port Radio
VHF	VHF channels 12 and 16
Telephone	81-78-391-5032
Facsimile	81-78-392-4921
Port Authority	
Telephone	81-78-327-8981

Regulations.—Tankers, when berthed in the harbor, must be given a berth of at least 30m to avoid accidents due to fire.

Kobe Ko Entry Manual (2014)
http://www.city.kobe.lg.jp/business/bussiness/img/PortofKobeEntryManualEnglish.pdf

Vessels of 15,000 gt or more and oil tankers of 1,000 gt or more wishing to transit Fairway No. III should notify the Port Captain of their ETA and anticipated ETD by 1200 the day before the passage through the fairway.

The following navigational regulations are in force in Fairway No. III in order to insure the safety of maritime traffic.

1. Vessels may not let go their anchor in the channel, nor may they release vessels being towed. However, these regulations do not apply when attempting to avoid an accident, when not under command, or when engaged in assisting a vessel which has encountered a sudden danger, or when saving life.
2. Vessels entering or leaving the fairway must keep out of the way of vessels navigating in the fairway.
3. Vessels must not navigate abreast each other in the fairway.

Kobe—Rokko Island

4. Vessels should navigate, as far as practicable, in that portion of the fairway which lies on the right side of the center of the fairway.

5. Vessels may not overtake other vessels in the fairway unless there is room to pass safely.

As a general rule, Fairway No. II and Fairway No. III are not to be used by vessels of less than 1,000 gt. Traffic control is in force in Higashi-Kobe Fairway for vessels over 500 gt in order to avoid danger of collision. Vessels must navigate in accordance with the signals shown from the signal station on the E side of the passage.

Signals.—Vessels must navigate in accordance with the signals shown from the signal station on the E side of the passage. The signals and their meanings shown from Higashi-Kobe Signal Station are the same as those shown from the South Harbor Signal Station in Osaka Ko. The table titled **Osaka Ko—South Harbor Signal Station—Traffic Signals** in paragraph 6.21 describes these signals and their meanings.

Traffic into Kobe Ko is required to display signal flags indicating their destination berth. These specific signals can be found in the Kobe Ko Port Entry Manual.

Traffic signals are shown from Kobe Signal Station situated at the root of Breakwater No. 6, from signal boards facing 035°, 125°, 195°, and 320°. The signals and their meanings are given in the accompanying table titled **Kobe Ko—Traffic Signals**.

Anchorage.—The quarantine anchorage is situated SW of Wada Misaki in depths of approximately 13.0 to 15.6m. Anchorages for vessels with dangerous cargo are designated in Section IV and Section VI. The bottom is mud, good holding ground.

Directions.—Kobe Ko can be approached using the Rokko Mountains (the highest peak, Rokko San) as a landmark. Kobe Light, about 1 mile W of Wada Misaki, is a good landmark for vessels approaching from the S.

There are a considerable number of wrecks located outside the harbor.

The harbor is used by a large number of ferries and scheduled passenger services. The scheduled passenger services operating from Naka Pier in Section II use Fairway No. I and Fairway No. II, and the ferries operating from Higashi-Kobe Ferry Wharf use the Higashi-Kobe Fairway.

Kobe Ko Section No. 5 Range Lights, in line bearing 029.6°, have been established at position 34°39'N, 135°13'E and position 34°39'N, 135°13'E.

Kobe Ko Approach Lighted Buoys have been established in position 34°35.4'N, 135°11.2'E and 34°35.6'N, 135°14.3'E.

Kobe Oki Lighted Buoy No. 1 (34°35.2'N., 135°11.4'E.) and Lighted Buoy No. 2 (34°35.5'N., 135°14.5'E.) have been established S of Kobe Ko to mark safe water.

All vessels over 500 gt bound to and from an area between Kobe Ko E of Fairway No. II (34°38.7'N., 135°12.8'E.) and Osaka Ko N of Hamadera Fairway (34°33.2'N., 135°20.2'E.) should pass Kobe Oki Lighted Buoy No. 1 and Kobe Oki Lighted Buoy No. 2 on their port side. Westbound vessels should use caution while navigating the area due to the presence of working vessels and vessels at anchor in the area.

Caution.—The following items should be considered during a typhoon:

1. When a typhoon passes W of Kobe, the water level during high tide is considerably higher.

2. Strong SE winds blow when a typhoon passes W of Kobe due to the topography, which has mountains lying NW while the harbor is open SE.

3. When a typhoon is advancing E, particularly from Shiona Misaki NE to Kumana Nada, the velocity of the wind increases, even though Kobe Ko is in the left semicircle of the typhoon, because of the winds blowing down from the Rokko Mountains behind.

The channel buoy lights and breakwater lights are difficult to see at night, as they are superimposed against the factory and city lights.

A large number of container ships and cargo vessels anchor inside Section No. IV, and a large number of ferries anchor S of Industrial Area No. 4.

Kobe Ko—Traffic Signals—Kobe Signal Station

Signal	Meaning
Flashing letter “I”	Vessels are permitted to enter the harbor through Fairway No. III. Vessels of 500 gt or more intending to leave the harbor should stop and wait.
Flashing letter “O”	Vessels are allowed to leave the harbor through Fairway No. III. Vessels of 500 gt or more intending to enter the harbor should stop and await permission.

Kobe Ko—Traffic Signals—Kobe Signal Station	
Signal	**Meaning**
Flashing letter "F"	Vessels of 40,000 gt or more and oil tankers of 1,000 gt or more intending to enter or leave Kobe Ko via Fairway No. III should stop and wait for permission to enter or leave. Vessels of less than 40,000 gt may enter or leave via the passage.
Alternating flashing letter "X" with letter "I," "O," or "F"	Signal will shortly change to flashing letter "I," "O," or "F." Vessels navigating through Fairway No. III may proceed. Vessels of less than 500 gt may enter or leave Kobe Ko. Vessels of 500 gt or more should wait outside the fairway, clear of all traffic.
Flashing letter "X"	Vessels not in the passage should keep clear of fairway traffic. Signal will soon change to fixed letter "X."
Fixed letter "X"	Vessels other than those under the direction of the Port Captain should stay well clear of Fairway No. III.

Low flying aircraft operate in the area E and W of Kobe Airport. Vessels with excessive air draft should keep well clear.

According to past experience, the handling of large vessels becomes difficult and tugs lose their usefulness with winds of 29 miles per hour. Damage occurs to moored vessels when the winds exceed 48 miles per hour.

For procedures for taking shelter, strict attention should be paid to the harbormaster's instructions and the typhoon bulletins. Large vessels should anchor outside the breakwaters or heave-to there with the use of the main engines. Small vessels generally anchor in an area least affected by the typhoon, and medium size vessels, ferries, etc. should find a similar place between the breakwaters and the coast. Vessels of 2,000 to 3,000 gt should anchor rather than remain secured to piers or buoys; it is recommended that they seek shelter in **Uchinoumi Ko** (34°28'N., 134°18'E.) in Shodo Shima.

Akashi Kaikyo

6.25 Akashi Kaikyo (Akasi Kaikyo) (34°37'N., 135°01'E.), connecting Osaka Wan and Harima Nada, is about 2 miles wide. The strait is deep and free from dangers, but the tidal currents are strong and in some places set across the fairway. A bridge, with a vertical clearance of 65m, spans Akashi Kaikyo at its narrowest part.

Prohibited areas are established around the bridge towers. Caution is necessary as traffic is heavy and there are a large number of fishing vessels. Vessels exceeding a length of 200m should arrange for an escort boat when transiting the strait during fishing season, which runs from the end of February until early April. Current navigational notices and warnings should be consulted.

The N side of the strait, in general, shoals gradually shoreward, with a few off-lying rocks. Westward of the W entrance there are depths of less than 10.1m extending up to 4 miles offshore. The S side of the strait is comparatively steep-to.

A traffic route, prescribed by the Maritime Safety Law, has been established in the strait.

Within Akashi Kaikyo Traffic Route all vessels should navigate in that portion of the traffic route which lies on the starboard side of the central line of the route.

Wrecks have been reported on the N and NE edges of the traffic route.

Tides—Currents.—The nature of the tides in Akashi Kaikyo is similar to that in Osaka Wan, but the diurnal inequalities are more marked, and in the second half of each month there is only one tide cycle per day. However, the diurnal inequalities in the tidal current are not very large, and even when there is only one tide cycle per day, there are two E currents and two W currents per day.

The main tidal current flows along the middle of the strait over about 35 per cent of its width. On the N side of the main stream, the tidal current gradually decreases as one approaches the shore and there is little difference in the time of tide compared with that of the main current in the center, but on the S side of the main stream tide rips are generated in places. There is a relatively large current velocity in the vicinity of Matsuho Saki, and the time of the tide is some 20 to 50 minutes earlier than in the center of the main current; further, in the area 1.3 miles ESE of Matsuho Saki, the tidal current turns at almost the same time as in the middle of the main current and its rate is about 1.4 times as much.

The maximum velocity at springs may reach 7 knots. Countercurrents are generated between Akashi and Karasaki Hana, in the vicinity of Hiro Iso, on the W side of Matsuho Saki, and on the N side of Iwaya. There is SW for 10 to 30 minutes.

In the central part of Akashi Kaikyo, the currents run to the W from about 3 hours after LW to about 3 hours after HW at Akashi, and to the E from about 3 hours after HW to about 3 hours after LW; the W currents are strongest about the time of HW, and the E currents are strongest about that of LW.

Aspect.—Hira Iso (34°37'N., 135°04'E.), on the N side of the E entrance to Akashi Kaikyo, lies about 0.4 mile offshore and is a rocky bank, with a depth of 1.5m. It is marked by a light shown from a black and red tower.

Hachibuse Yama, 246m high, is conspicuous about 2 miles ENE of Hira Iso; a white building, showing a white light, is on its summit. A fishing pier extends from the coast SE of Hachibuse Yama.

A blue two-story hexagonal building is conspicuous on Karasaki Hana, about 1.5 miles WNW of Hira Iso. Yamado Iso, a rock, with a depth of 1m, lies about 0.5 mile farther WNW and about 0.1 mile offshore.

A spherical gas tank, painted silver and standing on a black tower, is conspicuous about 1 mile NW of Akashi Ko.

Semento Iso, rocks with depths of 1 to 1.9m, and marked on the W and E ends as well as the S side of this shoal, respectively, by lighted buoys, lie about 1 mile W of Akashi Ko. Shoal

water, with depths of less than 4.9m, extends about 2.4 miles farther WSW; a rock, with a depth of 3.4m, lies midway along the S side of the shoal water.

A prominent ferris wheel, about 134m high, stands on the NE tip of Awaji Shima, near the coastline of Iwaya Ko, in position 34°35'N, 135°01'E.

Matsuho Saki (Matuho Saki), on the S side of Akashi Kaikyo, is the N extremity of Awaji Shima, and is low, sandy, and thickly wooded.

E Saki, a rounded point, marked by a light, lies about 0.5 mile WSW of Matsuho Saki; a shoal, with a depth of 4.6m, lies about 320m NE of the light structure. A conspicuous tower, 278m high, stands on a hillside, 0.5 mile SSW of E Saki Light. A hill, 305m high, with a steel tower on its summit, lies about 1 mile SSW of E Saki.

Pilotage.—Pilotage is compulsory for vessels of over 10,000 gt in Akashi Kaikyo and its approaches for about 3 miles SE and 5 miles W of the Akashi Kaikyo Traffic Route.

Japan Coast Guard has requested that the following vessels embark a pilot:

1. Vessels without local knowledge.
2. Vessels over 30,000 gt.
3. Oil tankers and vessels loaded with liquefied gas of over 10,000 gt.
4. Foreign vessels.

Regulations.—Vessels should maintain contact with Osaka Wan Vessel Traffic Service Center (Osaka MARTIS) on VHF channel 16 when navigating in the traffic routes, approaches to the traffic routes, and the adjacent sea areas.

Vessels of 50m and greater in length and vessels engaged in towing where the total combined length of the vessel and tow is 100m and greater are required to send position reports to Osaka MARTIS when passing a reporting line.

The table titled **Akashi Kaikyo—Reporting Lines** describes these lines and their locations. Position reports should include the vessel's name, call sign, and position or current reporting line.

Vessels fitted with AIS and broadcasting the correct information are exempt from making position reports to Osaka MARTIS.

Vessels loaded with dangerous cargo as specified by the Maritime Traffic Safety Law (except for huge vessels of 200m or more in length) are not to enter the fairway if the visibility is less than 2,000m. Entry by huge vessels is limited in accordance with the directions of the fairway supervisor.

The following vessels should notify Osaka MARTIS by noon of the day before the vessel is scheduled to enter the traffic route:

1. Vessels of 160m or more in length.
2. Vessels of 25,000 gt and over and carrying liquefied gas
3. Towing and pushing vessels of 160m or more in length.

This report should include the following information:

1. Vessel's name, gt, and loa.
2. Section of the route vessel intends to navigate and ETA at entrance and exit of route.
3. Vessel's call sign.
4. Means of communication for vessels without a radio.
5. Destination port.
6. Draft.
7. Dangerous goods on board (if any).

The following vessels should notify Osaka MARTIS 3 hours in advance of entering the traffic route:

1. Vessels of 300 gt and greater carrying gunpowder.
2. Vessels of 1,000 gt and greater carrying inflammable gas or inflammable liquid in bulk.
3. Vessels of 200 gt and greater carrying 200 or more tons of organic peroxide .

This report should include the following information:

1. Vessel's name, gt, and loa.
2. Section of the route vessel intends to navigate and ETA at entrance and exit of route.
3. Vessel's call sign.
4. Means of communication for vessels without a radio.
5. Destination port.
6. Dangerous goods on board (if any).

Vessels may be instructed by the captain of the port to evacuate the port in the event of abnormal weather or marine conditions such as typhoons or marine accidents.

Directions.—Vessels must navigate in accordance with the traffic methods established in Maritime Traffic Safety Law. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Vessels over 5,000 gt should navigate in accordance with the following procedures:

1. Vessels intending to enter the traffic route should head for it in such a way as to pass Point A (34°34.8'N., 135°05.1'E.) on their port bow. Point A is located at the Akashi Kaikyo Traffic Route Eastward Buoy, on the extended center line of the fairway.
2. Vessels leaving the fairway and heading for Kobe Ko or Osaka Ko areas should alter course after passing Point A on their port bow in order to keep out of the path of vessels entering the traffic route.
3. Vessels intending to enter the traffic route from the Himeji Ko or Higashi-Harima Ko areas should head for it in such a way as to pass Point B (34°36.3'N., 134°56.9'E.). Point B is located at the Akashi Kaikyo Traffic Route Westward Buoy.

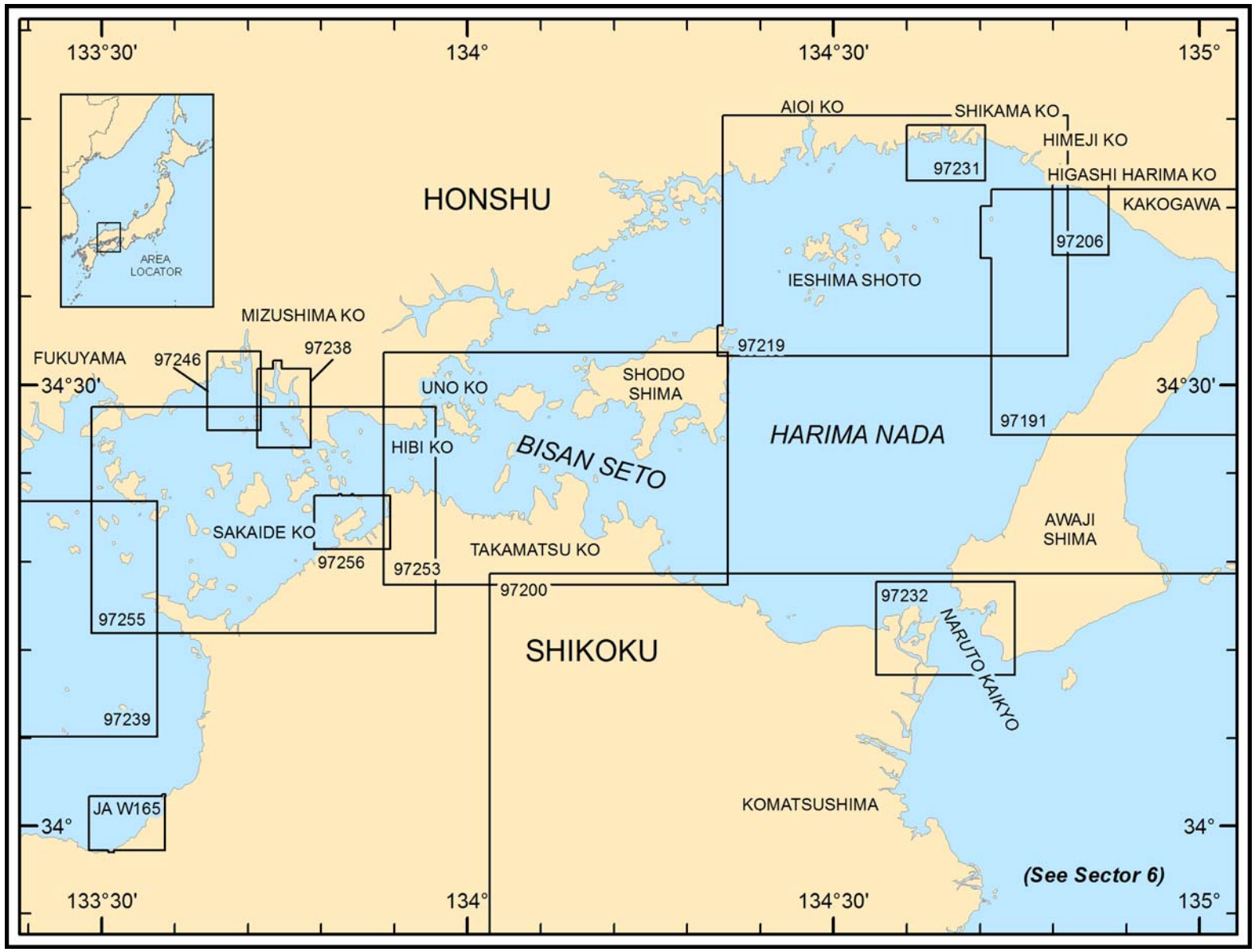
Caution.—At night, the glare of lights at Akashi may make it difficult to distinguish the navigation lights of other vessels.

A large number of westbound vessels from the Osaka Ko and Kobe Ko areas and Tomogashima Suido meet with eastbound vessels from the Harima Nada areas and Harima Nada North Fairway.

Akashi Kaikyo—Reporting Lines

Reporting Line Code	Description
AH	A line joining Eigashima Ko West Breakwater Light to Harima Kita No. 10 Lighted Buoy
AW	A line joining Harima Kita No. 10 Lighted Buoy to Murotsu Ko West Breakwater Light

Akashi Kaikyo—Reporting Lines	
Reporting Line Code	**Description**
AS	A line bearing 090° extending 20.9km from Sano Higashi Breakwater Light
AE	A line bearing 180° extending 21km from Kobe Ko Light
AN	A line bearing 090° extending 9.3km from Hiraiso Lighted Beacon



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **7** — CHART INFORMATION

SECTOR 7

THE NAIKAI (INLAND SEA)—HARIMA NADA AND BISAN SETO

Plan.—This sector first describes Harima Nada, then Bisan Seto. The sector includes the important ports of Higashi-Harima Ko and Himeji Ko, on the N side of Harima Nada; Mizushima Ko, on the N side of Bisan Seto; and Sakaide Ko, on the S side of Bisan Seto.

Harima Nada

7.1 Harima Nada (34°30'N., 134°35'E.) lies between Awaji Shima to the E and Shodo Shima to the W. The recommended route through the Naikai runs from the W entrance to Akashi Kaikyo, to the E entrance of Bisan Seto, a distance of about 40 miles. There are general depths of 20.1 to 40m in Harima Nada, except in the W entrance to Akashi Kaikyo, where there are shoals with depths of less than 10.1m. The S shore is steep-to, with a few scattered rocks, but on the N side there are a number of islands, rocks, and shoals. There is a least depth of 23m on the recommended route through Harima Nada, and depths of over 20m within 1 mile N and S of the center of the fairway.

Caution.—A dangerous wreck is situated about 0.9 mile SSE of Harima Nada Fairway Lighted Buoy No. 6; another wreck lies approximately 1.8 miles NE of Harima Nada Fairway Lighted Buoy No. 6.

Several fish havens lie close to the recommended track between Harima Nada Fairway Lighted Buoy No. 4 and Harima Nada Fairway Lighted Buoy No. 6.

The coast from **E Saki** (34°36'N., 135°00'E.), near the N end of Awaji Shima to Ei Saki, about 12 miles SW, is cliffy in places. The latter point is a cliffy headland, 41m high.

E Saki Light

Shikano Se (Sika-no-Se), on the N side of the fairway and centered about 10 miles WSW of E Saki, is a rocky bank, covered with sand and pebbles, with a least depth of 2.2m, and extending for about 3 miles in an ENE-WSW direction; it is marked midway on its S side by a lighted buoy.

A shoal, with a depth of 7.6m, lies about 1 mile E of Shikano Se; shoals, with depths of less than 10.1m, extend about 1 mile N and 1.5 miles NE. A lighted buoy is moored about 0.2 mile E of the NE end of the shoal area.

Murotsuno Se (Murotu-no-Se) lies on the S side of the fairway, parallel with, and 3 miles from Shikano Se; it is a sandy bank, with a least depth of 8.2m. E Saki Light, bearing 068° and in line with Hachibuse Yama, leads N and clear of Murotsuno Se.

Many fish havens are situated between Murotsuno Se and Shikano Se, and also on Matsuo and Takakura Se.

7.2 Joryuji Yama (Zyoryuzi Yama) (34°30'N., 134°55'E.), a mountain, 515m high, lies about 7 miles SSW of E Saki, and appears as the highest mountain on the N end of Awaji Shima.

Okado Hana (34°26'N., 134°20'E.), the SE extremity of Shodo Shima, is a cliffy headland; it rises to two hills, the S of which is 159m high. A light is shown from the point. There is a signal station at Okado Hana, and by day weather signals are shown from it.

Funoko Shima, an islet, 106m high, lies about 0.5 mile ENE of Okado Hana, to which it is connected by a reef which dries. Goishi Yama, a sharp peak, 435m high, with many towering crags, is conspicuous about 2 miles N of Okado Hana.

Anchorage can be obtained off the N side of Funoko Shima, in a depth of about 20m, but it is exposed NE.

Mizunoka Iwa, a rock, 3.1m high, lies NE about 5.5 miles of Okado Hana, and 3 miles E of Shodo Shima. Close E, a rock, with a depth of 7.6m, is marked E by a lighted buoy. Nakase Iwa, a rock, with a least depth of 1.6m, lies about 1 mile NW of Mizunoko Iwa.

Ofukube Shima, flat-topped and 57m high to the tops of the trees, lies about 2.5 miles W of Okado Hana; an islet, 20m high and conical, lies about 137m off the SE end of the island, to which it is connected by a drying reef.

Jizo Saki (Zizo Saki), the S extremity of Shodo Shima, lies about 5 miles WSW of Okado Hana, and is faced with steep cliffs; a light is shown from the headland. A hill, with two rounded summits, is prominent N of the headland; the N summit is 302m high and the higher of the two.

Umaga Hana, about 4 miles SSE of Jizo Saki, is a steep cliffy point, marked by a light. O-gushi Saki (Okusi Saki), about 2.5 miles farther NW, is well-wooded and 18.9m high; it rises to an elevation of 145m, about 0.3 mile S.

Goken San, 370m high, with a conspicuous rocky summit, lies about 5.5 miles SW of Jizo Saki, and is the highest mountain in the vicinity.

Directions.—Vessels should navigate W on a course of 248°

and E on a course of 068° on the line of Harima Nada Fairway Lighted Buoy No. 1 to Harima Nada Fairway Lighted Buoy No. 6, and in the vicinity of Shikano Se, should not deviate more than 1 mile from the center of the fairway. The buoys are spaced at intervals of 5 to 5.5 miles.

The tidal currents are weak on the recommended track, but vessels are set S during the flood current and N by the ebb current. Vessels eastbound between Okado Hana and Shikano Se should guard against being set off the track.

At night, eastbound vessels should not enter the red sector of E Saki Light until clear of Shikano Se. There are many fishing vessels in the vicinity of Shikano Se and Awaji Shima; in particular, many fishing boats cross the fairway from March to June (0300 to 0400 and 0700 to 0900). In this vicinity it is frequently difficult to distinguish the lighted buoys until close to them.

Caution.—From October to May, seaweed cultivation facilities are situated on Shikano Se and within 1.5 miles of the W coast of Awaji Shima. Lighted buoys with flashing lights are placed around the seaweed cultivation grounds.

Vessels carrying dangerous cargo are required to carry emergency towing wires forward and aft when navigating through Harima Nada. (See paragraph 6.16, Osaka Wan, for information on fire wires.)

Harima Nada—East Side

7.3 The NW coast of Awaji Shima, from E Saki to Ei Saki, about 12 miles SW, is generally cliffy. From Ei Saki to Kariko Saki, about 10.5 miles farther SW, the coast is backed by flat-topped hills except in the vicinity of the mouth of Mihara Kawa, about 2 miles E of Kariko Saki; the coast is bordered by sandy beaches except for two rocky points. Maruyama Saki, about 3 miles SW of Kariko Saki, has a flat summit, 24m high and wooded; it is joined to the mainland by a low isthmus, and appears as an island from a distance. The latter point is backed by mountains, and is a good landmark in the approach to Naruto Kaikyo.

Sen San (34°21'N., 134°49'E.), near the center of Awaji Shima, is 448m high and has a shape resembling Mount Fuji.

Toshima Ko is located about 5 miles SW of E Saki and is protected by breakwaters. A light is shown on the head of the N breakwater. Yoko Se, with a depth of 1m, extends about 1 mile WSW of Toshima Ko. Anchorage, sheltered from SE winds, can be taken, in depths of 10.1 to 14.9m, sand, good holding ground, off Toshima Ko; caution is necessary regarding Yoko Se and the tidal currents. Farther SW, between Toshima Ko and Gunge Ko, about 6 miles SW, the bottom is steep-to outside the 10m curve, but large vessels can obtain anchorage, in about 14m, sand, fair holding ground.

Myojin Misaki, about 1.5 miles SW of Ei Saki is a white cliffy point with a dense growth of trees in its upper part; it is joined to Awaji Shima by a narrow isthmus and appears as an islet.

Anchorage, sheltered from E to S winds, can be taken off the mouth of **Mihara Kawa** (34°20'N., 134°44'E.), in depths of 12.8 to 14.6m, mud.

Naruto Kaikyo (34°14'N., 134°39'E.) is described in paragraph 6.11.

Harima Nada—South Side

7.4 Hiketa Wan, about 10 miles W of Naruto Kaikyo, is open N and has sandy shores. **Hiketa Ko** (34°14'N., 134°25'E.), a small local harbor, lies in the W part of the bay. Hiketa Hana, the W entrance point of the bay, is marked by a light. A lighted buoy is moored 1.25 miles NE of Hikeda Hana. A submerged rock and a rock, awash, lie about 0.2 mile and 0.8 mile E, respectively, of the point. Matsu Shima, about 2 miles E of Hiketa Hana, is the outermost of several islets in the entrance of Hiketa Wan; it is about 410m long, 37m high, with pine trees on it. Mitsu Shima, a rocky islet, 37m high, with pine trees on it, lies about 0.4 mile WSW of Matsu Shima. Tsunen Shima, 1.9m high, lies about 320m farther WSW.

Anchorage can be taken, in 9.2 to 16.5m, in Hiketa Wan; the holding ground is good where the bottom is mud. Care is needed to avoid fishing nets (June to January) and seaweed cultivation grounds (October to April), which are to be found in all parts of the bay.

Kabukoshi Saki (34°15'N., 134°23'E.), about 2.5 miles NW of Hiketa Hana, is surmounted by an isolated hill with a pointed summit. Yoji Yama, an isolated hill with a pointed summit, rises to an elevation of 187m about 0.8 mile SE of Kabukoshi Saki. A reef extends about 90m NE of the point; a pointed rock is visible on the reef.

Futago Shima, about 0.5 mile NE of Kabukoshi Saki, consists of two rocky islets, each 26m high, and covered with pine trees. There are two above-water rocks close SE of Futago Shima, and the channel inshore of the islets should not be used.

Hitotsu Shima, a rocky islet, 21m high and covered with pine trees, lies about 1 mile NNW of Kabukoshi Saki; there are some high rocks on its N side.

Sombommatsu Ko (34°15'N., 134°21'E.), a small harbor sheltered by breakwaters, lies about 1.8 miles WSW of Kabukoshi Saki, in the central part of Matsubara Ura. A chimney, 30m high, is conspicuous near the harbor. Fish and oyster cultivation grounds lie up to 1 mile offshore E and W of Sombommatsu Ko.

Anchorage.—Matsubara Ura affords good anchorage during offshore winds, with good holding ground.

7.5 Marukame-jima, 69m high, with Mejima, 45m high to the tops of the trees, close S, lies about 2.3 miles NW of Sombommatsu Ko.

Mashino Wan (Umasino Wan) is entered between Marukame-jima and Ube Yama, about 2 miles W. The shores consist of sandy beaches separated by rocky headlands. A light is shown from a red tower at Wakimoto Ko on the W shore of the bay. Fish havens are situated in the bay. Ube Yama is an isolated flat-topped hill, 57m high, with a steep cliff on its E side. Dangerous rocks, with a rock 1.9m high near the outer end, extend about 0.5 mile NE of the W entrance point of the bay. Nako Shima, 32m high, lies about 0.3 mile N of Ube Yama. Kinujima, an islet, 32m high, lies about 0.3 mile offshore in the E part of the bay. Reefs and rocks lie between the islet, the shore S, and Mejima. Anchorage can be obtained, in about 9.2m, about 0.3 mile W of Kinu-jima, or in greater depths N of the islet, with a mud bottom.

Tsuda Wan (Tuda Wan) (34°18'N., 134°15'E.) is entered between Nako Shima and Taka Shima, nearly 2 miles N. The lat-

Akashi Ko Breakwater Lights

ter islet is 43m high and round-topped; Okino Sowai, a rock awash and steep-to, lies about 0.3 mile ENE of Taka Shima. Baku Iwa, a pointed rock, 5.8m high, lies about 0.3 mile NW of Taka Shima. A submarine wave recorder, connected to the shore by a submarine cable, is situated in the middle part of Tsuda Wan.

Tsuda Ko, a local harbor, lies at the head of the bay. A light is shown from a red tower. Ametaki Yama rises to an elevation of 254m, about 0.8 mile SW of Tsudo Ko.

Anchorage.—Good anchorage can be obtained by large vessels in Tsuda Wan, in a depth of 11.5m, with Nako Shima bearing 160° and Ametaki Yama bearing 230°. Small vessels anchor nearer the head of the bay according to draft. Winds between the NNE and ESE send a heavy sea into the bay. There are seaweed cultivation grounds from October to April within 1.5 miles of the shore of the bay.

Toraga Hana (34°20'N., 134°16'E.), about 0.8 mile NNW of Naka Shima, is a steep cliffy point; it rises to Toraga Mine, 307m high, about 1 mile SW. Umaga Hana lies about 1.3 miles NW of Toraga Hana.

Oda Wan is entered between Umaga Hana and O-gushi Saki, about 2.3 miles WNW. The bay is free of dangers except for Ikanago Se, a rock with a depth of 10.1m, about 0.8 mile E of O-gushi Saki. Oda Wan affords safe anchorage in adequate depths, except during N winds. Several fish havens exist within 0.3 mile of the W shore of the bay.

Harima Nada—North Side

7.6 In the N part of Harima Nada are the important ports of Higashi-Harima Ko, Himeji Ko, and Aioi Ko. There is traffic of large vessels in and out of the above ports, but there is a very large amount of small vessel traffic navigating E and W in the Naikai.

The route through the area is indicated by Harima Nada North Fairway Lighted Buoy No. 3 (34°33'N., 134°08'E.) through Harima Nada Fairway Lighted Buoy No. 10 (34°38'N., 134°49'E.). There is a depth of about 11m in the E part of Harima Nada North Fairway.

Caution.—Caution is necessary from October to May due to seaweed cultivation equipment, marked by lighted buoys, off the coast between **Akashi Ko** (34°38'N., 135°00'E.) and **Ako Ko** (34°43'N., 134°23'E.), except in the harbor entrance channels and in the vicinity of Ieshima Gunto and Shikano Se. There are also many net and line fishing vessels in the vicinity of Harima Nada North Fairway, particularly E of Kami Shima and N of Tanga Shima. It is also necessary to avoid the shoals in the W entrance to Akashi Kaikyo and the dangerous rocks, Kami-Shizumo and **Shimo-Shizumo** (34°42'N., 134°30'E.), N of Ieshima Gunto.

Akashi Kaikyo to Himeji Ko

7.7 The N part of Harima Nada, from Akashi Kaikyo to **Himeji Ko** (34°46'N., 134°38'E.), is bordered by a succession of industrial areas. The coast is a low plain. The chimneys of the steel works and generator stations at Higashi-Harima Ko and Himeji Ko are conspicuous landmarks. The area in the vicinity of **Kiba** (34°46'N., 134°44'E.), close E of Himeji Ko, is the only place where the mountains approach the coast.

A bank, with depths of less than 10.1m, extends to about 5 miles WSW of Akashi Ko. Kantama, with a least depth of 4.9m, lies near the W end of the bank. A lighted buoy is moored S of Kantama. Takakura Se, about 1.5 miles SW of Kantame, has a least depth of 7.8m and is marked E by a lighted buoy. Matsuo and Shikano Se, farther SW, were previously

described in paragraph 7.1.

In the vicinity of Harima Nada North Fairway Lighted Buoy No. 10, where there are depths of 11.6 to 17m, a sand wave extending about 3 miles E-W and 2 miles N-S was reported.

Higashi-Harima Ko (34°42'N., 134°50'E.)

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7.8 Higashi-Harima Ko, in the NE part of Harima Nada, lies about 6 miles WNW of Akashi Ko, and is a major port consisting of the former harbors of Futami Ko, Befu Ko, Taka-sago Ko, and Iho Ko. The cities of **Kakogawa** (34°42'N., 134°55'E.) (World Port Index No. 61573) and Takasago are developing into industrial areas, with berthing facilities for large vessels.

The harbor, from SE to NW, consists of Futami Chiku (Hutami), Befu Chiku (Behu), Takasago Chiku, and Iho Chiku. A dredged passage leads into Befu Chiku. Kako Kawa discharges into the harbor, E of Takasago.

Winds—Weather.—The most frequent winds are NE in spring and summer. South winds are most frequent in summer; W winds are most frequent in winter.

Tides—Currents.—The diurnal inequalities are large at Takasago, and a single tide per day is frequently observed. The mean tidal rise at springs is 1.2m.

In the vicinity of the dredged passage, the flood tidal current flows NW with a velocity of about 1 knot, and the ebb tidal current flows SE with a velocity of about 1.8 knots.

Depths—Limitations.—The passage leading into Befu Chiku is 400m wide and dredged to 17m. Dredged depths of 17m extend farther NNE into the harbor to the middle part of East Wharf, which lies on the W side of the harbor. A berth, in the middle part of East Quay, can accommodate vessels up to 160,000 dwt, in a depth of 17m.

The LPG Jetty, on the inner side of West Breakwater at Befu Chiku, has depths of 14 to 17m alongside, and can accommodate vessels up to 70,000 dwt.

Shoals, with depths of 4.8m and 3.6m, lie about 0.2 mile SSW and 410m SSE, respectively, of the head of East Breakwater at Befu Chiku.

West Wharf, inside the breakwater on the left bank of the mouth of Kako Kawa, can accommodate vessels up to 35,000 dwt at Berth W5, at its S end. Berth W6, close SE of West Wharf, can accommodate vessels up to 55,000 dwt, in a depths of 12m.

The reclaimed land on the right bank of Arai Kawa, close W of Takasago, has a berth on its E side with a depth of 7m alongside. A dolphin berth, with a depth of 8m alongside, lies on the W side of the reclaimed land. To the W of this berth, a breakwater extends SSW from the shore. A light is shown from its head.

Aspect.—A factory, with a pale green roof, is conspicuous about 0.3 mile ENE of the base of E breakwater at Befu Chiku. Three cranes are conspicuous at the base of the same breakwater.

Lights, in line bearing 022.3°, lead to the inner end of the harbor.

A group of chimneys of a steelworks are conspicuous on the W side of the harbor at Befu Chiku; the highest two are 174m high. Two tanks, each 35m high and painted light green, are situated near the base of W breakwater at Befu Chiku.

Two chimneys, 125m and 105m high and painted red and white, are situated about 0.3 mile N of Takasago W breakwater.

Two chimneys at Iho Chiku, on the right bank of Arai Kawa, are 123m and 112m high, and painted red and white. The chimney of a generating plant, close W, is 182m high and also painted red and white.

An overhead power cable, with a vertical clearance of 58m, spans Arai Kawa close within its mouth.

Pilotage.—Pilotage is not compulsory. Inland sea pilots are available at Wadi-Misaki (off Kobe), and the harbor pilot is available at the anchorage from sunrise to sunset. An inland sea pilot is compulsory for vessels over 10,000 gt; a harbor pilot is not compulsory.

Vessels are prohibited from approaching within 50m of vessels loaded with LPG, which are berthed at the LPG jetties at Befu Chiku and Iho Chiku.

Himeji Ko (34°45'N., 134°38'E.)

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7.9 Himeji Ko (Himezi Ko) lies close W of Higashi-Harima Ko, in the N part of Harima Nada. The harbor is divided, from E to W, into Higashi Ku (Higasi Ku), Shikama Ku (Sikama Ku), Hirohata Ku, Aboshi Ku (Abosi Ku), and Nishi Ku. East Passage (Higashi Passage) entrance (34°45'N., 134°41'E.) leads into Higashi Ku; Hirohata Passage entrance (34°44'N., 134°37'E.) leads into Hirohata Ku.

The city of Himeji is the central city for commerce and industry in the Harima Plain. In the coastal area of the harbor there are large factories, steelworks, and generating stations.

Winds—Weather.—At Himeji Ko, the wind is mostly NE in the spring and autumn, S in the summer, and W in the winter.

The directions of the harbormaster must be followed during the time of a typhoon. In Hirohato Ku, if there is a strong possibility that a typhoon will approach, and strong SE winds will blow, large vessels berthed at Central Wharf should leave the harbor.

Tides—Currents.—The diurnal inequalities of the tide are large at Hirohata, and a single tide per day is frequently observed. The mean tidal rise at springs is 1.2m and at HHW is 1.5m.

Between the entrance to Hirohata Passage and the harbor entrance the flood tidal current generally sets W and the ebb current E, but they are both weak. In the anchorage at Hirohata Ku, there is no tidal current.

Depths—Limitations.—Higashi Ku Passage is dredged to a depth of 14m. An LNG jetty, on the inner side of E breakwater, has dredged depths of 14m alongside and in its approach.

An offshore pipeline berth, consisting of a lighted mooring buoy painted in red and white stripes, is moored in depths of 20.5m, about 3 miles SSW of Higashi Ku harbor entrance; it can accommodate vessels up to 258,000 dwt. A submarine pipeline runs N from this berth to the mouth of Ichi Kawa (Iti Kawa).

In Section I, a dolphin berth, on the W side of the inner harbor, has depths of 12.2 to 12.5m alongside.

A channel, dredged to 12m, leads into Shikama Ku. Berths 3

to 6 on Shikama Quay, located on the W side of Section I, have depths of 10.0m alongside. Berths 7 through 9 have depths of 12m alongside.

Aboshi Breakwater lies on the W side of the E entrance channel and extends from the NE corner of reclaimed land. The channel has a least depth of 7.5m in it. A light is shown on the head of the breakwater.

Sector I of Nishi Ku is for timber only. A wharf, available for vessels of 9.2m draft, lies N of East Breakwater. There are also mooring buoys for vessels of similar draft in the mouth of the river.

East Passage, Hirohata Passage, and the dredged channel into Shikama Ku are marked by lighted buoys.

Five basins with and their corresponding berths are described below

Nishi Ku.—Two quays are located within Nishi Ku, as follows:

1. **Seibu Quay South A**—With a length of about 185m and a depth alongside of 10m.
2. **Seibu Quay South B**—With a length of about 130m and a depth alongside of 7.5m.

Aboshi Ku.—A factory chimney, 92m high, painted red and white, lies about 0.8 mile NNW of the head of Aboshi Breakwater. A restricted area, marked by lighted buoys and into which entry is prohibited, extends S of the W end of the reclaimed land shown on the chart. A signal station stands in Section 1 of Aboshi Ku.

Three quays are located in Aboshi Ku, as follows:

1. **Nihon Chemical Dolphin Berth C**—Comprised of four separate dolphin berths with depths alongside of 5m.
2. **Nishihama Chemical Dolphin Quay D**—A single dolphin berth with a depth alongside of 6m.
3. **Kibi Quay E**—Three berths with depths alongside of 3 to 8m.

Hirohata Ku.—Two pairs of range lights, in line bearing 016° and 000°, respectively, lead into the harbor. The channel is dredged to 17m and the lights may be difficult to distinguish in daytime.

Seven quays are located in Hiruhata Ku, as follows:

1. **Tsuruta Quay F**—With a length of 350m and depths alongside of 8.9 to 9.7m.
2. **Central Quay G**—With a length of 315m and depths alongside of 10.2 to 13.7m.
3. **Kamoda Quay H**—With a length of 720m and depths alongside of 7 to 7.8m.
4. **Yumesaki Quay I**—With a length of 280m and depths alongside of 3.9 to 7.6m.
5. **Higashihama Export Quay J**—With a length of 350m and depths alongside of 7.3 to 11.6m.
6. **Raw Materials Quay K**—With a length of 300m and a depth alongside of 17m.
7. **Hirohata Quay K1**—with an unknown length and a depth alongside of 14m.

Shikama Ku.—The three-stack composite chimney of a power station lies on the E side of the harbor interior; it is 150m high and painted red and white. Farther N, are two towers, 99m high, painted red and white, and supporting overhead cables.

Six quays are located in Shikama Ko, as follows

1. **Nakashima Quay L**—With a length of 740m and depths alongside of 7.6 to 12.5m.
2. **Nakashima Public Quay M**—With a length of 390m and depths alongside of 5.6 to 7.7m.
3. **Shikama Quay N**—With a length of 1,600m and depths alongside of 3 to 12m.
4. **Senbakawa Quay O**—With a length of 1,400m and depths alongside of 5.1 to 8m.
5. **Irifune Quay P**—With a length of 200m and depths alongside of 5.2 to 5.6m.
6. **Yumesakisawa Quay Q**—With a length of 560m and depths alongside of 6.1 to 6.5m.

Higashi Ku.—On the E side of the inner harbor, in the vicinity of the generating station, are two chimneys, 203m and 80m high.

The three-stack composite chimney of an oil refinery lies at the N end of the inner harbor; it is 127m high, painted red and white, and is a good mark when proceeding to the inner end of Section I.

A group of oil tanks, all painted white, lies on the W side of the inner harbor.

Himeji Port Office, a white six-story building, is conspicuous at the N end of the interior of the harbor.

Two cranes, painted red, are situated on Raw Materials Wharf, W of the entrance to Section I.

Two quays are located in Higashi Ku, as follows:

1. **Himeji LNG Dolphin Berth R**—Can accommodate vessels as large as 125,000 dwt.
2. **Idemitsu Oil Refinery Berth S**—Has six numbered dolphin berths and jetties. Vessels as large as 50,000 dwt can be accommodated. An LPG berth in this basin can handle vessels up to 3,000 dwt and has an alongside depthsof 7.1m.

Aspect.—The lighted mooring buoy of the offshore pipeline berth (34°43'N., 134°40'E.), previously described above, lies about 3 miles SSW of Higashi Ku harbor entrance.

Pilotage.—Pilotage is not compulsory but is recommended. Pilots are provided from Seto Naikai (Inland Sea) Pilots Moji for vessels approaching from the W, replacing Kanmon Kaikyo Pilots, or entering from the S through Bungo Suido. For vessels proceeding from Kobe, pilots will be provided from there, and if from the S and E through Kii Suido, then pilots will be provided from Osaka Wan.

Pilots for vessels bound for Seto Naikai board 4.5 miles SE of Seki Saki Light in position 33°16'00.6"N, 131°54'08.4"E, and very large vessels 10 miles distant bearing 100° from the light. In bad weather vessels embarking a pilot should proceed to calmer waters S of Tsuta Shima in position 33°14'15.0"N, 131°53'39.6"E.

Pilots should be ordered from Moji or Kobe at least 24 hours before entering the Inland Sea, then again 6 hours in advance, with both messages including the following information:

1. ETA and name of pilot station needed.
2. Destination.
3. Speed.
4. Draft.
5. Cargo.
6. Length.
7. Any other relevant information.

Vessels should maintain a continuous listening watch of VHF channel 16 when within range of Shimonoseki, Oita, or Kobe Port Radio Stations.

Kurakake Shima Light

Contact Information.—See the table titled **Himeji Ko Port Authority—Contact Information**.

Himeji Ko Port Authority—Contact Information	
Telephone	81-792-350176
Facsimile	81-792-345172
E-mail	himejikoukanri@pref.hyogo.lg.jp

There is a signal station on the W side of the harbor entrance of Hirohata Ku. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate answering signals, and other local or specific regulations.

Anchorage.—Deep-draft vessels, waiting for the tide, may take temporary anchorage close SE of the entrances to the passages and the dredged channel.

Caution.—With strong W winds of the winter monsoon, a vessel may be set markedly E when the ebb current is E in the vicinity of the breakwater entrance at Hirohata Ku. Caution is necessary when the bow of the vessel passes inside the breakwaters; the stern of the vessel may be set to the right, and a dangerous situation may arise as the bow of the vessel swings to the left.

Care should be taken to avoid a danger area caused by an Intake in Hirohata Ku,. The danger area is bounded by lines joining the following positions:

a. 34°47'1.5"N, 134°37'44.3"E. (shore)
b. 34°47'0.9"N, 134°37'44.3"E.
c. 34°47'0.9"N, 134°37'42.3"E.
d. 34°47'1.5"N, 134°37'42.3"E.

Ieshima Shoto

7.10 Ieshima Shoto (Ieshima Gunto) (34°40'N., 134°35'E.), in the N part of Harima Nada, consists of four large islands and more than ten small islands and islets. There are many dangerous rocks in the area, and care is particularly necessary to avoid Kami-Shizumo and **Shimo-Shizumo** (34°42'N., 134°30'E.), N of the islands.

Numerous fish havens are situated between and around the islands in this group.

Harima Nada North Fairway passes N of Ieshima Gunto, but passes S of Kami Shima, the E islet. Large vessels navigating to and from Himeji Ko and Aioi Ko also go between Ieshima Gunto and Shodo Shima.

Kami Shima (34°41'N., 134°43'E.), the E islet of the group, lies about 4 miles SSE of the entrance to Higashi Ku (Himeji Ko). It is a round-topped islet, 46m high, and marked by a light near its summit. The islet should not be approached too closely, as drying and submerged rocks lie up to about 410m N and S of the islet. A rock, with a depth of 11.9m, lies about 0.5 mile SSW of the islet.

Kurakake Shima, about 3.5 miles W of Kami Shima, has two summits. The E summit is 64m high; a light is shown from the W summit. A rock, 4.9m high, lies close to the SE end of the islet, and a rock, 8.8m high, with a rock awash close W, lies close to the NW end of the islet. A dangerous wreck, the charted position of which is approximate, lies almost 0.5 mile S of Kurakake Shima.

Futon Shima, nearly 1.5 miles WSW of Kurakake Shima, is 44m high; a rocky islet, 18.9m high, lies about 0.1 mile S of the SW end of the islet, to which it is connected by a drying bank.

Oikari, a rock, 1m high, with a submerged rock close E, lies about 0.4 mile SSW of the above-mentioned 18.9m islet. A lighted buoy is moored close NW of Oikari.

7.11 Tanga Shima (Tanka-jima) (34°40'N., 134°35'E.), about 1 mile WSW of Futon Shima, is the E of the four large islands. The island has two summits; the W summit is 220m high and marked by a light on its S side. Many white scars mark the coast where stone has been quarried.

Koikari, a rock, which dries 0.8m, lies about 0.2 mile E of Tanka-jima. Uwa Shima, two islets close together, lies about 0.3 mile N of the N extremity of Tanka-jima; the NW islet is

33m high. Ka Shima, about 0.5 mile SE of the S extremity of Tanka-jima, consists of three islets joined by a sandy beach; the SE islet is 56m high. A reef, with a pointed rock, 3.4m high, at its outer end, extends about 0.2 mile E of the N islet.

Ie Shima, nearly 1 mile W of Tanka-jima, is the principal island of the group; the summit of the island, in its SE part, attains an elevation of 134m. A light is shown from the N end of the island.

Ieshima Ko, which is protected by breakwaters that extend from both sides of the middle of the inlet and shows a light from each breakwater head, lies in a bay on the NE side of Ie Shima. Several dangerous wrecks lie in the NE approaches to Ieshima Ko.

Anchorage, sheltered from all but NE winds, can be taken by small vessels outside the breakwaters, in depths of 18.3 to 22m.

7.12 Kami-Shizumo (34°42'N., 134°30'E.), a rock with a depth of 1.4m, lies about 1.3 miles NNW of the NW extremity of Ie Shima. Shimo-Shizumo, a rock with a depth of 4.6m, lies close WSW of Kami-Shizumo. A lighted buoy is moored NE of Kami-Shizumo, and another lighted buoy is moored SW of Shimo-Shizumo.

Nishi Shima (Nisi Shima), about 1 mile WSW of Ie Shima, has many white cliffs on its coasts. Its summit, 276m high, lies in the SW part of the island; a pyramidal rock is conspicuous about 0.4 mile N of the summit.

Boze Shima (Bose Shima), 104m high in its W part, is connected to the SE extremity of Nishi Shima by a drying bank. A light is shown from the shoals close off the E side of Boze Shima. There is a small harbor, protected by a breakwater, on the E side of the island.

Yano Shima, 38m high, lies midway between the N end of Boze Shima and the SW end of Ie Shima. A drying rock lies close E of Yano Shima; a dangerous rock lies midway between Yano Shima and the S end of Ie Shima. A drying reef, with a 11.9m high rock and a submerged rock near its outer end, extends about 0.3 mile SW of Yano Shima.

Kuro Shima, 80m high, and another islet lie about 0.8 mile and 1.3 miles, respectively, S of Yano Shima. A rock, with a depth of 6.9m, lies midway between Kuro Shima and the S part of Boze Shima.

Taka Shima, 107m high, lies nearly 0.5 mile S of the SE extremity of Nishi Shima, with foul water between. **Taka Shima** (34°38'N., 134°32'E.) 31m high, is a small islet of the same name as the island 1.5 miles W of it.

Anchorage.—Anchorage can be taken, in 16 to 20m, between the E coast of Nishi Shima and the NW coast of Boze Shima. Care must be taken to avoid Uchi-Shizumo, a rock, with a depth of 1.4m, about 0.5 mile W of the N extremity of Boze Shima. Care is also necessary due to fish cultivation facilities between Uchi-Shizumo and the E coast of Nishi Shima, and in the inner parts of the anchorage.

Temporary anchorage can be taken, in 14.9 to 19.8m, in the bays on the N and S sides of Nishi Shima with local knowledge. A rock, with a depth of 7.2m, lies on the E side of the entrance to the S bay.

7.13 Inge-jima (Inge Shima) (34°39'N., 134°26'E.), about 1 mile W of Nishi Shima, has its 76m high summit near its SW end. A light is shown near the middle of the island. A chain of islets and rocks extends about 1.7 miles SSW of Inge-jima to Komatsu Shima, 32m high, with bushes on it.

Inge-jima Light

Matsu Shima, 88m high to the tops of the trees, lies about 2.5 miles SSE of the SW extremity of Nishi Shima. Odono Se, a rock with a depth of 1.2m, lies about 0.4 mile ENE of Matsu Shima; Dekisono Se, a rock, with a depth of 1.2m, lies about 0.4 mile WSW of Matsu Shima.

Mitsugashira Shima, 46m high, lies about 0.8 mile W of the SW end of Matsu Shima. A chain of islets, rocks, and dangers extends about 1 mile NNE of Mitsugashira Shima to Katsura Shima, 40m high. It is not advisable to pass between the islets.

Himeji Ko to Ako Ko

7.14 Noboriiwa Yama (34°46'N., 134°33'E.), 145m high, sparsely covered with pine trees, and with a large rock on its summit, is conspicuous about 1.5 miles NW of the head of the W breakwater at Nishi Ku of Himeji Ko.

Murotsu Wan, about 2.5 miles farther W, is free of dangerous rocks and provides anchorage for vessels up to 500 gt, sheltered from winds other than from the SW.

Murotsu Gyoko, protected by a breakwater, lies within 1.5 miles S of the entrance to Murotsu Wan. A light is shown on the head of the breakwater. A fish haven exists 0.2 mile S of the light.

Kanega Saki (34°45'N., 134°29'E.) separates Murotsu Wan from Aioi Ko, close W. Kimi Shima, 31m high to the tops of the trees, lies about 0.2 mile S of Kanega Saki.

Okino-Karani Shima, about 1.3 miles SE of Kanega Saki, is thickly covered with pines, and 38m high to the tops of the trees. Depths of less than 4.9m extend about 0.1 mile S of the islet, and an islet close NE is joined to it by a reef.

Jino-Karani Shima, about 0.5 mile NE of Okino-Karani Shima, is 40m high to the tops of the trees. Two rocks, one drying 0.8m and the other with a depth of 0.4m, lie about 0.2 mile NE and ENE, respectively, of Jino-Karani Shima.

Aioi Ko (34°46'N., 134°28'E.)

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7.15 Aioi Ko, protected by a detached breakwater, is entered between Kanega Saki and Kama Saki, about 1 mile W. Kazura Shima, marked by a light, lies about 0.5 mile WSW of Kimi Shima, in the middle of the entrance to Aioi Ko.

It was reported that shoaling had occurred in an area 0.6 mile N of Kanega Saki; depths of 4m have been recorded.

The entire W side of the harbor is occupied by a shipyard, with a number of drydocks and facilities for constructing vessels of up to 477,000 dwt.

The city of Aioi lies at the head of the harbor.

Winds—Weather.—Mountains border three sides of the harbor. The interior of the harbor is calm, even in the W to WNW storms of winter.

Tides—Currents.—The tidal rise is 1.5m at springs, and 1.3m at neaps.

Depths—Limitations.—The harbor has general depths of 6 to 7.9m.

The private wharves of the shipbuilding yard occupying the entire W side of the harbor, and have depths of 6 to 7m alongside.

The largest drydock on the W side of the harbor is 340m long, 56m wide, with a depth of 8m, and has a 150,000 dwt capacity.

Kasamatu Iwa, a rock, 3m high, lies close off the E shore, about 0.8 mile NNW of Kanega Saki. Kabe Shima, a rock, 2.1m high, lies about 0.2 mile offshore, about 0.8 mile farther N; a depth of 4.5m lies about 150m S of Kabe Shima.

Aspect.—A three-story building on the summit of a hill on the E side of the harbor entrance is conspicuous from a distance.

Lights, in line bearing 350.5°, lead into the harbor; the lights are shown from hills behind the shipyard at the head of the harbor. A white radio tower stands on the summit of a 181m hill, about 0.3 mile W of the range lights.

Pilotage.—For information, see paragraph 7.9. Pilots are available from sunrise until 30 minutes before sunset. The local port authority can be reached by telephone (81-791-582232) during the daytime.

7.16 **Sakoshi Wan** (34°45'N., 134°27'E.) lies close W of Aioi Ko and is open S. Sakoshi Ko, a local port, lies in the NW part of the bay and is sheltered E by Iki Shima, which is densely wooded and 60m high to the tops of the trees. A second harbor, protected by a breakwater, has a quay and jetty and lies 0.4 mile NE of Iki Shima. Fish havens lie within 0.3 mile SW of Kama Shima. Nabe Shima, 29m high and sparsely covered with pine trees, lies in the NE part of the bay. A light is shown from the head of a breakwater extending from the E side of the island.

Anchorage.—The bay has depths of 4.9 to 5.8m, mud, and anchorage can be taken as convenient. Sakoshi Ko has depths of 4 to 5m and is a safe roadstead for small vessels.

Mi Saki (34°44'N., 134°25'E.), 68m high, lies about 3 miles WSW of Kazura Shima. A light is shown from, and a shrine is situated on, the summit of the headland. There are many hotels in the area; their lights are visible from a distance. A rock, 0.9m high and marked by a light, lies about 0.2 mile S of the headland.

Toriage Shima, 17.1m high, and sparsely covered with pine trees, lies about 1.3 miles WSW of Mi Saki. It lies close off the mouth of Chigusa Kawa; extensive salt pans lie E of the river mouth.

Ako Ko

7.17 **Ako Ko** (34°44'N., 134°22'E.) lies in the mouth of Otsu Kawa, about 1.5 miles NNW of Toriage Shima. The harbor limit extends from Toriage Shima to Tuna Saki, at the W entrance to Otsu Kawa. A dredged channel and range lights lead into the harbor, which is being developed into an industrial harbor.

Depths—Limitations.—The entrance channel (34°43'N., 134°22'E.) is about 500m wide and dredged to 7.3 to 7.9m.

The cement wharf, in the vicinity of the front range light, has depths of 4.5 to 8.2m alongside. A dolphin berth, close SE of the cement wharf, has a depth of 7.5m alongside.

Aspect.—Range lights, in line bearing 000°, lead into the harbor through the dredged channel, which is marked by lighted buoys.

A chimney, 100m high, lies on the E side of the mouth of Otsu Kawa, between the range lights; the range lights may be difficult to see. Two chimneys, each 78m high, are conspicuous about 0.3 mile farther N.

A cliff on the S side of the 145m hill, about 1 mile W of Tuna Saki, is a good landmark for distinguishing the harbor from a distance.

Caution.—There are fixed fishing nets and seaweed cultivation grounds on both sides of the entrance channel from September to April.

Ako Ko to Ushimado Ko

7.18 **Kakui Shima** (34°43'N., 134°19'E.), about 2 miles SW of Ako Ko, has a conspicuous rounded summit, 219m high, and is marked by a light at its SE end. Several fish havens exist in the bight on the S side of the island. Tsura Shima, 37m high and treeless, lies about 1 mile S of the summit of Kakui Shima; a rock, 12.8m high, lies off its S end. Otabu Shima, 41m high, lies about 1 mile SW of Tsura Shima. There is a small harbor, protected by a detached breakwater, on the N side of the island. A light is shown from the W head of the breakwater. Kashiri Shima, 58m high, lies about 0.5 mile NNW of Otabu Shima.

Anchorage can be taken by small vessels, in 6 to 7m, mud, S of Kakui Shima, between the above-mentioned islands. Care must be taken to avoid Komeishi, a group of rocks, one of which dries 2m, lying about 300m E of Kashira Shima. Care is needed to avoid several submarine cables and pipelines laid between these islands.

There is also a bridge, with a vertical clearance of 23m, which connects Kashira Shima to Kakui Shima.

Naga Shima, about 0.8 mile W of Otabu Shima, has many summits about 100m high, and is covered with pine trees; a low isthmus is in its center. It is almost joined to the mainland W by a channel, which is crossed by a bridge with a vertical clearance of 13m. Ohira Yama, 262m high, is conspicuous

about 2.8 miles WNW of the E extremity of Naga Shima. Tamakazura Yama, about 1.8 miles farther WSW, is a sharp wooded peak, 267m high.

The approach to the small local harbors of Katagami Ko and Hinase Ko lies between Otabu Shima and Naga Shima. The many narrow channels between the above-described islands and the mainland are available to small vessels with local knowledge.

