PUB. 157

SAILING DIRECTIONS (ENROUTE)

★

COASTS OF KOREA AND CHINA

★

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Preface

Pub. 157, Sailing Directions (Enroute) Coasts of Korea and China, Fourteenth Edition, 2010, is issued for use in conjunction with Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia. Companion volumes are Pubs. 154, 155, 158, and 159.

Digital Nautical Chart 9, 12 and 28 provides electronic chart coverage for the area covered by this publication.

This publication has been corrected to 10 July 2010, including Notice to Mariners No. 28 of 2010. Subsequent Publication Digital Updates (PDUs) have corrected this publication to 19 November 2011, including Notice to Mariners No. 47 of 2011.

Explanatory Remarks

Sailing Directions are published by the National Geospatial-Intelligence Agency (NGA), under the authority of Department of Defense Directive 5105.40, dated 12 December 1988, and pursuant to the authority contained in U. S. Code Title 10, Sections 2791 and 2792 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 initial letters of 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 refer to both the paper chart and the Digital Nautical Chart (DNC).

Coastal Features.—It is assumed that the majority of ships have radar. Available coastal descriptions and views, useful for radar and visual piloting are included in geographic sequence in each Sector.

Corrective Information.—Users should refer corrections, additions, and comments to NGA's Maritime Operations Desk, as follows:

1. Toll free: 1-800-362-6289
2. Commercial: 571-557-5455
3. DSN: 547-5455
4. DNC web site: http://msi.nga.mil/NGAPortal/DNC.portal
5. Maritime Domain web site: http://msi.nga.mil/NGAPortal/MSI.portal
6. E-mail: navsafety@nga.mil
7. Mailing address: Maritime Safety Office
   National Geospatial-Intelligence Agency
   Mail Stop N64-SH
   7500 Geoint Drive
   Springfield VA 22150-7500

New editions of Sailing Directions are corrected through the date of the publication shown above. Important information to amend material in the publication is available as a Publication Data Update (PDU) from the NGA Maritime Domain web site.

NGA Maritime Domain Website
http://msi.nga.mil/NGAPortal/MSI.portal

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 meridianal 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.

Dangers.—As a rule outer dangers are fully described, but inner dangers which are well-charted are, for the most part, omitted. Numerous offshore dangers, grouped together, are mentioned only in general terms. Dangers adjacent to a coastal passage or fairway are described.

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. Geographic names or their spellings do not necessarily reflect recognition of the political status of an area by the United States Government.

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

Index-Gazetteer.—Navigational features and place names are listed alphabetically in the back of the book. The approximate position, along with the Sector and paragraph numbers (e.g. **1.1**), facilitate location in the text.

Internet Links.—This publication provides internet links to web sites concerned with maritime navigational safety, including but not limited to, Federal government sites, foreign Hydrographic Offices, and foreign public/private port facilities. NGA makes no claims, promises, or guarantees concerning the accuracy, completeness, or adequacy of the contents of the web sites and expressly disclaims any liability for errors and omissions of these web sites.

Light 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.

Ports.—Directions for entering ports are depicted where appropriate by means of chartlets, sketches, and photos, which facilitate positive identification of landmarks and navigational

aids. These chartlets and sketches are not always to scale, however, and should be used only as a general informational guide in conjunction with the best scale chart. Specific port facilities are omitted from the standard format. They are tabulated in Pub. 150, World Port Index.

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

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

Special Warnings.—A Special Warning may be in force for the geographic area covered by this publication. Special Warnings are printed in the weekly Notice to Mariners upon promulgation and are reprinted annually in Notice to Mariners No. 1. A listing of Special Warnings currently in force is printed in each weekly Notice to Mariners, Section III, Broadcast Warnings, along with the notice number of promulgation. Special Warnings are also available on the Maritime Division web site.

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

Reference List

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

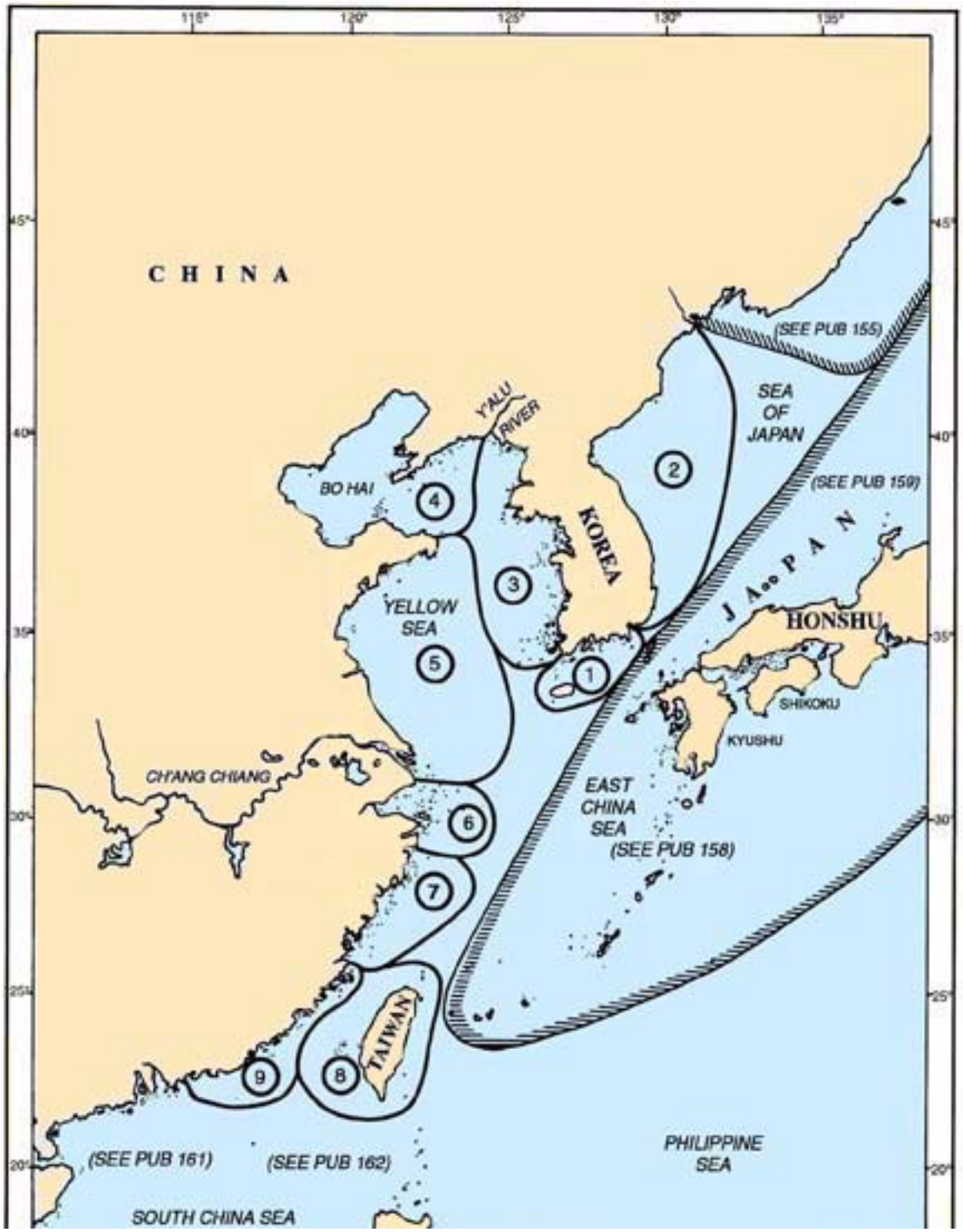
British Hydrographic Department Sailing Directions.

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.



SECTOR LIMITS — PUB. **157**

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

Abbreviations

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)
grt	gross registered tons	nrt	net registered 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		

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	HAT	highest astronomical tide
HWS	high water springs	LAT	lowest astronomical tide
LWN	low water neaps		

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

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

The following abbreviations may be used in the text:

IHO	International Hydrographic Organization	Pub.	Publication
IMO	International Maritime Organization	SOLAS	International Convention for Safety of Life at Sea
loa	length overall	St./Ste.	Saint/Sainte

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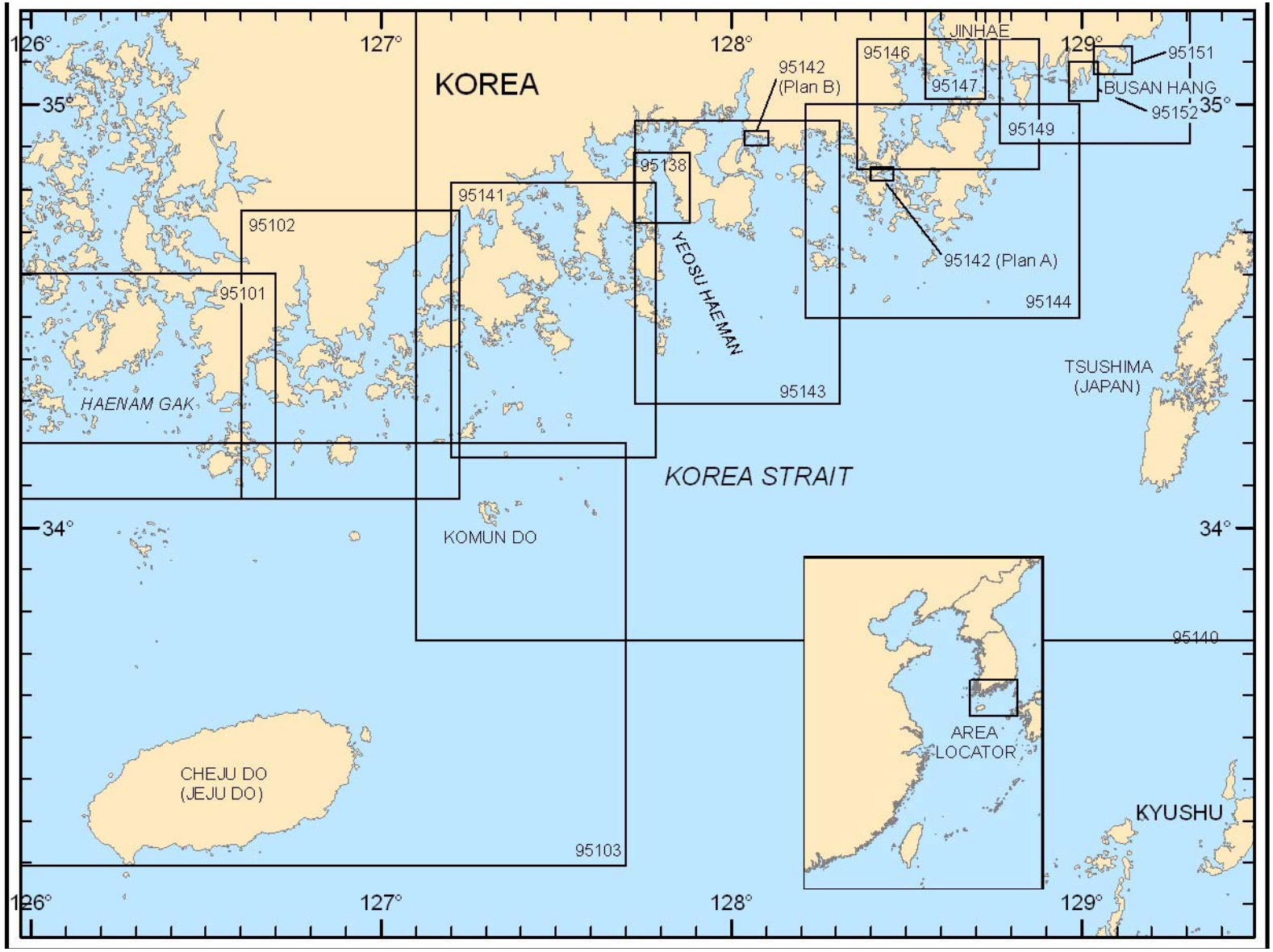


Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 1 — CHART INFORMATION

SECTOR 1

KOREA—SOUTH COAST

Plan.—This sector describes the S coast of Korea from Haenam Gak, the S tip of the Korean peninsula, to Pusan Hang. It also includes Cheju Do in the W entrance of Korea Strait or Joseon Haehyeob (known as Tsushima Kaikyo to the Japanese). The general descriptive sequence is from W to E.

General Remarks

1.1 The S coast of Korea, from Haenam Gag (34°18'N., 126°31'E.), its SW extremity, to the vicinity of Pusan Hang 135 miles ENE, is indented by large peninsula projections, and is fronted by numerous groups of islands, islets and rocks. Generally speaking, the islands and islets are steep-to and there are few below-water dangers.

The conversion to IALA Maritime Buoyage System (Region B) in the Republic of Korea is reported completed.

Mined Areas.—Extensive mine laying operation took place in Korean waters during the 1950-1953 war. For further details, refer to Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Fishing Industries.—The increasing number of fishing industries and their operations are developing in the offshore areas and around the coasts of Korea. These operations are performed throughout the year. Aquaculture farms, fish havens, fixed net fishing, and squid fishing operations may be established in positions where they constitute a hazard to navigation.

Fixed net fishing are set within 2 miles offshore in many places off the coasts of Korea; however, the distance may be extended up to 5 miles offshore. Newly established fixed nets are considered hazardous to navigation, and they are either published in the weekly Notices to Mariners in the Republic of Korea or an announcement is made through the Radio Navigation Warnings system.

Generally squid fishing operation is carried out throughout the year in the Sea of Japan, by boats up to 100 tons. Lights from these boats may be shown to attract the fish and not necessarily in conformity with the lights specified in 72 COLREGS.

Fish havens may be encountered on the surface, on the sea bed, or suspended below the surface, at distances within 5 miles of the coast. Those on the sea bed may consist of concrete blocks, scrap metal (including junked vehicles), or sunken hulks laid in a fixed position to develop a fish habitat and a marine environment in coastal waters. Those on the surface may consist of floating rafts under which fish are encouraged to feed out of the sunlight.

These contraptions are also known as fish aggregating devices (FADS). Concentration of fishing vessels may be expected in the vicinity of fish havens where conventional methods are used to catching fish. Occasionally fish havens may be marked by lights or special lighted buoys.

Caution should be exercised if it becomes necessary to pass over a fish haven or when anchoring near it.

Marine farms consist of rectangular cages made of thick wire mesh in two layers, having a standard measure of 20 by 30m. Fish are bred, fed, and harvested in these cages. Marine farms are encountered either in deep water or in an area close inshore, and may be marked by lights or lighted buoys.

The deep water marine farms may be positioned as far as 30 miles offshore, and they are usually attended by service vessels. Although they are moored in a temporary position on the surface, there are also others suspended 20 to 25m below the surface. These farms are frequently moved to safe water before the onset of winter. Inshore marine farms are more likely situated in permanent positions and they are shown on the appropriate charts.

Winds—Weather.—In the Korea Strait the winds are predominantly NE during the winter, but are not felt strongly W of Maemul To. During this season very light breezes blow from between NW and NE between Maemul To and Tumi Do.

On the S side of Namhae Do, W winds blow regularly during this season, and between this island and Kuma Yolto the prevailing winds are W. Between Kuma Yolto and Naro Yolto there are gales from between NW and WSW. Although these gales usually blow strongly during the night, they tend to moderate toward dawn.

At Chuja Kundo the prevailing winds during the spring are E, during the summer E and S, during the autumn N, and during the winter W and NW. The strongest winds are E, and bad weather with these winds often last for a period of 10 days.

Tides—Currents.—Along the S coast of Korea from the S end of Naro Yeoldo to the S end of Koje Do, the tidal currents are very weak. To the S of this area, between the islands off this part of the coast the tidal currents set W with the rising tide E with the falling tide, attaining a velocity between 1 to 1.5 knots. In the narrow channels between Koje Do and Busan the tidal currents attain velocities between 3 to 4 knots.

The tidal currents N and S of Soan Kundo set E and W, with the change occurring about 2 hours after HW and LW. At spring tides there is a brief period of slack water.

Off the S end of Soan Do the W currents divide into two branches, one setting into Soan Hang and the other flowing past both sides of Chagea Do, past the S end of Pogil To and then setting NW. The ebb current sets in the opposite direction. The maximum velocity is 4.5 knots.

In Chuja Kundo the tidal currents usually set in a W or E direction. The velocity of the tidal currents at springs is about 2.3 knots, but in the narrow channels between the islands and islets they attain a velocity of 5 knots in some places, producing dangerous overfalls.

During the ebb tide, eddies are experienced among the islets SE and S of Heonggan Do, and tide rips are common.

The W current flows from about 2 hours before HW until 4 hours after HW at Chang Jiang. The E current flows from about 4 hours after HW until about 2 hours before the following HW.

Pilotage.—The Korea Maritime Pilots Association (KMPA)

provides the following web site:

Korea Maritime Pilots Association
http://www.kmpilot.or.kr

Contact Information.—Korean Coast Guard stations can be contacted on VHF channel 16; the working channel is VHF channel 9.

1.2 Cheju Do (Jeju Do) (33°25'N., 126°30'E.), a large and rugged island, lies about 45 miles S of the S tip of the Korean peninsula. The volcanic island has few indentations, and no secure anchorages for large vessels. Halla San, the highest point on the island rises to an elevation of 1950m, has two peaks, the W of which is a precipitous wall of rock, and the E is slightly sloping. The lower slopes of the mountain are wooded. An ODAS buoy lies approximately 25 miles SSE of Halla San.

From NE of Haryur Ag, about 12 miles NE of Halla San, is the N of two sharp peaks, about 1 mile apart, which are useful to vessels approaching from this direction. Also very conspicuous from this same direction is a thickly-wooded sharp-peaked mountain about 3 miles NW of Halla San. The most conspicuous feature on the SW coast of the island is Sanbang San. This dome-shaped mountain rises precipitously from the coast about 13 miles SW of Halla San.

Sanbang San

Tides—Currents.—Off the S coast of Cheju Do the tidal current sets in an E and W direction, roughly parallel to the coast, at a velocity of 0.5 to 0.75 knot. The W current runs from 3 to 4 hours before until 2 to 3 hours after the time of HW. The E current flows from 2 to 3 hours after HW until from 3 to 4 hours before the time of the following HW.

Off the SW coast of Cheju Do the velocity of the tidal currents is strongest in the vicinity of **Mara Do** (33°07'N., 126°16'E.), where it attains about 3 knots. The passage N of Mara Do has strong tidal currents which generally cause a tidal race.

Tidal currents off the N coast of Cheju Do set parallel to the coast. In the vicinity of **Piyang Do** (Biyang Do) (33°24'N., 126°14'E.) the velocity of the tidal currents is about 2.5 knots.

Chagwi Do (33°19'N., 126°09'E.), lying close off the W extremity of Cheju Do, is a cliffy island covered with grass. A conspicuous rocky peak rises about 1 mile ESE of Chagwi Do.

Cheju Do—South and East Coasts

1.3 Hwasun Hang (33°14'N., 126°28'E.) is a fishing harbor protected by two breakwaters. The L-shaped S breakwater is 230m long, and extends S then W from the coast. The N breakwater has a landing quay for small craft and extends 250m WSW.

Hyeongjedo Moyji (33°13'N., 126°20'E.) is the roadstead SW of Hwasun and partially protected from the S by **Hyeong Do** (33°12'N., 126°19'E.), a small island, 25m high, lies 1.3 miles NE of Bunam Gag. A detached rock, 47m high, lies close S of Hyeongje Do. Foul ground lies between Hyeonggi Do and the coast NW.

Anchorage.—The best anchorage may be obtained, in a depth of 22m, sand bottom, about 1 mile offshore and midway between Hwasun Hang and Hyeongjedo. This anchorage is exposed to S and E winds which quickly raise a heavy sea.

Good marks in addition to Sanbang San include Gun San, about 5 miles NE of Bunam Got, and which may be identified by two large rocks on summit. A pier extends 183m W from a point 2 miles NE of Hyeongjedo. Hyeongjedo lies about 1.3 miles NE of the SE extremity of Bunam Got. Foul ground extends about 183m E from this islet, and there is a rock 45m high, close S of the islet; between the N extremity of the islet and the mainland NNW, there are reefs and shallow water.

Seogwip'o Hang (33°14'N., 126°34'E.), a fishing harbor, lies at the mouth of Yenoe Chon. A breakwater extends about 0.25 mile SE then 183m protecting the E side of the approach channel to the harbor. Lights are shown from the breakwater heads on the E and W sides of the harbor entrance. There are eight wharves within the breakwaters, with depths of 3.2 to 9.3m alongside.

Seogwi Ri is the principal town on the S coast of Cheju Do. It stands on a hill on the E side of the harbor. Nok Som and Sam Do lie in the approach to Seogwi Ri; the former, S of the town, has steep sides and a flat summit, the latter, SE of the town, has a sharp peak conspicuous from E or W. A prominent waterfall, located at the mouth of a river close E of Seogwi Ri, is a good landmark for vessels approaching the harbor from seaward between Nok Som and Sam Do. It is 26m high and looks like a white pillar from a distance. Two ODAS buoys are moored in the vicinity of Pom-do island in approximate position 33°13'N, 126°31'E.

Anchorage.—Large vessels can obtain temporary anchorage off the small harbor at Seogwi Ri, but it is open to the S.

1.4 Seongsan Bando (33°28'N., 126°56'E.) is the peninsula which forms the E extremity of Cheju Do and to which it is joined by a 50m wide and sandy isthmus. The NW part of the peninsula is low, flat and cultivated, but at the SE end, an extinct volcano rises sharply to a remarkable dish-shaped summit, 178m high. The rocks around the crater, the sides of which are almost perpendicular, are lower to the NE and higher to the NW, and have a conspicuous serrated outline providing a good landmark from some distance.

Aspect.—In addition to the volcano at the SE end of Seongsan Bando, there is Seongsan Am, an isolated rock lying close offshore NE of Seongsan Du; it is pointed, 22m high and prominent when seen from the N.

Four radio towers, each 65m high, are situated in the central

Seongsan Bando

NW part of Seongsan Bando.

The port of Ojolip'o is located on the NW side of the Seongsan Bando isthmus, on the S side is the port of Songsanp'o. These two ports are collectively known as Songsanp'o Hang, an important fisheries base.

Seongsan Du, the SE extremity of Seongsan Bando, is distinctive, projecting from the SE side of the peninsula and rising steeply to a sharp pointed summit 72m high.

Songsanp'o Hang East Breakwater Light (33°28.4'N., 126°56.3'E.) is shown from a framework tower standing at the end of a breakwater extending 660m from the end of Seongsan Bando, and runs NNE then N.

The N breakwater extends W from a position about 180m W of the head of the E breakwater. Lights are shown from round towers at each end of the breakwater.

Ojolip'o is protected by two breakwaters; the E breakwater, L-shaped and about 380m long, extends NW then WNW from Seongsan Bando; the W breakwater extends 524m NE from the mainland.

Small vessels up to 300 tons can berth alongside in depths of between 2 to 4m; the total quay length is 500m.

A submarine pipeline crosses the harbor 0.3 mile S of the breakwaters.

Songsanp'o lies on the SE side of the Seongsan Bando isthmus.

Anchorage.—Good anchorage may be obtained in the N part of Songsanp'o, about 0.7 mile WSW of Seongsan Du, in depths of 10 to 15m sand; the S part of the bay is rocky. This anchorage, which is a fishing station, is protected from NW winds in winter but is exposed to SE winds in summer.

Cheju Do—North Coast

1.5 The nearly straight N coast between Piyangdo Myoji and Udo Sudo consist mostly of black lava rocks, piled up in heaps, and projecting rocky ledges. Cheju (Jeju), about midway along this coast, is the principal town on the island. To the E of Cheju the hills rise steeply inland and are broken by narrow valleys.

Piyang Do (Biyang Do) (33°25'N., 126°15'E.) affords anchorage, in about 13 to 15m, sand, between the E side of the island of Piyangdo and Cheju Do. Anchorage may also be had SW of Piyangdo, in 13 to 31m, sand and shells. Local knowledge is necessary for both anchorages. Small local vessels can anchor either 0.3 mile S of Piyangdo, in 10 to 11m, sand, or in a bay on the SE side of the islan,d in depths of 2 to 3m; the latter is a good anchorage except in S winds. The bottom is rocky and uneven in the vicinity of these anchorages, and vessels may experience difficulty in weighing anchor. A light is exhibited on Piyangdo. A submarine pipeline has been laid SE from Piyangdo.

Hanrim Hang (33°25'N., 126°16'E.), a fishing harbor, is entered about 1.3 miles E of Piyangdo. The harbor is protected to the N and W by a breakwater which, connecting with Chiku Do on the N side, extends over 1,500m W and SW; another breakwater projects 180m from the shore to form an inner harbor basin. Breakwater extension works were in progress.

Aewol Got (Aeweol Got), the NW extremity of Cheju Do (Jeju Do), lies 3.5 miles NE of Hanrim Hang. A prominent hill 172m high, with an old beacon on its summit, lies 1.5 miles ESE of the point.

Aewol Hang (33°28'N., 126°20'E.), 1 mile E of Aewol Got, is a small fishing harbor protected by a breakwater with the entrance open NE.

Aewol Li (Aeweol Li) and another fishing village lie a short distance E of the harbor.

1.6 **Cheju** (Jeju) (33°31'N., 126°32'E.), the administrative center of the island, stands on the shore at the head of a small basin protected by a breakwater on its NW side and a breakwater on its E side. The inner harbor SE of the NW breakwater provides shelter and berthing for small vessels with drafts of less than 4.6m.

Cheju Hang (Jeju Hang) (33°31'N., 126°32'E.) (World Port Index No. 60350) is protected on its W and NW sides by a breakwater 0.5 mile long, on the inside of which a breakwater spur forms the N side of the harbor entrance. The harbor is open to the NE. A mole projects 183m NW from the shore to form the S entrance point of the harbor.

Cheju Hang

The international passenger terminal, situated near the foot of the W breakwater, has alongside depths of 11.4 to 11.9m.

The inner harbor side of the E breakwater provides shelter and berthing for large commercial cargo vessels with an aver-

age draft of 7.3m. Dredging is done as needed to maintain a depth of at least 8m. The harbor area can handle up to 13 vessels: one of 10,000 dwt, two of 5,000 dwt, six of 3,000 dwt, and four of 1,000 dwt.

Winds—Weather.—Strong NW winds are frequent in the winter months and often make it impossible to work cargo. Gales are most frequent in January.

Aspect.—In the vicinity of Cheju are several conspicuous peaks. To the W of the city is a prominent pine wood, and to the S is a group of pine trees.

Pilotage.—Pilotage is not compulsory, but is available. The pilot boards in approximate position 33°31.8'N, 126°32.7'E.

Regulations.—Vessels are required to report the following:

1. Preliminary arrival report.
2. Entry report.
3. Arrival report.
4. Shifting report.
5. Departure report.

Vessel Traffic Service.—A VTS is in force within an area with a radius of 5 miles centered on **Sanji Light** (33°31.3'N., 126°32.7'E.). It is under the authority of Cheju Port Service.

Participation in the VTS is compulsory for:

1. Vessels loaded with dangerous cargo.
2. Vessels greater than 300 grt (except fishing).
3. Vessels engaged in towing.

Anchorage.—The quarantine anchorage lies about 1.5 miles NW of the breakwaters in position 33°32'N, 126°31'E.

Cheju Hang Traffic Control Center

1.7 U Do (33°30'N., 126°58'E.), close off the E end of Cheju Do (Jeju Do), is separated from it by a passage with a general width of about 1 mile, and depths of 13 to 28m in the fairway. The tidal currents set through this passage in a NNW and SSE direction, attaining a maximum velocity of 3 knots.

Anchorage may be obtained 0.5 mile SW of the SW extremity of U Do, in depths of 15 to 22m, sand and shells.

Cheju Haehyob (Jeju Haehyeob) (33°50'N., 126°40'E.), lying between the N side of Cheju Do and Chuja Gundo and the islands E, is deep and unobstructed, except in its SW part.

Haeam Yeo (33°40'N., 126°18'E.), about 12 miles off the NW coast of Cheju Do, is steep-to and pointed. A depth of 4m lies close E of Haeam Yeo. Hwa Do, about 4.5 miles NE of Haeam Yeo, has a flat summit which can be easily identified.

Nakano Se, about 4.5 miles NNW of Hwa Do, is relatively steep-to.

Changsu Do (Jangsu Do) (Sasudo) (33°55'N., 126°38'E.), about 22 miles N of Cheju Do (Jeju Do), has a wooded flat summit and steep cliffs.

Yeoseo Do (33°59'N., 126°56'E.), about 14 miles ENE of Changsu Do, is very conspicuous. When seen from W it appears as a round hill with a long ridge extending NE, but from E it appears flat and resembles the back of an ox. A light is exhibited on the N side of the island.

Small local vessels obtain temporary anchorage, in a depth of 9m, in a shallow bay on the N side of Yeoseo Do, but care must be taken to avoid a rock awash lying on the E side of the entrance.

1.8 Chuja Kundo (Chuja Gundo)(33°57'N., 126°20'E.) is a group of islands, islets, and rocks lying about 25 to 30 miles N of Cheju Do (Jeju Do). Vessels should avoid passing through this group. **Jeolmyeong Seo** (33°52'N., 126°19'E.), considered to be the southernmost of the group, is a conical shaped rock lying 9 miles NNW of Hwa Do. Heavy tide rips are reported within 1 mile of Jeolmyeong Seo. Sudeog Do, 2.75 miles NE of Jeolmyeong Seo, is prominent as its N side is a precipitous cliff 126m high.

Bang Seo (33°55'N., 126°24'E.), the SE islet of the group, lies about 3 miles ENE of Sudeog Do.

Heonggan Do, the N of the group, lies about 8.5 miles NNE of Jeolmyeong Seo, and has two peaks. A light is exhibited on Heonggan Do.

Sangchuja Hang, on the NE side of Sangchuja Do, is a small harbor with depths of 3.7m. Winds from the N and E cause a swell in the harbor, but it is comparatively calm close offshore.

Hachuja Do (33°57'N., 126°20'E.), the largest and highest island of Chuja Gundo, 163m high, is connected to Sangchuja Do close NW, by a bridge with an overhead clearance of 9m. Foul ground extends 0.75 mile S and SE of the S point of Hachuja Do. A 10m wide breakwater extends 0.3 mile SSW from a position on the shore SE of the summit of the island.

Anchorage may be obtained SE of the summit of Hachuja Do, in depths of 18 to 20m, sand.

The islet of Jiggu Do lies about 2 miles NW of Sangchuja Do.

Abnormal magnetic variation was reported to exist about 10 miles NNW of Chuja Gundo.

1.9 Soan Kundo (Soan Gundo) (34°10'N., 126°27'E.), NE of Chuja Gundo, is separated from the Korean mainland by Hoenggan Sudo. The group consists of three large islands, several smaller islands, and numerous rocks.

Judun Cho (Chulon Cho), a rocky head awash, lies about 3.75 miles SW of Jagae Do. The sea breaks over this rock during strong winds and tidal currents.

Dangsado, the southernmost of the group, rises to a sharp peak at its S end. This wooded islet is an excellent landmark for vessels passing S of the group. A light is shown from the SE extremity of Dangsado.

Soan Do, the E island of the group, consists of two highlands

joined by a low narrow isthmus. The E end of the N part of the island is surmounted by a conspicuous conical peak. Soan Hang is formed by a narrow passage between Soan Do and the islands W of it. An overhead power cable, with a clearance of 31m, extends from the W extremity of Soan Do to the island W of it. Nohwa Do, the N island, can be distinguished from the other two large islands of the group because its hills vary little in height, and it is almost bare.

Bogil Do (Pogil To) (34°09'N., 126°32'E.), separated from Nohwa Do by a narrow channel, is densely wooded, with many sharp peaks. A submarine cable has been laid from the NW coast of Bogil Do and Na Do, 1.5 miles NW.

Hoenggan Do, the N island of the group, is separated from Nohwa Do by Janggu Sudo (Changgu Sudo), which has depths of 20 to 31m in the fairway. An overhead power cable spans the channel with a clearance of 31m. From E the island appears as a flat ridge terminating in a steep, rugged slope which ends in a cliff.

The maximum velocity of the tidal currents in the passage is 4.5 knots. A light is exhibited on the N coast of Hoenggan Do.

Yongjeon Cho, about 1.5 miles E of Hoenggan Do, marked by a light, is a drying pinnacle rock. There are heavy overfalls over this rock when the tidal currents are strong, but at slack water it is extremely dangerous as it is not seen.

A wreck lies sunk about 0.5 mile SSW of Yongjeon Cho.