7.19 **Ki Shima** (34°40'N., 134°13'E.), 24m high, is located about 0.5 mile SW of Naga Shima. Takatsubo Yama, about 1.5 miles farther WSW, is 143m high and surmounted by a pine woods conspicuous from a distance.

Kinkai Wan is entered S of Takatsubo Yama; the major part of the bay is being reclaimed.

Bangaishi Hana, the S entrance point of Kinkai Wan, is located about 1.3 miles S of Takatsubo Yama. Kami Ikada, a rock, 3.6m high and marked by a light, lies nearly 1 mile E of Bangaishi Hana; a rock, which dries 0.5m, lies about 0.1 mile NE of Kami Ikada. Nezu Shima, an islet, 35m high, is conspicuous about 0.3 mile WNW of Kami Ikada. Shimo Ikada, a rock, 3.1m high, lies about 0.6 mile SW of Kami Ikada; a rock, with a depth of 0.3m, lies close NW of Shimo Ikada.

Mae Shima (34°36'N., 134°11'E.) lies with its E extremity about 1.3 miles S of Kami Ikada; the summit of the island, in its E part, is 137m high and thickly covered with pine trees. A light is shown on the N extremity of the W end of Mae Shima.

Ao Shima, 31m high and treeless, lies about 0.4 mile SE of the E end of Mae Shima. Ki Shima, about 0.5 mile SW of Ao Shima, has two summits with pine trees; the W summit is 67m high. A light is shown from the SE extremity of the island. Two rocks, which dry 1.5 and 1.1m high, lie about midway between Mae Shima, Ao Shima and Ki Shima.

Kuro Shima (34°36'N., 134°10'E.), 33m high, with pine trees near its summit, lies close SW of Mae Shima, in the S approach to Ushimado Ko. It is the E of three islets lying on a drying bank. The group lies on a mud bank, with depths of less than 4.9m, extending about 0.5 mile W of the W islet. A channel, about 0.3 mile wide lies between the W edge of the bank and Yomogi Saki, the SW entrance point of Ushimado Ko. A light is shown from Yomogi Saki.

7.20 **Ushimado Ko** (Usimado Ko) (34°37'N., 134°10'E.), a small local port, is divided into an E area and a W area by Ushimado Seto, a narrow passage between the NW end of Mae Shima and the mainland. The passage is about 0.1 mile wide, and is not only restricted by rocks, with depths of less than 4.9m, extending from both sides, but there are tidal currents of over 2 knots. An overhead cable, with a vertical clearance of about 30m, crosses the narrows. A light is shown from the N extremity of the W end of Mae Shima; the E limit of the harbor extends N from this extremity.

There is a least depth of 5.2m in the S approach to the anchorage, between mud banks, with depths of less than 2m and with a dense growth of seaweed, extending from the N and S sides of the W harbor area.

The E approach to Ushimado Ko, N of Mae Shima, has depths of less than 4.9m.

Anchorage, with local knowledge, can be taken, in 14.6 to 15.9m, with the W end of Mae Shima bearing 164°, distant about 0.4 mile.

Shodo Shima

7.21 **Shodo Shima** (Syodo Shima) (34°30'N., 134°16'E.), on the W side of Harima Nada, rises to an elevation of 817m at Hoshigajo Yama (Hosigazyo), in the E part of the island. A 777m peak is located about 1.5 miles W of Hoshigajo Yama; a wooded ridge extends from this peak to Jizo Saki (Zizo Saki), the S extremity of the island. **Taima Zan** (34°29'N., 134°14'E.), a steep cliffy plateau, 427m high, in the W part of the island, slopes S to Ikada Wan.

Okado Hana, the SE extremity of Shodo Shima, and the offlying dangers off the E side of the island were previously described in paragraph 7.2.

Fukuda Wan (34°33'N., 134°22'E.), at the NE end of Shodo Shima, is sheltered from all but E winds. The bay is entered between Kanega Saki (Kanaga Saki), 105m high and Ko-jima, about 1 mile S. The latter islet is 44m high, and joined to the mainland at its W end. O Iso, a rock, marked by a light, lies about 1 mile ESE of Kanega Saki. Hinde Iwa, which dries 0.6m, lies about 0.7 mile E of Ko-jima and is marked SE by a lighted buoy. Manaita Iwa, a rock, with a depth of 2m, lies about 0.4 mile NE of Hinde Iwa. The fishing port of Fukuda lies at the head of the bay.

Anchorage.—Anchorage can be taken by vessels with local knowledge in Fukuda Wan. The major part of the bay has depths of 14.6 to 29.2m. There are seaweed cultivation grounds within 410m of the shore on the N side of the bay from October to April, and fish cultivation grounds within 400m of the S shore from April to January.

7.22 Obe Wan, an open bight on the N coast of Shodo Shima, lies between **Myoken Saki** (34°33'N., 134°16'E.), a steep- to wooded point, 103m high, and a point about 2 miles E. Obe Ko, a local port, lies at the head of Obe Wan.

O Shima, 29m high, lies about 0.8 mile ENE of Myoken Saki, and is the outermost of a group of rocks connected by shoals. A rock, with a depth of 1.7m, and marked close NE by a lighted buoy, lies about 0.5 mile E of O Shima, with above and below-water rocks in between. Ko Shima, 35m high, lies about 0.8 mile ESE of O Shima, and about 0.2 mile offshore.

Anchorage.—Temporary anchorage can be taken, in 5 to 7m, midway between O Shima and Ko Shima, by small vessels with local knowledge.

Kabura Saki, at the W end of the N coast of Shodo Shima, is 22.2m high to the tops of the trees. A reef, with depths of less than 10.1m, extends about 685m N from a position about 0.2 mile E of the point; a rock, with a depth of 2.4m, lies in the N part of the reef. Chiburi Shima, 32m high and marked by a light at its NE end, lies about 0.5 mile W of Kabura Saki; rocks lie within 0.1 mile N of the NE extremity, and within 0.2 mile off the SW side of Chiburi Shima. Kazura Shima, 59m high, lies about 0.5 mile SW of Chiburi Shima.

Caution.—It is inadvisable to go between Chiburi Shima, Kazura Shima, and Shodo Shima.

7.23 **Sakate Ko** (34°27'N., 134°19'E.) is located at the NE end of Sakate Wan, which is entered between Okado Hana, the SE end of Shodo Shima, and Shioya Hana (Sioya Hana), about

2.8 miles WNW. Ko Shima, 49m high and surmounted by a beacon, lies about 1 mile NW of Okado Hana, and is separated from the E shore by a shallow channel.

The harbor is open SSE to WSW; with strong SE winds, heavy seas enter the harbor.

A wharf, marked by a light at its outer end, lies in the N part of the inner end of the harbor; it is 115m long, with depths of 4 to 6.4m alongside its N side.

A jetty, close NW of the wharf, has depths of 5.5 to 10.1m alongside.

Anchorage can be taken in Sakate Ko, in 14.6 to 24m, except in strong SE winds.

Uchinoumi Wan (Uti-no-Umi), entered W of Shioya Hana, is separated from Sakate Wan by a hilly peninsula. The bay provides good anchorage for all types of vessels during typhoons. Uchinoumi Ko lies at the inner end of the bay.

Gongen Hana, the E entrance point of the bay, lies nearly 0.5 mile NW of Shioya Hana. Okino Hanage, a rock drying 0.6m, and marked NW by a lighted buoy, lies on a shoal about 0.3 mile SW of Gongen Hana. Jino Hanage, a rock awash, marked NW by a lighted buoy, and with shoal water extending about 230m N and S of it, lies about 0.3 mile NNW of Gongen Hana.

Anchorage can be taken as convenient in Uchinoumi Wan, in a depth of 11.9m, mud, by all types of vessels.

Ouchinoumi Ko (Utinomi Ko) (34°28'N., 134°19'E.) is a local port, sheltered from all winds, and known as a port of shelter for large and small vessels.

Benten Shima, 8.9m high and wooded, lies at the inner end of the harbor; a wooded islet, 5.6m high, lies about 0.1 mile W of Benten Shima, to which it is connected by a drying reef.

A wharf about 0.3 mile SE of Benten Shima is 71m long, and can accommodate a 1,000 gt vessel in a depth of about 4.9m.

7.24 **Ikeda Wan** (34°28'N., 134°13'E.) lies on the SW side of Shodo Shima; it is entered between Jizo Saki, the S extremity of Shodo Shima, and Kuro Saki, the S extremity of Ka Shima, about 5 miles NW. Chojaga Hana, about 1.5 miles N of Jizo Saki, is the N entrance point of a small cove in the SE part of the bay. Benten Shima, an islet, 21m high and sparsely wooded, lies about 1.8 miles farther N. Ikeda Ko, a small port, is entered close N of Benten Shima.

Yo Shima, 51m high, and wooded, lies in the NW part of Ikeda Wan, and is connected by islets and drying banks to the coast N.

Fujino Se, with a least depth of 6.1m, lies about 0.5 mile W of Chojaga Hana. Okino Mo, with a least depth of 3.7m, mud or sand and shell, and with a luxuriant growth of seaweed, extends about 0.8 mile E from a position about 0.3 mile S of Yo Shima. Sandwaves lie in the middle of the entrance to the bay.

Tonosho Higashi Ko, on the E side of Ka Shima, has a pier 180m long, with depths of 3.1 to 6m alongside. A channel, about 90m wide, with depths of 5 to 6.5m, leads to the pier. The approach channel is marked on its W side by lighted buoys (port hand) and by lighted spar buoys (red and yellow).

Anchorage.—Ikeda Wan provides good sheltered anchorage except in S winds. Large vessels can anchor, in 11 to 13m, on a line between Kuro Saki and Chojaga Hana or, in 9.2 to 14m, NW of Chojaga Hana, remaining clear of Fujino Se. Small vessels can anchor, in 5.5 to 7m, mud, in the inner part of the bay, clear of Okino Mo.

Tonosho Ko (34°30'N., 134°10'E.), a local port, on the W side of Shodo Shima, is available to small vessels with local knowledge through a narrow shoal channel between Ka Shima and Shodo Shima.

Bisan Seto

7.25 Bisan Seto extends from the SW part of Harima Nada to Bingo Nada, a distance of about 36 miles. The E entrance lies between **Jizo Saki** (34°25'N., 134°14'E.) and O-gushi Saki, about 3 miles SSW. The W entrance lies between Mu Shima and Mi Saki, nearly 2.5 miles SE.

Bisan MARTIS Home Page
http://www6.kaiho.mlit.go.jp/bisan/index.htm

Traffic Routes prescribed by the Maritime Traffic Safety Law are in force in Bisan Seto, as follows:

1. Bisan Seto East Traffic Route—Located in the E part of Bisan Seto. This traffic route is crossed by Uko East Traffic Route and Uko West Traffic Route
2. Bisan Seto North Traffic Route—For westbound vessels in the W part of Bisan Seto
3. Bisan Seto South Traffic Route—For eastbound vessels in the W part of Bisan Seto
4. Mizushima Traffic Route—Near the E end of Bisan Seto North Traffic Route

Vessels 50m long and over are required to remain within the limits of the Traffic Routes, the limits of which are best seen on the chart, and which are delineated by lettered lines, also best seen on the chart, as follows:

1. Mizushima Traffic Route.
   a. Between Line A and Line B.
   b. Between Line B and the harbor limit.
2. Bisan Seto Traffic Routes.
   a. Between Line G and Line F.
   b. Between Line F and Line E.
   c. Between Line E and Line D.
   d. Between Line D and Line C.

Bisan Seto Reporting Lines.—Vessels of 50m or more in length, not properly operating AIS, must report vessel name and time of crossing at the following position reporting lines to Bisan Seto Traffic Advisory Service Center as described in the table titled **Bisan Seto Position Reporting Lines**.

Depths—Limitations.—Bisan Seto East Traffic Route has a least depth of 14.9m at Taka Se, about 2 miles WSW of Jizo Saki; there are several places with depths of 18.3 to 18.9m, but otherwise the depths are over 20m.

Bisan Seto North Traffic Route has depths of over 17.1m, except for a rock, with a depth of 9.2m, which lies about 0.2 mile ENE of **Habushi Iwa** (34°20'N., 133°43'E.); the bottom in several places is rock, with depths of 17.1 to 18.9m.

Bisan Seto South Traffic Route has depths of 11.9 to 12.8m in its central part, and a least depth of 11.2m, about 0.3 mile SE of Takami Shima.

There is a least depth of 14.9m in Mizushima Traffic Route, except for in the area W of **Mitsugo Sashi** (34°22'N., 133°49'E.), where there is a least depth of 13.4m. Sandwaves

with depths of less than 10.1m have been reported in the most difficult part of Bisan Seto where the traffic routes intersect.

Pilotage.—Pilotage is compulsory in the above traffic routes for vessels over 10,000 gt. Pilotage is recommended for vessels carrying dangerous cargo and vessels making their first transit of the Naikai.

See paragraph 6.1 for further information.

Regulations.—Vessels should maintain continuous contact with Bisan Seto Vessel Traffic Service Center "Bisan MARTIS" on VHF channel 16 when navigating in the traffic routes, the approaches to the traffic routes and in the adjacent sea areas.

Vessels shall not navigate at speeds exceeding 12 knots in certain areas indicated on the charts, except when a vessel is crossing the traffic route.

Vessels may be instructed by the captain of the port to evacuate the port in the event of abnormal weather or marine conditions such as typhoons or marine accidents.

There are certain areas indicated on the chart where vessels are prohibited from crossing the traffic route.

Vessels should refer to the Bisan MARTIS user manual for a full description of regulations and requirements that may apply.

See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for regulations of the Maritime Traffic Safety Law.

Bisan Seto East Traffic Route

7.26 Bisan Seto East Traffic Route extends between **Jizo Saki** (34°25'N., 134°14'E.) and **Ko-Sei Shima** (34°22'N., 133°51'E.), N of Sakaide Ko. The traffic route is narrow and winding, with many fishing vessels, cross traffic of ferries, and heavy traffic. Vessels should not cross in the vicinity of the entrance and departure points of the traffic route. Vessels leaving the traffic route should not alter course in the vicinity of these points.

Lighted buoys mark the traffic route.

7.27 Aspect—North side.—Shodo Shima and **Jizo Saki** (34°25'N., 134°14'E.) have been previously described in paragraph 7.21.

Taka Se, with a least depth of 14.9m, lies about 2 miles WSW of Jizo Saki, and is the least depth of Bisan Seto East Traffic Route.

Ka Shima, separated from Shodo Shima by a barely-drying channel, lies about 4.5 miles NW of Jizo Saki. Ofuka Yama, 227m high, with few trees, is the summit of the island lying near its center.

Yoko Se, with a least depth of 17.1m, lies about 1.3 miles SSE of Kuro Saki, the S extremity of Ka Shima.

Te Shima, about 2 miles W of Ka Shima, rises to a plateau in its central part, from which rises Dan Yama, 340m high, the summit of the island. Uomi Yama, a sharp peak, 103m high, lies in the W part of the island.

Ode Shima, an islet, 133m high, lies between Ka Shima and Te Shima. It lies close on the E side of Te Shima and is separated from it by a narrow channel. Two overhead cables, with a least vertical clearance of 42m, span the channel. Fish havens are situated at the N and S ends of this channel. Awara Shima, a conical rocky islet, 31m high, lies about 0.5 mile S of Ode Shima.

A sand bank, with a least depth of 11.9m, lies close N of the traffic route, and extends from about 0.5 mile SSE of Kuro Saki to about 1 mile SE of Reita Saki, the S extremity of Te Shima.

Bisan Seto Position Reporting Lines

Name	Abbreviation	Position—A Line Drawn:
Bisan Seto South Traffic Route W	SW Line	180° from Futaomote Shima Lighthouse to the shore of Awa Shima.
Bisan Seto South Traffic Route S	SS Line	Connecting the N end of Awa Shima Yagura Hana and the N end of Shamijima.
Mizushima North	MN Line	75° from Futo-Noji Shima triangulation point to the coast.
Mizushima West	MW Line	From Futo-Noji Shima triangulation point to a point lying 180° at a distance of 2,000m.
Mizushima East	ME Line	Connecting Nishi-no-Saki Traffic Control Station and the W end of Hitsuishi Shima.
Bisan Seto East Traffic Route S	ES Line	90° from Ko-Sei Shima triangulation point to the coast and a line from Ko-Sei Shima triangulation point to a point drawn 238° and 2,860m distant.
Uko S	US Line	Connecting Megi Shima triangulation point and the top of Kushi-no-Yama.
Uko N	UN Line	Connecting the N end of Kama Shima and Manaita Ishi lighted beacon.
Ishima Suido	EN Line	Connecting the NE end of Nao Shima Tsuno Saki and Te Shima Reita Saki.

Bisan Seto Position Reporting Lines		
Name	**Abbreviation**	**Position—A Line Drawn:**
Takamatsu NE	ET Line	Connecting the S end of Ogi Shima and the N end of O Shima.
Takamatsu N	EY Line	Connecting the N end of Kabuto Shima and the N end of Taka Shima.
Bisan Seto East Traffic Route E	EE Line	Connecting Shodo Shima, Jizo Saki and Okushi Saki.

Nao Shima, about 2 miles WSW of Te Shima, rises to a 124m summit in its central part. Two chimneys, 236m and 98m high, of the refinery in the N part of the island, are conspicuous. Kashiwa Shima (Kasiwa Shima) lies close SE of Nao Shima; passage between the islands should be avoided due to a shoal, with a least depth of 3.8m, in the channel. Two large steel pylons, each painted red and white, for the overhead cables, with a vertical clearance of about 58m, running between Kojin Shima (Kozin Shima), on the W side of Nao Shima, to Inumodori Hana, about 1 mile farther W, are conspicuous.

Ozuchi Shima (O-Zuti Shima) (34°25'N., 133°55'E.), a conical island, 171m high, is conspicuous about 4 miles WSW of Kashiwa Shima. Three chimneys, 196m, 172m, and 156m high, are also conspicuous at Hibi, about 2 miles N of Ozuchi Shima.

Osono Se lies on a shoal area with depths of less than 20m, which extends from the W side of Kashiwa Shima to about 1.5 miles W of Ozuchi Shima. Osono Se lies between Uko East Traffic Route and Uko West Traffic Route. There are sand waves on Osono Se; lighted buoys mark the shoal.

O-yo Shima (Koyo Shima), about 48m high, lies nearly 5 miles WSW of Ozuchi Shima. Kanadeno Asari, a rock, with a depth of 19.4m, lies about 1.3 miles E of the S end of O-yo Shima, near the center of the traffic route. A depth of 18.3m lies about 1.3 miles farther ENE, near the center of the traffic route.

Between Ozuchi Shima and O-yo Shima there is an almost continual bank, with depths of less than 20m, and a least depth of 11.2m.

7.28 Aspect—South side.—Goken San (34°21'N., 134°09'E.), previously described in paragraph 7.2 with Harima Nada, has a conspicuous rocky summit, is the highest in the vicinity, and is conspicuous on the W side of Shido Wan. Ryuo San, 239m high, and Tomi Yama, 236m high, with a sharp peak, lie about 1.3 miles NNE and 1.5 miles N, respectively, of Goken San, near the N end of the peninsula. Taka Shima, 78m high to the tops of the trees, lies about 0.8 mile NE of the NE end of the peninsula; it is bordered by shoals. Yakuri Dashi, a bank with a least depth of 14.9m, lies about 1 mile NW of Taka Shima.

Inagi Shima, about 2 miles WNW of Taka Shima, is 58m high to the tops of the trees, with a round summit on its E end; a light is shown from the SE end of the island. From the E or W, the island appears saddle-shaped.

Okabuto Shima, about 0.5 mile farther NW, is round-topped and 77m high to the tops of the trees; an 11m high rock lies close N.

Kanawa Iwa, about 0.15 mile NE of Okabuto Shima, consists of rocks drying 1.5m. A light is shown from the W drying rock.

Kokabuto Shima, an islet, 42m high, lies about 0.2 mile S of Okabuto Shima. O Shima, about 1 mile SW of Okabuto Shima, has a low sandy isthmus in its central part.

There are many shoals between Inagi Shima and O Shima.

Yoko Se, with a least depth of 12.8m nearly 1 mile NW of Okabuto Shima, lies on the S side of the traffic route, with depths of less than 20m. There are sandwaves in the vicinity.

Ya Shima, about 1 mile S of O Shima, is a roof-shaped peninsula, separated from the mainland S by a drying canal. The summit of the island is plateau-shaped, with a luxuriant growth of pine trees; a temple is on the 293m high summit and the lights of the restaurant close W of it are conspicuous from W to N.

Aji Ko, a small shallow harbor protected by two breakwaters, one of which is detached, is situated in the NE corner of Ya Shima Wan.

Another detached breakwater lies parallel to and 0.3 mile offshore SW of Aji Ko. A light is shown from its N head.

7.29 Ogi Shima (34°25'N., 134°04'E.) lies about 2 miles WNW of O Shima, on the S side of Bisan Seto East Traffic Route. The island has two summits. The N summit is 213m high and flat-topped, while the S summit is sharp pointed and lower. A light is shown from the N extremity of the island. A small harbor, protected by a detached breakwater, is situated on the SE side of the island. A bank, with depths of less than 20m, extends between Ogi Shima and Okabuto Shima. Doro Se, with a least depth of 4.6m, extends about 0.7 mile E of Ogi Shima.

Naka Se, a sand bank, with a least depth of 0.6m, extends about 3 miles WSW from Ogi Shima, and is marked by a lighted buoy at its W end. A dangerous wreck lies close SE in position 34°23'51"N, 133°59'58"E.

Ko-Zuchi Shima (Ko-Zuti Shima), about 7 miles WSW of Ogi Shima, lies on the S side of the fairway, and is conical, wooded, steep-to, and 112m high. A light is shown from the N end of the island. Atsusa Iwa, about 0.5 mile E of Kozuchi Shima, has a least depth of 3.4m.

Osakino Hana lies close SE of Ko-Zuchi Shima. Kama Se, a long, narrow bank, with a least depth of 0.8m, lies between Osakino Hana and the S extremity of Megi Shima, about 5.5 miles ESE. Three lighted buoys, in the E half of the shoal, mark Takamatsu West Fairway. There are several sandwaves.

No Zaki (No Misaki), about 1.5 miles WSW of Kozuchi Shima, is a high headland, backed by several flat-topped hills, the N of which is 172m high and rather pointed. On the W side of the point there are the remains of conspicuous landslides in three places.

Kosei Shima, about 3.5 miles WSW of No Zaki, is a pine-covered islet, 41m high.

Regulations.—Vessels navigating in Bisan Seto East Traffic Route should keep to the right side of the center of the route.

Vessels navigating in Uko East Traffic Route must navigate in a N direction.

Vessels navigating in Uko West Traffic Route must navigate in a S direction.

Vessels navigating in Uko East Traffic Route and Uko West Traffic Route shall keep out of the way of a huge vessel (200m or more in length), which is navigating in Bisan Seto East Traffic Route.

Vessels, other than a huge vessel, shall keep out of the way of a huge vessel which intends to turn into Uko East Traffic Route from Bisan Seto East Traffic Route or which intends to turn into Bisan Seto Traffic Route from Uko West Traffic Route.

A speed limit of 12 knots is in effect for vessels navigating in that part of Bisan Seto East Traffic Route located E of Usi-jima (34°22'N., 133°47'E.).

See paragraph 7.25 for further vessel limitations in Bisan Seto East Traffic Route.

Caution.—Many small vessels keep close to the islands and headlands in the vicinity of Okado Hana, Jizo Saki and Ogi Shima. Ferries run between Uno and Takamatsu at a rate of about 1 every 10 minutes.

At night, caution is necessary to avoid confusing the lights of other vessels and navigational aids.

A large number of fishing vessels congregate between Jizo Saki and Ogi Shima, and may completely block the fairway; in addition, care is necessary as many of them do not show lights at night. There are boats operating with nets principally in the vicinity of Bisan Seto East Fairway Lighted Buoy 5 and Bisan Seto East Fairway Lighted Buoy 6.

Between Ogi Shima and Ko-Zuchi Shima, there are many vessels operating using nets and making use of the tidal current; they congregate principally S of Osono Se. Some of the vessels are reported to show no lights or to show lights suddenly when approached by other vessels.

Between Ko-Zuchi Shima and Kosei Shima there are many vessels operating using nets in the vicinity of Bisan Seto East Fairway Lighted Buoy No. 1.

Suspension bridges cross the W part of Bisan Seto East Traffic Route and the E part of Bisan Seto South Traffic Route; both spans have a vertical clearance of 65m.

Bisan Seto (East Part)—Honshu Coast

7.30 **Ushimado Ko** (34°37'N., 134°10'E.) was previously described in paragraph 7.20.

Inushima Shoto (34°34'N., 134°06'E.), a group of islands, lies about 4 miles SW of Ushimado Ko.

Inu Shima, the central and largest island, has many trees in its W half, and six conspicuous brick chimneys in its E half. A treeless islet, 25.9m high, lies close E of Inu Shima. Two islets, the highest 22.9m high to the treetops, lie off the SW end of Inu Shima. Shira Ishi, at the E end of the group, is a group of white rocks, 2.1m high and marked by a light. A shoal, with depths of less than 4.9m and a least depth of 3.8m, extends about 0.4 mile E of Shira Ishi.

Inno Shima, close NW of Inu Shima, is 39m high, with six conspicuous white chimneys. Nishino Sowai, a steep-to rock, with a depth of 2.8m, lies about 0.4 mile W of Inno Shima. Rocks, drying and awash, lie up to 0.1 mile off the N side of Inushima Shoto.

Naga Su, a narrow sand bank with a least depth of 7.3m, extends about 2.8 miles WSW from the W end of Inushima Shoto.

Okayama Suido

7.31 Okayama Suido, about 2 miles WNW of Inushima Shoto, is entered between **Kome Saki** (34°34'N., 134°03'E.) and Kiriishi Hana, about 0.8 mile NE. Kome Saki is 63m high and marked by a light; Hachijo-Iwa Yama, 281m high, is about 1.3 miles W of the point and is the E summit of the mountains in the vicinity. Kiriishi Hana is 89m high, with a large cliff formed by stone quarrying.

Caution.—An overhead power cable, with a vertical clearance of 42m, spans Okayame Suido W of Kiriishi Hawa. A mud bank, with depths of less than 4.9m, extends nearly 0.8 mile from the W side of the entrance of Okayama Suido.

Okayama Suido extends NW and W for about 5 miles to Okayamo Ko at its head, and has a navigable width of less than 0.2 mile in places. Yashii Kawa enters the N side of Okayama Suido, about 2 miles within the entrance, and Asahi Kawa enters Okayama Suido at Okayama Ko. Koshima Wan, close SW of Okayama Ko, has been formed into a fresh water lake by a dike.

Okayama Suido Lighted Buoy No. 1 is moored about 0.8 mile ESE of Kome Saki, on the W side of the entrance channel. The channel is narrow, with depths of less than 4.9m on either side, and local knowledge is necessary. The N part of Okayama Suido, between Yashi Kawa and Asahi Kawa, is shoal and the channel lies on the S side, and is marked by buoys.

7.32 **Okayama Ko** (34°36'N., 133°59'E.) is a minor harbor. A wharf, on the E side of the mouth of Asahi Kawa, has depths of 3.5 to 4m alongside. A berth, 103m long, on the E side of the shipping pool, can accommodate a 3,000 gt vessel, in a depth of 5.5m.

De Saki (34°31'N., 134°00'E.), about 4.5 miles SSW of Kome Saki, is the S extremity of a flat-topped peninsula; two radio towers and a beacon are on the point. An islet, 20m high, lies about 0.2 mile E of the point.

Ohiru Shima, 27m high and marked by a light at the W end, lies about 0.5 mile E of De Saki; a pointed rock, 11.9m high, lies close N of Ohiru Shima.

I Shima, about 0.3 mile S of Ohiru Shima, is marked by a light at its S end. Dango Yama, 157m high, lies in the middle of the island.

Te Shima, nearly 1 mile E of I Shima, has a conspicuous peak, Abu Yama, 200m high at its N end; a cliff formed by quarrying lies on the E side of the peak.

Dango Se, with depths of less than 10.1m and a least depth of 1.3m in its W part, lies N of Te Shima and extends about 4 miles ENE from a position about 1 mile E of the N extremity of I Shima; lighted buoys mark its E and W ends.

Chiburi Shima (34°32'N., 134°10'E.), off the NW extremity of Shodo Shima, was previously described in paragraph 7.22 with that island.

Desaki Uchi, entered W of De Saki, is obstructed by islets and shoals, and has irregular depths; it should not be entered without local knowledge. An area on the W side is being reclaimed and a quay is being constructed.

7.33 Kyonojoro Shima (34°29'N., 133°59'E.), about 1.5 miles SW of De Saki, is 84m high; both sides of the summit have been conspicuously cut away by quarrying and show a light brown color. A light is shown from the SE end of the island. A depth of 10.1m lies about 0.8 mile E of the island.

Tsubune Shima, 76m high, lies about 0.5 mile SE of Kyonojoro Shima.

Directions.—The route from Ushimada Ko to Uno Ko, in addition to being the route for large vessels in and out of Uno Ko, is the route normally used by small vessels. In general, vessels proceed between I Shima and Ohura Shima, between Kyonojoro Shima and Tsubone Shima, between Nao Shima and Kazura Shima, and head for Shimotsui Seto.

Ishima Suido (Isima Suido), a deep-water channel, lies between I Shima and Te Shima. Harima Nada North Lighted Buoy No. 2 (34°31'N., 134°02'E.) is moored at the N entrance, and Harima Nada North Lighted Buoy No. 1 (34°28'N., 134°02'E.) is moored at the S entrance. Uomi Yama, 103m high, with a sharp peak, is conspicuous near the W end of Te Shima. Rocks, with depths of less than 10.1m, and with a rock drying 1.2m, extend about 410m NW from Ko Saki, the NW extremity of Te Shima. An extensive shoal area, with depths of less than 10.1m, lies on SW side of Te Shima, and with its SW extremity about 1.5 miles S of the W extremity of the island; the part parallel with the coast of Te Shima, from which it is separated by a narrow channel, has depths of less than 4.9m and a least depth of 3.9m.

Kurakake Hana, the S extremity of I Shima, is conical shaped, conspicuous from the NE, and has many cliffs in the area caused by quarrying; a light is shown from the point. Care is necessary to avoid Dango Se in the N approach to the channel. Two submarine power cables, marked by beacons on the shore, cross the fairway close to the N of Karakake Hana.

Uno Ko (34°29'N., 133°57'E.)

World Port Index No. 61580

7.34 Uno Ko is a specified port lying on the W side of Katsurashima Suido. The city of Tamano, backing the harbor, is the center for traffic linking Honshu and Shikoku, and is an industrial city with waterfront industries such as shipbuilding. A railway ferry and scheduled shipping services run between Uno Ko and Takamatsu Ko; many eastbound and westbound vessels using Bisan Seto pass close to the harbor limits. A shipbuilding yard is situated on the SW side of the harbor. Hibi Ko, described in paragraph 7.35, lies SW of Uno Ko, and is included within the harbor area of Uno Ko.

Winds—Weather.—Several times between April and September there may be fog with a visibility of less than 0.15 mile; it can constitute an obstacle to shipping operations.

Tides—Currents.—In Katsurashima Suido, fronting Uno Ko, the tidal currents set S and N during the flood and ebb tide, respectively. The velocity of the current is about 2.5 knots at springs and 1.2 knots at neaps.

Depths—Limitations.—The piers in the N part of Uno Ko, which are marked by lighted ranges, are for the use of the ferries and hovercraft of the Japanese National Railway.

In the N part of the port there are three berths, 240m in length each with depths alongside of 12m. They can accommodate vessels of 30,000 gt.

Reclamation is in progress in several areas. For further bert information see the table titled **Uno Ko—Berth Information.**

Aspect.—Tera Shima (34°28'N., 133°59'E.), in a bay at the NW end of Nao Shima, is 84m high and marked by a light at its N end. Kyonojoro Shima, about 0.5 mile NNW, was previously described in paragraph 7.33.

Three islets, bordered by reefs, lie on the N side of the fairway; the SE islet, 6.1m high and the SW islet, 28m high, lie about 0.4 mile N and 0.7 mile NW of Tera Shima. Torino Se, with a least depth of 11.5m, extends about 0.5 mile SW of the SE islet.

Pier No. 3, about 0.7 mile W of the SW islet, has a conspicuous cliff close S and a gray chimney, 69m high, close N.

Katsura Shima (Kazura Shima), W of the harbor, is 105m high and sparsely wooded; a light is shown from its SE end. Tobi Su, a drying rock, about 90m long N-S, lies about 0.2 mile W of the W end of Katsura Shima, and is marked by a light near its S end.

Kojin Shima (Kozin Shima), about 0.5 mile S of Katsura Shima, is low, sparsely wooded, and 98m high in its W part. An overhead cable, with a vertical clearance of about 58m, and with red and white pylons at each end, extends between Kojin Shima and Inumodari Hana, about 0.8 mile W. The latter point is 69m high, a light is shown close off the point.

Uno Ko—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			Draft	Beam	Size	
Pier 1						
No. 1	280m	10.0m	—	25.0m	4,840 dwt	Passengers.
Pier 3						
South Quay	185m	10.0m	—	20.0m	11607 dwt	Passengers.
Taiminato						
B	240m	12.0m	10.9m	20.0m	57,982 dwt	Breakbulk.
C	240m	12.0m	10.9m	27.0m	6,389 dwt	Ro-ro.

Uno Ko—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			Draft	Beam	Size	
D	185m	10,0m	9.1m	20.5m	3,606 dwt	Ro-ro.

Ushinoko Iwa, two rocks drying 0.2 and 0.7m, lie about 320m ENE from the SE extremity of Kojin Shima, and on the E side of the fairway; a light is shown from the NW end of Ushinoko Iwa.

Manaiti Ishi, a drying rock, marked by a light, lies about 0.5 mile S of the SE extremity of Kojin Shima. Hokake Iwa, a rock, 1.7m high and marked by a beacon, lies about 0.3 mile farther SW.

Contact Information.—The port authority can be contacted by telephone at 81-683-313211.

Anchorage.—Anchorage is prohibited in the area of the ferry piers. A submarine water pipe extends from the NW end of Nao Shima to the NW part of Uno Ko.

Caution.—An overhead cable, with a clearance of about 59m, extends across the fairway from the NE end of Kojin Shima to Nao Shima.

7.35 Hibi Ko (34°27'N., 133°56'E.) (World Port Index No. 61590), about 0.8 mile W of Uno Ko, is included within the harbor area of that harbor.

Depths—Limitations.—There are five quays in Hibi Ko available for floating shipyard and repair work as follows: Quay No. 1 is 163m long with a depth alongside of 7m; vessels of up to 63,900 tons can be accommodated. Quay No. 2 is about 45 m long with a depth alongside of 7m; vessels of up to 45,500 tons can be accommodated. Quay No. 3 is 350m long with a depth alongside of 10.9m; vessels of up to 80,000 tons can be accommodated. Quay No. 4 is 260m long with a depth alongside of 10m; vessels of up to 90,000 tons can be accommodated. Quay No. 5 is 302m long with a depth alongside of 10m; vessels of up to 90,000 tons can be accommodated.

Aspect.—The large gray chimney of a refinery is conspicuous on top of a hill W of the harbor, and has an elevation of 156m. Two red and white chimneys, with elevations of 172 and 193m, are conspicuous about 0.2 mile S and E, respectively, of the gray chimneys. A red crane on Hibi Wharf is a good mark for approaching the wharf.

The coast between Hibi Ko and Kusumi Bana (Kusumino Hana), about 5.5 miles WSW, is indented by a large bay which is obstructed by a number of shoal and drying mud banks. The small ports of Kotouro Ko and Ajino Ko lie at the head of the bay. Local knowledge is necessary for navigation within the bay. A number of fish havens exist up to 1.5 miles S of Kotouro Ko. Kusumi Bana is the N entrance point of the E entrance to Shimotsui Seto, which will be described in paragraph 7.48 with Mizushima Traffic Route.

Tateba-jima (34°27'N., 133°51'E.), nearly 2 miles NE of Kusmi Bana, is conical, 54m high, thickly covered with pine, and conspicuous from the S. Jimba Shima, two rocks, 3.1m high, lie about 0.5 mile E of the N end of Tateba Shima.

Naida Su, a drying mud bank, extends about 1 mile E from a point about 0.5 mile E of Tateba Shima. A mud bank, with depths of less than 4.9m and awash in its shallowest part at lowest LW, extends from about 1 mile S to SE of Tateba Shima; a lighted buoy marks its SW end. Two shoals, with depths of 3.1m, lie between the latter mud bank and the NE end of Kama Shima, about 1 mile WSW.

Shido Wan (Sido Wan) is entered between **O-gushi Saki** (34°22'N., 134°13'E.) and Goken San Hanto, about 2 miles W. The head of the bay is divided into two shallow bays by a well-wooded peninsula, 100m high. Shido Ko and Mure Ko are two local ports on the S and W sides, respectively, of the W bay. A bank, with depths of 5.7 to 7m, mud, sand, and shell, lies in the middle of the entrance to Shido Wan.

With the exception of the fairways to Shido Ko and Muro Ko, Shido Wan is occupied by seaweed (October to April), fish (May to January), and oyster cultivation grounds.

Takamatsu Ko (34°21'N., 134°03'E.)

World Port Index No. 61940

7.36 Takamatsu Ko (Takamatu Ko), a specified harbor, fronts the city of Takamatsu (Takamatu). The harbor, the gateway to Shikoku, has the most frequent arrivals and departures of scheduled shipping services of all the harbors in the Naikai. In particular, there are vessels and car ferries running to Uno Ko on the Honshu side and scheduled passenger services to the Hanshin region, the Sanyo region, and the surrounding islands.

There are also calls by scheduled passenger services running between the Hanshin (Osaka/Kobe) region and Kyushu. Shipping is frequently congested in the harbor entrance.

Seto Ohashi Bridge

Takamatsu Ko consists of an inner harbor, sheltered by a W, central, and E breakwater; two tanker piers, sheltered by a breakwater, N of the reclaimed land E of the E breakwater; a large wharf, E of the tanker pier; and a fishing harbor, about 1

Takamatsu Ko

mile W of the inner harbor. A detached breakwater lies NW of the tanker piers.

Takamatsu Fairway, a statutory fairway, runs between the W and central breakwaters from the N, with a width of about 180 to 230m, and with minimum depths of 10.1m.

Tides—Currents.—The mean tidal rise at Takamatsu is 2.3m at springs, and 1.8m at neaps.

The tidal currents outside the breakwaters set nearly E and W, with a velocity of about 0.8 mile in Bisan Seto.

Depths—Limitations.—The W side of the large wharf has a berthing length of 370m, with depths of 9.5 to 10.1m alongside, and can accommodate vessels up to 10,000 dwt.

Central Wharf, on the S side of the inner harbor, can accommodate vessels of 3,000 dwt in depths of 6.5 to 7m on its N and W sides.

The Oil Depot has multiple dolphin berths with depths alongside of 5.2 to 7.5m.

Aspect.—Nebutono Hana (34°24'N., 134°07'E.), the E entrance point of Yashima Wan (Yasima Wan), is 88m high to the treetops; a lighted buoy is moored off the point. Mae Se, a sand spit with depths of 4.3 to 6.3m, extends from the coast to about 0.5 mile NE of Nebutono Hana; there are normally tide rips at its outer end and the noise of the tidal current is very loud during the strongest period of the flood and when there is an E wind.

Nagasaki Hana, the W entrance point of Yashima Wan, has a bare rock, 9.1m high, at its extremity.

Yatake Shima, flat-topped and 22m high, lies about 1.5 miles N of Nagasaki Hana, off the NW side of O Shima.

Noyama Dashi, with a depth of 7.6m, lies in the middle of the fairway W of O Shima, and about 0.5 mile NNW of Tatake Shima. A rock, with a depth of 7.7m, lies about 0.4 mile SW of Noyama Dashi, and a bank, with least depth of 8.4m, lies about 0.4 mile farther SSW. A pinnacle rock, with a depth of 4.9m, lies about 0.5 mile WSW of Tatake Shima. Rocky ledges, with a least depth of 2m, extend about 0.8 mile WSW from the SW end of O Shima.

Megi Shima, about 2 miles W of O Shima, rises to an elevation of 217m in its SW part, and is marked by a light at its SW end.

Masuno Mo, a sand spit with depths of 0.2 to 5.4m, and partially drying, extends SW from a position about 1.3 miles E of the N end of Mega Shima to the SW end of the same island. A fish haven is situated off the E coast of Megi Shima.

Inagi Dashi, a bank with a least depth of 4m, and marked NE by a lighted buoy, lies about 0.8 mile SW of Nagasaki Hana; depths of less than 10.1m extend about 0.3 mile NE, and 0.8 mile SW of the bank. An isolated patch, with a depth of 7.9m, lies about 1 mile W of Nagasaki Hana.

A chimney, 32m high, and a crane are conspicuous in the SE part of the large wharf.

Floodlights of the Takamatsu Railway Station are conspicuous about 0.8 mile WSW of Central Wharf.

Shiun Yama, 200m high, about 2 miles SSW of the head of the W breakwater, is a good mark when entering the harbor from the E.

Naka Se and Kama Se, in the W entrance to the harbor, were previously described in paragraph 7.29 with Bisan Seto East Traffic Route.

A lighted buoy is moored in the N entrance to Takamatsu Fairway.

Pilotage.—Pilotage is not compulsory. Inland sea pilots are available at Wada-Misaki, Hesaki, or Sekisaki and harbor pilots are available at the anchorage from 1 hour before sunrise to 1 hour before sunset. The pilots can be contacted on VHF channels 16 and 12 (call sign: Takamatsu-ho-an). For further information, see paragraph 6.1.

Regulations.—Vessels intending to proceed inside Takamatsu Ko breakwaters should enter through the W entrance. Vessels should leave through the E entrance. However, vessels of over 1,000 gt may leave by the W entrance, provided they are equipped with lights which are able to make flashing signals.

Vessels should keep to the starboard side of the fairway. Vessels leaving by the E entrance, except working boats and fishing boats of less than 10 gt, must not cross Takamatsu Fairway.

When there is danger that vessels leaving by the W entrance may encounter other vessels in the vicinity of the N entrance to Takamatsu Fairway, such other vessels shall keep out of the path of vessels leaving by the W entrance.

Signals.—Communications regarding harbor operations can be made by radiotelephone with the harbormaster on VHF channels 16 and 12.

Directions.—Takamatsu Ko is reached by the East Fairway, West Fairway, and Central Fairway.

East Fairway, between Nebutono Hana and the islands NW, is the route normally used by small vessels and by scheduled shipping services from the Hanshin (Osaka/Kobe) area.

West Fairway is the one normally used by the Uno to Takamatsu JNR ferries and other car ferries going to Takamatsu Ko from Uko West Fairway, and passing S of Megi Shima.

Central Fairway from the N is between Megi Shima and O Shima, and is the route normally used by scheduled shipping services from the Tonosho Ko region, crossing Bisan Seto East Fairway to Takamatsu.

Vessels coming from the E should pass W of Inaga Dashi and the dangers SW, keeping clear of Masuno Mo; to reach the N entrance to Takamatsu Fairway, approach with the center of Yatake Shima in range with the NW extremity of O Shima, bearing 043° astern.

See paragraph 7.29 for special regulations for entering, crossing, and leaving that the Bisan Seto East Traffic Route.

Sakaide Ko (34°20'N., 133°51'E.)

World Port Index No. 62110

7.37 Sakaide Ko, a specified port, lies on the S side of the central part of Bisan Seto. The harbor fronts the city of Sakaide, an important manufacturing city, and an assembly and distribution point. The harbor consists of an inner harbor, sheltered N by reclaimed land extending to close S of the main route through Bisan Seto. Banno Su Hakuchi, a large basin, is entered from the N side of the reclaimed land, then extends SW. A shipyard lies on the W side of the inner harbor.

The main harbor of Sakaide Ko is approached from a position between **No Misaki** (34°23'N., 133°54'E.) and a shoal, with a least depth of 7.8m, lying 0.75 mile E of Kosei Shima.

An underwater intake pipeline extending 0.2 mile NW from the shore is situated at the SW extremity of Berth A. Its seaward end is marked by a lighted buoy. A light is shown from the corner of the berth 0.2 mile ESE of Berth A.

Winds—Weather.—The area is surrounded by mountains and islands, and the interior of the harbor is tranquil even in the winter monsoon winds; however, swells enter the harbor with strong N winds. The most common wind direction throughout the year is WSW, followed by SE.

Tides—Currents.—The mean tidal rise at Sakaide is 3.1m at springs, and 2.4m at neaps. The tidal currents within the harbor have become weak due to the reclamation work.

Depths—Limitations.—Mitsubishi Kasei Berth A, the NE berth on the SE side of Banno Su Hakuchi, has a berthing length of 275m, with a depth of 13m alongside, and can accommodate a vessel up to 100,000 gt. Berth B, close SW, has a berthing length of 200m, with a depth of 13m alongside, and can accommodate a vessel up to 30,000 dwt.

There are least depths of 12.8m on the entrance range leading to the above-mentioned Berth A and Berth B. There are least depths of 12m in Banno Su Hakuchi, except near its head.

Asia Joint Oil Company Berth No. 2, the NE berth on the NW side of Banno Su Hakuchi, can accommodate tankers of 75,000 dwt, a in depth of about 12.5m. Berth No. 5, nearly 0.5 mile farther SW, can accommodate vessels up to 75,000 dwt, in a depth of 12m.

Asia Kyodo Sekiyu Berth No. 1, a dolphin berth, close W of the entrance to Banno Su Hakuchi and parallel to the seaward face of the reclaimed land, has a depth of 19.5m alongside and can accommodate vessels up to 260,000 dwt. A light is shown from the center of the berth and a light is shown and a fog signal sounded at each end.

A drydock at Sakaide Ko is 450m long and 72m wide, with a depth of 9.2m, and can accommodate vessels up to 270,000 dwt.

Central Pier is situated on the S side of the inner harbor, with the harbor office on its SE side. See table titled **Sakaide—Berth Information** for details on berths available.

Aspect.—Sei-jima (Seizima) (34°21'N., 133°51'E.), 112m high and well-wooded, lies at the NE end of the reclaimed area. Hijiri Iwa, 1.5m high, lies about 0.1 mile off the NW end of Sei-jima.

Ko-Sei Shima, 41m high and covered by pine trees, lies about 0.8 mile N of Sei-jima. A light is shown from the N end of the island. Depths of less than 4.9m extend up to about 135m off the N side of the island; a sand bank, with depths of less than 10.1m, extends about 0.8 mile E of the island.Berth

Sakaide—BerthiInformation

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Akahama Terminal						
Akahama Wharf	130m	7.5m	91.9m	6.5m	5,000 dwt	—
No. 1	188m	10.0m	200m	9.5m	15,00 dwt	Aggregates and cement.
No. 2	162m	8.0m	83.1m	7.5m	6,000 dwt	Grain.
No. 3	140m	6.0m	83.1m	5.5m	2,000 dwt	Grain.
No. 4	120m	4.5m	75.2m	—	—	Grain.
HayashidaWharf						
Berth A	398m	12.0m	179.9m	10.5m	30,000 dwt	General cargo.
Berth B	260m	7.5m	169.9m	6.5m	500 dwt	General cargo and cement.
Berth C	270m	5.5m	83.3m	5.0m	2,000 dwt	General cargo.
Berth D	260m	7.0m	110.3m	4.0m	700 dwt	General cargo.
Mitisubishi Chemical Terminal						
Berth A	275m	13.0m	225m	12.6m	100,000 dwt	Coal and aggregates.

Sakaide—BerthiInformation						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Berth B	200m	13.0m	228m	12.6m	55,000 dwt	Coal and aggregates.
Berth C	197m	13.0m	229m	12.6m	75,000 dwt	Coal and aggregates.
Berth D	53m	6.5m	90.8m	—	—	Coal and aggregates.
Berth G	—	6.5m	15.6m	—	—	Coal and aggregates.
Berth H	—	6.5m	13.2m	—	—	Coal and aggregates.
Berth I	—	6.5m	14.3m	—	—	Coal and aggregates.
Berth J	60m	6.5m	14.6m	—	—	Coal and aggregates.
Berth K	18m	5.0m	12.0m	—	—	Coal and aggregates.
Berth K	100m	12.0m	15.6m	—	—	Coal and aggregates.
Mitsubishi Light Metal	30m	4.0m	—	—	—	Aggregates.
Tanker Berths						
Como Oil Sakaide Refinery						
No. 1	66m	19.6m	333m	16.2m	30,000 dwt	CPP, DPP, and LNG.
No. 2	99m	12.5m	240m	11.2m	75,000 dwt	LPG.
No. 3	118m	7.5m	105m	—	—	Aviation, CPP, and DPP.
No. 4	120m	7.5m	104.9m	—	—	Chemicals.
No. 5	120m	7.5m	—	—	—	CPP.
No. 6	50m	7.5m	72.0m	—	—	LPG
No. 7	120m	7.5m	—	—	—	CPP.
Lion Chemical Sakaide Terminal						
Wharf No. 1	180m	10.0m	135m	9.8m	8,000 dwt	Chemicals and vegetable oils.
Wharf No. 2	105m	7.0m	52.9m	—	—	CPP.
Zen-Noh Fuel Terminal						
Zen-Noh Quay (LPG No. 2)	300m	12.0m	300mm	10.9m	57,000 dwt	LPG.

An oil refinery chimney, with an elevation of 158m, and numerous oil tanks are conspicuous on the N side of the reclaimed area.

Lights, in line bearing 181.3°, lead into Banno Su Hakuchi; the rear light is shown from a gray gas tank, 86m high. Lighted buoys are moored on each side of the entrance.

Tsuno Yama, 184m high and conical, is conspicuous about 3 miles S of Sei-jima. Inno Yama, about 2 miles farther S, is 422m high and conspicuous from a distance. Shotsuji Yama, about 1 mile NW of Tsuno Yama, is 117m high and surmounted by a conspicuous building (tourist center) and two steel pylons.

The large chimney of a salt company is conspicuous about 2 miles E of Sei-jima; it has an elevation of 120m and is painted red and white.

Pilotage.—Pilotage is not compulsory for the Naikai area, however vessels entering or leaving the port are advised to retain a pilot on board. Pilots are available at the quarantine anchorage between 0700 and 1700 for vessels requiring pilot services. There is a liaison office of the Naikai Area Pilot Association at Sakaide.

Contact Information.—The pilots can be contacted on VHF channels 12 and 16 (call sign: Sakide-ho-an). The Port Authority may be contacted by telephone (81-792-350-176) or facsimile (81-792-345-172).

Signals.—A signal station, at the N end of Sei-jima, displays signals concerning vessels entering and leaving Banno Su Hakuchi, as well as signals concerning berthing facilities.

Anchorage.—The quarantine anchorage is centered about 1.8 miles E of Sei-jima. Permission to use this anchorage or any other in Sakaide Ko must be obtained from the Maritime Safety Agency at Takamatsu. Anchorage for vessels carrying dangerous cargo is designated by the harbor authorities in the harbor area SE of Sei-jima.

Bisan Seto North Traffic Route and Bisan Seto South Traffic Route

7.38 Bisan Seto North Traffic Route and Bisan Seto South Traffic Route, as established under Maritime Traffic Safety Law, lie between Ko Sei Shima, N of Sakaide Ko, and Mu Shima. Numerous islands of Shiwaku Shoto (Siwaku Syoto) border Bisan Seto North Fairway. Caution is necessary due to the many rocks and shoals, strong tidal currents, fishing boats, and heavy traffic.

In the above traffic routes vessels must navigate in accordance with the regulations established by the Maritime Traffic Safety Law. Under these regulations, vessels must proceed W in Bisan Seto North Traffic Route and E in Bisan Seto South Traffic Route.

Mizushima Traffic Route crosses or joins the above traffic routes in the E part, and many large vessels enter and leave Sakaide Ko and Mizushima Ko. Considerable caution is necessary and there are special regulations and signals.

A bridge spans Bisan Seto from the S side of Honshu, near Kusomino Hana, to the N side of Shikoku, near Sakaide. There is a vertical clearance of 65m in both Bisan Seto North Traffic Route and Bisan Seto South Traffic Route.

See paragraph 7.25 for further information.

Bisan Seto North Traffic Route—Aspect

7.39 **Yo Shima** (34°23'N., 133°49'E.), close to the intersection of Bisan Seto North Traffic Route and Mizushima Traffic Route, has a 72m high summit at its NW end; there are many red-colored cliffs resulting from quarrying operations. Mizushima Fairway-Yo Shima control station, a white building with a flagstaff, lies near the SW end of the island. O-yo Shima (Koyo Shima), 48m high, lies about 0.3 mile E of Yo Shima.

Nabe Shima, close SE of Yo Shima, is a flat-topped islet, 22m high, marked by a light at its center. It is comparatively steep-to on its S side; there are drying and submerged rocks close off the E side of the island, the highest drying 2.6m. Due to the bridge piers of the Bisan Seto Bridge, Nabe Shima Light is obscured between the bearings 358° to 014°. The observation platform on Washua Yama, 133m high, about 2.5 miles N of Yo Shima, is conspicuous.

Ushingano Se (Usingano Se), a rock with a depth of 18.4m, lies on the S side of the fairway, about 0.4 mile S of Nabe Shima.

Mitsugo Shima (Mitugo Shima), about 0.5 mile S of Nabe Shima, consists of three wooded rocky islets. The two N islets, from E or W, appear to be joined. The W islet of the two is 19m high, marked by a light, and has a wooded pointed rock close off its E side; the E islet is 14.9m high and somewhat smaller. The S island is 19m high to the treetops, with a low rock on its W side. The group is bordered by shoals extending up to 0.1 mile offshore. Mitsugo Sashi (Mitugo Sasi), steep-to on its N side and with a least depth of 4m, extends about 0.5 mile W of Mitsugo Shima. Mitsugo Shima and Mitsugo Sashi are marked by a number of lighted buoys.

Inosakino Tsugai, a spit, with depths of less than 20m and about 0.1 to 0.3 mile wide, extends about 1.3 miles WNW from Mitsugo Sashi and has sandwaves in the vicinity. Its least depth of 10.1m lies in Mizushima Traffic Route, about 0.8 mile W of Mitsugo Shima Light, and is surrounded by depths of 11 to 14m. Within Bisan Seto North Traffic Route the depths are 17.1 to 20m. In addition, the tidal currents are strong and sand waves are liable to cause changes in depths in this area.

7.40 **Hon Shima** (34°23'N., 133°47'E.), nearly 1 mile W of Yo Shima, rises to Takamubo Yama, 200m high, in its N part, and to a 204m hill in its SW part. Kuro Hana lies at the S extremity of the island, and Kaburasaki Bana, a white, round-topped rocky point, 39m high, is conspicuous at the SW end of the island. A lighted buoy is moored about 90m SE of Kuro Hana, and Kurohanano Iso (Kurobana-no-Iso), with a least depth of 18.6m, extends about 0.3 mile SSW of Kuro Hana.

An overhead power cable, with a vertical clearance of 72m, crosses the North Traffic Route between the S end of Hon Shima and Ushi Shima.

A light is shown on the head of a breakwater at **Honshima Ko** (34°22.7'N., 133°47.3'E.). Kasashima is a small harbor on the NE coast of Hon Shima, 0.8 mile N of Honshima Ko. It is protected by breakwaters, including a detached outer breakwater from which lights are shown at both ends.

Ushi Shima, about 0.8 mile SE of Kuro Hana, has two summits. The NW summit is 95m high, with a steel pylon in the vicinity, and the SE summit is 111m high. A light is shown on the head of a breakwater, which extends N from the N extremity of the island; from a distance, this light structure appears isolated and quite separated from the island.

Okino Su, a sand spit with a least depth of 2.8m, extends about 2.5 miles WSW from a position about 0.2 mile SW of Ushi Shima. Farther W, depths of less than 10.1m extend to Takami Shima; on this bank lies Kojimadashi Se, two heads, with depths of 2.7 and 4.6m, and depths of less than 4.9m extending about 0.8 mile ENE of Takami Shima.

Hiro Shima lies about 1.5 miles W of Hon Shima. Sono Su, between the two islands, has depths of less than 4.9m, and dries for about 1 mile in its central part. There are landslides on the S end and W coast of Hiro Shima caused by quarrying and timber cutting. Dondoro Yama, 312m high in the S part of Hiro Shima, has a precipice on its S side; a pointed peak, 207m high, farther W, is conspicuous from the SE to SW.

Habushi Iwa (Habusi Iwa), a white rock, marked by a light, lies near the S limit of Bisan Seto North Traffic Route, S of Hiro Shima. A rock, with a depth of 9.2m, lies inside the traffic route, about 410m ENE of Habushi Iwa.

Habushi Iwa Light, in line bearing 300° with the SW end of Hiro Shima, leads in depths of over 8.5m in the channel W of Okino Su.

7.41 **Ko Shima** (34°20'N., 133°39'E.), a wooded conical island, 154m high, lies about 2.5 miles WSW of Hiro Shima. Sanagi Shima, W of Ko Shima, is 249m high, with Kongo Hana, a steep cliffy point, about 18m high, at its S end.

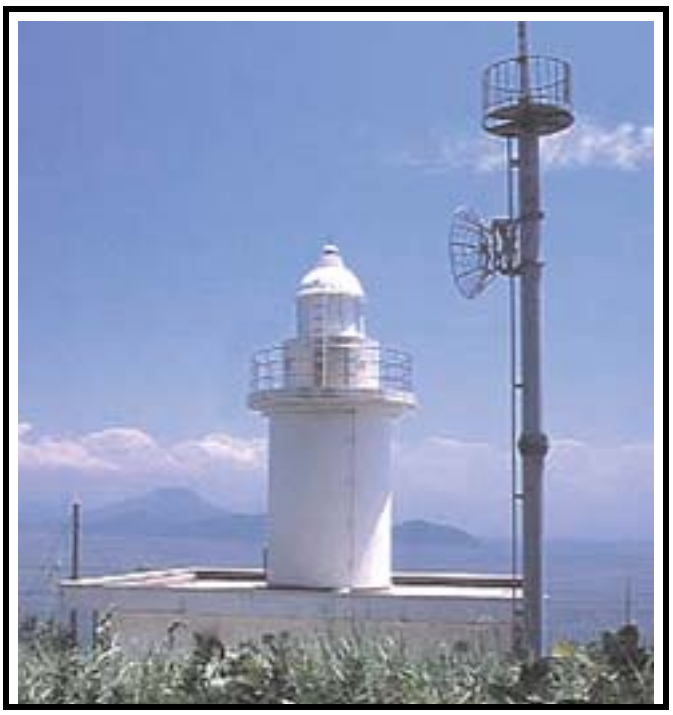
Kawara Su, a sandspit extending about 2.5 miles E of Sanagi Shima, has depths of less than 2m in many parts; it dries in places between Ko Shima and Hiro Shima.

Depths of less than 10.1m extend about 1 mile off the SW end of Sanagi Shima. A wreck, with a depth of 10.1m, lies about 0.5 mile S of the S end of Sanagi Shima. Wrecks, with depths of 13.7m and 14.6m, lie nearly 2 miles SW and 1.8 miles WSW of the S end of Sanagi Shima.

Takami Shima, about 1 mile SE of Ko Shima, borders the S side of Bisan Seto North Traffic Route. A light is shown on the NW extremity of the island. Ryuono Mori, 298m high, the summit of the island, lies in its SE part. A sandbank, with depths of less than 2m, lies between Takami Shima and Futaomote Shima. No. 3 Lighted Buoy is moored close SE of the shallowest part of this bank. A fish haven is situated 1.25 miles N of No. 3 Lighted Buoy.

Futaomote Shima, about 2.5 miles WSW of Takami Shima, is an islet, 24m high, with two grassy summits. It lies between the W entrances of Bisan Seto North Traffic Route and Bisan Seto South Traffic Route. The islet is surrounded by drying and submerged rocks. A light is shown from drying rocks, about 0.3 mile NE of Futaomote Shima.

7.42 Mu Shima (34°18'N., 133°32'E.), about 4.5 miles WSW of Sanagi Shima, is 185m high, and marked by a light at its S end. It lies at the N end of the recommended route. A submarine cable runs from the NE point of Mu Shima to Manabe Shima, about 3.5 miles NE.



Mu Shima Light

Nezura Iwa, a rock, drying 1.7m and marked SE by a lighted buoy, lies about 0.8 mile W of the S end of Mu Shima.

Habu Shima, 56m high to the tops of the trees, lies about 1 mile NNW of Mu Shima. Depths of less than 10.1m surround the island. Asa Se, with a least depth of 3.5m, lies about 0.2 mile NE of Habu Shima. Misaki Dashi, an isolated rock with a depth of 3.9m, lies about 1 mile NE of Habu Shima.

O-Tobi Shima (O-Bi Shima), 152m high, lies about 1 mile NNW of Habu Shima; a depth of 10.1m lies about 0.2 mile off the SW side of the island. A sand bank, most of which dries, extends about 0.2 mile E of the island.

Ko-Tibi Shima (Ko-Bi Shima), 80m high, lies about 0.5 mile ENE of O-Tobi Shima. The E part of the channel between the islands has depths of over 10.1m. Depths of less than 10.1m extend about 0.1 mile off the W side of Ko-Tibi Shima; a depth of 6.7m lies about 0.3 mile NNW of the island.

Mi Saki lies about 2.5 miles SE of Mu Shima and is marked by a light at its W end. Heavily-wooded hills extend SE of the point, gradually rising to Shiunde San (Siunde San), the summit of the peninsula, about 2 miles ESE. The peak, 352m high, with an observation platform, is a bare mountain with a Mount Fuji shape, and appears as an island from the Kurushima Kaikyo area.

Ogo Ishi, about 0.1 mile W of Mi Saki, consists of two rocks; the outer rock is 1.8m high, and the inner one is 4m high.

Bisan Seto South Traffic Route—Aspect

7.43 Awa Shima lies with its N extremity (34°17'N., 133°38'E.) nearly 1 mile S of Futaomote Shima. It has N, S, and E summits. Ashima Yama (Asima Yama), 181m high and conical, is the N summit. The S and highest summit is Shirono Yama (Zvo-no Yama), 222m high.

In the traffic route between Awa Shima and Ushi Shima, about 5 miles ENE, there are, in general, dredged depths of 12.4m or more, except for a sand bank, with a least depth of 11.2m, about 410m SE of Takama Shima; Kojimadashi Se, previously described in paragraph 7.40, and Okinu So border the N side of the traffic route, and an extensive bank, with depths of less than 10.1m, borders the S side of the traffic, between Tadotsu Ko and Marugame Ko.

A sand bank, with a least depth of 1.2m, extends to 1.25 miles WSW of the SE end of Takami Shima.

Okinonaka Se, a sand bank with two heads and with a least depth of 4.2m, lies about 1.5 miles E of the S end of Takami Shima; it is reported to move under the influence of the tidal current.

Takamimae Se, with a depth of 8.2m, lies about 1 mile SE of Takami Shima.

Bisan Seto North Traffic Route and Bisan Seto South Traffic Route—Regulations

7.44 Vessels navigating in Bisan Seto North Traffic Route are to proceed in a W direction; vessels navigating in Bisan Seto South Traffic Route are to proceed in an E direction.

Vessels leaving or entering a traffic route should not alter course in the vicinity of the entrance points.

Vessels navigating in Mizushima Traffic Route should, as far as practicable, keep to the right of the center of the traffic route.

Vessels, other than a huge vessel (vessels of 200m or more in length) and vessels engaged in fishing or other operations when navigating in Mizushima Traffic Route, shall keep out of the way of a vessel navigating in Bisan Seto North Traffic Route.

Vessels, other than huge vessels, navigating in Bisan Seto North Traffic Route, shall keep out of the way of huge vessels navigating in Mizushima Traffic Route.

At the intersection of a junction of a traffic route, all vessels should keep out of the way of a huge vessel navigating the traffic route.

Fishing vessels navigating in Mizushima Traffic Route

should keep out of the way of vessels proceeding W in Bisan Seto North Traffic Route.

See paragraph 7.25 for further vessel limitations in Bisan Seto North Traffic Route and Bisan Seto South Traffic Route.

Marugame Ko (34°18'N., 133°47'E.)

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7.45 Marugame Ko lies about 4 miles SW of Sakaide Ko, S of Bisan Seto South Traffic Route. The harbor lies between Kami-ma Shima, a bowl-shaped islet, 36m high, and Shimo-ma Shima, an islet, 32m high, about 1.5 miles WSW. It is an industrial harbor, with a shipyard in its NW part.

Depths—Limitations.—Dredged depths of 7.5m lead to the E side of the reclaimed area, where there are berths with depths of 7.5m alongside.

The W side of the reclaimed land has dredged depths of 11m in the outer part, with a depth of 9m alongside berths on the W side of the reclaimed land.

A drydock at the shipyard is 290m long and 57m wide, with a depth of 6.8m; it can accommodate vessels up to 80,000 gt.

Aspect.—A radar station, housing the Bisan Seto Traffic Advisory Service Center has been established (34°18'N., 133°49'E.). A chimney, 103m high, is conspicuous about 0.2 mile NE of the range lights. The keep of Marugame Castle, about 0.8 mile farther SSE, is 83m high, painted white, and floodlit. Eight silos, 33m high, are conspicuous about 0.8 mile SW of Kami-ma Shima. Seven cranes, painted pale blue, with red and white derricks, are conspicuous E of Shimo-ma Shima.

Tadotsu Ko (34°17'N., 133°45'E.)

7.46 Tadotsu Ko (Tadotu Ko), about 3 miles WSW of Marugame Ko, consists of an inner harbor which is protected by breakwaters; a light is shown at the head of each breakwater. Tadotsu Ko is bordered by large areas of reclaimed land E and W. It is an industrial harbor with a shipyard.

Depths—Limitations.—Jetties on the W side of the E reclaimed area have depths of 6 to 7m alongside. A wharf at the base of the inner harbor W breakwater has a berth, 105m long, with 6m alongside. A jetty on the W side of the W reclaimed area has depths of 7 to 10.1m alongside.

Aspect.—Ogi Yama, thickly wooded and 93m high, is conspicuous close inland of the inner harbor. Oil tanks are conspicuous on the W side of the W reclaimed area.

An overhead cable, with a vertical clearance of about 59m, crosses the harbor 0.4 mile within the entrance.

Directions.—Ogi Yama, bearing 158°, leads into the inner harbor.

Takuma Ko

7.47 **Takuma Ko** (34°15'N., 133°40'E.), about 3 miles SW of Tadotsu Ko, is an open port, divided into two parts by a peninsula. Koya Hana, the NE extremity of the peninsula, is a white steep cliff, 65m high. The E part of the harbor is an industrial and timber harbor. With strong N winds, the handling of cargo in the roadstead is reported to be difficult.

Depths—Limitations.—The draft limitation in the channel is 11m at high tide. The wharves lie on the E face of the reclaimed land on the W side of Takuma Ura. There is also reclaimed land forming a basin on the E side of Takuma Ura.

The anchorages for timber discharge can accommodate drafts of 8 to 11m; the three anchorages, designated A, B, and C, lie inside the harbor limit, W of Iwa Shima.

Takuma Ko—Berth Information

Wharf	Length	Depth
Maruchi Steel Berth	161m	—
LPG Berth	20m	—
Takuma No. 1	90m	5.5m
Takuma No. 2	130m	7.5m

Aspect.—Range beacons are situated at the N end of a promontory on the S side of Takuma Ura. The beacons, in line bearing 166°, lead through the fairway, marked by lighted buoys, in depths of at least 7.5m, to a position close NE of Takuma No. 1 Berth and Takuma No. 2 Berth.

Shishi Shima (Sisi Shima), about 1 mile N of Koya Hana, is heavily wooded and 109m high. Shishinomosaki (Sisi-no-Mo Saki), with depths of less than 4.9m, extends about 1.8 miles ENE of Shishi Shima.

Anchorage.—The best anchorage around Awa Shima is on the S side of the island. Anchorage can be taken, in 5 to 10.1m; care should be taken to avoid Taishino Mo, a bank, with a least depth of 1.8m, in the entrance to the bay. Anchorage can be taken, in depths of 11 to 15m, as convenient, between this bay and the Shikoku coast. Anchorage can be taken by vessels with a draft up to 9.2m, in depths of 10.1 to 11.8m, N of Koya Hana, within the harbor limit.

Large vessels should approach the anchorage from the W, passing between the SW end of Awa Shima and the Shikoku coast SW.

Mizushima Traffic Route

7.48 Mizushima Traffic Route (Mizusima Traffic Route), specified by the Maritime Safety Law, extends from Bisan Seto North Traffic Route and Bisan Seto South Traffic Route to Mizushima Ko. It is the route normally used by large tankers proceeding to and from Mizushima Ko.

Caution is necessary, as many small vessels in Shimotsui Seto cross the traffic route; there are also strong tidal currents flowing E and W.

Lighted buoys mark the traffic route.

7.49 **Mitsugo Shima** (34°22'N., 133°49'E.), Mitsugo Sashi, Yo Shima, and Nabe Shima have been previously described in paragraph 7.39.

Kameyanna Hanana Asari (34°23'N., 133°48'E.), rocks, with depths of 3.6m and marked E by a lighted buoy, lie about 0.3 mile SE of the E extremity of Hon Shima.

Wasa Shima, 32m high, and Ikuro Shima, 26m high and densely wooded, lie close NW and 0.75 mile N, respectively, of Yo Shima. A sandy shoal, with a least depth of 7.7m, and about 0.4 mile long N-S, lies about 0.4 mile W of Wasa Shima, close

E of the traffic route.

Hitsuishi-jima (Hituisi Shima), 78m high, lies about 0.3 mile N of Ikuro Shima. Besai Tsugai, a sand bank, with a least depth of 13.4m, lies W of Hitsuishi-jima. Bridges, with vertical clearances of 31m, connect Wasa Shima, Ikuro Shima, and Hitsuishi Shima. Fixed red and green lights mark the outer limits of the fairway under the bridge.

Mukaekasa Shima, Naga Shima, and Mukuchi Shima, respectively, border the W side of Mizushima Traffic Route. A red-colored, pointed rock lies on the N side of Mukaekasa Shima. A rock, drying 3.1m, lies about 0.2 mile N of the E end of Naga Shima, and close W of the traffic route. Mukuchi Shima (Mukuti Shima) is 125m high in its S part and marked by a light at its NW end.

Shimotsui Seto (Simotui Seto) intersects Mizushima Traffic Route from the E. The passage is deep and free of dangers, but the tidal currents exceed a velocity of 3 knots. Many small vessels use the passage, and vessels over 100 gt must show destination signals and give sound signals when entering, leaving, and crossing Mizushima Traffic Route.

A bridge, with a vertical clearance of 31m, spans Shimotsui Seto between the N end of Hitsuishi Shima and the mainland NNE. Bridge lights mark the center and outer limits of the fairway under the bridge.

The W entrance of Shimotsui Seto lies between Mukuchi Shima and Nishino Saki, about 0.8 mile NE. The latter point is 55m high, with a conspicuous cliff. The E entrance to the passage lies between Kusumi Bana and **Kama Shima** (34°25'N., 133°50'E.), about 0.5 mile SE. Matsu Shima, 27m high, about 0.5 mile WNW of Kama Shima, lies on the S side of the passage.

Kusumi Bana (Kusumi-no Hana) is marked by a light at its SE end. Washiu Zan, 133m high, lies about 0.8 mile WNW of Kusumi Bana; there is an observation platform, a hotel, and a tourist road on Washiu Zan. Exposed red-colored rocks, between the hill and the point, are good landmarks for Shimotsui Seto from the E.

7.50 **Noji Shoto** (Nozi Syoto) (34°27'N., 133°45'E.), close NW of Mizushima Traffic Route, consists of four islets, extending for about 1 mile in a NW direction from a position about 0.8 mile N of the N end of Mukuchi-jima. The islets, from SE to NW, respectively, are Kami-noji Shima, 33m high; Futo-noji Shima; Hoso-noji Shima; and Isaro-noji Shima. A rock, drying 0.9m, lies about 115m N of Isaro-noji Shima. The islets lie on the W side of the entrance to Mizushima Ko.

Regulations.—A speed limit of 12 knots is in effect for vessels navigating in Mizushima Traffic Route from the junction with Bisan Seto Traffic Route N to the harbor limit of Mizushima Ko.

Pilotage.—Pilotage is compulsory.

Signals.—Shapes or lights are shown from the signal station at the SW end of Yo Shima, and at Nishino Saki, on the N side of the W entrance to Shimotsui Seto. When signals cannot be made from the above signal stations, they will be shown from a vessel of the Maritime Safety Agency.

Caution.— Shoaling has been reported in the traffic route approaches; check the chart for depth changes.

Mizushima Ko (34°30'N., 133°45'E.)

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7.51 Mizushima Ko (Mizusima Ko), a specified harbor, has been constructed on reclaimed land fronting the mouth of Takahashi Kawa. It is an industrial harbor developed in conjunction with the establishment of heavy industry zones. Tamashima Ko, included within the harbor area of Mizushima Ko, lies W of Takahashi Kawa and will be described later in paragraph 7.52.

Winds—Weather.—The climate is temperate and the sea in the harbor is generally calm; even during the winter monsoon, there is no problem in handling cargo in the harbor. It receives hardly any damage from typhoons and high tides.

Fog sometimes occurs in spring, but it disperses in 2 to 3 hours and is no obstacle to navigation.

Tides—Currents.—The mean tidal rise at Mizushima is 3.3m at springs and 2.5m at neaps.

The flood current flows NW, and the ebb current flows SE. The maximum tidal current within the harbor is about 1 to 1.5 knots.

Depths—Limitations.—The statutory fairway (Konai Passage), established by Maritime Traffic Safety Law, extends from Mizushima Traffic Route to the inner harbor; it is about 3 miles long, with depths of 14.7 to 23m.

A shoal area, with depths of less than 10.1m, lies S of Katura Shima, on the E side of the fairway. There is a channel, with depths of over 10.1m and marked by buoys, E of the shoal area. The W side of the shoal area is steep-to, and care is necessary.

Seto Wharf A, NE of Katsura Shima, has a berthing length of 285m, with a depth of 14m alongside, and can accommodate vessels up to 12.3m draft and 75,000 dwt.

Nippon Oil and Energy No. 2 Oil Jetty, in the SW part of the inner harbor, has a depth of 17.2m alongside and can accommodate tankers up to 240,000 dwt, with a maximum draft of 16.5m.

Tokyo Steel Wharf A, in the NE part of the inner harbor, has depths of 10 to 11m alongside, and can accommodate vessels up to 54,000 dwt, with a maximum draft of 11m.

Nishi Nihon Grain Center, in the NW part of the inner harbor, has depths of 11.2m alongside, and can accommodate vessels up to 60,000 dwt, with a maximum draft of 11.5m.

Mitsubishi Oil Jetty No. 6, on the W side of the inner harbor, has depths of 16.3m alongside, and can accommodate tankers up to 240,000 dwt, with a maximum draft of 16.5m.

Kawasaki Steel Wharf, on the S side of the basin on the W side of the inner harbor, has depths of 17.1m alongside, and can accommodate vessels up to 200,000 dwt, with a maximum draft of 16m.

Kawasaki Steel Wharf T, on the E side of the mouth of Takahashi Kawa, has depths of 10.9m alongside, and can accommodate vessels up to 30,000 dwt, with a maximum draft of 10.9m.

Aspect.—Katsura Shima (Katura Shima) (34°28'N., 133°46'E.), 51m high, is conspicuous on the E side of the entrance to Mizushima Ko. Two gantry cranes, each 81m high and painted red and white, are conspicuous at a shipyard farther N. A signal station, painted white, stands on Taka Shima (Takasima), a hill, 59m high, farther N.

A chimney, 166m high and painted red and white, is conspic-

uous on the E side of the inner harbor, about 3 miles NNW of Katsura Shima.

Refineries with numerous chimneys are conspicuous on the E side of the main fairway.

Noji Shoto was previously described in paragraph 7.50. Kami-Mizu Shima, 51m high, on which there are the ruins of a chimney, lies about 1.5 miles WNW of Isaro-noji Shima, the NW islet of Noji Shoto. Shimo-Mizu Shima (Simo-Mizu Shima), 58m high, lies about 0.8 mile W of Kami-Mizu Shima; its summit, covered with pine trees, appears black.

Lighted buoys mark the channels and some of the basins.

Pilotage.—Pilotage is compulsory for vessels over 10,000 gt. The Harbor Pilot is available during daylight hours only, and boards vessels in the quarantine anchorage. The pilots can be contacted on VHF channels 12, 14, and 16. For further information, see paragraph 6.1.

Signals.—Communications regarding harbor operations may be made by radio or radiotelephone with the harbormaster.

Navigation control signals for the harbor fairway are shown from the Mizushima Signal Station on Taka Shima.

A liaison office of the Naikai Pilotage Area Pilots Association is situated at Mizushima.

Anchorage.—The quarantine anchorage lies W of Noji Shoto and has depths of 14.8 to 21m.

Tamashima Ko

7.52 Tamashima Ko (34°31'N., 133°41'E.), W of Takahashi Kawa, is included within the harbor area of Mizushima Ko. The harbor area is shallow except for the dredged fairways, and reclamation work is underway. A power station is situated near the SW end of the reclaimed land.

Depths—Limitations.—A fairway, with depths of about 4.9m, extends N from a position about 1.5 miles N of Shimu-Mizu Shima to the power station. Another fairway, with depths of 5.5 to 6.5m, leads N from a position about 2 miles NW of Shimu-Mizu Shima to the heavy industry factory on the W side of the reclaimed land.

Lighted buoys mark the fairways.

The fairway into Tamashima Ko leads to Wharf No. 1, Wharf No. 2, and Wharf No. 3, which have depths from 4 to 5.6m alongside.

Tamashima Harbor Island (34°30'N., 133°41'E.) is situated on reclaimed land E of the fairway. Wharf No. 6, with a depth of 10m alongside, lies at the NE section of this island.

Aspect.—Two chimneys, 233m and 173m high, and painted red and white, are conspicuous in the vicinity of the power station. The power station lies in the E part of the reclaimed land on the E side of the harbor. A fairway, marked on the E side by lighted buoys and on the W side by two lighted buoys, and with a least charted depth of 4.6m, leads to a basin on the S side of the power station.

Hachiman Yama, 34m high, lies at the W entrance of the river on the W part of the inner harbor. **Tamashima Light** (34°31'N., 133°40'E.) lies close E of Hachiman Yama.

Caution.—The fairways are dredged and shoal abruptly on each side.

Islands and Channels Northwest of the West Part of Bisan Seto

7.53 Kurotsuchi Seto (34°26'N., 133°31'E.), Shiraishi Seto, Kitagi Seto, and other passages lie about 14 miles W of Shimotsui Seto; the W entrances of the passages lead into Kasaoka Wan and Bingo Nada. Small vessels westbound often take passage from Shimotsui Seto, passing S of Ajiro Shoto, to reach Shiraishi Seto; small vessels eastbound take the reverse route. In addition, some large vessels proceeding to or from Mizushima Ko pass between Noji Shoto and Mukuchi-jima, between Gantsuga Se and Tokudakino Ishi, then N of Te Shima, and then between Manabe Shima and Sanaga Shima.

Mukuchi-jima (34°25'N., 133°46'E.) and Noji Shoto were described in paragraph 7.50 with the Mizushima Traffic Route.

A sand bank, with depths of less than 10.1m, extends about 2 miles W of Mukuchi-jima; Mukuchi Se, the inner part, with depths of 1 to 4.9m, extends about 1 mile W of Mukuchi-jima. Gantsuga Se, with a least depth of 6.8m, lies close SW of the outer end of the sand bank. A lighted buoy is moored off the W end of the sand bank and N of Gantsuga Se.

Ajiro Shoto (Aziro Syoto) (34°27'N., 133°42'E.), about 2.5 miles W of Noji Shoto, consists of four rocky islets. Chabin (Tyabin), the N islet, is 26m high with one pine tree. O-bishaku (O-Bisyaku), the SW islet, is 26m high with one pine tree. The middle and SE islets are bare. Okino Ishi, a rock with a depth of 4.5m, and Tokudakino Ishi, a rock, with a depth of 4.3m, lie about 0.8 mile ESE and 0.5 mile SE, respectively, of O-bishaku. A lighted buoy is moored between the two rocks.

Shimo-mizu Shima, about 0.8 mile NNW of Ajiro Shoto, was previously described in paragraph 7.51 with Mizushima Ko. Shimono Ishi, rocks, with a depth of 4.5m, lie nearly 2 miles ESE of Shimo-mizu Shima.

7.54 Yori Shima (34°28'N., 133°36'E.), about 4.5 miles W of Shimo-mizu Shima, has two summits; the E and higher summit is 81m high, pine-covered, and conspicuous from a distance. Aosa Yama, 250m high, about 1 mile farther W, is also conspicuous from a distance.

Kono Shima (34°27'N., 133°31'E.) is located about 3.5 miles WSW of Yori Shima. Its summit 302m high, surmounted by a TV tower, lies in the middle of the island and is a good landmark.

Konashimasoto Ko, on the S side of Kono Shima, is a small harbor protected by breakwaters and a light is shown from the head of the W breakwater. There is a chemical factory on its shore. The chimney of the chemical factory, 53m high, is conspicuous. Several jetties and wharves, fronting the factory, have depths of 4.9 to 5.8m alongside.

Anchorage.—Large vessels anchor, in 10.1 to 28m, sand, mixed with clay, off the harbor. Strong SE and SW winds raise a sea. The flood tidal current flows W, and the ebb tidal current flows E, with a maximum velocity of about 1 knot.

7.55 Taka Shima, about 1 mile S of Kono Shima, rises to an elevation of 77m in its NE part; a conspicuous shrine gateway stands on its summit. Sasude Shima, Moyaji Shima, and Inazumi Shima are islets which lie NE to SW, respectively, off the NW side of Taka Shima. Above-water rocks lie off the NW end of Sasude Shima. Overhead cables, with a vertical clear-

ance of 25m, connect Mayaji Shima with Sasude Shima and Taka Shima.

Kurotsuchi Seto (Kurotuti Seto), between Kono Shima and Taka Shima, is reduced to a navigable width of about 0.3 mile by Sasude Shima. The passage has depths of 12.8 to 32m, but there are depths of 7.6m in its E approach.

Shiraishi Seto (Siraisi Seto), between Taka Shima and Shiraishi-jima (Siraisi Shima), is about 0.8 mile wide, with generally deep water, but the navigable width is reduced by islets and submerged rocks. Strong tidal currents run between Taka Shima and Kotaka Shima.

Kotaka Shima, 41m high, lies about 0.2 mile SE of Taka Shima, and Kogochi Shima, 30m high, lies about 0.1 mile farther SE. Overhead cables, with a vertical clearance of about 22m, extend between the three islands. The E end of Kotaka Shima is bordered by drying rocks; the S side of Kogochi Shima is shoal, but with depths of over 10.1m about 0.1 mile offshore.

Okino-shira Ishi, a white rock, 7m high and marked by a light, lies about 0.3 mile SSW of Kogochi Shima. Kajikake, a rock, with less than 0.3m, lies about 0.2 mile SSW of Okino-shira Ishi.

Caution.—Kajikake is the most dangerous rock in this passage.

7.56 Hyakken Zowai, a rock marked by a light, lies about 0.3 mile SW of the SW end of Taka Shima; rocks extend to Tori Shima, 12m high, about 0.3 mile N.

The NW coast of Shiraishi-jima has depths of more than 10.1m about 0.1 mile offshore. Tako Zowai, with a depth of less than 1.6m, lies in the SW approach to Shiraishi Seto, about 1 mile WSW of the NW end of Shiraishi-jima.

Kanari-jima, 21m high, with a rock drying 0.2m close N, lies about 1.3 miles SW of the NW end of Shiraishi-jima. Rocks, with depths of 7.6m and 7.3m, lie between the above rock and islet.

Kitagi Seto, between Shiraishi-jima and Kitagi Shima, close SE, has a least navigable width of about 0.2 mile and mid-channel depths of 11.9 to 22m.

Kitagishima Ko, protected by two breakwaters, lies at the head of the bight on the E side of Kitagi Shima. A light is shown on the head of the N breakwater. A fish haven is situated close to the N entrance point to this bight. Temporary anchorage, sheltered from W winds, can be obtained in the bight, in depths of about 8m, mud.

A light is shown from the head of a breakwater which extends 0.15 mile N from a position midway along the NW shore of Kitagi Shima. A second light is shown from a breakwater head at Kanafuro Ko, in the NW part of Kitagi Shima.

Tateishi Yama, 171m high, the summit of Shiraishi-jima, lies in the S part of the island.

Tate Shima, a conical rock, 10.1m high, lies in the middle of the NE entrance to Kitagi Seto; several flat rocks extend about 0.1 mile NE of Tate Shima. Suzuki, with a depth of 6.4m, lies about 0.2 mile SW of Tate Shima.

Kajiko Shima, 39m high, lies in the SW approach to Kitagi Seto, about 0.8 mile W of the W extremity of Kitagi Shima; a rock, drying 3.1m, lies about 0.2 mile N of Kajiko Shima. Inuno Kashiro, a rock, drying 0.3m, lies about 0.4 mile SE of Kajiko Shima. Yokobe Shima, 17.1m high, lies about 0.7 mile ESE of Kajiko Shima.

Caution.—An overhead cable, with a vertical clearance of about 28m, crosses the narrows of Kitagi Seto.

7.57 Kitagi Shima (34°23'N., 133°32'E.), is easily recognized by its red-colored rocks caused by quarrying, and rises to an elevation of 226m in its central part.

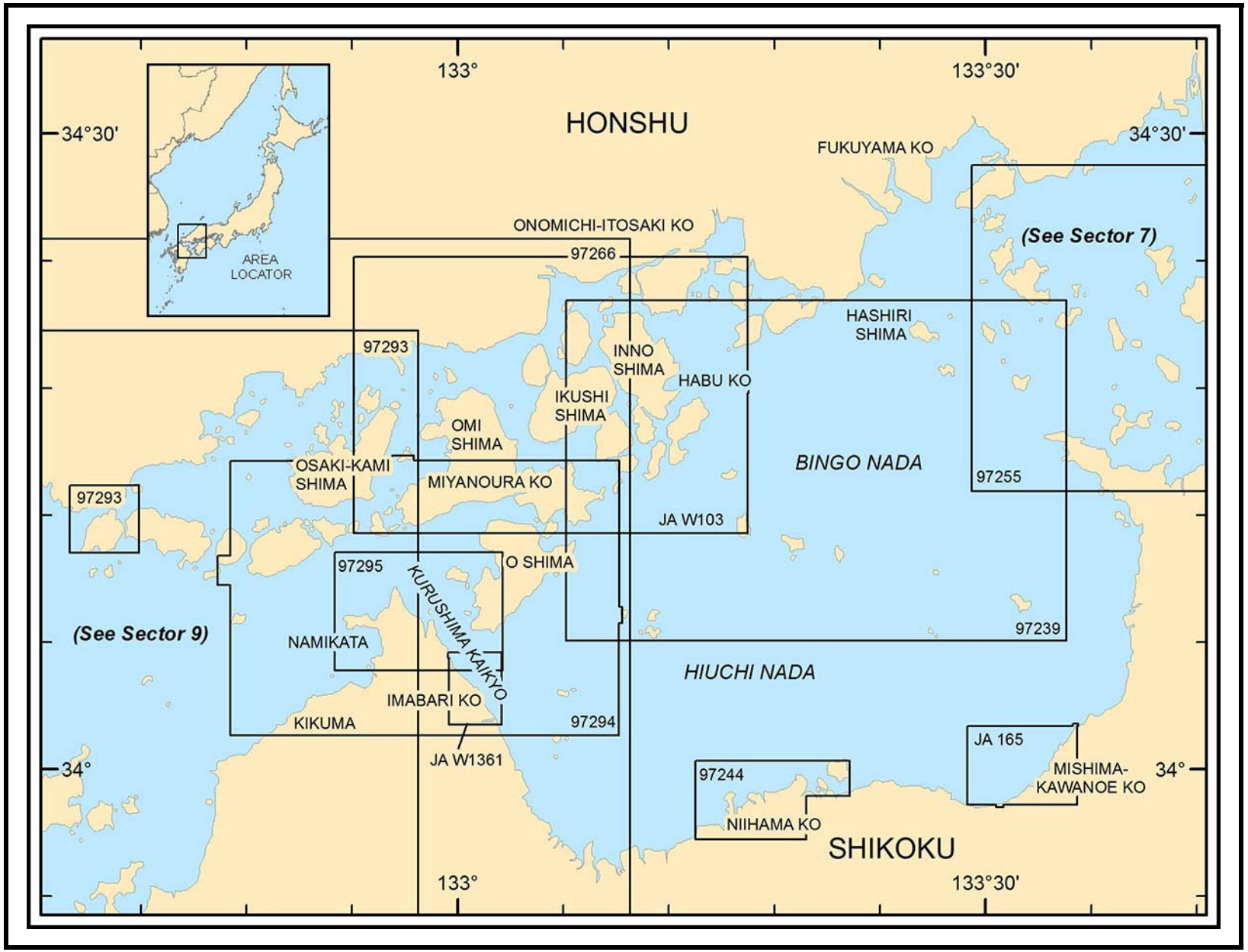
The passage between Kitagi Shima and Manabe Shima has depths of 10.1 to 30m except for Oshimano Se, which has a depth of 8.9m and lies about 0.5 mile E of Shishi Saki

A rock, with a depth of 3.7m, extends about 0.1 mile NW of Shishi Saki, the S entrance point of the bay on the E side of Kitagi Shima.

O Shima, 57m high, joined by a sandy isthmus to Ko Shima, 64m high, close S, lies in the E entrance, about 1 mile E of Shishi Saki. A reef, with a depth of 6.4m at its outer end, extends about 0.2 mile NE of the NE end of O Shima. A reef, on which there is a rock, 3.5m high, extends about 0.1 mile SW of the SW end of Ko Shima. Modoka Shima, 29m high, lies about 0.2 mile E of Ko Shima.

Manabe Shima, about 1 mile SE of Kitagi Shima, rises to Shiro Yama, 131m high, its summit, at its N end. There are two hills in its W part; the S hill is 126m high. The coasts of the island are mostly cliffy and comparatively steep-to. There is a small harbor, protected by a breakwater, at the head of a bight on the N coast of the island. A light is shown from the breakwater head.

Toi Shima, 39m high to the tops of the trees, lies in the middle of the W approach, about 0.8 mile W of the W end of Manabe Shima. Meota Iwa, a group of rocks, drying up to 1.5m, lies about 0.3 mile NE of Toi Shima, and is steep-to except on its S side. Foul ground, with a rock drying 3.8m at its outer end, extends about 0.1 mile ESE of Toi Shima. Ozowai, a rock with a depth of 5.9m, lies about 0.3 mile SSW of Toi Shima. A rock 3.1m high, lies close N of Toi Shima, to which it is joined by a reef.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **8** — CHART INFORMATION

SECTOR 8

THE NAIKAI (INLAND SEA)—EASTERN PART

Plan.—This sector first describes the passage through Bingo Nada and Hiuchi Nada, including Kurushima Kaikyo. The S part of Hiuchi Nada is then described. Fukuyama Ko and its approaches, in the N part of Bingo Nada, are then described. Finally, the passages and islands NW of Bingo Nada, including Mihara Seto, are described. The general sequence of each part is from E to W.

General Remarks

8.1 The recommended route through the Naikai, from between **Mu Shima** (34°18'N., 133°32'E.) and Mi Shima to Kurushima Traffic Route, about 28 miles WSW, is marked by lighted buoys. Bingo Nada and Hiuchi Nada lie in the N and S parts, respectively, of this portion, and are separated from each other by a chain of islets. Kurushima Traffic Route then connects Hiuchi Nada with Aki Nada. Special regulations as prescribed by the Maritime Traffic Safety Law are in force in Kurushima Kaikyo Traffic Route. See Pub. 120 Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia, and the graphic with the description of Kurushima Kaikyo Traffic Route in paragraph 8.5.

Mihara Seto and other channels lie between the NW part of Bingo Nada and the NE part of Aki Nada.

Tides—Currents.—Within Bingo Nada and Hiuchi Nada, there is a confluence of the E and W tidal currents which follows the inflow of the tide from Kii Suido and Bungo Suido. Furthermore, within this area, the currents divide and set to the E and W. The positions of this confluence, and also those at which the currents divide, vary with the accompanying changes in times of HW and LW. With the exception of the passages between the islands and islets, the currents are weak from day to day. There is a marked difference in their directions and velocities.

In the narrow channels of Mihara Seto, the tidal currents are strong, with some tide rips and eddies. The flood current flows E, and the ebb current W. In the lee of the islands there are countercurrents, generally weak with unsettled directions. In Mekari Seto, Aogi Seto, and Oge Seto, the maximum velocities are 4.4, 5.6, and 3.6 knots, respectively.

The tidal current in Haguri Seto has a mean velocity of about 5 knots, and a maximum velocity of 7 knots. Slack water occurs 1 hour after HW and LW and lasts for about 1 hour.

The tidal currents in Miyanokubo Seto are strong, attaining velocities of 9 knots at springs.

Routes through Bingo Nada and Hiuchi Nada

8.2 The recommended route through Bingo Nada and Hiuchi Nada is indicated by Bingo Nada Lighted Buoy No. 1 to Bingo Nada Lighted Buoy No. 7. Bingo Nada Lighted Buoy No. 7 is moored between Mu Shima and Mi Saki, while Bingo Nada Lighted Buoy No. 1 is moored about 2 miles WNW of **Kaji Shima** (34°07'N., 133°10'E.). The least depth in the vicinity of the fairway is 14.9m, about 5 miles WSW of the NW end of **Takaikami-jima** (34°18'N., 133°16'E.).

The route branching off the main route between Mu Shima and Mi Saki, and extending W to Mihara Seto, in the NW part of Bingo Nada, has a depth of about 10.1m in the E entrance to Mihara Seto.

Takaikami-jima Light

8.3 North side of route.—Mu Shima, the islands NW of Mu Shima, and Nezura Iwa, W of the island, have been previously described in paragraph 7.42.

Hassyomaki and an isolated group of rocks, with a depth of 14.7m, lie about 1.7 miles SW of Mu Shima.

Uji Shima (34°19'N., 133°28'E.), nearly 3 miles W of Mu Shima, has a 188m high summit at its E end.

Hyakkan-jima (34°18'N., 133°17'E.), off the E entrance to Mihara Seto, is a conical island, 71m high, marked by a light on its summit; the coast has generally steep cliffs.

Toyo Shima, about 4 miles S of Hyakkan-jima, and on the N side of the recommended route, has 2 summits; the W and higher is 109m.

Yuge Shima, about 2 miles NW of Toyo Shima, consists of two parts joined by a low isthmus. The N part is mountainous, with three peaks, and Mi Yama, 326m high, the N peak is the summit of the island. Kushi Yama, in the S part, is 199m high and conical.

Sa Shima, close SW of Yuge Shima, has hills alternately

covered with small trees, and others with exposed granite. Its summit, 123m high, is near the middle of the island.

Hakata-jima, about 2 miles SW of Sa Shima, has a conspicuous summit, Hoko San, 304m high, near its center.

O Shima lies on the N side of the E entrance to Kurushima Kaikyo. Nembutsu Yama (Nenbutu Yama), its summit 382m high, lies in the N part of the island. Todai Yama, 234m high, with Takatori Yama, 253m high, with a wooded peak, lie in the NE part of the island. Tate Yama, 231m high, lies near the SW end of the island. Kiro Yama, 308m high, lies about 0.8 mile ENE of Tate Yama. All are conspicuous bare mountains.

Kamagi Shima, 22m high and bordered by rocks, lies about 1 mile SE of Todai Hana, the NE extremity of O Shima; a rock, with a depth of 0.9m, lies about 320m NE of Kamagi Shima.

Yoko Shima, 41m high, lies about 0.8 mile SW of Kamagi Shima. A rock, with a depth of 10.1m, lies about 0.3 mile SSW of Yoko Shima; Kamo Sho, a group of rocks, drying 2.4m, lies about 0.8 mile WSW of Yoko Shima.

8.4 South side of route.—Ibuki-jima (34°08'N., 133°32'E.), about 8 miles SSW of Mi Saki, is 122m high; it is low and flat in its E part, while its W half is high. The village in its central part is conspicuous from a distance. A light is shown from a round concrete tower standing on Aka Saki, the S extremity of the island. A lighted buoy is situated 0.2 mile W of Aka Saki.

A power cable, several telephone cables and a water pipeline, all on the seabed, are laid from the E side of Ibuki Shima E to the mainland shore.

A fishing village is situated in the middle of Ibuki Shima, and a basin protected by Kitaura Breakwater lies on the N side of the island. A detached outer breakwater, marked by a light, located N of the harbor entrance.

Marugami-jima, nearly 4 miles WNW of Ibuki-jima, is 83m high, and heavily wooded on its N side. It is uninhabited except during the fishing season. Ongo Iwa, drying 4m, lies about 0.3 mile ESE of Marugami-jima.

Mata-jima, about 4 miles WSW of Ibuki-jima, has two summits; the S and higher summit is 56m high, and is a flat area of cultivated land. The N and S ends of Mata-jima are densely wooded. Komata Shima, 37m high to the tops of the trees, lies about 0.3 mile SE of Mata-jima, to which it is joined by a reef.

Eno Shima, about 4.5 miles WNW of Marugami-jima, is 131m high; its N end is low, but the W side is steep and treeless. An islet, 17.1m high, lies close off its S end, and Yoshido Iso, a rock, with a depth of 1.3m, and steep-to, lies about 0.3 mile SE of the small islet.

Uo-jima, about 1.5 miles W of Eno Shima, has three summits. The central peak, 170m high, is the summit of the island, rather flat and cultivated. The E peak is rounded while the W peak has a sharp summit. Hyotan Shima, an islet, 59m high, with conspicuous pine trees on its summit, lies about 410m S of Uo-jima; there is a least depth of 2.1m between the island and islet.

There is a small harbor protected by breakwaters within the small bay on the N side of Uo-jima. Lights are shown from each breakwater head.

Takaikami-jima (34°11'N., 133°16'E.), about 1.5 miles WNW of Uo-jima, lies on the S side of the recommended route and near the central turning point. It slopes gradually N and S, but drops steeply on its E and W sides. The summit of the island, 258m high, is conspicuous from a distance. A light is shown from the N slope of the island, and pine trees mark the NE end of the island. Depths of less than 10.1m extend up to 0.5 mile E and W of the island.

Submarine power cables link the islands Takaikami-jima Toyo, Yuge, and Uo-jima.

Hiuchi Deitai, a mud bank with depths of less than 20m, extends from S of Takaikami-jima to the NE end of O Shima. There is a least depth of 15m near the recommended track.

Kaji Shima (Kazi Shima), about 6.5 miles SW of Takaikami-jima, is a round-topped island, 79m high, and covered with bamboo grass. A reef extends about 0.1 mile S of the island.

Shisaka-jima is the collective name for four islets, about 1 mile E of Kaji Shima. Ieno Shima (Iye Shima), the middle island, is joined by reclaimed land to Mino Shima, close S. The chimney of a former refinery, 110m high on Ieno Shima, is conspicuous from a distance. Nezumi-jima, 49m high, lies close W of Ieno Shima. Myojin-jima, 88m high and covered with bamboo grass, lies about 0.3 mile N of Ieno Shima. Shoals, with depths of 8.7 and 10.8m, lie about 185m and 348m NW, respectively, of Nezumi Shima; a group of rocks, some drying, extends about 0.1 mile SE of the same island.

Bandai Iso, a steep-to rock, with a depth of 0.3m, lies about 0.8 mile ESE of Mino Shima. About 0.2 mile farther ENE, there is a rock, with a depth of 1.3m, with another rock close E, with a depth of 4.7m. A lighted buoy is moored S of the above rocks.

Okino Se, a steep-to rock, with a depth of 5.8m, lies 2.75 miles N of Higi Shima. A light is shown from a round concrete structure on Okino Se. A long narrow shoal, with depths of less than 20m and a least depth of 14.4m, extends about 1.3 miles SSW from a position about 3.5 miles WSW of Kaji Shima.

Caution.—Fishing nets are positioned between April and June (it is reported times can vary), as follows:

1. About 2.3 miles SW from Uji Shima.
2. About 2.5 miles SW from Hashiri Jimi.
3. In the area 2 miles E of Hyakkan-jima (length about 2 miles).
4. In the area 2.5 miles NE of Hyakkan-jima (length about 2.3 miles).
5. In the area 2 miles NE of Toyo Shima (length about 2.3 miles).

The nets NE of Hyakkan-jima and SW of Uji Shima cross the fairway. The nets are indicated by buoys with flashing lights and small flags, but are reported to be difficult to see when a strong tidal current is running.

Fishing vessels infrequently congregate in the vicinity of Takaikami Shima, spreading E and W over a large area, and when there is a wind they operate in pairs to tow their nets, and some may run across the fairway at considerable speed.

The area W of Mi Saki and the area in the vicinity of Ibuki Shima and Marugami-jima may have large numbers of fishing boats operating in them.

Kurushima Kaikyo

8.5 Kurushima Kaikyo (34°07'N., 133°00'E.) is an important strait joining Hiuchi Nada to Aki Nada. There are four channels through the strait, but they are all narrow and winding, with a poor forward view; the tidal currents are strong and complex.

There is considerable traffic in Kurushima Kaikyo and its approaches. Passage through the strait should not be made at the time of the strongest tidal current or in poor visibility.

Winds—Weather.—The average wind velocity throughout the year is about 11.5 knots, but due to the topography of the straight there are frequent W and N winds in the vicinity of the W entrance, but rarely S winds in the vicinity of the E entrance. During the winter monsoon winds and when a depression is transiting the Sea of Japan, the W wind strengthens and has on occasion exceeded a maximum velocity of 58 knots.

Fog on a monthly basis is concentrated from April to June, but is more frequent in Bingo Nada than in the vicinity of the W entrance. The generation of fog occurs in the later half of the night and is most frequent 4 to 6 hours before sunrise. The tendency is for the fog to disperse by about 1100. Its duration is relatively short in summer, but frequently 6 to 12 hours in spring.

Tides—Currents.—The tidal currents in the narrow channels of Kurushima Kaikyo are very strong and extraordinarily complex, causing tide rips and whirlpools in places. In addition, there are areas of countercurrents in the lee of islands, etc., but generally the rate of the current is weak and the direction variable. The general condition of the various channels is, as follows:

1. On the center line of Naka Suido, the S current (N current) flows from about 1 hour 20 minutes after LW (HW) at Hashihama, until about 1 hour 20 minutes after HW (LW). The maximum velocity is attained close downstream of the narrowest part of the channel for both N and S currents, and the maximum velocity may exceed 10 knots.
2. In the central part of Nishi Suido the turn of the tidal current is about 20 minutes later than in the Naka Suido. The area of the strongest velocity of the S current is almost on the center line of the channel, and for the N current in the area of the line from the SW end of Uma Shima to the NE end of Ko Shima. The velocity is about the same as that of Naka Suido. In addition, when there is a N current, it sets down hard on Ko Shima except during its final period.
3. The turn of the tide in the central part of Higashi Suido is almost simultaneous with that in the central part of Naka Suido, but the maximum velocity is about 0.5 times the maximum velocity in Naka Suido.
4. In the channel between Ko Shima and Kuru Shima the turn of the tide is about 15 minutes earlier than in Naka Suido. When there is a NW current, it sets down strongly on Kuru Shima. The NW current is stronger than the SE current, and the maximum velocities are 0.75 and 0.5 times, respectively, of the maximum velocity in Naka Suido.

Information about tidal currents in Kurushima Kaikyo can be found at http://www6.kaiho.mlit.go.jp/kurushima.

Depths—Limitations.—The least depth in the central part of Kurushima Kaikyo is 18.4m at the N entrance to Naka Suido, with deep water elsewhere. There are many shoals and submerged rocks around Uma Shima and along the coast of Shikoku; there are frequent marine accidents due to groundings, etc.

Regulations.—Pre-Entry Reports.—The following vessels must notify Kurushima MARTIS of a vessel's ETA by noon local time of the day prior to the date of entering Kurushima Strait traffic scheme. Notification may be made by telephone, MF, VHF, or facsimile.

1. Huge vessels—vessels with a length of 200m and over.
2. Vessels of 160m and over.
3. Vessels of 25,000 gt and more carrying liquefied gas.
4. Vessels engaged in towing or pushing with a total surface length of 100m or more.

Pre-Entry Reports should include the following information:

1. Vessel name, call sign, gt, and loa.
2. Draft.
3. Section of the traffic route the vessel intends to navigate.
   a. ETA at the entrance to the traffic scheme.
   b. ETD from the traffic scheme.
4. Vessel's contact information.
5. Port of destination.
6. Type and quantity of dangerous goods if carried.
7. Length between the bow of the towing vessel and the stern of the towed vessel, or between the front of the pushed vessel and the stern of the pushing vessel.

Changes to the information provided to Kurushima MARTIS should be reported 3 hours prior to entry of the traffic route. Changes occurring within 3 hours of traffic route entry should be reported immediately.

The following vessels, except those listed previously, intending to navigate the Kurushima Strait traffic route are required to report to Kurushima MARTIS 3 hours prior to entering the traffic scheme.

1. Vessels of 300 gross tons and over carrying quantities of powder as specified in the Ordinance for Enforcement of the Act on Maritime Traffic Safety.
2. Vessels of 1,000 gross tons and over carrying inflammable high pressure gas in bulk.
3. Vessels of 1,000 gross tons and over carrying inflammable liquid in bulk.
4. Vessels of 300 gross tons and over carrying 200 tons or more of organic peroxide.

Reports should include the following information:

1. Vessel name, call sign, gt, and loa.
2. Section of the traffic route the vessel intends to navigate.
   a. ETA at the entrance to the traffic scheme.
   b. ETD from the traffic scheme.
3. Vessel's contact information.
4. Port of destination.
5. Type and quantity of dangerous goods if carried.

Steering and Sailing Rules.—The following navigation rules apply to vessels transiting the Kurushima Kaikyo traffic route:

1. Prohibited Overtaking.—Vessels should not overtake other vessels in the no-passing zone. This rule excludes vessels engaged in fishing, vessels engaged in construction work, vessels navigating a low speed to perform urgent service, and vessels unable to maintain a ground speed of 4 knots.

The prohibited overtaking rule shall not apply to vessels which must depart from this rule to avoid immediate danger.

2. Minimum Speed.—Vessels navigating against the tidal current must maintain a minimum speed of 4 knots over the speed of the tidal current. Vessels unable to maintain this minimum speed will be instructed to wait off the traffic route.

Kurushima Kaikyo Traffic Route and No Passing Zone

3. Mandatory Reports.—Vessels intending to navigate the traffic route within an hour of a change of current direction must report the following to the Traffic Advisory Service Center (TASC) upon passing the reporting line:
   a. Vessel name.
   b. Means of communication with JCG.
   c. Vessel speed.
   d. ETA at the traffic route.

4. Alternate Channels.—Vessels may be required to navigate channels other than Kurushima Kaikyo in accordance with the direction of the tidal current. Vessels will be advised by the Japan Coast Guard (JCG).

Vessels of 50m and greater in length and vessels engaged in towing or pushing should report to Kurushima MARTIS on VHF channel 13 or 16 when crossing any of the reporting lines listed in the table titled **Kurushima Kaikyo—Reporting Lines**.

Vessels equipped with accurate AIS may omit sending position reports by VHF, however a continuous watch on VHF channels 13 and 16 is obligatory.

Vessel Traffic Service.—Kurushima Kaikyo Vessel Traffic Service (VTS).—Vessels of 50m in length or more are required to maintain continuous contact with Kurushima MARTIS on VHF channels 16 and 13 when navigating in the traffic routes, the approaches to the traffic routes, and the adjacent sea areas.

The following ports lie within the Kurushima Kaikyo Traffic Advisory Service area:
1. Imabari.
2. Kikuma.
3. Kikuma Oil Terminal.
4. Namikata.

Signals.—The tidal signals refer to the tidal current in Naka Suido, W of Nakato-jima. For additional information, see the Kurushima Kaikyo Traffic Route graphic. The tidal stations are, as follows:

1. At the Nagaseno Hana Tidal Signal Station and the Osumi Hana Tidal Signal Station, the signals are shown continuously, day and night, by a white isophase light every 4 seconds. The signals consist of letters, numerals, and arrow symbols, as follows:
   a. The letter N or S—The direction of the current.
   b. A numeral from 0 to 9—The velocity of the current.
   c. An arrow pointing vertically up—An increasing current.
   d. An arrow pointing down—A decreasing current.
   e. The letter X is shown during the last period of the current from about 20 minutes before slack water to about 20 minutes after slack water.

2. At the Nakato-jima Tidal Signal Station, the signals are made, by day, with a white beam having a red disc at one end and a black rectangle at the other, pivoted at the head of a white post at an elevation of 37m; the night signals are made by a light shown from the station. The positions of the day signal, the characteristics of the light for the night signal, and their meaning are given in the accompanying table titled **Nakato-jima Tidal Signal Station—Tidal Signals**.

3. At the Ohama Tidal Signal Station and the Tsu Shima Tidal Signal Station, the following tidal current signals are shown day and night:
   a. Green flashing light every 10 seconds—South current.
   b. Green group flashing light, three flashes every 20 seconds—The last period of the S current.
   c. Red flashing light every 10 seconds—North current.
   d. Red group flashing light, three flashes every 10 seconds—Last period of the N current.

There is an indicator light, showing a fixed yellow and red light, at the Ohama Tidal Signal Station, the Nakato-jima Tidal Signal Station, and the Tsu Shima Tidal Signal Station.

Kurushima Kaikyo—Reporting Lines

Name of Reporting Lines	Abbreviation	Description
Kurushima Kaikyo East Entrance N	EN	A line bearing 325° from Kaji Shima to the coast at O Shima
Kurushima Kaikyo East Entrance S	ES	A line bearing 218° from Kaji Shima to the coast of Shikoku
Imabari	KI	A line bearing 120° from Ohama Signal Station to position 34°04'N, 133°02'E then 189° to the coast
Hashihama	KH	A line drawn from Osumi Hana to O Shima East Light then 199° to the coast
Namikata	KS	A line bearing 250° from Osumi Hana to position 34°08'N, 132°54'E then 205° to the shore
Kurushima Kaikyo North Entrance E	KE	A line bearing160° from the coast at position 34°11'N, 132°58'E to the signal station on Tsu Shima then 141° to the coast of O Shima
Kurushima Kaikyo North Entrance W	KN	A line bearing 075° from Osaki-Shimo Shima to Ago-no-Hana Light then 075° to Omi Shima
Kurushima Kaikyo West Entrance N	WN	A line bearing 000° from the E end of Itsuki Shima to the coast at Osaki-Shimo Shima
Kurushima Kaikyo West Entrance S	WS	A line connecting the E end of Itsuki Shima and Kajitori Hana Light

Nakato-jima Tidal Signal Station—Tidal Signals		
Meaning	**Day Signal**	**Night Signal**
The period of the S current	Black rectangular shape upward, beam inclined at an angle of about 30° from the vertical	Flashing green light every 3 seconds
Last period of S current	Black rectangular shape upward, beam inclined at an angle of about 70° from the vertical	Group flashing green light, three flashes every 8 seconds
The period of the N current.	Red disc upward, beam inclined at an angle of about 30° from the vertical	Flashing red light every 3 seconds
Last period of the N current	Red disc upward, beam inclined at an angle of about 70° from the vertical	Group flashing red light, three flashes every 8 seconds

The **Ohama Tidal Signal Station** (34°05'N., 133°00'E.) lies near the N harbor limit of Imabari Ko. Chikami Yama (Tikami Yama) rises to an elevation of 244m, about 1 mile WSW of the signal station. Karako Yama, 105m high, an isolated hill resembling Mount Fuji, is conspicuous about 4.3 miles SSE of the signal station.

The Ohama Tidal Signal Station also broadcasts continuously on 1,665 kHz, identification signal NT. Signals broadcast the period and direction of the tidal current in Naka Suido are, as follows:

1. S—The period of the S current.
2. LS—Last period of the S current.
3. N—The period of the N current.
4. LN—Last period of the N current.
5. R—Information not available.

8.6 Namikata Oil Terminal (34°07.1'N., 132°54.6'E.) lies 2 miles SW of Osumi Bana, on the N coast of the projection forming the N side of Obe Wan. There are seven oil berths, the main jetty having a depth of 20m and can accommodate vessels of up to 125,000 dwt. Tugs of up to 3500 horsepower are available for berthing/unberthing, which is undertaken in daylight hours only.

Aspect.—O Shima, at the E entrance, was previously described in paragraph 8.3. **Nagaseno Hana** (34°06'N., 133°02'E.), a cliffy headland, lies at the SE end of O Shima. There is a tidal signal station on the headland.

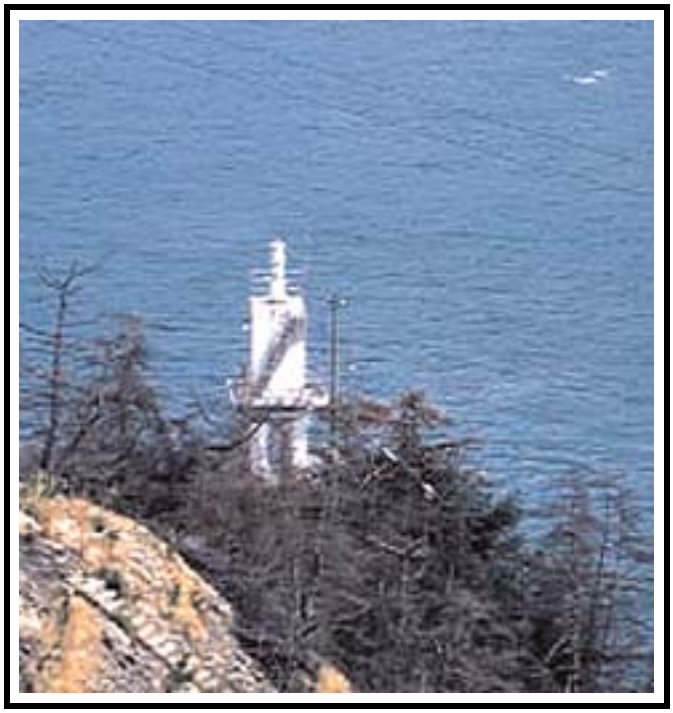
Kozo Iso, drying rocks, with a small rock, 2m high, near its center, extend to about 410m SSW of Nagaseno Hana. Tide rips occur S of Kozo Iso.

Ryujin To (Ryuzin Shima), a small rock, marked by a light, lies W of Kozo Iso, and about 0.4 mile SW of Nagaseno Hana. A rock, drying 0.2m, and a depth of 3.2m, lie close S and 137m S, respectively, of Ryujin To.

A rock, with a depth of 17.1m, lies about 2.8 miles ENE of Ryujin To, with depths of less than 20.1m extending about 0.3 mile NW and SE, respectively, from it. Okino Se and the bank SSW were previously described in paragraph 8.4.

Hiki Shima (Higi Shima) (34°03'N., 133°06'E.), a flat-topped island, 58m high, and marked by a light on its summit, lies about 4.3 miles SE of Ryujin To. There is a line of three islets on the W side of the island; Ko-hiki Shima (Ko-Higi Shima) lies close ENE of the island. Hiki Shima and Ko-hiki Shima are surrounded by shoals, and a depth of 3.4m lies nearly 0.2 mile SSE of Ko-higi Shima.

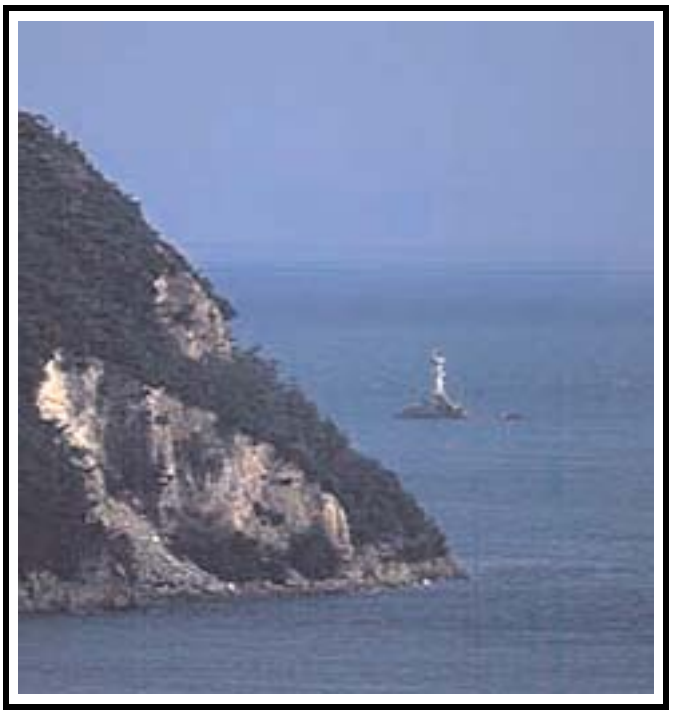
Ajika Iwa (Asiko Iso), a rock drying 2.3m, lies about 1 mile ENE of Ko-higi Shima; it is marked by a beacon and a lighted buoy on its NE side. Aino Ishi, drying 0.5m, lies about 0.2 mile SW of Ajika Iwa. Shitano Ishi, a rock with a depth of 0.9m, lies about 0.3 mile farther WSW; a depth of 4.3m lies about 0.1 mile SE of Shitano Ishi. Rocks, with depths of 13.6 and 17.1m, lie about 0.5 mile SSE and 0.4 mile SW, respectively, of Ajika Iwo.



Nagaseno Hana Light

Heichi Shima (Heiti Shima), about 2 miles S of Hiki Shima, has a flat summit, 96m high, with rows of pine trees on its slopes; there is a forest of pine trees on its summit. Ko-heichi Shima (Koheiti Shima), covered with bamboo grass, lies close E of Heichi Shima, from which it is separated by a narrow, shallow channel. Shiakabe Iwa, a pointed rock, 17.1m high, lies about 0.5 mile S of Heichi Shima.

Teraga Iso, a sandbank, with depths of less than 10.1m and a least depth 4.7m, extends from a position about 1.3 miles NW of the NW extremity of Heichi Shima, in a WNW direction to about 0.5 mile off the coast of Shikoku. There are sandwaves on the sand bank. A rock, with a depth of 6.4m, lies about 0.2 mile off the mouth of Tomita Kawa, W of Terago Iso.



Ryujin To Light

Narrows of Kurushima Kaikyo

8.7 There are four conspicuous steel pylons for the overhead cables running from the SW part of O Shima to the Shikoku coast via Nakato-jima and Uma Shima. There is a vertical clearance of 66m over Nishi Suido and Nake Suido, and a vertical clearance of 41m over the channel between Nakato-jima and O Shima.

There is an overhead cable, with a vertical clearance of 75m, across Nishi Suido, between Uma Shima and Ko Shima to the NW. The steel pylons are 80m high.

A bridge crosses Nishi Suido, between the coast of Shikoku and Uma Shima and between Uma Shima and Mushi-jima; there is a vertical clearance of about 65m in both channels. The bridge continues ENE from Mushi-jima to O Shima, with a vertical clearance of about 36m.

Naka Suido Nakato-jima (Nakato Shima) (34°07'N., 133°00'E.), a round-topped island, 62m high, lies on the E side of Naka Suido. The tidal signal station is situated at its NW end.

Mushi-jima (Musi Shima), 55m high near its SE end, lies about 0.3 mile NE of Nakato-jima. Ko-mushi Shima, 37m high, lies close off the NW end of Mushi-jima. Warabe Iso, an isolated rock, with a depth of 3.1m, lies about 82m W of Mushi-jima.