1.10 Hoenggan Sudo (34°16'N., 126°35'E.), deep and free from dangers in the fairway, lies between the N island of Soan Gundo (Soan Kundo) and the islands E of Haenam Gag. Baegil Hang lies E of Haenam Gag and N of the islands of Heugil Do and Baegil Do.

Haenam Gag (34°18'N., 126°31'E.), the SW extremity of the Korean peninsula, is surmounted by a pointed hill and another hill close N, both of which are conspicuous. It is also the SW extremity of Tarumasan Sammyaku, which extends to Delma San 489m high, 6 miles NNE, and has a very irregular outline.

Baegil Hang (Paegil Hang) (34°18'N., 126°34'E.) is entered from W between Haenam Gag and the W end of Heugil Do (Hugil To) about 1 mile SE. The S and E sides of the harbor are formed by two islands, Heugil Do and Baegil Do, 0.5 mile NE.

Tides—Currents.—In Baegil Hang, currents attain a rate of 4 knots.

Anchorage.—Anchorage may be obtained by small local vessels in Baegil Hang, in a depth of 10m. A good berth is with the NE tangent of Baegil Do in line with the S summit of **Gye Do** (34°18.5'N., 126°36.8'E.), bearing 069°, and the SW extremity of Baegil Do, bearing 155° in a depth of 9m, where the tidal currents are weak.

Caution.—An overhead power cable runs between Baegil Do and Donghwa Do, and has a 37m vertical clearance. A dangerous wreck, at a depth of 26m, lies in the SW entrance to Baegil Hang about 1 mile W of Heugil Do.

1.11 Heugil Do (Hugil To) (34°17'N., 126°33'E.), 184m high and wooded, is fringed by a bank, with depths of less than 5m extending 1 mile ENE from its NW point. Baegil Do, 109m high, lies 0.5 mile NE of Heugil Do. An overhead cable, with a vertical clearance of 49m, spans the channel between the E end of Heugil Do and Baegil Do, 0.4 mile NE.

The E continuation of Hoenggan Sudo leads N of Somo Do and the islands E of Soan Hang, and S of the islands on the W side of the approach to Tungnyang Man (Deugryang Man). Meeruan, a rock, lies on the N side of the passage about 2.8 miles NNW of Somo Do. A light is exhibited from a red round concrete tower, with black bands, standing on the rock.

Somo Do (Soma Do) (34°14'N., 126°47'E.) is 121m high at its E extremity. Somo Do has a conspicuous clump of trees on the W side of its summit. A reef extends 0.5 mile SW from Somo Do; two above-water rocks, the inner 17m high, stand on the reef. A light is shown from the NW extremity of Somo Do. Taema Do, about 0.8 mile S of Somo Do, has an irregular serrated summit. A bank, with a depth of 9.6m at its W edge, extends about 1 mile W from Taema Do. The high and flat **Pulgun Do** (Bulgeun Do) (34°09'N., 126°45'E.), with two small islets close S, lies about 1.5 miles S of Taema Do. A rock, with a depth of less than 1.8m, lies close N of the N extremity of the island.

Ch'ongsan Do (Cheongsan Do) (34°11'N., 126°53'E.), is 343m high at the SE end of the island. The island is mostly cultivated but the peaks are bare. There are several villages on the coast. Close off the NW coast of Ch'ongsan Do are two islets, Chang Do (Jang Do) and Chich'o Do (Jicho Do), 1 mile S of it. A rock, 21m high, lies about 0.7 mile SW of Chich'o Do (Jicho Do) and 0.55 mile offshore. An important fishing village lies at the head of an inlet entered 0.5 mile SSE of Chich'o Do. A light is exhibited from the head of two breakwaters near the village.

A submarine power cable is laid between the N side of Ch'ongsan Do and the S end of Sinji Do, 5.5 miles NNW. The cable is marked along its length at intervals of about 1 mile by several lighted buoys.

Tides—Currents.—In the middle of Hoenggan Sudo the tidal currents set in an E and W direction. The E current attains a velocity of 4.5 knots, and the W about 3.5 knots. In Baegil Hang (Paegil Hang), the tidal currents reach a velocity of from 4 to 5 knots.

Between Ch'ongsan Do and Soan Hang the tidal currents set in a N direction with the rising tide, and in a S direction with the falling tide. The current attains a velocity of about 2 knots.

Anchorage.—Anchorage may be obtained by vessels with local knowledge in fine weather, off the W side of Ch'ongsan Do in position 34°10.7'N 126°50.9'E, in a depth of about 15m. Anchorage may be also obtained during N winds in a bay on the S side of Ch'ongsan Do at its W end. The bay has depths of 10 to 15m and the best anchorage during N winds is in a depth of 11m. A sandy beach lies at the head of the bay.

On the E side of Ch'ongsan Do lies a shallow bay the S entrance point of which is formed by **Hang Do** (34°11'N., 126°56'E.), 89m high. In this bay small local vessels can obtain shelter from SW winds, in depths of 7m, sand and mud.

Off-lying Islands

1.12 Geomun Do (Komun Do)(34°02'N., 127°19'E.), the outermost group of islands along this part of the coast, lies about 23 miles S of the Korean coast and about 37 miles NE of Cheju Do (Jeju Do). The group consists of two large islands, Seo Do (So Do) and Dong Do (Tong Do), and a smaller island Go Do (Ko Do) lying between their SE ends. The islands of

this group are easily distinguished from the numerous other islands and rocks in the vicinity, being larger, rugged, and densely wooded. Except when seen from SE, Seo Do and Dong Do have the appearance of one island. A breakwater extends for 72m from the E side of the village on the NE side of Seo Do, about 0.3 mile SW of the NE extremity of Seo Do. A light is shown near the S extremity of Seo Do.

Daesambu Do, with some smaller islets lying close offshore, lies about 3 miles E of Dong Do. Its summit rises to a conspicuous conical peak.

Sosambu Do, about midway between Daesambu Do and Dong Do, is a small group of islets and rocks, the S islet of which has a dome-shaped peak, conspicuous because of its brownish color.

Man Am, nearly 0.75 mile N of Dong Do, is 3m high and steep-to.

Donae Hae (34°03'N., 127°18'E.), lying between Dong Do and Seo Do, is a sheltered spacious harbor with depths of 15 to 18m. The holding ground is good, but strong E winds cause a swell. The main entrance, and the only one which can be used by deep draft vessels, is through a channel about 0.18 mile wide between the SW end of a rocky spit, extending 0.45 mile SSW from the SW point of Dong Do and Go Do. A lighted buoy marks the fairway SW of the rocky spit.

Tides—Currents.—Tidal currents in Donae Hae set N with the rising tide and S with the falling tide, attaining a velocity of 1.25 to 1.75 knots in the N entrance.

Anchorage.—The best anchorage is on the E side of the harbor between the N entrance point and the SW point of Dong Do, in a depth of 15m, mud. The swell caused by the SE gales is less felt here than on the W side.

1.13 Sangbaeg Do (Sangbaek To) (34°02'N., 127°37'E.), the S of the off-lying islets, lies about 14 miles E of Geomun Do. This group consists of three unmistakable islets which resemble a castle from all directions. It was reported that Sangbaeg Do is an excellent radar target.

Habaeg Do (Habaek To) (34°03'N., 127°35'E.), 1.5 miles NW of Sang baeg Do, is a group consisting of three islets and several pinnacle rocks; the S of the two W islets is 147m high and pyramidal in shape. From its S end several above-water rocks extend 0.5 mile S.

Both Sangbaeg Do and Habaeg Do are easy to identify because of the precipitous summit of Habaeg Do. A light, with a racon, is situated on the summit of Habaeg Do. The summits of both groups are also thickly covered with shrubs.

Mun Do (34°07'N., 127°31'E.), about 4.75 miles NW of Habaeg Do is 102m high, and, with the exception of its summit, is thickly covered with shrubs. Its coasts, except on its E side, consist of vertical cliffs which are prominent.

Mun Seo (Mun So) (34°08'N., 127°34'E.), 23m high, lies about 2.75 miles ENE of Mun So, and consists of two pinnacle rocks lying close together. An 8.5m rocky shoal lies about 0.8 mile S of Mun Seo.

Islands in the Approach to Deugryang Man (Tungnyang Man)

1.14 Maemu To (Maemu Do) (34°13'N., 127°00'E.), on the E side of the W approach to Deugryang Man, lies about 17 miles NW of Geomun Do and 4 miles NE of Ch'ongsan Do. Maemul To (Maemul Do) is one of three islands of similar appearance, all thickly wooded and darker than other islands in the vicinity. The island Ku Do (Gu Do), 127m high, lies about 0.75 miles E of Maemul To. The third island lies about 0.35 mile S of Ku Do. A light is shown from the NW side of Oyudo Island.

A local magnetic anomaly, with a deflection of 4°E and 5°E, was reported in a position 2 miles SSW of Maemul Do covering an area of about 1 mile.

Hwangje Do (34°11'N., 127°05'E.), about 4.3 miles ESE of Maemul To, consists of a group of six islets which, when seen from E or W, have the appearance of being three islets.

Togu Do (Deogu Do) (34°15'N., 127°01'E.), about 1 mile N of Ku Do, presents two distinct peaks when seen from E or W. Sodogu Do, about 1.5 miles N of Togu Do, is conical with thickets of brushwood. A light is exhibited on the NW coast of Sodogu Do. A bank, with a depth of 5.5m, extends 0.2 mile NW from the islet.

Hyongje Do (Choko To), midway between Togu Do and Sodogu Do, consists of three islets lying close together; from a distance these islets have the appearance of one island.

Chodo Gundo (Chodo Kundo) (34°14'N., 127°15'E.), about 10 miles N of Geomun Do, consists of one fairly large island and a number of islets and rocks. Cho Do, the largest island, may be identified by a peculiar long ridge which appears as a sharp peak when seen from N or S. Chang (Jang) Do, the westernmost island of the group, lies about 2.75 miles WSW of Cho Do; it is high, cliffy, and flat-topped. The N islet of the group lies about 2.75 miles N of Cho Do; a rock which dries 0.9m lies close W of another rock about 1.3 miles SE of this islet.

1.15 Yongman Do (Yeogman Do) (34°10'N., 127°21'E.), about 5 miles SE of Chodo Gundo and 7 miles NNE of Geomun Do, has a flat summit about 216m high and is thickly covered with trees. The N part of the island is a bare conical hill, 113m high, joined to the S part by a sandy isthmus and is prominent from E or W. Yongman Do Light is shown from the N part of the island.

Sonjug Yeoldo (34°17'N., 127°23'E.), consists of three islands, Sonjug Do and Geomun Do with the smallest, Sogeomun Do, between them. Sonjug Do, the W island, is wedge-shaped with a conical hill at its NE end. Sogeomun Do, 92m high and somewhat flat, lies close off the NE extremity of Sonjug Do. Geomun Do, 0.75 mile E of Sonjug Do, is the easternmost island of the group and has a sharp double peak.

Mog Seo, 44m high, with an above-water rock 183m S of it, lies a little over 0.75 miles W of Sonjug Do.

Dae Am (Tae Am)(34°17'N., 127°26'E.), a red rock 55m high with a single pine tree on its summit, lies 1.75 miles E of Geomun Do.

Wang Do (34°16'N., 127°32'E.), about 6.5 miles E of Sonjug Yeoldo, is cliffy and cultivated. A rock, 27m high, lies about 0.4 mile SE of Wang Do. Vessels should not approach the N side of Wang Do within 0.2 mile. Daeduyeog Seo, two black rocks, the S of which is 28m high, steep-to, and marked by a light, lies 1 mile S of Wang Do.

Gansu Jedo, lying SW of Wang Do, is a group of five islands and rocks lying 3 miles SE of Geomun Do. Pyeong Do, the central and largest island is cliffy along its S coast and there is

a sharp peak at its SW end. The central part of the island is low-lying, while its N part is flat and attains an elevation of 137m. Gu Do, 158m high, the S and highest island of the group, is cliffy except at its SE point. Sopyeong Do, 65m high, lies less than 0.5 mile N of Pyeong Do, with an islet midway between.

Between Chodo Gundo and Sonjug Yeoldo and the entrance of Deugryang Man to the N, there is a chain of islets extending about 15 miles ENE from **Paek So** (34°15'N., 127°06'E.) to **Jima Do** (34°20'N., 127°22'E.).

The latter islet is saddle-shaped and thickly covered with shrubs.

Deugryang Man (Tungnyang Man)

1.16 Deugryang Man (34°35'N., 127°05'E.), which affords shelter, is about 8 miles wide and 20 miles long. This extensive inlet is approached by one of three channels which leads between several islands and islets which encumber the entrance. The NW side of the bay is fairly shoal, with depths of less than 5m extending up to 2 miles offshore in places. Depths on the SE side, which is mostly steep-to, are greater. The bottom everywhere is soft mud.

The NW side of the bay is backed by mountain ranges, with many bare or rocky peaks, rising precipitously from the coast. Ch'ongwan San, the highest peak, has a conspicuous cairn on its summit. The E side of the bay is formed by **Goheung Bando** (Kohung Bando) (34°33'N., 127°20'E.), which has several barren peaks. P'aryeong Sa (Palyong Sa), the summit of this large peninsula, is very conspicuous.

Changgodo Sudo, the main channel leading into Deugryang Man, lies between Sinji Do and Choyak To, on the W, and Saengil To and Pyongil To, on the E. The direct approach to this channel from seaward is between Ch'ongsan Do and the islets extending SSE from Saengil To. The channel N of Saengil To leads W of Taech'ilgi Do, Changgu Do and Chilma Do, and then NNE into the bay.

Saengil To (34°19'N., 127°00'E.), one of the most conspicuous islands in the vicinity, has two distinct peaks, both of which are conspicuous because of a blackish color and of their being densely wooded. The N peak is slightly flat, and the S peak has the appearance of two nipples. Pyongil To, separated from Saengil To by a passage about 0.5 mile wide, rises to a sharp peak near its middle part.

Sinji Do rises to its summit near its W end. This summit shows as two conspicuous peaks when seen from E. Chang Do and Mohwang Do lie S of Sinji Do. A light is exhibited on the NE coast of Mohwang Do. Choyak To, separated from Sinji Do by a passage with moderate depths in the fairway, is hilly. The summit of Choyak To appears as a level ridge, the easternmost peak being sharp and conspicuous. A light is shown from about 2.3 miles SE of the W extremity of Sinji Do. A power cable with a vertical clearance of 29m spans the channel between Sinji Do and Wan Do. Red and white metal towers, marked by obstruction lights, stand at each end of the cable.

A bridge is under construction close N of the power cable.

Geumdang Sudo (Kumdang Sudo)(34°25'N., 127°07'E.), the central channel leading into Deugryang Man, lies between Ch'ung Do and Kumdang Do, on the W, and Geogeum Do, on the E. The channel leads W of the densely wooded and conspicuous **Hou Do** (34°24'N., 127°07'E.) and Yonhong Do, about 2.75 miles farther NNW. Chungang Do (Chuo To), the black steep-to rock about 0.5 mile SW of the S end of Yonhong Do, can be passed on either side, but the W side is recommended. Overhead cables exist between Yonhong Do and Geogeum Do. They have a minimum clearance of 19m.

Kumdang Do, with several bare hills, lies at the N end of the E side of Changgodo Sudo, in addition to the N end of the W side of Geumdang Sudo.

Geogeum Sudo (Kogum Sodo) (34°26'N., 127°16'E.), the N channel leading into Deugryang Man lies between Geogeum Do and Sisan Do, on the SW, and Goheung Bando (Kohung Bando), on the NE and N. The channel leads between **Gye Do** (34°30'N., 127°14'E.), the largest and highest of a group of islets and rocks lying off the NE extremity of Geogeum Do, and Kamdung So (Kanton Yo), a detached rock, 2m high, about 0.6 mile farther NNE. The main channel through the W end of Geogeum Sudo is N of Sanghwa Do, and between Taegodu Do, on the S, and Sorok To, on the N.

Numerous overhead power cables are located in Geogeum Sudo, Mado Sudo and between Choyak To, Geogeum Do, Sinji Do, and Wan Do. The charted vertical clearances of these cables range from 12m for those S of Sorok To to 35m for those in Mado Sudo.

1.17 Geogeum Do (34°27'N., 127°10'E.) is covered with trees which stand out in contrast to the bare appearance of the hills on Goheung Bando (Kohung Bando). The wooded mountains in the E part of the island are conspicuous when seen from seaward. Sisan Do, on the SW side of the entrance of Geogeum Sudo, lies about 1.75 miles ESE of Geogeum Do. The summit of Sisan Do appears almost round from any direction. A light is exhibited close SE of the S extremity of Sisan Do. Another light is shown from the N end of the island. Bua Do (Pua Do), 89m high, lies about 2.5 miles W of Sisan Do is conical and wooded.

Jijug Do (Jiho Do), on the NE side of the entrance of Geogeum Sudo, is the largest of numerous islets and rocks lying off the S extremity of Kohung Bando (Goheung Bando). The summit of this islet is a black hill which rises steeply over the S extremity.

Tides—Currents.—In Kumdang Sudo the tidal currents set in a NW and SE direction, attaining a velocity of 3 knots at spring tides. Slack water occurs about 40 minutes after high water at Ch'ang Chiang, with the ebb beginning to run almost immediately.

In Kogum Sudo the tidal currents set in a NW and SE direction, attaining a velocity of 2 knots. Slack water occurs about 30 minutes after high water, with the ebb beginning to run almost immediately.

Anchorage.—Vessels may obtain anchorage anywhere in Deugryang Man according to draft. The holding ground is very good, and the tidal currents are not felt much here.

Islands in the Approach to Yeoja Man (Suncheon Man)

1.18 Tanggeon Yeo (34°22'N., 127°31'E.), a group of conical rocks, lies about 10 miles SE of the S extremity of Goheung Bando, and is the outermost of the dangers on the W side

of the entrance of Yeoja Man. A light is shown from Tanggeon Yeo; a racon is situated at the light.

Gogdu Seo, about 1.8 miles NNW of Tanggeon Yeo, consists of two rocky islets, the SE one of which is wooded and of a conspicuous reddish color. A dangerous wreck lies sunk between Tanggeon Yeo and Gogdu Seo.

Naro Yeoldo (34°30'N., 127°30'E.) consists of two relatively large islands and several islets lying on the W side of the approach to Yeoja Man (Suncheon Man). Onaro Do, 392m high, the S island, has a wooded range of hills extending from its S end to its summit, on which stands a conspicuous tower.

Naenaro Do (34°30'N., 127°28'E.), 240m high, separated from Oenaro Do by a narrow passage, is largely wooded and hilly. Several islets and rocks lie within 3 miles of the E side of these two islands. Samam Lighted Beacon stands at the W end of Naenaro Do, 1.3 miles N of Sayang Do Light. A drying rock was reported to lie about 0.5 mile W of this beacon. Sayang Do, 201m high, lies at the W end of the Oe Sudo passage separating Oenaro Do and Naenaro Do. Oe Sudo is a narrow intricate channel with depths of 6 to 20m in the fairway. It it suitable for small local craft. A bridge spans connecting the two islands at the W end of the channel. Overhead power cables, laid between pylons painted red and white in stripes and each marked by a light, connect Naenaro Do with Oenaro Do and with Sayang Do; the least vertical clearance is 39m. A light is exhibited on the S side of Sayang Do. A light is exhibited on the SE extremity of Naenaro Do. A breakwater extends 45m WNW from the W side of Oenaro Do, a little over 1 mile SE of Sayang Do S extremity. There is an oil tank close SSE of the root of the breakwater and there is a mooring buoy off the head of the breakwater. A quay about 305m long with a short concrete pier projecting from it, is situated close N of the breakwater.

Kumo Yolto (Geumo Yeoldo) (34°30'N., 127°47'E.), consisting of three islands and several islets, lies on the E side of the approach to Yeoja (Suncheon) Man, and the W side of the approach to Yeosu Haeman. Sori Do (Sorido), the S island of the group, has a conspicuous pyramidal peak, 230m high, at its S end. Sori Do Light is shown from the S point of the island.

An Do (Ando) is separated from Sori Do by a channel. Shingang Sudo (Singang Sudo) has a clump of trees on its summit which is a good landmark. **Geumo Do** (Kumodo) (34°32'N., 127°45'E.), the largest island of the group, is densely wooded. The peak at the SE end of the island is a good mark.

Caution.—An overhead power line with a vertical clearance of 19m extends from An Do to the mainland. Shoals, with a depth of 6.4m, lie about 2.3 miles SSW of the W end of Geumo Do.

1.19 Geumo Sudo (Kumo Sudo) (34°33'N., 127°45'E.), N of Geumo Do, is deep and free of dangers in the fairway. Vessels should keep in mid-channel to avoid the tide rips off the points of Geumo Do.

Regulations.—A Precautionary Area and a Restricted Area exist within **Kumo Sudo** (34°33.3'N., 127°45.3'E.) and are bounded, as follows:

a. 34°35'N., 127°41'E.
b. 34°35'N., 127°50'E.
c. 34°30'N., 127°50'E.
d. 34°30'N., 127°41'E.

Vessels over 100 grt are recommended not to navigate within this area. Between Tarduri Do and Soduri Do to the N and Geumo Do to the S, navigation is restricted during the period from April 1 to July 31 each year due to reduced visibility.

Kumo San (34°35'N., 127°48'E.), a 320m high hill with a saddled-shaped depression, forms a good landmark near the SE end of Tulsan Do. Koma Gak Light is shown from a white, round, 7m high, concrete tower that stands near the coast 0.75 mile E of Kumo San.

An islet, 39m high, lies 0.25 mile off the SE side of Tulsan Do, fronting a small bay, 1 mile NNE of Tulsan Do. A patch drying 2.7m lies close ESE of the islet.

Fish nets are set within the area extending up to 4 miles ESE and 6 miles SE of the SE end of Tulsan Do. A fish haven (concrete blocks) extends up to 0.75 mile SSE of the point.

Tides—Currents.—The tidal currents about 1 mile S of Tanggeon Yeo have a velocity of about 2 knots. Vessels are recommended to give Tanggeon Yeo and Gogdu Seo a berth of at least 1 mile because of the strong tidal currents in their vicinity.

In Geumo Sudo, the tidal currents set in a W direction with the rising tide at a velocity of 4.3 knots, and in an E direction with the falling tide at a velocity of 3.25 knots.

Anchorage.—Small local vessels can obtain good anchorage in the bay SW of the 39m high islet, in a depth of 8m, mud. A drying reef extends 137m SE from this islet.

Caution.—Pinnacle rocks are reported to exist and they are extended up to 4 miles from the coast between **So Yong Dan** (34°24'N., 127°48'E.), and **Tulsan Do Light** (34°42'N., 127°48'E.).

Yeoja Man (Suncheon Man)

1.20 Yeoja Man (34°40'N., 127°30'E.) lies between the E side of Goheung Bando and the W side of Yosu Pando (Yeosu Bando). The entrance is encumbered by numerous islands which extend SE to the N side of Geumo Sudo. The recommended channel into the inlet is So Sudo, which lies between **Nang Do** (34°36'N., 127°33'E.) and the E end of Goheung Bando. This passage is about 0.6 mile wide, but is reduced to a width of 0.3 mile at its N end by the reef extending from the W side of the channel. Nang Do has a cairn on its summit which is conspicuous from seaward.

Caution.—Two overhead power cables, one with a vertical clearance of 38m, the other with a vertical clearance of 35m, cross the S end of So Sudo.

Gae Do (Kae Do)(34°34'N., 127°40'E.), about 5 miles SE of Nang Do, is the largest of the several islands fronting the entrance of Gamag Yang. The summit of Gae Do, 337m high, along with a 330m high summit close NW of it, are both pointed and form good landmarks. Anchorage may be obtained in the E bay on the S coast of Gae Do, by small local vessels, in depths of 7 to 13m.

Yosu Haeman (Yeosu Haeman)

1.21 Yosu Haeman (34°40'N., 127°51'E.) is an extensive inlet between **Tolsando** (34°38'N., 127°48'E.) and Yosu Bando on the W side, and Namhae Do on the E side. At its head are two branches, the W leading into Kwangyang Man, and the E

leading into Noryang Sudo.

Kanyo Am (34°17'N., 127°51'E.) is the outermost of dangers lying on the approach to Yosu Haeman. It is 23m high and lies 16 miles E of Kwang Do and is marked by a lighted beacon. **Chag To** (34°25'N., 127°54'E.) lying about 8 miles NNE of Kanyo Am, is 100m high and flat-topped.

Sejon Do (34°30'N., 128°05'E.), about 10 miles ENE of Chag To, shows two curiously-shaped rocky peaks when seen from NW, and when seen from NE, these two peaks are in line. A light has been established on Sejon Do. A village is located on the W side of Sejon Do. A dangerous wreck lies 7 miles WNW of Sejon Do.

Kal To, about 6 miles NE of Sejon Do, shows four peaks when seen from SE. Near the S coast of the island there is a 64m high pointed rock, which is conspicuous when seen from the SW.

Kudol So (Gudol Seo) (34°37'N., 128°07'E.) lies about 4.5 miles NW of Kalto. Kudol So Light stands on the islet.

1.22 Paekso (Baeg Seo) (34°38'N., 128°00'E.) lies 6 miles W of Kudolso; it is a brown, flat, rocky islet. A light, from which a racon transmits, is shown from the islet. Taedo (Dae Do), about 3.5 miles NW of Paekso, is covered with brushwood. A light is exhibited on Paek So (Baeg Seo). A lighted buoy is moored 3.5 miles WNW of Taedo (Dae Do) and marks a 16.8m patch. Lighted buoys mark the approaches to Yosu oil terminal.

Tides—Currents.—In Yosu Haeman, the tidal currents set in a N direction with the rising tide, attaining a velocity of about 1 knot. A velocity of 2 knots is reached in the vicinity of the S end of the group of islets and reefs lying in the channel off the NW side of Namhae Do.

In the vicinity of Sejon Do, the ENE current has a velocity of 1.3 knots, while the tidal currents between Sejon Do and Kal To (Gal Do), which set WSW and E, attain a velocity of about 1 knot.

To the S of Paek So, the WSW current has a velocity of 1.3 knots, and the SSE current, 0.75 knot. Northward of the area between Paek So and Kudol So the tidal currents set in a WNW and a NE direction at 0.75 knot.

Aspect.—Tolsan Do (34°38'N., 127°48'E.) is an irregular island with rugged hills rising inland. A good landmark is the hill with a saddle-shaped depression in it at the SE extremity of the island. Another conspicuous peak is about 4.3 miles farther NW. **Tai Tan** (34°39'N., 127°49'E.), about 4 miles N of the SE end of the island, is a conspicuous point, backed by several conical hills.

1.23 Namhae Do (34°48'N., 128°00'E.), one of the largest islands off the S coast of Korea, is mountainous. A bridge, with a vertical clearance of about 25m, spans Noryang Sudo at the N end of Namhae Do. Mangun San, the conspicuous summit of the island, rises near the middle of the W part of the island. A metal framework television tower, marked by an obstruction light, stands on the mountain. In the SE part of the island is a pointed peak about 1.3 miles WNW of its SE extremity; a stone enclosure, which is very conspicuous, stands on this summit. About 3.5 miles farther NW is the highest peak in this part of the island. It is a black rocky mountain, conspicuous from a distance. In the SW part of the island, Sori San is the summit of a precipitous range, the S side of which slopes steeply to the coast. A conspicuous tower stands on the summit of Sori San. Ungbong San, about 1 mile W of Sori San, shows a conspicuous pointed peak from E or W. Another peak, about 2 miles NW of Ungbong San, has a conspicuous pointed summit when seen from N or S.

The Tolsan Bridge

Aenggang Man, on the S side of Namhae Do, affords shelter from all directions, except from S. Anchorage can be taken off the village on the W side of the head of the bay, in 7 to 15m, mud.

Mijo Kundo is the group of islands and islets separated from the SE extremity of Namhae Do by Mij Sudo.

U Am (34°43'N., 127°48'E.), 1 mile NE of Tolsan Do, is a white rock easily identified in the daytime. A light is shown from U Am.

In the inner part of Yosu Haeman, on the E side of the channel, is **Samgi** (Sam Gi) (34°48'N., 127°49'E.), a reef with three drying heads, the highest being 3m. Fishing boats assemble in this vicinity.

Yang Am (34°44'N., 127°47'E.), a reef, drying 2.8m, lies 0.45 mile E of Odongdo. A lighed beacon stands on the reef. A 4.5m patch, marked by a lighted buoy, lies in the harbor 0.7 mile NW of Odongdo. Yosu Haehyop is the channel separating the N end of Tulsando from the SE end of **Yosu Bando** (34°44'N., 127°45'E.), 0.1 to 0.2 mile wide, with depths of 6 to 16m in the fairway.

Tides—Currents.—Tidal currents in Yosu Haehyop set W with the rise and E with the fall.

Changgun Do (34°43.8'N., 127°44.3'E.) is situated at the W end of Yosu Haehyop on the S side of the channel. A bridge with an overhead clearance of 20m spans the channel 183m S of Changgun Do Light, shown from 10m high concrete tower.

Yosu (Yeosu) (34°44'N., 127°45'E.)

World Port Index No. 60370

1.24 Yosu (Yeosu), a major commercial port, fishing port, and first port of call is also an important rail terminus and is developed as a subsidiary port for Pusan.

The recommended approach from seaward lies 3 miles SW of **Paek So** (34°38'N., 128°00'E.) and leads into Yosu Haeman.

The port consists of five major terminals, as follows:

1. Dry Cargo Harbor (paragraph 1.25).

2. Yosu-Honam Oil Refinery (paragraph 1.26).
3. Yosu-Nakpo Wharf (paragraph 1.27).
4. Yosu Energy Berth (paragraph 1.28).
5. Kwangyang Steel Mill (paragraph 1.29).

Pilotage

Pilotage is compulsory for vessels over 500 gross tons. The pilot boards in the following positions:

1. Pilot Boarding Station No. 1 (34°41'N., 127°56'E.) is for tankers of more than 50,000 grt; other vessels, excluding container vessels, of more than 70,000 grt; container vessels of more than 100,000 grt; and vessels having a draft of more than 14m.
2. Pilot Boarding Station No. 2 (34°42'N., 127°52'E.) is for vessels of 13m or greater draft and 50,000 gross tons or more.
3. Pilot Boarding Station No. 3 (34°45'N., 127°50'E.).

Yeosu (Yosu) Pilots

http://www.yspilot.co.kr

Regulations

A maximum speed limit of 12 knots is enforced within the Designated Area in Yosu Haeman swept channel; this area is bounded by lines joining the following positions:

a. 34°50.2'N, 127°47.0'E.
b. 34°50.7'N, 127°48.5'E.
c. 34°45.0'N, 127°48.8'E.
d. 34°45.0'N, 127°50.1'E.

Vessel Traffic Service

Yosu Vessel Traffic Service (VTS) is operated by Yosu Port Service within the approaches to Yosu. Participation in the VTS is compulsory for the following vessels:

1. Vessels over 300 grt.
2. Vessels transporting dangerous cargo.
3. Deep sea vessels.
4. Vessels with a tow over 200m long.
5. Tugs and barges engaged in construction.

The VTS area is bounded by lines joining the following positions:

a. 34°50.1'N, 127°46.5'E.
b. 34°50.8'N, 127°48.2'E.
c. 34°43.5'N, 127°51.5'E.
d. 34°41.3'N, 128°00.0'E.
e. 34°35.0'N, 128°00.0'E.
f. 34°35.0'N, 127°53.2'E.
g. 34°45.6'N, 127°45.4'E.

The VTS is divided into two sectors, as follows:

1. Sector No. 1 lies S of the NR Reporting Line, which is a line joining position 34°49.3'N, 127°46.5'E and position 34°49.3'N, 127°48.9'E.
2. Sector No. 2 lies N of the NR Reporting Line.

The established reporting lines are, as follows:

1. Within 10 miles of position 34°35'N, 128°00'E (Inbound only).
2. ER Reporting Line—A line joining position 34°41'N, 128°00'E and position 34°35'N, 128°00'E.
3. SR Reporting Line—A line joining position 34°35'N, 128°00'E and position 34°35'N, 127°54'E.
4. NR Reporting Line—A line joining position 34°49.3'N, 127°46.5'E and position 34°49.3'N, 127°48.9'E, with reporting made, as follows:
   a. Vessels transiting N of this line must report to Yosu Sector 2 VTS on VHF channel 67.
   b. Vessels transiting S of this line must report to Yosu Sector 1 VTS on VHF channel 12.

Vessels should maintain a continuous listening watch on VHF channel 67 or 12 while in the respective VTS sector.

Navigation safety and meteorological information is broadcast on VHF channel 12.

Vessel ETA, arrival, departure, and/or deviation reports should be made, giving the vessel's name, destination, and estimated time to destination.

The reporting points and schedule are listed in the table titled **Yosu Vessel Traffic Service—Reporting Information**.

Yosu Vessel Traffic Service—Reporting Information

Report	Required
Pre-Arrival	One hour prior to passing Baekseo Light or when passing Geomagak.
Passing	When abeam Baekseo Light and Daedan Light during arrival or departure.
Arrival	Upon arrival at the mooring area.
Anchoring or Unberthing	When anchoring or unberthing in the mooring area.
Departure	Upon departure from the mooring area.
Outer Port Position Reports	Vessels inbound to the outer port should report to, as follows: 1. 10 miles prior to arrival at the ER/SR Reporting Line. 2. When passing the ER/SR Reporting Line. 3. When passing the NR Reporting Line. Vessels departing the outer port should report, as follows: 1. When passing the NR Reporting Line. 2. When passing the ES/SR ReportingLine.

Yosu Vessel Traffic Service—Reporting Information	
Report	**Required**
Samch'onp'o Position Reports	Vessels bound for Samch'onp'o should report to, as follows: 1. When passing the NR reporting line. 2. When passing No. 5 lighted buoy in the Hadong Fairway. 3. When passing Namhae Bridge (34°56.7'N., 127°52.3'E.) Vessels departing Samch'onp'o should report, as follows: 1. When passing Namhae Bridge. 2. When passing No. 5 lighted buoy in the Hadong Fairway.
Mokp'o Position Reports	Vessels arriving from the Mokp'o vicinity should report, as follows: 1. When passing Geomagak 2. When passing Daedan Light. 3. When passing the NR reporting line. Vessels departing the Mokp'o vicinity should report, as follows: 1. When passing the NR reporting line 2. When passing Daedan Light.

Anchorage

Yosu Haeman Outer Anchorages.—The following designated anchorages are available in the outer approaches to Yosu Haeman:

1. Area D-1, a quarantine anchorage, about 2 miles NW of Paek So, is a circle with a radius of 0.6 mile centered on position 34°39.1'N, 127°57.9'E, with depths of 26 to 27m
2. Area D-2, a general anchorage, is a circle with a 0.4 mile radius centered on position 34°40.2'N, 127°53.9'E, with a depth of 21.5m.

Yosu Haeman Anchorage.—There are four designated anchorage areas, the limits of which are best seen on the chart, situated on the W side of the main channel, as follows:

1. Area A—For vessels with a draft of less than 8m.
2. Area B—For vessels with a draft between 8 and 11m.
3. Area C—For vessels with a draft between 11 and 14.5m.
4. Area W (quarantine anchorage)—For vessels with a draft of less than 14.5m.

Caution

Fish havens have been established in close proximity to the route in the vicinity of the VLCC pilot boarding station and NW of the VLCC quarantine anchorage.

Yosu Town

1.25 Dry Cargo Harbor (34°44.3'N., 127°45.3'E.) has three piers in Yosu Town; Pier No. 1 is used only by small vessels. Pier No. 2 can accommodate vessels having less than 6m draft, and Pier No. 3 is for vessels of less than 8m draft.

The harbor is protected by the breakwater joining Odongdo to the shore SW and by a breakwater extending 0.3 mile NNE from the NW point of the island. Another breakwater extends E from the shore of about 1 mile NW of Odong Do Light, then bends SE.

Anchorage.—Anchorage with good holding ground, in depths of 8 to 16m, mud and sand, may be obtained in Bug Ham (North Harbor), 1.3 miles NNE of Odong Do Light; it accommodates vessels up to 10.6m draft.

Nakp'ogak (34°51'N., 127°47'E.) is a cliffy point forming the NE extremity of Yosu Pando. Nakp'ogak Light is shown from a white, round, concrete tower, that stands near the point.

Noryang Yo, a rock with a depth of 1.5m, lies on the edge of the coastal bank 0.5 mile SE of the E extremity of Myodo. Another rocky shoal, with a depth of 1.1m, lies in the fairway about 0.33 mile E.

Myodo (Myo Do) (34°53'N., 127°45'E.), located 2.25 miles WNW of Nakp'ogak and the highest point on the island rises to 248m.

Noryang Yo, a rock with a depth of 1.4m, lies on the edge of the coastal bank 0.5 mile SE of the E extremity of Myodo. Another rocky shoal, with a depth of 1.1m, lies in the fairway about 0.4 miles farther E. Another rock, with a depth of 0.1m, lies 0.5 mile N of the same point. Buoys mark the fairway in the vicinity of the dangers. Passage II connects, S of Lighted Buoy No. 19; a buoyed channel, with a least depth charted depth of 6.5m, leads through Myodo Sudo about 3.5 miles W then SW direction for about 2 miles to a jetty situated 5 miles WSW of Nakp'ogak.

Myodo Sudo is the channel S of Myodo. It is narrow and encumbered by several islets and shoals towards its W end.

Anchorage.—Anchorage may be obtained N of Myodo, in depths of 8 to 13m. Anchorage in the S of Myodo is suitable only for small local craft. Although the holding ground in the S part is good, the tidal currents are strong and cannot be relied as a safe anchorage.

Yosu-Honam Oil Refinery

1.26 Crude Oil Wharf (34°51.0'N., 127°46.9'E.) is situated at the head of Yosu Haeman, 0.75 mile SE of Nagp'ogak Light. At No. 1 Wharf, crude carriers up to 285,000 dwt or product carriers up to 80,000 dwt can be accommodated. At No. 2 Wharf, crude carriers up to 80,000 dwt or product carriers up to 30,000 dwt can berth.

Depths—Limitations.—A passage through Sam Gi Channel, 3.75 miles SSE of the wharf, is made before a high water to berth with the slack water. Berthing conditions require:

1. Vessels are swung around to steer a course on or about

160°, N of the crude carrier berth, assisted by tugs. The approach to the berth is then made at an angle of 10° under a speed limit of 0.3 knot.

2. Wind conditions not exceeding 25 knots for southerlies and 29 knots for northerlies.

3. To berth with the bow facing seaward, to ensure a smooth departure.

4. The maximum draft limit is 21m.

Refined Product Wharf (34°51.7'N., 127°44.2'E.) has seven tanker berths with facilities to accommodate vessels day or night, as follows:

1. Berth No. 1 and Berth No. 4 allow vessels up to 5,000 dwt.
2. Berth No. 2 takes vessels up to 2,000 dwt.
3. Berth No. 3A takes vessels up to 35,000 dwt.
4. Berth No. 5 can take a vessel of 50,000 dwt.
5. Berth No. 6 takes vessels up to 5,000 dwt.

Berth No. 7 takes tankers of 12,000 dwt.

In addition, there is one more berth for chemical and LPG product carriers of less than 5,000 dwt.

The approach channel to the Refined Product Wharf has a least depth of 3.2m at LLW and berthing may require crossing this channel at a high tide.

Yosu-Nakpo Wharf

1.27 Raw Material and Fertilizer Wharf (34°51.7'N., 127°44.7'E.) has crane facilities. It has a straight running wharf and can accommodate 50,000 dwt and 30,000 dwt bulk carriers in addition to two 20,000 dwt vessels.

Advanced Material Pier (34°51.5'N., 127°44.1'E.) is located close to the Refine Oil Product Wharf. This pier accommodates one vessel of up to 4,400 dwt with a draft of 5.5m.

Yosu Energy Berth

1.28 Yosu Energy Berth (34°51.6'N., 127°46.2'E.) provides berths for LPG tankers and coastal tankers, as follows:

1. **Pier 1.—**The berth provides cargo connection to the shore facilities for LPG tankers. The cargo operations conducted involve are Liquified and Vaporized Butane, as well as Vaporized and Liquified Propane. This pier accommodates ocean-going LPG tankers from 30,000 to 75,000 cubic meters.

   Some mooring restrictions apply during daylight, wind, and current conditions.

2. **Pier 2.—**This berth provides facilities for coastal tankers of 1,000 to 3,000m^3.

Kwangyang Steel Mill

1.29 Kwangyang Steel Mill (34°54'N., 127°45'E.) is a newer port built on reclaimed land 3 miles WNW of Nakpo'ogap Light. A deep-water terminal has been constructed on the N side of the channel, 1 mile NE of Myodo. This terminal accommodates vessels of up to 250,000 dwt handling bulk, coal, and ore cargo.

At the head of Yosu Haeman, from N of the N limits of Designated Area and where the Deep Water Route ends, Passage I (Fairway I) begins. This passage leads NW between Lighted Buoy No. 13 and Lighted Buoy No. 14, then divides into four directional traffic flows at 1.5 miles NW of Lighted Buoy No.13. The channel to the NE leads to Kwangyang Hang Basin Zone-1 Anchorage, and further NE it leads to Noryang Sudo. The traffic flow leading S of Lighted Buoy No. 19 is Passage II. This passage leads W to LPG, Energy, Oil terminals, Zone-2 Anchorage, through Myodo Sudo and further. Passage III leads WNW between Lighted Buoy No. 19 and Lighted Buoy No. 20 to Zone-3 Anchorage NW of Myodo. Passage IV leads NW between Lighted Buoy No. 41 and Lighted Buoy No. 42 to the Steel Mill terminals.

Winds—Weather.—During the summer and autumn a heavy swell may be raised by the strong E winds which predominate at these periods. In spring the prevailing winds are S and in winter they are W. Gales are frequent during the spring and autumn transition periods between the winter and summer monsoons.

Tides—Currents.—In Yosu Haeman, the currents set N with the rising tide and S with the falling tide attaining a rate of 1 knot. In Yosu Haeyop (Yosu Haehyop), the tidal currents set W with the rising tide and E with the falling tide. The currents are strong, attaining a rate of 3.75 knots with the falling tide; the rate of the flood tide is less than that of the ebb. Eddies occur on the N side of the strait during the ebb, and, with NE winds there is a confused sea.

As a result of the reclamation work that has been carried out on both sides of the strait, it is reported that the rate of the tidal currents is increasing. The currents were reported by a Japanese man-of-war to have attained a rate of over 6 knots for about 1 hour at springs.

Aspect.—Odong Do, a flat islet 45m high and wooded, is joined to Yosu Pando (Yosu Bando), 0.4 mile WSW by a breakwater. A light is exhibited near the center of Odong Do. Yang Am, a drying reef, lies about 0.45 mile E of Odong Do.

In **Yosu** (34°44'N., 127°45'E.), landmarks include two silos on the shore near the W end of the breakwater which connects Odong Do and the mainland, the radio tower about 0.3 mile farther W, and the statue about 0.2 mile SW of the silos.

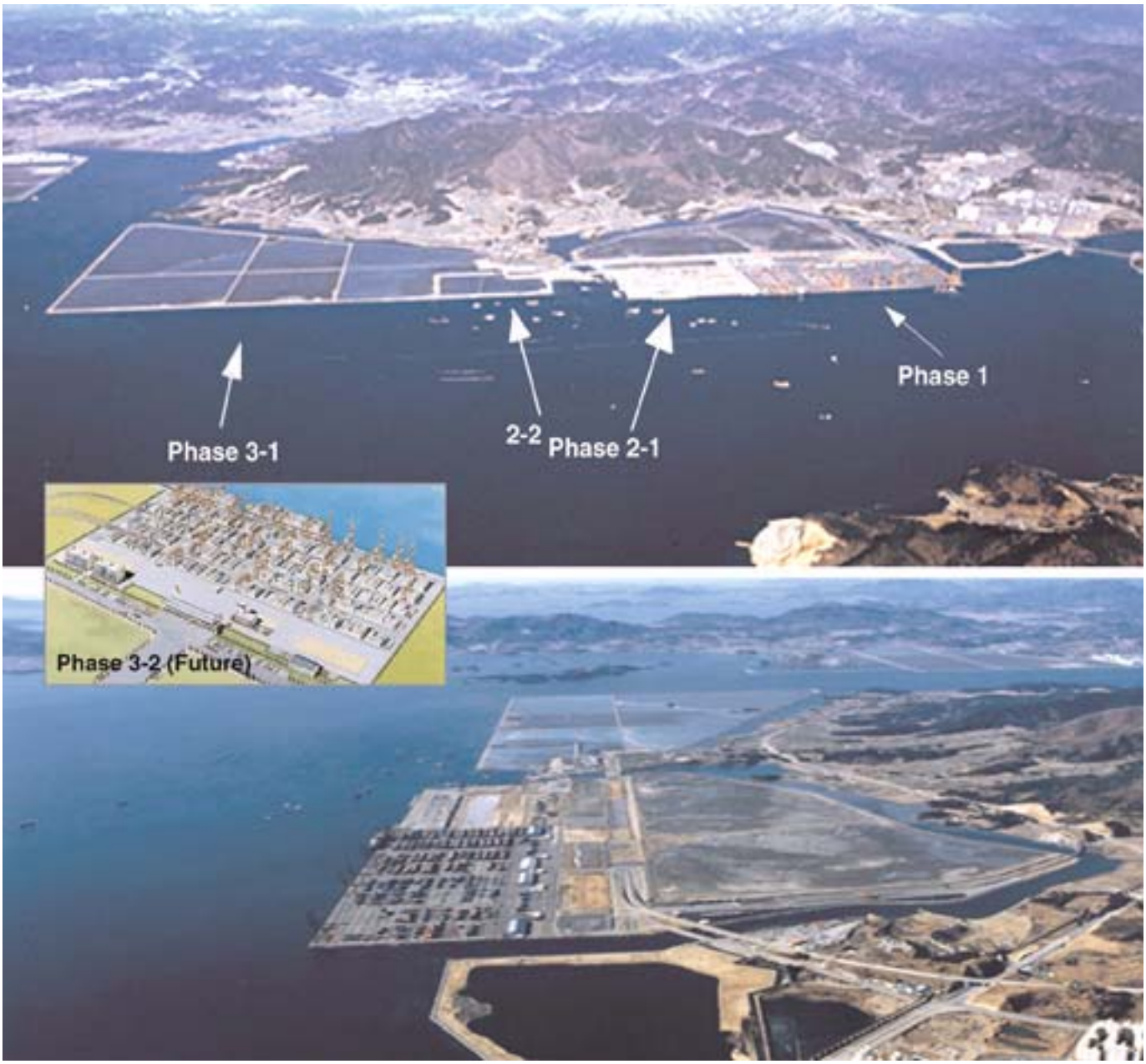
Kwangyang Hang (Gwangyang Hang) (34°51'N., 127°48'E.) is a natural harbor and an open basin, which lies at the head of Yosu Haeman. The port facilities are in development primarily to support the steel industry established at Kwangyang, but also for container vessel trade. The port is scheduled for completion in 2011.

Anchorage.—The basin provides anchorage areas in three zones:

1. Zone 1 lies N of Lighted Buoy No. 16 and NE of Passage I (Fairway). It provides seven anchor berths (Anchor Berth No. 1 through Anchor Berth No. 7) for vessels of less than 100,000 dwt.
2. Zone 2 lies in Myodo Sudo, close E of
   islet, and provides Anchor Berth No. 8 through Anchor Berth No. 10.
3. Zone 3 designated in two areas. One lies SW of Myodo and provides Anchor Berth No. 11 and Anchor Berth No. 12. Another section lies off the NW coast of Myodo and provides Anchor Berth No. 13 through Anchor Berth No. 15.

Extensive work is in progress (2006).

Regulations.—A VTS is in operation by Kwangyang Port Services. For further information, see Vessel Traffic Service in



Kwangyang Hang—Container Terminals

paragraph 1.24.

The Designated Area is bounded by lines joining the following positions:

a. 34°50'12"N., 127°47'00"E.
b. 34°43'04"N., 127°49'21"E.
c. 34°40'07"N., 127°54'48"E.
d. 34°35'30"N., 127°55'30"E.
e. 34°35'30"N., 128°00'00"E.
f. 34°40'30"N., 127°59'43"E.
g. 34°42'54"N., 127°53'30"E.
h. 34°43'05"N., 127°51'42"E.
i. 34°43'50"N., 127°50'42"E.
j. 34°44'46"N., 127°50'06"E.
k. 34°46'02"N., 127°50'03"E.
l. 34°50'42"N., 127°48'30"E.
m. 34°50'12"N., 127°47'00"E.

Caution.—A fish haven has been established 1.25 miles E of the outer pilot (VLCC) boarding station, 1.25 miles S of Ho Do.

Off-lying Islands—Namhae Do to Geoje Do (Koje Do)

1.30 **Yogchi Do** (Yogj Do)(34°38'N., 128°15'E.), about 10

miles SE of Namhae Do, is an irregular island covered with grass. The SW end of the island is a cliffy peninsula joined to the island by a low neck of land. The summit of the peninsula is round, covered with grass, and prominent. A light is exhibited near the summit of the SW peninsula.

On the W side of the island there are two bays, but they are exposed and not recommended as anchorages.

Chwasari Do (Jwasari Do)(34°34'N., 128°21'E.), about 4.5 miles SE of Yokchi Do, is the southernmost and largest of a group of islands and rocks. A light is exhibited on Chwasari Do. A fish haven, consisting of concrete blocks and hulks, lies one mile SE of the S island of Chwasari Do.

Kuk To (Gug Do), about 4.75 miles ESE of Chwasari Do, is a steep brown-colored island. A red pinnacle rock lies close S of the island. From the SW direction Kuk To (Gug Do) is sometimes mistaken for Hong Do, about 14 miles E. **Go Am** (34°30'N., 128°29'E.), about 3 miles SE of Kuk To and marked by a light, is a black rock, 20m high, with a flat top.

Hong Do (34°32'N., 128°44'E.), the outermost danger E of the S extremity of Geoje Do (Koje Do), is rugged and steep. A light, equipped with a racon, is exhibited from the summit of Hong Do.

Yo Do (Yeo Do), about 8.5 miles NNE of Hong Do, consists of two groups of rocks about 0.5 mile apart.

Maemul To (Maemul Do) (34°38'N., 128°34'E.), the largest island S of Geoje Do, rises to a conspicuous pointed peak near its middle part. Another pointed, but lower peak NE of the summit, may be mistaken for the summit from N. Tungga Do, Taeguulbi Do, and Soguulbi Do lie S of Maemul To, and Kaik To and Soji Do lie W of Maemul To. Taeguulbi Do and Soguulbi Do are both very conspicuous black rocks when seen from a distance, and Kaik To, which has a reddish brown color and consists of a group of pillar-shaped rocks, shows as five or six pinnacles when seen from E or W; several of these latter rocks have the appearance of junks.

1.31 Samcheonpo (Samch'onp'o) (34°55'N., 128°04'E.) stands on the Korean mainland, and is approached between Namhae Do and Ch'angson Do, on the W, and Saryang Do a little over 4.3 miles E. The town is fronted by **Samch'onp'o Hang** (34°55'N., 128°05'E.) is a large harbor with its limits extending N and E of Shinsu Do. During the fishing season large numbers of fishing boats use the harbor, the oldest part of which is a basin protected by a breakwater situated close NW of No Mal.

Depths—Limitations.—A deep water wharf, capable of accommodating vessels of up to 100,000 dwt, is located about 1.75 miles ESE of No Mal. It has a berthing face about 540m long, with depths of 13.4 to 16m alongside reported. It is used mainly for importing coal for the power station.

Reclamation was in progress on the shoreline NE of Hang Do Light. The breakwater extending SW from Changdung Mal is completed. Samch'onp'o town is situated N of the old harbor.

Aspect.—Landmarks and their locations described are made in reference from the N end of Shinsudo (34°54.6'N., 128°04.6'E.). Sado, with 81m high pylon obstruction light, lies 0.3 mile N. Siyado, 11m high, lies 1.3 miles NW. Mogaedo, 19m high, lies 2 miles WNW. A war memorial on No Mal lies 1 mile N. A prominent war memorial stands on high ground at the S end of the peninsula 0.2 mile E of the Samch'onp'o breakwater light. Two radio towers and another tower, marked by obstruction lights, stand close together 0.2 mile NNW of the same light.

Pamam Light is shown from a black, round concrete tower, red band and stands 18m high on the NW end of a rocky shoal 0.4 mile WSW of Sa Do.

Hangdo, 23m high, with a sparsely-wooded summit, lies 0.2 mile E of **No Mal** (34°55.2'N., 128°04.5'E.). Hangdo Light is shown from a white round concrete tower on the S side of the island.

Coal Pier Light (34°54.2'N., 128°06.6'E.), shown from a red metal tower, stands 4m high at the SE end of Hangdo, off the deepwater wharf. A lighted beacon marks a drying reef situated 0.2 mile WNW of the breakwater head. The harbor is entered via Samcheonpo Sudo.

Anchorage.—There are four designated anchorages, best seen on the chart, in Samch'onp'o Hang. Anchorage No. 1 is suitable for vessels of up to 3,000 grt. Anchorage No. 2 and Anchorage No. 3 are suitable for vessels of up to 10,000 grt. Vessels of up to 100,000 grt can anchor in Anchorage No. 4.

1.32 Maan Do (34°45'N., 128°05'E.), lying close off the E coast of Namhae Do, has a conspicuous conical summit.

Ch'angson Do (Changseon Do) (34°51'N., 128°02'E.), separated from Namhae Do by the channel Changseon Haehyeob, rises to **Taebangsan** (Daebang San) (34°51'N., 127°59'E.), its summit in the SW part. Ch'angson Haehyop has a depth of 18m in the E entrance, but 1.5 miles within the entrance the channel becomes shallow and is encumbered with rocks and shoals. It is therefore not recommended even for small vessels.

Saryang Do (34°49'N., 128°14'E.) consists of two large islands about 3.75 miles E of Ch'angson Do (Changseon Do). Ha Do (Hado), the SE island of Saryang Do, is 344m high. Sang Do (Sangdo), the NW island, is 398m high.

The summits of both islands consist for the most part of rocky boulders, and the ridges are black and serrated.

Saryang Haehyop, a narrow channel separates **Ha Do** (34°49'N., 128°14'E.) and Sang Do.

Chukto (Jug Do), 48m high, lies about 0.5 mile WSW of the SW extremity of Sang Do.

Suu Do (Suudo) (34°50'N., 128°08'E.), 188m high and rugged, lies 2.5 miles W of the S point of Sang Do.

Nonggaedo (Nong-gae Do), a conical islet 45m high, lies midway between Suu Do and Sang Do.

Samcheonpo Sudo, with a least depth of 7.2m, lies between **Sinsu Do** (34°54'N., 128°05'E.) and the mainland NE. Sinsu Do lies about midway between Ch'angson Do and the mainland. Sa Do, about 0.3 mile N of Sinsu Do, is conspicuous. On the mainland a tower standing on a hill, about 0.5 mile NNW of **Yulpo Mal** (34°53'N., 128°08'E.), is conspicuous when seen from a distance. The channel is spanned by an overhead power cable, with a vertical clearance of 25m.

Shinsu Hang (34°54'N., 128°04'E.), a bay on the W side of Shinsudo is protected by two breakwaters. Lights are shown from the heads of the breakwaters.

Taebang Sudo (34°56'N., 128°02'E.) leads between the mainland and the islands off the NE extremity of Ch'angsondo, and connects Chinju Man with Samch'onp'o Sudo.

1.33 Chodo (34°56'N., 128°02'E.), 37m high with a wood-

ed summit, is the N island of the group lying off the NE extremity of Ch'angsondo. Chodo Lighted Beacon stands on the S end of the island.

The fairway from Chinju Man leads S of Chodo, and keeps to the mainland side NE of **Mado** (35°56'N., 128°02'E.) before it connects with Samch'onp'o Sudo.

The direction of buoyage should be observed that leads SE through Taebang Sudo from Chinju Man. A beacon stands in the shoal water 0.7 mile SE of Chodo Lighted Beacon; it marks the fairway. A lighted beacon stands on a drying rock 1.5 miles SE of Chodo Lighted Beacon; N of this rock the fairway narrows to about 0.15 mile wide.

Tides—Currents.—In Samcheonpo Sudo the flood current has a velocity of 2 knots and the ebb current 2.5 knots. In the narrow W part of this channel, the flood current has a velocity of 4.25 knots and the ebb 4.5 knots.

In So Sudo both currents attain a velocity of 5.5 knots in its narrow W part.

In the SE approach and E entrance to Chinju Man, the tidal currents generally set NE on the rising tide and SE on the falling tide. By the shore, the tide turns at about the times of high and low water, with a short interval of slack water. The rate of the current is weak for about 30 minutes before and after low or high water. However, the following maximum rates have been observed:

Location	Speed/Direction
So Sudo	Flood—1.5 knots Ebb—2.3 knots
Samchonpo Sudo	Flood—2 knots Ebb—2.3 knots
Samchonpo Sudo—Narrow part of channel	Flood—4.3 knots Ebb—4.5 knots
Channel W of **Nukto** (34°55'N., 128°02'E.)	5.5 knots
Taebang Sudo	Flood—5.8 knots Ebb—6.5 knots

Fog appears frequently from May to September with storms occurring most often in August and September.

Anchorage.—Samcheonpo Myoji, between No Mal and Changdung Mal, 0.75 mile ESE, affords good anchorage. The bay is fringed by a bank, with depths of less than 5m, extending 0.4 mile from its head; another bank, with depths of less than 5m, extends about 183m S from No Mal. The best position to anchor is with the S extremity of Hang Do in line with the 26m high hill about 0.2 mile N of No Mal, bearing 318°, in a depth of 9m, sand and mud.

Anchorage No. 1, Anchorage No. 2, and Anchorage No. 3 are located 0.15 mile SE, 0.6 mile S, and 0.35 mile SW respectively, from Hang Do Light.

During W or N winds, vessels can obtain temporary anchorage 0.2 mile SE of **Ch'u Do** (34°55'N., 128°05'E.) in a depth of 13m. However, local knowledge is necessary.

Depths—Limitations.—The deep water wharf has a berthing face 540m long with depths between 13.4 to 16m alongside. There are numerous berths and piers in the NW part of the harbor, in the vicinity of Samch'onp'o harbor basin.

Signals.—Storm signals are displayed from white metal masts, 12m high, at the N of Shinsu Do, at the N part of Nukto, and on the E shore of Chinju Man, 1.25 miles NNE of Nukto.

T'ongyong Haeman

1.34 T'ongyong Haeman (Tongyeong Heaman)(34°47'N., 128°27'E.) lies between Miruk (Mireug) Do and the mainland on the W, and Hansan Do and Geoje Do (Koje Do), on the E. The bay is approached between **Ogok To** (Ogog Do) (34°44'N., 128°26'E.) and **Pijin Do** (Bijin Do) (34°43'N., 128°28'E.), and extends about 10 miles N to a shallow channel of 2.8m leading into Jinhae Man (Chinhae Man). Chungmu Hang is between the N end of Miruk Do and the mainland. The Hansan Do Bridge has a vertical clearance of 15m and a horizontal clearance of 30m on either side of its center stanchion (34°46.0'N., 128°30.6'E.).

Off-lying islands.—Oebuji Do (34°42'N., 128°24'E.), on the W side of the approach to T'ongyong Haeman, has a flat summit and cliffy sides. Naebuji Do, about 0.7 mile N of Oebuji Do, has a sharp summit.

Pijin (Bijin) Do on the E side of the approach, consists of two parts joined by a sandy isthmus. Yongcho Do, about 0.6 mile NE of Pijin Do, also consists of two parts connected by a low isthmus, the E part of which is the higher.

Ogok To (Ogog Do), about 1.3 miles W of Pijin Do, lies on the W side of the approach to the bay. **Hangnim Do** (Hagnim Do)(34°45'N., 128°25'E.), 140m high, is divided in two by a narrow, shallow channel. **Yondae Do** (34°44'N., 128°24'E.), with a wooded summit 219m high lies 0.75 mile W of Ogok To (Ogog Do). A light is exhibited approximately 0.5 mile NW of Yondae Do.

Caution.—Two islets, fringed by foul ground, lies on the E side of the channel close off the W coast of Hansan Do. Another small islet, on which a light is exhibited, and wrecks lie about 1.75 miles S and 0.75 mile SSW respectively, of these two islets. About 2 miles farther N of the two islets, two other islets joined by a reef lie close off the NW end of Hansan Do. A light is exhibited on a small islet on the N side of the entrance to Hansan Hang, an inlet on the W side of Hansan Do.

1.35 Hwa Do (34°49'N., 128°28'E.), 0.25 mile N of Hansan Do, is an island 115m high and is fringed by drying and below-water rocks extending about 0.15 mile SW from the SW end. A below-water rock lies 0.2 mile SW of the N extremity of Hwa Do and 183m offshore. A bank, with depths of less than 10m, extends about 0.3 mile W from the island.

Hwa Do is separated from the N end of Hansan Do by Ch'ukp'a Sudo (Chugpa Sudo), and it is free from dangers. Panghwa Do (Banghwa Do), fringed by a reef, lies in the fairway about 0.3 mile NW of Hwa Do. A light is shown from the W extremity of Panghwa Do.

Chungmu (Ch'ungmu) (34°50'N., 128°26'E.) stands on the mainland on the N side of Chungmu Hang. It is the principal fishing harbor in this part of Korea. The harbor affords protection against winds from all directions.

Changso Do, in the middle of the N coast of the bay, is joined to the mainland N by reclaimed land.

Changso Light (34°50.1'N., 128°26.3'E.) is shown from a

black, round, concrete tower with a yellow top, stands on the SE end of the peninsula extending 0.5 mile SE from Changso Do.

Tongyong (Ch'ungmu Hang) (34°50'N., 128°25'E.), an important commercial port, is entered N of Jongsong Mal, the NE point of Mirugto (Mireug Do), 31m high and nearly steep-to E. The entrance to the bay is about 1 mile wide indents the coast 2 miles as far as the E entrance of Ch'ungmu Unha.

The port is sheltered from all winds, but the anchorage area is limited to a few vessels.

Pilotage.—Pilotage is compulsory for vessels over 500 tons. Requests for pilot are made through an agent or directed to the harbor administration office. Pilotage is free and there is only one pilot, who boards near **Pigin Do** (34°43'N., 128°28'E.).

Anchorage.—Vessels can obtain anchorage in the E part of the harbor, in 9m, mud and shells. The quarantine anchorage is on the W side of the channel about 1.75 miles SSW of Panghwa Do.

1.36 KOGAS LNG Terminal (34°57'N., 128°26'E.) is operated by the Korea Gas Corporation.

Pilotage.—Pilotage is compulsory. The pilot boards in position 34°56.2'N, 128°48.9'E.

Regulations.—Vessels should contact Masan Port Service on VHF channel 14 at least 1 hour before passing Dondu Mal Light and report the following:

1. Vessel name and call sign.
2. ETA at the pilot station.

Contact Information.—The terminal may be contacted, as follows:

1. VHF: VHF channels 8 and 16
2. Telephone: 82-55-6493160
3. E-mail: tymarine@kogas.or.kr

Nam Po (34°49.5'N., 128°29.0'E.) is protected by breakwaters and affords good anchorage for fishing vessels. Lights are shown from the breakwater heads.

1.37 Geoje Do (Koje Do) (34°50'N., 128°40'E.), large and mountainous, forms the W side of Kadok Sudo (Gadeog Sudo) and its approach, and the S sides of Jinhae Man (Chinhae Man). The SW coast of the island is indented by several bays and inlets and is fringed by several islands and islets. Saegam Mal, the E end of the S extremity of Geoje Do (Koje Do), is surmounted by a conical hill. Kao Do, Sobyongdae Do, and Taebyongdae Do lie within 1.3 miles of the S end of the island.

The SE side of Geoje Do, between Saegam Mal and **Soi Mal** (Seoi Mal) (34°47'N., 128°44'E.), about 6.5 miles NE, is high and bold. The tide rips off this stretch of coast causing the mud in the open bays to be stirred up creating discolored patches of water. Tadae (Dadae) Man, entered N of Saegam Mal, has deep water with good holding ground of mud but is open SE. When there is a swell from NE it sets into the bay.

Tojang P'o (Dojang Po) (34°46'N., 128°41'E.), NE of Tadae (Dadae) Man, has depths of 20 to 27m, mud and sand in its center. Tojang P'o is entered between Kalgot Tu (Galgod Do) and Soi Mal (Seoi Mal), 4 miles NE. A light is shown from Soi Mal. The island Changhuk To (Jungheug Do), rugged with dark steep cliffs, and Naohuk To (Naeheug Do), with two summits, lie on the N side of the entrance of Tojang P'o.

An oil terminal (34°49'N., 128°44'E.), comprising a single buoy mooring from which a light is exhibited, stands 0.5 mile offshore 2 miles N of Soi Mal (Seoi Mal) Light. It is connected to the shore SW by a submarine pipeline. The buoy is capable of handling vessels up to 330m in length, with a draft of 28m. Berthing of tankers takes place in daylight hours only. The maximum size vessel berthed was 250,000 dwt, with a 21m draft.