An area to the W and N of Mushi-jima is delineated by nine lighted buoys. Entry into this area is restricted due to bridge construction.

Taka Se, about 0.5 mile NNW of Nakano-jima, is a rock, with a least depth of 18.4m, and the least depth in the fairway.

Uma Shima lies about 0.3 mile W of Nakato-jima, leaving a navigable width of about 0.2 mile. The island has two summits, the S is higher and surmounted by the previously-mentioned pylon. Uzuno Hana, Okora Saki, and Nagase Hana, the SW, W, and E extremities, respectively, of the island, are marked by lights. The N and E shores are bordered by dangerous rocks extending from 90 to 180m offshore. Caution must be taken to avoid a fish have that is enclosed within the area bounded by lines joining the following positions:

a. 33°59'18.3"N, 131°43'43.7"E.
b. 33°59'17.6"N, 131°43'43.5"E.
c. 33°59'17.9"N, 131°43'39.8"E.
d. 33°59'18.1"N, 131°43'39.0"E.
e. 33°59'19.5"N, 131°43'39.6"E.

Mukuri, a rock, with a depth of 1.7m, lies about 250m N of Nagase Hana. Nagase Hana, bearing 188°, in range with Ohama Tidal Signal Station, clears Mukuri.

8.8 **Nishi Suido.—**The SW and N ends of Uma Shima are bordered by dangerous submerged rocks. Rocks, with depths of 5.2 and 1.8m, lie about 230m W of the N end of the island. Depths of over 20m lie from 150 to 250m off the W coast of Uma Shima. Nishi Suido should be navigated against the current, which attains a rate of as much as 8 knots.

An overhead power cable, with a vertical clearance of about 66m, spans Nishi Suido between the S end of Uma Shima and Shikoku to the WSW. The towers supporting the cable at each end are conspicuous and stand at elevations of 200m and 162m. They are marked by red obstruction lights.

The Shikoku coast N of Imabari Ko should not be approached closely, due to the many rocks and shoals bordering the coast.

Ama Se, a rock, drying 0.6m, lies about 0.1 mile offshore, about 0.5 mile W of the SW extremity of Uma Shima. A lighted beacon stands on Ama Se.

Oiseno Se, a rock, with a depth of 4.4m, lies about 0.1 mile offshore, about 295m NNW of Ama Se.

Shiro Ishi, a white rock marked by a light, lies about 0.3 mile SSE of Ama Se. Mukuri, a rock, with a depth of 4.7m, lies about 228m ESE of Shiro Ishi, and is the outermost of the shoals; it lies close to the traffic route.

Hiro Se, a group of rocks, some of which dry, lies about 0.3 mile SSE of Shiri Ishi. Wakameji, consisting of reefs with a least depth of 2.1m, extends about 137m NNE of Hiro Se.

Ko Shima (O Shima), about 0.5 mile NW of Uma Shima, is 100m high, with much cultivated ground and some wooded areas. Biwano Kubi, a small wooded bluff, 43m high, and surmounted by a pylon, is connected to the SW end of Ko Shima by an isthmus. Futatsu Iwa, a rock drying 3.7m, and marked by a light, lies about 90m SW of Biwano Kubi.

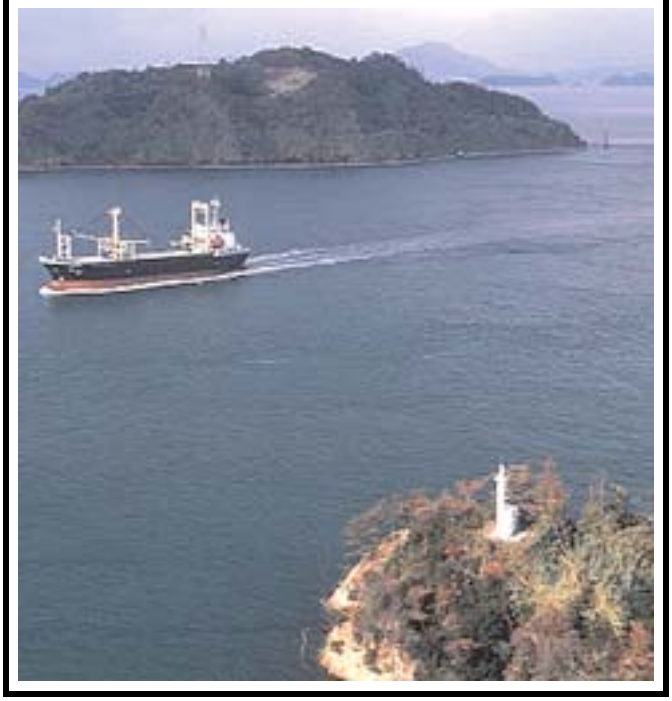
Oasari, a steep-to rock, with a depth of 8.6m, lies about 0.2 mile off the coast of Ko Shima, about 0.3 mile ESE of Biwano Kubi. Nezumi Iso, a rock, with a depth of 8.4m, lies about 0.1 mile NW of Oasari.

8.9 **Kono Se** (34°07'36"N., 132°59'24"E.), with a depth of 19.2m, is steep-to on its E and W sides, and lies on the W side of the N end of Nishi Suido.

In Higashi Suido (Higasi Suido)**,** the pylons supporting the overhead cable are conspicuous. Gono Ishi, rocks with depths of less than 1.8m, lie about 137m E of Nakato-jima.

Bujiro, an isolated rock, with a depth of 3.8m, lies in the middle of Higashi Suido, about 0.2 mile E of **Mushi-jima**

The Kurushima Kaikyo Bridge



Okora Saki Light

Uzuno Hana Light

(34°07'N., 133°01'E.).

Lights, in line bearing 122°, are situated on the N side of Hinai Hana, nearly 0.5 mile NE of Mushi-jima. Wakame Iso, a rock with a depth of 1.1m, lies about 230m SE of this headland.

Kenashi Shima lies close N of the E part of Mushi Shima; a rock, with a depth of 2.7m, and steep-to on its N side, lies about 90m N of Kenaski Shima.

Ozukuma Shima, 35m high, lies about 1.3 miles N of Mushi-jima; its W coast is bordered by dangerous rocks extending to about 250m offshore. A reef, with a rock drying 0.7m at its outer end, extends about 0.1 mile S of the island.

An overhead cable, with a vertical clearance of 29m, extends from the SE side of Ozukuma Shima, to Boze, a headland, about 0.3 mile SE. Bozo Iso, a rock with a depth of 9.5m, lies at the end of a reef extending about 0.1 mile WSW of Boze.

Hinai Hana Range Lights

8.10 Kuru Shima (34°07'N., 132°58'E.), about 0.3 mile SW of Ko Shima, is 40m high, covered with trees, and lies in the entrance to Hashihama. Depths of 2.5 to 6.5m extend to about 137m N of the island. Umano Se, rocks with a least depth of 2.9m, lie about 320m E of Kuru Shima.

Hiro Se, a rock drying 1.3m and marked by a light, lies in the approach to Namikate Ko, about 0.8 mile WNW of Kuru Shima. Shoal water extends up to 0.2 mile offshore, about 0.5 mile SE of Osumi Bana.

Shiro Ishi, a white, pointed rock, 8.5m high, lies about 1 mile N of Kuru Shima. Dangerous submerged rocks extend about 1.5 miles WNW of Ko Shima. Tanishi Su, with a least depth of 6.6m, lies about 0.8 mile ESE of **Osumi Bana** (34°08'N., 132°57'E.).

There are sand waves about 1 mile offshore between Ko Shima and Osumi Bana.

Aspect.—Tsu Shima (34°09'N., 133°00'E.), about 1.5 miles N of Uma Shima, lies on the E side of the W entrance to Kurushima Kaikyo. It has E and W peaks, which appear as one mountain when viewed from the W. Ichinose Yama, the W peak, 177m high and rather pointed, is a good mark for passing through the narrows of Kurushima Kaikyo. There is a tidal signal station near Ichinose Hana, the SW end of the island. Tsu Shima Tidal Signal Station consists of a round concrete structure. Signal lights are shown at an elevation of 48m, and a light indicating the position of the station is shown at an elevation of 54m.

8.11 Osumi Bana (Osumi Hana) (34°08'N., 132°57'E.), about 2.5 miles WSW of Tsu Shima, lies on the S side of the W entrance to Kurushima Kaikyo. There is a tidal signal station about 0.1 mile S of the headland. Drying rocks, on which there is rock, 3.8m high, extend about 137m N of the headland.

Ikado Iso, about 0.2 mile long N-S, lies about 0.4 mile WNW of Osumi Hana. It is marked by a light at its N end, and a rock, 7m high, lies at its S end. Ko-ikado, two white rocks, 4.6m high, and a drying rock, lie about 90m SSE and W, respectively, of the S rock. A shoal, with a least depth of 14.9m, lies about 0.3 mile ENE of Ikado Iso Light.

Kajitori Hana (Kazitori Hana), marked by a light, lies about 3 miles WSW of Osumi Hana. Ogon Sho, an isolated rock, with a depth of 9.5m, and with tide rips in its vicinity, lies about 0.4 mile WNW of Kajitori Hana.

Oge Shima, about 2.5 miles N of Osumi Bana, attains an elevation of 208m in its N part; it is marked by light on its W side. Ko-oge Shima, about 0.5 mile W of Oge Shima, has a 133m summit in its SW end; white cliffs, caused by quarrying, are conspicuous on the S side of its summit. **Yakushi Yama** (Yakusi Yami) (34°12'N., 132°58'E.) is conspicuous in the SW end of Omi Shima.

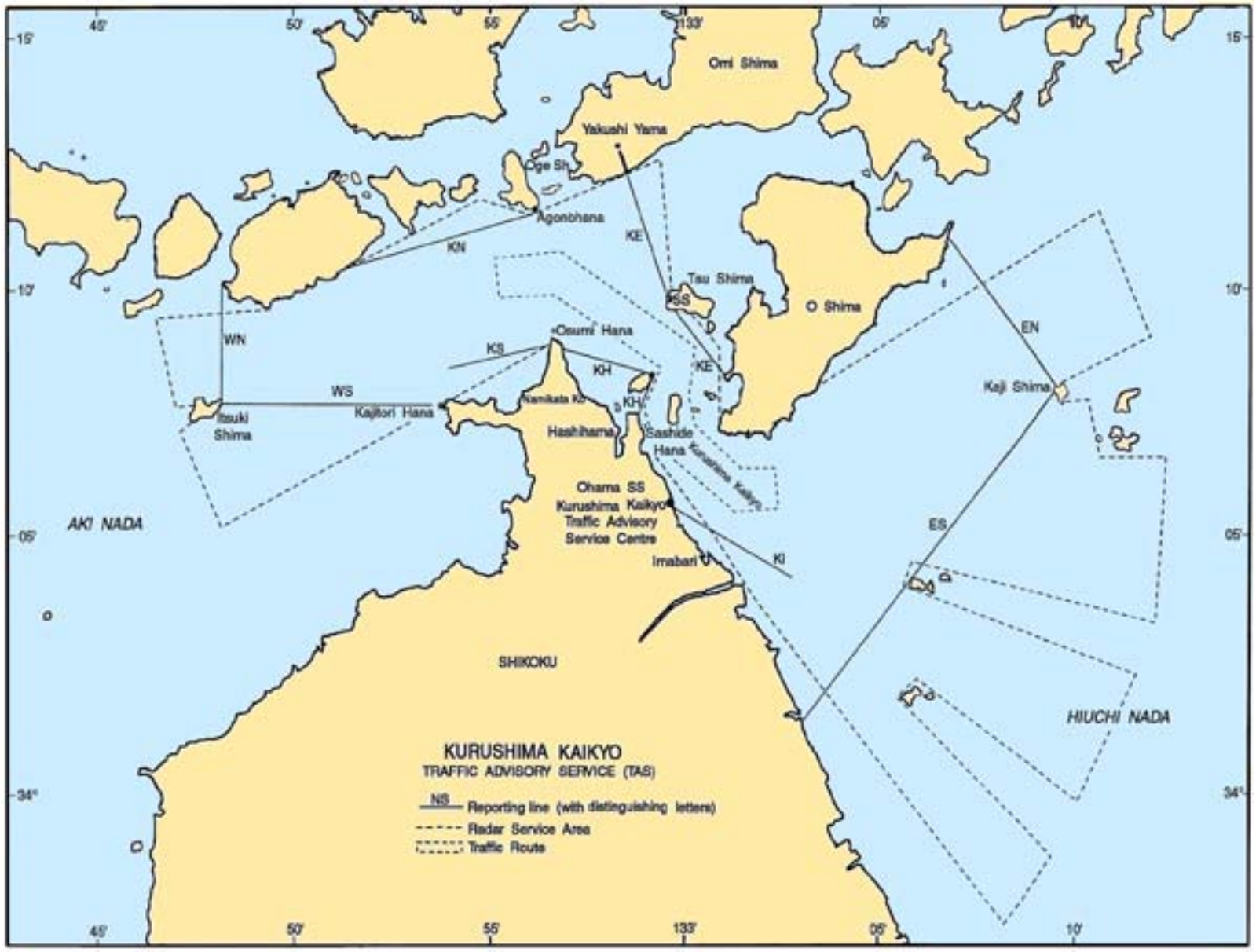
Pilotage.—Pilotage is compulsory in Kurushima Kaikyo and its approaches for the following vessels:

1. Vessels of 10,000 gt or over.
2. Foreign vessels carrying dangerous cargo.
3. Foreign vessels whose master is making a first voyage through the Naikai.

For further information, see paragraph 6.1.

Regulations.—The Kurushima Traffic Route (Kurusima Traffic Route) has been established under the Maritime Traffic Safety Law. Vessels must navigate in accordance with the traffic procedures established under this law:

1. Traffic in Naka Suido and Nishi Suido is one-way, depending on the direction of the tidal current.
2. When there is a S tidal current, vessels meeting in the E and W entrances should pass each other starboard to starboard.
3. When there is a N tidal current, eastbound vessels in Nishi Suido and vessels heading to pass between Ko Shima and Hashihama should pass starboard to starboard.
4. When in the passage at the time of the turn of the tide, there is danger of meeting conflicting traffic within a given



Kurushima Kaikyo Traffic Route—Position Reporting Lines

Ikado Iso Light

channel around the time of the turn of the tide, because navigation in a particular channel continues without interruption.

Higashi Suido and Kurushima Seto are the channels normally used by scheduled shipping services and small vessels.

5. The following vessels are required to have an escort vessel, with a fire fighting capability before navigating the straits:
   a. Vessels of 250m or more in length.
   b. Vessels of 200m or more in length which are carrying a dangerous cargo.
   c. Vessels of 25,000 gt or more which are carrying liquefied gas.
6. The following additional limitations and regulations apply to tankers using the strait:
   a. Laden tankers and tankers in ballast, but not gas-free:
      i. Length overall of 200 to 230m—Maximum draft of 11.9m.
      ii. Length overall of 230 to 285m—Maximum draft of 11.0m.
   b. Gas-free tankers:
      i. Length overall of 200 to 250m—Maximum draft of 12.8m.
      ii. Length overall of 250 to 300m—Maximum draft of 11.0m.

Tankers should only navigate Naka Suido during daylight hours and when the favorable tidal current is less than 3 knots.

The draft of tankers in passage between Kurushima Kaikyo Traffic Route and Mizushima Traffic Route should not be more than 11m.

7. In low visibility, entry into Kurushima Kaikyo Traffic Route is restricted as given in the accompanying table titled **Kurushima Kaikyo Low Visibility Restrictions**.

Kurushima Kaikyo Low Visibility Restrictions	
Type of Vessel	**Restriction**
Vessels of 200m or more in length.	Entry prohibited when the visibility in the traffic route is less than 1 mile.
Vessels of 50,000 gt or more carrying dangerous cargo.	
Vessels of 25,000 gt or more carrying liquefied gas.	Entry prohibited when the visibility in the traffic route is less than 1 mile.
Vessels towing or pushing very long tows.	
Vessels carrying dangerous cargo (excluding those listed above).	Entry prohibited when the visibility in the traffic route is less 0.5 mile.

The **Kurushima Kaikyo Traffic Advisory Service** (TAS) provides vessels with information, controls traffic routes, and ensures safe navigation. Huge vessels, vessels of 10,000 gross tons or more (except huge vessels), and vessels towing (or pushing) an object between 100m and 200m in total length, should report to Kurushima Martis, by VHF or telephone, on passing the Reporting Points listed in the accompanying table titled **Kurushima Kaikyo—TAS Reporting Points**.

The following information should be included in the report:

1. Vessel's name.
2. Time passing Reporting Point.
3. Abbreviation of Reporting Points.
4. If towing or pushing, length of vessel.
5. Destination of vessel (that do not need seaway information).

Vessels may be instructed by the captain of the port to evacuate the port in the event of abnormal weather or marine conditions such as typhoons or marine accidents.

Caution.—Vessels should avoid crossing in the vicinity of the entrance and departure points of the traffic route.

Vessels intending to enter the traffic route or to alter course after leaving it shall not alter course in the sea area near the entrance and departure points of the traffic route.

Kurushima Kaikyo—TAS Reporting Points		
Name of Reporting Point	**Abbreviation**	**Description**
Kurushima Kaikyo East Entrance N	EN	A line bearing 325° from Kaji Shima to the coast (O Shima).
Kurushima Kaikyo East Entrance S	ES	A line bearing 218° from Kaji Shima to the coast (Shikoku).
Off Imabari	KI	A line bearing 120° from Ohama Signal Station.

Kurushima Kaikyo—TAS Reporting Points		
Name of Reporting Point	**Abbreviation**	**Description**
Off Hashihama	KH	A line connecting Ko Shima East Light and Osumi Hana and a line connecting Ko Shima East Light and Sashide Hana.
Off Namikata	KS	A line bearing 250° from Osumi Hana.
Kurushima Kaikyo North Entrance E	KE	A line connecting Tsu Shima Signal Station and Yakushi Yama on Omi Shima and a line connecting the Signal Station and Naibana Front Range Light.
Kurushima Kaikyo North Entrance W	KN	A line bearing 075° from Agono Hana Light on Oge Shima and a line bearing 255° from Agono Hana Light.
Kurushima Kaikyo West Entrance N	WN	A line bearing 000° from the E end of Itsuki Shima to the coast (Osaki Shimo Shima).
Kurushima Kaikyo West Entrance S	WS	A line connecting the E end of Itsuki Shima and Kajitori Hana Light.

At Reporting Point WS, a large number of fishing vessels congregate in every channel.

At Reporting Point WS, line fishing vessels congregate in the fairways and may greatly impede the passage of large vessels. They do not enter the fairway when the current is strong, but some may remain while the current is still weak. The greatest obstruction to navigation is the concentration of fishing lights in use on the coasts of Uma Shima, Nakato-jima, and Ko Shima; the islands and headlands may not be visible due to these lights.

A triple-linked suspension bridge spans Nishi Suida, Naka Suida, and Higashi Suida, with a vertical clearance of 65m for Nishi Suida, 65m for Naka Suida, and 46m for Higashi Suida.

Imabari Ko (34°04'N., 133°01'E.)

World Port Index No. 62070

8.12 Imabari Ko is a specified harbor on the S side of Kurushima Kaikyo. It consists of Section I to Section III; Section III at **Hashihama** (34°06'N., 132°58'E.) is used as an anchorage for small local vessels and for the construction and repair of medium and small vessels.

Winds—Weather.—The inner harbor is safe even in NE to E winds, which are the most severe, and raise a sea at the entrance.

Tides—Currents.—The tidal rise at Imabari is 3.4m at springs, and 2.6m at neaps.

The flood current flows SE, and the ebb current flows NW, but are not strong enough to have any particular effect on navigation.

Depths—Limitations.—The controlling depth in the channel is 9m. In Section I, the inner harbor, the wharf S of the base of the E breakwater has depths of 4.5m alongside and a length of 235m.

A bent groin, from which a light is shown, extends from the shore; its head is situated close E of the S end of the detached breakwater.

Kurashiki Wharf, on the W side of the commercial harbor, about 0.5 mile farther SE, N of the mouth of Soja Kawa (Sosya Kawa), has a depth of 9m alongside its N berth, which can accommodate vessels with a draft of up to 8.5m and 15,000 gt. Two berths at Tomita Quay, on the southernmost groin of the harbor, have charted depths alongside of 10.2 to 12.6m. Temposan Wharf, with a depth of 7.5m alongside, lies on the SE side of the inner harbor and can accommodate two vessels of 5,000 gt. Three piers and a ferry quay, with a depth of 6.1m alongside, lie on the SW side of the harbor.

Aspect.—A conspicuous building lies about 0.5 mile SE of the head of the E breakwater.

The harbor office, a five-story building with radio masts, lies on the inner side of the inner harbor. A radio tower is situated about 0.5 mile SW of the harbor office. A power station chimney, 68m high, is conspicuous about 0.8 mile NW of the E breakwater. A hotel, 102m high, is reported conspicuous in position 34°03.7'N, 133°00.0E.

Pilotage.—Pilotage is not compulsory. The harbormaster can be contacted by radiotelephone.

For further information, see paragraph 6.1.

Anchorage.—Vessels carrying dangerous cargo will be assigned anchorages in Section II. Temporary anchorage is available in Section III; however, Umano Se, previously described in paragraph 8.10, lies in the E entrance, and a shoal, with a depth of 4.7m, and marked by a mooring buoy, lies about 0.2 mile S of Kuru Shima.

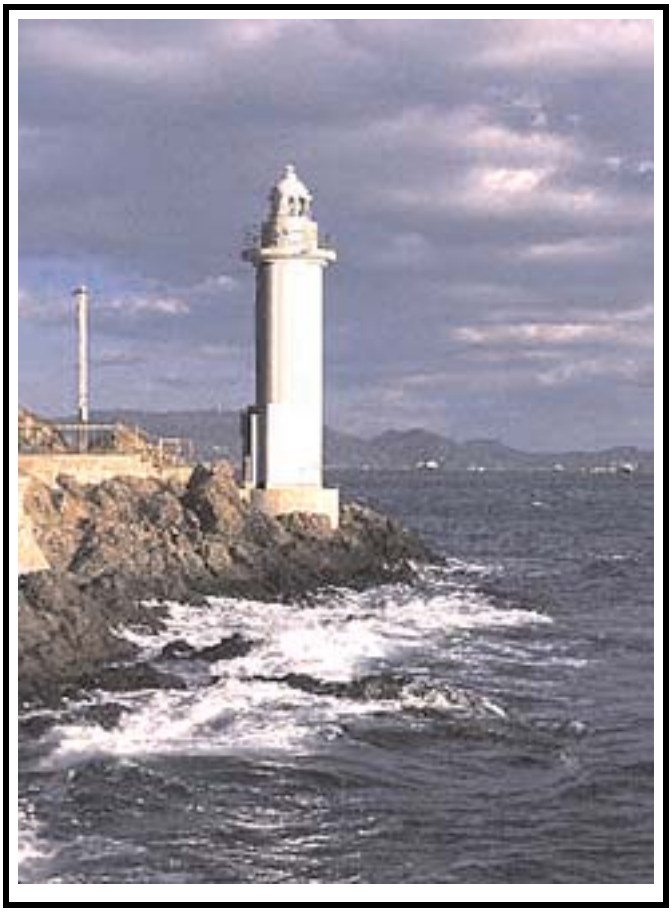
Caution.—Many ferries and sightseeing vessels use the inner harbor. In addition, caution is necessary entering or leaving the harbor as there may be fishing vessels which operate in the E entrance to Kurushima Kaikyo, particularly at Reporting Point WS.

Hiuchi Nada—South Shore

8.13 The coast of Shikoku, from **Mi Saki** (34°15'N., 133°34'E.) to **O-jima** (34°00'N., 133°22'E.), about 18 miles SW, forms a large bay with generally level sandy shores and a few steep places. Anchorage can be taken in suitable depths, about 1 mile off the coast, except in the vicinity of Mi Saki, in a bottom of mud, or mud and sand. The tidal currents are weak and there are few uneven parts in the sea bed, but there are many fishing nets and seaweed cultivation grounds along the coast, some of which extend up to about 1 mile offshore.

Maruyama Shima (34°13'N., 133°37'E.), about 3.5 miles

Imabari Ko Breakwater Lights



Agono Hana Light

SE of Mi Saki, is 101m high, densely wooded, conspicuous, and has a black appearance.

Otsuta Shima, 91m high, lies about 1 mile farther SE, with Kotsuta Shima, close SSE. Tenjinno Iso, steep-to, with a depth of 7.4m, lies about 1.5 miles W of Otsuta Shima.

Tsukumo Saki, about 2.5 miles S of Kotsuta Shima, is surmounted by Tsukumo Yama, a conical hill, 153m high, and appears as an island from the N; the large landslide on the SW side of the hill is conspicuous.

Kannonji Ko (34°07'N., 133°38'E.), about 1.5 miles farther S, lies at the mouths of Saita Kawa and Ichinotani Kawa. Numerous fish havens extending up to 1 mile offshore exist in this vicinity. A chimney, 37m high, is conspicuous on the N side of the mouth of Saita Kawa, from which a breakwater extends. Close S of this breakwater, N and S breakwaters enclose the harbor at the entrance of Ichinotani Kawa; a detached breakwater fronts the harbor entrance. A wharf, at the base of the N breakwater, has depths of 4m alongside its S side, with a length of 111m. The roadstead W of the pier has depths of 6m.

Toyohama Ko, a small harbor, lies about 3 miles S of Kannonji Ko. A light is shown at the head of the W breakwater. Yoki Saki, a headland, 28m high, is conspicuous about 2.8 miles farther SW; it lies about 1 mile NNW of Yahachi Yama, 264m high. Okino Iso, a rock with two heads, each drying 0.8m, lies about 0.3 mile offshore, about 0.5 mile ENE of Yoki Saki.

Mishima-Kawanoe Ko (34°00'N., 133°33'E.)

World Port Index No. 62085

8.14 Mishima-Kawanoe Ko is a specified harbor on the SE side of Hiuchi Nada. It is developing into an industrial port with paper-making and cotton-spinning industries. The harbor consists of Kawanoe Chiku and the city of Kawanoe, in its NE part, and Mishima Chiku and the city of Iyo-Mishima, in its SW part.

Kawanoe Shiku consists of a small harbor, (formerly Kawanoe Ko), sheltered by breakwaters; the fishing harbor close SW; and Nishi Ko Wharf 2 and Nishi Ko Wharf 1, respectively, farther SW. The W breakwater of the local harbor is being extended NNW. Kinsei Kawa discharges into the middle of Kawanoe Chiku.

Mishima Chiku consists of the small local harbor (formerly Mishima Ko), sheltered by breakwaters; Taio Dolphin Berth,

close NE; and Muromatsu Wharf, farther NE. East Wharf lies in the S part of the harbor.

A breakwater is situated at the NW end of East Wharf; a light is shown from the end of the breakwater at Sankawa, 1.5 miles WSW of East Wharf. A detached breakwater, from which a light is shown, is situated 0.5 mile seaward of Muromatsu Wharfs.

Winds—Weather.—The most frequent wind is W, followed by NE. North and S winds are the least frequent. As the harbor opens into Hiuchi Nada, the berthing of vessels alongside the wharf is difficult when there is a strong N wind.

Tides—Currents.—The mean tidal rise at Mishima is 3.7m at springs and 2.9m at neaps. The flood current flows SE, and the ebb current flows NE to SW, but does not constitute an obstacle to navigation.

Depths—Limitations.—There is a dolphin berth, with a depth of 9m alongside, projecting N from East Wharf.

Nishi Ko Wharf 1 (Kawaneo Chi-ku) has depths of 11.6 to 12m alongside the major part of its NE side. There is a least depth of 10.1m in the approach to the NE side of the wharf; however, close NE, a bank, with a least depth of 9.5m, fronts Nishi Ko Wharf 2.

Goten Iso, a fishing reef with a least depth of 7.9m, lies about 0.3 mile NW of the NW extremity of Nishi Ko Wharf 2.

Murumatsu Wharf has two berths on the outer part of its S side, with depths of 15m alongside.

Taio Dolphin Berth has depths of 9.5m alongside.

Okidai Wharf is 200m long, with a depth alongside of 3.5m.

Aspect.—Shiro Yama, 62m high, with a park, is conspicuous, S of the fishing harbor.

The smoke from the factories at Kawanoe and Iyo-Mishima is very visible from a distance.

A paper mill chimney, 186m high and painted red and white, is conspicuous on the S side of Murumatsu Wharf.

Pilotage.—Pilots are available from Sakaide with sufficient advance notice, when required. For further information, see paragraph 6.1.

Anchorage.—The quarantine anchorage is centered about 0.5 mile NW of Murumatsu Wharf; there are depths of 14 to 17.1m in the anchorage.

Niihama Ko (33°59'N., 133°17'E.)

World Port Index No. 62080

8.15 Niihama Ko is a specified harbor located near the middle of the S shore of Hiuchi Nada. The harbor is divided into Niihama Ku and Takihama Ku. Takahama Ku (Takahama Ko), the E part, is a timber harbor; Niihama Ku, the W part, is divided into Sections I to IV. The city of Niihama is a major industrial city, from metal and chemical industries, and mining.

Kokuryo Kawa flows into the sea about 1 mile E of the entrance to the inner harbor and considerable reclamation work has been carried out in the intervening area. A breakwater extends ENE from the E entrance point to Kokuryo Kawa.

Matsunoki, a small harbor constructed on reclaimed land, lies at the E entrance to Kokuryo Kawa. A detached breakwater lies 91m N of the harbor entrance from the NW end of which a light is shown.

Extensive piling work is being carried out along the shoreline between Matsunoki and Habu Saki, 1.5 miles ENE.

Winds—Weather.—Throughout the year, the most frequent winds are WSW and W, followed by ENE. North and S winds are least in frequency and velocity. Typhoons are blocked by a mountain range, with elevations of over 1,000m, which lies S of the harbor; it is reported that typhoons rarely affect the harbor. In strong N winds, swells enter the harbor, but it has no effect on the inner harbor.

Tides—Currents.—The mean tidal rise at Niihama is 3.5m at springs and 2.7m at neaps. The flood current flows E outside the breakwater and generally S inside the breakwater; the ebb current is the reverse. The current has velocity of 0.75 knot outside the breakwater and is weak inside the breakwater.

Depths—Limitations.—North Wharf, about 0.3 mile NE of the E breakwater at Niihama Ku (Section I), has a depth of 14m alongside and can accommodate vessels up to 50,000 gt and a 12.8m draft.

Berth K-6, about 0.5 mile ESE of the head of the E breakwater, can accommodate vessels up to 10,000 gt and a 9.2m draft. A berth on the W side of Section I, about 0.8 mile S of W breakwater, has a depth of 9.5m alongside. A least depth of 7.4m lead to the above berths.

Aspect.—Lighted buoys in Hiuchi Nada mark the approach to Niihama Ko from the NE. **O-jima** (34°00'N., 133°22'E.), 147m high and comparatively steep-to on its N side, forms the NE harbor limit of Takihama Ku.

Habu Saki, about 1.5 miles farther W, is marked by a light, and is surmounted by Habu Yama, 101m high, about 0.3 mile SE. The land S of Habu Yama is low and it appears as an island from a distance.

Kuro Shima, 49m high, lies about 1 mile ESE of Habu Saki. It was formerly an island, but has been extended W and S by reclamation and is now separated from the mainland SE only by a narrow channel. Its N and E sides are fringed with rocky ledges.

Two lighted buoys are moored 0.3 mile NW of Kareneko Hana, the N extremity of Kuro Shima, and mark the entrance channel to the inner harbor at Takihama Ku.

The large chimneys of the factories at Niihama Ku are good landmarks; at night the lights of the factories are visible from a distance. A chimney, 124m high, is conspicuous about 0.8 mile ESE of the head of the E breakwater; another chimney, 134m high, and painted red and white, is conspicuous about 0.8 mile S of the W breakwater.

With offshore winds, the breakwater lights may be difficult to distinguish due to smoke, but in these circumstances, the summit of Miyo Shima, 74m high and heavily wooded, is a good mark close W of the W breakwater.

Drying rocks extend about 0.2 mile W of **Nishiha Shima** (Saki) (33°58'N., 133°15'E.), in the NW part of Niihama Ku. Funagami Iwa (Hunagami Iwa), a rock drying 2.7m and marked by a light, lies about 0.5 mile W of Nishiha Shima.

In Takihama Ku, Kajikake, a submerged rock, marked NW by a lighted buoy, lies about 0.2 mile off the W side of O-jima. Farther SE, Nagaeno Iso, with a least depth of 2.2m, lies between O-jima and Kuro-jima. The NE side of Kuro-jima is bordered by rocky ledges.

Pilotage.—Pilotage is not compulsory but is recommended. There is a liaison office of the Naikai Pilotage Area Pilots Association at Niihama. Local harbor pilots are available with 48

hours advance notice.

Pilots can be contacted on VHF channels 12 and 16 (call sign: Nihama-ho-an).

The harbormaster can be contacted by radiotelephone regarding harbor operations.

For further information, see paragraph 6.1.

Anchorage.—The quarantine anchorage is centered about 0.8 mile NNE of the head of the E breakwater. Vessels loaded with dangerous cargo are assigned anchorages in Section III.

There is good anchorage, sheltered from S to W winds, in depths of 4.9 to 20m, mud, between O-jima and the coast of Takihama Ku.

Caution.—Caution is necessary to keep clear of submarine cables, a submerged water line, and oyster beds. There are seaweed cultivation grounds (September to April) around O-jima and NE of Kuro-jima.

8.16 Toyo Ko (33°56'N., 133°09'E.)**.—**Saijo Ko, about 4 miles W of Niihama Ko, and Nyugawa Ko, about 3 miles farther W, are subject to harbor regulations, but the extended harbor area, which includes both harbors, is the principal port of Toyo Ko.

Saijo Ko (Saizyo Ko), at the mouth of Honjin Kawa, can be recognized by a large number of chimneys and oil tanks of the factories and power stations on each side of the harbor. The harbor is sheltered by breakwaters. The channel into the harbor is about 68m wide, with depths of 3.1 to 4m. Lighted buoys mark the entrance to the channel, and lights, in line bearing 156°, at the head of the harbor, lead into the inner harbor. Two overhead power cables, the lower with a vertical clearance of 37m, span the harbor about 2 miles N of the range lights.

Several fish havens exist to the E of the range line. A lighted buoy is situated close to the range line 1.75 miles offshore, while a similar buoy is 1 mile farther E.

A wharf, on the E side of the mouth of Honjin Kawa, has depths of 3.1 to 4.9m alongside.

Nyugawa Ko is divided into two parts; the E part is called Chuo Chiku while the W part is called Nyugawa Chiku. There are factories, refineries, and a power station in Chuo Chiku, and a cotton factory in Nyugawa Ku.

Nyugawa Chiku is sheltered NW by a breakwater. A channel, with depths of 4 to 4.9m and marked by lighted buoys, lies close SE of the breakwater and leads to the inner harbor. A wharf, at the base of the breakwater, has a depth of 4.5m alongside.

Lighted buoys, about 1 mile ESE of the head of the breakwater at Nyugawa Chiku, mark the entrance to a channel, 4.9m deep, leading to the harbor at Chuo Chiku. The inner harbor has a dredged depth of 4.9m bordered by shoal ground. The power station, on the NW side of the inner harbor, has a conspicuous four-stack composite chimney, 183m high and painted red and white. The power station jetty has depths of 4.9m alongside; the oil jetty, close NE, has depths of 5.5m alongside.

Osaki Hana (33°59'N., 133°04'E.), about 3 miles NW of Toyo Ko, is a sloping point, high in its N part and low in its S part. The coast N of Osaki Hana consists of sandy beaches backed by mountains. Kasamatsu Yama, about 1.5 miles W of Osaki Hana, is 328m high, appears flat-topped from the E, but from the N, has the appearance of a dark, pointed summit.

Torii Ishi, a rock 4.4m high, lies about 410m E of the mouth of Sakurai Kawa, about 2 miles NNW of Osaki Hana.

Karako Yama, Heichi Shima, and other features farther N were described in paragraph 8.5 and paragraph 8.6, respectively, with Kurushima Kaikyo.

Islands and Dangers in the Approach to Fuku-yama Ko

8.17 Hashiri-jima (Hasiri Shima) (34°20'N., 133°26'E.), in the approach to Fukuyama Ko, lies about 1.3 miles NW of Uji Shima. Taka Yama, 180m high, its summit, lies in the SE part of the island. Kanayama Hana is the SE extremity of a small peninsula joined to the SE end of the island by a low isthmus. Kajiya Shima, 43m high to the tops of the trees, lies about 0.5 mile W of the N end of Hashiri-jima; a reef, with a rock drying 2.6m at its SE end, extends about 0.2 mile SE of Kajiya Shima. A fish haven is situated close to the SE point of the islet. Tako Zowai, a rock with a depth of 3.1m, lies about 0.1 mile N of Hashiri-jima.

Okino Hachikazano Se, an isolated group of rocks, with a depth of 13.7m and marked E by a lighted buoy, lies about 2 miles WSW of Hashiri-jima.

Hakama Shima, a flat-topped islet, 36m high, lies about 1 mile NE of the E end of Hashiri-jima. Towu, a rock, drying 2.1m, lies about 228m off the E coast of the islet.

Kong Ishi, a rock 2.7m high and marked by a light, lies about 1 mile NNW of the N end of Hashiri-jima; a depth of 2.1m lies close NE of the rock.

Shirodashi Iso, a rock nearly awash at lowest LW, lies about 1.5 miles ENE of Kono Ishi, near the entrance of the main fairway to Fukuyama Ko. A rock, with a depth of 9.2m and marked W by a lighted buoy, lies about 0.2 mile NW of Shirodashi Iso.

Sensui Shima (34°23'N., 133°24'E.), about 2.5 miles NW of Hashiri-jima, rises to a 159m high summit, on which there is a radio tower with a parabolic antenna. Tutsuji Shima, an islet, 25m high, lies about 0.2 mile E of the SE extremity of Sensui Shima.

Benten Shima, a rocky islet, 12.8m high, lies in the channel between Sensui Shima and **Tomo Ko** (34°23'N., 133°23'E.) (World Port Index No. 61610), close WSW. A three-story pagoda on its summit is illuminated at night and forms a good landmark.

A floating breakwater extending NNW-SSE lies about 0.1 mile NNW of Benten Shima. A lighted beacon is situated about 0.1 mile SSE of Benten Shima.

Submarine cables and a submarine water pipe extend WNW from Hashiri-jima to the vicinity of Sensui Shima and Tomo Ko.

A lighted buoy lies about 1.5 miles S of Sensui Shima.

Fish havens are situated and seaweed cultivation is carried out in the bay within 2 miles N of Sensui Shima.

Fukuyama Ko (34°26'N., 133°26'E.)

World Port Index No. 61605

8.18 Fukuyama Ko, a specified harbor, lies in the N part of Bingo Nada. The harbor is accessible to large vessels as a result of dredging, extensive reclamation, and the development of a steel tubes factory complex. The latter complex of factories and chimneys lies N and NW of the signal station. A

dredged channel, entered about 2 miles E of Sensui Shima, leads to the harbor. An overhead power cable, with a vertical clearance of 55m, spans the harbor. Further W, it is spanned by a bridge with a vertical clearance of about 13m. The city of **Fukuyama** (Huku-yama) (34°29'N., 133°22'E.) is a commercial city but is becoming more of an industrial city.

Tides—Currents.—The mean tidal rise at Fukuyama is 3.6m at springs and 2.7m at neaps. The tidal currents in the harbor are weak and do not affect harbor operations.

Depths—Limitations.—The main fairway, with a depth of about 16m and a width of about 300m, extends from about 2 miles E of Sensui Shima to the Raw Materials Wharf. The branch fairway branches off the main fairway near the signal station and leads to the Export Berths; it is about 300m wide, with depths of 10.1 to 11.9m.

Raw Materials Quay Berth A is 300m long, has a depth of 17.1m alongside, and can accommodate vessels up to 150,000 dwt; Berth B is 280m long, has a least depth of 16.5m alongside, and can accommodate vessels up to 100,000 dwt. **Raw Materials Wharf** Berth M, 250m long, and Berth L, 315m long, have depths of 17.1 to 18m and can accommodate vessels up to 200,000 dwt.

Kasaoka Wharf has depths of 10.1 to 11.3m alongside and can accommodate vessels up to 35,000 dwt.

Export Berth X and Export Berth Y have depths of 12.5 to 12.8m alongside. Export Berth 2 and Export Berth 3 have a depth of 13m alongside; these berths can accommodate vessels up to 35,000 dwt. Export Berth 1 has a depth of 11m and can accommodate vessels up to 20,000 dwt.

The dangers in the approach to the harbor were previously described in paragraph 8.17.

Aspect.—The islands in the harbor approach were previously described in paragraph 8.17.

Tsuganomaru Yama (34°27'N., 133°31'E.), in the middle of Kono Shima, is conspicuous from all directions; it is 302m high and has a TV tower on its summit.

Mi Saki, the W extremity of Kono Shima, is conspicuous due to its barren appearance.

Lighted buoys mark the fairways. Lights, in line bearing 000.5°, lead to the Raw Materials Wharf, and lights, in line bearing 300°, lead through the branch fairway to the vicinity of the Export Berths.

The signal station, painted white, lies at the SE end of the steel tubes works.

A group of chimneys is conspicuous in the steel tubes works. The highest chimney, 206m high and showing a flare, lies nearly 1 mile NNW of the signal station.

Miyazaki Yama, 155m high to the tops of the trees, is conspicuous on the right bank of the mouth of Ashida Kawa (Asida Kawa). Takamaru Yama, 129m high, with few trees, lies on the left bank of the mouth of Ashida Kawa.

Pilotage.—A liaison office of the Naikai Pilotage Area Pilots Association is situated at Fukuyama. A signal station is situated at the SE end of the steel tube works. The harbormaster can be contacted by radiotelephone regarding harbor operations. Anchorage and berthing signals are shown from the signal station. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques about other local or specific regulations.

Pilotage is compulsory on Tomogashima Suido, Bisan Suido, and Kurushima Strait for vessels over 10,000 gt. A vessel with an loa greater than 200m, is required to navigate in Bisan Seto and Kurushima Strait only in daylight. The Osaka pilot for Tomogashima Suido Berthing boards in position 34°10'N, 135°00'E. Inland sea pilot boards at either Wada Misaki or Sekisaki. Harbor pilots are available at the port anchorage; VHF channels 12, 14, and 16 are used.

For further information, see paragraph 6.1.

Anchorage.—The quarantine anchorage is centered about 1.8 miles E of Sensui Shima, about 1 mile SW of the main fairway entrance buoys.

Caution.—Vessels must use caution when anchoring due to the large amount of small vessel traffic between the lighted buoy S of Sensui Shima and **Shiraishi Seto** (34°25'N., 133°31'E.). The latter passage is described in paragraph 7.55.

A large number of islands lie between the NW part of Bingo Nada and NE part of Aki Nada. There is a large number of channels formed between the islands. Mihara Seto, the main passage, is used by many low speed large vessels, small vessels, and lighters under tow. The tidal currents are weaker than those in Kurushima Kaikyo, but the distance traveled is longer and more winding. In the channels between the islands, inter-island vessels run between Honshu and Shikoku, and large vessels enter and leave Onomichi-Itosaki Ko, Habu Ko, and Inokuchi Ko.

Fukuyama Ko to Mihara Seto

8.19 **Tsugara Shima** (34°22'N., 133°23'E.), a wooded islet, 15.8m high, lies about 0.5 mile offshore, about 1.3 miles WSW of the S end of Sensui Shima.

Aburo Sho, about 0.8 mile farther WSW, is a rock drying 0.6m and marked by a light.

Abutono Seto (34°22'N., 133°21'E.) is entered about 1 mile farther W, between Abu Saki, marked by a light, and Ta Shima, close W. Abutono Seto has strong tidal currents and should only be used by small vessels with local knowledge.

Ta Shima is divided into an E part and a W part by an isthmus. The summit of the island, 329m high, lies near the SW end of the island.

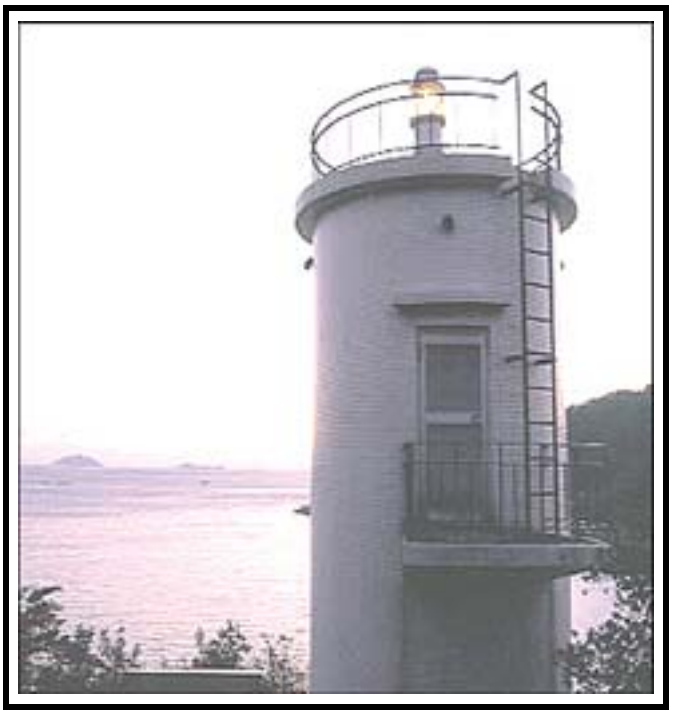
Yoko Shima lies close WSW of Ta Shima, from which it is separated by a narrow canal passable by small craft and crossed by a drawbridge. Ategi Shima, an islet, 25m high, barren, and with steep cliffs, lies close off the SW end of Yoko Shima and is conspicuous from a distance.

A tanker berth with a T-head pier extends S from the SW end of Yoko Shima; mooring buoys are on each side of the berth. There is a depth of about 10.1m in the berth, which can accommodate tankers up to 40,000 dwt. The berth is unsuitable during strong winds and heavy seas from the S. Vessels berth port side-to at SW with tug assistance. Night movements are not normally carried out. There are a number of oil tanks N of the pier, on the W side of Yoko Shima.

Pilotage.—See paragraph 6.1.

Mekari Seto and Approaches

8.20 The E entrance of Mihara Seto is called **Mekari Seto**



Abutono Seto Light

(34°21'N., 133°11'E.), between Mukai Shima and Inno Shima. The channel then extends W along the coast of Honshu, through Mihara Wan and Aogi Seto, and then between Omi Shima and Osaki-Kami Shima. It then joins the main traffic route at the W entrance to Kurushima Kaikyo, through Oge Seto, between Oge Shima and Ko-oge Shima.

Hyakkan-jima (34°18'N., 133°17'E.), previously described in paragraph 8.3, is the best mark for entering Mihara Seto.

The recommended route, N of Hyakkan-jima, has depths of about 10.1m. Bozino Su, close SW of the fairway, has depths of less than 10.1m and a least depth of 8.4m; it is about 1 mile wide and 1.5 miles long. Shoals, with depths of 8.9 to 9.5m, lie close N of the fairway.

Kannon Zaki (34°21'N., 133°13'E.), the SE extremity of Mukai Shima, is a steep, cliffy point, surmounted by a 57m high, red-colored bare hill. Takami Yama, about 1 mile NNW of Kannon Zaki, is 289m high, with a TV antenna near its summit; another TV antenna is on a 246m hill, close NE. Kota-kami Yama, about 1 mile W of Takami Yama, is 194m high, with a sharp peak, conspicuous from a distance.

Morinoseno Su, with depths of 1.8 to 4.9m, and marked NE by a lighted buoy, lies about 1 mile SE of Kannon Zaki. Shoal ground, with depths of 4.5 to 10.1m, extends from Morinoseno Su, WSW to Ategi Shima, and W to Tachibanano Su. Tachibanano Su, a shoal with a least depth of 5.6m, lies about 0.4 mile S of Kannon Zaki; shoal ground, with depths of less than 10.1m, and a least depth of 6.1m, extends between Tachibanano Su and Nagasowa Hana to its WNW. A lighted buoy is moored 0.2 mile SE of the shoal. A shoal depth of 5.6m lies approximately 0.5 mile SW of Kannon Zaki.

Ryuo San, covered with pine trees, with Ishiba Yama, a granite hill close W, lies about 0.3 mile N of Nagasowa Hana; each peak is 147m high and pointed.

Sasa Shima, a grassy round islet, 14.9m high, lies about 0.2 mile W of Nagasowa Hana.

Iwashi-jima, W of Mukai Shima, has several granite peaks; Nishiwa Take, 131m high and pointed, lies in the NW part of the island and is conspicuous from the W. Tono Yama, 117m high, lies in the SW part of the island.

8.21 Kajino Hana (34°20'N., 133°12'E.), a steep cliffy headland, lies on the NE side of Inno Shima, at the S side of the E entrance to Mekari Seto. Aka Ne, a steep-to rock with a least depth of 9.8m, lies about 0.5 mile NW of Kajino Hana; it has been swept to a depth of 9.5m. Matsui Dashi, an isolated rock with a depth of 9.5m, lies about 0.5 mile farther NW; it has been swept to a depth of 8.5m.

Ohama Saki, marked by a light, lies at the NE end of Inno Shima. Shiju Shima, an islet, 18m high, lies about 0.6 mile WNW of Ohama Saki; rocks, drying 1.5 and 1.1m, lie within 0.1 mile N of Shiju Shima. Shoals, with depths of less than 4.9m, lie between Shiju Shima and Hoso Shima to its WNW.

Ohama Saki Light

A bridge, with a vertical clearance of about 50m, crosses the narrowest part of Mekari Seto, close S of Ohama Saki. The center and each side of the fairway under the bridge are marked by lights.

Mekari Iwa is a group of rocks that fronts Mekari Hana, the SW extremity of Mukai Shima. The highest rock dries 1.3m and is marked SE by a lighted buoy.

Farther NW, Iedashi Ishi, a group of rocks, with a least depth of 4m, extends up to 0.2 mile off the S coast of Iwashi-jima.

Hoso Shima lies about 0.5 mile SW of Iwashi-jima. A jetty extends 120m SE from near the SW point of the island. Hosogashira, 50m high, lies at the NE end of the island, and is

surmounted by a red and white pylon, 82m high. An overhead cable, with a vertical clearance of 53m, extends between Hoso Shima and Iwashi-jima. Another overhead cable extends from the SE coast of Hoso Shima (34°21'48"N, 133°08'41"E.) to Inno Shima. A third overhead cable, with an overhead clearance of 32m, extends from the S tip of Hoso Shima to the N side of the island of Koboso (34°22'N, 123°08'E).

An overhead cable, with overhead clearance of 31m, spans Shigei Ko, the channel between the S tip of Koboso and Inno Shima.

Chodayu Sho, rocks with depths of less than 1.8m and marked by a light, lie about 0.3 mile WNW of the N end of Hoso Shima. A rock, with a depth of 3.7m, lies about 90m NNE of Chodayu Sho.

Kakari Se (Ko Kari Se), a group of rocks, with a width of about 91m and a least depth of 8.9m, lies near the middle of the channel, about 600m N of the N end of Hoso Shima. It has been swept to a depth of 8.2m, and there are eddies in its vicinity. Kakari Se is indicated by the red sector of Chodayu Sho Light between the bearings of 219° and 239°, and by a red light shown on Ohama Saki between the bearings of 125° and 130°.

A 10.8m patch lies about 0.3 mile WNW of the SW extremity of Iwashi Shima.

Ko-Sagi Shima Light

Mekari Seto to Aogi Seto

8.22 Hachiga Mine (34°23'N., 133°08'E.), 430m high and thickly covered with pine trees, lies on the E side of Mihara Wan, and is the highest peak in the vicinity.

Inuboeno Hana, the W entrance point of Mihara Wan, rises about 0.3 mile inland to Inubo Yama, 309m high, conical, and surmounted by an observation platform. Hata Yama, 448m high, about 0.5 mile SW of Inubo Yama, has a dome near its summit, and is also conspicuous. A radio tower lies close NE of the summit.

Hosono Su, a sandspit which dries 0.6m in places, is centered about 0.5 mile SW of Chodayu Sho; it is surrounded by foul ground. The red sector of Chodayu Sho Light indicates the foul area.

An extensive fish trap lies close off the N side of Honoso Su; a dangerous wreck lies about 0.3 mile NW of the same bank. A lighted buoy is moored 183m SSW of the dangerous wreck.

Sukune Shima, about 1 mile WSW of Chodayu Sho, is a conspicuous, rounded, dark islet, 30m high, and covered with pine trees. A shoal, with a depth of 4.6m, lies about 0.2 mile E of Sukuna Shima.

Ko-Sagi Shima, about 0.5 mile W of Sukune Shima, has two summits; the NE summit is 72m high and the SW summit is 76m high. A light is shown from the NW end of the island. A reef, with rock drying 2.1m at its outer end, extends about 90m N from the NW end of the island. Ko-Sagi Shima is separated from the NW end of Sagi Shima by a narrow channel, which should not be attempted without local knowledge.

An overhead power cable, with a vertical clearance of 34m, spans the narrow channel.

A light is shown from the S end of a detached breakwater, situated on the W side of Aogi Seto, 0.5 mile W of Ko-Sagi Shima. A second breakwater is situated 183m farther N.

Kankano Ishi, a rock with a depth of 12.8m, and Okino Ishi, a rock with a depth of 17.1m, lie about 0.8 mile NNW, and 0.25 mile NW, respectively, of the NW end of Ko-Sagi Shima.

Sunamino Su, with a least depth of 15m, is centered about 0.8 mile SSW of Ko-Sagi Shima.

8.23 Sagi Shima (34°20'N., 133°07'E.) lies close S of Ko-Sagi Shima. Hoteiiwa Hana, near the middle of the W side of the island, is surmounted by a conspicuous monument. A harbor, protected by a detached breakwater, is situated in the NE part of the island.

Toramaru Sho, which dries 1.2m and is marked by a light, lies about 0.1 mile NW of Hoteiiwa Hana. Yake Yama, the summit of the island, rises to an elevation of 278m, about 0.8 mile ESE of Hoteiiwa Hana. Inu Yama, about 0.4 mile farther N, is a sharp granite peak, 251m high. Tera Yama, a sharp conical peak, 155m high, is conspicuous in the NW part of the island.

The N extremity of **Kone Shima** (34°19'N., 133°05'E.), marked by a light, lies about 1 mile WSW of Hoteiiwa Hana. Two parallel ranges of hills running N-S are on Kone Shima. Kannon Yama, 310m high, the summit of the island, lies in its SW part.

Aogi Hana, rising to an elevation of 129m, lies about 0.6 mile N of Kone Shima. Uryu Shima, a red islet, 21m high, lies about 0.8 mile W of Aogi Hana. A gantry crane is conspicuous about 1 mile WSW of Uryu Shima. A two-story building is conspicuous on the E side of the shipyard. Kami-taka Se, a rock with a depth of 3.8m, and Shimo-taka Se, a rock with a depth of 12.2m, lie about 0.3 mile SE and SSE, respectively, of Uryu Shima. Depths of less than 4.9m extend about 0.5 mile SW of Uryu Shima.

Aogi Seto to Oge Seto

8.24 Otani Iso (34°18'N., 133°05'E.), with depths of 3.1 to

Sagi Shima Light

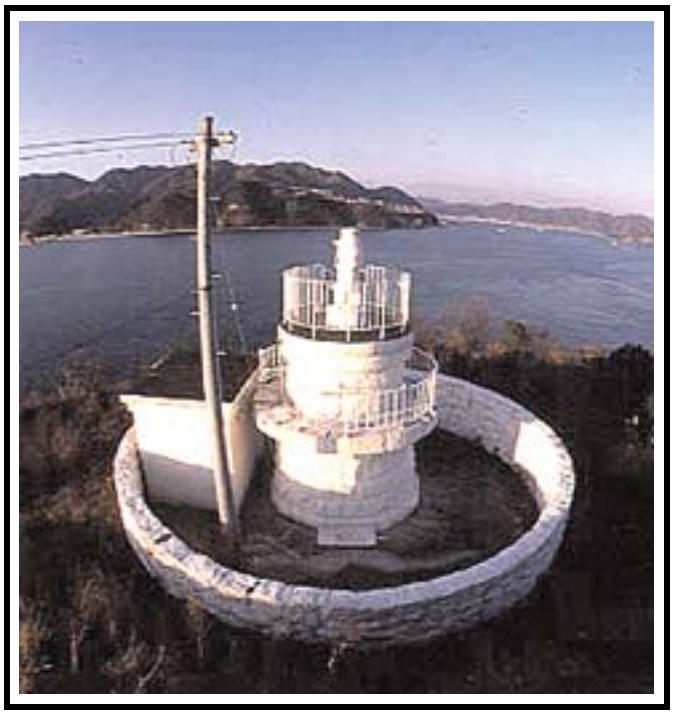
4.9m, sand and shells, is a detached shoal lying parallel with and within 0.5 mile of the W coast of Kone Shima. Depths of less than 10.1m extend up to 0.8 mile W of the central part of the W coast of Kone Shima.

Omi Shima, on the E side of Mihara Seto, is a large wooded island; it appears dark, but there are granite outcrops on the lower slopes of the hills in its S part. It is divided into three mountainous parts by valleys running SSE from the SE corner of **Mishima Uchi** (34°15'N., 132°59'E.), and ENE from Miyano Ura, at the head of Mishima Uchi. Kusono To, 395m high, lies in the N part of the island. Washigato Yama, 437m high and the summit of the island, lies about 2.8 miles farther SSE. Yakushi Yama, 436m high, lies in the SW part of the island.

8.25 **Miyanoura Ko** (34°15'N., 132°59'E.) lies at the inner end of Mishima Uchi. Depths of 4 to 6m may be found through most of the bay area and there is a floating jetty having depths alongside of 3.1 to 3.4m at the SE inner end.

Shiju Shima, a rocky islet, 11.9m high, lies about 0.1 mile offshore, off the N coast of Omi Shima.

O-kuno Shima (34°17'N., 133°00'E.) lies N of Omi Shima, leaving a navigable width of 0.3 mile in the channel. A light is shown from the S end of the island; a beacon is shown from a drying rock at the SE end of the island. Lights are shown from several towers standing at the jetty heads of the port complex



Kone Shima Light

near **Salzaki** (34°20'N., 33°02'E.). The summit of the island is 108m high, and a large red and white pylon for overhead cables, near the summit, is very conspicuous. There are also conspicuous pylons on the N coast of Omi Shima, on the S coast of O-kuno Shima, and on the Honshu coast N of O-kuno Shima.

Caution.—An overhead cable, with a vertical clearance of 50m, spans the channel to the S of O-kuno Shima; another cable, with a vertical clearance of 41m, spans the channel to the N. The pylons supporting these cables are prominent.