There is no deballasting facility. The quarantine and holding anchorage lie about 2 miles NNE of the terminal. The pilot boards about 3 miles E of Jisim Do.

A quay, 0.75 mile long constructed on reclaimed land, fronts the shore S of the oil terminal.

The coast from W of the oil terminal to Yangji Am (Yangjiam), 5 miles NNE, is high, bold, and indented.

Chisim Do (Jisim Do) lies about 2 miles NNE of Soi Mal. Two radio towers stand on the summit of the island near its S end.

Chise P'o (Jise Po) (34°50'N., 128°43'E.), entered 3.3miles N of Soi Mal (Seoi Mal), is 0.2 mile wide at its entrance. This fishing port affords a safe haven, deep and free from dangers. Two silver-colored oil tanks stand on the SW shore of the bay, about 0.8 mile WSW of its S entrance point.

The village Daedong Ri stands at the head of the bay. A pier, 150m long where small vessels can berth alongside, is situated near the village.

Ongnyo Bong (Ognyeo Bong), 554m high, stands 1.5 miles NW of the harbor entrance.

Anchorage.—Anchorage may be obtained in Chise P'o (Jise Po) on the N or S sides of the bay, in 9 to 15m, mud.

1.38 Jangseungpo Hang (34°52'N., 128°44'E.) is a small port used by a large number of fishing vessels. A short breakwater extends from each side of the harbor entrance.

A radio tower, 30m high, stands close NE of the entrance to the port.

On the E side of the head of the harbor there is an embankment, on the SE side of which is a pier, 16m long, where vessels of 100 tons can berth.

1.39 Okp'o Do (Okpo Hang) (34°53'N., 128°43'E.) is entered between Yangji Am (Yangjiam) and a point 1.75 miles NW. Yangji Am is a narrow point 47m high with a pinnacle rock 3m high off its extremity. A light is shown from the E side of Yangji Am (Yangjiam). Two breakwaters protect the harbor from the NE.

Depths—Limitations.—There is extensive quayage as well as a floating dock. The Royal Docks lie at the head of the harbor and have charted depths of 10 to 20m alongside.

Daewoo Shipyard, including large dry docks and shipbuilding and repair facilities, occupies the SW shore of Okp'o Man.

Pilotage.—The pilot boards in the quarantine anchorage located 0.5 mile NNE of the N breakwater light.

Anchorage.—Anchorage may be obtained in the NW corner of the harbor, in depths of 5 to 14m.

1.40 There is a small harbor at **Oepo Ri** (34°56'N., 128°43'E.). A light is exhibited from the seaward end of the S of two piers close S of Oepo Ri.

Isu Do (34°58'N., 128°44'E.), 77m high, is located about 1.75 miles N of Oepo Ri. It is flat, bare, and red in color. Rocks, which dry 0.6m, extend 91m S from the SW extremity of Isu Do. A 4m rocky shoal lies 0.18 mile N of the E extremity of the island.

Kyok To (Gyeog Do), 15m high, lies 1 mile NW of Isu Do and 0.6 mile offshore. A spit, with a depth of 0.9m over the outer end, extends 0.2 mile S and SW from the islet. A detached rock, with a depth of 4m, lies about 0.5 mile S and another rock, with a depth of 6.7m, lies 1 mile NE of Kyok To (Gyeog Do).

Kalsan Do (Galsan Do) (34°58'N., 128°46'E.), 1 mile E of Isu Do, consists of 4 rocks from 11 to 19m high. The two S rocks are the highest and are pointed. Paekso Do (Baeg Seo) rock is 15m high and whitish. Rocky ground extends about 183m NW from this rock.

1.41 Gadeog Sudo (Kadok Sudo) (35°00'N., 128°48'E.), the principal approach to Jinhae (Chinhae) Man and Masan, lies between the islets E of the NE extremity of **Geoje Do (Koj Do)** (34°50'N., 128°40'E.) and **Gadeog Do** (Kadok To) (35°00'N., 128°50'E.). This passage leads NW into Budo Sudo (Pudo Sudo), and then into Jinhae Hang and Masan Hang. The channel is marked by lighted buoys and beacons. A light, equipped with racon, is shown from Gadeog Do.

Tides—Currents.—In Gadeog Sudo, the set is NW on the rising tide at a maximum rate of about 2 knots and SE on the falling tide at a maximum rate of about 2.3 knots.

Tongdumal (Dongdumal) (34°59'N., 128°50'E.), the S point of Gadeog Do, is almost steep-to. Tongdumal Light is shown from a brick tower on a dwelling, 9m high, stands on the point; a fog signal is sounded from the light.

A surveillance radar is mounted on a white building near the light.

Caution.—A dangerous wreck lies about 1 mile SE of the light.

1.42 Cheonseong Man (35°01'N., 128°49'E.) is the only bay on the W coast of Gadeog Do to afford any protection from S. A fishing village is located at the head of the bay. Cheonsutae Mal is the S point of the entrance to the bay, where a breakwater projects ENE from the N side of it.

Pilotage.—The pilot boards about 1.5 miles S of the E entrance of the TSS.

Vessel Traffic Service.—A traffic separation scheme (TSS) leads through Gadeog Sudo, then NW through Budo Sudo, W through Chinhae Man, SW into Gohyeonseong Man and NNE into Haengam Man.

Vessels transiting within the indicated sections of the TSS, must observe a maximum speed limit of 15 knots. The sections where the speed restriction is in force, lie within an arc of 1.2 miles NE of **Byeongsan Yeoldo** (35°01'N., 128°46'E.); in the vicinity of the junction close N of Jam Do; in the section between Gwangji Mal and Deogwan Mal; and close NE of Baeg Am.

A Vessel Traffic Service (VTS) is in operation in Cheonseong Man. Inbound and outbound vessels should contact the Gadeog Sudo traffic center at the following reporting points:

1. 35°04'15"N, 128°44'44"E.
2. 35°01'15"N, 128°45'32"E.
3. 34°56'20"N, 128°45'15"E.

Anchorage.—Anchorage Area S2 lies about 3.5 miles ENE of Tongdumal Light in depths of approximately 20m.

Small local vessels with a draft not exceeding 5m anchor in Cheonseong Man. The best anchorage is with Cheonsutae Mal in line with the SE extremity of Daejug Do, bearing 242°, in a depth of 5.9m, mud bottom.

Anchorage is prohibited in Ga-deog Sudo S of Cheonsutae Mal.

Caution.—A restricted area prohibiting fishing and anchoring extends across the main channel over a width of 4 miles from Geoje Do (Koje-Do) to Gadeog Do (Kadok-To).

Work is in progress (2006) on the construction of a bridge between Koje-Do and and Kadok-To, in the area N of Pyongsan-Yolto. The bridge will cross Kadok Sudo and is scheduled for completion in 2010.

Submarine tunnel construction is in progress between Chungjuk-To and Taejuk-To, approximately 0.5 mile NW of Daejug Do Light.

A fish haven has been established about 1 mile E of the quarantine anchorage.

1.43 Namhyongje Do (Namhyeongje Do) (34°53'N., 128°57'E.), about 8.5 miles SE of Gadeog Do (Kadok To), is the S of three groups of islets and rocks lying in the approaches of both Gadeog Sudo (Kadok Sudo) and Pusan. Namhyongje Do, marked by a light on its E side, is very rugged, with steep sides and a wooded summit. A reef extends a short distance N from Namhyongje Do and a 10.8m patch lies 0.4 mile NNE of the island, with a 16m patch about 0.7 mile farther NNE. An ammunition dumping ground lies centered 1 mile NW of Namhyeongje Do.

Bughyeongje Do (Pukhyongje Do), about 3 miles NNE of Namhyongje Do, consists of five above water rocks which appear as two islets from a distance. A rock, 3.5m high, lies detached from the main group a short distance SW. Bunghyeongje Do, an island 60m high, with several above water rocks on the reef extending NE and E of the island. A detached rocky patch, 5.4m high, lies 0.3 miles NW of the island.

Mok To (Mog Do) (Namuseom) (34°59'N., 129°00'E.), 3 miles NNE of Pukhyongje Do (Bughyeongje Do), is an island 60m high with several above water rocks on the reef extending NE and E of it. A detached 5.4m rocky patch lies about 0.35 mile NW of the island. A light is shown from Mok To; a racon is located at the light.

Dangerous wrecks lie about 9.5 miles and 10.3 miles NW of Namhyongje Do.

Gadeog Do (Kadok To), rugged and irregular, rises to Yeondae San, 459m high, 2.3 miles N of its S point. On the S side of the summit of Yeondae San there is a large prominent boulder. The N coast of the island is high, precipitous, and barren.

Byeongsan Yeoldo (Pyongsan Yolto), forming the W side of the recommended channel through Gadeog Sudo (Kadok Sudo), consists of three conical islets about 183m apart and fringed by foul ground. A rock, 15.9m high, and a drying reef lie about 0.3 mile SE of K'undae So, the easternmost islet of the group.

Jeo Do (35°01'N., 128°45'E.) is a wooded islet with cliffy sides. Near its SE end stands a conical summit 88m high. The NW side of the island is cultivated and terminates in a shingle beach on which is a village. A jetty projects 45m from the N side of Jeo Do near its NW end.

A rock, with a depth of 5.4m, lies about 0.3 mile ESE of the SE extremity of Jeo Do.

Sakunso Seo (Saegeun Seo) (35°02'N., 128°44'E.), 0.5 mile NNW of Jeo Do, is a group of rocks, above and below-water. The highest rock, 4m high, stands in the middle of the group. A

light is exhibited on Saegeun Seo.

Mangwa Do (35°02'N., 128°43'E.), 58m high, lies about 0.8 miles WNW of Sakunso Seo. It has a conical appearance when seen from SE or NW.

1.44 Chinhae Man (Jinhae Man)(35°00'N., 128°34'E.) is a large landlocked bay formed by the NW side of Geoje Do (Koje Do) and the mainland. The bay, which has moderate depths, is entered from E through the deep passages on either side of **Jam Do** (35°03'N., 128°40'E.), which lies 1 mile N of the N extremity of Geoje Do.

The route through Jinhae Man, SW of Jam Do, is marked by lighted buoys.

Baeg Am (Paek-am) (35°02'N., 128°38'E.), a rock 2m high, lies 2 miles SW of Jam Do.

Heug Am (Huk-am), drying 1.5m, lies about 1 mile W of Baeg Am. It is marked by a light.

Chilcheon Do, on the E side of the bay, is separated from the NW side of Geoje Do by the narrow Chilcheon Sudo. This fairway has a least depth of 8.5m and is spanned by a new bridge (2001), with a vertical clearance of 15m and a maximum width of 11m. The overhead power lines have been incorporated into the Chilcheon Bridge.

Hwangdeog Do (Hwangdok To) is an islet lying close off the NW side of Chilcheon Do. A light is shown from Hwangdeog Do (Hwangdok To).

A wreck, with a depth of 13.1m, lies in the N traffic lane a little over 0.75 mile SW of Hwangdeog Do.

Gajo Do (Kajo Do) (34°58'N., 128°32'E.), the largest island in the S part of Jinhae Man, consists of two hilly sections joined by a narrow neck of land. Ognyeo Bong (Ongnyobong), the summit of the N section, has a conical appearance when seen from the E entrance of the bay.

Chwi Do, 9m high, lies about 0.6 mile NE of the NE side of Gajo Do. A black round concrete beacon on the summit of Chwi Do forms a good landmark.

1.45 Budo Sudo (Pudo Sudo) (35°05'N., 128°39'E.), the N continuation of Gadeog Sudo (Kadok Sudo) is entered between Jam Do and **Ung Do** (35°04'N., 128°43'E.) about 1.75 miles ENE. Jinhae Hang lies at its N end, and the port of Masan at its NW end, about 9 miles NNW of Jam Do. There are general depths of 9 to 18m S of Masan, with most of this area having been swept to depths of 8.5 to 10m. Both sides of the strait are mountainous, with barren ridges, and are indented by several small bays.

Jam Do (35°03'N., 128°40'E.), about 1 mile N of the N end of Geoje Do, lies on the W side of the entrance of Budo Sudo. It also lies at the entrance of Jinhae Man. Tide rips are off the S side of the island. A storm signal station is on the E extremity of the island.

Chori Do, on the E side of the entrance of Budo Sudo, has steep sides and a rounded summit depressed in the middle.

Channel Cho, 0.75 mile W of Chori Do, lies on the N side of Budo Sudo; at low water the sea breaks over two rocky heads which dry. Channel Cho Lighted Beacon, 12m high, stands on Channel Cho.

Kureisser Cho (K'uresa Ch'o) (35°05'N., 128°38'E.), on the SW side of the fairway, lies about 1.75 miles W of Channel Cho. It has a least depth of 4.7m, and is marked on its NW side by a lighted buoy.

Bu Do (35°06'N., 128°39'E.), the largest island in Budo Sudo, lies about 2.3 miles N of Jam Do. The island appears darker in color than the neighboring hills and islets and has a few clumps of trees. On the W tip of the island is a degaussing station. Hwa Do, 35m high and bare with a flat summit, lies 0.5 mile ENE of the S end of Bu Do. Dotumari Am, about 0.3 mile E of Hwa Do, is a reef on which there are two rocks 9m high. Totumariam Lighted Beacon stands on the E end of the reef.

Nam Do and Song Do lie on the NE side of the fairway about 2 miles NW of Bu Do.

Anchorage.—Vessels may obtain anchorage, sheltered from seaward, in 9.1m, mud, N of the W end of Chori Do. A quarantine anchorage is located S of Chori Do. It is centered in position 35°04'N 128°42'E.

Jinhae

1.46 Jinhae Hang (35°08'N., 128°39'E.) is entered between Daeyul Do and Somo Do, 2.5 miles NW. This is a prohibited area as indicated on the chart. A channel leading to Jinhae Hang, passing W of Bu Do, has been swept to a depth of 9.4m.

Chinhae (Jinhae) (35°09'N., 128°40'E.), standing at the head of the promontory separating Haengam Man and Jinhae Hang, is the site of the Republic of Korea's principal naval base. The port is restricted to entry by naval vessels only. Vessels with drafts of up to 7.9m can be accommodated.

Pilotage.—Pilotage is not compulsory but recommended. Korean naval officers act as pilots on request.

Anchorage.—Designated numbered anchorage berths are assigned in an area N and W of Bu Do, in 10 to 16m. The N anchor berth is for vessels in quarantine. Mooring buoys in the harbor are normally used only by Korean naval vessels.

1.47 Haengam Man (35°08'N., 128°41'E.), NE of Bu Do, is a commercial harbor entered between Daeyul Do, the NW entrance point, and the promontory about 1.3 miles ESE. Madang Seo, which dries, lies near the middle of the entrance of the bay. A light is exhibited on Madang Seo. Daeyul Do and Soyul Do, on the W side of the entrance of the bay, are joined by a reef with the mainland.

Daejug Do (Taejuk To) (35°08'N., 128°41'E.), with a drying

rock N, lies off the W side of the bay, and Sojug Do lies a little over 0.5 mile farther NE.

A buoyed channel leads from E of Madang Seo to the facilities about 1.5 miles NE. The berth, about 201m long, can accommodate vessels with a draft of 10.4m.

A pier, with a dolphin close off its head, extends about 0.15 mile SW from Daeil Mal, the SE entrance point.

There is a depth of 11m alongside the NW side of the pier where vessels of 20,000 tons can berth. A storm signal station is on the SE side of the bay, about 1.3 miles NE of Madang Seo.

Masan Hang

Masan (35°11'N., 128°34'E.)

World Port Index No. 60380

1.48 Masan, on the W side of Masan Hang, an extension of Budo Sudo, is entered between the SW extremity of Somo Do and a point 0.5 mile SW. The channel is deep and free from dangers in the fairway. Somo Do, 127m high, is connected to the mainland by a causeway; a number of oil tanks stand in the middle of the island. Makkae Do, a black rock, lies on the W side of the fairway about 0.35 mile W of Somo Do. A light is exhibited on Makkae Do.

Cho Do (Jeo Do), the barren islet close within the S limit of the harbor, can be passed on either side.

A small harbor, fronting the old town, is protected by a detached breakwater with lights on each end.

Winds—Weather.—The weather in Masan Hang is not extreme and is not affected by the NW seasonal winds in winter. In summer, typhoon precautions may be necessary. Rain occurs most frequently in the months of June, July, and August with an annual rainfall of 245cm, but in winter there is only 30cm. Fog is fairly frequent in March and April but rare in August and September.

Tides—Currents.—Currents in the harbor run SE at up to 0.5 knot on the ebb and run NE at up to 1 knot on the flood. Velocities in the lower harbor may reach 2 knots on the ebb.

Depths—Limitations.—Masan Hang is an excellent natural harbor which is almost completely sheltered. The bay is narrow and long with widths ranging from less than 1 to 2 miles. The harbor is open to the S and three sides surrounded by mountains.

The channel to the main deep water berth has a least charted depth of 9.8m; however, vessels with drafts of more than 6.5m should approach No. Pier 1 with caution.

Development and reclamation works were in progress in the bay SSW of Isim Mal; in the SW corner of Masan Hang, 1.5 miles S of Cho Do; and in the harbor fronting the old town.

Pier	Depth	Length	Vessel size (tons)	No. of berths
No. 1	8m	445m	8,000	4
No. 2	5m	385m	500	2
No. 3	11m	420m	20,000	1
No. 4	11m	1,050m	20,000	5
Dolphins	7m	88m	5,000	1
Center Pier	3m	400m	—	—
KHIK	11m	240m	20,000	1
Yukong	7m	100m	20,000	1

No. 1 Pier and No. 2 Pier serve the Free Port Zone. There are oil product pipelines at No. 2 Pier. A conveyor belt at No. 3 Pier has a 500 tons/hour working capacity.

A submarine pipeline crosses the channel between the W end of Cho Do and the mainland. An overhead cable, with a clearance of 58m, crosses the channel in the same area between pylons displaying red obstruction lights.

Aspect.—Reclamation works are in progress in the harbor area fronting the old town 1.3 miles N of Cho Do and in the bay 1.5 miles S of Cho Do. Landmarks include a silvery radio tower, marked by an obstruction light standing on Isim Mal. A group of three chimneys stands 0.3 mile W and a group of 3 oil tanks 0.75 mile WNW of Isim Mal.

Pilotage.—Pilotage is compulsory. There are eight pilotage boarding positions that are best seen on the chart.

Requests for pilotage should be made to Masan Regional Harbor Administration Office giving 24 hours notice.

Regulations.—Vessels transiting Masan Passage must not exceed a speed of 15 knots.

Vessel Traffic Service.—A Vessel Traffic Service (VTS) is in operation in the approaches to Masan Hang. A reporting line extends N from a position in the proximity of Yangjiamch'wi, the E point of Koje-Do, which is marked by a light, to the vicinity of U-do (35°05'N., 128°43'E.). Inbound vessels must report to Masan VTS on VHF channel 14 when passing the reporting line.

Anchorage.—Nine numbered anchorage berths, with depths of 6.4 to 13.9m, are situated in Masan Hang. Three numbered anchorage berths lie NE of the entrance channel.

The coast between Morun Mal and Danggang Mal is indented by Tadaep'o and Kamnaep'o, both opening to the S.

Vessels up to 7.3m draft can take an anchor berth. Quarantine anchorage is established 0.5 mile S of Joe Doi, in a depth of 11m, mud bottom with good holding ground. It also serves as a working anchorage.

1.49 Sodo (Seo Do) (35°01'N., 128°59'E.), 93m high, 0.4 mile SE of Morun Mal is steep at the S end; several rocks, the largest being 20m high, lie within 0.2 mile of its NE and W sides. Seodo Light, from which a racon transmits, stands on a 9m high concrete tower. A fishing reef is situated between 0.2 mile S and 0.3 mile WSW of the S point of Sodo.

Kyongdo, a rocky islet 30m high, lies 0.5 mile NE of Sodo. A spit, with depths of less than 5m and drying rocks on it, extends 0.2 mile from N end of the islet. A light is shown from a 10m high concrete tower on Kyongdo.

Tadaep'o, on the NE side of Morun Mal, affords good sheltered anchorage to small local vessels, in depths of 2m to 11m, but it is exposed to S winds and waves.

Tadaep'o

The anchorage is used by fishermen as a place of refuge. A breakwater, 150m long, fronts the head of the bay. Extensive reclamation works have been in progress.

Tadae Ri stands close WSW of this breakwater.

Songdo, 61m high, is a peninsula which lies on the W side of the entrance to Tadaep'o with a timber pond between it and the W side of the bay. The saw mill, protected by the breakwater, lies close S of the timber pond.

1.50 Nagdong Po (Naktong P'o) (35°03'N., 128°54'E.), E of Gadeog Do, is shoal. A spoil ground, marked by lighted buoys, lies centered off the mouth of Naktong P'o (Nagdong Po), 2 miles WSW of **Morun Mal** (35°02'N., 128°58'E.).

Nagdong Gang is about 170 miles long and discharges into Nagdong Po through several channels, in which there are some low islets. Some islets are covered with clusters of reeds and others, wooded and cultivated. A least depth of 0.9m exist on the bar, and within the bar for a distance of 11 miles there are even lesser depths.

Anchorage.—Nagdong Po is open to S and SE winds but vessels can obtain anchorage, in a depth of 12m, on the E side of Gadeog Do. Vessels should not proceed into a depth of less than 9m as the sandbanks obstruct the head of Nagdong Po.

Caution.—Depths in Nagdong Po are continually changing and charted soundings should not be relied on.

Nagdong Gang appears to be navigable by small craft for about 100 miles. Motor boats of 4 to 5 tons are able to proceed 15 miles up the river.

Two silos stand on reclaimed land in the area. Reclamation work and quay constructions are in progress.

Gamcheon

1.51 Kamnaep'o (Kamch'on) (Gamcheon) (35°03'N., 129°00'E.), E of Tadaep'o, is separated from it by Tusongsan peninsula 95m high, the S end of which is Jadam Mal. The entrance to Kamnaep'o is protected by breakwaters. A light is shown from the head of each breakwater. Kamnaep'o is a small bay which forms a narrow and long indentation between Jadam Mal and Tanggang Mal. The harbor is open to the S. It is surrounded by high mountains on the mainland, which makes it a good anchorage for avoiding winds and waves except from the S.

Kamnaep'o has been subject to extensive land reclamation and development work which extends from the breakwaters to the head of the inlet and lines the harbor, with quays having depths of 1.8 to 14.3m alongside. A Traffic Separation Scheme leads into the harbor.

A lighted range marks the inbound lane of the Traffic Separation Scheme.

Tanggang Mal (Danggang Mal) (35°03'N., 129°01'E.), the E entrance point of Kamnaep'o, is also the W entrance to Pusan (Busan) South Outer Harbor. A breakwater extends about 0.2 mile WSW from the W side of Taaggang Mal (Dannggang Mal).

Du Do (35°03'N., 129°01'E.), an islet 57m high, lies about 0.15 mile S of Danggang Mal. A light, 8m high, is situated S of the summit of the islet. Fairway No. 3 leads W of Du Do from Pusan South Outer Harbor to the entrance of Kamnaep'o.

Depths—Limitations.—A jetty 61m long lies in a cove, dredged to 6.1 to 7.9m, at the NE end of Kamnaep'o. It is protected by a breakwater S of it which projects NW from the S side of the cove. A pier, 520m long, 0.3 mile WNW of the jetty fronts a power station. Land has been reclaimed in both the NW and NE corners of Kamnaep'o.

Two T-head piers, 70m long, are situated on the E side of Kamnaep'o 0.35 mile S of the dredged cove; vessels of 10,000 tons can berth alongside.

The bottom is muddy and the depths are 7 to 17m.

Pusan (Busan) (35°06'N., 129°02'E.)

World Port Index No. 60390

1.52 Pusan, one of the principal ports in Korea, extends along the W and N shores of the harbor. The port has undergone considerable development and has a capacity of more than 10 million teu. Further expansion is underway and provides additional berthing and cargo-handling facilities at Pusan New Port.

Winds—Weather

Pusan is protected from the cold NW winds of winter by high mountain ranges and gets the full advantage of the warm winds coming from the sea, S and E winds during the summer.

From October to May, NW winds prevail and from June to July SE winds prevail. During August and September, NE winds are predominant.

With winds from E and S, heavy seas may run in the outer harbors, but the inner harbor is afforded some protection by the breakwaters at the entrances.

Although within the typhoon belt, the port is affected no more than approximately twice a year by winds on the fringe of typhoon storms.

Fog may occur from mid-May to mid-June but is rarely thick or of long duration. Fog with visibility of 500m or less occurs about three times a year and each may last about 3 hours. Radar assistance is available in conditions of limited or reduced visibility through harbor control.

Tides—Currents

In the area of the Korea Strait about 10 miles off Pusan, the surface current flows in a general NE direction at a velocity which is constantly changing but usually somewhat exceeds 1 knot. The combined flow of the current and tidal currents reaches its maximum velocity about 3 hours after the time of high water at Pusan, and its weakest about 3 hours after low water. A SW set may be experienced when the ocean current is weak.

In the vicinity of Saeng Do, about 0.75 mile S of the S end of Yongdo, the tidal currents are very strong. The flood current attains its maximum velocity E of **Sangi Mal** (35°03'N., 129°06'E.), and the ebb current between Saeng Do and Yongdo; the tidal currents have a velocity of 2.5 knots in this vicinity, and there are often overfalls during the ebb current.

At the approach to the entrance of Pusan Hang the tidal currents usually set SW with the rising tide, and NE with the falling tide. Within the harbor the maximum velocity of the tidal currents is about 2 knots, and it sets in the same directions as in the approach.

In the approach to the S entrance of Pusan Hang the tidal currents set in a N direction with the rising tide, passing around the NW end of Yongdo. Here the current unites with the flood currently flowing in a SW direction from the N entrance. Together they flow in a W and S direction along the mainland and out to the open sea. A part of the N current strikes the SW coast of Yongdo and is deflected E and S. Then it joins the main current setting S along the mainland to the open sea.

In North Inner Harbor, the tidal currents set SW through Pusan Hang, with the rising tide, and NE with the falling tide. The maximum rate is 2.3 knots.

Strong currents at their maximum rate are reported to set through the entrance between the breakwaters.

Depths—Limitations

The depths in the approach to Pusan decrease as the inner harbor is approached, from a depth of 13.5m between the breakwaters. Depths in the navigable part of North Inner Harbor range from 5 to 10.4m.

The deepwater piers lie on the NW side of North Inner Harbor, with alongside depths of 7 to 13m. Illuminated signs, showing numbers 1-5, lie on each of the five pierheads.

Pier No. 1 is for general cargo and steel, with depths of 8 to 9m alongside.

Pier No. 2 handles the same cargo plus raw sugar, with depths alongside of 9 to 11m. Continuing NNE, Central Wharf extends about 646m up to Pier No. 3,and handles heavy cargo.

Pier No. 3 is for general cargo, container, steel, and lumber, with depths of 8 to 9.4m alongside.

Pier No. 4 handles the same cargo plus bulk cement, with

Pusan—Namhang

Pusan Hang

depths alongside of 9 to 11m.

Pier No. 5 extends into Pier No. 6, with a collective length of 1,220m and alongside depths of 12.1 to 13.3m. Pier No. 5 handles grain and containers, while Pier No. 6 handles containers.

Pier No. 7 is situated on the NE side of the harbor, and used exclusively for the handling and storage of coal, scrap, ores, and minerals. Depths alongside range from 9.9 to 12.5m. An underwater obstruction with a depth of 10.2m lies close NE of the pier. Pier No. 8 close SE of Pier No. 7 is 1,000m in length, with depths alongside of 6 to 10m. It is used for handling of special cargo.

Gamman Container Terminal, in the NW part of the North Outer Harbor has four container berths, each with an alongside depth of 12.9 to 15.6m. Vessels of up to 50,000 dwt can be accommodated.

Shinsundae Container Terminal, is situated on the E shoreline of the harbor, close S of Gamman terminal. Shinsundae terminal has a total berthing length of 1,200m; four berths can accommodate vessels of up to 50,000 dwt.

Tankers berth at a T-head oil pier on the SE side of the North Harbor. The depth alongside is 9.7m.

The Nam Hang Bridge, with a vertical clearance of 30m, crosses Passsage II Fairway about 0.3 mile S of the E breakwater to South Harbor.

Pusan—North Harbor Terminals

A wreck, dangerous to navigation, lies on the E side of the fairway leading into South Harbor, 183m S of the head of the E breakwater.

Pusan New Port has been established around Gadeog Do. The port contains a North Quay, a South Quay, and a West Quay.

There are three container berths in operation (2009) with alongside depths of 18m. The new port has a total of 18 berths in operation (2010) and is to be completed by 2011.

Caution.—Charted depths alongside Central Wharf, Singamman Container Terminal, Gamman Container Terminal, and Jaseongdae Container Terminal indicate depths found 3 to 5m distant from the wharf.

Caution is necessary when berthing.

Aspect

The country in the vicinity of Pusan is almost devoid of trees, except for Yongdo and the city itself. The hills, which in general parallel the coast, are covered to their summits by a rank growth of grass. In autumn and winter this grass takes on a brownish, barren appearance with outcroppings of rock.

Cultivated areas lie in the valleys, between the spurs running down to the shore.

The principal peaks near the coast are **Kudok San** (35°07'N., 129°00'E.), about 2.8 miles NW of Yongdo; Kumyor (Gumyeon San) with two summits, the higher reaching an elevation of 428m about 5 miles NE of Kudok San; and Chang San (Jang San), lying about 4 miles farther NE of Kumyor (Gumyeon San), 634m high.

Yongdo, which separates the N harbor from the S harbor, rises to Bongrae San (Pongrae San), its summit in its N part at 395m. The hills slope down to its N and NE shores; the SW coast consists of steep cliffs. The reclaimed land on the NE side of Yongdo is fronted by the coastal bank, which at the N end is encumbered with rocks. Several radio masts and towers stand on the island.

Pusan Tower, a large white tower with a pagoda-like top, standing close W of the Yunan Ferry Terminal, stands out very well; at night it is lit until about 2330.

The North Outer Harbor of Pusan is entered between Sangi Mal and Seungdu (Sungdu) Mal, about 2.75 miles NNE. The former, the E extremity of Yongdo, is a bold precipitous headland; the latter can be identified by Oryug Do (Oryuk To), a group of four islets lying within 0.5 mile S of the point. A light is exhibited on the SE end of Yongdo, about 0.5 mile SSW of Sangi Mal, the E extremity of the island. A DGPS station and ramark are situated on the S islet of Oryuk To. Cho Do, on the SW side of North Outer Harbor, is faced with cliffs on its E and N sides.

The South Inner Harbor lies between the mainland and the NW end of Yongdo. It has depths of 4 to 9m in the bay and is not suitable for large vessels. The Inner harbor is protected from the S by two breakwaters. The W breakwater extends 400m E from the W shore, and the E breakwater extends 140m SW from Yongdo.

A detached breakwater extends 270m NNE-SSW in the NW corner of the harbor. The S limit of South Inner Harbor is a line drawn E from a point 0.3 mile NNE of Songdo. The N limit is the drawbridge 1.3 miles NNE of Songdo.

South Outer Harbor is entered between **Dangang Mal** (35°03'N., 129°01'E.) and Seangdo, 4 miles ESE. Depths in the main approach to South Outer Harbor decrease gradually from 30m to about 10m N of **Songdo** (35°04'N., 129°01'E.).

Pilotage

Pilotage is compulsory for vessels over 500 gross tons. Pilots board vessels in the following positions:

1. No. 1—Position 35°04.0'N, 129°08.9'E.
2. No. 2—Position 35°01.5'N, 129°02.5'E.
3. No. 3—Position 35°00.0'N, 128°48.2'E. (New Port)

Vessels over 7m draft are to anchor 1 mile NE of **Chodo** (35°04'N., 129°06'E.) while waiting for the pilot. There are three pilot vessels and 15 pilots providing day and night service. It has been reported that the pilot will only bring ships into/out of harbor at night time in emergencies.

Requests for pilots and vessel's ETA are sent 72 hours and 24 hours in advance, and VHF contact with Pusan Port Control must be established 3 hours prior to arrival on VHF channel 12.

Pusan (Busan) Pilots

http://www.pilotbusan.co.kr

Regulations

Speed in the fairway of the North Outer Harbor and in North Inner Harbor is restricted to 10 knots in depths over 18m and to 5 knots in shallower depths.

Entry to North Inner Harbor may also be made from South Inner Harbor but this is regulated by the height for the Pusan Bridge and the opening of the drawbridge close W of it. The bridge has conclusive times of the day when it is open, and when under certain weather conditions it is closed.

A Traffic Separation Scheme has been established in the approaches to Pusan Harbor. The scheme is not IMO-adopted; it is, however, implemented by the local authorities where Rule 10 of 72 COLREGS applies.

Vessel Traffic Service

Pusan Vessel Traffic Service, located on Chodo and run by Pusan Port Services, is available 24 hours. Reporting lines and associated VHF communication channels are established as follows.

Vessels should report to Busan VTS Area 1 on VHF channel 9 when passing a line, located E ofSaeng Do Light (35°02.2'N., 129°05.6'E.). joining the following positions:

a. 35°01.9'N, 128°57.9'E.
b. 34°58.8'N, 128°59.4'E.
c. 34°59.6'N, 129°05.8'E
d. 35°03.1'N, 129°05.5'E.

Vessels should report to Busan VTS Area 2 on VHF channel 12 when passing a line, located E of Saong Do Light, joining the following positions:

a. 35°03.1'N, 129°05.5'E.
b. 34°59.6'N, 129°05.8'E.
c. 35°00.2'N, 129°09.9'E
d. 35°05.2'N, 129°14.9'E.

e. 35°09.1'N, 129°09.2'E.

Participation in the VTS is compulsory for all vessels of 300 grt and over, vessels transporting dangerous cargo, towing vessels having a tow of 200m in length or greater, and all foreign vessels. Vessels between 5 grt and 300 grt should report only when entering or departing.

Vessels must report the estimated arrival report approximately 2 hours prior to arrival at the VTS. Other reports are made, as follows:

1. Initial report— When passing the reporting line.
2. Arrival report—Upon berthing or anchoring.
3. Shifting report—When shifting within harbor limits.
4. Departure report—Upon departing the port of Pusan.

While within the VTS, vessels must maintain a continuous listening watch on VHF channel 12. The priority of vessels within 6 miles of the harbor limit is reported by the VTS on VHF channel 12. Vessels passing the reporting line and vessels bound for Pusan New Port, when arriving, shifting, or departing, must use this channel to report to Pusan VTS.

Anchorage

The quarantine anchorage is centered in position 35°05'00”N, 129°07'15"E, in North Outer Harbor. A dangerous wreck lies close SE of this anchorage; unexploded ordnance lies within 0.5 mile, E of this anchorage. ;

There are several anchorage areas in addition to the quarantine anchorage in Pusan Hang. The designated anchorages are E, O, M, and A. Anchor Berths E-1 and E-2 are located in the SW portion of Section I and are for general cargo vessels of 500 to 20,000 grt.

Anchorage O-2, located SE of Nahang South Breakwater, is a temporary anchorage for vessels less than 3,000 grt. Anchor Berths M-7 to M-11, for timber vessels of over 10,000 grt, lie S of the fairway leading to the inner harbor.

Anchor Berths A-4 to A-6, for vessels up to 50,000 grt, are located NW of Oryukto Breakwater. Vessels of up to 50,000 grt may anchor in the area established 3.5 miles ENE of Tongdumal Light.

Caution

A Designated Area is established in the approaches to Pusan, seaward of the SE harbor limit, within the area of 6 miles radius, centered on a position 0.2 mile SE of the SW end of Oryukto Breakwater.

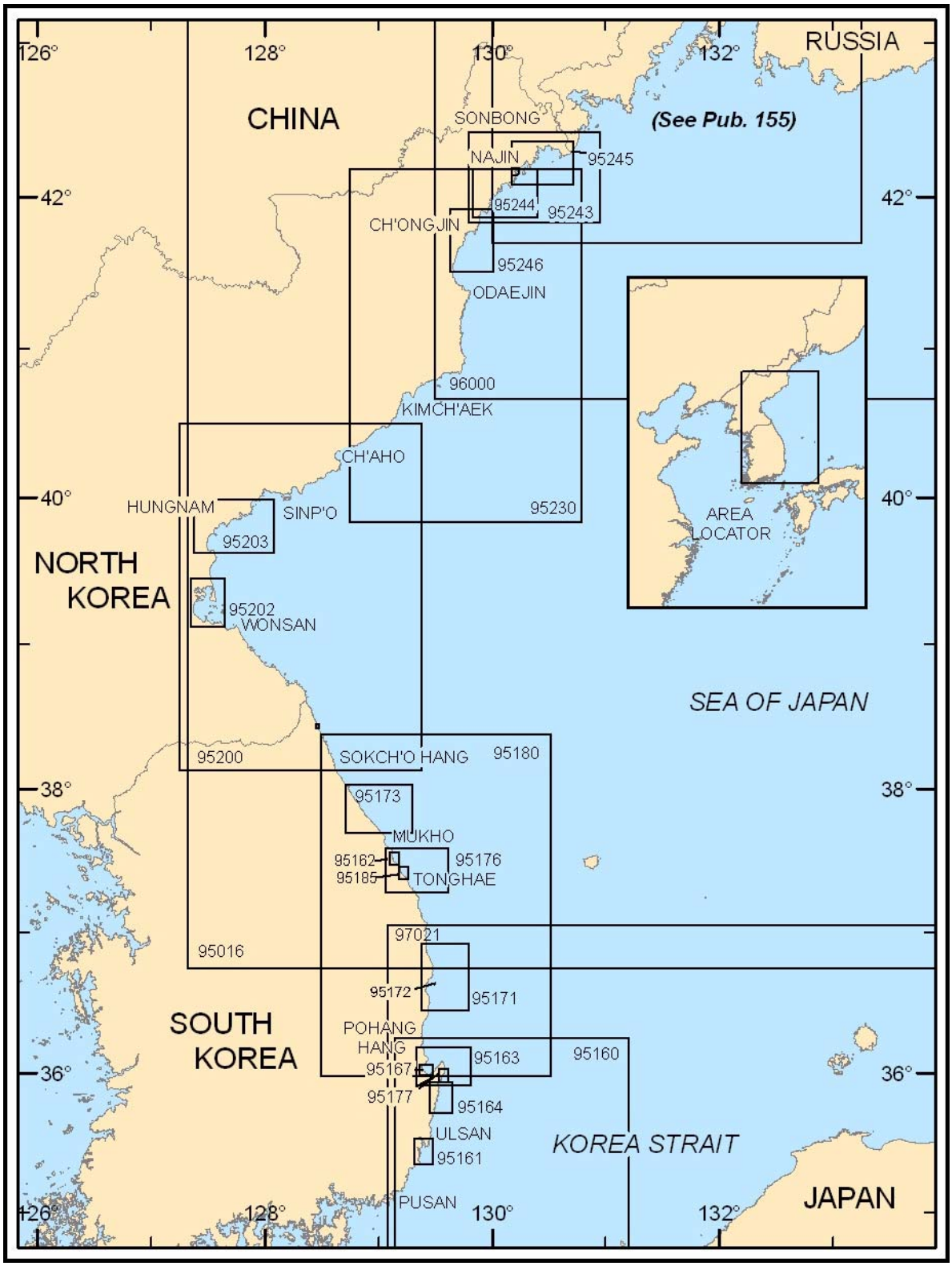
Several spoil grounds lie in the harbor approaches. The limits of these areas may best be seen on the chart.

Anchoring and fishing is prohibited within the approaches to North Outer Harbor extending E to meridian 129°12'E, as seen on the chart.

Fishing nets are laid on either side of the fairway through North Outer Harbor from September to March. They are also laid over most of the head of the N part of North Inner Harbor. The limits of these nets may be extended and caution is necessary, especially at night.

Reclamation and harbor engineering projects may be encountered when approaching the harbors that comprise the port. Pusan Hang, well protected and available for large vessels, is divided by Yongdo into a N and S harbor. Both harbors are divided into outer harbors and inner harbors, with the latter being protected by breakwaters. The North Harbor is for ocean vessels, while South Harbor is used primarily by coastal vessels.

Pusan—Namhang North Harbor



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

SECTOR **2** — CHART INFORMATION

SECTOR 2

KOREA—EAST COAST

Plan.—This sector describes the E coast of Korea from Busan Hang, at the NE entrance of Korea Strait, to the Tumen River, at the border between Korea and Siberia. The descriptive sequence of this coast, which forms the W limit of the Sea of Japan, is from S to N.

General Remarks

2.1 Winds—Weather.—Between Yongch'u Gap and Suwon Gap local inhabitants report on this coast W winds prevail in December and January, changing to a NW direction in February and March, with rough weather. During June the direction is variable with intermittent S, SE and NE winds. Gales may sometimes accompany SE or NE winds in late August. Fisherman report that the heaviest seas on the E coast of Korea are raised along this stretch, particularly with N winds from October to March.

Tides—Currents.—Between Busan and Ulsan the current which flows through the Western Channel of the Korea Strait, flows NE parallel to the coast. In winter this current is weak, but in April or May its strength gradually increases. The S current ordinarily does not extend to this area, but it may be experienced on rare occasions.

The flood tidal currents between Busan and Kwaogge Mal sets SW and the ebb current is NE. The SW current is extremely weak, but the NE ebb attains a velocity of about 1.5 to 2 knots. The NE current usually flows for about 9 hours, and the SW current for about 3 hours. Both currents may be influenced greatly by winds and seasonal conditions.

Between Orang Dan and the Tuman River, there are no regular currents, but irregular currents may set in any direction for 1 or 2 days at a velocity of 1 knot or less, depending on the winds prevailing for the few preceding days.

The current between Musu Dan and Orang Dan at a distance between 2 to 10 miles offshore sets in a S direction with a velocity of about 1 knot. Near the two headlands it increases somewhat in strength, especially during strong N winds when a velocity of about 2 knots may be attained.

The current between Yujin Dan and Musu Dan S of Al Som probably sets in a S direction. To the N of Al Som it may set in an E or W direction. The direction and velocity of these currents cannot be depended on. Its irregularity is because it is being deflected by Al Som and Yang Do.

Pilotage.—The Korea Maritime Pilots Association (KMPA) provides the following web site:

Korea Maritime Pilots Association
http://www.kmpilot.or.kr

Contact Information.—Korean Coast Guard stations can be contacted on VHF channel 16; the working channel is VHF channel 9.

Caution.—Offshore fishing industries and their operations are frequently met in the areas covered by this sector. For further information, see paragraph 1.1.

A dangerous wreck lies about 0.3 mile N of Cho Do.

Although the E coast of Korea has generally a uniform appearance, its character changes suddenly from being mountainous and rocky it becomes low and sandy, and then resuming its former appearance after a short interval. This coast is generally steep-to at a short distance offshore; in some places sunken dangers lie close to the coast. At night or in thick weather, vessels should not proceed into depths of less than 200m.

Extensive mine laying operation took place in Korean waters during the 1950-1953 war. For further details, refer to Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Off-lying Islands

2.2 Liancourt Rocks (Dok To) (Take Shima) (37°15'N., 131°52'E.), about 118 miles off the Korean coast, consists of two barren, rocky islets, about 183m apart and surrounded by numerous rocks. A depth of 19m was reported, 2 miles NW of Liancourt Rocks. The W islet has a sharp peak, 157m high, with the E islet being lower and flatter. A light is shown from the E islet.

Ullung Do (Ulleung Do)(37°30'N., 130°50'E.), about 70 miles off the Korean coast, is a mountainous island with sharp conical peaks, most of which are wooded. Several islets and rocks lie close off the coast, particularly its N and E sides. Jug Do (Chuk To), with a flat summit and covered with trees, lies off the NE extremity of Ullung Do.

Landing can be effected in fine weather on the occasional small shingly beaches, but the greater part of the island is inaccessible.

Kanyong Mal, the southernmost extremity of Ullung Do, has a light on a white tower 5m in height. A light is shown on a rock close off the N point of the island. A light is situated on the W extremity of the island. Hyongnangap Light stands about 2.8 miles NE of Kanyong Mal. There are two breakwaters and a cargo handling wharf situated about 0.5 mile NNW of the light structure.

A shoal, with depths of 22 to 58m, lies about 55 miles NNW of Ullung Do.

An Ocean Data Acquisition System (ODAS) buoy is moored in Jumunjin Hang in position 37°32'N, 130°00'E.

Busan Hang to Ulsan Man

2.3 Between the NE entrance of Busan Hang and Ulsan Man, about 25 miles NNE, mountain ranges run parallel with the coast. Other ranges slope to the coast. Trees are extremely rare on this part of the coast and mountains are mostly covered with verdure. There is a green appearance in summer, but in autumn and winter the mountains show no signs of vegetation.

Suyeong Man (Suyong Man) (35°08'N., 129°09'E.), NE of

Busan Hang, is entered between Tongsaeng Mal (Dongsaeng Mal) at the N end of a promontory and Kodu Mal (Godu Mal), about 3.3 miles ENE. The bay is open SE and has depths of 5 to 14.5m, but it is encumbered with rocky shoals varying in depth from less than 2 to 9m. The bottom is irregular and consequently this bay is not suitable as an anchorage.

Suyeong Gang discharges into the head of Suyeong Man. Land has been reclaimed on both sides of the river mouth. Vessels calling at Suyeong Man should proceed first to Busan to obtain pratique, then proceed to Suyeong Man. There is quayage in the SW corner of Suyeong Man which fronts a Steel Manufacturing Company Works. There are reported depths of between 2.9m and 6.3m alongside.

Jang San (Chang San), 634m high lying N of the bay, is a good landmark standing 3 miles NW of Kodu Mal. Busan Aerodrome Light is shown from about 3 miles WNW of Kodu Mal. Another light for the use of aircraft is shown from Kumyor (Kumnyon San), a 415m high summit about 2 miles NW of Tongsaeng Mal.

Pilotage.—Pilotage is available during daylight hours only.

Signals.—Storm signals are displayed during the daylight hours from a white metal mast, 12m high, on a breakwater 1.6 miles NW of Tongsaeng Mal.

Off-lying Dangers

2.4 A rock, which dries 0.5m, lies 0.5 mile SW of Kodu Mal and there are others closer inshore SW and E of the point.

A detached reef, consisting of above and below water rocks and on which there is a wreck, lies 1 mile ENE of Kodu Mal.

Songjungri Light marks a reef with above and below water rocks lying 2 miles NE of Kodu Mal. A detached rocky 8.5m patch lies 0.5 mile offshore, 0.75 mile NE of Sungjungri Light.

The coastal bank along the stretch S of **Daebyeon Hang** (35°13'N., 129°14'E.) is narrow; there are several islets and below water rocks, but they all lie close inshore.

Daebyeon Hang

2.5 **Daebyeon** (Taebyon) (35°13'N., 129°14'E.), where there is a small harbor, is situated at the head of Daebyeon Hang. A breakwater, 180m, extends W from the E side of the harbor. It affords shelter to small vessels up to 100 tons except during S and SW winds.

The harbor is used by many fishing boats during the months of August and November. A light is shown from the head of the breakwater.

Signals.—Storm signals are shown from about 0.3 mile NE of the breakwater head.

A rock, drying 0.3m, lies on the E side of the approach 0.3 mile SE of the breakwater head. An islet lies on the W side of the approach, 0.2 mile S of the head of the breakwater at the end of a spit extending from the W shore. A rock, 2m high, lies 0.45 mile SSE of the breakwater head at the end of another spit extending from the W shore.

Gwanggye Mal (Kwanggye Mal) (35°14'N., 129°15'E.) is a promontory, dark brown and fringed by scattered boulders. A pointed hill, 228m high and very prominent, stands on Gwanggye Mal.

Godong Mal (Kodong Mal) (35°19'N., 129°18'E.), is a low sandy point; a short distance inland is a sharp hill covered with vegetation.

A reef of below-water rocks lies 0.2 mile SSE of Gwanggye Mal.

A black rock, 10m high, lies close offshore 0.5 mile E of Godong Mal.

A small bay lies on the W side of Godong Mal and has depths of 5 to 12m, sand and mud. There is a wharf at the head of this bay with a depth of 5.2m alongside.

The N and E sides of Godong Mal are being reclaimed to become the site of S Korea's first nuclear power station. In front of the site there is a breakwater, 80m in length, on the inner side of which is a coast wall, 110m long and with depths of 5.3m alongside, where vessels of 1,000 tons can berth.

Anchorage.—Small local vessels obtain temporary anchorage in the small bay W of Godong Mal except with winds between E and S, in depths of 11m, mud.

Kanjol Gap (Ganjeol Gap) (35°21'N., 129°22'E.) is a flat point of sand and gravel, fringed with rocks which extend 1 mile offshore. A light is shown from Kanjol Gap. A mountain, the best landmark between Busan and Ulsan, stands about 7.8 miles WNW of Kanjol Gap. The summit of this mountain has several sharp peaks. Two other mountains, with conspicuous sharp summits, stand about 12 miles NW of Kanjol Gap.

Hoeya Gang

2.6 Hoeya Gang discharges 2 miles NNW of Kanjol Gap. Small vessels with local knowledge and a draft of not more than 1m can proceed about 2 miles up this river. An islet, 16m high and covered with pine trees, lies about 0.3 mile SE of the mouth of the river.

Yonja Do (Yeonja Do) (35°25'N., 129°22'E.), 11m high and foul all round, lies in the middle of the bay. Vessels should not proceed W of a line drawn N and S through Yonja Do as the bay W of this islet is foul. There is a jetty on both the N and S sides of Yonja (Yeonja) Do.

Beomweo Gabl (Pomwol Gab) is the N entrance point of Yonja Do. A rocky shoal, with 14.3m and marked SE by a lighted buoy, lies 0.7 mile NE of Beomweal Gab.

A restricted area, 0.4 mile wide, is centered on a large mooring buoy (35°25'N., 129°23'E.), which is connected by submarine pipeline to the shore, 0.5 mile NW of Yonja Do (Yeonja Do).

Choam Do (Joam Do) (35°26'N., 129°22'E.), 7m high, lies close offshore 0.5 mile NNW of Beomweol (Pomwol) Gab.

Onsan

2.7 **On San** (Onsan) (35°27'N., 129°22'E.) lies at the mouth of Sangnam Cheon (Oehwang Gang), which flows from the W and empties into Ulsan Man. The port is entered 0.6 mile NNE of Choam Do, between the head of a breakwater which extends 0.5 mile NNE of Choam Do, and the head of another breakwater which extends 0.75 mile SE from a position 1.25 miles N of Choam (Joam) Do. The entrance is 0.2 mile wide.

Onsan SBM is situated 0.9 mile SE of Pomwol Gap. Tankers of 30,000 dwt berth at the terminal. A light is shown and a fog signal is sounded from the SBM, and a submarine pipeline

leads W to the shore 0.5 mile NW of Yonja Do (35°25'N., 129°22"E.).

Depths—Limitations.—Six jetties, with berthing depths of 11.1 to 13.9m alongside their NW and SE sides, are available for unloading tankers, and situated close NE of **Chun Do** (35°26.3'N., 129°21.3'E.).

Ships normally berth with bows NE; berthing and unberthing is carried out in daylight hours only. Ships should be well secured as the pier is open to E swells which are common in the summer months.

Dongbuk Wharf, with an alongside depth of 12m, lies close E of Damneungsan summit (35°26.5'N., 129°21.1'E.). Wharf No. 1 through Wharf No. 6, situated S of Dongbuk Wharf, have alongside depths of 10.3 to 12.1m. Administration Wharf, at the head of the basin, has alongside depths of 8.3 to 11.1m. Jeongil Wharf No. 1 has an alongside depth of 14.6m. Jeongil Wharf No. 2, which lies NE of Jeongil Wharf No. 1, has depths of 12.0 to 13.6m.

Pilotage.—Pilotage is mandatory for entering into the port of On San.

Anchorage.—Anchorage in On San is not recommended, although it is sheltered from the W and protected by breakwaters from E, because of the rock and shoals which encumber it.

Ulsan Man (35°27'N., 129°24'E.)

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2.8 Ulsan, a port of entry, is situated about 3.5 miles upstream from the mouth of the Taehwa Gang which flows into the head of Ulsan Man. Ulsan Man is one of the main ports of South Korea. The harbor limits are marked on the chart.

Ulsan Hang (35°30'N., 129°23'E.) is the inner port of Ulsan Man. It lies between two rugged, mountainous peninsulas and is entered at the N end of Ulsan Man. The peninsulas form the E and W shores of the harbor and protect ships from the prevailing winds. Extensive ship repair facilities exist on the W coast of the peninsula that forms the E shore of Ulsan Hang.

Winds—Weather.—In summer the winds are frequently E, but in other seasons N winds prevail. Southerly winds may send a heavy sea into the inlet. Heavy fogs occur from April to late August, most frequently in June and July.

Tides—Currents.—In the area from 1 to 2 miles outside the entrance of Ulsan Man, the ebb current sets to the NE with a velocity of about 2 knots, and the flood current to the SW with a velocity of about 1.3 knots.

Depths—Limitations.—In the approach to Ulsan Man the depths are deep and clear of dangers. In the entrance and in the central part of the harbor the depths range from 10 to 20m. A shoal, with a depth of 3m, lies about 0.4 mile SSE of Hwaam Chu. This shoal, which is reported to break in rough weather, can be identified at high water. In the N part of the harbor a buoyed channel, with depths of 11.8 to 13.6m, leads to the quays.

Fairway I leads N from Ulsan Man to a system of quays situated within a large open basin at the NW end Ulsan Hang. The basin is protected by a breakwater from the flow of Taehwa Gang on the N side. At the head of Ulsan Hang there are several numbered wharves, with depths of 7.0 to 13.5m alongside.

Five SBM offshore oil berths, connected W to the shore by submarine pipeline, are located on the W side of the approach to Ulsan Man close SSW of Hwaam Chu and have the following berthing charachtaristics:

Ulsan Hang

1. Yukong A and Yukong B have a depth of 23m and can accommodate vessels up to 300,000 dwt, with a maximum draft of 19.7m.
2. Yukong C has a depth of 26.6m and can accommodate vessels up to 325,000 dwt, with a maximum draft of 22.6m.
3. Ssangyoung Oil D lies 2.5 miles SSW of Hwaam Chu, has a depth of 27m, and can accommodate vessels up to 350,000 gross tons.
4. Korea Oil E lies 3 miles SSW of Hwaam Chu, has a depth of 27m, and can accommodate vessels up to 300,000 gross tons.
5. Vessels may berth in daylight hours only, although departure from the buoys is allowed at any time. As the berths are exposed to S and SE winds, vessels must always be ready to get underway. Vessels may tend to ride up against the mooring buoy as the tidal currents change.
6. Navigation is restricted within 400m of the buoys and anchorage is not permitted less than 1 mile from them.

Yugong Sea Berth extends 280m SE from **Kwanch'ong Mal**

(Gwan-cheong Mal) (35°29'N., 129°23'E.) has a T-head berth at its seaward end, with dolphins N and S of it, for tankers of up to 40,000 dwt. From a point near its T-head, the pier extends further 380m to the S. This extension also has T-head with dolphins N and S of it. The depths alongside the T-head are 13.8 to 15.2m.

T5 Oil Pier consists of a concrete jetty with a T-head, extending NE from the shore 0.35 mile NNW of Kwanch'ong Mal. The coastal area NNW of the oil pier has been reclaimed. There is a dolphin berth at the head of this jetty with a depth of 10m alongside; it is available for tankers up to 25,000 tons.

It was reported that vessels having 215m in length, 11m draft, and 45,000 dwt could use the wharves at the head of Ulsan Hang. The port is under development as a major petrochemical and industrial complex involving the handling of much larger vessels.

Jangsaengpo Hang (Changsaengp'o Hang) is entered from the NW corner of Ulsan Man, 2.25 miles NW of Hwaam Chu. Fairway II leads NW into the harbor. Lighted buoys mark the fairway in places.

The entrance to Jangsaengpo Hang is narrow and the sides of the channel are marked by buoys. An overhead cable, with a vertical clearance of 40m, spans the entrance. Within Jangsaengpo Hang, land has been reclaimed on the S shore, 0.25 mile within the entrance.

A refinery stands at the head of Jangsaengpo Hang.

A wharf, 250m long with a depth of 7m alongside, lies on the S side of the inlet, 0.6 mile within the entrance. The wharf is used by tankers of up to 7,000 tons.

Care should be taken when entering Jangsaengpo Hang to avoid the shallow water on the N side of the entrance which is only 91m wide. When navigating in Jangsaengpo Hang large vessels should exercise great caution due to shoals, lack of maneuvering room, and fishing nets.

Aspect.—Three prominent chimneys, 149m high, stand near **Sin Po** (35°28'N., 129°23'E.), the W entrance point of Ulsan Hang.

Bongdae San (Pongdae San), 132m high, stands about 0.4 mile NW of Sin Po. Bongdae San summit, on which is a ruined cairn, appears dome shaped from a distance and forms a good mark.

Several silver oil tanks stand near the shore S of Bongdae San. The peninsula forming the E side of Ulsan Hang presents an ochre appearance. Hwaam Chu, the S extremity of this peninsula, consists of reclaimed land.

In the approach, good radar returns will be received from the tanks ashore at about 20 miles, the Imodco buoys at about 8 miles, and the small buoys marking the floating hose at about 1.5 miles.

Pilotage.—Pilots board in position 35°24'N, 129°25'E, except for VLCCs, which board a pilot approximately 2 miles to the SE in position 35°22'24"N, 129°27'12"E. If a vessel is at anchor the pilot will board at the anchorage.

Pilotage is undertaken by day only. The ETA of a vessel should be forwarded 24 hours in advance.

Ulsan Pilots

http://www.uspilot.co.kr

Vessel Traffic Service.—Ulsan Vessel Traffic Service (VTS) is in operation at all times. Vessels over 200m long, deep draft vessels, tug boats, and vessels carrying dangerous cargo are requested to inform the VTS, at least 12 hours prior to arrival, of the vessel's name, gross tonnage, and ETA Vessels should contact the VTS Center 2 hours prior to arrival to acquire berthing or anchorage instructions. Vessels must also report to the VTS before and after shifting and prior to departure. A continuous listening watch on VHF channel 14 must be maintained while in the harbor limits.

Inbound vessels should report to the VTS Center when crossing the reporting line joining the following positions:

a. Ulgi Light
b. 35°28.5'N, 129°30.5'E
c. 35°23.5'N, 129°30.5'E
d. 35°20.0'N, 129°26.0'E
e. Ganjeolgot Light

Anchorage.—Anchorage may be obtained in Ulsan Man, in depths of about 12m, but S winds raise a heavy swell.

Quarantine Anchorage E1 and Quarantine Anchorage E2 lie 1 mile SSE and 2 miles S of Hwaam Chu, respectively. Area E1 is for vessels of 10,000 grt or less, while E2 is for vessels of 10,000 to 30,000 grt. Anchorage E3 lies 3 miles SE of Hwaam Chu and is for vessels not exceeding 150,000 grt. All anchorages are exposed from N through E to S. Radio pratique is not granted. Anchorage is prohibited within 500m of the obstruction in position 35°26'N, 129°26'E.

Vessels are advised to contact local authorities for further details on anchorage berths, anchorage areas, and anchorage regulations.

Vessels must keep clear of the charted prohibited anchorage areas.

Caution.—Fishing stakes, partly obstructing navigation, may be found from September to March in any part of Ulsan Man. Near the entrance, and along the coast outside the bay, they may be found at anytime.

Construction is in progress (2006) in the area S of the breakwaters and W of the submarine pipline berths moored S of Passage III.

Bangeojin Hang

2.9 Bangeojin Hang (Pangojin Hang), entered between a position about 0.8 mile ENE of Hwaam Chu, the E entrance point of Ulsan Man, and Seul Do 0.4 mile SE, is a major fishing harbor open S, with depths of 3 to 10m, sand and mud.

A breakwater extends E from the W entrance point to within about 0.2 mile of the E shore. A light is shown from the head of the breakwater.

Seul Do (35°29'N., 129°26'E.), an islet 9m high with a flat top, has isolated depths of less than 5.5m extending about 0.3 mile S and SE.

Anchorage.—The best anchorage outside the breakwater is about 0.35 mile SSW of the E end of the breakwater, in a depth of 16m, sand and mud.

Ul Gi (Ulgi) (35°29'N., 129°27'E.), a peninsula about 1 mile NW of Seul Do, is covered with pine trees and, from a distance S, appears as an island. A light is shown from Ul Gi.

Daeyang Am, an island 21m high, lies close off the SE point of Ul Gi.

There is a small bay close N of Ul Gi with depths of 7m in the middle and a drying reef 183m SE of the N entrance point. The major part of this bay is used for seaweed cultivation.

Mi Po

2.10 **Mi Po** (Mipo) (35°31'N., 129°27'E.) port consists of two bays 1.75 miles and 2.75 miles N of Seul Do. The designated harbor limit is found by a semicircle which has a 2,000m radius and is centered about a midpoint located on the E shores of the port.

The port is engaged in major shipbuilding of tankers up to 1,000,000 tons, and the repair of tankers up to 700,000 tons. There are three drydocks and two repair docks. The N harbor gives access to two drydocks. Both bays are protected by breakwaters.

North Harbor has irregular depths within the harbor; the quays, concrete and rubber faced, are 1,140m long with depths alongside of 7.9 to 10.4m. Temporary lights can be shown from the heads of the breakwaters; the quays are well lit at night.

Pilotage is compulsory; pilots are available from Ulsan Man.

Mi Po (Mipo) to Gampo Hang (Kampo Hang)

2.11 The coast is fringed by numerous rocks and vessels should keep well offshore.

Reoeo Mal (35°35'N., 129°28'E.) is a low point from which below-water rocks extend 0.3 mile E. A flat rock, 1.5m, lies 0.3 mile SW of this point.

Uga Mal (Ugi Mal) (35°36'N., 129°28'E.) is a rocky point with a flat summit, 153m high. This point is densely wooded, blackish in color, and prominent from a distance.

Sunyeom Mal (35°40'N., 129°28'E.), 3.5 miles N of Uga Mal, is a flat cultivated point 3m high.

Daebon Mal (35°45'N., 129°30'E.), 5 miles NNE of Sunyeom Mal, is a black rocky point, fringed with rocks.

Songdae Mal, 3.5 miles N of Daebon Mal, is a low rocky point, densely wooded, and prominent. A light is shown from **Songdae Mal** (35°48'N., 129°31'E.).

Fish havens, composed of sunken hills and concrete blocks, lie within about 0.5 mile E and SE of Songdae Mal.

A rock, 4m high, lies 0.2 mile SE of Songdae Mal.

Gampo Hang (Kampo Hang) (35°48'N., 129°31'E.) is a small fishing harbor close SW of Songdae Mal, and affords shelter from N and W winds. There are some wooden piers at which small boats can go alongside.

Winds—Weather.—In spring and summer, S through SE winds are the most frequent; in winter, the W through NW winds are strong. The air is generally dry and, with the influence of the currents, most of the time the humidity level is healthy. From June until August, there is sometimes dense fog.

Anchorage.—The best anchorage outside the breakwater is 0.3 mile SE of the head of the S breakwater, in a depth of 18m, sand, but this anchorage is not suitable with a heavy swell between E and S. Small local vessels up to 300 tons anchor inside the breakwater, in depths of 4 to 8m, coarse sand.

Directions.—When approaching Gampo Hang, Daebon Mal and the low-lying land at the mouth of Daejong Cheon, 0.75 mile SW of that point, can usually be identified, even when visibility is restricted. When a vessel is closer to the dense growth of pine trees on Songdae Mal, the village standing on the W shore of Gampo Hang can be seen.

Yangpo Hang to Changgi Gap (Janggi Gab)

2.12 **Yangpo Hang** (Yang Po Hang) (35°52'N., 129°32'E.) lies a little over 4 miles N of Gampo Hang. A breakwater extends S from the northern entrance point of the bay. Rocky reefs extend 0.5 mile NE of the root of the breakwater.

A light with remark and a DGPS station is situated on Jeongjog Mal, the S entrance point of Yangpo Hang

There are depths of 18m in Yangpo Hang on a line joining the two entrance points of the bay, and the depths shoal gradually towards the shore.

Anchorage.—Small local vessels anchor, in a depth of 5m, in Yangpo Hang, sheltered from S and W winds.

Guryongpo Hang (Kuryongp'o Hang) (35°59'N., 129°34'E.) is a small fishing harbor, lying about 7 miles N of Yangpo Hang. It is sheltered by hills and one of the principal fishing harbors on the E coast of Korea. A breakwater, 0.25 mile long, extends SW from the N side of the harbor. Inside the breakwater there is a concrete pier, 15m long, and also a number of quays. A pier, 120m long, extends SE from the NW side of the harbor.