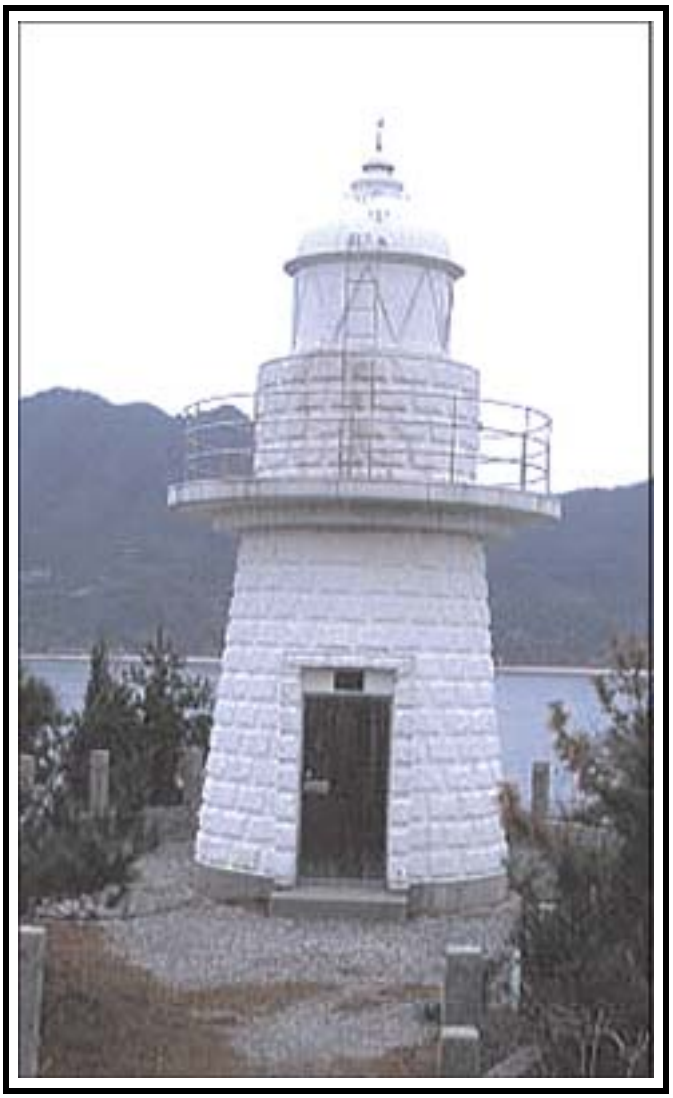
Noji Tai, a sand bank with depths of 1.4 to 4.9m and a width of about 0.1 mile, lies parallel to the coast and extends from a position about 1.8 miles ENE of O-kuno Shima to about 0.8 miles SW of Uryu Shima. A lighted buoy is moored at the SW end of Noji Tai; it is indicated by the red sector of O-kuno Shima Light.

Mekarino Su, a sand bank with depths of less than 10.1m and about 0.5 mile long, lies with its least depth of 4.7m at its E end, about 0.8 mile NE of O-kuno Shima.

8.26 Ko-kuno Shima, a round-topped islet, 84m high, lies about 0.4 mile W of O-kuno Shima. Shiraishi Sho, rocks drying 3.9m, lies between the islands. Matsu Shima, nearly 1 mile WSW of the S end of O-kuno Shima, has two summits, which appear as one from the SW.

Tadanoumi Ko (34°20'N., 133°00'E.), a local port, lies about 1 mile N of O-kuno Shima. Kurami Saki, on which there is a shrine surmounted by a red light, lies close E of the E breakwater at Tadanoumi Ko. Ushikuso, a rock drying 2m and marked by a beacon, lies about 0.3 mile SE of Kurami Saki.

Anchorage.—Anchorage can be taken, in 13 to 16m, in the bay fronting Tadanoumi Ko.



O-kuno Shima Light

8.27 Osaki-kami-jima, on the W side of Mihara Seto, attains an elevation of 453m at Kanno Mine, its summit, located about 1 mile NW of Nakano Hana, the SE extremity of the island. Kanno Mine has conspicuous woods on its summit. Nakano Hana is a steep cliff, marked by a light. A steep granite hill, 182m high, lies about 0.3 mile WNW of Nakano Hana. Oko Yama, a conical peak, 275m high, lies about 2.3 miles NNE of Kannon Mine.

Mebaru Saki, marked by a light, lies at the NE end of Osaki-kami-jima. A conspicuous cliff caused by quarrying lies in the central part of the E coast of the island; it affords temporary anchorage to small vessels awaiting a favorable tidal current through the straits.

Kodono Shima, 48m high, lies about 1 mile E of Mebaru Saki. A group of rocks, with a least depth of 4.6m and marked W by a lighted buoy, lies about 0.3 mile N of Kodono Shima, and a rock, 4.3m high, lies about 0.1 mile W of the islet. A rock, drying 0.6m, lies about 0.3 mile ENE of Kodono Shima, and a shoal, with a depth of 8.9m, lies about 0.3 mile farther NE.

Nakano Hana Light

Ko-yoko Shima, 56m high, lies about 1.5 miles SSW of Kodono Shima and is joined at LW to O-yoko Shima, close S. The latter island has two summits, the W being 86m high. The N end of O-yoko Shima is a wooded peninsula which appears as a separate islet from a distance. A shoal, with a least depth of 9.5m, lies about 0.6 mile S of O-yoko Shima.

Fuku Shima, 45m high, lies about 0.8 mile ENE of Nakano Hana. Shoal ground extends about 0.1 mile E of Fuku Shima and Kuro Iso, a rock awash at HWS, lies about 595m SE of the islet.

Chishago Sho, a rock drying 3.1m and marked by a beacon, lies about 410m N of Nakano Hana, and Kinoe Su, with a least depth of 9.5m, lies about 1 mile farther N.

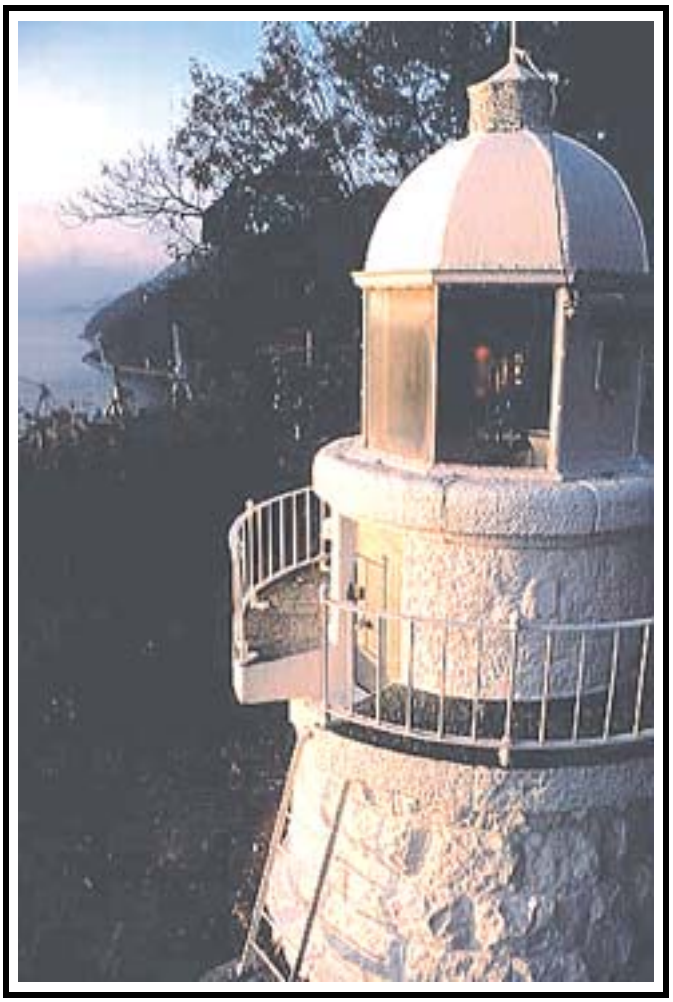
8.28 **Oge Shima** (34°11'N., 132°56'E.) lies on the E side of Oge Seto. Oishino Mine, 211m high, the summit of the island, lies in its N part; the interior of the island is under intensive cultivation. A peninsula, forming the SW side of Oge Shima, has steep black cliffs on its W side and is marked by a light.

Ko-oge Shima lies on the W side of Oge Seto, about 0.5 mile W of Oge Shima. Okinohera Mine, its summit, lies in the SW part of the island and is 133m high and conical. The island is composed of quartz and has been much quarried, especially on the S side of the summit, where a large white cliff, visible from a distance, has been formed.

Deep-draft vessels entering Mihara Seto from the E should choose a suitable tide due to the depths of 8.9 to 10.1m about 1.8 miles NW of Hyakkan-jima. Vessels entering the W entrance via Kurushima Kaikyo have general depths of 18m to Onomichi-Itozaki Ko.

Vessels in the vicinity of Ohama Saki should maintain nearly a mid-channel course, moving right when there is oncoming traffic.

There are channels on either side of Karkare Se but vessels other than deep-draft vessels pass safely over the shoal.



Mebaru Saki Light

Between Kone Shima and O-kuni Shima, Gobori Hana, the NW end of Omi Shima, in line bearing 238° with Oko Yama, in the N part of Osaki-Kami-jima, leads midway between Noji Tai and Otani Iso.

The two lights in the vicinity of Mebaru Saki, in line bearing 144°, are good marks for passing between O-kuno Shima and Omi Shima. Mekari Saki Light is on the slopes, and the front light is low and difficult to see when there are conflicting lights.

Onomichi-Itosaki Ko (34°23'N., 133°10'E.)

World Port Index No. 61630

8.29 Onomichi-Itosaki Ko is a specified harbor in the N part of Mihara Seto. The harbor includes Mihara Wan and Onomichi Seto. The harbor is backed by mountains and is a good natural harbor enclosed by a large number of islands, including Mukai Shima. It is an industrial belt, with many factories and some shipyards; there is frequently marine traffic congestion.

Large vessels enter and leave Onomichi Seto through the W entrance. The E entrance, N of Mukai Shima, is narrow and only used by small vessels with local knowledge. The area NW of Mukai Shima, and N of **Takoma Hana** (34°23'N., 133°15'E.), including Tosaki Seto, is part of Onomichi-Itosaki Ko.

Winds—Weather.—The climate is extremely mild, with little precipitation. Good weather prevails and a typhoon passing has little effect. Except for Mihara Wan, the winds are mostly NE and S in spring and summer, and NNE and W in winter. In Mihara Wan, the winds are predominantly S to W.

Tides—Currents.—The tidal rise at Onomichi is 3.4m at springs and 2.7m at neaps. In Onomichi Seto, the maximum velocity is about 2.8 knots; the flood current flows E, and the ebb W. In Mihara Wan, the mean velocity of the current is about 0.5 to 1 knot.

Depths—Limitations.—Itosaki Wharf No. 2, fronting the railway station at Itosaki, in the NE part of Mihara Wan, has a depth of 10m alongside and a length of 185m; it can accommodate vessels up to 15,000 dwt.

Itosaki Wharf No. 1 has a depth of 8.5m alongside and a length of 135m,; it can accommodate vessels up to 15,000 dwt. There is a private wharf, with a length of 205m, depths alongside of 4.5 to 7.5m, and a capacity of 10,000 dwt.

A wharf at Onomichi, about 2.3 miles ENE of Kujiro Shima, has a depth of 6.5m alongside and a length of 404m; it can accommodate vessels up to 2,000 gt.

A drydock at Onomichi is 350m long and 56m wide, with a depth of 7.4m; it can accommodate vessels up to 150,000 dwt.

Aspect.—Kujiro Shima, in the middle of the W entrance to Onomichi Seto, is 18.9m high, and wooded. Kokujira Shima, 11.9m high, lies close SE.

A cement plant chimney, 65m high, is conspicuous close W of the railway station at Itosaki.

A chimney, 63m high and showing a neon light, and with a large number of chimneys in the vicinity, lies on the SE side of the mouth of Nishi Kawa, the river emptying into the N part of Mihara Wan.

Pilotage.—Pilotage is not compulsory at Itozaki. Inland sea pilots are available at Wada Misaki, Seisaki, and Hesaki and can be contacted on VHF channels 12 and 16 (call sign: Itozaki-ho-an). For further information, see paragraph 6.1.

Pilotage is not compulsory at Onomichi. Harbor pilots are available at the anchorage off Kashima Island or off Kihara; VHF channels 16 and 12 are used.

Anchorage.—Mihara Wan provides sheltered anchorage for large and medium-sized vessels according to draft; the bottom is mud and sand in many places. To avoid the mud bank on the W side of Mi-hara Wan, keep the W side of Kone Shima, bearing more than 209° and open E of Aogi Hana. Vessels with dangerous cargo are assigned anchorage in the vicinity of the harbor limit at the W entrance to Onomichi Seto.

Caution.—The passage between Kujira Shima and Kokujira Shima is narrow and should not be used by large vessels; both islets are bordered by shoals. Passage should not be made between Kokujira Shima and Iwashi-jima, as there are rocks with depths of about 1m.

There is a shoal patch, with a least depth of 5.2m, mud, and swept to 4.4m, about 600m NE of Kujira Shima. Ushino Ura lies about 1.8 miles ENE of Kujira Shima and is marked by a light. A shoal patch, with a least depth of 4.7m, rough sand, and swept to 4.3m, lies about 0.3 mile W of Ushino Ura.

Onomichi Light

Approach to the East Entrance to Onomichi Seto (Mekari Seto to Tosaki Seto)

8.30 Nagamoji Sowa, a rock awash, lies at the extremity of a reef extending about 410m SW from the NW extremity of Yoko Shima.

Momo Shima (34°22'N., 133°16'E.), N of the W end of Yoko Shima, is 184m high, and consists of red-colored rocks; its W side is steep. Ka Shima (Ko Shima), about 0.5 mile W of Momo Shima, is 103m high, conical, and consists of broken red stones.

Shira Ishi, a rocky islet, 6.1m high, lies about 0.6 mile S of Ka Shima. A reef extends about 0.4 mile SW of Ka Shima; Okinotaka Sowa, a rock with a depth of 4m, lies at its outer end; Taka Sowa, a rock drying 0.2m, lies in the central part of the reef.

Niboneno Sho, midway between Ka Shima and Mukai Shima, is a group of rocks marked E by a lighted buoy; the W end of the group dries 2.4m while the E end dries 1.5m. Lights are shown from a breakwater on the E coast of Mukai Shima, 0.5 mile WNW of Niboneno Sho.

Takoma, rocks with a least depth of 4.5m and marked S by a lighted buoy, lies nearly in the middle of the S entrance to Tosaki Seto.

Ushino Ura Light

There are several channels between the islands separating Kurushima Kaikyo from Mihara Seto, but they are mostly narrow and intricate, and should not be attempted without local knowledge.

Habu Ko (34°17'N., 133°11'E.)

World Port Index No. 61617

8.31 Habu Ko, a local port, lies in the S part of Inno Shima. The harbor comprises all of Nagasaki Seto and the W side of the N part of Yuge Seto. The main industry of the port is shipbuilding; the main portion of the Hitachi Shipyard is situated in the S part of Inno Shima.

Winds—Weather.—The temperature is relatively high and there is little rainfall. The harbor, except for Mitsunosho Wan in its NE part, is calm throughout the year, as it is surrounded by islands.

Tides—Currents.—The flood current flows along the coast of Inno Shima, from Nagasaki Seto to the N entrance of Yugo Seto; the ebb current flows in the opposite direction. The maximum velocity of the tidal current at springs is 3.25 knots in Nagasaki Seto.

Depths—Limitations.—The largest drydock at the Hitachi Shipyard at Habu Ko is 282m long and 47m wide, with a depth

of 11.3m; it can accommodate vessels up to 130,000 dwt. A berthing wall in the NW part of the harbor can berth vessels of 20,000 dwt; the berths have reported depths of 4 to 10.1m.

Nagasaki Seto, occupying the W half of the harbor, has a least navigable width of about 90m. The N half is generally shallow, while the S half is generally over 10.1m deep, but with shoals in many places.

Rocks and shoals extend up to 0.2 mile off the N coast of Yuge Shima. A rock, with a depth of 4.9m, lies about 0.2 mile N of Isega Hana, the W extremity of Yuge Shima. In the S entrance to Yuge Seto, a rock with a depth of 1.8m, lies about 0.1 mile offshore, about 0.2 mile W of the S end of Yuge Shima; in the narrows of this same strait, rocks and shoals extending from both sides restrict the navigable width to about 0.1 mile.

Rocks, with depths of 4.9 to 5.8m, extend up to 410m N of Sa Shima.

A rock, with a depth of less than 1m and marked N by a lighted buoy, lies between **Isega Hana** (34°16'N., 133°12'E.) and Itsuki Shima, about 0.5 mile W.

There is a bridge, with a vertical clearance of about 24m, between Yuge Shima and Sa Shima, and an overhead cable, with a vertical clearance of 40m, between the N end of Sa Shima and Ikina Shima. There is also an overhead cable, with a vertical clearance of 30m, between the N end of Ikina Shima and Inno Shima.

A lighted beacon stands in shoal water close to the SW point of Ikina Shima. A submarine pipeline is also laid across the strait 0.2 mile N of the submarine cables. A light is shown from the end of a breakwater extending from the shoreline of Iwagi Shima, 0.5 mile farther N.

Aspect.—Tengu Yama (34°17'N., 133°11'E.), a conical mountain, 208m high, with a TV tower on its summit, is conspicuous in the S part of Inno Shima. Mi Yama, 326m high, the N summit of Yuge Shima, is also conspicuous.

A light (34°17.4'N., 133°10.5'E.) is shown from a white round concrete tower, 10m high, situated at the breakwater head on the NW side of the entrance to the principal harbor basin. A lighted buoy is moored about 0.2 mile off the N end of Yuge Shima.

When entering from the S entrance of Yuge Seto, Kushi Yama, 199m high and rather conical, the S summit of Yuge Shima, is conspicuous.

Pilotage.—See paragraph 6.1.

Anchorage.—Mitsunosho Wan, in the NE part of Habu Ko, is open E, but is relatively calm except in E winds; it provides anchorage, in 4.9 to 7m, in its outer part.

8.32 Setodo Ko (34°19'N., 133°06'E.), a local port entered from Mihara Seto, is enclosed by Kone Shima, Sagi Shima, and Ikuchi Shima. The main harbor installations lie on the E side of the channel between Ikuchi Shima and Kone Shima; a shipyard is situated at the NW end of Ikuchi Shima. A bridge, with a vertical clearance of about 22m, spans the channel between Kone Shima and Ikuchi Shima.

Tides—Currents.—The mean tidal rise at Setoda is 3.5m at springs and 2.7m at neaps. There are tidal currents of about 2.5 knots in the N entrance to the harbor, 2 knots in the E entrance, and 3.5 knots between Kone Shima and Ikuchi Shima.

Depths—Limitations.—The shipyard berthing wall has depths of 3.5 to 7m alongside. The largest drydock is 230m long and 36m wide, with a depth of 7m; it can accommodate vessels up to 37,000 dwt. A floating jetty, with a depth of 7m on its fairway side, lies on the E side of the channel between Kone Shima and Ikuchi Shima, and S of the bridge.

The channel between Sagi Shima and Kone Shima is used by scheduled passenger vessels and was reported to be used by vessels of 1,000 gt making use of the tide.

The channel between Sagi Shima and Ikuchi Shima is wide and deep, but there are many shoals E of the harbor limit; it is only used by small craft.

The channel between Kone Shima and Ikuchi Shima has depths of 3 to 7m and a least width of about 90m.

Pilotage.—The shipyard dockmaster is to report to the pilot when the vessel is to enter the shipyard. For further information, see paragraph 6.1

Hakata Seto

8.33 Hakata Seto leads from Mihara Seto to Bingo Nada, passing between Kone Shima and Omi Shima, then between Hakata Shima and Akahone-jima.

Hyotan Shima (34°17'N., 133°03'E.), an islet, 48m high, lies near the middle of the N entrance to Hakata Seto. Shoals, with least depths of 3.6m, lie about 1 mile ENE and NE of Hyotan Shima.

Tides—Currents.—The tidal currents are strongest in the vicinity of the S entrance to Hakata Seto. Between Tsuba Shima and Kubito-Ko Saki, at the E end of Hakata Shima, the maximum velocity at springs reaches 5 knots. Farther N, the current weakens, with a minimum velocity of about 2 knots. In general, the SE (flood) current is somewhat stronger than the NW current.

Kannon Yama, the summit of Ikuchi Shima, near the islands SW end, has twin peaks 475m and 478m high.

Tatara Iso, a rock marked by a light, lies about 0.2 mile ENE of Tatara Misaki (Tatara Saki), at the E end of Omi Shima. Rocks, awash and drying, extend about 320m N of Tatari Saki, and Chitori Ishi, a rock with a depth of 11.5m, lies about 686m N of the same point. The tidal currents are strong in this vicinity, attaining a maximum velocity of 4.5 knots.

Caution.—A bridge, with a vertical clearance of about 40m, crosses Hakata Seto between Omi Shima and Ikuti Shima, in the vicinity of Tatara Iso.

Gojno Taka, steep-to rocks, with a least depth of 5.9m, lie about 0.5 mile S of Gohammatsu Saki, at the S end of Ikuchi Shima.

Mukaiyama Misaki, 39m high, lies about 0.5 mile E of Gohammatsu Saki. Sato Sho, a rock with less than 1m, and Mekari Sho, a dangerous rock, lies about 0.3 and 0.8 mile ESE, respectively, of Mukaiyama Misaki; a rock, with a depth of 4.4m, lies about 0.1 mile S of Mekari Sho. A lighted beacon stands in shoal water 1 mile ENE of Mekari Sho. A second lighted beacon is situated 300m farther NE.

8.34 Sekizen Yama (34°15'N., 133°09'E.), the summit of Iwagi-jima, is 368m high, and has a ridge extending E-W; from the E or W, it appears as a sharp peak, but from the N or S, it appears to have a flat top.

Hoko San, 304m high and pointed, is the summit of Hakata-jima and is conspicuous in the middle of the W part of the island. Kanzai Dashi, a rock with a depth of 9.5m, lies about 0.3

mile NW of Tobyo Bana, the N extremity of Hakata-jima.

Kubito Saki, 38m high, lies at the E end of Hakata-jima; Kubito-Ko Shima (Kubagashira Shima), 17.1m high and conical, lies close off the point. Wanwan Se, a rock with a depth of 5.2m and marked N by a lighted buoy, lies at the outer end of a group of detached rocks, with depths of 4.9 to 6.7m, extending about 0.6 mile N of Kubito-Ko Shima.

Akahone-jima, SE of Iwagi Shima, has a 160m summit in its SE part. Depths of less than 4.9m extend up to 0.2 mile off the W side of Akahone-jima. Akahone-jima lies close SE of Iwagi Shima and is separated from it by a very narrow channel spanned by two overhead cables with a least vertical clearance of about 26m. A light is shown from a round, concrete tower standing 1 mile ENE of Mekari Sho. A beacon exhibiting a light stands about 5 miles WNW.

Iwagi Ko (34°14.5'N., 133°09.0'E.), protected by a breakwater, lies on the S side of Iwagi Shima. A light is shown on the head of the breakwater; another light is shown on the E side of the harbor. A detached breakwater has been constructed to the W of the harbor entrance.

Tsuba Shima divides the E entrance to Hakata Seto into N and S channels. The summit of the island, 88m high, lies near the S end of the island and is faced by a rocky cliff. An overhead cable, with a vertical clearance of 42m, crosses the S channel between Kubito Saki and Tsuba Shima. Overhead cables, with vertical clearances of about 32m and 40m, cross the narrow N channel between Tsuba Shima and Akahone-jima.

Inokuchi Ko

8.35 Inokuchi Ko (34°16'N., 133°03'E.), a local port, lies in the middle of the E side of Omi Shima. It is the site of an oil storage depot with a large number of oil tanks.

Tides—Currents.—The tidal current is fairly strong off the T-head pier, decreasing shoreward. The current flows parallel to the coast in the vicinity, but off the buoys, an offshore set may be experienced, especially marked with an ebb current. Seven tugs are available.

Depths—Limitations.—A T-head pier, with a berthing face of 71m, extends from the shore at Inokuchi Ko. It has depths of 9.5m alongside and can accommodate tankers up to 35,000 dwt. There are four mooring buoys N and S of the pier, which is floodlit. A smaller jetty lies about 0.3 mile farther NW.

Vessels normally berth heading into the current, port side-to on the flood and starboard side-to on the ebb. There is ample swinging room off the pier. One tug is sufficient for berthing and unberthing, but a powerful tug is necessary due to the current.

Aspect.—There are seaweed cultivation grounds (September to April) within about 300m offshore N and S of the T-head pier.

Hanagui Seto, branching off Hakata Seto, between Omi Shima and Hakata-jima, is S-shaped, with a minimum navigable width of about 90m. The tidal currents are strong and there are dangerous rocks in its narrowest part. A bridge, with a vertical clearance of 36m, crosses the narrowest part. An overhead power cable, with a vertical clearance of 35m, spans the channel close NE of the bridge. Hanaguri Seto is used by local ferries and small vessels, and should not be used without local knowledge and experience.

A light is shown from a round concrete tower standing on a rocky islet situated on the N side of the narrows.

Pilotage.—See paragraph 6.1.

8.36 Miyanokubo Seto, the passage between Hakata Shima and O Shima, is divided by **U Shima** (34°11'N., 133°05'E.), near its E end, into Funaore Seto and Kojin Seto. The latter passages have a least navigable width of about 90m and the tidal currents are very strong; they should be avoided by vessels without local knowledge and experience. The tidal currents at springs attain a maximum velocity of 9 knots. About 40 per cent of the small vessels, mostly under 500 gt, going through the Naikai use this passage, as it is shorter than going through Kurushima Kaikyo. The majority of the vessels generally use Funaore Seto, N of U Shima; care is necessary as there are many fishing vessels. A bridge, with a vertical clearance of about 23m, spans the W entrance to the narrows between O Shima and Michika Shima.

Yanagino Seto (34°18'N., 132°54'E.) is the channel between the various islands on the NW side of Osaki-Kami-jima and the Honshu coast. There is deep water and a least navigable width of about 0.5 mile. The E entrance is divided into Takasaki Seto and Karashima Seto.

Tides—Currents.—The maximum velocity of the tidal current at springs is about 2 knots. The E current flows for about 1 hour and 40 minutes after LW in the area to about 1 hour and 40 minutes after HW. The W current flows for about 1 hour and 40 minutes after HW in the area to about 1 hour and 40 minutes after LW.

Aba Shima (34°19'N., 132°58'E.), in the E entrance to Yanagino Seto, has two summits; the S summit is 100m high, and the N summit is 74m high and pointed. Depths of less than 10.1m extend up to 0.8 mile off the E side of the island. Mote Sho, with a least depth of 0.6m, lies about 0.5 mile SW of the NW end of Aba Shima. Dodono Sho, two rocks with depths of 3.5m and 3.9m, lie nearly midway between Mote Sho and the NW end of Aba Shima.

Takehara Ko lies at the mouth of a river about 1 mile W of Aba Shima. Mitsu Ishi, a steep-to, isolated reef, lies about 0.5 mile SSE of the head of the breakwater at Takehara Ko.

Anchorage.—Large vessels can anchor, in 15 to 17m, about 500m SW of the head of the breakwater at Takehara Ko. Lumber vessels of 10,000 gt are reported to anchor about 1 mile SW of the breakwater head, in 22m, sand and shell, good holding ground; it is a good anchorage, but it receives the countercurrent of the tidal current in Yanagino Seto, with a reported velocity up to 2 knots.

8.37 Ikari Shima (34°18'N., 132°53'E.), a rock, 8.1m high and marked by a light, lies about 2.5 miles SW of Takehara Ko. Shoal ground extends to the headland close N.

Islands lie in the entrances to Mitsu Wan and Mitsukuchi Wan. Aka Saki, the E entrance of Mitsu Wan, is a very conspicuous, steep, red headland. Karafune Shima, 25m high, lies about 0.3 mile SE of Aka Saki; a drying bank extends about 0.2 mile NE of the islet. Aino Shima, 32m high, and O-shiba Shima, 122m high, each covered with peach trees, lie about 1.5 miles W and 2 miles WSW, respectively, of Aka Saki. Ko-shiba Shima, close SW of the S end of O-shiba Shima, is 32m high, with a red cliff in its SW part. Uma Shima, 68m high, lies

about 0.5 mile farther WSW. Shimo-Ikari Iso, a rock, 2m high and marked by a light, lies about 0.3 mile SE of Uma Shima; a rock, with a depth of 8.9m, lies about 0.2 mile SW of Shimo-Ikari Iso.

Yoko Shima (34°14'N., 132°46'E.), a wooded islet, 36m high, lies about 1 mile SW of Uma Shima. A rock, 2.5m high, lies about 0.3 mile NE of the N end of Yoko Shima.

Sakumi Shima, 131m high, lies close off the NE end of Osaki-Kami-jima. Kara Shima lies about 0.8 mile farther NNE. Sakumini Mo, a mud bank with depths of 1.4 to 4.6m, lies about 0.2 mile N of Sakumi Shima. Sakumini Ishi, a steep-to rock with a depth of 4.6m, lies about 0.3 mile NW of Sagumini Mo. The S end of Matsu Shima, bearing 094°, and in line with **Jio San** (34°17'N., 133°01'E.) in the NE part of Omi Shima, leads about 137m N of Sagumini Ishi.

8.38 Ikuno Shima (Ikino Shima), a wooded island, lies close NW of the N end of Osaki-Kami Shima. It has two conspicuous wooded summits; the NW summit is 154m high, and the other is 159m high. A lighted buoy is moored close off the N end of the island.

Chirigi Shima, about 0.3 mile off the NW side of Ikuno Shima, has three hills joined by beaches of gravel; the central and highest hill is 37m high. A factory on the low ground in the N part of the island, and a large chimney on the summit of the island, are very conspicuous. A 3.1m patch lies about 0.3 mile W of the S hill.

Usu Shima, about 1 mile W of Ikuno Shima, has a 69m high summit near its N end. Ko-Usu Shima, 51m high, lies close E of the N part of Usu Shima.

Overhead power cables, with a vertical clearance of 44m, cross Yanagino Seto from the N extremity of Usu Shima. Overhead power cables, with a vertical clearance of 28m, cross the channel between Usu Shima and Naga Shima.

Naga Shima, about 0.6 mile SW of Usu Shima, has some red cliffs. Tsuzuki Shima, rocks, 6.7m high, lies about 0.4 mile W of the NW end of Naga Shima; groups of rocks lie between Tsuzuki Shima and the NW coast of Naga Shima.

A bridge, with a vertical clearance of 25m, is built across the channel between Osaki Kami Shima and Naga Shima. Bridge lights are shown to show the channel. Overhead power cables, with a least vertical clearance of 28m, span the channel close N of the bridge. An overhead power cable, with a vertical clearance of 40m, spans the channel between Osaki Kami Shima and Ikino Shima.

Tsukuga Shima (34°15'N., 133°00'E.), 47m high, is the W of the islands off the NW coast of Osaki-Kami Shima. A drying reef extends about 0.4 mile N of the island. A light is shown from the NW extremity of the reef.

Kuru Shima, 68m high, lies about 2.3 miles SW of Tsukuga Shima, and appears to have two summits when viewed from the E or W.

Caution.—There are many rocks, shoals, submarine pipelines, and obstructions between the islands off the NW side of Osaki-Kami Shima; passage between the islands, or between the islands and Osaki-Kami, should not be attempted without local knowledge.

8.39 **Neko Seto** (34°12'N., 132°40'E.) is the deep, narrow channel about 0.5 mile wide, with a depth of about 50m, between Shimo-kamagari-jima and the coast of Honshu. Its navigable width in its narrowest part is about 0.3 mile. An overhead cable, with a vertical clearance of 36m, crosses the channel.

Tides—Currents.—The turn of the tide at the W entrance, N of Shimo-kamagari-jima, occurs about the same time as in the central channel of Kurushima Kaikyo. The E current flows for about 1 hour 30 minutes after LW until about 1 hour 30 minutes after HW. The W current flows for about 1 hour 30 minutes after HW until about 1 hour 30 minutes after LW. The velocity of the current is about 0.5 times that in the central channel of Kurushima Kaikyo. The current velocity S of Kashiwa Shima is about 1.25 times that at the W entrance and the turn of the tide occurs about 30 minutes earlier; the maximum velocity of the current at springs here is 5.5 knots.

Aspect.—Meneko Shima (34°12'N., 132°51'E.), 21m high, with small trees and marked by a light at its SW end, lies at the narrow part of Neko Seto. A rock, with a depth of 4.9m, lies about 0.2 mile E of Meneko Shima.

Kashiwa Shima, 135m high and covered with dense dark woods, lies on the N side of the E entrance to Neko Seto, and is conspicuous against the background of grassy hills in the vicinity.

Kasane Iwa Light, about 1 mile W of Meneko Shima, is shown from the W entrance point of Nigata Wan.

Kami-Kamagari Shima and Shimo-Kamagari-jima, on the S side of the channel, have many orange groves; the mountains sweep down to their steep-to shores. A lighted buoy is moored close off the SW extremity of the island.

Nigata Ku (Nigata Wan), on the N side of Neko Seto, is part of Kure Ko. At the head of the bay there are several hotels. Nigata Ku provides anchorage, in depths of over 14m, good holding ground, but it is reported that wind and sea penetrate the bay during strong S winds.

There is a quay, with a reported depth of 5m alongside, in Nigata Ku which is used by a train ferry.

8.40 **Akashi Seto** (Akasi Seto) (34°12'N., 132°53'E.) is the channel between the S coast of Osaki-Kami Shima and Okamura-jima to the S. The fairway of the channel is deep; the narrowest part is about 0.4 mile wide. A beacon marks a rock, which dries 1.8m, about 0.5 mile NNW of the N extremity of Okamua-jima.

A light is shown on the head of a breakwater on the N side of Akashi Seto near its narrowest part.

Several submarine cables are laid across Akashi Seto.

Tides—Currents.—The turn of the tidal current is about 1 hour earlier than in the central channel of Kurushima Kaikyo. The E current flows for about 30 minutes after the time of local LW to about 30 minutes after the time of local HW. The W current flows for about 30 minutes after the time of local HW to about 30 minutes after the time of local LW. The maximum velocity of the current at springs is 2.25 knots.

Okamura-jima, close W of Ko-oge Shima, has two summits in line in its NW and central parts; Kono Mine, the central and highest, is 221m high.

The narrow channel between Ko-oge Shima and Okamura Shima has a depth of about 20m in its narrow part, and is crossed by an overhead cable, with a vertical clearance of about 27.1m.

8.41 Mitarai Seto (34°11'N., 132°52'E.) is the channel between Okamura Shima and Osaki-shimo Shima. O Shima, 99m high and marked by a light at its N end, lies in the N entrance. Hera Shima, 78m high, and Ko Shima, 79m high, lie close W and SE, respectively, of O Shima. Okino Su, with a depth of 3.4m, rock bottom, and steep-to on its E side, lies in the S entrance.

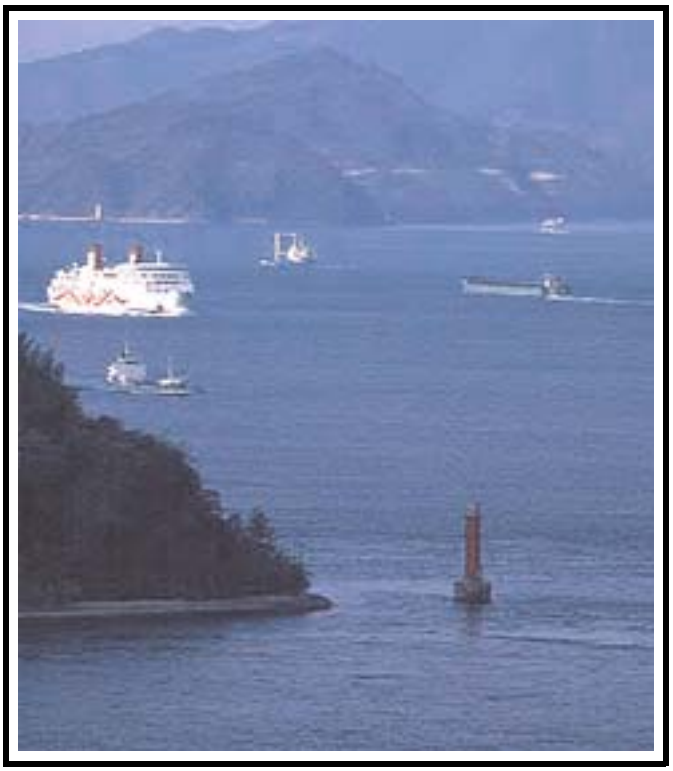
The Okamura-jima side of Mitarai Seto has depths of over 10.1m and is used by small ferries; it should not be attempted without local knowledge. Overhead cables, with vertical clearances of about 38m and 41m, cross Mitarai Seto.

Bridges, each with a vertical clearance of 21m, span the passages E and W of O Shima.

Mitarai Ko, a local harbor, occupies Mitarai Seto and the N coast of Osaka-shimo Shima. The main part of the harbor lies on the W side of the S part of Mitarai Seto. It is used by small vessels on passage through the Naikai as a port of shelter and for waiting for the tide.

Anchorage.—The tidal currents change direction continually in the vicinity of the S entrance to Mitarai Seto and it is not a good anchorage. A position about 500m W of Kannon Saki, the S extremity of Okamura-jima, is suitable as a temporary anchorage, in 20 to 30m, sand, good holding ground.

Okamura Ko, at the head of the bay on the SE side of Okamura Shima, is protected by breakwaters, but is only suitable for small craft. A light is shown from the head of the E breakwater.



O Shima Light

Osaki-Shimo Shima to Kami-Kamagari Shima

8.42 Osaki-shimo Shima (Osaki-simo Shima) (34°10'N., 132°50'E.) has a bare hill, with a double summit, at the E end of the island; its E slope descends to the town of Mitarai. Ippoji Yama, the flat summit of the island, attains an elevation of 449m, about 1 mile W of the E end of the island, and from it there is a gradual slope to steep cliffs at the W end of the island; the island is almost completely bordered by orange groves. Osaki-shimo Shima, E of Toyo Shima, is separated by a channel. The narrowest part of this channel is spanned by an overhead cable with a vertical clearance of 48m. In 1992, a bridge spanning the channel was under construction.

Mikado Shima (Sankaku-jima), 110m high, lies about 0.3 mile off the NW coast of Osaki-shimo Shima. Maru Ishi, a rock with a depth of 0.5m, lies about 0.1 mile NE of the N end of Mikado Shima.

The passage between Osaki-shimo Shima and Toyo Shima has a least navigable width of about 0.1 mile, with depths of over 20m. Nagaskai Garama, rocks with a depth of 10.7m, lie in the N entrance, about 90m W of the W end of Mikado Shima. A shoal, with a depth of 14.9m, lies about 0.3 mile farther SW. In the S entrance, Suzume Iso, a rocky islet, 6.7m high, lies about 0.2 mile W of the W extremity of Osaki-shimo Shima. Okino Ishi, a rock with a depth of 1.8m, lies about 0.2 mile SW of Suzume Iso.

The tidal currents are strong, attaining a maximum velocity of 6 knots at springs.

Caution.—An overhead cable, with a vertical clearance of 22.9m, runs between Osaki-shimo Shima and Mikdao Shima.

8.43 Toyo Shima (34°10'N., 132°47'E.) has N and S summits; the S summit is 309m high, pointed, and conspicuous. The island is covered with orange trees.

The passage between Toyo Shima and Kamikamagari Shima should not be attempted without local knowledge due to the strong currents and the dangers in the S approach. A bridge, with a vertical clearance of 50m, spans passage.

Ni Shima, 15.8m high and marked by a light, lies close off the NE extremity of Kami-kamagari Shima, in the N approach. Aka Ishi, a rock with a depth of 0.9m, lies about 0.4 mile NW of Ni Shima. Sasa-jima, 21m high, lies about 0.4 mile SE of Ni Shima; other islets, rocks, and shoals lie between Sasa-jima and the coast SW.

Okubi-jima, in the S approach, lies with its NE end about 0.2 mile S of the SW extremity of Toyo Shima. The island has three summits, the highest, 99m high, at its NE end. A 5.9m patch and a 6.9m patch lie about 0.3 mile NE and 0.2 mile N, respectively, of the NW end of Okubi-jima; a 2.7m patch lies close S of the latter patch.

Kamo Se, 15.8m high and marked by a light, lies about 0.3 mile SSW of the SW end of Okubi-jima; a rock, drying 2.1m, lies about 0.1 mile E of Kamo Se. Taishi Shima, 32m high and covered with pine trees, lies about 0.5 mile WNW of the NW end of Okubi-jima. Futamado Shima, about 14.9m high, lies on a drying reef, about 0.4 mile S of Taishi Shima; sunken rocks lie between Taishi Shima and the reef.

Kami-kamagari Shima (Kami-kamakari Shima), close W of Toyo Shima, is nearly covered with orange groves. Shichi-kokumi Yama, 457m high, the summit of the island, lies near the center of the island.

Kamagari Ko is a bay located in the middle of the N side of the island, with the town of Tado at its head. A light is shown

from the W extremity of a breakwater extending W into the bay.

Ko-matsu Shima lies about 0.4 mile off the middle of the N side of Kami-kamagari Shima. A 7.8m patch and a rock, with a depth of less than 1.8m, lies about 0.2 mile WNW, and 0.1 mile SE, respectively, of Ko-matsu Shima. O-matsu Shima lies about 0.2 mile ESE of Ko-matsu Shima; a rock, with a depth of less than 1.8m, lies about 0.1 mile S of O-matsu Shima.

Anchorage.—Temporary anchorage can be taken, in 10 to 20m, mud, off the side of Kami-kamagari Shima during NE winds.

8.44 Sannose Seto (34°11'N., 132°41'E.), the passage between Kami-kamagari Shima and Shimo-kamagari-jima, is only about 0.1 mile wide in its narrowest part. The passage should not be attempted without local knowledge.

An overhead cable, with a vertical clearance of about 33m, and a bridge, with a vertical clearance of about 22.9m, crosses the passage between Kami-kamagari Shima and Shimokamagari Shima.

Several fish havens, consisting of sunken hulks or concrete blocks, lie both in the N and S entrances to Sannose Seto.

Tides—Currents.—The turn of the tidal current is about 1 hour 15 minutes earlier than in Kurushima Kaikyo. The maximum velocity at springs reaches 6 knots.

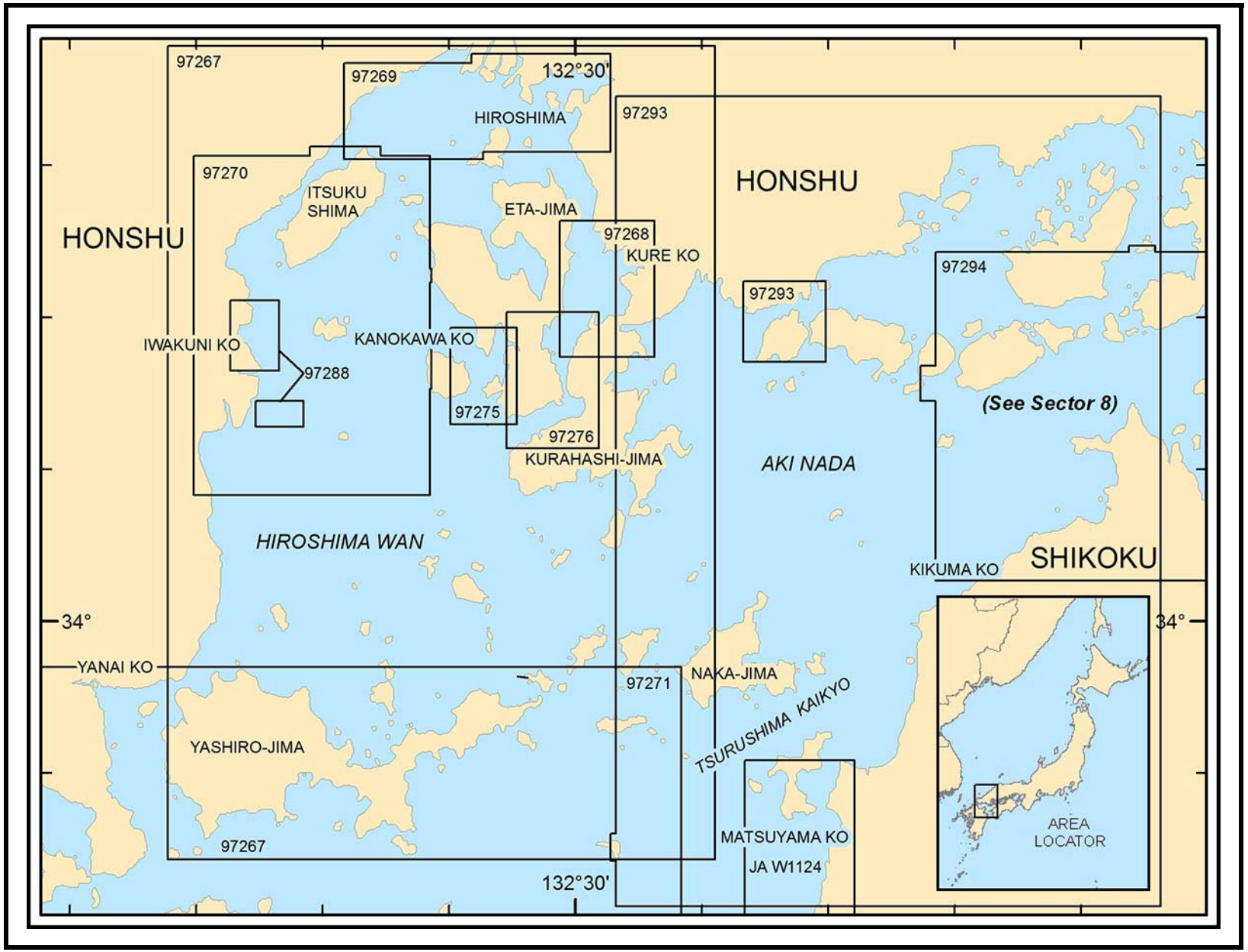
Aspect.—Ohira Yama (Taihei San) (Oitari Yama), 275m high, the summit of Shimo-kamagari-jima, lies nearly in its center. A shoal, with a least depth of 6.4m, extends about 0.3 mile SE from Shiro Saki, at the NE end of the island.

Ko-jima (Ko Shima), 20m high, lies in the S entrance to Sennose Seto, about 0.3 mile S of Kushi Saki, the SW extremity of Kami-kamagari Shima. Rocks and shoals extend about 0.1 mile N and 0.15 mile S of Ko-jima; a rock, 5.5m high, lies about 0.2 mile SSW of the islet.

Hikube Shima, a rock, 14.9m high, lies about 1 mile SSW of Ko-jima. Hira Iwa, a rock, 2.1m high, lies close W of Hikube Shima; a depth of 73m lies about 0.1 mile farther W. Okino Sone, with a depth of 9.2m, lies about 0.2 mile E of Hikube Shima.

Kami-kuro Shima, 83m high, is located about 0.4 mile SW of Hibuke Shima; depths of less than 10.1m extend about 0.4 mile SW of the island.

Shimo-kuro Shima, 102m high, is located about 0.4 mile W of Kami-kuro Shima. Otono Ishi, a rock with a depth of 4.5m, lies about 0.3 mile ESE of the SW extremity of Shimo-kuro Shima.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **9** — CHART INFORMATION

SECTOR 9

THE NAIKAI (INLAND SEA)—AKI NADA, TSURUSHIMA KAIKYO, AND HIROSHIMA WAN

Plan.—This sector describes, from E to W, the E and SE side of Aki Nada, from the vicinity of Kajitorino Hana on the mainland of Shikoku, SW to Matsuyama Ko, including the off-lying islands and dangers. The sector continues W to Obatake Seto, with a description of the islands and islets S of Hashira-jima Suido and then trends N along the coast to Hiroshima Ko, including Hiroshima Wan, Itsukushima Kaikyo, and Ono Seto. The sector concludes by going S to Hiro Wan, including the adjacent islands and straits.

General Remarks

9.1 Aki Nada lies W of Hiuchi Nada, NE of Iyo Nada, and E of Hiroshima Wan. The main routes shown on the charts lead SW through Aki Nada, from Kurushima Kaikyo to Tsurushima Kaikyo, the widest of several channels between Aki Nada and Iyo Nada.

Hiroshima Wan is the largest bay and lies W of Aki Nada and N of Iyo Nada. Hiroshima Ko and Kure Ko, at the head of the bay, are large important harbors. The port of Iwakuni Ko lies on the W side of Hiroshima Wan.

Tides—Currents.—In Aki Nada, in the area between the W entrance off Kurushima Kaikyo and the N entrance of Tsurishima Kaikyo, the tidal current has a tendency to set N during the flood tide and S during the ebb. At night or in thick weather, caution is necessary.

Between the vicinity of the W entrance of Kurushima Kaikyo and the vicinity of the islands of Ai-jima and Ko-Ai-jima, the flood tidal current sets NE from about 2 hours after LW by the shore until about 2 hours after HW. The ebb current sets SW from about 2 hours after HW until about 2 hours after LW. The change is about 30 minutes in advance of that in the W channel of Kurushima Kaikyo. Except close to the shore, the maximum velocity at springs is about 2 knots.

Although a cross-channel set is seldom experienced in Tsurishima Kaikyo, caution is necessary when the tidal current is at its maximum velocity of 3 to 3.5 knots.

In Kudako Suido, the tidal currents attain their greatest velocities of 5 to 6.5 knots in the W and E channels, respectively, of Kudako-jima. It is sometimes difficult or impossible for some vessels to maintain their headings in this area.

Tidal currents in Hiroshima Wan are weak, being about 0.5 knot, and the general set is in a N and S direction. In the narrow passages between the smaller islands, the velocity is about 1 to 2 knots. The direction and velocity vary considerably from day to day.

Aki Nada—East Part—Shikoku Coast

9.2 Between **Kajitorino Hana** (34°07'N., 132°54'E.) and Kikuma Ko, about 6 miles to the SW, lies the NW coast of Shikoku, which forms the SE side of Aki Nada. The coast in this area consists of a number of small bays and coves backed by rolling hills and mountains. Most dangers between the two points lie within 1 mile of the coast. Kajitorino Hana is marked by a light.

A terminal for oil and LPG tankers is situated about 0.7 mile E of Kajitori Hana. A T-head jetty at the center of the terminal can accommodate oil tankers of up to 125,000 dwt, or LPG tankers of up to 67,000 dwt. Berth No. 1, Berth No. 2, and Berth No. 3, to the W of the T-head jetty, can accommodate tankers of between 3,000 and 6,500 dwt. Berth No. 4, Berth No. 5, and Berth No. 6, to the E, can accommodate tankers between 3,500 and 10,000 dwt. Lights are shown from the T-head jetty and from the outermost E and W dolphins. Berthing is carried out in daylight when the current is nearly slack. Two to four tugs are required, depending on the size of vessel.

Obe Wan (34°06'N., 132°54'E.) indents the coast to the E, between the projection of which Kajitorino Hana is the extremity and Suwano Hana, a point about 3 miles to the S. The town of Obe stands on the NE shore of the bay. A shoal, with depths of 10.4 to 11.0m, lies to the middle of the bay.

Anchorage.—Obe Wan is open W, but affords good anchorage, in depths of 11 to 14.6m, mud, with Mi Saki, a point on the N side of the entrance to the bay, bearing 315° and Ke Shima, an islet 2.75 miles S of Kajitorino Hana, bearing 225°.

Itsuki-jima lies 5 miles to the W of Kajitorino Hana and is a good landmark for vessels transiting Aki Nada. Shira Ishi, two prominent rocks, lie about 2.5 miles SW of the summit on Itsuki-jima.

Aji Iwa (34°04'N., 132°51'E.), with a depth of 2m, lies 1.5 miles WSW of Ke Shima. The rock is marked by a lighted buoy moored 0.1 mile off its NNE side. A shoal, with a least depth of 5.8m, lies 0.3 mile W of Aji Iwa, and is marked on its SW side by a lighted buoy.

Kikuma Ko (34°02'N., 132°50'E.)

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9.3 Kikuma Ko is a harbor subjected to immigration and harbor regulations; it is located about 4.5 miles SW of Obe Wan. The inner harbor is protected by a breakwater. The town of Kikuma stands on the E side of the harbor.

Winds—Weather.—Throughout the year the wind is generally from the NE and is very strong at times. Small vessels generally seek shelter in the inner part of the harbor during strong NE winds.

Depths—Limitations.— Kikuma Ko Tanker Port is situated about 1.3 miles NE of Kikuma Ko Breakwater. The port consists of a dolphin berth connected to the shore by a jetty and a sea berth made up of mooring buoys. Depths at the dolphin berth are from 15.5m alongside; depths at the sea berth are from 20 to 30m. The berths cannot be used during heavy weather. Vessels usually berth on the flood and lie heading SW. The port is capable of handling tankers up to 280m in length and 125,000 dwt.

There is a pier in Kikuma Ko outer harbor, with depths of up

to 4.5m alongside.

A submarine pipeline is laid from the sea berth SSE to the shore. Reclamation is being carried out SE of the landfall of the pipeline.

Aspect.—There are three tall television towers on a hill ESE of the breakwater that serve as a good mark when entering the harbor. A light is shown from the breakwater.

Numerous tanks and chimneys stand near the oil terminal. At night, the lights of the terminal may be seen for a considerable distance.

Pilotage.—Pilotage is not compulsory, but the Naikai Pilot Service will provide a pilot. The pilot is obtained at the port of Kure Ko.

Anchorage.—Anchorage may be found about 0.3 mile W of the oil sea berth, in depths of 15 to 30m. The holding ground is good, but the current offshore is very strong.

The outer harbor of Kikuma Ko affords anchorage with good holding ground, but it is unsafe in the face of strong NE winds. During winter months, strong NW winds prevail.

9.4 **Matsuga Saki** (34°02'N., 132°50'E.) lies about 0.5 mile SW of the breakwater head at Kikuma Ko. The point is closely fringed by a reef and foul ground.

Senbagazake Hana lies about 1.5 miles SW of Matsuga Saki and appears as a dark and precipitous point. The point is easily distinguished as it is in marked contrast with the other light gray points in the vicinity.

Shiode Iso (34°01'N., 132°48'E.), 0.9m high and surrounded by rocks that dry, lies on the extremity of a shallow spit that extends about 0.5 mile N from the shore, and 0.75 mile W of Senbagazake Han. A light is shown from Shiode Iso.

Hazumano Hana is a prominent salient point, about 1.5 miles SW of Shiode Iso. Strong tide rips form close off the point. A light is shown from Hazumano Hana.

Ka Shima (33°58'N., 132°46'E.), a round-topped thickly-wooded islet, lies 1.5 miles S of Hazumano Hana, and 0.25 mile W of the entrance to the port of Hojo Ko. Ko-Ka Shima, a small islet, Gyokurikandori Iwa, a group of rocks, and Chigiri Iwa, a rock, all lie within 0.5 mile WSW of Ka Shima. A light is shown from the head of the breakwater at the NE point of Ka Shima. An overhead cable joins the islet to the coast.

9.5 **Hojo Ko** (33°58'N., 132°46'E.) is a local harbor located about 1.5 miles S of Hazumano Hana. There is a floating jetty at the inner end of the inner harbor, with a depth of 2.4 to 3.1m alongside. The town of Hojo lies E of the harbor. The harbor is protected by a N and S breakwater, and a light is shown from the head of the N breakwater.

Horie Wan is the S part of the bight which lies between Hazumano Hana and Shiraishi Bana. The open bay is exposed to winds from the N and W. The mouth of the Kuma Kawa, which dries, flows into the S side of the bay.

Anchorage.—The bay affords good anchorage, except when the winds are from W to N, in 12.8m, with Tsumuri Zaki, the NE extremity of Gogo Shima, bearing 293°, distant about 2 miles.

Temporary anchorage, in depths of 11 to 16m, can be taken with Tsumuri Zake bearing 262°, distant about 2 to 2.75 miles.

Caution.—Care is necessary to avoid the shallow water dangers when entering the bay and the submarine cables near the mouth of the Kuma Gawa.

9.6 **Horie Ko** (33°54'N., 132°45'E.) lies on the SE side of Horie Wan and is protected by an off-lying breakwater showing a light on its SW end. A second breakwater, also showing a light, lies on the E side of the harbor. The depths in the main part of the harbor range from 4 to 7m.

There is a floating jetty in the port, which can berth two vessels of the 1,000 gt class at the inner end.

A light is shown from a white tower on the N breakwater head at Yanigihara, a small harbor 3 miles NNE of Horie Ko.

Takahama Seto (Shijushima Seto) (33°53'N., 132°42'E.) is the strait between Gogo Shima and the mainland coast of Shikoku. The N entrance to the strait lies between Ken Saki, the E extremity of Gogo Shima, and Shiraishi Bana, on the mainland. The S entrance lies between Kuro Saki, the SE extremity of Gogo Shima, and Shiju Shima, 1.5 miles S of Shiraishi Bana.

Tides—Currents.—The maximum rate attained is about 2.5 knots, but both the rate and direction of the current vary considerably from time to time due to the diurnal inequality and to wind currents.

Depths—Limitations.—Mid-channel depths are deep in Shijushima Seto, which has a least navigable width of about 0.3 mile at the S entrance between Kuro Saki and Shiju Shima. A 5.2m shoal lies 0.5 mile S of Kuro Saki and is marked on its W side by a lighted buoy.

Matsuyama Ko (33°51'N., 132°42'E.)

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9.7 The port of Matsuyama Ko (Mitsuhama Ko) lies on the E side of the S approach to Shijushima Seto (Takahama Seto) Seto. The small harbors of Nishi-Habu Hakuchi, Taka-hama Ko, and Matsuyama Kanko Hakuchi, which form part of the port, lie 2.5 miles S, 1.25 miles N, and 2 miles N, respectively, of the main harbor. The main harbor is divided into an inner harbor and an outer harbor. The port has anchorage and berthing facilities for large vessels.

Winds—Weather.—The wind is mostly from the NW and strongest from February to April. The areas within the breakwaters are sheltered from wind and sea. The weather is generally clear, except during June and July, when dense fog may be encountered.

Depths—Limitations.—The controlling depth in the channel is 10.9m. The outer harbor has six main berths up to 400m long, with depths alongside of 7.4 to 13.1m. Generally, tanker vessels up to 50,000 dwt, 240m in length, and 12m draft can be handled alongside. Cargo vessels of 26,500 dwt, 170m in length, and 10.3m draft can be accommodated. The inner harbor has depths of 4m.

Pilotage.—Naikai Pilot Service provides pilots for the port through the pilot station at Kure. Pilotage is not compulsory but is advisable for vessels without local knowledge.

An aircraft approach area as shown on the chart lies in the S entrance to Takahama Seto. Mariners approaching Matsuyama Ko through this area should exercise caution, maintaining a distance from the shore, depending on masthead height, at least

as great as that given in the following table:

Distance offshore	Masthead height
400m	15m
800m	23m
1,200m	31m
1,600m	39m
2,000m	47m
2,500m	57m
2,950m	66m

Anchorage.—Anchorage can be obtained, in a depth of about 14.6m, sand, about 0.3 mile WNW of the head of the inner breakwater. In winter, when strong W winds blow, vessels find it best to anchor off Tomari.

A quarantine anchorage is situated 1 mile W of the root of the outer breakwater.

Caution.—Unexploded ordnance lies approximately in position 33°50.6'N, 132°41.8'E; anchorage is prohibited in this vicinity.

Islands in the South and Southwest Part of Aki Nada

9.8 Gogo Shima (33°54'N., 132°41'E.) lies 0.8 mile W of Shiraishi Bana and forms the W side of Shijushima Seto. The NW side of the island forms the S side of Tsurushima Kaikyo, and the SW side of the island forms the E side of Ko Seto.

The island is mostly hilly, with Ko Fuji, its conspicuous summit, located on the S side. The shores of Gogo Shima are very irregular, being indented and mostly fringed with reefs. Tsumuri Zaki, the NE extremity, shows a light.

Maytsuyama—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Outer Harbor No. 2 Wharf						
No. 1	300m	4.5m	—	—	—	—
No. 2	180m	5.5m	—	—	—	—
No. 3	390m	7.5m	—	—	—	—
Outer Harbor No. 1 Wharf						
No. 1	237m	6.5m	—	—	—	—
No. 2	370m	10.0m	—	9.0m	10,000 dwt	General cargo and cement.
Okaga Wharf						
No. 1	180m	4.5m	—	—	—	—
No. 2	200m	4.5m	—	—	—	—
No. 3	90m	4.5m	—	—	—	—
Outer Harbor New Wharf No. 1						
No. 1	170m	10.0m	—	—	—	Containers.
Okaga Wharf						
No. 1	200m	4.5m	—	—	—	—
No. 2	180m	4.5m	—	—	—	—
No. 3	90m	4.5m	—	—	—	—
Outer Harbor New Wharf						
No. 1	170m	10.0m	—	—	—	Coal.
Yoshidadama Quay						
No.1	270m	5.5m	—	—	—	—
No. 2	180m	5.5m	—	—	—	—
Habu Quay						
No. 3	272m	5.5m	—	—	—	—

Maytsuyama—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
No. 4	370m	10.0m	—	10.0m	16,000 dwt	Breakbulk.
Ubemitsubishi Cement Terminal						
Cement Berth	175m	—	—	—	—	Cement.
Tanker Berths						
Outer Harbor New Wharf						
No. 2	130m	7.5m	—	—	—	LPG.
No. 3	130m	7.5m	—	—	—	—
No. 4	130m	7.5m	—	—	—	Chemicals.
Cosmo						
Cosmo Berth	400m	12.0m	220m	10.9m	—	—
Wharf No. 2	130m	7.5m	—	—	—	CPP.
Wharf No. 3	130m	7.5m	—	—	—	—
Wharf No. 4	130m	7.5m	—	—	—	Chemicals.