Good landmarks at a distance of about 5 miles offshore include the town on the NE side of the harbor and the tanks near the root of the breakwater. Storm signals are shown. A light is shown from Saramal (Sara Mal), close NE of Guryongpo Hang.

Anchorage.—Anchorage may be obtained by small vessels, in depths of 7 to 10m, sand, but there are rocky patches and the holding ground is poor.

Changgi Gap (Janggi Gab) (36°05'N., 129°34'E.) is the NE point of a promontory and is described in paragraph 2.13.

A light is situated on Kyosokch'o (Gyoseog Cho), 1 mile NW of Changgi Gap.

Yongil Man (Yeongil Man) (36°04'N., 129°28'E.), the bay, is surrounded by the mainland on the W and S and Changgi Gap on the E. It is entered between Changgi Gap and **Talman Gap** (Dalman Gap) (36°06'N., 129°26'E.), a low point 6 miles WNW.

Pohang Hang (36°03'N., 129°23'E.)

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2.13 Pohang stands at the entrance of a shallow river at the W end of Yongil Man. Pohang Hang, which includes the entire SW part of Yongil Man, consists of an important fishing harbor at the old mouth of Hyseonsan Gang lying within the breakwaters of the river, and the deep-water facilities of an iron and steel company about 2 miles SE. There are two breakwaters, the S breakwater is 183m and extends NNE from the S entrance; the N breakwater is 80m in length. A light is shown from the head of each breakwater.

Winds—Weather.—From November to April, NE winds cause a heavy swell making it difficult for small vessels to enter the harbor; during the summer when S winds prevail the inner part of Yongil Man is calm. This bay is reported to have the least fog on the E coast of Korea. Yongil Man is never ice

Pohang New Harbor

bound.

Depths—Limitations.—Yongil Man, open to the NE, has depths of 15 to 29m in the entrance decreasing to less than 10m about 0.8 mile from the head. The bottom is mostly mud and sand, affording good holding ground.

Two general cargo berths are under construction (2009). The berths will accommodate vessels of up to 20,000 dwt when they are completed in 2012.

The submerged oil pipeline berth, marked at its seaward end by buoys, has a depth of about 12m.

Aspect.—Changgi Gap (36°04'N., 129°34'E.), the SE entrance of Yongil Man, is the NE extremity of the peninsula which forms the E side of the bay. In clear weather the cape can be identified at about 18 miles. Talman Gap, the NW entrance of the bay, about 6 miles WNW, is a low promontory. A light is shown from the point.

A recommended route, established for vessels inbound to and outbound from Pohang Hang, is in effect for vessels exceeding 1,000 tons. This route lies apporximately 1.5 miles N of Changgi Gap and is best seen on the chart.

The SE side of the bay is high with black rocky hills rising somewhat abruptly. The NW shore is backed by hills, about 95 to 115m high, with cultivated valleys. The head of the bay consists of white sandy beaches with two or three streams emptying into it.

Regulations.—A Port Traffic Management Service (PTMS) operates within the Pohang harbor limits; the area of responsibility extends to a 6 mile radius from Changgi Gap Light. The PTMS provides navigational information to vessels navigating within Pohang Harbor.

Participation in the PTMS is compulsory for all vessels except fishing vessels. Contact shall be made to Pohang Port Service when vessels are approaching 10 miles from Changgi Gap Light. Vessels should give an ETA and report any damage or defects to the vessel or its equipment which might affect navigation. A continuous watch should be maintained on VHF channel 16 and 12. Reports should also be made once berthed or anchored, before shifting, before departure, and when leaving berth or anchorage.

Caution.—In summer it is reported that numerous fishing nets may extend as much as 3 miles offshore.

A rock, dangerous to surface navigation, lies in a depth of 0.4m in position 36°18'56"N., 129°22'56"E.

A sunken wreck, dangerous to surface navigation in position

36°01'10"N., 129°27'10"E., is marked by P'ohang Shin Hang Lighted Buoy.

Pohang New Harbor

2.14 Pohang New Harbor (36°01'N., 129°25'E.) consists of an outer basin with an inner harbor. It serves a large steel and iron plant complex with many chimneys standing on its NW side. The harbor facilities are constantly being expanded.

The main breakwater, 1 mile in length, protects the outer basin and the inner harbor. Another breakwater on the E side, 0.3 mile in length, extends N from an area reclaimed for harbor development. A large reclamation project is underway in the harbor. Two detached breakwaters have been constructed near the middle of the harbor to protect the inner basin.

Winds—Weather.—Vessels berthed at Pohang New Harbor may experience difficulty from September to April, when heavy NE winds may occur, or during the passage of a tropical cyclone in summer.

Vessels at berths may experience difficulty in a storm in summer; in these conditions a heavy and confused swell can develop in the harbor.

Depths—Limitations.—The harbor's entrance channel has a 160m width, decreased to about 90m about 0.5 mile E of the head of the main breakwater, with a dredged depth of 18.5m. Proceeding W to Pier 1, the depth is 18m.

Pohang New Harbor has eight piers. Piers 1 and 2 are located along the W shore of the harbor. Pier 3 to Pier 6 are located on the SW shore of the harbor. Piers 7 and 8 are located on the E side of the harbor. Pier facilities are described in the accompanying table.

Pilotage.—Pilotage is compulsory and available by day only. Pilots board about 4 miles ENE of Yonam Gap.

Anchorage.—Eighteen designated anchorages lie in Pohang Hang. The anchorages are within the port limits and separated into five sections, which are best seen on the chart. The restrictions for vessels anchoring in each section are, as follows:

1. Section I—For vessels of 10,000 tons or less.
2. Section II—For vessels of 100,000 tons or less.
3. Section III—For vessels of 100,000 tons or less.
4. Section IV—For vessels of 30,000 tons or less.
5. Section V—For vessels of 100,000 tons or less.

Anchorage is prohibited in the harbor approach, about 0.3 to 2.3 miles ENE of the head of the main (outer) breakwater.

Directions.—When entering Pohang New Harbor a set of range lights, bearing 241.5°, leads through the approach channel. The forward beacon is situated on the E breakwater.

Changgi Gap to Yongchu Gab

2.15 Between Changgi Gap and Yongchu Gab, about 60 miles N, the coast is backed by a range of mountains attaining heights of over 975m and running parallel to the coast about 10 miles inland. The first 25 miles of this stretch of coast is backed by a range of mountains lying about 7 miles inland. This range, over 600m high and with several conspicuous sharp peaks, is mostly treeless, grass and weeds being the general vegetation. In winter this range has an ochre color. In summer it appears green. Lower ranges extend from this range to the coast.

Bihag San (36°09'N., 129°16'E.), the highest peak in this part of the coastal range, is conical and very conspicuous. About 9 miles farther NNE is a summit with three sharp peaks which can be easily identified from a considerable distance.

Weolpo Man, approximately 6 miles NNW of Talman Gap, is about 1.8 miles wide at its entrance. A light is shown from Weolpo Man.

Ganggu Hang (Kanggu Hang) (36°21'N., 129°24'E.), a fishing harbor used only by local small craft, lies at the mouth of Osib Chon which discharges 9 miles N of Weolpo Man. A sand bank often forms at the river mouth.

Changpo Mal (36°25'N., 129°26'E.), 4 miles NNE of Ganggu Hang, is a sandy point; from S it appears to project a good distance from the coast.

Daetan Mal (Taet'an Mal), 1 mile NNE of Changpo Mal, is a black point of rock and cliffs; it is the most projecting point between Yeongil Man and Chugsan Hang. The point is marked by a light.

2.16 Chugsan Hang (Ch'uksan Hang) (36°31'N., 129°27'E.), marked by a light, is a small inlet with depths of approximately 3.7m; the head of the inlet is sandy.

Chukto, 78m high and conical, is a peninsula connected to the mainland by a narrow isthmus forming the S sides of Chugsan Hang. The harbor lies between two isolated hills. The S hill appears as an island at a distance. Ponghwa San, 286m high, about 1.3 miles NW of the S hill, is the highest hill in the vicinity.

Pohang New Harbor—Port Facilities

Pier	Length	Depths	Vessel size	Remarks
1	1,680m	16.0-19.5m	250,000 dwt	Ore imports
2	1,010m	5.5-12.0m	50,000 dwt	Ore imports
3	545m	7.5m	10,000 dwt	Steel exports
4	420m	11.0m	30,000 dwt	Steel exports
5	855m	6.8-10.8m	20,000 dwt	Steel exports
6	734m	6.8m	5,000 dwt	Steel exports
7	1,338m	7.5-12.0m	30,000 dwt	General cargo
8	1,488m	9.5-12.0m	30,000 dwt	General cargo

Anchorage.—Small local vessels find temporary anchorage, in a depth of 11m, sand, about 0.15 mile offshore in a small bay on the S side of Chukto off a river mouth.

Hup'o Hang (36°40.5'N., 129°27.0'E.) is a small bay on the W side of **Bingjang Mal** (Pingjang Mal) (36°41'N., 129°28'E.) with depths of 2.7 to 4.6m, sand. It is protected by three breakwaters; the W breakwater extends from the coast in a SSE direction for a little over 0.3 mile. Another breakwater extends about 0.5mile SW from the E side of the harbor. A light is situated at the head of the E and W breakwater.

A fish haven is established 1.5 miles S of Pingjang Mal.

Signals.—Storm signals are displayed from a storm signal station at Hup'o Ri, a village standing at the head of Hupo Hang. A light is shown about 1 mile E of Hup'o Ri.

Caution.—A bank, with a number of dangerous shoals of which the shallowest is a 5.4m patch, lies between 14 miles E and 13 miles ENE of Bingjang Mal. North of these dangers is a coral patch, with a depth of 6.5m, lying 13.5 miles ENE of Hup'o Light.

2.17 To the W of Hupo Hang there are several conspicuous peaks in the coastal range, which is from 3 to 9 miles inland on this part of the coast. Geumjeong San (Kumjong San), about 10.5 miles WNW of Bingjang Mal, is a sharp summit covered with dark trees and is very conspicuous. The height of the mountain range decreases N of Geumjeong San until it rises again N of latitude 37°N. A fish haven is established about 4 mile NNE of Hup'o Hang.

Hwamo Mal, 5.5 miles N of Bingjang Mal, is a hilly sandy point 69m high. A light is shown from the point.

Hasa Mal (36°50'N., 129°27'E.), about 4 miles NNW of Hwamo Mal, is a black rocky point, 115m high. A prominent conical hill, 198m high, lies about 1 mile SW of this point. A fish haven is situated about 2 miles SSE of Hasa Mac.

Hyeonjong San, 2.75 miles NW of Hasa Mal and 0.75 mile from the coast, is a very prominent mountain with three peaks; the middle peak, 415m high, is the highest.

Gyujem Cho (Kyujem Cho), a rock with a depth of less than 2m, lies about 3.3 miles NNW of Hasa Mal and 0.75 mile offshore. It is steep-to and the sea breaks over it in rough weather. An 8.6m patch, which is also steep-to, lies 0.75 mile S of Gyujem Cho.

Jinmi Mal (36°54'N., 129°25'E.), a salient point 4.25 miles NNW of Hasa Mal, rises to over 100m high a short distance W of the point. A light is shown from the point.

Sujeon Mal (37°00'N., 129°25'E.) is a steep headland, 37m high, with several rocks close offshore in its vicinity.

Jugbyeon Man (Chukpyon Man)(37°03'N., 129°25'E.), on the SW side of Yongchu Gap, is a shallow harbor protected by breakwaters. The bay affords protection from NW winds, but it is not a good anchorage because of the heavy swells. A light is shown from Jugbyeon Man.

Yongchu Gap to Mukho Hang

2.18 **Yongchu Gap** (37°03'N., 129°26'E.) is a promontory, covered with bamboo, which forms the E side of Chukpyon Man. Ungbong San, 999m high and covered with dark trees, lies about 10 miles W of Yongchu Gap. Kum San, another mountain, sharp-peaked, stands about 8 miles SE of Ungbong San.

The coast N continues mountainous with few breaks. Most of the peaks are densely wooded, with an occasional conspicuous rocky peak. The hills close to the coast are for the most part barren, but the valleys are cultivated.

Imun Mal (37°14'N., 129°21'E.), about 11 miles NNW of Yongchu Gap, is a light brown rocky point rising close inland to a hill on which are the conspicuous remains of a cairn. A light is shown on Imun Mal.

Imun Hang is a small harbor protected by breakwaters and entered about 0.8 mile SW of Imun Mal. Vessels with local knowledge can anchor SW of Imun Mal, in 12.8 to 20.1m, sand and rock. This small bay is completely open to winds from E and SE.

Galsan Man (Kalsan Man) (37°17'N., 129°19'E.), about 3 miles NNW of Imun Mal, is a high, steep, and conspicuous point. A group of rocks lie between Galsan Mal and Jangho (Changho), a bare sandy point 0.75 mile NW. A light is shown from Jangho.

Sail Dan (Sail Tan) (37°18'N., 129°18'E.), 1.75 miles NW of Jangho, is a black cliffy point.

2.19 **Samcheog Hang** (Samch'ok Hang) (37°26'N., 129°12'E.) is an important fishing center located a little over 14 miles NNW of Imun Hang. The harbor entrance has depths of 5.8 to 8.5m.

Depths—Limitations.—Pier No. 1 is 220m long, with a depth of 5.5m alongside. Pier No. 2 is 305m long, with a depth of 6.5m alongside. Pier No. 3 is 270m long, with a depth of 4m alongside. The cargo landing pier is 300m long, with a depth of 4m alongside.

A conveyor loading system for cement clinker is situated W of the port entrance. The maximum draft allowed alongside the conveyor berth is reported to be 6.8m.

The harbor is protected by breakwaters. A prominent chimney, 53m high, is a good landmark lying 0.25 mile SW of the harbor entrance with numerous other chimneys. Pi Mal (Bi Mal), about 4.5 miles SE of Samcheog Hang, is black and cliffy and is a good landmark; an islet close off this point is conspicuous when seen from N or S. A light is shown on Pi Ma. A directional light is shown from Wharf No. 1.

Pilotage.—Pilotage is compulsory; there are three pilots for the area of Muk'o Hang and Samcheog Hang.

Vessel Traffic Service.—See Tonghae Hang in paragraph 2.20.

Anchorage.—Good anchorage may be obtained, in depths of 12 to 22m, sand and mud, E of the harbor entrance.

Tut'a San, 1,353m high about 9 miles W of Samcheog Hang (Samchok Hang), is somewhat dome-shaped and when seen from a distance is prominent.

2.20 **Tonghae Hang** (Pukp'yong Hang) (Bugpyeong Hang) (37°29'N., 129°09'E.) (World Port Index No. 60431), 3 miles N of Gwangjin Dan (Kwangjindan), is a port designed to provide increased handling capacity to that of Mukho Hang. Depths inside the harbor are 9 to 14m. The port is protected by two breakwaters; the N breakwater extending 1,400m SE and ESE from the shore and the short S breakwater extending NNE towards the knuckle of the N breakwater leaving an entrance 240m wide.

Tonghae Hang (Bugpyeong Hang)

The S pier, which is 735m long and has alongside depths of 12 to 13.5m, can accommodate vessels up to 30,000 dwt. The central pier, which is 270m long and has alongside depths of 8.1 to 14.3m, can accommodate vessels up to 50,000 dwt. The N pier, which is 570m long and has alongside depths of 7.8 to 12.9m, can accommodate vessels up to 30,000 dwt. The coal pier, which is 270m long and has alongside depths of 13 to 14m, can accommodate vessels up to 50,000 dwt. A floating pier is situated in the SW part of the harbor.

Vessels up to 65,000 dwt, with a maximum draft of 12.5m, can use the harbor. Charted depths inside the harbor are 10 to 17m.

Pilotage.—Pilotage is compulsory and available during daylight hours only. Pilots board in the following positions:

1. No. 1—Position 37°32.7'N., 129°09.0'E.
2. No. 2—Position 37°29.3'N., 129°11.4'E.
3. No. 3—Position 37°25.5'N., 129°13.0'E.
4. No. 4—Position 37°37.2'N., 129°06.5'E.3
5. No. 5—Position 38°11.3'N., 128°37.5'E. (Sokch'o)

Vessel Traffic Service.—A VTS is in operation by Tonghae Port Service within the approaches to Tonghae, Mukho, and Samcheog. Participation in the VTS is compulsory for all vessels except coastal fishing vessels. Vessels must make a preentry report, an ETA, an entry report, a final report, and a departure report.

Anchorage.—A quarantine anchorage, 500m in radius, lies approximately 0.8 mile ENE of the of the N breakwater. Anchorages A1 through A5 and B1 through B3, best seen on chart, lie N and E of the N breakwater.

Caution.—The harbor is exposed to an E swell, which can prevent berthing.

A wreck, dangerous to navigation, lies in the approach to Bugpyeong Hang in position 37°31.2'N, 129°09.2'E.

Mukho Hang (37°33'N., 129°07'E.)

World Port Index No. 60430

2.21 Mukho Hang (Mugho Hang) (Muk'o Hang) is a small artificial harbor protected by breakwaters. Mukhojinni (Mughojin Ri) stands at the head of the harbor.

Ch'oroksan, the best landmark in the vicinity, is a conspicuous mountain with two peaks standing about 3 miles SW of the harbor. This mountain is almost barren except for a small dense growth of pine trees near its summit. It appears ochre and contrasts with the dark green color of the neighboring mountains.

Depths—Limitations.—In the approach to the harbor the depths are deep and free of dangers. The maximum size vessel permitted to enter the harbor is 180m in length, with a draft of 8.5m.

Mukho Hang has five piers; Pier No. 1 is exclusively used for the loading of coal or graphite in bulk. A maximum draft at LW of 7.5m is allowed alongside Berth A, and a maximum LW draft of 8m is allowed alongside Berth B. Pier No. 2 is the naval pier, with a 4m depth alongside. Pier No. 3, for the loading and discharging of bulk and bagged cement along with general cargo, accepts a maximum LW draft of 8.5m. Pier No. 4, which is utilized for the same purpose as Pier No. 3, has a permissible LW draft of 7.5m. Central Pier, which is exclusively used for general cargo, has a permissible LW depth of 6.5m.

Pilotage.—Pilotage is compulsory, and pilots are available from 0500 to 2200. The pilots usually board approximately 1 mile to the ESE of the E breakwater head.

Vessel Traffic Service.—See Tonghae Hang in paragraph

2.20.

Anchorage.—A quarantine anchorage lies approximately 0.6 mile ESE of the E breakwater. Anchorages A1 through A3, B1, and B2, best seen on chart, lie NE of the E breakwater.

It is reported that with E winds the harbor becomes rough, and cargo cannot be worked. It is common practice to keep engines ready with E winds of over force 4.

Kanshin Tan to Sokch'o Hang

2.22 Between **Kanshin Tan** (37°34'N., 129°07'E.) and Chongdongjin Dan (Jeongdongjin Dan), about 6.5 miles NNW, is an open sandy bay. Lights are shown on both Kanshin Tan and Chongdongjin Dan. Chongdongjin Dan is a rocky and cliffy point, which appears to project some way from the coast and to be an unusual dark blue color when seen at a considerable distance either N or S. Detached patches, ochre in color, can be seen on this point within a distance of about 7 miles.

Okgye Hang (37°37'N., 129°03'E.), at the mouth of the Jusucheon River, is a commercial port open to international shipping. The port, protected by breakwaters, handles raw materials and cement. There are three wharves in Okgye Hang with alongside depths of 11 to 15.6m. An oil terminal that can accommodate vessels of up to 5,000 dwt is situated on the inside of the S breakwater. The pilot and quarantine anchorage lies approximately 1.2 miles E of the light at the head of the N breakwater.

Chumunjin Hang (37°53'N., 128°50'E.), lying between Chumunjin Dan and the river Yongok Ch'on, about 2 miles SSE, is a roadstead well protected from N winds, but exposed to swells from E. The holding ground, which is mostly sand, gradually becomes rocky as Chumunjin Dan is approached. Breakwaters enclose the fishing harbor and commercial port. A light and a DGPS are located 0.3 mile N of the S extremity of **Chumunjin Dan** (37°54'N., 128°50'E.). An Ocean Data Acquisition System (ODAS) buoy lies in approximate position 37°33'N, 129°58'E.

Aspect.—About 10 miles inland a high range of mountains runs parallel to the coast. Within it are several conspicuous mountains and peaks. The range extends from a position about 14 miles SSW of Chumunjin Dan at an elevation of 1,123m, in a NNW direction for about 30 miles. The S end of the range is cone-shaped and has a dark blue color.

This very conspicuous mountain is the best landmark in the vicinity, unless there are low thick clouds. Sorak San (Seorag San), at the N end of this range, is of an indigo color and also a good landmark when there are no low-lying clouds. At a distance its pointed summit towers up over the other mountains.

A light has been established on Namae Ri (Namae Hang), approximately 4 miles NNW of Chumunjin Hang. Kisamun Dan is a low-lying inconspicuous cliffy point, 8.5 miles NW of Chumunjin Dan. A light is shown on the point.

Anchorage.—Anchorage may be obtained about 0.15 mile S of the E breakwater head, in a depth of 9m, sand.

2.23 **Susan Dan** (38°05'N., 128°41'E.), about 13.5 miles NW of Chumunjin Dan, is a rocky precipitous point with a cairn on its summit. A light is shown from Susan Dan. About 0.5 mile farther NW is a small point, dark-colored and conspicuous, which has the appearance of an islet when seen at a distance.

Sokch'o Hang (38°12'N., 128°36'E.) (World Port Index No. 60435), about 8.5 miles NNW of Susan Dan, is an international commercial port. The bay, open between E and S, has depths of 5 to 14.6m.

Pisonjang (Biseonjang) is a small, protruding, cliffy cape 36m high, its summit covered with pine trees. A silvery radio tower stands 0.5 mile SW of the cape. Sokch'o Hang Light is situated on Pisonjang. A dangerous shoal, over which the sea breaks in rough weather, lies in the entrance of the harbor.

Chodo (Cho Do), about 1 mile SE of Pisonjang, is 21m high, ochre-colored, and conspicuous.

Ongjin Dan (Ongjindan), about 1 mile S of Chodo, is a slightly-projecting point, the cliffs of which are composed of ochre-colored rocks and are conspicuous. Taep'o Hang (Daebo Hang), open between E and S, is on the SW side of Ongjin Dan. It is a small fishing harbor with wharves where fishing vessels can berth. A breakwater, 240m long, extends from the N shore.

Regulations.—A restricted area, best seen on chart, exists in the E approaches to Sokch'o Hang. All vessels over 100 grt, except military and fishing vessels, are prohibited to enter. Reports are made to Sokch'o Port Service.

Anchorage.—Anchorage may be obtained off the N breakwater. A quarantine anchorage lies approximately 1.5 miles SE of Cho Do.

Ayajin Ni (38°16'N., 128°33'E.) stands at the head of a small bay about 5 miles NNW of Chodo.

Deogpo Dan to Suwon Dan

2.24 **Deogpo Dan** (Tokp'o Dan) (38°22'N., 128°31'E.), lying a little over 6 miles NNW Ayajin Ni, is a slightly-projecting point 47m high. Half of the face of this point is wooded and the other half is barren, which has the effect of rendering it very prominent.

Geojin Hang (38°27'N., 128°28'E.), SW of Geojin Dan, is a small artificial harbor protected by breakwaters. The shore of the roadstead consists of a sandy beach.

Geojin Dan (Kojin Dan) (38°27'N., 128°28'E.) is a projecting point with a deep blue color. A light is shown on Geojin Dan. The E side of Geojin Dan is foul up to 183m offshore.

The E breakwater extends about 0.4 mile SW of Geojin Dan. The W breakwater, 0.15 mile in length, extends E from a position a little over 0.5 mile SW of Geojin Dan Light. Koro Ho, about 10 miles SW of Geojin Dan, is a good mark in the approach to the roadstead. This rugged peak, 1,293m high, is indigo-colored and resembles a hat.

Anchorage.—Anchorage can be obtained, in 7.8 to 9.1m, fine sand, close off the harbor. It is sheltered from N winds, but a swell runs into the roadstead with strong N winds.

Taejin Ni (Daejin Ri) (38°30'N., 128°26'E.), a small bay, is entered close S of a small promontory marked by a light 3.75 miles NNW of Geojin Dan, with depths of less than 2m. A sandy beach lies at the head of the bay.

The coast between Geojin Dan and Suwon Dan, about 15 miles NNW, is precipitous in places with rocky cliffs and a few off-lying rocks. It is backed by a range which runs parallel with the coast and has only a few conspicuous peaks.

Tongjoson Man

2.25 Tongjoson Man (39°30'N., 128°00'E.), the major indentation on the E coast of Korea, is usually defined as lying between Suwon Dan and Mayang (Mayan) Do, about 80 miles N. The gulf recedes about 40 miles and has no obstructions in its approach and central part.

Nan Do (39°00'N., 128°06'E.), a good mark for vessels approaching from SE, lies about 8 miles offshore. This islet has a pointed summit and steep cliffs on its E side.

Ranges of high mountains fringe the N and S shores of the gulf; lower hills and coastal plains are at the head of the gulf.

Winds—Weather.—From October to May, prevailing W winds blow offshore, being especially strong in winter. In summer E winds are fairly prevalent and frequent gales send heavy swells into the gulf. Typhoons are of rare occurrence. Fog prevails during the rainy season, which is usually in July and August.

Tides—Currents.—In Tongjoson Man, the tidal currents are weak and irregular, but the warm and cold ocean currents off the E coast of Korea meet in this area, flowing in directions which are counterclockwise. Generally, in summer the cold current sets in a S direction along the shores of the gulf and the warm current is N in the offing. In the area N of latitude 39°N, between these two currents, a circular counterclockwise set is formed. The velocity of this current seldom exceeds 1 knot.

According to observations made from June to August, the currents near Mayang Do usually set in an E direction. One branch flowing from S of Mayang Do and another N of that island. The velocity is about 1 knot. These branches combine off Songdo Gap, about 5 miles E of the island, and the resultant current appears to turn gradually to the SW through S.

Caution.—A danger area bounded by a circle, radius of 1 mile, lies in position 39°16'N., 128°02'E.

Anchoring is prohibited in an area extending SW from Nan Do to the mainland.

Tongjoson Man—Southwest Shore

2.26 Suwon Dan (38°41'N., 128°22'E.), the S entrance of Tongjoson Man, is a low promontory which gradually rises inland. The cape is fringed by rocks. A light is shown on Suwon Dan. Between Suwon Dan and **Irari Gak** (39°09'N., 127°36'E.), about 45 miles NW, the mountains slope gradually to the coast. Piro Bong (Kumgang San), about 12 miles WSW of Suwon Dan, is a good mark for vessels approaching this cape. This mountain, which has several peaks, is dark-colored and conspicuous, but is sometimes obscured by clouds.

Changjon Man (38°44'N., 128°12'E.), about 7 miles NW of Suwon Dan, is a fishing harbor entered between Changadae Kkut and GyeganMal (Kyegan Mal), about 3 miles WSW. A light is shown from the N part of the entrance. The shores of the bay are low and sandy, but inland are several conspicuous peaks. Changadae Kkut, which consists of black rocks piled one on another, is a good mark in the approach from S. Also, conspicuous from the offing is the isolated mountain, 333m high, about 4 miles S of Changadae Kkut.

The inlet has depths of about 7 to 11m and afford shelter. Small vessels with local knowledge can obtain good anchorage, in 6.4m, sand, sheltered from all directions, about 0.2 mile W of the point about 0.8 mile SW of Gyegan Mal. Close SE of this anchorage the depths are about 9m, sand, but the holding ground is not good.

Large vessels can anchor outside the inlet, in 13 to 15m, about 1 mile SSW of the N end of Changadae Kkut during E winds, but the holding ground is not very good. Strong N winds cause a swell in the inlet.

Sol Som (Song Do), about 3.5 miles NNW of Gyegan Mal, is wooded with a flat summit. The islet is very conspicuous and presents a black color when seen from a distance.

A hill, 145m high at the head of Changjon Man, bearing 222° leads through the middle of the fairway of the entrance to the harbor.

Caution.—Winds, which are dangerous to shipping, periodically blow down from Piro Bong. Warnings of these winds are shown by dark clouds covering the highest peak of Piro Bong, and rain clouds moving fast in a NE direction; distant thunder in this direction is a further warning.

2.27 Kojo P'o (38°58'N., 127°53'E.), about 20 miles NW of Changjon Man, is a small fishing harbor sheltered from all directions except E. Ch'ongsok Tan, the SE entrance of the harbor, is a long, somewhat conspicuous rocky point. A light is shown from Ch'ongsok Tan. Kusin Dan, about 3.3 miles SE, is a steep cliffy point, easily identified by wood on its summit. From a point on the E side of the harbor, about 0.9 mile W of the E extremity of Ch'ongsok Tan, a breakwater extends W.

Amyong Kkut (Amnyong Kkut) (39°08'N., 127°45'E.) 11 miles NW of Kojo P'o, is a black, cliffy, rocky point about 30m high. From it a low sandy isthmus, on which there is a green dome-shaped hill 31m high, extends 2 miles SE where it joins the mainland. The islet Kuk To, about 1 mile WNW of Amyong Kkut, is precipitous.

Caution.—An area which is dangerous to navigation lies 16 miles NE of Amyong Kkut.

Irari Gak (39°10'N., 127°36'E.), the S entrance point of Yonghung Man, is 44m high; there is a large village on the neck of land within the point. Umi Do, lying about 0.2 mile NNW of Irari Gak, is 29m high and wooded. A spit, with a depth of 3.7m, extends about 0.2 mile N from this islet.

Anchoring is prohibited in an area close W of Irari Gak; this area extends NNE to Yo Do.

Yonghung Man

2.28 Yonghung Man (39°15'N., 127°30'E.), in the SW part of Tongjoson Man, is entered between Irari Gak and Taegang Got, about 8.5 miles N. There is fairly good holding ground throughout the bay, and considerable protection is afforded by the islets and reefs in the entrance. The port of Wonsan is on the S side of the bay, and the sheltered anchorage of Songjon Man is on the N side of the bay.

Yo Do, the largest of the islets at the seaward end of Yonghung Man, lies close outside the middle of the entrance about 4 miles NNE of Irari Gak. This high islet is densely wooded and fringed by shoals extending SW from it. The main fairways leading into the bay pass on either side of Yo Do.

Taegang Got, the N entrance of the bay, is the small tongue of land at the S end of **Hodo Pando** (Ho Do) (39°20'N.,

127°33'E.). Duyu Bong (Samsang Bong), about 1.5 miles NNW of Taegang Got, has two sharp pointed peaks close together. These peaks, together with the islets in the entrance, make identification of the entrance of Yonghung Man easy for vessels approaching from E. Some low wooded hills on the sandy isthmus N of Hodo Pando appear to be islets from a distance.

Regulations.—A TSS has been established for Yonghung Man as seen on chart.

Caution.—Vessels are required to follow the traffic separation scheme as shown on the chart. If approaching from the S steer to pass between Irari Gak and **Taeo Do** (39°13'N., 127°38'E.). Care should be taken not to pass within a distance of 1 mile of Irari Gak, or into depths of less than 11m. Proceed E of Sin Do to join the traffic scheme which leads into the harbor.

Wonsan

2.29 Wonsan (39°10'N., 127°27'E.) (World Port Index No. 60440), an important industrial and transportation center, stands on the SW side of Wonsan Hang. This natural harbor is sheltered on its E side by **Kalma Bando** (39°11'N., 127°29'E.) which is low except at its N end. Kalma Gak, the N extremity of Kalma Bando, is cliffy and precipitous, and from a distance appears as an island. The harbor area is protected by breakwaters.

Winds—Weather.—At Wonsan, W winds prevail, and a strong blow from that direction will often last intermittently for several days in winter. These winds are very cold in January and February. Thick fogs, often low lying, have been recorded at Wonsan on an average of about 10 days annually, and are said to be still more frequent at the entrance of the bay where they come in from the E and gradually dissipate.

Ice.—Wonsan Hang is never icebound, but during W winds in winter, drift ice accumulates on the W side of Kalma Bando, and when the comparatively warm E wind sets in, the drift ice moves in a SW direction into the harbor.

Depths—Limitations.—In the approach to the harbor there are general depths of 11 to 18.5m, decreasing to depths of 6.7 to 8.2m in the entrance and middle part of the inner harbor. A chain of rocky shoals, with a least depth of 3.7m, extends SE from Ghangdok To. The positions of the buoys marking these shoals can not be relied on during the winter because of drift ice. Other dangers lie in the approach to the harbor and in the vicinity of Kalma Gak.

There are numerous wharves and quays within Wonsan Hang, but the biggest are in front of and to the NW of the Customs House. Depths alongside range from 3 to 7.2m.