Washigasu Wan, located on the W side of the island, affords good anchorage, in 11.9m, about 0.2 mile WNW of Kamose Shima, a small islet in the bay. The bay is sheltered from winds from the N through E to SE.

Yuraa Wan indents the E side of Gogo Shima and forms the W side of Shijushima Seto. The villages of Yura and Monda lie on the N side of the bay.

Tsuru Shima lies about 1 mile W of Washigasu Wan and forms the W side of Ko Seto. Shoal depths of 5.5m and less surround and lie within 0.1 mile of the shore on its NW side. A light is shown from the NW side of the island; a racon is located at the light.

Tsurushima Kaikyo (33°56'N., 132°39'E.) is the widest of a number of deep-water channels that connect Aki Nada and Iyo Nada. Its narrowest part has a least width of 1.5 miles and lies between Ho Zaki, the SE extremity of Muzuki-jima, and Kotohiki Han, the N end of Gogo Shima.

The depths in Tsurushima Kaikyo are deep and there are no known dangers on or close to the main charted track.

Nokutsuna-jima is located on the N side of the NE entrance to Tsurushima Kaikyo, about 2.5 miles N of Kotohiki Hana. The summit of the island is a bare hill of reddish-brown color. Shoal depths of 1.8 to 5.5m surround the island, and a depth of 12.8m lies 0.75 mile N of its N extremity. Tano Shima, a small islet, lies close off the NE extremity of Nokutsuna-jima. A light is shown from Ushigakuchi Hana, the SE extremity of the island.

Muzuki-jima (33°58'N., 132°40'E.) lies about 0.5 mile W of Nokutsuna-jima and forms the W side of Imoko Seto, the strait between the two islands. The village of Muzuki lies at the head of a bight on the S side of the island. Imoko Shima, a steep-to islet, lies midway between Muzuki-jima and Nokutsuna-jima, in Imoko Seto.

Anchorage.—Anchorage can be obtained off Tomari, opposite Takahama Ko, in a depth of 33m, about 0.3 mile offshore.

Naka-Jima

9.9 Naka-Jima (33°58'N., 132°37'E.), with its SE extremity lying close W of Muzuki-jima and are connected to each other by an overhead cable, with a clearance of 23.8m. The NW side of the island forms the E side of Kudako Suido, and the W side of the island forms the E side of Heyano Seto. The S coast lies N of the W entrance to Tsurushima Kaikyo.

Tobino Hana, a promontory, is located about the middle of the NW side of Naka-jima. A light is shown from a red tower on the breakwater head of a small harbor 0.4 mile S of Tobino Hana.

The island is mostly mountainous, with Osato Yama, its summit, rising in about the middle of the island. The coastline of Naka-jima is indented with coves and bays, most of which are shallow but are suitable as a refuge for small craft.

Uta Zaki, the N extremity of the island, shows a light, as does Shirono Hana, the SW extremity. Aka Saki, the S extremity of the island, forms the W side of a bight, suitable as an anchorage, with a depths of 11 to 16.5m.

Taka Shima is a small islet close off the S coast of Naka-jima; it forms the E end of the above-mentioned bight. The islet has two high points of nearly equal height and appears as two islets when observed from a distance. Tono Shima, a rocky islet, lies almost 0.5 mile SE of Taka Shima.

Fuguri Iwa, a black detached rock, 2m high, lies 0.5 mile SSE of Aka Saki. The top of the rock is white and conspicuous. The rock is marked on its SE side by a lighted beacon.

9.10 Ai-jima (34°04'N., 132°43'E.) lies 4 miles NE of Uta Zaki, the N extremity of Naka-jima. Shallow depths surround the island within 0.1 mile of the shore, which is fringed by reefs. A light is shown from the SE side of the island.

Temporary anchorage is afforded small vessels in the shallow bight which indents the S side of Ai-jima.

Ko-Ai-jima, a reef fringed islet, is densely wooded and lies about 1.3 miles SE of Ai-jima. Except for the S side, shoal depths lie within 0.15 mile of the islet's shore.

O-tateba-jima (34°02'N., 132°35'E.), 108m high and covered with brush, lies about 6.5 miles SW of Ai-jima. The island should not be approached within 0.1 mile, as it is fringed by shoals. Ko-tateba-jima lies about 0.3 mile NE of O-tateba-jima; the channel between the two islands is shoal.

Shira Ishi lies about 1.8 miles W of O-tateba-jima, and is comprised of three above-water rocks that lie on a reef. The W rock is 9m high and white. The reef runs N and S for about 0.3 mile; a light is shown from the N rock.

Kudako Suido

9.11 **Kudako Suido** (33°59'N., 132°35'E.), the strait lying between Naka-jima and Nuwa-jima, forms a deep-water channel that connects Aki Nada with Iyo Nada. Judako Shima, an islet, lies in the middle of the strait and shows a light.

Heyano Seto, the narrowest part of Kudako Suido, lies between Kudako Shima and Shirono Hana, the W extremity of Naka-jima.

The depths in Kudako Suido are deep, with the exception of Hokko Ku Iwa, with a depth of 1m lying about 0.5 mile SSW of Kudako Shima. Yoko Se, with a depth of about 14.6m, lies about 0.2 mile N of Hokkoku Iwa. The charted track through the straits is free of dangers.

Caution.—The traffic through Kudako Suido is very heavy and particular care is needed at its N and S entrances, where traffic meets from a number of directions.

Islands to the West and South of Kudako Suido

9.12 **Nuwa-jima** (33°59'N., 132°33'E.) lies about 1.3 miles W of Naka-jima; the E side of Nuwa-jima faces Kudako Suido and the W extremity of the island lies on the E side of Nuwashima Suido. The hills on Nuwa-jima are almost of equal height, thus making its summit hard to identify.

A light is shown from Kazakiri Hana, the NE extremity of Nuwa-jima; a lighted buoy is moored in the N approach to Nuwashima Suido, marking foul ground, close off the NW extremity of Nuwa-jima.

Tsuwaji Shima lies on the W side of Nuwashima Suido, with its NE extremity joined to the NW extremity of Nuwa-jima by an overhead cable, with a clearance of 40m. The village of Tsuwaji lies in a bight on the E side of the island; small vessels with local knowledge are afforded shelter in the bight. Abutatori Se, a small islet, lies close off the SE side of Tsuwaji Shima and is marked by a light.

Moro Shima (33°57'N., 132°30'E.), a round top island, thickly covered with coarse grass, lies 0.5 mile S off Tsuwaji Shima. The island forms the SE side of Moroshima Suido. Nenashi Sho, a small island, lies about 0.5 mile SE of Moro Shima and is marked by a light.

Futago Shima, consisting of two islets joined by a shoal, forms the N side of Futago Seto, which lies about 1 mile E of Nenashi Sho. The S side of Futago Seto is formed by Futagami-jima, about 1.3 miles S of Futago Shima. The islands of Yoko Shima, Naka Shima, and Koichi Shima lie in a NW-SE direction, about 2 miles SE of the E end of Futagami-jima. Koichi Shima, the S and highest island, shows a light from its SE end.

Kamose Shima (33°55'N., 132°32'E.), a small islet, lies about 0.5 mile S of the S coast of Futagami-jima. Kamoseno Okino is a steep-to detached rock, with a depth of 9.2m, lying about 0.3 mile S of Kamose Shima.

Nasake Shima forms the SW side of Moroshima Suido and is located about 0.3 mile W of Moro Shima. An overhead cable, with a vertical clearance of 39m, spans Kushigase Seto, from the S side of Nasake Shima to the NE extremity of Yashiro-jima.

Yashiro-Jima—North Coast—East Part

9.13 Between Setono Hana, the N point of the E end of Yashiro-jima, and Obatake Seto, at the W end of the island, the N coast of Yashiro-jima forms the S side of Hiroshima Wan.

Matsuga Hana (33°57'N., 132°26'E.) lies about 1.5 miles W of Setono Hana and is the reddish pointed extremity of the NE slope of Omi Yama. The point forms the W side of the entrance to a small bay. The village of Ihota stands at the head of the bay. The bay affords anchorage, in a depth of 11.9m, 0.1 mile abreast the village and is sheltered from S to W winds.

Zushi Saki is the E entrance point to a small bay and is located about 1.8 miles W of the village of Ihota. A shrine atop a wooded hill stands on the point; the village of Wada lies about 0.5 mile S of the point. Mistu Shima, an islet fringed by shoal water, lies almost 1 mile NW of Zushi Saki.

Matsuga Hana (33°56'N., 132°22'E.) lies about 1.8 miles WSW of Zushi Saki and should not be confused with the point of the same name previously discussed above. Nabe Shima, a steep thickly-wooded islet, lies about 0.2 mile NW of Matsuga Hana. The channel between the two is very narrow and should not be attempted without local knowledge.

Numerous islets lie between Matsuga Hana and Fu Saki, about 2.5 miles to the W. The shore between the two points is indented with small bays and coves, on which a number of small villages stand.

Anchorage.—Anchorage is afforded, in depths of 11 to 15.8m, 0.75 mile SE of Fu Saki.

Yashiro-Jima—North Coast—West Part

9.14 **Osaki Hana** (33°57'N., 132°17'E.) lies about 2.8 miles NW of Fu Saki and is the extremity of a mountain range. A sharp thickly-wooded peak lies about 0.8 mile S of the point. A light is shown from Osaki Hana.

Kuka Wan is entered between Osaki Hana and Heburi Hana, about 2.5 miles to the W. The town of Kuka lies on the W side of the common mouth of two rivers that flow into the SE corner of the bay. A boat basin, protected by breakwaters, lies on the E side of Kuka. A light is shown from the head of the W breakwater. Anchorage for small vessels can be found, in a depth of 10.1m, 0.25 mile N of Kuka, except with winds between the NW and NE.

Heburi Shima (33°58'N., 132°14'E.), consisting of two small islets joined by a reef that dries, is located about 0.3 mile N of Heburi Hana. Passage between the S islet and Heburi Hana should not be attempted without local knowledge.

Between Heburi Hana and Myojin Hana, 2.5 miles to the W,

lie two small bays separated by Tanoshiri Hana. The E bay is shallow and is the smaller of the two. Migama Wan, the W bay, has depths of 12.8 to 33m. A detached shoal, with a depth of 9.6m, lies in the middle of the bay. The village of Migama, protected by breakwaters, lies at the head of the bay. Vessels with local knowledge can obtain anchorage, in depths of 10 to 13m, sand. From October to April, there are seaweed beds at the inner end of the bay.

Obatake Seto

9.15 Obatake Seto (33°57'N., 132°11'E.) is the channel which leads between the NW coast of Yashiro-jima and the mainland coast of Honshu. Being the shortest route from Suo Nada and Iyo Nada to Hiroshima Wan, Obatake Seto is used heavily by large vessels. All vessels must navigate in accordance with the specified channels established under Maritime Traffic Safety Law.

The narrowest part of Obatake Seto, with a width of about 0.4 mile, lies between Myojin Hana, the NW extremity of Yashiro-jima, and Setoyama Hana, on the mainland of Honshu. A bridge, with a vertical clearance of 24m, spans the strait between the two points.

Tides—Currents.—The tidal currents in the narrowest part of the strait attain a velocity of 7 knots at times. In the wider areas, the rate is between 2 to 3 knots.

Depths—Limitations.—Shoals and dangerous rocks on either side of the narrow part restrict the navigable width of the channel to about 0.2 mile, over depths of more than 10.1m.

Regulations.—Vessels navigating through Obatake Seto are requested to comply with the following cautionary items:

1. In order to prevent accidents, proceed through the strait as slow as practicable.
2. Vessels are not to overtake or steam alongside other vessels in the vicinity of the bridge.
3. As a great many fishing boats operate here, vessels should use precise caution to prevent accidents.

Directions.—The channel under the Oshima Ohashi Bridge is between Pier 3 and Pier 4, is marked on each side of the bridge by a fixed white light. Fixed green and red lights mark the N and S edges of the channel, respectively. A fog signal is sounded from Pier 4. The Maritime Safety Agency has designated routes for ships of 5 gt or more navigating through Obatake Seto, as indicated:

1. Line A is drawn from **Morisige Sake** (33°56'52"N., 132°12'08"E.), through Buoy No. 3 on a bearing of 341°, to the opposite shore.
2. Line B is drawn by joining **Myojin Hana** (33°57'07"N., 132°11'26"E.) and **O Iso Light** (33°57'03"N., 132°10'47"E.), and the extremity of the right bank of the mouth of the Sikami Kawa, on the Honshu side of the strait.
3. Line C is drawn from Buoy No. 3 at Line A, through the middle of Pier 3 and Pier 4, to where it intersects with Line B. Line C is the middle of the channel on a bearing of 264.5°.

The following transit regulations are in effect:

1. Westbound vessels from Line A to Line B shall navigate N of Line C, between Pier 3 and Pier 4. The vessel may pass midway between these piers should there be no oncoming traffic.
2. Eastbound vessels from Line B to Line A shall navigate S of Line C, and N of Kaizenzi Syo Buoy and then between Pier 3 and Pier 4, where the rule is the same as for westbound vessels.
3. Vessels are in no way to navigate between Myojin Hana and O Iso Light.

Yashiro-Jima—West Coast

9.16 Komatsu Ko (33°56'N., 132°11'E.) lies in a bight between Myojin Hana and Tsunaga Hana, about 1.5 miles to the SSW. The bight indents the N part of the W coast of Yashiro-jima to a distance of about 0.5 mile. At the head of the bight is a stone embankment enclosing salt pans, behind which lies the town of Komatsu.

Depths in the bight are over 10.1m in most places, except for Okinomo, which lies in the middle of the entrance to the bight. A lighted buoy is moored on the NE side of Okinomo.

Komatsu Ko is used as a refuge harbor and by vessels awaiting favorable tidal conditions to transit Obatake Seto.

Kasasa-jima lies in the S approach to Obatake Seto, about 1 mile W of Komatsu Ko. The whole island is thickly covered with trees and appears dark in color. It is fringed with a shoal bank that extends about 0.2 mile from its N side and about 0.2 mile from its S side.

Wakiga Hana (33°55'N., 132°10'E.), a prominent headland and an extremity of a mountain range, lies about 1.3 miles SSE of Kasasa-jima. A shoal, with a depth of 2.7m, lies about 0.2 mile WSW of the point.

Himi Saki (33°53'N., 132°11'E.), a prominent salient point, lies about 1.8 miles S of Wakiga Hana. The point is bare, with a reddish color, and backed by rolling hills. Hiko Shima, a small rocky islet, lies almost 0.8 mile SSE of Himi Sake. From the W, the three high points of the islet are conspicuous.

Tsunogi Saki lies 1.75 miles SSE of Himi Saki and forms the S entrance point to a bight. The bight consists of a sandy beach on which lie the villages of Tsunogi and Heta.

Obatake Seto—South Approach—West Side

9.17 The W side of the S approach to Obatake Seto is formed by Murotsu Hanto, a 7 mile long mountainous peninsula of the Honshu mainland coast, about 2.5 miles W of Yashiro-jima.

Yokozoe Hana (33°51'N., 132°10'E.) lies 2.25 miles WSW of Tsunogi Saki and forms the S point of a bight, protected from W and S winds. The village of Ainoura stands at the head of the bight. Kuro Saki, 1 mile NNW of Yokozoe Hana, forms the N point of the bight. A lighted buoy is moored about 0.8 mile NE of Kuro Saki.

Naga Saki is a red, rocky point about 2.5 miles NNW of Yokozoe Hana. A black rock that dries lies about 90m E of the point. The village of Atsuki lies on the shore of the bight on the N side of Naga Saki.

Karasu Shima (33°55'N., 132°08'E.) lies on a shoal 0.3 mile offshore, about 1.5 miles N of Naga Saki. A conspicuous white rock lies close off the NE extremity of the island. Aino Se, a detached rock with a depth of 1.8m, lies 0.15 mile SW of the S extremity of Karasu Shima.

Kuoshima Hana, a projection of the coast marked by black

rocks and trees, appears as an islet and lies at the S end of Yanai Ko, about 1.3 miles NNW of Karasu-jima. A prominent chimney stands at Oda, about 0.4 mile NNW of Kuroshima Hana.

9.18 Yanai Ko (33°57'N., 132°07'E.), a local harbor, includes the whole of a bight that lies between Kuroshima Hana and the coast 1.25 miles NE of Kuroshima Hana.

Tides—Currents.—The tidal rise at Yanai Ko is 3.1m at springs and 2.1m at neaps. Currents in the area attain a strength of 1 to 2 knots.

Depths—Limitations.—Depths in the greater part of Yanai Ko are shallow. Shoal water extends around Hadaka Shima. Within the line joining Hadaka Shima and Kuroshima Hana, the depths shoal quickly to less than 4.9m.

A dock about 0.2 mile N of Hadaka Shima has a depth of about 4.3m alongside; farther N is a quay with a depth of 4m alongside. There is a dolphin berth SW of Hadaka Shima with a depth of about 8.9m.

In the area approximately 0.5 mile SSW of Hadaka Shima there are dangerous rocks, including Koiketsugawano Su, with a minimum depth of 4.6m, Okino Iso and Jino Iso.

Aspect.—At the W end of Yanai Ko, a large industrial area and harbor facility have been constructed on reclaimed land. It is reported that oil and LNG berths, with depths of 14m alongside, are situated on the E side of the S end of the reclaimed land.

A power station chimney, gray in color with an elevation of 209m, stands about 0.4 mile NW of the LNG berth and is a conspicuous landmark. Red obstruction lights are shown at its top.

A detached breakwater extends from close NE of Hadaka Shima; a short breakwater extends W from the islet. A light is shown from the head of each breakwater. A lighted channel buoy is moored about 0.5 mile SE of the W breakwater light.

Obatake Ko, a local harbor, is located about 2 miles E of Yanai Ko. The harbor consists of a shallow boat basin with a small pier. Small vessels with local knowledge can find temporary anchorage close off the harbor.

Anchorage.—Anchorage, sheltered from all winds except from the E to S, is afforded, in depths of 17 to 18m, mud and sand, about 0.3 mile E of Hadaka Shima. Small vessels can obtain anchorage, in 3 to 9m, about midway between Hadaka Shima and the floating pier to the N of the islet.

Hiroshima Wan—South Part—Islands and Islets

9.19 Hotaka Shima (Hodaka Shima) (34°04'N., 132°24'E.) lies on the SE side of Hiroshima Wan and the NW side of the entrance to Hashirajima Suido. The island is thickly wooded and ringed with shoal water. Te Shima, a wooded islet, lies 0.75 mile S of Hotaka Shima.

Ha Shima lies about 1 mile SSW of Te Shima and is marked by two hills, the S hill being the higher. A village lies in the NW corner of a bight on the E side of the island. Nakanoko Shima, a small islet, lies between Ha Shima and Te Shima.

Hashira-jima (34°01'N., 132°25'E.), a dark, conical, and prominent island, lies about 1 mile SE of Ha Shima and is the largest island on the W side of Hashirajima Suido. A light is shown from the NE side of the island. Ko-hashira-jima, with two wooded summits, lies about 0.2 mile NE of the N extremity of Hashira-jima.

Tsuzuki Shima, Kottoi Shima, and Fukura Shima form a chain of islets that lies within 2 miles of the SE extremity of Hashira-jima. The islets are all wooded and fringed by reefs and rocks. Passage between the islets is not recommended without local knowledge.

O Zone (34°01'N., 132°20'E.), a steep-to rock with a depth of 4m, lies about 2.8 miles W of the S extremity of Ha Shima. Ise-ko Shima, an islet, lies about 0.3 mile S of O Zone. A beacon stands on the S extremity of the islet. Fish havens are situated to the N and W of the island.

Kuro Shima, lying about 1 mile S of Ise-ko Shima, is thickly wooded; when seen from the N it appears conical and is easily identified. Shingoro Shima, an islet, showing a beacon from its E end, lies 0.75 mile SE of Kuro Shima.

9.20 Kashira Shima (33°58'N., 132°21'E.) lies about 1 mile S of Shingoro Shima and has three dark wooded summits. Uka Shima, located close S of Kashima Shima, is separated from it by a shallow narrow channel spanned by an overhead cable, which has a vertical clearance of 9.2m.

Mae Shima (34°00'N., 132°16'E.), located about 3 miles W of Kuro Shima and about 4 miles NE of Obatake Seto, is divided into two parts by a narrow isthmus. Oban Yama is the summit on the N part; the hill on the S part has a pointed top.

Fuku Shima, a small islet with a rounded top, lies about 0.8 mile W of the S part of Mae Shima and almost 4 miles NE of Setoyama Hana.

Setoyama Hana (33°58'N., 132°11'E.) is 33m high and covered with pine trees. Red earth outcrops are prominent on a mountain behind the point. The point is at the N end of the Oshima-Ohashi Bridge. See paragraph 9.15 for further information on the bridge.

Omodaka Hana lies about 7 miles N of Setoyama Hana, with several small villages and their basins between them. A greater part of this coast has a stone protective wall and drying sand banks.

Iwakuni Ko (34°11'N., 132°15'E.)

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9.21 Iwankuni Ko, in general terms, refers to the harbor area, the limits of which are charted, between Omodaka Hana and the mouth of Oze Gawa. A U.S. Marine Corps Air Station, comprising an airport, piers, and berths, occupies the land area between Monzen Gawa and Imazu Gawa in the S part of Iwakuni Ko. The main part of the harbor lies NW, between Imazu Gawa and Oze Gawa. There are several seaweed cultivation grounds, some marked by a large number of buoys showing orange lights, in this area.

Winds—Weather.—Iwakuni Ko, frequently in the path of typhoons, has sustained a great deal of damage in the past. The harbor is mostly safe during N and W winds. Westerly winds prevail throughout most of the year. Seasonal temperatures are mild. Rainfall is heavy April through October.

Tides—Currents.—The current sets N and S at 0.5 knot full strength. The mean tidal rise at Iwakuni is 3.3m at springs and 2.5m at neaps.

Depths—Limitations.—There are five main cargo wharves 100 to 185m long. Vessels of up to 40,000 dwt, 200m in length, and 11.5m draft can be accommodated. There are three main oil wharves; tankers up to 150,000 dwt and 16.5m draft can be handled at the crude oil berth.

Aspect.—Several radio towers and numerous tanks and chimneys are conspicuous.

Pilotage.—Pilotage is not compulsory, but is available at the quarantine anchorage from 1 hour after sunrise to 1 hour before sunset, when required. Pilots can be contacted on VHF channels 12 and 16 (call sign: Iwakuni-ho-an).

For further information, see paragraph 6.1

Anchorage.—The bay SW of the mouth of Monzen Gawa affords a good sheltered anchorage, in 10.1 to 15m, mud, during NW winds. The quarantine and repair anchorage is situated about 1.8 miles NE of the mouth of Imazu Kawa and is shown on the chart.

Anchorage berths are assigned by the pilot.

Caution.—A seadrome area, which is charted as a prohibited area, lies inside the harbor limits. The seaplane runways inside the seadrome are marked by special purpose lighted buoys.

Charted depths are reported to be unreliable in the Iwakuni harbor area E of Imazu Gawa and the airfield.

9.22 **Atada-jima** (34°11'N., 132°18'E.) lies on the E side of Iwakuni Ko. Except for an occasional sandy beach, the shore of the island is mainly cliffy and reef-fringed. The bights on the N and S sides of Atada-jima are suitable only for small vessels.

The islet of Inoko-jima lies close off the NE side of Atada-jima. A conspicuous white building stands on the S side of Inoko-jima.

Danna Se, a steep-to rock with a depth of 6.6m, lies 0.5 mile W of the W side of Atada-jima. Fish havens lie 0.1 to 0.3 mile S of the SE extremity of Atada-jima.

Kabuto-jima (34°07'N., 132°19'E.), about 4 miles S of Atada-jima, is composed of red soil. The pointed summit of Kabuto-jima is a good landmark.

Otake Ko (34°14'N., 132°14'E.), a local harbor, lies close N of Iwakuni Ko. The harbor is mostly calm. The smelting furnaces and the chimneys of an iron foundry are conspicuous; a number of other chimneys and stacks serve as landmarks.

Himeko-jima, a rock 13m high, stands on a shoal about 2 miles NW of Kabuto-jima. An isolated shoal, with a depth of 17m, lies 0.75 mile SE of the rock.

Caution.—A submarine pipeline and cable lie between Otake Ko and Atada-jima, and may best be seen on the chart.

9.23 Karakasa Yama, a good landmark with twin sharp peaks, stands about 4.8 miles NNW of the mouth of the Oze Gawa, the boundary between Iwakuni Ko and Otake Ko.

Itsuku Shima is a large, thickly wooded island extending NE from Otake Ko along the Honshu coast. The island has a rocky shore with some sand beach.

Ono Seto, the channel that leads between Itsuku Shima and the mainland shore, has a depth of about 7.3m and is narrowed by shoals to a width of about 0.1 mile near its central part. It is tortuous and navigation is very difficult, therefore, no attempt should be made to pass through without local knowledge.

Hijiri Zaki (34°19'N., 132°20'E.), the N extremity of Itsuku Shima, is fringed with rocks and shallow depths within about 0.2 mile of the point. A stone beacon stands close N of Hijiri Zaki.

Itsukushima Ko is a local harbor located on the N shore of Itsuku Shima, about 1 mile SW of Hijiri Zaki. A conspicuous shrine gate stands on a drying bank that fronts the shrine at the town of Itsukushima.

Anchorage.—Anchorage can be taken by small vessels, in about 7m, mud, about 0.5 mile WNW of the shrine gate.

Misen, the summit of the island about 2 miles S of Hijiri Zaki, attains an elevation of 529m.

The shore from the NE entrance of Ono Seto to Hiroshima, a distance of about 7 miles, is irregular and embanked with stone; along it are several towns and villages. The shore is mostly fringed with drying sand banks.

Hatsukaichi Ko lies about 2.5 miles N of Hijiri Zaki. A radio tower, with red and white bands, is conspicuous on Kakunomae Hana, nearly 0.5 mile SSW of the entrance to Hatsukaichi Ko.

Ebiyamano Hana, an extremity of a small hill on the coast S of the town of Itsukaichi, is conspicuous with its gray appearance.

Hiroshima (34°21'N., 132°28'E.)

World Port Index No. 61650

9.24 Hiroshima harbor lies at the head of Hiroshima Wan and is protected by breakwaters.

Winds—Weather.—Light N to NE winds predominate for most of the year. Storms are mostly from the WNW. Precipitation is greatest during the spring and summer seasons, with the highest amounts occurring during June and July.

The high terrain of the numerous islands and the surrounding coast shelter the harbor. High waves are experienced only during strong S winds.

Tides—Currents.—The tidal currents in the harbor are weak; they have little effect on vessels that are underway.

Depths—Limitations.—Designated fairways lead through the harbor and may best be seen on the chart. The minimum depth in No. 1 channel is 9m.

At Hatsukaichi and Hiroshima, there are ten main wharves, 170 to 370m long, with depths of 10 to 12m alongside. Vessels of up to 30,000 dwt can be handled. In addition, there are several private wharves of 75 to 630m long with depths of 4 to 8m.

Aspect.—The shipyard at Hiroshima is conspicuous. **Kanawa-jima** (34°20'N., 132°29'E.) has pointed hills located in a N and S direction. The pointed summit of Kanawa-jima is located on the S part of the island.

An overhead cable, with a vertical clearance of 47m, spans the channel between Hiroshima and the N end of Kanawa-jima. Another cable, with a vertical clearance of 49m, spans the channel between Kanawajima and the promontory close E of it.

Three submarine cables and a water pipeline are laid across this channel at its narrowest part, about 0.4 mile S of the overhead cable.

A light is shown from the S extremity of **Ujina-jima** (34°20'N., 132°28'E.). Numerous red and green lights are shown off the coast about 0.3 mile NE of the light. Two conspicuous television towers standing at an elevation of about

260m are situated 2 miles NE of the light structure.

Kaida Wan is located on the E side of the inner harbor; its entrance is spanned by the Hiroshima Bridge.

Pilotage.—Pilotage is not compulsory, but without the aid of local knowledge, it is recommended. Pilots are available from sunrise until 2000 in the quarantine anchorage; VHF channel 16 is used.

For further information, see paragraph 6.1.

Signals.—Storm signals, local weather signals, and weather forecast signals are shown. The harbormaster can be reached by VHF.

Anchorage.—Anchorage can be taken in designated anchorages in suitable depths; the mud bottom, a mixture of clay and fine sand, affords good holding ground. Specified anchorages are designated by signals from the signal station.

Directions.—Large vessels approaching the port from the SW should pass through Miyazima Seto, W of Eno-jima and NW of Ko-Kakuma Sima, or through Nasabi Seto and Ozu (Osu) Seto.

Caution.—Several submarine pipelines and cables lie within the harbor limits and may best be seen on the chart.

Numerous small vessels and fishing boats may be encountered in the approach channels to the port.

9.25 Between **Kannon Zaki** (34°19'N., 132°30'E.), the point on the S limits of Hiroshima harbor, and Shibitono Hana, the point on the N limits of Kure harbor, the mainland coast on the E side of the N approach to Kure Ko is backed mostly by hills and mountains, which in places descend steeply to the shoreline.

Shallow depths, rocks, reefs, and mud flats fringe the coast to a distance of about 0.1 mile between Kannon Zaki and Shibitono Hana. Depths of 9.2 to 18.3m lie in places within about 0.5 mile of this stretch of coast.

Tengujo Yama rises about 0.5 mile inland of the coast and is conspicuous about 1.5 mile SE of Kannon Zaki. **Shishi Yama** (34°15'N., 132°31'E.), round topped and wooded, serves as a good landmark.

Between **Yataka Ishi** (34°18'N., 132°29'E.) and Koyo, about 3 miles SSE, the E coast of Eta-jima, which forms the W side of the approach to Kure Ko, is mainly cliffy and marked by steep slopes of a mountain range.

This coast is fringed by reefs in places but it is without dangers, in depths of 9.2m and greater, up to about 90m from shore. The outer part of a bank, with a depth of 14.6m, lies about 0.5 mile SE of the light tower on Yakata Ishi.

Kure Ko (34°14'N., 132°33'E.)

World Port Index No. 61640

9.26 Kure Ko is a natural harbor sheltered by a number of small islands consisting of the following regions; Kure, Hiro, Nigata, and Yoshiro. Yoshiro is located W of Kure while all the other regions are E. Main imports are iron ore, timber, wood chips, and coke. Exports include iron, machinery, paper and lumber. There is a coal berth and two tanker berths located at the Kinoe Terminal located on Osaki-Kami Sima Island, about 16 miles E of Kure.

Winds—Weather.—Normally the weather is mild and calm. Light NE and W winds predominate throughout the year. Storms are mostly from the W.

Kure Ko, surrounded by the high terrain of the mainland coast and adjacent islands, is sheltered from wind and sea during all seasons.

Tides—Currents.—Tidal currents within the harbor are negligible.

The tide rises about 3.5m at springs and 2.5m at neaps.

Depths—Limitations.—Depths in the channel are 17m, allowing vessels with under 200,000 dwt with drafts as deep as 17.4m to use the channel at HW. Vessels over 200,000 dwt are limited to a draft of 16.3m.

Kure—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Kure West (Takaramachi District)						
Kawaraishi Quay West S (2 berths)	360m	4.0-7.6m	150m	7.0m	5,000 dwt	—
Kawaraishi Quay West South SW (2 berths)	400m	10.0m	—	9.0m	15,000 dwt	—
Takaramachi 01	200m	5.5m	—	—	2,000 dwt	General cargo.
Takaramachi 02	115m	6.5m	—	—	3,000 dwt	General cargo.
Takaramachi Pier 02 E	117m	4.5m	—	—	700 dwt	General cargo.
Central Ferry Pier	56m	—	—	—	—	Ferries and ro-ro.
Nisshin Steel Mill No. 3	330m	18.0-18.8m	360m	17.4m	276,000 dwt	—
Hirohigashiookawa District						
Oji Paper Mill	36m	4.1m	—	—	—	Paper machines and pulp plant.
Dolphin	295m	9.2m	—	—	—	—

Kure—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Aga Marino Police District						
Aga Marino Quay	260m	7.5m	—	—	—	General cargo.
Hirotagaya District						
01	240m	4.5m	—	—	700 dwt	General cargo.
02	360m	5.5m	—	—	200 dwt	General cargo.
Chugoku Lumber	410m	10.0m	—	—	3,327 dwt	Timber.
02	330m	18.0m	—	—	276,000 dwt	General cargo.
03	273m	6.0m	—	—	—	General cargo and steel.
04	312m	7.5m	—	—	—	Bulk cargo.
Coke Wharf	490m	6.0m	—	—	—	General cargo.
Syowa District						
Syowa Wharf 1 and 2	300m	7.5m	150m	7.0m	15,000 dwt	—
Horiguchi ShippingTerminal						
East Berth	156m	4.5m	87m	—	3,918 dwt	Steel.
South Berth	400m	10.0m	132.5m	—	—	Steel.
Kinoe Terminal (Osaki-Kami Sima Island)						
Coal	350m	—	—	—	16,000 dwt	Coal.
No. 1	200m	—	175m	12.3m	35,000 dwt	—
No. 2	107m	—	—	—	—	—

There are dry cargo berths located at Kure West with anchorage berths designated for discharging cargo or for awaiting an alongside berth. The anchorage berths are located off Yoshiura, S of Kure West and S of Hiro.

There are shipbuilding and repair facilities, with the largest being Drydock No. 3. It is 510m long, 80m wide, with depths of 13.5m. Vessels of up to 800,000 dwt can be handled. Drydock No. 4 is 284m long and 42m wide with depths of 17m for accommodating vessels up to 69,000 gt. There are 3 floating drydocks equipped with lifts for handling smaller vessels from 3,000 to 25,000 tons. For further berthing information refer to the table titled **Kure—Berth Information**.

Aspect.—O-urume-jima and Ko-urume-jima are conspicuous islets which lie on the shoal that extends about 0.5 mile SW from the S entrance point of Yosiura Wan. The high cable towers, which stand on the islets, and the lighthouse and signal station of Ko-urume-jima are good landmarks. A shipyard at the head of Kure Ko is conspicuous. Mitugo Shima, about 2.5 miles S of Ko-urume-jima, is prominent from a distance.

Pilotage.—Pilotage is not compulsory, but is advisable for those without the aid of local knowledge. Inland sea pilots board 3 miles S of Sekisaki Light. Harbor/berthing pilots are available during daylight hours only and board vessels at the quarantine anchorage;

Contact Information.—See the table titled **Kure Port—Contact Information**.

Kure Port—Contact Information	
VHF	VHF channels 12 and 16
Telephone	81-82-3253333
Facsimile	81-82-3251361
E-mail	kowankan@city.kure.hiroshima.jp

Signals.—A signal station on Ko-urume-jima relays instructions from the harbormaster with reference to berthing and to the movement of vessels entering and departing the port. Vessels should retain onboard the most recent edition of Japan Maritime Safety Laws and Regulations, obtainable through the Japanese Coast Guard. This publication should be kept as a reference for signal station communiques and their meanings, appropriate answering signals, and other local or specific regulations. Radiotelephone may be used to contact the harbormaster.

Weather signals are shown from the station on Ko-urume-jima and from the roof of the harbor office on the E side of the mouth of Niko Gawa, about 1.5 miles E of Ko-Urume-jima.

Anchorage.—There are 4 designated anchorage berths for loading and discharging cargo at Kure and 2 areas for Hiro. The quarantine anchorage lies outside the harbor limit.

The Kure anchorages are as follows:

1. **Y1**—centered on 34°18'50"N, 132°31'08"E., depth available is 18m for vessels with loa of less than 200m.
2. **Y2**—centered on 34°14'54"N, 132°31'35"E., depth available is 15m for vessels with loa of less than 150m. this anchorage used mainly for loading of steel products.
3. **C**—centered on 34°13'09"N, 132°31'30"E., depth available is 18m for vessels with loa of less than 200m.
4. **D**—centered on 34°13'29"N, 132°31'45"E., depth available is 18m for vessels with loa of less than 200m.

The Hiro anchorages are, as follows:

1. **A**—centered on 34°12'N, 132°37'E., with depths of 16m for vessels less than 200m loa.
2. **B**—centered on 34°13'N, 132°37.4'E., with depths of 16m for vessels less than 200m loa.

Caution.—Numerous small fishing boats are prevalent along the final approach to Kure Ko.

9.27 Ondono Seto (34°12'N., 132°32'E.) is a narrow and shallow channel which lies between the N end of Kurahashi-jima and the mainland coast of Honshu. It is the shortest route leading into Hiroshima Ko from the E and is normally used by small vessels.

The navigable width of the channel is 60m, with a charted depth of 4.9m. The channel has strong tidal currents reaching a maximum of about 4 knots velocity. The vessel traffic in this channel is very heavy. There are many high-speed hydrofoils, ferries, rafts, and small vessels crossing this channel.

The Ondono Seto Bridge, with a vertical clearance of 39m, crosses the channel E of Ondo Light (34°12'N., 132°32'E.). The width of the channel under the bridge is about 60m. Power cables having a vertical clearance of 28m cross the channel SSE of Ondo light. The Ondo Ohashi Bridge, with a vertical clearance of 23m, crosses the channel close N of Stone Lantern point. The bridge is painted red.

Regulations.—The lighted buoys moored in the N and S entrances indicate the center of the shipping route; vessels should leave the buoys to port. Speed should be as slow as possible. If oncoming traffic is met in the narrow channel, alter course to starboard so as to pass port to port.

Kannon Saki (34°12'N., 132°34'E.) is a point on the mainland coast about 1.5 miles E of Ondono Seto. A conspicuous hotel stands on the point.

9.28 Hiro Wan (34°12'N., 132°36'E.) indents the mainland coast of Honshu to the N between Shimoneko Zaki, a point on the N side of the W entrance of Neko Seto, and Kannon Zaki.

Hiro Ko, at the head of Hiro Wan, is a part of the port of Kure Ko.

Winds—Weather.—Hiro Wan, open to the S, is exposed to wind and sea from that direction. Strong winds and sea from the S cause heavy swells to enter the harbor, even after the wind subsides or changes direction.

Depths—Limitations.—The dredged channel, marked by range lights and lighted buoys, has a width of 150m and a charted depth of 8m. The Tokyo Pulp Company Dolphin Berth, with depths of 8.5 to 10m alongside, is situated close S of the front range light.

Extensive land reclamation was in progress on the W side of the channel. A detached breakwater extends off the SW end of the training wall on the W side of the mouth of Hirohigashi Okawa. A light is shown from the S end of this breakwater.

Aspect.—Two white chimneys of a paper mill stand on the E side of the mouth of the Hirohigashi Okawa. Radio towers stand close N of a wharf, situated about 0.2 mile NNE of Ishiga Hana, a point on the E side of the harbor, about 1 mile WNW of Shimoneko Zaki.

Anchorage.—Hiro Wan has good holding ground, with a bottom composed mostly of layers of clay. It affords good anchorage, except during strong S winds.

Hiroshima Wan—North Portion—Off-lying Islands, including Channels Between the Islands

9.29 Kurahashi-jima (34°07'N., 132°31'E.) is of considerable size, being about 7.5 miles long, N and S, and about 7 miles wide at its S end. There are two large bights, Okuno Uchi and Taino Uchi, on the E side. The depths in these bights are moderate. Rocks, below-water, lie in several places near the shore of Taino Uchi, the S bight.

Shoal water extends off the N side of the N entrance point of Okuno Uchi; on this shoal are two islets, the N being Koajiwa Shima and the S being Oajiwa Shima.

Oajiwa Shima, consisting of two islets, lies on the coastal bank 0.7 mile N of Oura Saki. A rock, which dries 0.2m, lies 183m E of the islets. Another dangerous rock, detached from the coastal bank lying about 0.2 mile NE of the drying rock, is marked by a lighted buoy moored close NW of it. There are oyster beds S of this rock and in Okuno Uchi.

Nasake Shima is located about 0.5 mile E of the entrance of Okuno Uchi. The island has conspicuous trees on the hillsides on its E side.

Kamegakubi (34°07'N., 132°36'E.), the E extremity of Kurahashi-jima, is prominent.

Karato Shima (34°04'N., 132°33'E.) is close S of the SE extremity of Kurahashi Shima and is separated from it only at HW.

Sengai, a rock that dries 1.7m, lies about 0.2 mile E of the E extremity of Karato Shima, and at about 0.6 mile S of this rock is Hiyama Dashi, with a swept depth of 10.1m. A swept depth of 11.3m, rocky, lies about 320m NE of Sengai.

Ka Shima, close SW of Karoto Shima, is 1.5 miles long, N and S. Three densely-wooded peaks are prominent on the S part of the island.

Karato Koseto, the channel between Karato Shima and Ka Shima, is 0.15 mile wide, but as shoals project from both sides, the part between the 5.5m curve is only about 90m wide. It is spanned by a bridge with a vertical clearance of about 23m. Nakano Haye, dangerous rocks, lies about 0.1 mile offshore on the W side of the channel. At lowest LW, rocky heads are visible, drying to a maximum height of 1.3m. Local knowledge is necessary for this channel.

Ha Shima, a small islet, lies about 0.5 mile S of the SW extremity of Ka Shima. Three rocks form a chain in the vicinity of its N point, and shoal water extends off for about 0.1 mile from its S extremity. Manaita Se, a detached shoal which dries about 0.6m, lies about 0.6 mile E of Ha Shima. It is usually difficult to make out.

The S side of Kurahashi Shima forms a large bay, with depths of about 14.6 to 21.9m, mud bottom. Torii Dashi, a

rocky shoal covered by about 8.2m, lies at about the middle of the entrance to the bay and 1 mile W of the N end of Ka Shima. About 0.1 mile W of this shoal, there is a submerged rock with a depth of about 13.2m. The head of the bay is divided into several bights.

9.30 Yamaura Take (34°06'N., 132°28'E.), on the SW part of Kurahashi Shima, has a blunt summit from which a ridge descends gradually to the NE.

Zyogesi Hana, the SW extremity of Kurahashi Shima, is cliffy; outcrops of rocks and stones make it easy to recognize from a distance.

Yoko Shima is the S of a group of rocky shoals and islets extending nearly 3 miles NW. Tsuzuki Shima consists of several rocks that extend from the middle of the NW side of Yoko Shima for a distance of about 0.6 mile in a NW direction. The highest rock is about 31m high and shows three rounded summits which resemble islets from a distance. Ukiikada, a rock which dries, lies about 0.3 mile NW of the above rock.

Kashinoko-jima, a small islet 21m high to the treetops, lies about 0.7 mile NW of the highest rock on Tsuzuki Shima. A ledge of drying rocks extends 0.2 mile N from it. A reef extends S from the S end of the islet and dries for a distance of about 90m offshore; about 140m offshore there is a 0.9m depth, beyond which the depths increase rapidly.

Kuro Shima, 1.25 miles NW of Yoko Shima, is about 72m high and wooded. A sandspit projects from its SE side. Ebigahire, a patch of drying rocks, lies about 0.4 mile W of Kuro Shima. The highest rock dries 2.7m. O Goban, a rock which dries about 0.3m, lies about 0.6 mile NW of Ebigahire.

Dentaro Hana (34°06'N., 132°27'E.), the W extremity of Kurahashi Shima, is difficult to distinguish W, but its summit is dark and rounded. A light is shown from a round concrete tower standing on the point.

9.31 Hayase Seto (34°09'N., 132°30'E.) is the channel that leads between Kurahashi Shima and Higasinomi Shima, and then to Kure.

Tides—Currents.—Strong tidal currents flow through the narrow part of the channel at velocities of 3 to 4 knots.

Fish havens exist on the E side of the channel.

Depths—Limitations.—The W entrance of Hayase Seto, between Dentaro Hana and Oyake Hana, the S extremity of Higasinomi Shima, is wide and deep, as in the channel along the S side of Higasinomi Shima. The narrowest part of Hayase Seto has a navigable width of about 90m between the 5m curves and about 46m between the 10m curves.

Aspect.—Hiki Shima, an islet, presents a dark brown to yellowish aspect on the W side of the N entrance of Hayase Seto; the islet lies about 1.8 miles SW of **Mitugo Shima** (34°12'N., 132°31'E.).

Matsuga Hana (34°10'N., 132°29'E.), a narrow headland, lies about 0.3 mile WNW of the N end of Hiki Shima. A short detached breakwater is situated 0.1 mile WNW of Matsuga Hana; a light is shown from its W end. Numerous oil tanks mark the coast about 1.3 miles NNE of Matsuga Hana.

Eboshi Iwa, a wedge-shaped rock, 8.5m high, lies on the N side of the W entrance of Hayase Seto in a position about 200m W of Oyake Hana.

Caution.—Hayase Seto should not be attempted without local knowledge.

9.32 Higasinomi Shima, Nisi-nomi Shima, and Eta Shima appear to be separate islands but are actually one large island about 10 miles long, N and S. The S part of the island is named Higasinomi Shima, the NW section is Nisi-nomi Shima, and the N is Eta Shima. The summit of the island stands on the S part, in a central position; its ridge slopes gradually SW forming the long and narrow point named Oyake Hana.

Yakata Ishi lies on the extremity of a reef which extends about 0.2 mile N from a low tongue of land which forms the NE end of Eta Shima. A light is shown from Yakata Ishi and is a good mark when entering Kure Ko.

Kirikushi Wan, close W of Yakata Ishi, affords anchorage to small vessels, in a depth of 13m.

Naga Shima, about 0.5 mile W of Oyake Hana, is fringed with shallow rocks. A drying sandspit extends about 200m NNE from the NE extremity of the island. A breakwater extends from the N coast. Aino Iso, two rock heads with a depth of 1.9 and 0.9m, lie between Naga Shima and Oyake Hana.

Okino Shima (34°09'N., 132°26'E.), an island with three wooded hills, lies 1 mile N of Oyake Hana. The SW hill is the summit of the island. Conspicuous light brown cliffs mark the W extremity of Okino Shima.

Akabane Saki, about 0.5 mile NNE of the N extremity of Okino Shima, is a round bluff headland. The town of Fukae stands at the head of a cove on the S side of Akabane Saki.

9.33 Kanokawa Uchi (34°11'N., 132°26'E.) indents the S part of Nisi-nomi Shima to the N for about 1.5 miles. The entrance of Kanokawa Uchi lies between Akabane Saki and Oya Bana, the S extremity of Nisi-nomi Shima, about 0.8 mile WNW of Akabane Saki. Numerous prominent oil tanks stand on the W shore of Kanokawa Uchi. Kanokawa Uchi has depths of 10.1 to 16m, mud bottom, over its width of about 0.5 mile.

Shindo Yama, 287m high, a conspicuous, conical hill, stands about 2.3 miles NNE of Oya Bana; it serves as a good landmark for vessels entering Kanokawa Uchi from the area between Okino Shima and O-kurokami Shima.

Anchorage.—Kanokawa Uchi provides a good anchorage, mud, in 12 to 15m. It is sheltered from heavy seas even during SW winds. Vessels arriving off the harbor entrance at night can take temporary anchorages SW of Naga Shima or S of O-Kurokami Shima.

9.34 Kanokawa Ko (34°11'N., 132°27'E.) (World Port Index No. 61655) consists of an oil terminal that lies on the W side of Kanokawa Uchi, about 0.8 mile NNE of Oya Bana.

Depths—Limitations.—There are two main oil berths. Berth No. 1 can accommodate tankers up to 30,000 dwt, 240m in length, and 11.2m draft; Berth No. 3 can accommodate tankers up to 125,000 dwt, 270m in length, and 14m draft.

Berth Nos. 2 and 4 have depths alongside of 7.5m and are used for coastal tankers of up to 5,000 dwt.

Pilotage.—Pilotage is not compulsory. Berthing occurs during daylight hours only. Pilots are available at the quarantine anchorage of Iwakuni. Inland sea pilots are available at Sekisaki or Wada Misaki; VHF channel 16 is used. For further information, see paragraph 6.1.

The E side of the fairway leading to Kanokawa Oil Terminal

is marked by a line joining Lighted Buoy No. 2, moored 0.4 mile SSE of Oya Hana, and Lighted Buoy No. 4, moored 0.8 mile NE of the point. A lighted buoy is moored 183m E of Oya Hana and marks the W side of the fairway.

Regulations.—Quarantine and customs are handled by officials from Kure.

9.35 O-kurokami Shima (34°10'N., 132°24'E.) lies about 1 mile SW of Oya Bana. Three small bights indent the N side of O-kurokami Shima. The island is conspicuous, with its dark appearance being in contrast with the red terrain of the nearby islands. The S and W sides of the island are cliffy.

Umaga Se, a circular group of rocks, awash at LW, lie about 0.6 mile WSW of the NW extremity of O-kurokami Shima. About 0.1 mile NW, there are rocks with a depth of 10.9m.

Sira Isi, comprised of two white rocks in a N and S direction, lies about 1.8 miles W of the NW extremity of O-kurokami Shima.

Mitsuke Ishi, a rocky patch with a depth of 1.3m, lies about 1.3 miles ENE of the NW extremity of O-Kurokami Shima. Ikada Ishi, with a depth of 2.7m, lies about 1 mile S of Mitsuke Ishi. These hazards lie in the channel between O-Kurokami Shima and Nisi-nomi Shima. It is dangerous to use this channel without local knowledge.

Between Oya Bana and Ganneno Hana, about 6 miles NNW of Oya Bana, the W coast of Nisi-nomi Shima presents a monotonous shoreline broken only by Iruka Hana. South of Iruka Hana, the shore is mostly a sandy beach while to the N of the point it is rocky; several villages stand on this coast.

A white, round pillar stands on the W side of **Iruka Hana** (34°14'N., 132°23'E.). **Notoro Yama** (34°13'N., 132°25'E.), the prominent summit of Nisi-nomi Shima rises to a height of 542m and is located 2 miles ESE of Iruka Hana.

Ko-kurokami Shima, a dark, conical and densely-wooded islet, lies about 1.5 miles WNW of Iruka Hana. A white round pillar stands close to the N extremity. Manaita Ishi, a rocky shoal about 0.1 mile long, lies about 0.6 mile NNE of Ko-Kurokami Shima. The E rock dries about 1.2m and the W rock is awash.

From **Ganneno Hana** (34°16'N., 132°23'E.) to the entrance of Eta Uchi, about 2.5 miles E of Ganneno Hana, numerous rafts lie along the N coast of Nisi-nomi Shima. The villages of Mino, Koso, and Miyoshi, with a number of basins and small breakwaters, mark this coast. Numerous rocks and shoals lie along this stretch of coast.

9.36 O-Nasami-jima (O-Nasabi-jima) (34°16'N., 132°22'E.) lies about 0.5 mile N of Ganneno Hana. Two hills mark the above island; the E hill is the summit and is marked by surface cutting. Nakano Se, a rock 2.1m high and marked by a lighted beacon, lies about 0.2 mile S of the E end of O-Nasami-jima. Numerous oyster rafts lie near the N shore of O-nasami-jima.

Eno Jima, an islet 39m high, lies about 1 mile N of the W end of O-Nasami-jima. A light is shown from the islet; numerous oyster beds lie to the SE of the islet.

Miyazima Seto is the channel lying W of O-Nasami-jima; it is divided into two channels by Eno Jima. Nasabi Seto is the channel lying S of O-Nasami-jima; it is deep and free of dangers.

Ando Shima, an islet 11m high, lies about 1.5 miles ENE of Ganneno Hana. Vessels should pass N of Ando Shima. A light is shown from this islet. Numerous obstructions, best seen on the chart, lie SE, SW, and W, respectively, of Ando Shima.

Eta Uchi (34°15'N., 132°26'E.), between Nisi-Nomi Shima and Eta Shima, is almost landlocked except for Tsukumo Seto, the entrance channel, which is narrow and has adequate depths and a width of about 0.3 mile. Eta Uchi has depths of 9 to 18m, mud, within about 0.2 mile of the shore, except for a rocky patch with a depth of 9.8m which lies in the E part of the harbor. The chimney which stands in the middle of the S side of the bay provides a good mark while entering the bay. Several radio towers and buildings stand on the E side of the bay.

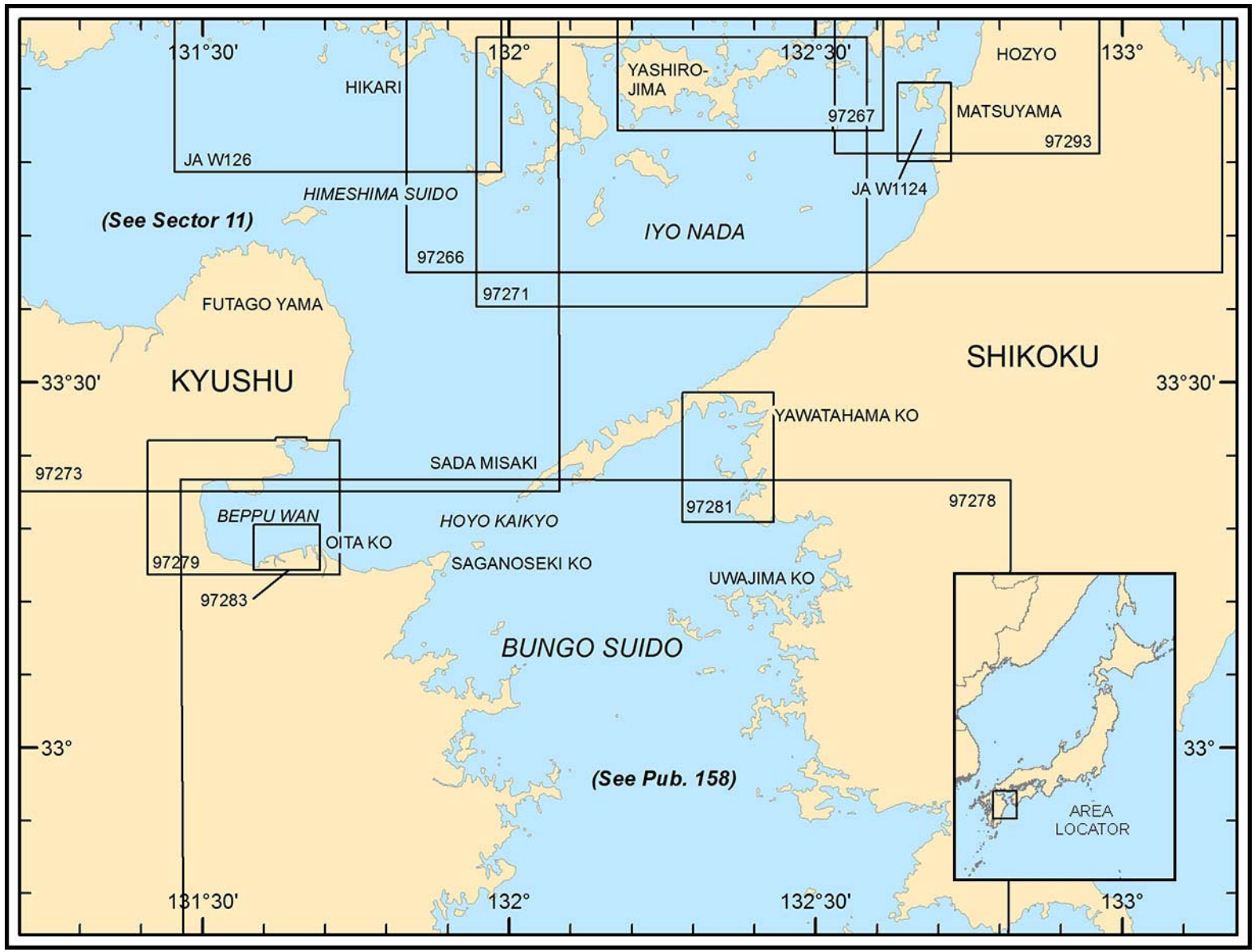
Caution.—Oyster beds extend up to 0.5 mile offshore on the W side of Eta Uchi, between Tsukumo Seto and Matsuga Hana. Vessels should proceed at moderate speed to avoid disturbing the beds.

9.37 Ozu Seto (34°17'N., 132°26'E.) is a deep channel between the N coast of Eta Shima and the S shore of Nino Shima. It is the main route to Kure Ko and the route recommended for large vessels approaching Hiroshima Ko. The narrowest part of Ozu Seto has a navigable width of about 0.4 mile between Shinoki Hana, a cliffy point on the N side of the NW end of Eta Shima, and Gaibono Hana, the SE extremity of Nino Shima.

Nino Shima (34°18'N., 132°26'E.) is a large hilly island that lies about 0.8 mile N of Hana Guri, the NW extremity of Eta Shima. Aki-ko Fuji, the summit of Nino Shima, is located on the N part of the island. Topped by a white staff, Aki-ko Fuji is a good landmark. Oikada Hana, the cliffy N end of Nino Shima, is the termination of the steep N slope of Aki-ko Fuji. The S coast has exposed rock and many cliffs.

Dogen Ishi is a submerged rock with a depth of 2.7m, about 0.6 mile NE of Gaibono Hana. A lighted beacon stands on Dogen Ishi. A dangerous reef extends about 0.2 mile SE of Gaibano Hana. Misen Dashi, a submerged rock with a depth of 9.5m, lies about 0.6 mile E of Dogen Ishi. Fishing banks lie about 250m NNW and close SW of Misen Dashi. A rock, with a depth of 10.1m, lies about 0.2 mile NNE of Misen Dashi. Suno Ishi, with a depth of 11m, lies on the S side of the channel, about 1 mile SSE of Misen Dashi.

Ko-kakuma Shima (34°19'N., 132°24'E.) is a small island with a few cliffs. O-kakuma Shima lies about 400m S of Kokakuma Shima and is joined to it by reefs and shoals. There are some houses on its summit. Several fishing reefs, best seen on the chart, lie close to these islands.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 10

THE NAIKAI (INLAND SEA)—IYO NADA AND BUNGO SUIDO

Plan.—This sector commences with a description of Iyo Nada and includes, in the order listed, the islands in the N and NE parts, the N side along with the S coast of Yashiro-jima, and the SE side which comprises the NW coast of Shikoku. The progression is from E to W. The description continues with the Kyushu coast, on the W side of Iyo Nada, and finally concluding with Bungo Suido, the E and W sides of which, respectively, are discussed in a S to N direction.

General Remarks

10.1 Iyo Nada.—This part of the Naikai lies next E of Suo Nada. It is bounded SW by part of the NE coast of Kyushu, SE by the NW coast of Shikoku, and NE by a chain of islands and islets extending E from the E side of Murotsu Hanto. It is approached from the S through Bungo Suido. See charts for courses to be followed.

Bungo Suido leads from the Pacific Ocean to the Naikai (Inland Sea) between the E side of Kyushu and the SW end of Shikoku; it is entered from the S between **Tsurumi Saki** (32°56'N., 132°05'E.) and Komo Saki, about 20 miles E, and at its N end is Hayasui Seto, the entrance into Iyo Nada.

Pilotage information for the Naikai can be found in paragraph 6.1.

Iyo Nada—Islands in the North and Northeast Parts

10.2 Kata Shima (33°55'N., 132°28'E.) appears as two parts joined by a low isthmus. The NW and higher part attains an elevation of 216m. Tokkuri Se lies 0.1 mile SW of the S extremity of Kata Shima. O Ishi, 2.9m high, lies about 0.3 mile E of Kata Shima. A light is shown from O Ishi. Tide rips occur in the vicinity of Tokkuri Se and O Ishi during the flood tide.