Pilotage.—It was reported that the pilot boarding station was situated in a position about 3 miles NE of Yo Do.

Anchorage.—Anchorage may be obtained N of the E and W breakwaters, in depths of 7 to 13m. A good position, sheltered from W winds, is 0.5 mile NNW of **Changdok To** (39°10.5'N., 127°26.4'E.), in a depth of 12m. There is also anchorage inside the breakwaters in a depth of about 7m, sand, or mud and silt.

Caution.—Areas where anchoring and fishing are prohibited are located in the S part of Yonghung Man in the approaches to Wonsan and are best seen on the chart.

Songjon Man

2.30 Songjon Man (39°20'N., 127°30'E.), the N part of Yonghung Man, is entered between Mangdok Kot, the SW extremity of Hodo Pando (Ho Do), and Wonch'u Gak, about 3 miles W. The bay affords sheltered anchorage to large vessels, with good holding ground, but has no commercial importance.

Ice.—The bay for about two months during the winter may be covered with thin ice, but it is broken up with strong winds; N winds drift it into Wonsan Hang.

Anchorage.—There is good anchorage in the outer part of Songjon Man in position 39°20.5'N, 127°29.5'E, in depths of 10 to 16m, mud. Vessels can anchor with Mangdok Kot bearing 154° and Wonch'u Gak bearing 227°. Wonch'u Gak is very conspicuous.

Hungnam (39°50'N., 127°37'E.)

World Port Index No. 60450

2.31 Hungnam stands along the N shore of Sohojin Hang at the N end of Hamhung Man. This bay is entered between Yongo Dan and Oeyangdo Dan, about 11.5 miles NNE, and has a low sandy beach on which the sea breaks during E winds. The city of Hamhung is about 6 miles above the entrance of the Songch'on Gang in the N part of the bay. The harbor consists of a small basin protected by a breakwater and has limited berthing space.

Winds—Weather.—In winter and spring, when W winds prevail, gales from the NW usually raise a considerable sea. Winds from the S sometimes send in a heavy sea in summer, but this is not common. The harbor is fog bound only about twice a year. Thin ice, causing no hindrance to navigation, may be experienced.

Depths—Limitations.—In the approach to Hamhung Man, the depths are deep and clear of dangers. The 18.5m curve lies roughly across the entrance of the bay. In the middle of the bay are general depths of 11 to 14.7m, with a gradual shoaling toward the shore. Hyongje Do, two conspicuous white rocks, 15.8m and 14.9m high, lie near the S and N ends of the steep-to rocky shoal about 4.3 miles NNE of Yongo Dan.

At Hungnam, vessels up to 7.6m draft can berth alongside; vessels in excess of this draft discharge cargo into barges at the anchorage, about 1 mile S of the breakwater.

Aspect.—A good mark in the approach to the bay is Tansok San. This peak, conical in shape, stands at the S end of a ridge of mountains about 21 miles WNW of Yongo Dan. Also, conspicuous from a distance, is the clump of scrub surmounting the knoll on the summit of Hwa Do. The sea breaks on the spit which connects this island to the mainland NW.

Oeyangdo Dan, where a light is shown, the N entrance of Hamhung Man, is faced with reddish cliffs which can be identified from a distance. This point along with two hills close N appear to be detached when seen from offshore.

A dangerous wreck lies 3 miles SE of Oeyangdo Dan Light.

A waiting area is located 4 miles SSE of the same light.

Unju Bong, about 7.5 miles N of Oeyangdo Dan, is conspicuous.

Pilotage.—Pilotage is compulsory. Pilots board off Oeyangdo Dan from a launch.

Regulations.—A TSS has been established in the approach to Sohojin Hang (Hungnam Harbor). This scheme is not IMO-adopted. Mariners are advised to assume that Rule 10 of the 72 COLREGS applies, since it is not known what regulations are in force.

Anchorage.—An anchorage area is located 1.25 miles S of Taejin Do breakwater light, in depths of from 10.9 to 12.8m. The area off the breakwater, where vessels often have to anchor because of the limited facilities, is exposed to winds from SE to SW through S.

Tongjoson Man—Northwest Shore

2.32 T'oejo Man (39°53'N., 127°47'E.), about 7.5 miles NE of Oeyangdo Dan, affords the best anchorage on this stretch of coast. The shores of the inlet are high, steep, and indented with small bays with sandy beaches at their heads. The coast on either side of the entrance of T'oejo Man consists of high precipitous cliffs. Chindong Do and Tae Som lie E of the entrance of the bay.

Anchorage may be obtained in T'oejo Man, in depths of 10 to 16m, mud, where it is sheltered from all winds except those from SE which do not cause much swell. The bay is never ice bound, but during exceptionally cold periods there is thin ice close inshore.

Ansong Gap (39°53'N., 127°53'E.) together with Ongnyo Bong, about 1.8 miles WNW, make good landmark for identifying the coast in this vicinity. This cape, connected to the mainland by a sandy isthmus, has high precipitous cliffs on its S and E sides. When seen from a distance, the peninsula appears as a dark island. During SW winds, shelter can be obtained, in 14.6 to 18.3m, off the NE side of the peninsula.

Between Ansong Gap and Songnyong Man, about 10 miles NE, the coast consists mainly of low sandy beaches. Chonsuk To lies off the entrance of a bay about 3.3 miles N of Ansong Gap; Som Pawi lies about 1.3 miles farther ENE. Chuk To, two islets lying close together, is about 3 miles NE of Chonsuk To.

Songnyong Man (40°02'N., 128°00'E.), about 4 miles wide at its entrance, affords shelter from N winds to vessels with local knowledge. Mukpang San, about 8 miles NNE of the W entrance of the bay, has a conical shape and is a good mark when seen from seaward. **Kiwa Pau** (Wa Am) (40°01'N., 128°02'E.), a black prominent rock 5m high, lies close off the middle of the entrance to the bay.

Anchorage.—Anchorage for small vessels, sheltered from the N, may be obtained in the bay, in a depth of about 12m.

2.33 Pongsu Pando (40°00'N., 128°09'E.), a conspicuous headland, rises to a conical peak which has the appearance of an island at a distance. A fairly conspicuous white landslip is at the SW end of this headland.

Mayang Do (Mayan Do)(40°00'N., 128°11'E.), the N entrance of Tongjoson Man, is an irregularly shaped island lying close offshore. The pointed summit of the island surmounts a chain of hills which rise steeply along the S side of the island. The lower part of the two highest peaks has a striking reddish appearance.

Caution.—During the fishing season, from June to September, nets may be encountered in the area at the E end of Mayang Do.

2.34 Sinp'o (40°02'N., 128°12'E.) stands at the head of Sinp'o Hang, the largest of the coves N of Mayang Do. The harbor, sheltered from all except S winds, is approached via the strait lying between Mayang Do and the mainland. The E entrance is free from dangers in the fairways; the W entrance is comparatively shallow and should not be used by large vessels.

Winds—Weather.—In December and January, thin ice forms in the inlets on the coast of Mayang Do, but the strait is never icebound. Some fog, usually accompanied by E winds, occurs from April through June. The prevailing winds are from E to SE in spring and summer, S to SW from late summer to early autumn, and W to NW in winter.

Depths—Limitations.—The E and recommended entrance of the strait is unobstructed over a width of about 0.8 mile between the reef extending about 183m off the NE point of Mayang Do and Taegu Do, close off the N side of the strait. The S side of this islet is cliffy and somewhat conspicuous. Sinp'o Hang has depths of 5.5 to 9.1m.

Aspect.—The E part of the mainland N of Mayang Do consists of spurs of hills which terminate in three small and rocky points. The W part, low and sandy, extends to Pongsu Pando which serves as a good mark for the W entrance of the strait.

Landmarks for Sinp'o Hang include a black rock, 11.9m high, close off Saam Dan, the W entrance of the harbor and two chimneys, three radio masts, and a flag staff, all on the W side of the harbor. The above black rock can be identified from both the E and W entrances of the strait.

Anchorage.—Anchorage, protected except from the S, may be obtained, in a depth of about 7m, mud and sand.

Songdo Gap to Hwangdan Tan

2.35 Songdo Gap (40°02'N., 128°20'E.), the E entrance of Yanghwa Man, is the extremity of a blackish promontory, which is joined to the mainland by a low, flat, white sandy beach. The cape has two conspicuous summits which have the appearance of being detached islets when seen from a distance.

Yanghwa Man, free from dangers, affords shelter to large vessels, in depths of 14.6 to 21.9m.

Sinch'ang Hang (40°07'N., 128°29'E.), about 8.5 miles NE of Songdo Gap, is entered between Yonggo Dan and Ungam Dan, about 4 miles NE. The bay is exposed to swells with all but N winds. A basin fronts the village in the NE part of the bay. Some brown cliffs stand on the N side of the mouth of the shallow river at the head of the bay and help to identify it.

Yonggo Dan is cliffy on its SE side and is conspicuous when seen from a distance. Ungam Dan is precipitous and can be identified by a brownish rock, about 35m high, on its SW side. Taedok San, about 12 miles NNW of Ungam Dan, is conspicuous. Mountain ranges extend in a S and SE direction from Taedok San toward the coast.

Ch'aho (40°12'N., 128°39'E.)

World Port Index No. 60470

2.36 Ch'aho, the principal fishing harbor in the area, stands at the head of Ch'aho Hang, a deep narrow inlet entered W of Chinsuk To (Chonch'o Do). The harbor, which is sheltered by the surrounding hills, is about 0.4 mile wide.

Winds—Weather.—Dense fog occurs on an annual average of nine days from March through August, and is a slight hindrance to navigation. Light snowfall begins in November. Ice may form in the inlet, but it does not freeze over solidly.

Depths—Limitations.—The depths in the entrance range from 14.6 to 21.9m. The navigable channel has a depth of 9m or more. An iron pier, with a depth of 9.1m alongside its T-head, lies at the S end of town, about 1 mile N of the W entrance point. There are also three small wharves in the harbor, one of which has a depth of 5.8m alongside.

Aspect.—Hwangdan Tan, about 1 mile SW of the entrance of Ch'aho Hang, is a precipitous cape, particularly conspicuous because of its reddish color. It is backed by the conspicuous Kwan San with its sharp peak. Sam Bong, with three sharp peaks, is about 4 miles farther WNW. Nip Am, 24m high and conspicuous, lies close S of the W entrance of Ch'ho Hang.

Chinsuk To (Chonch'o Do), forming the E entrance of Ch'aho Hang, is high and densely wooded. The island appears black when seen from a distance. A treeless islet lies between Chinsuk To and the mainland N.

Anchorage.—Ch'aho Hang affords anchorage to moderate sized vessels, in a depth of about 16m, mud, in the middle of the harbor.

Iwon Hang to Kimch'aek

2.37 Iwon Hang (40°17'N., 128°39'E.), about 4 miles wide at its entrance, affords shelter during S winds, but E winds cause a heavy swell. The S entrance point is treeless, rising to a wooded hill about 0.5 mile inland. Close ESE of the S entrance point is a prominent grayish rock 11m high. Ch'ongnyong Mal, the N entrance of the bay, is a headland with brownish cliffs which can be made out fairly easily from seaward. Ch'udok San, about 7 miles NNW of Ch'ongnyong Mal, is dome-shaped, and can, together with two other peaks farther W, be easily identified. Chokoku San, about 5 miles farther NNW, is, together with two other peaks about 2 miles NW, conspicuous from a distance.

Anchorage.—Anchorage can be taken in Iwon Hang, in 12.8 to 14.6m. The shore of the bay consists of a white sandy beach which is densely wooded.

2.38 Nan Do (40°19'N., 128°46'E.), about 4.3 miles E of Ch'ongnyong Mal and 1.5 miles offshore, is a gray cliffy islet, densely wooded and conspicuous from a distance. Chak To (Jag Do) islet, about 2.3 miles WNW of Nan Do, is wooded with a flat summit.

The W part of the coast between Iwon Hang and Yongdae Gap, about 21 miles NE, is characterized by steep cliffs interspersed with sandy beaches, while the E part is mostly low and sandy. Sabujin, about 8.3 miles NE of Nan Do, is an artificial harbor sheltered by two breakwaters.

Kwae Do (40°27'N., 129°00'E.), about 5 miles NE of Sabujin and 0.75 mile offshore, is a brownish rock conspicuous from a distance. Unju San, about 5.3 miles WNW of Kwae Do, has three gray peaks and is conspicuous. The mountain range extends about 8 miles N from Unju San, then about 6 miles NW; it contains peaks that can be identified. Another good landmark is the black mountain with two peaks about 4 miles NW of Unju San.

Yongdae Gap (40°28'N., 129°04'E.) is the S extremity of a peninsula which forms the E side of Yongdae Myoji. Wonsandok San, about 4 miles N of Yongdae Gap, has a pointed summit and is conspicuous at a distance. Yongyon San, about 17 miles farther NNW, is the highest mountain of a range which extends about 25 miles N from the cape.

Yongdae Myoji affords anchorage, in 9.1 to 13m, fine sand, about 0.5 mile off the shallow cove in its NE part. It is not a safe anchorage, except with NE winds.

The coast for a distance of about 13 miles NNE is high and fringed by numerous rocks, most of which are steep to.

Kimch'aek (40°40'N., 129°12'E.)

World Port Index No. 60480

2.39 Kimch'aek stands on the coast at the SW entrance of Immyong Hae. Songjin Hang, one of the important harbors of NE Korea, occupies two small bights separated by Songjin Pando. Songjin Pando is a cliffy tongue of land, surmounted by conspicuous pine trees, and joined to the mainland by a low neck of land. The principal harbor is N of Songjin Pando; the S harbor, S of Songjin Pando, is the fishing center. Both harbors are somewhat protected by breakwaters.

Winds—Weather.—The prevailing winds from September to March are NW; in the remaining months, the direction is predominantly S or SE. During April and May, from about 1100 to 1500, strong S or SSE winds are liable to blow toward Kimch'aek. Sea fogs from NE usually occur in the morning.

Winds from the E coastal mountains, known as Fohn winds, are generally experienced in fair weather.

The rivers always freeze in the winter, but the harbor is never obstructed by ice. It is reported that weather rarely interferes with the working of cargo. Light snow, frequently accompanied by N or NW winds, falls on an average of about forty days. Drift ice does not penetrate to the shores of Immyong Hae. Thin ice, not sufficient to obstruct navigation, is sometimes seen floating in the middle of the bay.

Depths—Limitations.—In the greater part of Immyong Hae, there are depths of 18.3 to 36.6m. The shores of the bay are fringed in places by rocks, but there are no dangers beyond a distance of about 0.2 mile offshore.

Dangerous wrecks lie about 0.5 mile SSW of Yujin Dan, the N entrance point of Immyong Hae.

Within the N harbor there are depths of 9.1 to 18.3m. Alongside the 400m long quay on the N side of Songjin Pando there is a depth of 9.8m. The small basins at the head of the N and S harbor are shoal.

Aspect.—The land on either side of the entrance of Immyong Hae is high, but the head of the bay is low and sandy. Yujin Dan, the E entrance of the bay, is conspicuous from E and S.

Also conspicuous are the white cliffs at the foot of the mountain, about 1 mile N of Yujin Dan; these cliffs are the best mark in approaching from S. Other prominent peaks are farther N.

Anchorage.—The outer harbor affords adequate protection from W winds, but with S or SE winds shelter is limited to the constricted section close N of Songjin Pando. Depths are from 12.8 to 14.6m.

Yujin Dan to Musu Dan

2.40 The coast NE of Yujin Dan is high for a distance of about 4 miles, then it becomes low and sandy to Tadong Dan, about 8 miles farther NE. Then between Tadong Dan and Musu Dan, about 9.5 miles ENE, the coast is indented by several small coves. Kwanam Bong, about 4.5 miles NW of Tadong Dan, is very conspicuous because of its distinctive cockscomb appearance.

Hwangamdong Myoji (40°49'N., 129°34'E.), about 2 miles NE of Tadong Dan, affords anchorage, in about 11m, about 0.4 mile offshore. Hyongje Do is a group of rocks lying about 0.4 mile SE off the SW entrance of the bay. The two E rocks of this group are rugged, bare, and reddish-brown in color; the S of these two rocks, somewhat higher than the other, is dome-shaped. Yom Am, light brown in color, lies in the entrance of the bay.

Kalma P'o, about 1 mile NW of Musu Dan, affords shelter to small vessels. The inlet is surrounded by high steep hills.

Al Som (Nan Do) (40°39'N., 129°33'E.), about 11.3 miles E of Yujin Dan, is a conspicuous white, barren, rocky islet. The two rocks close E of the islet are very pointed. Al Som, a good mark for vessels running the coast, is reported to be altered in appearance due to a mirage occurring from about the middle of May to the end of July.

Yang Do, about 2 miles S of Tadong Dan, consists of the two NW islets in a group of three. Kanghui Do is the SE islet and the highest of the group.

Anchorage.—Large vessels can obtain shelter from S winds, in 18.3 to 21.9m, about 0.2 mile N of Yang Do.

Musu Dan to Orang Dan

2.41 **Musu Dan** (40°50'N., 129°43'E.) consists of high, reddish cliffs at the extremity of a bold promontory projecting S. These cliffs slope gradually to their S end.

A light is shown on the S extremity of Musu Dan. A rock, reported to be 16.8m high, lies close S of the cape. Another rock lies close offshore approximately 1.8 miles N of Musu Dan. This rock, which is conspicuous, resembles two crouching dogs facing each other when seen from N or S.

Abnormal magnetic variation has been reported over the years in the vicinity of Musu Dan.

Between Musu Dan and Orang Dan, about 33 miles N, the coast is entirely composed of steep rocky cliffs, with ranges of hills and low mountains rising inland. Rocky peaks, often oddly shaped, are common. The color of the cliffs on either side of Poksuk Tan, about midway along this stretch of coast, creates a distinct contrast. Those S of Poksuk Tan are reddish-brown, while those N of the point are whitish-brown. In addition, the elevations S of Poksuk Tan are higher than those N.

The coast N of Musu Dan consists of high, precipitous, ash-colored cliffs for a distance of about 5 miles to Mokchin Dan, a conspicuous black, rocky point. Unmandae Dan, about 2 miles farther N, is also conspicuous. Prominent peaks backing this part of the coast include Ch'imabawi San, about 3 miles N of Musu Dan; Kaegi Bong, about 4.5 miles W of Unmandae Dan, and Kkach'i Bong (Kakch'i Bong), about 5 miles NW of Kaegi Bong.

P'ohang Man (40°59'N., 129°44'E.), about 3.3 miles NNW of Unmandae Dan, affords shelter to small vessels in a 10.5m depth about 0.2 mile off the SW part of the bay. The bay is encumbered by islets and foul ground. Chondok Tan, the N entrance of the bay, is the extremity of a densely wooded peninsula with conspicuous cliffs on its S side.

2.42 **Hwangjin Man** (41°06'N., 129°44'E.), with steep cliffy shores, is entered N of Poksuk Tan. The bay affords shelter to small vessels in a depth of 13m, fine sand, about 0.8 mile W of Poksuk Tan. This conspicuous point consists of reddish-black cliffs.

Taeryanghwa Man (41°13'N., 129°44'E.), about 6.5 miles N of Poksuk Tan, is entered between Song Dan and a point about 0.4 mile N. Song Dan, 51m high and densely wooded, is the NE end of a peninsula which appears as a detached island from seaward; its SE end is composed of light brown cliffs. It is always a good mark because in winter the trees on the point are almost black and in summer the cliffs on the SE side of the peninsula are white.

Anchorage.—Taeryanghwa Man is open to the E. It affords anchorage to large vessels, except during E winds when there is a heavy swell, 0.4 mile NW of Song Dan, in depths of 11 to 15m, sand. Smaller craft can anchor closer to the N or S shore of the bay according to the direction of the wind.

Tajin Man (Dajin Man)(41°16'N., 129°45'E.) lies about 3.5 miles NNE of Taeryanghwa Man. It consists of two almost identical bays. Between them is Haeju Do, 55m high, a good landmark. Both bays are open to the SE and their waters sufficiently deep. For small vessels. they are good anchorages. The central part of the S bay provides shelter from SE to SW winds; vessels of less than 1,000 tons can better avoid the strong E wind here which occasionally blows in the area in the summer and winter than in Taeryanghwa Man.

2.43 **Kyongsong Man** (41°35'N., 129°50'E.), crescent-shaped, lies between Orang Dan and Komalsan Dan, about 23 miles N. The head of this bay, which is open E, is mostly sandy and presents a white color, except for two or three rocky points. The several hills sloping down to the shore of the bay divide the land within the head into a number of valleys and wide plains. Conspicuous among these hills are **Chinjudok San** (41°30'N., 129°37'E.), about 11 miles NW of Orang Dan, and one located about 7 miles N of Chinjudok San.

Orang Dan (41°23'N., 129°48'E.), the S entrance of Kyongsong Man, is a treeless, rocky, precipitous point with a pointed summit. A pointed rock, 15m high and conspicuous from seaward, is close off Orang Dan. A light is situated on Orang Dan.

The harbors within Kyongsong Man include Odaejin Hang and the important Ch'ongjin Hang.

Odaejin (41°23'N., 129°47'E.) stands at the head of the small boat basin about 1 mile WNW of Orang Dan. Odaejin Hang, off the boat basin, is shallow, but affords some shelter. Bagaso Gan, a pointed rock 9m high, lies about 0.15 mile N of the E entrance of the bay. Another rock, 12m high, lies about 137m S of Bagaso Gan, and between the two lies a rock with a depth of less than 2m.

Fishing nets usually extend some distance seaward from the E entrance point to Odaejin Hang.

Anchorage.—Large vessels can obtain anchorage, in a depth of 15m, 0.3 mile W of the 12m rock. Small vessels can

obtain safe anchorage in the boat basin, in depths of 1 to 5m.

Caution.—Anchorage is reported to be poor during N and E winds.

Ch'ongjin (41°46'N., 129°49'E.)

World Port Index No. 60500

2.44 Ch'ongjin, the principal commercial center of NE Korea, stands along the N shores of Ch'ongjin Hang at the extreme N end of Kyongsong Man. The harbor is entered on the W side of the promontory terminating in Komalsan Dan. The city is backed by an alluvial plain, through which the Susong Ch'on flows into the sea. Encircling mountains rise farther inland. It is an important developing port area consisting of Main Harbor, Fishing Harbor, and Wwest Harbor. Main Harbor is the built up area to the NE of Ch'ongjin. Breakwaters protect the harbors.

Winds—Weather.—The prevailing winds are NW in winter and from E directions in summer. Thick fog, sometimes continuing for several days and hindering navigation, is frequently blown in by E winds from the Japan Sea in the foggy season from April until early August. The snowfall, usually light, lasts from early November to April.

Ice is not a hindrance to navigation, though ice about 0.2m thick has been encountered in the E basin, and floes from N occasionally drift to the vicinity of the harbor.

Tides—Currents.—Observations made indicated that a S current flows about 5 miles from the coast of Ch'ongjin Hang at a velocity of 0.3 to 0.75 knot. It was also reported that vessels have been set toward the mouth of Susong Ch'on, particularly during E or S winds, and during the seasons when thick fogs occur and snow falls.

It has also been reported (1994) that vessels entering the harbor are set to the W.

Depths—Limitations.—In the approach to Ch'ongjin Hang the depths are deep and clear of dangers, except for the shoal reported to lie about 2.3 miles SSW of Komalsan Dan. Depths of over 18.3m are within 0.3 mile of the basins.

The E basin, protected by a breakwater on its S side, is entered from W in depths of 10 to 17m, a wharf, with 7.6 to 8.8m alongside, can accommodate a vessel up to 9,000 tons.

The W basin, protected by breakwaters, is entered from S. Depths of 6.1 to 9.1m are reported in this basin; vessels of up to 10,000 tons can be accommodated.

Aspect.—Komalsan Dan is the SE extremity of the promontory which forms the E side of the harbor. A light is shown on Komalsan Dan. Komal San, near the center of the promontory, is a rounded treeless hill, 183m high; it is conspicuous from E. Ch'oltan Bong, farther N, is also conspicuous.

Chonma San rises near the W end of the E basin and is an excellent mark. Radio masts are on the slope of this hill. Several stacks are in the area about 1 mile WSW of Chonma San.

The walls surrounding the town of Kyongsong, about 10 miles SW of Komalsan Dan, can be sighted from several miles seaward.

Pilotage.—Pilotage is compulsory. Pilots board about 2.8 miles SSE of Komalsan Dan; closer approach without a pilot is forbidden. The vessel's ETA at this position must be passed through the ship's agent as no VHF contact is possible. The pilot does not board before 0800 and entry is not normally allowed after 1600. Vessels leaving must do so at least 1 hour 30 minutes before sunset.

Regulations.—A TSS has been established in the approach to Ch'ongjin Hang. This scheme is not IMO-adopted. Mariners are advised to assume that Rule 10 of the 72 COLREGS applies, since it is not known what regulations are in force.

Anchorage.—Large vessels can anchor off the NE side of Ch'ongjin Hang, in depths of about 10.1 to 34.7m, mud and sand, with good holding ground.

This anchorage is reported to be exposed and SW winds create a heavy sea.

Kidong Man to Najin Man

2.45 **Kidong Man** (41°54'N., 129°56'E.), entered W of Kal Tan, is suitable for temporary anchorage except during strong winds between E and SW. The shore of the bay, consisting of rocky places alternating with sandy beaches, is backed by hills. Fishing nets are laid in the entrance of the bay from the beginning of March until the end of August.

Kal Tan is a conspicuous, barren, cliffy point, fringed by rocks which are steep-to, and the highest being 7m.

Ssangp'o Man (41°57'N., 129°59'E.), about 4 miles N of Kal Tan, is the first of three small bays indenting the coast N of Kal Tan. Yongje Man and Sajin Man are the two other bays. Chungbong Dan, the S entrance point of Ssangp'o Man, is foul for a distance of 183m offshore. A bank, with depths of less than 5m, extends 0.2 mile from the SW side of the bay. Yongje Man, the center of the three bays, is open E and strong E winds raise a heavy swell. Sajin Dan, the E entrance of Sajin Man, is the extremity of a narrow peninsula. It is a rocky precipitous point which rises to a grassy rounded summit. The S rock off Sajin Dan is conspicuous.

Anchorage.—Ssangp'o Man affords anchorage, except during strong E winds, in 6.9 to 20.1m, fine sand. The other two bays, Yongje Man and Sajin Man, are better anchorages, except during August and September when S winds are frequent. Moderate-sized vessels can anchor in Yongje Man, in 14.6 to 20.1m, mud, good holding ground. A bare rock, lying about 0.3 mile offshore from the SW side of the bay, somewhat restricts the anchorage.

2.46 **Ijin Man** (42°04'N., 130°07'E.), about 5 miles NNE of Sajin Dan, affords temporary shelter to vessels with local knowledge. The bay is entered between Piso Dan and Hwa Dan. The latter point is cliffy and conspicuous. Anchorage is available in the bay, in 10.5 to 29.3m, sand or mud. Care is necessary in the approach because of the dangers SW of Hwa Dan and in the center of the bay. At the head of the bay are two projecting points with green woods on their summits. At a distance these points appear as islets with trees on them and are prominent.

Naksan Man (42°05'N., 130°11'E.), the inlet N of Hwa Dan, is divided into two parts by the two islets at its head. Nose Dan, the NE entrance of the bay, has a bluish aspect from seaward and is conspicuous. The NW side of Nose Dan is cone-shaped. Large vessels can obtain good sheltered anchorage in the NE part of the bay, in depths of up to 20.1m, sand. Care is necessary to avoid the dangers off Nose Dan.

Najin (42°14'N., 130°18'E.)

World Port Index No. 60510

2.47 Najin, an important commercial outlet, stands at the head of Najin Hang at the N end of Najin Man. The port was the first in North Korea to be declared a free port and improvements to the berths are expected.

This deep natural bay, surrounded by hills, indents the coast about 5 miles in a NNE direction and is reported to be the best natural harbor on the NE coast of Korea. The main entrance lies W of Taech'o Do and Soch'o Do.

Winds—Weather.—The prevailing winds are SE from May to September, and NW during the balance of the year. During strong SE winds, a heavy swell runs in past the islands on its exposed side. The rainy season lasts from June through August, and snow falls from October to February. Dense fogs occur from April to August, being especially frequent from June until the end of July.

Ice does not seriously hinder navigation in the main part of the harbor.

Depths—Limitations.—In the comparatively unobstructed W part of the entrance of Najin Man the depths are from 27.4 to 36.6m, decreasing gradually toward the head of the bay. Depths of less than 11m lie within about 0.2 mile of the NW shore, and up to a maximum of 1 mile from the NE shore of the harbor.

There are three quays in the NW part of the harbor, all of which have dredged depths of 9.5m. The cargo handling wharf to the N of these quays has a dredged depth of 4m. Oryong Am, about 0.7 mile W of the SW side of Taech'o Do, breaks in bad weather. Vessels should pass W of this danger. It is marked on its W side by a lighted buoy.

Numerous shoals lie between Taech'o Do and the coast NE, and Soch'o Do and the coast E. Both navigation and anchorage is prohibited within this area, and fishing nets extend from **Kolsom** (42°10'N., 130°19'E.).

Aspect.—Kwangjang Bong, on the W side of the entrance of Najin Man about 2.5 miles NNW of Nose Dan, has a somewhat sharp peak, covered with vegetation and conspicuous. Another conspicuous sharp conical peak is about 0.8 mile farther NNE. The E side of the entrance of Najin Man rises to Yondu Bong about 1 mile NE of Songjong Dan. The two peaks of Such'o Bong, about 2 miles farther NNE, are good marks.

Kamt'o Bong, on the NW side of the bay about 4.3 miles WNW of Songjong Dan, is a conspicuous densely wooded mountain with a green appearance and a sharp summit. Poroji Bong, about 5 miles farther N, has a sharp and very conspicuous summit. It is the highest peak in the mountain range NNW of the bay.

Taech'o Do, in the middle of the entrance of Najin Man, has a somewhat sharp summit which is wooded. The E side of this conspicuous island is mostly cliffy, but the W side slopes gradually to the coast.

Soch'o Do, about 0.8 mile NE of Taech'o Do, is a round-topped islet that appears saddle-shaped when seen from SE. A conical knob at the N extremity of the islet is conspicuous.

Song Do, densely wooded and conspicuous, lies on the N side of the bay about 1.8 miles WNW of Taech'o Do at the NE entrance of Yujin Man.

Between **Songjong Dan** (42°11'N., 130°19'E.) and Ch'wijin Dan (Chujin Dan), 4 miles NE, there are several bays exposed to S and E winds. There are no off-lying dangers. Small boats can land at the head of the bay on the W side of Ch'wijin Dan, except when the wind is blowing from S.

Pilotage.—Pilotage is desirable, though not compulsory. The resident pilot will board near the lighted buoy 0.6 mile SSW of Oryong Am.

Regulations.—A TSS has been established in the approach to Najin Man. This scheme is not IMO-adopted. Mariners are advised to assume that Rule 10 of the 72 COLREGS applies, since it is not known what regulations are in force.

Foreign vessels waiting to enter Najin Hang are to use the designated area 1 mile SE of P'i Do best seen on the chart.

Anchorage.—Good anchorage for large vessels may be obtained anywhere in Najin Hang according to draft, in depths of about 10 to 22m.

The foreign vessel anchorage is located 0.5 mile NE of Soch'o Do.

Caution.—Vessels approaching Najin Man in thick weather should exercise great caution. A possible SW or W set, in which vessels may close the land in the vicinity of Hwa Dan, has been reported. As the coast is steep-to, very little warning can be had from soundings.

Chosan Man

2.48 **Chosan Man** (42°17'N., 130°30'E.), entered between Ch'wijin (Chujin Dan) and Op'o Dan, about 10 miles E, contains several inlets and coves, all of which, with the exception of Sosura Hang, are exposed to heavy seas from the E. In winter the inlets and coves afford shelter from the prevailing NW winds; they are occasionally covered by a thin coating of ice. Unggi Hang is in the NW corner of the bay.

The W side of Chosan Man is backed by a range of hills, about 305m high, which slope down from the inland ranges. Songjin San, about 7 miles NW of Unggi, has a sharp peak and is an excellent landmark. Its summit, the highest in the vicinity, may be made out frequently during fog and rain. The NE shore of the bay is low; a few isolated hills inland resemble scattered islands at a distance.

Al-Som (Nan Do), with a conspicuous irregular rocky summit, lies in the entrance of Chosan Man about 3 miles SW of Op'o Dan. A light is shown on the SW end of Al-Som (Nan Do). Two small islets lie on the reef which extends about 0.5 mile NE from Al-Som. About 1.5 miles NW of Al-Som (Nan Do), Sogunsok and Tonggunsok are islands lying at either end of a rocky reef.