Yuri Shima lies 5 miles SE of Kata Shima, and consists of two parts, connected by a low sandy isthmus. It appears as two islands when seen from the N or S. A light is shown from the S end of the island. Kamoji Sho is a group of submerged rocks in a depth of 7.3m, lying about 2.5 miles NW of Yuri Shima.

Ao Shima (33°44'N., 132°30'E.) lies 7 miles SSW of Yuri Shima and shows a light from its W side. A sunken rock, with a depth of 1.2m, lies about 0.2 mile E of the E extremity of the island. Three beacons stand near the middle of the N side of the island.

Ko-minase Shima lies about 5 miles NW of Ao Shima and is flat-topped and wooded. The NE coast of the island has perpendicular cliffs. Tide rips occur in the vicinity of a rocky patch, with a depth of 0.3m, off the NW end of the island. Three beacons stand on the island; these beacons are one end of a measured distance, the other end being the beacons on Ao Shima. A light is shown from the E end of Ko-minase Shima.

O-minase Shima (33°48'N., 132°25'E.) lies about 1.5 miles N of Ko-minase, and has a flat and wooded summit. Tide rips occur on occasions within 0.5 mile N and SE of the island.

Sengai Se dries 1.5m and lies about 1.5 miles NW of O-minase Shima. Ko Sengai Se, a rock with a depth of less than 1.8m, lies about 0.2 mile further SE. A light is shown from Sengai Se.

South Coast of Yashiro-Jima and Adjacent Islands

10.3 Yuu Ura (33°56'N., 132°27'E.) lies on the extreme end of the SE coast of Yashiro-jima, about 1 mile WNW of the NW extremity of Kata-jima. The bay affords anchorage, sheltered from N winds, to small vessels with local knowledge, in a depth of 20.1m, hard mud. A light is shown from a breakwater at the head of Yuu Ura.

Kodomari Wan lies about 2 miles WSW of Yuu Ura and affords anchorage, in depths of 12 to 20m, sheltered from all but the S wind. Hage Shima and Sasa-jima lie on a reef on the W side of Kodomari Wan.

Okikamuro Shima (33°51'N., 132°22'E.) lies close off the central part of the SE coast of Yashiro Shima, about 4 miles SSW of Kodomari Wan. The island's summit, 173m high, is densely wooded and appears black in color. A light is shown from a group of rocks, close off the S coast of the island. A light is also shown from the N side, between the island and Yashiro Shima.

Agenosho Wan lies about 4 miles NW of Okikamuro Shima and affords anchorage, in 20.1 to 30m, mud or sand. A good anchorage can be obtained, except during SE winds, in 20.1m, mud, about 0.5 mile N of Age Saki, the W entrance point of the bay. Take San, with a tower about 2.5 miles N of Age Saki, is a good landmark. A light is shown from a breakwater in Agenoura and Tononyu at the head of the bay.

Hoshi Saki (33°51'N., 132°13'E.) lies about 4 miles WSW of Agenosho Wan. The point is dark in color and 142m high. From the W, it appears as an island and is very prominent.

Kami-ninai Shima (33°50'N., 132°12'E.) is located about 0.5 mile SSW of Hoshi Saki and is 108m high. The island is thickly covered with brambles. Kura Iso lies 0.5 mile S of the island, and is sometimes marked by tide rips.

Shimo-ninai Shima, about 1 mile W of Kamininai Shima, is a rounded island with a small flat summit that resembles an inverted bowl. The island is densely covered with shrubs and shows a light on its NE side.

Heigun-jima (33°48'N., 132°13'E.) lies about 3 miles S of Hoshi Saki. Near the middle of the island, two mountains of nearly equal elevation, and covered with shrubs, are prominent. Mi Shima consists of three islets, close off the S extremity of Heigun-jima. Okino Iso and Jino Iso lie close S of Mi Shima. A light is shown from Okino Iso.

10.4 Heigun Suido.—This strait is bounded on its S side by the W part of the N coast of Heigun-jima. It is an alternate track to the N of the main track; this route is to a vessel's advantage when navigating with the tidal current. However, nu-

merous small vessels and tugs with tows use the route; it is not recommended for night navigation. The track is plainly laid out on the charts.

Kaketsu-jima (33°49'N., 132°15'E.) lies about 0.8 mile off the NE coast of Heigun-jima. The island is 201m high, partly cultivated, and grassy. Matsubushi Se, a steep-to rock with a depth of 3.2m, lies about 0.5 mile ENE of the N extremity of the island.

Hando-jima, a perpendicular rock, lies about 1 mile S of Kushi Saki, located on the W side of Heigun-jima. The rock, 15.8m high, resembles a boat under sail.

10.5 Ya Shima (33°44'N., 132°09'E.) lies about 4.5 miles SW of Heigun-jima. The island has a flat summit on its S side, trees cover most of the hills on the island. A narrow isthmus in the middle of the island separates the N from the S end of the island. Three submarine cables project from the W coast of this narrow isthmus, in a NW direction to Naga Shima. Tide rips occur in the vicinity of Su Zaki, the N extremity of Ya Shima, during the ebb tide.

Anchorage.—The bay on the W side of the isthmus that joins the middle and S part of Ya Shima affords anchorage, in 6 to 30m, mud and sand. The anchorage is sheltered from E winds, but with NW winds and N and S gales, swells run into the bay. A submarine cable is landed in the NE corner of this bay and should be avoided when anchoring.

On the E side of the isthmus, there is an opened bay suitable only as a temporary anchorage during W winds. A rock, with a depth of 2m, lies nearly 0.1 mile from the shore in a position about 0.4 mile NW of the S entrance point of the bay.

Lights are shown from Hirane Zaki, the S point of the island, and from a breakwater at Yashima, on the W side of the island. A lighted buoy marks Sengai Se, off the NW coast of Ya Shima.

Uwa-jima (33°44'N., 132°02'E.) lies about 5 miles W of Ya Shima, is 85m high and wooded. Hojiro Shima, the mostly W island in the N part of Iyo Nada, lies less than 0.5 mile WSW of Uwa-jima. A light is shown from Hojiro Shima.

Iyo Nada—Southeast Side—Northwest Coast of Shikoku

10.6 Between Gunchu Ko and Nagahama Ko, on the NW coast of Shikoku, a distance of 14 miles, the mountains slope down to the shore, and off it there are no known dangers more than 0.5 mile offshore.

Gunchu Ko (33°45'N., 132°42'E.) is a small harbor, protected by three breakwaters, in which there are depths of 1.4 to 3.2m. The town of Gunchu lies with its S end abreast the harbor. A light is shown from the SW breakwater.

Nagahama Ko (33°37'N., 132°29'E.) is a local harbor lying close NE of the mouth of the Hiji Kawa. A large bridge across the mouth of the river and a red chimney on the W side of the harbor are conspicuous.

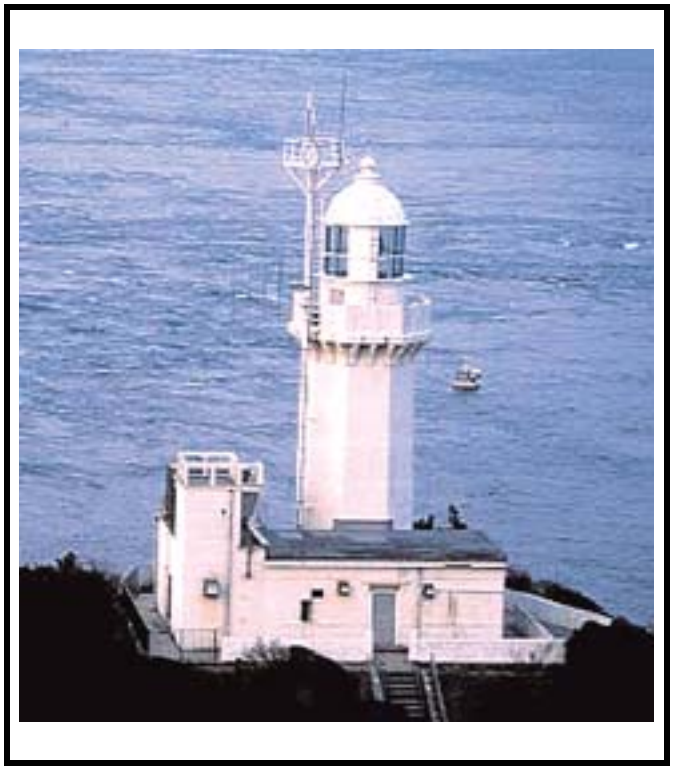
Katayama Su is a sandbank lying about 0.3 mile N of the head of the N breakwater at Nagahama Ko. The sand bank at the mouth of the river continually changes position, particularly at times of winter gales.

A floating pier and two wharves accommodate 1,000 gt vessels in an alongside depth of 4.9m. A light is shown from the head of the N breakwater and the E breakwater.

Two breakwaters, N and S, protect the small harbor, in which there are depths of 2 to 5.8m in the main part. The mud and sand bottom in the harbor affords a relatively safe anchorage, except during strong NE winds.

Mitsukue Ko lies about 14 miles SW of Nagahama Ko and is entered between Fusuma Saki and Hasede Hana. It is exposed to the NNW, and with N winds, a heavy sea runs into the bay. On the W side of the bay is a cove that is sheltered from all winds and has depths of 10.1m, but is only available to small vessels with local knowledge. A light is shown from Fusuma Saki and a point on the W side of Mitsukue Ko.

Anchorage.—All the bays between Mitsukue Ko and Mimai Saki, about 7 miles SW, afford anchorage, but with indications of N winds, vessels should put to sea. Anchorage is afforded in Mitsukue Ko, in depths of 20 to 30m, mud, good holding ground.



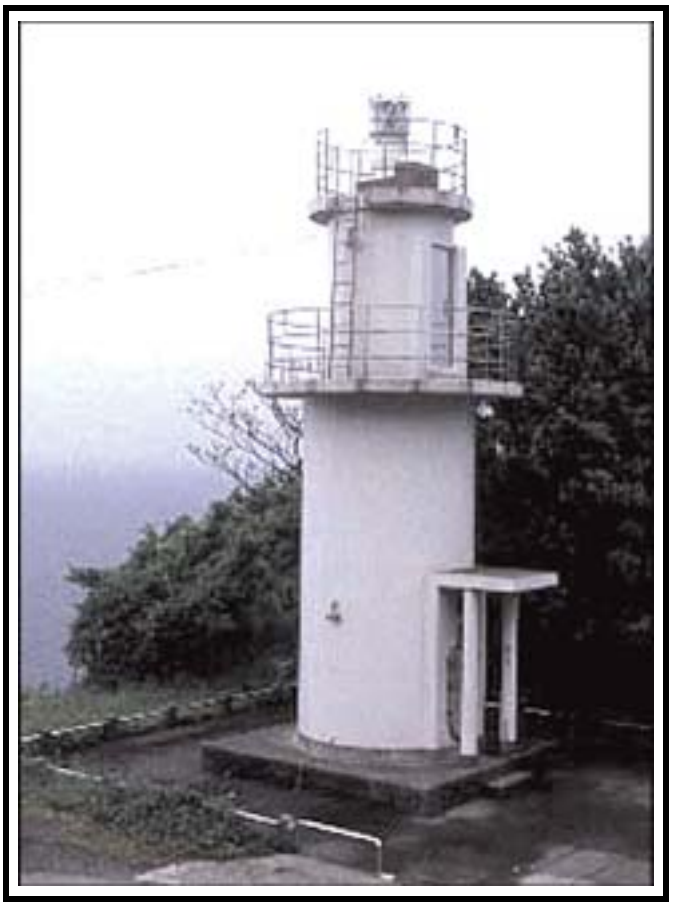
Sada Misaki Light

From September to April, there are seaweed beds on the E and S sides of Mitsukue Ko.

Sada Misaki (33°20'N., 132°01'E.), the SE entrance point to Iyo Nada, is cliffy and steep-to. A light is shown from the point.

Iyo Nada—West Side—Northeast Coast of Kyushu

10.7 Taka Shima (33°16'N., 131°57'E.) lies on the W side of Hoyo Kaikyo, the strait between Sada Misaki and Jizo Misaki. Ashika Bae, a rock, 15.2m high, lies close off the E extremity of the island and shows a light.



Mimai Saki Light

Jizo Misaki (Seki Saki), the NE extremity of a wooded peninsula on the SW side of Hoyo Kaikyo, lies about 2 miles WSW of Taka Shima. A light is shown from the point and Naikai Pilots board vessels SE of the light.

Saganoseki Ko (33°15'N., 131°52'E.) (World Port Index No. 62165), located about 2 miles WSW of Jizo Misaki, is an open harbor and port of entry.

Tides—Currents.—The MHW interval at Saganoseki Ko is 8 hours 18 minutes; spring tides rise 2.1m and neap tides rise 1.5m.

Depths—Limitations.—Depths in the harbor range from 8 to 16m in the outer part and 4.9 to 8m in the inner part.

The draft limitation in the channel is 8.8m. Pier 1 has a draft limitation of 9m, a length of 100m, and a gt capacity of 15,000. Pier 2 is 200m long, with a draft limitation of 9.4m, and accommodates vessels up to 20,000 gt. Pier 3 is 130m long, with a draft limitation of 9.4m, and accommodates vessels up to 7,000 gt. Vessels are also moored at several mooring buoy berths in the harbor. The inner harbor can accommodate small ore vessels in depths of 2.7 to 4m.

Pilotage.—Pilotage is not compulsory, but pilots are available and board either at the quarantine anchorage or Seki Saki; VHF channel 16 is used. Pilots is only available during daylight hours.

Anchorage.—The harbor affords good anchorage, with a mud bottom, but is exposed to NW winds during winter months.

Oita Ko (33°15'N., 131°40'E.)

World Port Index No. 62160

10.8 Oita Ko includes about 8 miles of the shore on the S side of the approach and entrance to Beppu Wan. The port includes Kasagura Harbor, Sumiyoshi Harbor, and **Tsurusaki Harbor** (33°15'N., 131°41'E.). Reclamation projects, some of which have been completed, are in progress throughout the port area.

Winds—Weather.—The harbor is protected most of the year, but during strong NW seasonal winds, the harbor becomes quite rough.

Tides—Currents.—The MHW interval is 8 hours 21 minutes. The tidal currents in the harbor are weak.

Depths—Limitations.—The three sections of harbors are protected by breakwaters. Kasagura Harbor can berth vessels of up to 5,000 gt, with drafts of up to 7.3m, Sumiyoshi Harbor berths vessels of up to 15,000 gt, with a deep draft of 10.1m. Tsurusaki Harbor berths vessels with drafts up to 5.5m. A number of privately-owned piers can berth vessels of up to 50,000 gt, with drafts of up to 11.9m.

There is a sea berth for the export of steel that can accommodated vessels of up to 300,000 dwt with a maximum draft of 25m.

The dolphin berth for oil products can accommodate vessels of up to 273,000 dwt with a draft of 19.8m.

The container terminal can accommodate vessels of up to 50,000 dwt with a maximum draft of 14m.

Pilotage.—Pilots are not compulsory, but recommended. Vessels may berth during daylight only, and unberthing is generally impracticable from wharfs during the hours of darkness. Vessels at Sea-Berth and Seichin Berth may depart up to 2000, depending on weather conditions; VHF channel 16 is used.

Anchorage.—Anchorage is available within Nishi Oita Hakuchi, in 6.5 to 7m, sand and mud, good holding ground. Except for periods of NW winds, the harbor is quiet throughout the year.

Large vessels anchor off Tsurusaki Harbor's E breakwater, in depths of 37 to 38m. The quarantine anchorage is situated in position 33°16'N, 131°46'E, in depths of 25 to 43m.

The fairway through the central part of the Tsurusaki Hakuchi is designated as a prohibited anchorage area.

Caution.—All vessels except those having the permission of the Port Captain are prohibited from approaching within 30m of any tanker loading inflammable materials, or any such vessel not certified gas-free within Oita Ko.

A detached breakwater, which has been destroyed, lies approximately 1.3 miles ESE of the LNG dolphin berth located in position 33°16'N, 131°43'E. The rubble is marked by buoys, as charted, and by a light at the E end of the ruins.

10.9 **Beppu Wan** (33°18'N., 131°35'E.) is entered between Oita Ko and Toro Hana, about 6 miles to the N. Fishing nets are laid within 0.2 to 0.3 mile of its shores, except on the S side of the bay.

The track of the swept channel leading from a position about

5 miles N of Jizo Misaki into the center of Beppu Wan is marked by lighted buoys.

Beppu Ko (33°19'N., 131°31'E.)

World Port Index No. 62150

10.10 Beppu Ko, the head of Beppu Wan, fronts the entire W shore of the bay. The harbor includes the four anchorages of Beppu Hakuti, Beppu Kokusi-kanko Hakuti, Kamegawa Hakuti, and Hizi Ko (Hiji Ko). The port is primarily dedicated to passenger vessels and ferry traffic.

Tides—Currents.—The MHW interval at Kamegawa Hakuti and Hizi Ko is 8 hours 19 minutes; spring tides rise 2.1m and neap tides rise 1.5m.

Depths—Limitations.—Beppu Hakuti consists of three small basins, protected by breakwaters, with depths of 2.1 to 4.3m. Beppu Kokusaikanko Hakuti is protected by a detached breakwater, 0.5 mile in length, and a second breakwater on the S side. Depths inside the breakwaters range from 4 to 11.9m. Lights are shown from the head of the S breakwater, and about 100m from the head of the E breakwater.

Wharf No. 1 to Wharf No. 3 have alongside depths of approximately 3.1m, 4.9m, and 7 to 12.5m, respectively. Passenger vessels of up to 50,000 tons can be accommodated at Wharf No. 3.

Kamekawa Gyoko lies about 1.5 miles N of Kokusaikanko Hakuti, a boat basin having general depths of 3.4m, protected by a lighted breakwater. Hizi Ko is protected by breakwaters and is available for small vessels.

Aspect.—The red tower of the geophysical institute stands toward the rear of Beppu and is conspicuous. The electric lights of a cable railway on the hillside W of Beppu are visible for a considerable distance. The blue colored buildings of the hospital in Kamegawa are good landmarks from a distance. The white walls in front of the town of Hizi are conspicuous.

Beppu is a renowned hot spring resort and columns of white steam rising from the springs may be seen in the approach to the port.

Pilotage.—Pilotage is not compulsory but if used, they will board in the Quarantine Anchorage or Seki Saki. Pilots are available only from sunrise until 1 hour before sunset.

Pilots are provided from Seto Naikai (Inland Sea) Pilots Moji for vessels approaching from the W, replacing Kanmon Kaikyo Pilots, or entering from the S through Bungo Suido. For vessels proceeding from Kobe, pilots will be provided from there, and if from the S and E through Kii Suido, then pilots will be provided from Osaka Wan.

Pilots should be ordered from Moji or Kobe at least 24 hours before entering the Inland Sea, then again 6 hours in advance, with both messages including the following information:

1. ETA and name of pilot station needed.
2. Destination.
3. Speed.
4. Draft.
5. Cargo.
6. Length.
7. Any other relevant information.

Vessels should maintain a continuous listening watch on VHF channel 16 when within range of Shimonoseki, Oita, or Kobe Port Radio stations.

Contact Information.—See the table titled **Himeji Ko Port Authority—Contact Information**.

Himeji Ko Port Authority—Contact Information	
Telephone	81-97-506-4622
Facsimile	81-97-506-1766
E-mail	himejikoukoukanri@pref.hyogo.lg.jp

Anchorage.—Anchorage is prohibited from April through September within an area extending about 300m E of the S side of the pier at Beppu Hakuti.

Vessels usually anchor NE of Beppu Hakuti breakwater, seaward of the prohibited anchorage. Vessels anchor off Kamegawa Hakuti, but local knowledge is necessary. Hizi Ko affords anchorage in moderate depths, mud and sand bottom.

Caution.—Fishing nets and fishing reefs are hazards in Beppu Ko. A large number of fixed nets are set along the coast in the vicinity of Hizi Ko.

10.11 Kitsuki Wan (33°23'N., 131°40'E.) is entered between Gongen Bana and Usuishi Hana, from which a light is shown, about 3 miles to the ENE. The head and NE side of the bay are fringed with sandbanks that dry out 0.5 mile in places. The town of Kitsuki lies at the head of the bay.

Morie Ko, about the middle of the NE side of Kitsuki Wan, is shallow and is sheltered from all but S winds, but is only available to small vessels with local knowledge. A light is shown from a sand spit on the S side of Morie Ko. A spoil ground lies in position 33°24'N, 131°39'E.

Gyoja Misaki, 4.5 miles NNE of Tsukuishi (Usuishi) Hana, is a headland now overlaid by the development of Oita Airport. An aeronautical light is shown from the airport.

The E side of the airport is fringed with foul ground extending 0.5 mile offshore. A lighted buoy is moored off the SE edge of the foul ground.

Numerous fish havens exist within 4 miles of Gyoja Misaki Light.

Kurotsuno Hana (33°32'N., 131°45'E.) is about 4 miles N of Gyoja Misaki, and consists of a rocky point backed by a dense growth of pine trees. The point should be given a wide berth for numerous reefs lie in the vicinity.

Kunisaki (Tabuka) lies about 1.3 miles N of Kurotsuno Hana. There is a small basin, protected by breakwaters, and available to small vessels at Kunisaki. A light is shown from the E breakwater, and a second light from the S breakwater. O Se, a narrow reef with depths of less than 5m, extends about 0.6 mile ENE, from abreast of Kunisaki. A lighted buoy marks the E extremity of O Se.

Futago Yama (33°35'N., 131°36'E.) rises about 6 miles WNW of Kunisaki, and is 721m high. It is the highest mountain in this vicinity, and makes an excellent landmark.

10.12 Tomiku lies about 3 miles NNW of Kunisaki. It has a small basin, protected by breakwaters, but is only available to small craft with local knowledge. A light is shown from the head of the N breakwater. Me Se, a rocky ledge that dries 0.6m, extends about 0.5 mile offshore, about 0.4 mile SE of the

breakwater light of Tomiku.

Tsurugi Hana (33°40'N., 131°40'E.) is located 5 miles NNW of Tomiku; between them the shore is fringed with a bank, with the depths of less than 5.5m, extending about 0.3 mile offshore, but there are no off-lying dangers. There are many fish havens up to 3.5 miles offshore in this area.

Imi, a village protected by breakwaters, is situated about 3.5 miles WNW of Tsurugi Hana. A light is shown from the head of the N breakwater at Imi.

Hime Shima (33°44'N., 131°40'E.) is separated from the mainland by Himeshima Suido, with its SW extremity about 2 miles NE of Imi. Yahazu Take, a remarkable conical peak, 267m high, forms the summit of the island, and lies on its S side. A large number of fish havens, consisting of sunken hulks, lie on all sides of Hime Shima and in Himeshima Suido.

A light is shown from Hashiragatake Hana, the E extremity of the island. Lights are shown from the SW and NW sides of the island.

Anchorage.—Anchorage during SE winds can be taken, in 24m, sand, off the NW side of Hime Shima, with Su Hana, the W extremity, bearing 180°, distant 0.75 to 1 mile off. Lighter draft vessels can anchor closer inshore.

During N winds, anchorage is afforded, in about 14.9m, sand, about 0.6 mile SW of a sharp pointed rock at the E extremity of Hime Shima.

Bungo Suido

10.13 Bungo Suido (33°08'N., 132°08'E.) passes between the W coast of Shikoku and the E coast of Kyushu and is the channel leading from the Pacific Ocean to the Naikai (Inland Sea). The S entrance lies between Komo Saki on Shikoku, and Tsurumi Saki on Kyushu, about 20 miles to the W. Hoyo Kaikyo is the N entrance. Several power transmission lines, with vertical clearances of 29 to 51m, cross Bungo Suido in the vicinity of position 33°13'N, 132°31'E.

Komo Saki Light

Komo Saki (32°54'N., 132°29'E.) is a black steep cliffy headland, forming the SW extremity of a peninsula on the E side of the S entrance of Bungo Suido. A light is shown from the point. Okino So, a group of rocks, lies about 1.5 miles SW of Komo Saki.

Ka Shima is located about 2.5 miles NNW of Komo Saki. Its summit, near its E end, is 214m high. The S coast of the island consists of dark brown cliffs. There are tide rips in the narrow channel between Ka Shima and the coast to the SE. A light stands on the NE side.

Yoko Shima (32°56'N., 132°24'E.) lies about 4 miles WNW of Komo Saki; steep cliffs mark the S and W sides of the island. A black rock lies about 1.5 mile N of Yoko Shima. Close to the S end of Yoko Shima lies Ko Yoko Shima, 59m high, with tide rips occurring in the area to its E.

Hirajo Ko (32°59'N., 132°30'E.) shows a light from the N entrance point, located about 3.3 miles NE of Ka Shima Light. Hirajo Ko, sheltered from all winds, affords anchorage to vessels with local knowledge. Mabune, a rock on the W side of Hirajo Ko, shows a light.

Komatsu Saki is a steep headland faced with reddish-brown cliffs and marked by a round hill, 119m high. Kashiwa Ura is a cove on the E side of Kimatsu Saki and affords anchorage to small vessels, except during S winds.

Between Komatsu Saki and Yura Saki, about 5 miles W, the shore forms a bight in which are a number of small bays, most of which are exposed S and have depths too great for anchorage. A light is shown from Yura Saki.

10.14 Suge Saki (33°04'N., 132°25'E.) lies about 3.5 miles NNE of Yura Saki, and between it and Kashiwa Saki, about 3.3 miles further NNE, the shore forms a bight in which are numerous small bays. Arashi Ura lies about 3.5 miles E of Suge Saki, has depths of 27.4 to 45.7m, and is sheltered and free of dangers, but can only be entered with local knowledge. A light is shown from Suge Saki.

Iwamatsu Byoti lies 4 miles NNE of Suge Saki and is a sheltered bay and anchorage. Shono Shima, a rocky islet, lies on the S side of Iwamatsu Byoti and shows a light. A light is also shown at Iwamatsu Ko, situated at the head of the inlet.

Aspect.—Takega Shima, located with its S extremity about 2 miles N of Suge Saki Light, is prominent, with a wooded summit. The W side of the island is cliffy, and a light is shown from the W end of the island. A water pipeline and a submarine cable are laid from Takega Shima E to the mainland.

Oitsukami Shima (33°06'N., 132°20'E.) lies 4 miles W of Takega Shima. The W side of the island consists of high cliffs fringed by rocks. Nedoko Iwa, two prominent rocks, lie about 0.8 mile of the E side of Oitsukami Shima.

Hiburi Shima, sparsely covered with trees, is located about 2.5 miles N of Oitsukami Shima. The island is divided into two parts by a narrow boat channel that can only be used during HW. The SW part of the island is mostly cliffy and is fringed in places with rocks. The NE side is indented; at the heads of three of the bays lie small villages. A light is shown from the W side of the island.

Anchorage.—Vessels with local knowledge can obtain anchorage in Ako Ura, near the village of Ako, on the E side of the NW part of Hiburi Shima, when the winds are S to W. The depths in the greater part of the bay are too deep for anchorage.

Hiburi Shima Light

During N to E winds, the anchorage is untenable.

10.15 Komobuchi Byochi (33°10'N., 132°25'E.) is a sheltered bay entered between Kuro Shima and Noto Saki, about 1.5 miles ESE. A light is shown from Noto Saki. There are two sheltered coves at the head of Komobuchi Ko, one on the SE and one on the NW. A light is shown from a small islet which lies close off the W entrance point of the NW cove. There are depths of 32 to 55m, mud and sand, in each cove.

A canal has been constructed across a narrow neck which forms the NW branch of Komobuchi Ko; at LW the canal has a depth of 3.1m. A light is shown on the W side of the N entrance to the canal.

To Shima (33°12'N., 132°22'E.) is located 2 miles W of the canal light on Komobuchi Ko. The island is densely wooded; on its E side are the villages of Honura and Kojuura. A light is shown from the breakwater at Honura Ko. Ka Shima lies about 0.8 mile NNW of To Shima, and a light is shown from its N side.

Fubushino Seto (Hubusi-no Seto) is the channel between To Shima and the mainland. In the middle of the channel, at its narrowest part, is Oko Shima, an islet, from which a light is seen. There is no passage on the W side of the islet, as it is obstructed by a reef.

Uwajima Wan (33°14'N., 132°28'E.) is entered between Mizugaura Saki, about 3.3 miles E of Oko Shima, and Ora Saki, the S extremity of Ora Shima, about 2.8 miles N. Ko Shima, a small islet from which a light is shown, lies close S of Ora Saki.

Mizugaura Ko lies close S of Mizugaura Saki and is protected by a breakwater. Two lights, disposed horizontally, are shown from the breakwater.

Nishi Ura and Higashi Ura, two small bays in the SE part of Uwa-jima Wan, affords anchorage to small vessels with the aid of local knowledge.

Maru Se, a detached rock with a depth of 1.3m, lies in the middle of the entrance to Uwajima Wan. A lighted buoy is moored off the NW side of the rock.

Uwajima Ko (33°13'N., 132°34'E.)

World Port Index No. 62010

10.16 Uwajima Ko lies at the head of Uwajima Wan and consists of a natural harbor, with anchorage for large vessels and berthing for smaller vessels.

Winds—Weather.—In winter during strong NW winds, swells enter the harbor up to the breakwater. With the wind from any other direction, the harbor is safe and affords good shelter. The wind is mostly E during the typhoon season.

Tides—Currents.—The MHW water interval at Uwajima Wan is 7 hours 21 minutes; spring tides rise 2.1m and neap tides rise 1.5m.

Depths—Limitations.—Depths of 21m and greater lie in the channel NE of Ku Shima; similar depths lie in the narrow channel S of the island. Ushiga Se, a detached rock with a depth of less than 1.8m, lies about 0.4 mile E of Hako Saki, the S extremity of Ku Shima.

Depths in the outer part of the harbor range from 10.1 to 20m; depths in the inner part SE to S of the breakwater range from 4 to 7m.

Kabasaki No. 1 Quay has an alongside depth of 6m. Kabasaki No. 2 Quay has a depth of 4.5m

Sakashizu Quay, on the S side of the harbor, lies on reclaimed land and has five berths with alongside depths of 3.5 to 7.5m; vessels of up to 14,000 tons can be accommodated.

On the S side of the reclaimed land is a harbor with a depth of 4.6m in the outer part and a depth of 2.4m in the inner part.

There are two timber berths at Tsukiji jetty, on the N side the inner harbor, with alongside depths of 4 to 6m.

Aspect.—Ebisu Yama, on the S side of the harbor entrance, is a conspicuous round-topped hill, about 1.3 miles ESE of the summit of Ku Shima. The white tower of a castle stands on the SE side of Shiro Yama and is conspicuous in the city.

A light is shown from a red tower situated on the head of a breakwater on the S side of Ku Shima.

Anchorage.—Good anchorage can be had, in about 13m, mud, about 320m NNW of the head of the breakwater. O Ura, on the N side of the harbor, affords good anchorage to small vessels during strong NW winds; local knowledge is essential.

Yoshida Ko (33°15'N., 132°31'E.), a local harbor in the NE corner of Uwajima Wan, affords anchorage to large vessels, in 25m and greater, mud.

Directions.—Hikide Hana, in line bearing 092° with Gongenmori, leads about 183m N of O Se, 0.25 mile N of the dangers of No Shima, and 183m S of Kirige Se.

Uwa-jima Ko is entered between Udono Saki, the N point of Ku Shimas, and Hikide Hana, about 0.3 mile NE of Udono Saki.

The passage S of Ku Shima is narrow between the shoals that extend from each shore.

Hokezu Wan is entered between Ora Saki and Hirabae Hana, a conspicuous red point, about 3.8 miles NW. Takamori Yama, 635m high, rises conspicuously about 1.3 miles NE of the head of the bay.

Anchorage.—Anchorage is available at Tawaratsu Ko, on the N side of Hokezu Wan. Vessels anchor, in 12.8m, off the village of Waki. Vessels with local knowledge can anchor in Takayama Ko and Tamatsu Ko.

10.17 Osaki Hana (33°19'N., 132°22'E.) is a densely-wooded promontory, lying about 5 miles W of Hokezu Wan. The point is fringed by reefs extending about 0.1 mile offshore. A light is shown from the point.

Okuchi Wan is entered between Muro Hana, about 1 mile NNE of Osaki Bana, and Su Zaki, a projecting headland with steep cliffs, about 1.5 miles farther NNE. The entrance to the bay is about 0.6 mile wide. Taka Shima, the larger of a number of islets on the S side of the entrance, shows two lights.

Nakano Ura, Minae Ura, and Kuranuki Ura lie on the S side of the bay from W to E, respectively. Mikamie Ko lies in the NE part of Okuchi Wan.

Anchorage.—Nakano Ura, sheltered by the islets on the S side of the entrance of Okuchi Wan, affords a safe refuge anchorage for vessels of local knowledge. Mikamie Ko is also sheltered.

In general, anchorage can be found according to the direction of the wind in the inlets on the S and E sides of the bay, but they are restricted in the area due to the fact the depths are somewhat great and the anchorage space is limited.

Osaki Hana Light

10.18 Jino O Shima (33°22'N., 132°21'E.), 128m high and uninhabited, is located about 1.5 miles WNW of Su Zaki. A light is shown from Ko Shima, which lies close off the NE extremity of Jino O Shima. O Shima, lying close N of the W end of Jino O Shima, has a flat-topped summit.

Watariga Haya, a rock that dries 0.9m, lies about 0.8 mile N of the N end of O Shima. A lighted buoy marks the NW side of Watariga Haya.

Shitama Ko (33°26'N., 132°24'E.) is entered between Tatsu Saki and Suwa Saki, about 1.5 miles to the N. The bay is unsuitable as an anchorage because of its exposure to W winds. A light is shown from a rock close off Suwa Saki.

Sa Shima, a barren reddish-colored island, lies on the S side of the main approach to Yawatahama Wan, about 0.8 mile W of Suwa Saki. A light is shown from the W side of the island. Kuro Shima and Karasu Shima lie to the W of the approach to Yawatahama Wan.

A reef extends about 0.1 mile E from the E end of Sa Shima; on its extremity is a rock with a depth of 2.2m.

Yawatahama Ko (33°27'N., 132°25'E.)

World Port Index No. 62020

10.19 Yawatahama Ko is located at the head of the bay and consists of a town and a small harbor, with anchorage and berthing space for small vessels.

Tides—Currents.—The MHW interval at Yawatahama Ko is 7 hours 20 minutes; spring tides rise 1.6m and neap tides rise 0.9m.

Depths—Limitations.—The harbor is separated into an outer harbor and an inner harbor by the Deshima Wharf. A shallow basin used by fishing vessels is located at the innermost portion of the inner harbor. Berthing details are provided in the table titled **Yawatahama Ko—Berth Information**.

Yawatahama Ko—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Okishinden Terminal			
Quay No. 2	92m	5.5m	Ro-ro.
Kurinoura District Terminal			
Ganpeki	70m	5.0m	General cargo.
Kaisen	130m	7.5m	General cargo.
Taiheiyo Cement Terminal			
Cement	100m	3.0m	Cement.
Dolphin	23m	5.5m	Cement.
Yawatahama Ferry Terminal			
Pier 1	125m	5.5m	Ro-ro.
Pier 2	113m	5.5m	Ro-ro.

Aspect.—Suwa Saki is conspicuous on the S side of the entrance. Sanuki Mine rises between the heads of Yawatahama Ko and Kawanoishi Ko, about 2.3 miles NE of Suwa Saki; the wooded summit is a good landmark. A radio tower, with an obstruction light, stands on a hill about 0.5 mile E of the breakwater at the head of the harbor.

Anchorage.—Vessels anchor, in depths of 12 to 16m, mud, W of the head of the breakwater at the mouth of Shin Kawa. The anchorage is sheltered from all winds except from the W.

Caution.—A disused submarine cable, laid between the E

side of Sa Shima and the mainland E of Suwa, is marked by beacons. Local knowledge is required.

10.20 Kawanoishi Ko (33°28'N., 132°23'E.) is entered between Yono Saki and Nihonmatsu Hana, about 0.4 mile to the W. The town of Kawanoishi lies at the head of the harbor.

Kawanoishi Ko affords anchorage sheltered from all winds. Vessels anchor in the E side of the harbor, in depths of 11 to 20m, mud; local knowledge is necessary.

Ikata Wan is the small bay W of Kawanoishi Ko. Muroga Hana (Muro Saki), the W entrance point, shows a light and is conspicuous. The depths in the bay are too great for convenient anchorage.

Muroga Hana Light

Kucho Wan (33°28'N., 132°18'E.) is located about 3 miles WSW of Ikata Wan. The shores of the bay are fringed with reefs extending about 0.2 mile offshore in places, but landing can be effected at a wharf at Kucho, at the head of the bay. A submarine cable projects out through Kuco Wan, laid SW through Bungo Suido.

Between Kuicho Shima and Ko-Kajiya Hana, about 10.5 miles to the SW, the coast is fringed with reefs in places, but fairly close inshore. The only danger is a rock, awash, less than 0.5 mile SSE of Ko-kajiya Hana. A lighted buoy is moored close S of the rock.

Misaki Ko (33°22'N., 132°05'E.) is located about 1.5 miles NW of Ko-kajiya Hana, and is entered NW of **Doji Hana** (33°22'N., 132°06'E.). The village of Misaki lies at the head of the bay and shows a light. Sada Ura and Ino Ura are two coves on the SE side of the bay.

Misaki Ko affords anchorage to vessels with local knowledge, except during W winds. When the wind is W, small vessels can obtain shelter in either Sada Ura or Ino Ura.

From the head of Misaki Ko, the shore trends SW for a distance of 6 miles to Sada Misaki. The point is shown by a light and is a ramark signal station. There are no known offshore dangers.

West Side of Bungo Suido and Off-lying Islands

10.21 Shibiko Se (32°57'N., 132°16'E.) is an isolated rock, with a depth of 14m, lying almost in mid-channel in the S approach to Bungo Suido.

Mizunoko Shima is a small dark islet, 19.2m high, lying in mid-channel, about 7.5 miles NW of Shibiko Se. Ko Bae, about 0.2 mile S of the islet, is a brown, rounded rock, about 0.6m high. Hira Se, about 0.2 mile SE of the islet, has a depth of 1.8m, rock. A light is shown from Mizunoko Shima.

Montonoma Kaikyo (32°57'N., 132°04'E.) separates the S end of **O Shima** (32°58'N., 132°04'E.) from the N end of the peninsula of which Tsurumi Zaki is the E extremity. The strait is narrow and almost impassable because of rocks on either side and the strong tidal currents. An overhead power cable, with a vertical clearance of 26m, spans the channel. A light is shown from the S side of the strait.

Sakino Se consists of three islets lying about 1.3 miles E of the NE extremity of O Shima. The middle islet is dark in color and shows a light.

10.22 Takate Shima (32°59'N., 132°04'E.), 42m high and covered with dense growth, lies about 0.5 mile NNW of the N extremity of O Shima; between them is Komo Shima, flat-topped, with a growth of pine trees.

Saiki Wan is entered between Takate Shima and Kamado Saki, about 5 miles to the NW. The shores of the bay are indented with coves and inlets. The several headlands within the bay should all be given a wide berth, for off them lie dangerous reefs and rocks.

Aspect.—Higashikuro Mine and Tonoue Yama, two high peaks on the S side of the bay, are very conspicuous. Takahira Yama, bare and dome-shaped, serves as a landmark on the N side of the bay, about 2 miles W of Kamado Saki.

Caution.—Sunokoshi is a sandbank in the middle of the entrance of Saiki Wan. The S extremity of **Takega Shima** (32°59'N., 131°59'E.) and Tsurumatsu Bana, the NW extremity of a **Ya Shima** (32°58'N., 131°57'E.), in line bearing 240°, leads close NW of Sunokoshi.

Takega Shima and Katashiro-jima, about 1.8 miles to the WNW, lie on the E and W sides of the fairway, respectively.

Saiki Ko (32°58'N., 131°56'E.)

World Port Index No. 62175

10.23 Saiki Ko, the site of a naval air base and commercial harbor, lies in the SW corner of Saiki Wan. Main commodities handled include cement, wood chip, wood pulp, and general cargo. About 100 vessels visit the port annually.

The port consists of a town and a small natural harbor, with anchorage and berthing for vessels up to 44,000 tons.

Tides—Currents.—The MHW interval at Saiki Ko is 7 hours 8 minutes; spring tides rise 1.5m and neap tides rise 1.2m.

The tidal currents in the approach to the anchorages set E and W between Takega Shima and Todo-jima, on the falling and rising tides, respectively, but do not attain any great rate.

Depths—Limitations.—Vessels are limited to a maximum draft of 12m in the channel.

The Nihon Cement Pier has a permissible draft of 8.5m; the Kokoku Jinken Pulp Pier allows a draft of 5m; and the Dolphin Pier has a depth of 9m, with a 12,000 dwt capacity.

Mejima Pier has an alongside depth of 10m, and there is a mooring buoy in a depth of 12m able to accommodate vessels of up to 20,000 gt.

The lumber anchorage has a depth of 14m and is able to handle four 10,000 dwt vessels.

Aspect.—A large chimney and four towers are good landmarks on Me Shima, on the S side of the entrance to the harbor. The two chimneys of the cement factory, about 1.5 miles WNW of the summit of Onyu Shima, are good marks for entering when S of Onyu Shima.

Pilotage.—Pilotage is not compulsory, but pilots are available and board at the quarantine anchorage; VHF channel 16 is used.

Anchorage.—Anchorage is afforded large vessels in the vicinity of the quarantine anchorage E of Todo Hana, in a depth of about 20.1m. Anchorage can also be obtained ENE of the cove on the W side of the harbor and between the W side of Onyu Shima and the mainland shore; the bottom is mud and sand. The latter anchorage is safest when the winds are E to S during typhoons.

10.24 Hoto Shima (33°06'N., 132°01'E.) lies about 2.5 miles N of Kamado Saki, and has a pointed summit, sparsely covered with shrubs. A light is shown from a white tower on the N side of Hoto Shima. From its E extremity, a reef, on which several above-water rocks lie, extends about 1 mile NE. A light is shown from a rock near the end of the reef. A light is shown from the head of a breakwater, on the SW side of Hoto Shima.

Tsukumi Wan (33°06'N., 131°53'E.) is entered between **Kannon Zaki** (33°06'N., 131°57'E.) and Kusuya Saki, about 2 miles to the NNW. A light is shown on Kusuya Saki. A light is also shown from a white tower at a point 0.6 mile SW of Kannon Zaki.

Steep cliffs mark the shores of Tsukumi Wan. The crumbling white cliffs that back Tsukumi Ko at the head of the bay are conspicuous.

Shira Ishi is a white rock, 5.2m high, lying in the entrance to Tsukumi Wan, about 0.8 mile N of Kannon Zaki. A light is shown from the rock. Kuro Iwa is a black rock lying about 1.8 miles W of Shira Ishi. A lighted buoy is moored close off the E side of Kuro Iwa.

Kuro Shima (33°06'N., 131°54'E.), 92m high and wooded, lies about 0.8 mile WSW of Kuro Iwa. Chinu Saki is the extremity of a promontory that extends NW from the S shore of the bay. A light is shown from Chinu Saki, situated at the head of a breakwater extending N from the point.

Tsukumi Ko (33°05'N., 131°52'E.)

World Port Index No. 62170

10.25 Tsukumi Ko lies at the head of Tsukumi Wan and is divided into two parts by a peninsula, the head of which lies 0.75 mile W of Chinu Saki. The port consists of a town and a natural harbor with anchorage and berthing for large vessels. The port is mainly used for the export of limestone and cement.

Tides—Currents.—The MHW interval at Tsukumi Ko is 7 hours 38 minutes; spring tides rise 1.8m and neap tides rise 1.5m.

The tidal currents W of Shira Ishi are slight; the direction and velocity are uncertain.

Depths—Limitations.—The Onoda Cement Wharf, Berth A through Berth D, have depths alongside from 13 to 16m. All berths can accommodate vessels up to 60,000 dwt, except for Berth C, which accommodates 2,000 dwt. There are five other berths, with drafts of 7 to 10.5m, for vessels of 3,000 to 23,000 dwt.

Aspect.—The limestone quarries on the hills that back Tsukumi Ko are conspicuous from a distance and serve as landmarks for the harbor. Two chimneys of a cement factory on the S side of the mouth of Aoe Kawa are conspicuous. A conspicuous cement factory stands at the head of the N part of the harbor.

Pilotage.—Pilotage is not compulsory, but a pilot is available. It is recommended unless the master is acquainted with the locality. The pilot boards at the anchorage in position 33°5'30"N, 131°54'E. The Pilots can be contacted on VHF channels 12 and 16 (call sign: Tsukumi-ho-an}. There are no restrictions to night berthing/sailing, but to avoid accidents they are subject to master/pilot agreement.

Contact Information.—The Port Authority can be contacted via telephone (81-972-634-136).

Signals.—A weather signal station stands on the S side of the mouth of the Aoe Kawa, in a position about 0.5 mile SW of No Shima, the E extremity of the peninsula that separates the harbor into N and S parts. Weather signals are displayed by flashing light from the signal mast.

Anchorage.—The anchorage lies between Kuro Shima and Yokura Zaki, the point on the N side of the entrance to Tsukumi Ko.

Open to the NE, anchoring in Tsukumi Ko is impossible during strong NE to E winds; sea and swell enter the harbor with these winds. Mountains on three sides of Tsukumi Ko afford protection from winds from other directions; anchorage can be obtained, in 9.2 to 29m, clay, to within about 0.1 mile of the shores of the harbor. However, the inlet on the S side of Tsukumi Ko is exposed to NNW winds.

The quarantine anchorage lies SW of Kuro Shima.

Usuki Wan

10.26 Usuki Wan (33°10'N.,131°53'E.) is entered between Kusuya Bana and Kushiga Hana, about 5.3 miles to the NNW.

Tsukumi Shima, a dark, wooded islet with a sharp summit, lies about 0.8 mile off the S shore of Usuki Wan in a position about 1.8 miles WNW of Kusuya Bana.

Two rocks, the N of which has a depth of 0.9m, with the other drying 0.6m, lie between Tsukumi Shima and the shore S. A beacon stands on the drying rock. A yellow light is shown from the beacon. A lighted buoy is moored 0.7 mile E of Tsukumi Shima.

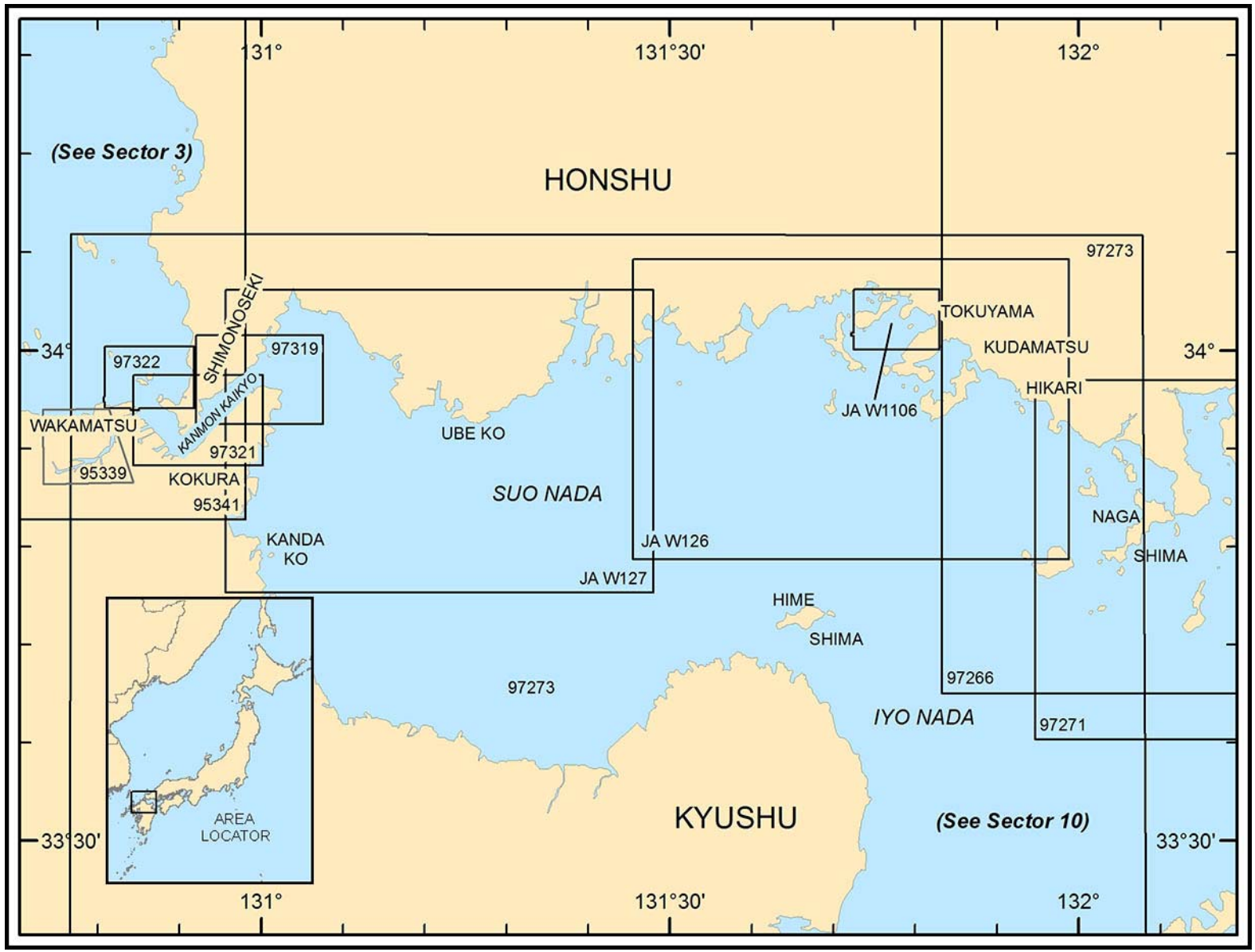
Shitanoe Ko (33°10'N., 131°50'E.) is a small harbor on the NW side of Usuki Wan, about 3.5 miles SW of Kushiga Hana. Depths of 4.9 to 8.9m, mud, affords anchorage to small vessels with local knowledge. A light is shown on the E entrance point to Shitanoe Ko.

Usuki Ko is a local harbor at the head of Usuki Wan. A basin, enclosed by breakwaters, lies on the S side of the head of the harbor, depths of 3.1 to 4.9m in this basin affords shelter to small vessels. A light is shown from the head of the SE breakwater, as well as from the breakwater on the N side of the mouth of Usuki Kawa.

The harbor is relatively safe from all winds except those from the NE. A chimney at the head of the harbor is conspicuous.

Tsuta Shima (33°14'N., 131°54'E.) lies about 5.5 miles NNE of Shitanoe Ko, and about 1.8 miles S of Jizo Misaki in the approach to Shita Ura, which is the winter anchorage for Saganoseki. A light is shown from a small breakwater on the NE side of Shita Ura. A lighted buoy is moored about 0.2 mile S of Tsuta Shima.

The Naikai pilots board vessels in the vicinity of Tsuta Shima.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **11** — CHART INFORMATION

SECTOR 11

THE NAIKAI (INLAND SEA)—SUO NADA AND KANMON KAIKYO

Plan.—This sector discusses Suo Nada and Kanmon Kaikyo, the W entrance of the Naikai. The descriptive sequence for Suo Nada is generally E to W, with the N coast described first, followed by the S coast. Kanmon Kaikyo is described from W to E.

General Remarks

11.1 Suo Nada (33°50'N., 131°31'E.), the W section of the Naikai, is bounded on the N by the coast of Honshu and on the S and W by the coast of Kyushu. On the E, it is separated from Iyo Nada by Naga Shima, Iwai Shima, and Hime Shima. On the W it is separated from the Sea of Japan by Kanmon Kaikyo. Suo Nada is about 50 miles long, E and W, and about 20 miles wide.

Tides—Currents.—In general, the currents in Suo Nada flow E during the ebb tide and W during the flood. It alternates 40 minutes after HW and LW. The velocity and direction of the current may sometimes vary considerably, but is generally less than 1.5 knots.

Caution.—The depths of Suo Nada are about 51m in its E entrance and gradually decrease toward the W, where depths of less than 11m lie within 7 miles of the shore. Several dangerous wrecks lie sunk on or near the main navigational track and can best be seen on the charts. Care should be taken with regards to submarine cables which are laid throughout the area.

Suo Nada—North Coast and Off-lying Islands

11.2 Naga Shima (33°50'N., 132°06'E.) is about 5 miles long and irregular in shape. Its NW and SE sides are washed by the waters of Suo Nada and Iyo Nada, respectively. The SW part of the island is joined to the rest of the island by an isthmus.

Anchorage.—Vessels with local knowledge can obtain anchorage, sheltered from W winds, either off Shida, a village on the SE coast, or in a bight off Kamai, a village about 1.8 miles further NE.

Amata-jima lies about 0.4 mile S of the S extremity of Naga Shima. Passage, between the two islands, is dangerous because of sunken rocks. A light is shown from the S extremity of Amata-jima. Usu Se are the two SW rocks of several rocks that lie on foul ground extending SW from the SW side of Amata-jima.

Hanaguri To (33°47'N., 132°02'E.) is an islet that lies close off the SW end of Naga Shima on the E side of Hanaguri Seto. The islet is wooded and cliffy on all sides. A light is shown from the W extremity of the island.

Iwai-jima lies on the N side of the E entrance to Suo Nada, about 1.5 miles W of Hanaguri To Light. The island is mountainous and forms a tableland of nearly uniform height. Rocky shoals lie within 0.15 mile of its shores. Eboshi Se, three above-water rocks, lie at the outer end of a reef which extends about 0.2 mile off the SE extremity of the island. A lighted buoy marks the E end of Eboshi Se. The islets of Ko-iwai-jima and Ko-jima lie off the W side of Iwai-jima.

11.3 Kaminoseki Kaikyo (33°50'N., 132°07'E.) is the strait between the NE end of Naga Shima and the SW extremity of Murotsu Hanto. The narrowest part of the strait is about 0.2 mile long, in an E and W direction, with depths of 8.9 to 11.9m. The passage, which does not exceed 90m in width, is reduced to a navigable channel of about 46m and a depth of 4.9m by the shoals on each side. Both sides of the strait are marked by navigation lights. Yoko Shima lies about 0.5 mile S of the entrance to Kaminoseki Seto.

Kaminoseki Seto is spanned by the Kaminoseki Bridge, with a vertical clearance of about 21m. A green fixed light marks the center of the bridge and a red fixed light marks each side of the clear passage.

Sago-jima lies about 0.8 mile NNW of Koyamando Hana, the N extremity of Naga Shima. The island forms the N side of Zoshi Seto, which leads into Sago Wan. Ikada Se, showing a light, is a black rock lying on a reef that extends 0.3 mile SW from the SW point of Sago-jima.

Kame Iwa (33°52'N., 132°05'E.) consists of three rocks, awash, lying on the S side of Zoshi Seto, about 0.3 mile NE of Kayomano Hana. A light, 14m in height, is shown from the S part of Kame Iwa.

Ushi-jima lies about 2 miles WSW of Sago-jima and is triangular in shape, with four summits of nearly equal height. A light is shown from Kaitsuke Hana, the N extremity of the island, and from a breakwater on the NW side of the island.

Four submarine cables, one of which is a power cable, are laid from the bay on the NW side of Ushi Shima to the mainland N.

11.4 O Shima (33°52'N., 131°59'E.), located about 1 mile NW of Ushi-jima, consists of two islets joined by drying rocks. The S islet is the larger of the two.

Hirao Ko at the NW end of Sago Wan, is a long narrow bight which makes a tortuous indentation to the NE, and has a width of slightly more than 0.2 mile. The bight is protected from the S by Atada Shima. In the S part of Hirao Ko the depths are 5.5 to 10.1m, mud.

Sagowan Hakuchi, on the S side of the peninsula, affords anchorage, in depths from 7 to 13m, mud. There are a number of mooring buoys in the N part of this anchorage; a submarine cable is laid from the N end of Uma Shima to the W end of the peninsula.

Murozumi Hanto (33°55'N., 131°58'E.) lies about 3 miles NNW of O Shima. The S face of the peninsula is cliffy and conspicuous; the E side forms a bay, which is open to the SE. The town of Murozumi is situated at the head of the bay. A light is shown from the W entrance point to the bay.

Hikari Ko, located about 3 miles NW of Murozumi Hanto, is a narrow basin on the SE side of Shimada Gawa. The basin is about 700m long and from 90 to 140m wide. A light is shown from the head of a breakwater forming the W side of the en-

trance.

A jetty berth, with a dolphin off each end and a depth of 11.3m, lies alongside the SE side of the entrance to the basin. A lighted buoy is moored close S of the S end of the basin.

O-Mizunase-jima (33°56'N., 131°56'E.) is located about 1 mile S of Hikari Ko, and consists of two hills of equal height. Ko-minase-jima, two small islets, lie close NW of O-Mizunase-jima. The NW end of O-Mizunase-jima and the S islet of Ko-minase-jima are connected by a breakwater. A light is shown from the S point of O-Mizunase-jima.

11.5 No Shima (33°56'N., 131°42'E.) lies about 3 miles SW of the entrance of Tokuyama Wan and exhibits a light at its S end. A light is also shown from a breakwater on the NW side of the island. Hira Shima and Oki Shima, two islets, lie N of No Shima. These three islets are joined by rocky ledges and reefs. Omo Ze, a shoal which dries, lies about 0.6 mile SW of the S extremity of No Shima. A light is shown from Omo Ze. A submarine pipeline and three cables lead NNW from No Shima to the shore of mainland; another submarine cable leads NNE to Uma Shima.

Uma Shima (see paragraph 8.7) and Otsu Shima are connected by a low isthmus. Miyaichigo Shima and Itsutsu Shima, small islets, lie close off the W side of Otsu Shima. A cable is laid from a position about 1 mile E of Itsutsu Shima, NW to the mainland.

A conspicuous radio mast is situated at Marusyama Saki on the N headland of Otsu Shima. A light is shown from the breakwater head at Hon Ura, a small harbor on the W side of Otsu Shima. Caution should be taken to avoid a fish haven enclosed within the area described by the lines joining the following positions:

a. 34°00'36.1"N, 131°41'47.3"E.
b. 34°00'34.7"N, 131°41'48.1"E.
c. 34°00'33.7"N, 131°41'45.2"E.
d. 34°00'35.0"N, 131°41'44.5"E.

Tokuyama-Kudamatsu Ko

11.6 Tokuyama-Kudamatsu Ko (34°00'N., 131°48'E.) is an important industrial and harbor complex. The extent of the harbor is divided into four areas. Area No. 1 lies off the city of Tokuyama at the head of Tokuyama Wan, and includes the E part of Senshima Suido; Area No. 2 lies off the city of Kudamatsu at the head of Kasado Wan; Area No. 3 consists of the areas to seaward of Area No. 1 and Area No. 2, bounded SE by Kasado Shima, SW and W by the harbor limit, and N by the coastline E of Shinoki Hana; Area No. 4 lies E of Kasado Shima, between the harbor limits and the coast.

Winds—Weather.—During typhoons in summer and autumn, the SE wind is the strongest, in winter the West Monsoon is strongest. Surges and waves enter Tokuyama Wan when strong SSE winds blow during typhoons. Wind from any other direction has little effect on vessels at anchor in the harbor, which is protected by the islands and peninsula.

Tides—Currents.—At the entrance to Tokuyama Wan, the flood current flows W, and the ebb flows E, with a rate which may reach more than 1 knot.

In the vicinity of the entrance to Kasado Wan the flood current flows WNW, and the ebb flows SSE, with a rate which may reach 1 knot.

11.7 Kasado Wan (33°58'N., 131°50'E.) lies between the SE side of O Shima and the NW side of Kasado Shima. The W approach to Kasado Wan is divided into two deep channels by islets, and rocks and reefs, which lie W of the entrance to the bay. The N channel has depths of 12.8 to 21.9m, and the S channel 14.6 to 27m. Miyano Seto, between the N end of Kasado Shima and Miyanosu Hana, is a deep-water channel, 0.1 mile wide with a depth of 12.8m.

Kudamatsu (34°00'N., 131°52'E.) (World Port Index No. 61675) stands at the head of Kasado Wan and contains a number of deep-water berths and anchorage space. An oil berth, E of Miyanosu Hana, can accommodate large tankers with a draft of up to 11.9m.

Anchorage.—Vessels can anchor in Kasado Wan, as convenient, in depths of 11 to 14.6m, mud.

Pilotage.—Pilotage is not compulsory, but is advisable for those without local knowledge; it is available during daylight hours only. The pilot boards in the quarantine anchorage.

Tokuyama Wan

11.8 Tokuyama Wan (34°02'N., 131°49'E.) lies between O Shima and Sukumo-jima on the SE, Otsu Shima on the W, and Kurokami-jima and Sen-jima on the NW.

Tides—Currents.—On a rising tide, the current divides after entering the channel, one branch flows N through Nakayano Seto then NE, and the other branch flows W along the coast. The two opposing flows meet N of Kurokami Shima where the surface current diminishes. The spring rate of flow at the entrance is 1.25 knots, but the rate in the middle of the bay reduces to 0.25 knot.

Depths—Limitations.—The main deep-water channel into Tokuyama Wan from the S lies between Su Shima and Iwa Shima, and is 0.5 mile wide and with a least depth of 25m.

Idemitsu Sea Berth, with nine mooring buoys, is situated about 1 mile NE of the entrance channel to the bay. A submarine pipeline connects between the sea berth and the coast of Oshima Hanto, and a special mark buoy is moored near the seaward end of the pipeline. The sea berth has a depth for vessels with a draft of 19.5m, and it is equipped with a submersible oil boom, and can accommodate vessels between 70,000 and 275,000 dwt, with maximum length of 340m.

Nishiga Mori Jetty lies about 1.3 miles E of Iwa Shima, which projects from the shore, and has an 11.9m depth alongside. Tank depot and oil installation occupy the NW side of Osima Hanto. Jetty No. 2 through Jetty No. 7 are situated along the NW coast, with mooring dolphins off Jetty No. 2, Jetty No. 3, Jetty No. 4, and Jetty No. 7. Jetty No. 3 has a depth of 11.7m alongside; Jetty No. 5 has a depth of 12.3m alongside.

Aspect.—The S entrance to the bay lies between Iwa Shima, which shows a light, and Su Shima, about 0.8 mile to the W. Senshima Suido, the N channel into the bay, lies between the N side of Sen Shima and the mainland N. Vessels also use Nakatanino Seto, between the N end of Otsu Shima and the W side of Kurokami-jima.

Pilotage.—Pilotage is not compulsory; however, an Inland Sea Pilot or the harbor pilot can be requested with a message to Anjeir Moji, 24 hours in advance. Sea pilots board ship 3 miles

S of **Seki Saki Light** (33°13'N., 131°54'E.). Harbor pilots board at the quarantine anchorage area (34°01'N., 131°46'E.), in a depth of 11m. Pilots board deeper draft vessels 2 miles SW of the anchorage.

Anchorage.—Anchorage can be taken in almost any part of Tokuyama Wan, in depths of 10 to 18.3m; however, submarine pipelines and cables are to be avoided.

Caution.—Two submarine oil pipelines, marked by yellow buoys, are laid NE from the N of oil installation to the oil refinery in Tokuyama.

11.9 **Tokuyama** (34°02'N., 131°49'E.) (World Port Index No. 61680) lies at the head of Tokuyama Wan. The public wharves have depths of 4 to 12.2m and can accommodate vessels of up to 40,000 dwt.

The oil installation occupies the NE side of the bay, N of Osima Hanto. It consists of a large harbor with berthing facilities for vessels of up to 50,000 gt and a deep draft of 11.9m.

There are also a number of buoy berths in depths of up to 20m for vessels of up to 250,000 dwt.

Pilotage.—Pilotage is not compulsory, but pilots are available and board at the quarantine station when requested.

Mitajiri Ko (34°01'N., 131°36'E.) lies about 9 miles W of Tokuyama-Kudamatsu Ko, and is entered between Edomari Hanto and Muko Shima. The harbor is divided into two areas, Mitajiri Ko and Nakanoseki Ko.

The channel leading into the port is about 122m wide and 7m deep. The channel is marked by lighted buoys. A berth, with depths of 3.7 to 7m alongside, lies on the W side of the channel.

A wharf, with depths of 5.7 to 7.8m, lies across from Heiwa Wharf. Nakanoseki No. 2 Quay has alongside depths of 7.5 to 8.2m.

Muko Shima forms the E side of Nakanoseki Ko and the SW side of Mitajiri Ko. Tazuno Hana, its S extremity, lies about 1.5 miles SE of Nishidomari Saki, and in its center, Nishiki Yama, attains a height of 354m and is a good landmark. Kuro Se, a rock marked by a lighted buoy, lies 0.2 mile off the SW extremity of Muko Shima.

Saba Shima (33°58'N., 131°31'E.), 32m high, is thickly covered with trees and lies about 2.5 miles SW of Kuro Se. A shoal bank, with two above-water rocks, extends almost 0.5 mile to the SE. A light is shown on the W side of the bank, close to the island.

Omi Wan is available to small vessels only, the bay being mostly shoal. Its shores are mainly sandy beaches fringed with a drying sand bank. The bay lies about 3 miles NNW of Saba Shima. Navigational lights mark the shores of the bay.

Aio Wan (34°00'N., 131°25'E.), a shallow bay used by small craft, is located about 3 miles W of Omi Wan. A boat basin lies at the head of the bay and is protected by breakwaters. Take Shima lies in the S approach to Aio Wan. Iruka Se, marked by a lighted buoy, is located 0.75 mile SSW of Take Shima.

The bay close W of Aio Wan is encumbered with numerous islets and rocks and is shoal. The shores of the bay are fringed with sandbanks that dry. The village of Azisu stands on the W side of the bay, and is protected by a breakwater.

Between **Maruo Saki** (33°58'N., 131°21'E.) and Ube Ko, about 7 miles WSW, the coast is backed by low hills with no conspicuous features.

Seaweed nurseries, containing steel piles, extend up to 0.2 mile offshore for 1 mile W of the entrance to Ube Ko.

Ube Ko (33°56'N., 131°14'E.)

World Port Index No. 61690

11.10 Ube Ko occupies the whole of a bight between Motoyama Misaki and Ube Misaki. The port consists of three harbors, namely, East Harbor, Main Harbor, and West Harbor. The harbors are made up mainly of reclaimed land, constructed from coal slag.

Winds—Weather.—The climate is generally mild and as a rule the wind direction is frequently E. During the winter, there are frequently W or NW winds, but there is rarely wind from the SE.

Tides—Currents.—The seas are generally low and the adverse effects of tidal currents and drifting silt are not to be seen, but there is a danger of abnormal high tides caused by typhoons. It is necessary to maintain course at the entrance to the various fairways as the tidal currents may be strong across the fairways.

Depths—Limitations.—The fairway is dredged to a depth of 11m. The principal berths have alongside depths of 7.5 to 13.0m. Shibanaka West Wharf has a depth of 13m and can accommodate vessels up to 50,000 dwt.

A bridge, with a vertical clearance of about 25m, spans the entrance to West Harbor. A fixed white light on the bridge marks the mid-channel approach which leads into West Harbor. The channel is also marked by fixed red and green lights on each side.

Seibusekiyu Sea Berth consists of a large mooring buoy equipped with a light, a horn, and a radar reflector. The berthing capacity is up to 250,000 dwt, in a depth of 20m. The buoy is situated about 6 miles SSE of Motoyama Misaki.

Aspect.—Motoyama Misaki is a salient point terminating in a cliff. Three chimneys at a power station about 2 miles NE of Motoyama Misaki are conspicuous.

Shimofuriga Daki, located about 5.5 miles N of Ube Misaki, appears as three peaks and is conspicuous because of the surrounding low land.

Pilotage.—Pilotage is not compulsory, but is recommended. Inland sea pilots are available at Seisaki or Hesaki. Pilots are available during daylight hours only and can be contacted on VHF channels 12 and 16. Harbor pilots board at the quarantine anchorage, which lies about 1.5 miles WSW of the light tower on Montoyamano Su. Pilots for Seibusekiyu Sea Berth board about 0.3 mile NE of the sea berth.

Contact Information.—The Port Authority may be contacted by telephone (81-839-228-111).

Anchorage.—There is anchorage for four ships, two of 500 gt and two of 1,000 gt, in depths of 3.5 to 7.3m.

A quarantine anchorage lies 3 miles SE of Motoyama Misaki. Vessels also anchor SE of the sea berth buoy.

11.11 Between Motoyama Misaki and the entrance to Kanmon Kaikyo, about 10 miles WNW, the coast forms a large shallow bight at the head of which is a drying sand bank that dries out about 1 mile in places.

Onoda Ko (33°58'N., 131°10'E.), located about 2.5 miles N

of Motoyama Misaki, extends about 2 miles N from the foothills of Ryuo Zan, and consists of a harbor enclosed by breakwaters. A light is shown at the head of the N breakwater. Permission to enter the harbor must be obtained prior to entry.

Depths—Limitations.—The harbor has depths of 4 to 7m. It is approached by a channel, marked by lighted buoys, which has depths of 4.9 to 7m. Caution is necessary because there are places on both sides of the channel where the water rapidly becomes shallow. Large vessels normally wait for high tide.

Aspect.—Two chimneys E of the N breakwater, and four chimneys S of the S breakwater are conspicuous.

Pilotage.—Pilotage is not mandatory, but recommended.

Regulations.—Vessels are permitted to arrive and depart during daylight hours only.

Suo Nada—South Coast—Takedazu Ko to Kanda Ko

11.12 Takedazu Ko (33°41'N., 131°34'E.), a small fishing harbor, lies between two cliffy points, Biwa Saki, on the W, and Kame Saki on the E. A small basin protected by breakwaters is located on the W side of this shallow bay.

Naga Saki is a salient cliffy point, covered with trees, and located about 2 miles W of Biwa Saki. Near the extremity of the point is a rock covered with a few trees, and resembles a boat under sail when viewed from the E or W. A light is shown from the point.

Takada Ko (33°35'N., 131°26'E.), located about 7.8 miles SW of Naga Saki, is a small harbor between a curved breakwater and the entrance of Katura Kawa. The town of Takada is about 1 mile S of the entrance to the river. A light is shown from the head of the breakwater.

Nagasu Ko, a small port, is located about 3 miles W of Takada Ko. The town stands on the E side of the mouth of the Yakkan Kawa. The port is protected by a breakwater from which a light is shown.

11.13 Nakatsu Ko (33°36'N., 131°12'E.), at the mouth of Yamakuni Kawa, lies about 9.5 miles WNW of Nagasu Ko. The river has two entrances,; the W entrance, with depths of 1.5 to 2.1m is the deeper of the two and is protected by training walls, which are covered at HW.

Entrance buoys have been established at Nakatsu Ko. Two chimneys on the right bank of the river are conspicuous. Another chimney, about 48m high, stands on the foreshore 1.5 miles SE of the mouth of Yamakuni Kawa.

There are depths of 8 to 11m at Public Quay, inside the E breakwater.

Unoshima Ko, a harbor protected by breakwaters, is available to small vessels with local knowledge, and lies about 3 miles W of Nakatsu Ko. A detached breakwater, exhibiting a yellow light at its W end, lies about 230m N of the quayed breakwater on the E side of the harbor entrance. An approach channel, 1.25 miles long and dredged to 7.5m, leads S from 230m outside the harbor limit to the harbor entrance.

A pier, with dolphins on each side, lies on the NE corner of reclaimed land, 0.2 mile WNW of the W breakwater. There are depths of 6.1 to 7m alongside the pier. A lighted buoy is moored 1.5 miles NNE of the pier; lighted buoys mark the channel to the pier.

Mino Shima (33°44'N., 131°01'E.), 60m high and wooded, lies about 9 miles NW of Unoshima Ko and lies on a drying sandbank that extends from the shore to which the latter is joined by a causeway. A signal station is situated at the N end of Mino Shima.

Kanda Ko (33°47'N., 131°01'E.)

World Port Index No. 62145

11.14 Kanda Ko is an open harbor located about 10 miles S of the E entrance to Kanmon Kaikyo. The port is used primarily for the shipment of coal and cement. The harbor is protected by Kono Shima and a breakwater to the N.

Winds—Weather.—Throughout the year, the most frequent wind is from the E. During strong E winds, the sea enters the port. From autumn through winter there are frequent W and NW winds, but they have no great effect on the harbor because of the mountains to the W of the port. In spring and winter, fog may effect visibility, but is not persistent.

Tides—Currents.—The tidal current flows in an E and W direction. The rate of the current in the harbor entrance is about 0.5 knot.

Depths—Limitations.—A buoyed channel, dredged to 12m, leads to the harbor entrance. A rectangular area, marked by lights, is being reclaimed N of the entrance channel. The channel continues, dredged to 10m, from a position within the harbor limits and leads SE of Kono Shima to the S basin. To the S of this channel lies a detached breakwater. A large area on the SE side of the S basin is being reclaimed.

The port has berthing space for vessels up to 40,000 gt, with up to 13m alongside. An area, marked by buoys to the W of Kono Shima, has been dredged to a depth of 7.3m.

Aspect.—Kono Shima, on the E side of the harbor, is long and narrow in an NE and SW direction. Two large chimneys in the central part of the inner harbor are the most conspicuous marks.

Matsu Yama, 128m high on the N side of the harbor, is very conspicuous.

Pilotage.—Pilotage is not compulsory. Inland Sea pilots are available, however, from Sekisaki or Matsure. A harbor pilot may be boarded at the anchorage in position 33°48'09″ N, 131°02'30″E until nightfall.

Caution.—Due to the possibility of explosives on the sea bed, a prohibited area is centered on approximate position 33°47.1'N, 131°00.5'E.

Vessels should exercise caution due to the proximity of the fairway to the airport traffic approach routes.

11.15 Inoura Ko (33°50'N., 130°59'E.) is a small harbor located about 3.5 miles N of Kanada Ko. The harbor is protected on its SE side by a breakwater and on its NE side by reclaimed land. A light is shown from the head of the breakwater.

There are some red cliffs on the W side of the harbor, which are conspicuous from E.

A basin, in which there is a wharf with a depth of about 5.2m alongside, lies between two reclaimed areas, 1.25 miles N of the head of Inoura Ko Breakwater. The basin is approached by a buoyed channel, dredged to a depth of 6.1m. There is a pier, with a depth of 6.1m alongside its head, N of the entrance to

the basin, and is approached from the S by a narrow channel.

He Saki lies on the S side of the E end of Kanmon Kaikyo, about 6 miles N of Inoura Ko. A light is shown from the point. A signal station stands close by the light and transmits information on traffic, tidal current, and berthing. Vessels can communicate with the station by day or night.

Kanmon Kaikyo

11.16 Kanmon Kaikyo connects the Sea of Japan and The Nakai (Inland Sea). The channel forms the W entrance to the Naikai. The straits are about 15 miles long from a position E of Mutsure Shima to a position E of He Saki. The E entrance is divided into North Channel and Middle Channel by Nakano Su; the W entrance is divided into E and W channels by Mutsure Shima, Uma Shima, and Kata Shima.

Depths within Kanmon Channel are generally over 10.1m, except for Kamatokono Se, with a depth of 6.7m, and several other depths of 8.2 to 9.5m.

Kanmon Kaikyo is narrow and winding, with a navigable width in the wide places of 1 mile, and no more than 0.25 mile in the narrowest part.

Caution is necessary because of strong tidal currents and extremely heavy traffic. The largest vessel to transit the straits was reported to be of 92,112 gt, 340m long, and had a deep draft of 9.5m. A draft of 9.2m can transit the straits at any stage of the tide.

Small or medium size vessels should enter the strait during daytime and about 1 hour before the tidal current in Hayatomo Seto turns from an adverse current to a following one. When it is SW in Hayatomo Seto, an eastbound vessel should be in the vicinity of Nakano Su, and a westbound vessel should be near Fukuura Wan. Passage through the strait between midnight and dawn is not recommended, as the W side is sometimes enveloped in thick fog or mist.

A vessel should, if possible, avoid transiting the strait or entering or departing harbors on either side of the strait with a following tidal current, but if this is unavoidable vessels should not do so when the tidal current is running at full strength.

It is not safe for large vessels to transit the strait with any appreciable following current, or at SW when numerous local craft encumber the fairways.

Large vessels with sufficient power should pass through Hayatomo Seto with an adverse current of more than 2 knots and less than 4 knots; about 3.5 knots is reported to be advantageous, as by this time the possibility of meeting any ocean-going vessels proceeding in the opposite direction will be at a minimum. When a current exceeding 4 knots is running, the strait should not be attempted as strong eddies may cause a dangerous shear.

Vessels passing though the strait are instructed to navigate at speeds of 10 to 12 knots, increasing to 15 knots through Hayatomo Seto narrows, about 1 mile either side of Moji Saki. If salvage operations are in progress, it will be necessary to reduce speed to about 5 knots. Vessels must maintain a minimum speed of 4 knots against the current.

Winds—Weather.—The wind direction in the strait is influenced by the topography, but throughout the year E winds are the most frequent, followed by ENE, and WNW, in that order. During the night, there is generally an E wind until about 0900, thereafter, it blows from the W. In fair weather this phenomenon, constituting the land and sea breezes, occurs with regularity.

Fog is most frequent in the strait from early spring to July or the end of the rainy season. The fog develops mainly at sunrise when the wind is light and disperses as the sun ascends higher. Fog rarely occurs when the speed of the wind is over 10 knots.

When the winds are E to S, the smoke from the various factories on the Kyushu side covers the interior of the strait, particularly in the western part. On some rare occasions it may extend as far as **Futadi-jima** (34°06'N., 130°48'E.), which lies NNW of the W entrance of the strait. However, as soon as the wind shifts to the W, the smoke clears and the visibility becomes good.

Tides—Currents.—The maximum velocities obtained in the straits can reach 13 knots. The current is weakest at about midway between HW and low water. Slack water lasts only a few minutes. The straits require careful navigation and slow vessels need to be aware that at times they may be unable to make way over ground.

Tidal signal stations within the straits are situated at Daiba Hana, He Saki, and from a position on the NW shore of Kanamon Kaikyo, about 685m NE of the Kanmon Bridge.

Tidal current signals are displayed from an electric sign board mounted on a quadrangular metal framework structure; they indicate the direction, rate, and expected change of rate of the tidal current in Hayatomo Seto.

The signals consist of symbols, as follows:

1. The letter E or W, indicating the direction of the current.
2. A digit or digits, from 0 to 13, indicating the rate of the current in knots. The digits symbol is omitted if the rate cannot be measured.
3. An arrow pointing up or down, indicating that the rate of the tidal current is expected to increase or decrease, respectively.

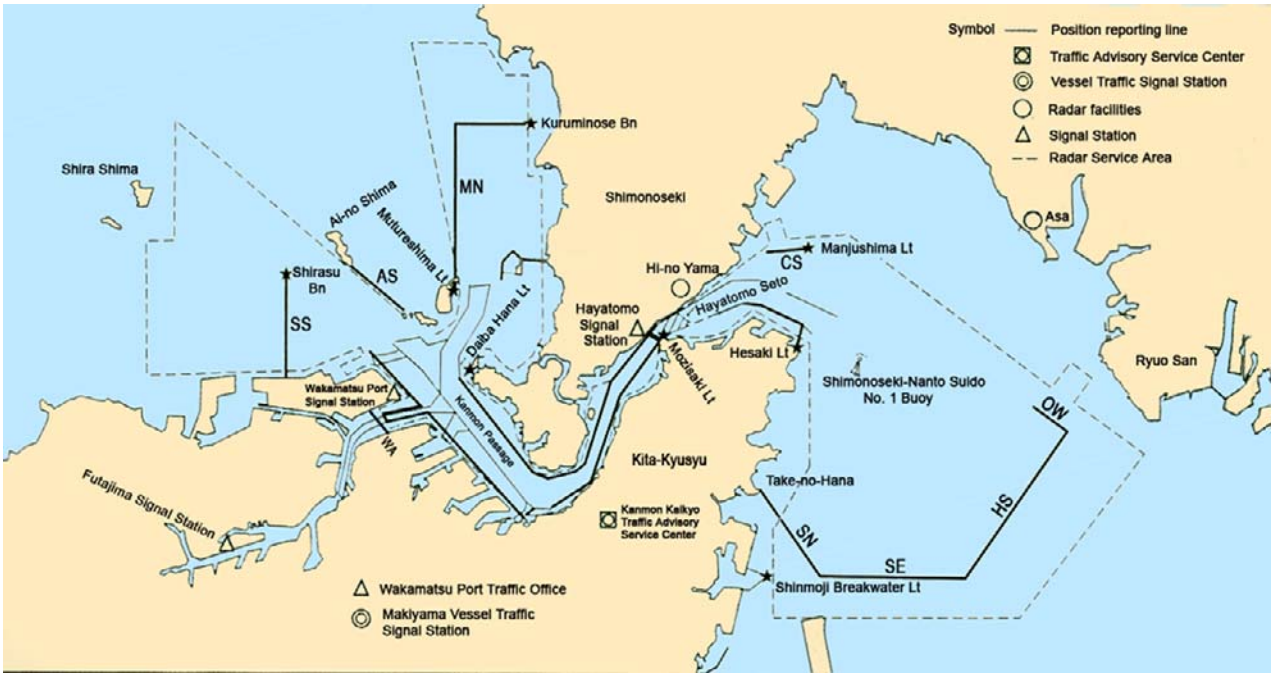
The symbols are white and are flashed in succession continuously.

Pilotage.—Pilotage is compulsory for the following vessels and should be requested no less than 2 hours before arrival at the Hesaki Anchorage or the Mutsure Shima Anchorage:

1. All vessels 10,000 gt and over passing through Kanmon Kaikyo.
2. Vessels 3,000 gt and over entering or departing Kanmon Ko.
3. Japanese vessels 1,000 gt and over, not engaged in international navigation, entering or departing Wakamatsu Ko Sections 1 to 4.
4. Japanese vessels 1,000 gt and over, not engaged in international transits, entering or departing Kanmon Ko loaded with dangerous cargo.
5. Vessels 300 gt and over on international navigation or foreign vessels, entering or departing Wakamatsu Ko Sections 1 to 4.
6. Vessels 300 gt and over on international navigation or foreign vessels, entering or departing Kanmon Ko loaded with dangerous cargo.

Pilots board, as follows:

1. West Entrance.—Vessels with a draft of more than 14m or with a length of over 250m board the pilot 1.5 miles N of **Mutsure Shima Light** (33°58'N., 130°52'E.). Other



Kanmon Kaikyo Traffic Advisory Service

vessels board the pilot 1 mile NNE of the same light.

2. East Entrance.—Vessels board pilots approximately 1.3 miles SE of He Saki Light.

Regulations.—Vessels should maintain continuous contact with Kanmon Kaikyo Vessel Traffic Service Center on VHF channel 16 when navigating Kanmon Kaikyo, the approaches to the passage, and the adjacent sea areas.

A vessel traffic service, the Traffic Advisory Service Center (TASC), operated by the Japan Coast Guard (JCG) in Kanmon Kaikyo, provides traffic control and information about vessels entering, departing, and navigating within the strait.

Kanmon MARTIS may be contacted, as follows:

Kanmon MARTIS—Contact Information	
Call sign	Kanmon Martis
VHF	VHF channels 13,16, 14, and 66
Telephone	81-93-3720099
Facsimile	81-93-381449

Specified vessels should report to and comply with guidance provided by TASC (call sign: MARTIS). Specified vessels are defined as follows:

1. Vessels of 50m and more in length that navigate on the traffic routes designated by the Maritime Traffic Safety Act and the vicinity of these traffic routes.

2. Vessels more than 300 gt that navigate Kanmon Kaikyo Passage, Kanmon Kaikyo Passage 2, and the vicinity of these passages.

3. Vessels of 10,000 gt and over and tankers of 3,000 gt and over intending to navigate the Haytoma Seto Fairway. Vessels intending to navigate Haytoma Seto Fairway should contact Kanmon MARTIS by 1200 of the day prior to entry into the fairway.

Kanmon MARTIS Home Page
http://www6.kaiho.mlit.go.jp/kanmon

Kanmon Kaikyo VTS—Reporting Lines		
Name of Reporting Lines	**Abbreviation**	**Description**
North of Mutsure Shima	MN	A line bearing due N for a distance of 3.7 miles from Mutsure Shima Light then drawn due E to Kurumino Se Lighted Beacon.
South of Ai-no-Shima	AS	A line joining the S point of Ai-no-Shima with the N point of Kata Shima.
South of Shira Su	SS	A line bearing due S from Shira Su Light to the shore.

Kanmon Kaikyo VTS—Reporting Lines		
Name of Reporting Lines	**Abbreviation**	**Description**
North of Shin Moji	SN	A line drawn from Takeno Hana to a point due E and a distance of 1.2 miles from Shin Moji Hakuchi Breakwater Light.
East of Shin Moji	SE	A line from a point due E and 1.2 miles distant from Shin Moji Hakuchi Breakwater Light to a point 4.4 miles due E of this light.
Southeast of He Saki	HS	A line from a point due E and 4.4 miles distant from Shin Moji Hakuchi Breakwater Light to a point bearing 215° and distant 2.1 miles from Ryuo San Triangulation Point.
West of Onoda	OW	A line from a point 215° and 2.1 miles distant from Ryuo San Triangulation Point to a point bearing 240° and 2.3 miles distant from the same point.
South of Chofu	CS	A line joining Manju Shima Light and the S point of Kanju Shima.
Wakamatsu-kita	WA	A line joining a point bearing 232° and distant 0.9 mile from Wakamatsu Dokai Bay Entrance Light to a point bearing 222°45' and 0.9 mile distant from the same light.

Information provided by the Traffic Advisory Service Centers include:

1. Traffic routes.
2. Traffic obstacles.
3. Dangerous sea areas.
4. Information regarding vessels restricted in their ability to maneuver.
5. Information regarding other specified vessels in close-quarter situations.
6. Other information as necessary for safety of navigation.

Vessels navigating in designated traffic routes or the port areas should enter their JCG-designated destination codes into the AIS to communicate their intended course to other vessels.

Vessels of 10,000 gt and above and tankers of 3,000 gt and above should report to Kanmon MARTIS on VHF channel 16 or 13 when crossing any reporting line listed in the table titled **Kanmon Kaikyo VTS—Reporting Lines**.

Kanmon Ko Port Regulations Law.—The following are extracts from Port Regulations Law, Section V, for vessels in Kanmon Ko:

Article 42.—Vessels of more than 500 gt (300 gt for Wakamatsu Quarter) will use two anchors when anchoring in the Port of Kanmon. Section 5 of Wakamatsu Quarter, with the exception of Tobata Anchorage, is exempt from this requirement.

Article 44.—Consists of the following requirements:

1. Vessels proceeding W through Kanmon Kaikyo from the E must enter Yayatomo Seto N of a line joining Moji Saki Lighted Buoy and the highest peak on Manju Shima before reaching a line joining Hino Yama with Tobigasu Hama. Vessels proceeding E through Hayatomo Seto must take a course passing N of a line joining Moji Saki Light and the S tip of Ganryu Shima before reaching a line joining Shimonoseki Range Light and the summit of Sankaku Yama. Vessels of less than 100 gt are exempt from this rule. They may sail as close to Moji Saki as possible and when sailing as such, the vessels when meeting opposing vessels shall pass starboard to starboard when the current is running E and port to port when the current is running W.
2. Large vessels sailing E through Hayatomo Seto must keep vessels of 100 gt to starboard and when sailing W to port
3. Vessels sailing through Hayatomo Seto against the current must maintain a speed of at least 3 knots in excess of the speed of the current.
4. Vessels sailing through Hayatomo Seto are to sound three long blasts on the whistle or siren as the occasion demands from the time a position 0.5 mile from Moji Saki is reached until the vessel has passed Moji Saki.
5. Vessels proceeding in Kanmon Passage may overtake other vessels where there is adequate sea room to safely pass. When one vessel intends to overtake another vessel along its starboard side, it is to sound one long blast, followed by one short blast, on the whistle or siren, and when it intends to overtake along the other vessels port side, it is to sound one long blast, followed by two short blasts.
6. In Wakamatsu Passage, vessels of above 500 gt will proceed near the middle of the channel while vessels of less than 500 gt will proceed on the starboard side of larger vessels.
7. The whole area of Kanmon Passage has been designated a restricted area. When visibility falls to 1,000m or less “precaution against poor visibility” will be ordered. Vessels navigating in the restricted area are advised to navigate with great caution and maintain a good lookout. When visibility falls to 500m or less “requisition to avoid entering the passage” will be ordered. Vessels intending to transit the restricted area are prohibited from entering and should wait until restrictions are lifted. Vessels underway in the restricted area when the order is made should navigate with great caution or wait in a suitable area outside the fairway informing “KANMON MARTIS” on VHF channel 16 and continuing communication on VHF working channels 13, 14, and 22.

Restrictions will be ordered either by KANMON MARTIS, MOJI SEA PATROL RADIO/JNR, or patrol craft sta-

tioned in the area.

Article 46—Part 1.—Vessels which intend to anchor will display in a prominent place a blackball or shape by day and a red light at night, in addition to the other standard lights prescribed by International Rules for Preventing Collisions at Sea.

Article 46—Part 2.—Vessels of over 300 gt intending to depart Wakamatsu Quarter and vessels over 500 gt intending to depart through Seitetsu Tobata Hakuchi are to sound two long blasts on the whistle or siren and by day, show the International Flag Signal for getting underway, and by night hoist two white lights in a vertical line, 30 minutes before getting underway.

Article 48.—Vessels sailing to and from the port of Kanmon Ko will, between Mutsure Shima on the W side and He Saki on the E side, display on the foremast or at another conspicuous place the International Flags in accordance with the table below to indicate their destinations:

1. Proceeding E to depart Kanmon Ko—Flag E below First Repeater.
2. Proceeding W to depart Kanmon Ko, passing W of Uma Shima, S of Shira Su and Shira Shima—Flag W and Flag S below First Repeater.
3. Proceeding W to depart Kanmon Ko, passing W of Uma Shima and E of Aio-no-Shima—Flag W and Flag A below First Repeater.
4. Proceeding W to leave Kanmon Port, passing E of Mutsure Shima—Flag W and Flag M below First Repeater.

Anchorage.—Anchoring is not permitted within the Kanmon Kaikyo channel.

Caution.—Numerous dangers and hazards exist in Kanmon Kaikyo, and great caution must be exercised during the transit of the strait. The vast majority of the accidents and disasters within this area are caused by violations of the rules, with most of these occurring near the entrance of Wakamatsu Ko, in O Seto, and in Hayatomo Seto.

When passing E of Mutsure Shima in the W approach, a large number of vessels may be found anchored here. These vessels may be waiting the turn of the tidal current, in quarantine, or weather bound.

When in the vicinity of Daiba Hana, a lookout must be kept for vessels leaving Wakamatsu Ko.

When rounding the S end of Hiro Shima in O Seto, which is a blind corner, special care must be exercised. The many accidents which occur here are mainly due to the frequent changes of course that have to be made, to the fact that vessels approaching one another are on converging courses, to the short cuts taken by small vessels making it impossible to pass port to port, and to the large number of sailing vessels and vessels in tow that are sometimes encountered. This latter case is especially so in the vicinity of the approach to Wakamatsu Ko.

In the vicinity of Shimonoseki and Moji, a lookout must be kept because of the numerous ferryboats, sailboats, and vessels turning into the above harbors.

In Hayatomo Seto, the narrowest and most congested part of Kanmon Kaikyo, every effort should be made to keep in the main current, and try not to meet other vessels here. There are numerous fishing boats to the E of Hayatomo Seto and in the vicinity of O Seto. Alterations of course to the right or left by large vessels in order to avoid them is dangerous and it is better to reduce speed and arouse their attention by sounding the whistle. Overtaking another vessel is prohibited in Hayatomo Seto.

In Kita Suido, eastbound vessels must exercise caution when crossing the track of westbound vessels entering the main fairway from Chuo Suido. Care must also be used because of the tidal currents at the E end of Kita Suido, where there is a large change of course.

Kanmon Kaikyo—West Approach

11.17 Shira Shima (34°00'N., 130°44'E.) consists of two islets, O Shima and Me Shima, and lies about 7 miles NW of the W entrance of Kanmon Kaikyo. O Shima has a high cliff on its N side and is the larger of the two islets. The NW extremity of Me Shima is a steep-to precipitous cliff.

An oil storage facility and harbor have been constructed on the E side of O Shima. A T-head pier extends NE from the center of the N side of the new harbor.

Depths of less than 4m extend about 0.5 mile S from O Shima; a shoal with a least depth of 2.1m extends about 1.5 miles SSE of Me Shima.

Aino Shima, located about 4 miles ESE of Shira Shima, is a low, flat, and densely-wooded island. Two small islets lie on the reef extending from the N end of the island; one small islet lies on the reef extending from the S end of the island. A light is shown from the SW side of the island.

Koshiki Iwa (33°59'N., 130°50'E.) is a small square rock, 4m high, located about 0.6 mile ENE of the S end of Aino Shima. Shoal banks extend about 0.5 mile to the NW and about 0.2 mile to the S of the rock. A lighted buoy is moored 0.3 mile E of Koshiki Iwa.

Omoji Iwa lies about 0.5 mile N of Aino Shima, and shows a light. Hiro Iwa, 0.6m high, lies on a shoal about 0.4 mile WSW of Omoji Iwa.

Shira Su (33°59'N., 130°48'E.) lies in the middle of a sand and gravel bank located about 1.5 miles SW of the NW extremity of Aino Shima. A light is shown from the middle of the bank. The channel between Shira Su and Aino Shima could not be attempted without local knowledge.

11.18 Mutsure Shima (33°58'N., 130°52'E.) (World Port Index No. 62065), a flat-topped island, showing a light from the NE extremity, is located about 2 miles SE of Aino Shima.

Depths—Limitations.—There is a tanker berth on the SE side of the island, consisting of dolphins and a mooring buoy, with depths of up to 18m.

Tankers up to 260m long, with a draft of 15.5m, can be accepted. Vessels berth heading either N or S.

Pilotage.—Pilotage is compulsory for berthing.

Signals.—The following flag signals should be displayed:

1. Vessels bound for mooring facilities in Mutsure Oil Tank Facilities—Flag J and Flag B under Second Substitute.
2. Vessels bound for mooring facilities in Shinko Wharf Multipurpose Terminal—Flag J and Flag C under Second Substitute.

Anchorage.—Two quarantine anchorages lie E of Mutsure Shima. Vessels anchoring temporarily should anchor, in about 11.9m, sand and mud, E of the fairway, where the pilot normally comes

on board.

Komutsure is a group of islets which lies about 0.5 mile off the SW side of Mutsure Shima. They include Uma Shima, the largest islet; Kata Shima, with the remains of a lighthouse; and Wagora Shima, marked by a lighted buoy off its S end.

Honshu Coast

11.19 **Murasaki Hana** (34°02'N., 130°55'E.) is a low headland located about 3.25 miles NNE of the N extremity of Mutsure Shima. The point projects to the SW and is covered with an abundance of pine trees. A light is shown from the head of a breakwater on the E side of the point.

Kuro Saki is a flat headland of steep cliffs located about 2.5 miles NE of Mutsure Shima Light. The point is conspicuous because of the low cultivated land which lies on its N side. The coast S of Ko Seto, a distance of 2.5 miles, is foul for about 0.4 mile offshore. In a compound of a railroad station about 1.5 miles SE of Kuro Saki, is a gray tower on which are bright powerful lights. These lights are very conspicuous and make a good landmark for vessels approaching Kanmon Kaikyo from the W.

Ko Seto (33°57'N., 130°55'E.), a shallow tortuous channel, about 0.1 mile wide, separates Hiko Shima from the mainland, and is located about 2.5 miles S of Kuro Saki. Its E end has been diverted by reclamation works, and there is access to the harbor of Shimonoseki through a lock and dredged channel of 4.9m.

An overhead power cable, with a vertical clearance of 42m, spans Ko Seto nearly 0.5 mile from the W entrance. A light is shown on the S side of the W entrance to Ko Seto.

Daiba Hana (33°57'N., 130°53'E.) lies on the E side of the W entrance of Kanmon Ko, about 1.5 miles W of Ko Seto. It is part of the SW extremity of Takenoko-jima and the site of a tidal signal station.

Kanmon Ko

11.20 Kanmon Ko (33°55'N., 130°56'E.), occupying the major part of Kanmon Kaikyo, is a specified port, a port of entry, and a quarantine inspection port. It is divided into districts, as follows:

1. Wakamatsu Ko
2. Moji Ko.
3. Shimonoseki Ko.
4. Kokura Ko.
5. Nishi-yama Ko.
6. Tanoura Ko

The urban area on t.he S side of Kanmon Kaikyo is now known as **Kitakyushu Port** (33°55'N., 130°56'E.), one of the nation's largest industrial complexes.

Regulations.—General regulations prescribed by the Port Regulations Law apply. Additionally, except with the permission of the Port Captain, vessels may not approach within 30m of a tanker loading inflammable materials, nor within 50m of a tanker loaded with LNG.

Vessels entering or departing Kitakyushu Port should report the following to Port Radio on VHF channel 16:

1. Prior Report, 2 to 3 hours before arrival at the outer harbor.
2. Entrance Report, upon arrival at the outer harbor.
3. Entrance Report, when anchoring in the outer harbor.
4. Shifting Report, when weighing anchor.
5. Docking Report, at the time of docking.
6. Departure Report, at the time of departure.

Wakamatsu Ko (33°54'N., 130°49'E.)

World Port Index No. 62120

11.21 Wakamatsu Ko lies on the S side of the W entrance of Kanmon Kaikyo, and consists of the cities of Wakamatsu-Ku, Tobata-Ku, and Yahata-Ku. The whole area is under a combined harbor authority and is called Dokai Ko.

Winds—Weather.—The E wind is most frequent in summer and seas are moderate. In the winter, the NW wind dominates, occasionally accompanied by heavy swells.

During or after strong NW winds, deep-draft vessels must make allowances for the heavy swells when approaching the head of the breakwater or when anchoring in the outer harbor. The entrance across the bar, which is difficult, may be dangerous at this time. The swell does not, as a rule, reach the main or inner harbor.

Tides—Currents.—During the ebb tide, the tidal current sets off the inner harbor along the breakwater, and then curves toward Kanmon Kaikyo. In the main and outer harbors, the velocity does not appear to exceed 1 knot. During the flood, the tidal current sets in the opposite direction and is somewhat weaker, attaining a velocity of 0.75 knot in the outer harbor. In the vicinity off the N extremity of the breakwater, a current setting NW is sometimes experienced during the flood.

Depths—Limitations.—The Wakamatsu Passage, which branches off from Kanmon Kaikyo, has depths of 7 to 10m; the Tobata Pass, which branches off from Wakamatsu Passage and runs to Seitetsu Tobata Hakuchi, has depths of 7 to 10m. The Okudokai Passage, which branches off the Wakamatsu Passage and runs to the inner end of Dokai Wan, has depths of 8 to 10m; and the Anse Passage, which runs from the W entrance to Kanmon Kaikyo to the Anse Hakuchi, has a depth of 12.8m.

The port consists of a number of alongside berthing facilities and dolphin moorings. There is also a large number of mooring buoys for use by both large and small vessels. The deepest alongside berths are found in Seitetsu Tobata Hakuchi, with depths of 10.1 to 17.1m alongside. Most mooring berths have no limit on gt capacity.

There is a new container terminal in progress along the N coast of Wakamatsu. The new **Hibiki Port** (33°56'N., 130°48'E.) is operating two container berths on the N side with a total length of 700m and alongside depths of 15m. An additional two berths on the E side have a total length of 500m and alongside depths of 10m.

Phase 2, which has a completion date of 2020, will add a total of eight more container berths. Four of these will add 1,400m of quayage, and will have depths of 15 to 16m alongside. The other four will add 1,000m of quayage and have an alongside depth of 12m.

Pilotage.—Pilotage for the above areas is compulsory. Pilots will board vessels in the quarantine anchorages about 0.5 mile E of Mutsure Shima and about 1 mile SE of He Saki, respectively. Pilots can be contacted on VHF channels 16 and 12. Berthing is allowed only during daylight hours.

Pilots for Hibiki board in position 34°01'N., 130°46'E. Pilots

are not available after sunset.

Regulations.—Berthing and unberthing operations are controlled by the harbormaster; movements are dependent upon daylight, vessel size, tidal conditions, and wind conditions.

Wakamatsu Traffic Security may be contacted by telephone (81-93-8712482) or facsimile (81-93-8816094).

Vessels of 300gt and over intending to navigate Wakamatsu Passage or Okudokai Passage should contact Wakamatsu Traffic Security by noon of the day prior to entry into the fairway.

In addition to the regulations for vessels in Kanmon Ko, there are local regulations which are also in force. The following regulations apply to Wakamatsu Ko:

1. Vessels under way in Kanmon Kaikyo have right of way over vessels leaving Wakamatsu Passage and Anse Passage.
2. Vessels over 100 gt are to sound three long blasts occasionally while proceeding off Wakamatsu Breakwater to their berths and on their way out.
3. No vessel is to anchor, stop, or otherwise obstruct the passage.
4. Vessels at buoys are to secure bow and stern, or if they secure the stern only they are also to moor.
5. A vessel crossing a fairway is to give way to one proceeding along it. Vessels are not to proceed abreast or to overtake in a fairway

The Wakato Ohashi Suspension Bridge restricts a vessel's air draft to 42m in the center of the fairway.

Signals.—Traffic signals regulating passage in the Wakamatsu Passage and Okudokai Passage are shown from **Maki Yama** (33°53'N., 130°49'E.), and **Hutazima Signal Stations** (33°53'N., 130°47'E.). The signals and their meanings are given in the accompanying table titled **Traffic Signals for Wakamatsu Passage and Okudokai Passage**.

Anchorage.—There are quarantine anchorages on the SE side of He Saki and to the E of Mutsure Shima. The dangerous cargo anchorage is an area as specified by the harbormaster in Area No. 5. Anchorage for vessels under 300 gt is in Area No. 2 and Area No. 3, and all of Area No. 6 anchorages are designated by the harbormaster. Vessels are not permitted to anchor in the main or inner harbors without special permission.

Caution.—Vessels bound for Wakamatsu Ko from the W should pass S of Funa Se, and those from the E should pass N of Kasa Se. Eastbound vessels leaving the harbor should alter course SE into the main fairway as soon as possible if sighting a vessel approaching from Moji Ko. This is necessary in order that the two vessels may pass port to port. Extra caution is necessary in the fairways because of the heavy traffic.

A spoil ground, best seen on the chart, lies in Area No. 5.

Traffic Signals for Wakamatsu Passage and Okudokai Passage

Signal	Meaning
Flashing letter I	All inbound vessels and outbound vessels of less than 300 gt may proceed. Outbound vessels of more than 300 gt stop and wait.
Flashing letter O	All outbound vessels and inbound vessels of less than 300 gt may proceed. Inbound vessels of more than 300 gt wait outside the entrance and clear of the fairway, keeping out of the way of outbound vessels. Vessels of more than 300 gt moving between berths in Area No. 1 and Area 2 stop and wait.
Flashing letter F	Inbound and outbound vessels of less than 500 gt may proceed. Inbound vessels of more than 500 gt wait outside the entrance and clear of the fairway, keeping out of the way of outbound vessels. Outbound vessels of more than 500 gt stop and wait.
Letters X and I, X and O, or X and F flashing alternately	Inbound and outbound vessels of less than 300 gt navigating in the fairway may proceed. Inbound vessels of more than 300 gt outside the fairway wait outside the entrance and clear of the fairway, keeping out of the way of outbound vessels in the fairway. Vessels intending to get under way outbound wait. Signal will soon change to flashing letter I, O, or F.
Letters I and Y flashing alternately	Inbound vessels may proceed, except that vessels of more than 300 gt proceeding to a berth in Area No. 2 S of a line drawn 288.5° from Maki Yama Signal Station, wait clear of the fairway NE of a line drawn 315° from the signal station, keeping clear of vessels moving from Area No. 2 to Area No. 1. Outbound vessels of less than 300 gt may proceed. Outbound vessels of more than 300 gt stop and wait, except that vessels proceeding from a berth in Area No. 2 S of a line drawn 288.5° from Maki Yama Signal Station to Area No. 1 may proceed.
Letters O and K flashing alternately	Outbound vessels may proceed, except that vessels of more than 300 gt intending to proceed outward from a berth in Area No. 2 S of a line drawn 288.5° from Maki Yama Signal Station, stop and wait. Inbound vessels of less than 300 gt may proceed. Inbound vessels of more than 300 gt wait outside the entrance and clear of the fairway, keeping out of the way of vessels in the fairway. Vessels moving from Area No. 1 to a berth in Area No. 2 S of a line drawn 288.5° from Maki Yama Signal Station, may proceed.

Traffic Signals for Wakamatsu Passage and Okudokai Passage	
Signal	**Meaning**
Flashing letter X	Inbound and outbound vessels navigating in the fairway may proceed. Inbound vessels outside the fairway wait outside the entrance and clear of the fairway, keeping out of the way of outbound vessels in the fairway. Vessels intending to get under way outbound wait. Signal will soon change to fixed letter X.
Fixed letter X	All movements are prohibited except for a vessel instructed by the Captain of the Port.

Kokura Ko (33°53'N., 130°54'E.)

World Port Index No. 62130

11.22 The port of Kokura Ko consists of all the wharf basins between the dredged channel leading to Sakai Kawa Wharf and the Akasaka Wharf located about 2.5 miles SE.

The deep-draft facilities are in Sunatu Hakuchi Basin and on the W side of the approach to the basin 0.5 mile farther W. These facilities are approached via Sunatu Passage. The facilities on either side of the reclaimed land in the NW part of the port are approached via separate channels; Hiagari Basin is the SE of the latter two.

Winds—Weather.—During winter months, the strong Northwest Monsoon makes it almost impossible for small vessels in Sunatu Hakuchi to handle cargo.

Tides—Currents.—The current in Sunatu Passage reaches a maximum of 3 to 4 knots at times.

Depths—Limitations.—The Sunatsu Passage, which branches off from Kanmon Kaikyo, has depths of 8 to 10.1m, and is marked by lighted buoys. The fairway leading to Hiagari Basin has depths of 10.1 to 11.9m and is also marked by lighted buoys.

Depths alongside the berths at Kokura Wharf (Hiagari Wharf) range from 5.5 to 12.0m at Berth No. 7. Berth No. 7 can accommodate vessels up to 22,000 gt. All other berths can accommodate up to 14,000 gt. In Sunatsu Hakuchi, the deepest depth alongside is 8m.

Pilotage.—Pilotage for Kokura Ko is compulsory and is obtained as stated in paragraph 11.21. The pilots can be contacted on VHF channel 16.

Anchorage.—Anchorage may be taken at the Mutsure quarantine anchorages; see Section 11.19 for details.

11.23 Nishiyama Ko (33°56'N., 130°54'E.) lies between the W extremity of Hiko Shima and Kabutoyama Misaki, on the SW side of Hiko Shima. The town of Nishiyama stands at the head of the harbor, which consists of a docking basin with depths of 4 to 4.9m. There is a pier, with a depth of 12.5m alongside, close W of the basin entrance. Two piers project from reclaimed land close SE of the basin.

Berthing signals are displayed at the port signal station, as follows:

Signal	Meaning
N3	Moor to Nisiyama Wharf Quay 3
N4	Moor to Nisiyama Wharf Quay 4

In each case, the vessel should acknowledge the berthing signal by a flag hoist of 2nd Substitute over N3 or N4, as appropriate.

A light is shown at the W entrance point of the basin. A red light is shown at the head of Nishiyama Ku Breakwater.

Fukuura Wan, about 1.3 miles SSE of Nishiyama, is entered S of Kabutoyama Misaki. The town of Fukuura stands on the NW shore on this inlet.

A breakwater extends S from the S end of Kabutoyama Misaki, and a short detached breakwater protects a timber storage area.

In the outer part of the bay, between the entrance and the detached breakwater protecting the timber storage area, there are depths of 7.3 to 7.6m; elsewhere, depths are less than 3.4m.

Moji Ko (33°57'N., 130°57'E.)

World Port Index No. 62140

11.24 Moji Ko is on the Kyushu side of the E part of Kanmon Ko, opposite Shimonoseki Ko. Tanoura Ko, which extends about 1.8 miles E from Moji Saki, is included within this port.

Winds—Weather.—Throughout the year, the wind blows most frequently from the E, followed by ENE, and then WNW, in that order. Dense fog frequently prevails in spring and autumn. On occasions, there may be smog persisting for part of the day, due to the many factories and chemical plants in the area.

Tides—Currents.—Currents near the entrance of the port set W at flood and E at the ebb. The current in the vicinity of the narrowest section of the straits will at times reach a rate of 7 to 8 knots. Close off the port, the current is about 1 to 3 knots.

Depths—Limitations.—The controlling draft in the channel is 11m.

There are a number of berths that can moor vessels in the 10,000 gt class simultaneously, in depths from 8 to 11m at Nishikaigan Wharf, Quays No. 1 to No. 7. Quays No. 8 to No.10 have depths of 9.5 to 10.5m, with 14,000 ton capacities.

Shinhama Wharf (Berth No. 11 to Berth No. 13), has depths of 9 to 9.5m, with a 14,000 ton capacity.

Tanoura Oil Berth, in a depth of 13m, can accommodate vessels of up to 33,000 dwt.

The Kanmon Bridge, crossing the NE entrance to Kanmon Passage, allows for a maximum air draft of 63m.

Pilotage.—Pilotage is compulsory for vessels at Moji Ko. Vessels of 200m loa and greater and LNG/LPG vessels 25,000 gross tons and greater board pilots in position 33°14'N, 132°06'E when entering through Bungo Suido. For general cargo vessels entering Bungo Suido, pilots board in position

Kitakyushu—Kokura Ko—Kokura Wharf (Hiagari Wharf)

Kitakyushu—Tanoura Ko—Tanoura Wharf

Kitakyushu—Tachinoura Wharf

Kitakyushu—Hibiki Port—Hibaki Container Terminal (Future)

33°13'N, 131°58'E. Vessels may enter or leave the port area 24 hours, but docking and undocking at night is at the discretion of the pilot. The pilots can be contacted on VHF channel 16.

Signals.—A berthing signal, using the special flags displayed at Moji Signal Station at the NE end of Foreign Trade Quays, is, as follows:

Signal	Meaning
MA	Anchor S of Kajiga Hana

Flag signals assigning an alongside berth comprise the

Berthing Flag above the berth number.

In every case, the ship should acknowledge the berthing signal with a flag hoist substituting the Answering Pennant for the Designation or Berth Flag.

Anchorage.—The anchorage off Moji Ko provides good holding ground for large vessels in depths of 9 to 11m.

When there are vessels berthed at Pier No. 1 and Pier No. 2, it is prohibited to anchor in the area E of Mooring Buoy No. 9. When there are no ships berthed at the piers, temporary anchorage is permitted, provided the vessel is leaving the same day.

Caution.—When entering, leaving, or shifting berth in Moji Ko, special care is necessary because the tidal currents are very complex, especially during the W current, when eddies are formed in the harbor.

Vessels anchoring and turning must avoid remaining longer than necessary in the fairway near Ganryu Shima.

After anchoring, cross bearings marking the position must be communicated to the harbor office.

Vessels must try to avoid entering or leaving the harbor during the middle period of the tidal current.

Vessels anchored near the harbor limits must not show any light that might interfere with the safe navigation of other vessels.

No vessel may have more than two lighters secured alongside or astern simultaneously.

Shimonoseki Ko (33°56'N., 130°56'E.)

World Port Index No. 61700

11.25 Shimonoseki Ko lies on the N side of Kanmon Kaikyo Passage, between Kanenoturu Misaki and the E limits of Kanmon Ko, about 5.5 miles NNE. The SW part of Shimonoseki Ko is mostly shoal and on it lies Ganryu Shima.

Winds—Weather.—Throughout the year, the wind direction is mostly from the ENE, followed by E winds, and then WNW, in that order.

Tides—Currents.—Between Hiko Shima and Ganryu Shima, the N current flows at the same time as the E current in Hayatoma Seto and the S current at the same time as the W current in Hayatomo Seto. The velocity in its center is almost half that in Hayatomo Seto. When these currents meet the main currents through the strait, whether N or S of Ganryu Shima, the counter-currents causes eddies.

Depths—Limitations.—The minimum depth in the entrance channel is 13m.

The harbor consists of a number of berths with alongside depths of up to 13m for vessels of up to 20,000 gt.

Hananocho Wharf has four berths for vessels up to 15,000 gt, with a depth of 11m alongside.

Arukapoto Quay, in the E port area, is a passenger terminal. The quay is 335m long with a depth alongside of 12m; vessels of up to 50,000 dwt can be accommodated.

Pilotage.—Pilotage is compulsory. Pilots board at the Mutsure Anchorage or the Hesaki Anchorage. Kitakyushu Port Radio, VHF channel 16 is used for initial contact, VHF channels 12 and 14 are the working frequencies, and VHF channel 13 is used for the pilots. Port entry is restricted to daylight hours only.

Signals.—Storm signals and local weather signals are displayed at the conspicuous meteorological station on the hill about 1.3 miles NNE of Ganryu Shima.

Anchorage.—Anchorage may be taken off the No. 1 Jetty, near the Maritime Office, in a depth of 11m, depending on vessel traffic.

Anchorage can be obtained in the harbor, but caution must be exercised because of the high velocity of the current and poor holding ground.

Kanmon Kaikyo—East Approach

11.26 He Saki (33°57'N., 131°02'E.) is the S entrance point of the E entrance to Kanmon Kaikyo. The approach channel to He Saki is dredged to a depth of 13m and marked by buoys. Pilotage is not compulsory for vessels transiting Kanmon Kaikyo, but is recommended for vessels without local knowledge. The pilot will board vessels off He Saki, and at the quarantine anchorage, close SE of He Saki.

Nakano Su is a large sand bank, about 1 mile in length and better than 0.25 mile wide, lying in the middle of the E entrance to Kanmon Kaikyo. The bank is marked by a number of lighted buoys. Vessels entering or leaving Kanmon Kaikyo may pass either N or S of Nakano Su, using the standard courses shown on the charts.

Manju Shima (Manzyu Shima) (34°00'N., 131°02'E.), an islet, lies on the N side of the E entrance to Kanmon Kaikyo, about 1 mile N of Nakano Su. A breakwater extends 870m NNE from a position 0.3 mile WNW of the W extremity of the islet. A light is shown from the S side of Manju Shima.

Kanju Shima (Kanzyu Shima), a thickly-wooded islet, lies about 1 mile W of Manju Shima. A shoal bank, on which lie several above-water rocks, extends about 0.2 mile S and SE from Kanju Shima. Numerous fish havens lie on the edge of the coastal bank SE of Kanju Shima.

North Channel, with a least depth of 10.4m, marks the N side of Nakano Su.

Shoal patches, with a least depth of 10.1m, have been reported close N of North Channel, 0.4 mile SSE of Kushi Saki.

Japanese

JAPANESE	English
A	
abura	oil
asai	shallow
asase	ledge, shoal
B	
bae (see hae)	bank, shoal, rock
bakufu	waterfall
bana (see hana)	cape, point
bashi	bridge, point
byochi	anchorage, harbor
C	
chiiasi	little, small
cho	township
chu	middle
D	
dai	large, great
daiba	fort
dake (see take)	hill, mountain
dashi	rock, reef
F	
fukai	deep
futo	wharf, pier
G	
gaiko	outer harbor
gake	cliff
gan	rock
ganpeki	quay, wharf, seawall
gata	lagoon, bay, inlet
gawa (see kawa)	river
genya	field, plain
genyu	crude oil
guchi (see kuchi)	entrance, strait, channel
gun	district
gunto	island group
guri	reef, rock, shoal, bank
gyoko	fishing harbor
H	
hae (see bae)	bank, shoal, rock
hakuchi	roadstead, anchorage
hama	beach, coast
hana	cape, point
hanto	peninsula
hashi	bridge, point
hatoba	wharf
heigen	plain, field
higashi	east
hikui	low
hira	flat, level
hiro	fathom
hiroi	wide, broad
ho	cove, peak
hoku	north
I	
ikari	anchor
ike	lake, pond
ishi	rock
iso	reef, rock, shoal
iwa	rock, island, shoal, mountain
J	
jima (see shima)	island, rock, reef
jorikusho	landing place
ju	middle
juyu	crude oil, heavy oil
K	
kai	sea
kaiho	fort
kaikyo	strait, channel
kaiwan	gulf, inlet, sound
kaku	point, cape
kami	upper
kawa guchi	estuary
kawa	river
kei	river
ki	tree
kita	north
ko	harbor, port
ko	lagoon, lake, small
kubi	cape, isthmus
kuchi	mouth of channel, entrance
kuri	reef, rock
kuro, kuroi	black
M	
machi	town
matsu	cape, point, pine tree
michi	road
mijikai	short
minami	south
minato	harbor, port
mine	peak, mountain
misaki	cape, point, peninsula
mizu	water
mori	forest, wood
mura	village
myaku	chain (of hills, reefs)
N	
nada	sea, gulf
nagai	long
naikai	inland sea

JAPANESE	English
naiko	inner harbor
naka	middle
nan	south
ne	rock, reef, island
nishi	west
nobori	mountain
numa	marsh, swamp
nupuri	mountain
O	
o	great, large
o	small
oka	hill, land, mound
oki	offing, offshore, bay
okii	great, large
P	
pii	cape
R	
ressho	chain of islets, archipelago
reto	chain of islands, archipelago
retsugan	chain of rocks
S	
saki	cape, point
sambashi	pier
san	mount, mountain
satai	sandbank
sawa	marsh, swamp, lake
se	bank, islet, reef, shoal
sei	west
seki	cape, point, rock
sekiyu	oil
sen	peak
sendan	shoal
seto	strait, channel
sha	sand
shi	city
shima	island, rock, reef
shimo	lower
shio	current, tide
shiri	cape, point
sho	bank, reef, shoal, small
sho	island, reef
shoto	archipelago, island chain
shu	country, province, state
sima (see shima)	island, rock, reef
son	village
sone	rock, shoal
su	bank, reef, shoal
sui	water, waterway
suido	channel, strait
suna	sand
syoto (see shoto)	archipelago, island chain
T	
ta	ricefield
tai	bank, sandbank
takai	high, tall
take	hill, mountain
taki	waterfall
to	island, islet, east, rock
toge	mountain, pass
torii	gateway of shinto temple
tsu	harbor, port
U	
uchi	bay
umi	in, inside
unga	canal
ura	bay, bight, beach
W	
wan	bay
Y	
yama	mountain, hill, range
Z	
zaki (see saki)	cape, point, headland
zan	peak, mountain, hill
ze	shoal
zeikanjo	customhouse
zen	mountain
zone, zono	shoal

How to use the Index—Gazetteer

Geographic names of navigational features are generally those used by the nation having sovereignty and are listed alphabetically. Diacritical marks, such as accents, cedillas, and circumflexes, which are related to specific letters in certain foreign languages, are not used in the interest of typographical simplicity.

Geographic names or their spellings do not necessarily reflect recognition of the political status of an area by the United States Government. Positions are approximate and are intended merely as locators to facilitate reference to the charts.

To use as a Gazetteer note the position and Sector number of the feature and refer to the Boundaries diagram for the Sector. Plot the approximate position of the feature on this diagram.

To use as an Index of features described in the text note the Sector-Paragraph number at the right. The Sector-Paragraph number is then used to manually locate the feature. Each Index entry is also hot-linked to its location in the text.

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