Kwak Tan, the N entrance of the bay of **Kaidae Man** (42°15'N., 130°23'E.), is formed by a high cliff with a grass-covered summit.

A conspicuous sharp peak is about 1 mile NNW of Kwak Tan. Kaidae Man is open SE and has depths of 9 to 27m. Anchorage for small vessels during E winds may be obtained E of **Song Do** (42°15.0'N., 130°22.5'E.), which lies close off the W side of Kaidae Man.

Ch'angjin Man, about 2 miles N of Kwak Tan, affords temporary anchorage, except during SE winds.

Taejin Man, on the N side of Chosan Man, is an open bay exposed to the S and SE winds in the summer. In other seasons it

affords good shelter. It is entered between **Tae Dan** (42°18.2'N., 130°27.1'E.) and a point 3.3 miles ENE. A rock, 2m high, lies 0.55 mile NW of the E entrance point of Taejin Man.

Og Am (42°18'N., 130°30'E.), 2.5 miles E of Tae Dan has a depth of about 3.2m and is steep-to.

Sosura Hang lies at the E end of Chosan Man, and is entered between **Hung Dan** (42°18'N., 130°35'E.) and P'ansok Tan, 1.75 miles S. It affords shelter from N through E to SE winds, but not S or SW winds.

In the N part of the bay, E of Hung Dan, stands a range of hills with four prominent peaks. The two W peaks have rocky summits.

Sosuraji (42°16'N., 130°36'E.) stands on the S side of Sosura Hang and is an important fishing station. The port is used by vessels according to season and wind direction. The shallow basin off the town is protected by breakwaters.

Aspect.—The red chimney of a sardine factory lies about 137m E of P'ansok Tan.

Senbong (42°20'N., 130°24'E.)

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2.49 Senbong, at the northernmost point of North Korea, is the terminal for a crude oil refinery established on the NE side of the head of Unggi Hang. The crude oil facilities consist primarily of a SPM buoy berth surrounded by a prohibited area located in the entrance to Unggi Hang.

Winds—Weather.—During the winter, N winds prevail in Unggi Hang, blowing down from Unggi San. In summer, when S winds are predominant, occasional SE gales may send in heavy seas which interrupt cargo operations.

Fogs occur from April to August, most frequently in June and July. They are usually of short duration, but may last for days, especially when accompanied by fine rain.

The harbor is never ice-bound. Fast ice may fringe the shores of the outer harbor, interfering with the operation of lighters, and on occasion the small craft basin freezes solidly.

Depths—Limitations.—In the outer part of Unggi Hang, the depths vary from 11 to 23.8m. There is a crude oil berth at Yongsu-dong, 455m long with an alongside depth of 30m; vessels of up to 200,000 dwt can be accommodated.

Closer in the depths decrease to about 3m at the head of the harbor. There was 6.4m reported between the breakwaters. Within the basin, there are reported depths of from about 1.8 to 4.9m.

Five vessels of 5,000 tons can berth at a quay protected by breakwaters and there is a quay with a reported depth of 7.3m alongside.

Aspect.—Pip'a Do (Pip'a-som) and Tae Dan are both conspicuous. The former has a conspicuous rock on a flat summit covered with grass. A beacon stands on the E extremity of the islet.

Other conspicuous landmarks reported are Unggi San, about 2 miles NNW of Tae Dan, and the red brick meteorological station on the NE side of the head of the harbor.

It was reported that at night Pip'a Do is difficult to make out against the hills behind it. In thick weather Songjin San, about 6.5 miles NW of Unggi, may sometimes be a useful mark.

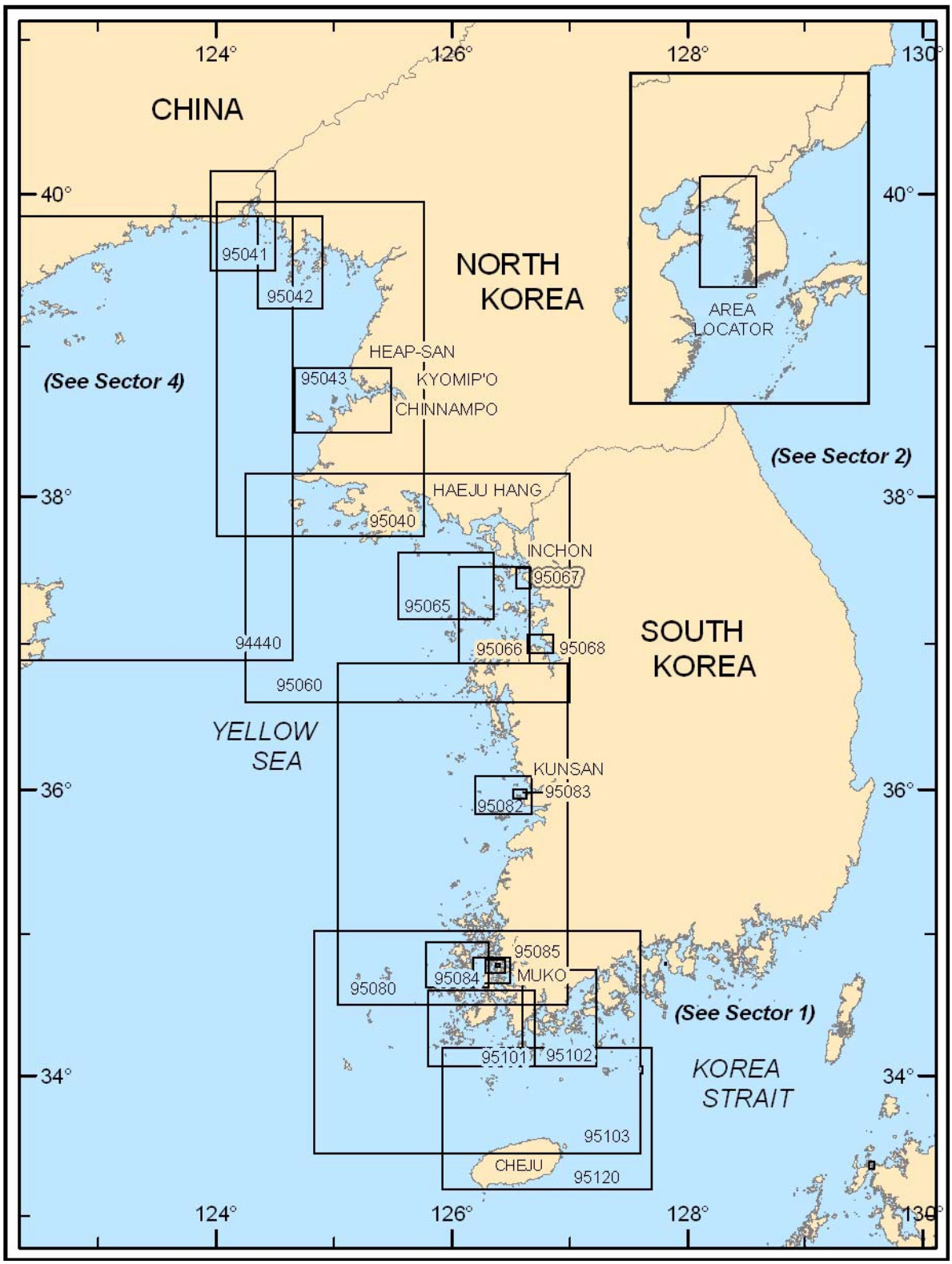
Pilotage.—Pilotage is compulsory for foreign vessels. Pilots board about 2 miles SSE of the SPM buoy.

Anchorage.—Large vessels are afforded suitable anchorage, and though SE winds may send in long swells, there is good holding ground with little danger of dragging. Vessels may anchor anywhere in the harbor, in 5.4 to 21.9m, mud or sand, good holding ground.

2.50 The **Tumen River** (42°17'N., 130°41'E.), the boundary between Korea and Siberia, is reported to be generally navigable by junks for a distance of about 40 miles from its mouth. The entrance, partly blocked by a shifting bar, has a maximum depth of about 1.8m in a very narrow channel.

The coast in the vicinity of the river is low, with Chogaramsan (Ogaram San), about 2 miles W of the river entrance, rising to jagged summits resembling somewhat a conspicuous castle. The sea surface which is from 5 to 6 miles offshore in this vicinity has a very muddy color.

Tides—Currents.—The direction of the current off the mouth of the Tumen River appears, from earlier observations, to be very irregular. It attains a velocity of about 0.3 knot.



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

SECTOR **3** — CHART INFORMATION

SECTOR 3

KOREA—WEST COAST

Plan.—This sector describes the W coast of Korea, which forms the E side of the Yellow Sea, between Haenam Gak, its SW extremity, and the Yalu River, about 250 miles N. The general descriptive sequence is from S to N.

General Remarks

3.1 Tides—Currents.—In the approach to Inchon in the area W of a line through Gyeongryeolbi Yeoldo, Tokchok Kundo, and Youp'yong Yolto and E of a line S from Sunwi Do, the tidal currents are rotary, turning clockwise in 12 hours. That is at the time of LW at Inchon the direction is between S and SE, 3 hours after LW between N and NE, at HW between N and NW, and 3 hours after HW between W and SW. The lowest velocity occurs about the time of HW and LW, and about the maximum velocity about 3 hours after HW and LW.

In Ch'onsu Man the tidal currents run N and S. The N current runs from about 6 hours before HW to the time of HW and Inchon, and the S current from the time of HW until 6 hours later. Slack water lasts for only about 10 minutes. The maximum velocity of the tidal currents near Tasurigii Amu is from 1.5 to 2 knots, and in the channel between the islets in the entrance the maximum velocity is from 4.5 to 6.25 knots.

Heavy overfalls occur off the SE end of Wonsan Do and on the E side of the fairway. The tidal current near the N end of Hyoja Do are very irregular and may cause the vessel to yaw.

In the passage between Anma Do and Songman Do the tidal currents are weak, but outside the latter and along the SE coast of the former they are strong. Near the W ends of Hoeng Do and Chuck To the tidal currents are somewhat stronger, with a velocity of 2 to 2.75 knots having been experienced.

Pilotage.—The Korea Maritime Pilots Association (KMPA) provides the following web site:

Korea Maritime Pilots Association
http://www.kmpilot.or.kr

Caution.—Fishing nets and aquaculture farms are set within 2 miles offshore in numerous places off the coast of Korea. In some places they extend as far as 5 miles offshore. For additional information see paragraph 1.1.

Extensive mine laying operation took place in Korean waters during the 1950-1953 war. For further details, refer to Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Heugsan Jedo

3.2 Heugsan Jedo, consisting of five groups of islands, lies about 50 miles off the SW part of the Korean peninsula and is separated from it by Maemul Sudo.

These groups extend along the coast for a distance of nearly 50 miles. The coasts of the various islands are more or less indented by bays which afford anchorage for small vessels.

Jitsuko Sho (Himuki Sho) (33°57'N., 124°36'E.), with a depth of 6.7m, lies about 27 miles WSW of Sohuksan Do, the SW group of Heugsan Jedo.

Gageocho Ocean Research Station (33°56'31"N., 124°35'34"E.) stands on Ilhyang Ch'o, a pinnacle rock; the station exhibits a light and is equipped with a racon.

Sohuksan Do (Gageodo) (34°04'N., 125°07'E.) consists of precipitous coasts, with its higher parts densely wooded, especially on its N side; the summit of the island is a rounded peak. The SE extremity of the island consists of high cliffs rising to a sharp, conspicuous peak, while the N extremity is low and covered with grass. Several islets and rocks lie close off the island. A light is situated on the S extremity of Sohuksan Do. A light is shown from an elevation of 88m on the N end of Sohuksan Do.

A sunken rock, the position of which is approximate, was reported to lie about 10 miles N of the island.

Sojunggwan Kundo (34°12'N., 125°30'E.), the SE group of Heugsan Jedo, lies about 20 miles NE of Sohuksan Do at the SW entrance of Maemul Sudo. This group consists of one large island and a number of islets and rocks. A light is situated on the N extremity of the large island.

Samt'ae Do (Hataedo) (34°25'N., 125°17'E.), the middle group of Heugsan Jedo, lies about 20 miles NNE of Sohuksan Do. The group consists of three islands and several islets and rocks. The S and largest island of the group shows a light on the extremity of land extending from the N side. Sangt'ae Do, the central island of the group, is reported to be a good radar target at 14 miles. Pyon So, about 5 miles NNE of Sangt'ae Do, has a summit which appears pointed when seen from E or W, but rounded from N or S.

The tidal currents near Pyon So run N with the rising tide, with a maximum velocity of about 1 knot, and ESE with the falling tide, with a maximum velocity of 2 knots.

Hong Do (34°42'N., 125°12'E.), the NW group of Heugsan Jedo, lies about 35 miles N of Sohuksan Do. It is the outermost island among the islands lying SE of Korea. It is rugged and isolated; the surrounding waters are deep.

When seen from a distance NW, the island appears as two separate islands. A light is shown from an elevation of 88m on the N end of Hong Do.

3.3 Daeheugsan Gundo (Taehuksan Gundo) (34°42'N., 125°26'E.), the NE group of Heugsan Jedo, lies about 35 miles NNE of Sohuksan Do at the NW entrance of Maemul Sudo. The group consists of Taehuksan Do, the main island, which exhibits a light, and several smaller islands, islets, and rocks.

Yongsan Do, off the SE coast of Taehuksan Do, is difficult to identify from E as it does not show up plainly against Taehuksan Do. A light with racon is situated on the NW end of **Ka Do** (34°42'N., 125°27.8'E.). A light is situated on Hajuk To.

Yori Am, about 4 miles NE of Daeheug Gundo, is the most dangerous rock in Heugsan Jedo. This rock barely covers and

reefs extend about 0.2 mile from it. Caution is necessary in this vicinity because the tidal currents are strong, and it is not always marked by ripples.

Chinni Hang, on the N side of Taehuksan Do, affords the only good anchorage in Heugsan Jedo. The small harbor, which is protected by a breakwater, is sheltered from all except NE winds. A radio tower, painted in red and white bands, stands on a hill on the E side of the harbor, and about 0.2 mile NE of the village. Temporary anchorage, in 26 to 35m, can be taken off the N coast of Taehuksan Do and W of Chinni Hang. The tidal currents which run along the E and W sides of Taehuksan Do meet here and are weaker. Care should be taken to avoid the axis of the current running through Kado Sudo, the passage between Taehuksan Do and Ka Do. The flood and ebb tidal currents in this passage flow NW and SE with velocities which may attain 3 or 4 knots or more.

Caution.—In general, the tidal currents in the vicinity of Heugsan Jedo set between N and NNW with the rising tide, and in the opposite direction with the falling tide. The maximum velocity in Maemul Sudo has been estimated at 2 knots, but this velocity increases in the narrow channels between the various islands of each group and off the promontories. Caution is therefore necessary when approaching these islands in foggy weather.

Maemul Sudo

3.4 Maemul Sudo (Single Channel), lying between Heugsan Jedo and the islands and islets off the SW end of Korea, is wide and deep with good passage to Inchon Kunsan, or to Mokpo through Jungdeung Hae on the W.

Regulations.—Traffic Separation Schemes have been established in Mae-mul Sudo. The schemes are not IMO-adopted, but adherence to Rule 10 of the International Regulations for Preventing Collisions at Sea (1972) is recommended by the Korean authorities. Vessel speeds of less than 15 knots are advised in the TSS.

Vessel Traffic Service.—Chin Do (Jindo) Vessel Traffic Service (VTS) (34°27'N., 126°15'E.) is in operation in Maemul Sudo and the waters E, including the channels between the islands S and E of Chin Do. Participation in the VTS is mandatory, except for certain vessels of 300 grt or less. Chin Do VTS may be contacted on VHF channels 12 and 14.

The general depths in the passage are over 36m throughout, except for the small bank with a depth of 19.2m, lying about 7 miles NW of **Chuk To** (Jug Do) (34°13'N., 125°51'E.), and a depth of 21.9m lying about 17 miles NNW of the same island. Two wrecks lie about 7 miles W of Chuk To. A light, equipped with a racon and siren, is situated on the summit of Chuk To.

Kyomaek To (Maemul To) (34°31'N., 125°41'E.), in the fairway of Maemul Sudo, rises vertically on its N side.

Maenggol Kundo (34°13'N., 125°51'E.) lies on the E side of the S entrance of Maemul Sudo, about 18 miles E of Sojunggwan Kundo. This group consists of three main islands which appear as one when seen from SE. A light, equipped with a racon, is shown from Maenggoldo (34°13'28"N., 125°50'51"E.).

Pyongp'ung Do, about 5 miles SE of Maenggol Kundo, is very conspicuous.

Ui Do, the largest island of Ui Gundo, lies on the E side of the passage about 8 miles NE of Kyomaek To. The summit of the island, a sharp peak, is a good landmark.

A regular passenger ship is running between Ui Do (Jinri) and Mokpo.

Ch'ilbal To (34°47'N., 125°47'E.) lies on the E side of the N entrance of Maemul Sudo, about 10 miles N of Ui Do. A light is situated on Ch'ilbal To.

Tides—Currents.—On the E side of Kyomaek To, the N tidal current runs from about 1 hour before to 5 hours after the time of HW at Ch'ang Chiang; the S current runs for the remainder of the time. The maximum velocity is 3 knots.

About 1 mile E of Ch'ilbal To, the N current runs from about 30 minute before to 5 hours after the time of HW at Ch'ang Chiang; the S current runs for the remainder of the time. The maximum velocity of either current is about 4 knots.

Maenggol Sudo

3.5 **Maenggol Sudo** (34°14'N., 125°53'E.), lying between Maenggol Kundo and Koch'a Kundo, is a deep passage about 2 miles wide. Mongdok To on the SW side of the channel, is a conspicuous islet as is Yanggan So, about 2 miles N of the N island of Koch'a Kundo.

Tides—Currents.—The tidal currents in Maenggol Sudo run NW from 2 hours after LW until about 2 hours after HW at Hajo Do, and SE from 2 hours after HW until about 2 hours after LW at the same island.

Approaches to Mokp'o Hang

3.6 **Mokp'o Hang** (34°47'N., 126°23'E.), on the SW side of the Korean peninsula can be approached by any one of several channels which lead through the numerous off-lying islands. While there are several passages suitable only for small craft and coasters with local knowledge, there are a few available for shipping. These latter passages, all of which meet at **Mogp'o Gu** (34°46'N., 126°18'E.), the principal entrance of Mokp'o Hang, will be the only ones described. From S these are Maro Hae and Changjuk Sudo, both of which lead into Chongdung Hae and Si Hae, from W directly into Chongdung Hae via Maemul Sudo, and from N through Myondo Sudo.

Although Chin Do VTS, previously described in paragraph 3.4, regulates the approaches to Mokp'o, the port and closer vicinities are regulated by Mokp'o Port Traffic Management Service. Each of the two reporting systems is mandatory.

Maro Hae (34°23'N., 126°25'E.) lies between the coast N of Haenam Gak and the E side of Chin Do. At its N end this passage leads into Chongdung Hae via the narrow Myongyangdo. A least depth of 9.1m can be carried throughout, but it should not be entered without local knowledge because of the numerous dangers and the strong tidal currents. The S approach to Maro Hae is encumbered by several island groups, islets, and dangers. Chang Kundo, lying WSW of Haenam Gak, consists of five small islands and a few islets. A light is situated on the summit of Oryong Do. A fog signal is sounded from the light. Oryong Do is the largest island of the Chang Kundo group. Oemo Gundo, SW of Chang Gundo, consists of three small islands and several rocks. Am Do, the middle island of this group, is a good mark when seen from SE, having the appearance of a dog lying down with its head raised.

Other islands in the S approach include Milmae Do, Man So, Kalmyong Do, Kuja Do, and Soguja Do. A light is situated on Kuja Do.

Tides—Currents.—In Maro Hae the tidal currents run N and S near Samma Do with a maximum velocity of from 2 to 2.5 knots. In the SE entrance of Myongyangdo, HW and LW occur about 40 minutes later than at Samma Do, and in the NW entrance about 1 hour 30 minutes later.

In Myongyangdo, the tidal currents set NW with the flood and SE with the ebb. Off the light structure in the narrows the tidal currents attain a velocity of 7 knots at neap tides and 9 knots at spring tides, but close within the strait these velocities increase to 9 and 11 knots.

Aspect.—A useful mark for vessels proceeding N through the gulf is the conical hill on the W side of the second island N of Samma Do. A light is situated on the W side of this island. The rocky hill on the coast ENE is a good mark when entering Maro Hae from N. In the vicinity of Myongyangdo several hills are useful marks. **Kumgol San** (34°32'N., 126°18'E.), near the N end of Chin Do, is a sharp rocky peak and conspicuous from all sides. Manggum San, about 1 mile farther NNE, plainly indicates the position of the narrowest part of the strait.

An overhead cable, with a vertical clearance of 30m, spans Myongyangdo at its narrowest part. A bridge (34°34.1'N., 126°18.4'E.), with a vertical clearance of 30m, also spans the channel.

Caution.—A wreck, with a depth of 9.7m, lies in position 34°36.9'N, 126°14.0'E in the center of the channel through Myonyangdo and on the E edge of the SW fairway through Chongdung Hae.

Changjuk Sudo

3.7 Changjuk Sudo (34°19'N., 126°07'E.), the best approach to Mokp'o Hang from the S, lies between the SW side of Chin Do and the NE side of Tokko Kundo, Hajo Do, and Sangjo Do. The passage leads SW of a group of islands lying off the SW end of Chin Do, and then E of Songnam Do, at the NW entrance of the channel.

Tides—Currents.—In Changjuk Sudo, the tidal currents run NW from about 1 hour 20 minutes after LW at Hajo Do until about 1 hour 20 minutes after HW, and SE for the remainder of the time. The maximum velocity is 7 knots.

Chin Do, the largest island off the SW extremity of the Korean peninsula, is generally hilly. Sangoru San, the summit of the island, is difficult to identify except from N, but Yogwi San in the S part of the island is conspicuous from all sides. Somangni, at the SW extremity of the island, is a conical wooded hill useful as a landmark for vessels using the passage. A rocky peak, the S side of which is steep, stands near the coast about 1 mile E and appears as a horn when seen from E or W.

Bogsa Ch'o (34°06'N., 126°10'E.), about 10 miles S of the S entrance of Changjuk Sudo, has two rocky heads on which the sea breaks heavily.

On the SW side of Changjuk Sudo, Tokko Do, the largest and E island of the Tokko Kundo group, has a conspicuous and somewhat pointed summit. Pyon Do is also conspicuous.

Hajo Do has a fairly conspicuous sharp summit with a ridge running W and terminating in a conspicuous sharp, rocky crag. The rocky peak in the middle of the N side of the island is very conspicuous from N. A light is situated from the NE extremity and the NW side of Hajo Do. The summit of Sangjo Do is a sharp peak which is conspicuous from W.

Caution.—A wreck dangerous to navigation exists about 0.5 mile W of Chin Do.

Chongdung Hae

3.8 Chongdung Hae (34°27'N., 126°04'E.), the S and deepest approach to Mokp'o Hang, is the passage lying between the NW coast of Chin Do and the SE islands of Naju Kundo. Si Hae is the N continuation of this channel. Chongdung Hae is entered from S through Changjuk Sudo, and from W through Maemul Sudo.

Kasa Do, in the middle of the SW entrance of Chongdung Hae, lies about 3 miles NW of the W end of Chin Do. The summit of the island, in the N part, is a double peak and, along with the peak at the S end of the island, are conspicuous from W. From S only the N one is visible. Kunsodong Som (Taesodong Do), close off the S end of Kasa Do, is conspicuous. A light is situated on the S point of Kasa Do.

The pilot station off Kasa Do is approached from SE through Changjuk Sudo, and then E of Pul To, which lies about 1 mile SE of the S end of Kasa Do. A group of trees stands on the summit of Pul To. If approaching from W, vessels pass S of Puksong Do and Mosa Do, and then between Kasa Do and Pul To. Both of the former islets, lying about 3 miles SW of Kasa Do, are covered with low trees, and Puksong Do has a pointed summit.

Chongdung Hae is about 10 miles in length and extends to a position off the N extremity of Chin Do where it joins Sia Hae. The recommended track is buoyed and passes on either side of Yangdok To and Panggu Do, and then on either side of Chakto Do. A light is situated on the NW point of Cho Do. Cho Do is located approximately 2 miles E of Panggu Do in position 34°30.5'N., 126°09.9'E. The track then leads about midway between Ku Do and Song Do. A light is situated on Ku Do. **Yangdeog Do** (34°30'N., 126°07'E.), with a peculiar-shaped rock on its summit, is thickly covered with pine trees and is a good landmark. Chuji Do, about 0.75 mile W of Yangdeog Do, has a large, conspicuous boulder on its summit and is the best mark in the vicinity. Chakto Do, in the middle of the main fairway, is cliffy with a flat summit.

Song Do, at the NE end of Chongdung Hae, is round-topped with a single pine tree on it.

Tides—Currents.—At the SW entrance of Chongdung Hae, SE of Kasa Do, the tidal currents run NE during the flood and SE during the ebb. The maximum velocity is about 4 knots. The flood runs from about 2 hours before to 4 hours after the time of HW at Ch'ang Chiang. At the NE end of Chongdung Hae, between Song Do and Ku Do, the tidal currents run NE with the flood, and SW with the ebb; it turns to SW about 4 hours after time of HW at Ch'ang Chiang and has a maximum velocity of about 3 knots, and to the NE about 1 hour before the time of HW and has a maximum velocity of about 4 knots.

3.9 Sia Hae (34°40'N., 126°14'E.), the N continuation of Chongdung Hae, lies between Hwaweon Pando and the SE islands of Naju Kundo. The bottom is very irregular throughout this passage, and there are several rocky islets on either side of

the fairway.

Siha Do, on the E side of the fairway about 8 miles NNE of Ku Do, has a flat summit; a conspicuous clump of trees is E of the light. Vessels should steer a mid-channel course between Siha Do and the sunken rock about 1 mile WSW. Vessels should continue N, passing E of Pulmugi Do, and continuing far enough N so as to approach Mogp'o Gu on an ESE course. Pulmugi Do, a useful mark in clear weather, is a flat islet covered with grass.

Tides—Currents.—Near the middle of the channel through Sia Hae the tidal currents run N with the rising tide and S with the falling tide. The maximum velocity is 4 knots. The tidal currents turn to S about 4 hours the time of HW at Ch'ang Chiang, and to N about 1 hour before HW at Ch'ang Chiang. About 1 mile E of Pulmugi Do the direction of the tidal currents is the same as above, but the maximum velocity of the N current is 2 knots.

Myondo Sudo

3.10 Myondo Sudo (34°58'N., 126°06'E.), the N approach to Mokp'o Hang, lies between the N islands of Naju Kundo, and Hujung Do and Chonjung Do to the NE. This passage, which narrows to a navigable width of about mile, has a least depth of 7.3m. Vessels approaching from N generally use Chaewonso Sudo, which is about 1 mile wide and free from known dangers.

Bichi Do (35°13'N., 125°55'E.), the N group on the W side of the N approach to Myondo Sudo, are two cliffy islets covered with grass. Heosa Gundo, two grass covered islets, lie about 4 miles S of Bichi Do. Bunam Dundo lies about 3 miles farther SSE; a conspicuous group of trees stand on the S and higher of the two peaks on Gal Do, the SE islet of this group.

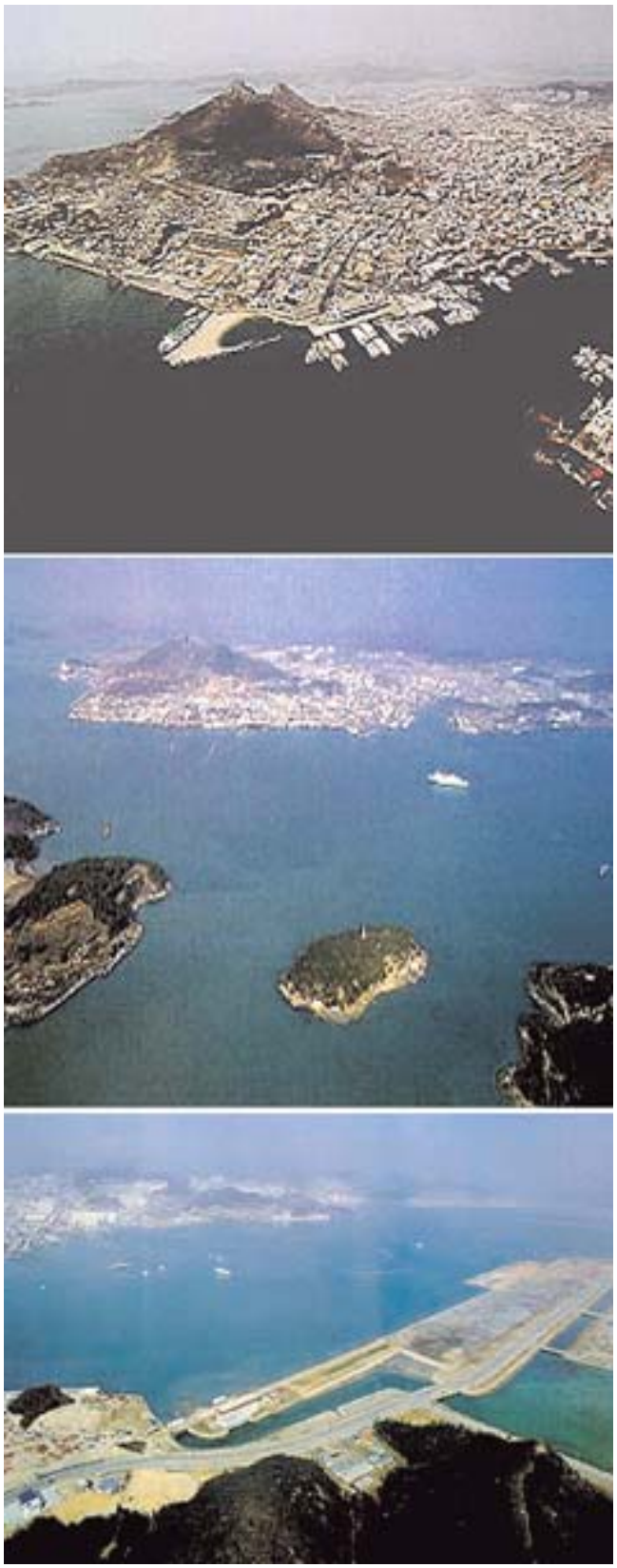
Jaeweonseo Sudo (Chaewonso Sudo) (35°06'N., 126°00'E.) lies between Taenorok To and Chaewon Do. The channel is deep and clear, but there are some dangers to the N of Taenorok To. A light is situated on the SE side on Taenorok To. Depths in the fairway over the bank extending NNE from Taenorok To are from 7.3 to 9.1m.

The summit of Jaeweon Do is conspicuous, and the summit of Imja Do, separated from Jaeweon Do by Jaewondong Sudo, is also a good landmark.

Myondo Sudo is about 2 miles wide at its entrance, NNE of Chaun Do, but it is narrowed by a large shoal. The summit of Chaun Do is a conspicuous rocky peak, as is the summit of Amt'ae Do, close SE. On the latter island, a rocky ridge runs SE from the conspicuous hill on the central promontory on the E side of the island to a prominent cliff.

Jaeweon Do, shaped like a helmet and covered with grass, lies in the middle of the channel about 1 mile N of Amt'ae Do. A light is situated on the NE point of Amt'ae Do. The fairway is W of this islet. After passing the NE extremity of Amt'ae Do, conspicuous landmarks include the conical summit of **Amhae Do** (34°51'N., 126°16'E.) and the sharp summit of Yok To, lying off its SW extremity.

Tides—Currents.—In Chaewonso Sudo and Chaewondong Sudo, the tidal currents run N with the rising tide and S with the falling tide, with a maximum velocity of 3 knots. The currents turn to S about 5 hours after, and to N about 1 hour before the time of HW at Ch'ang Chiang.



Mokp'o

In Myondo Sudo, the tidal currents run N with the rising tide and S with the falling tide. The N current has been reported to attain a velocity of over 3 knots off the W end of Hujung Do.

Caution.—Depths of 0.9m and 3.7m were reported to lie approximately 1 and 2 miles SSW, respectively, of the S extremity of Jaeweon Do, and charted depths in the area up to 2 miles SW of Imja Do were reported to be unreliable.

Mokp'o (34°47'N., 126°23'E.)

World Port Index No. 60340

3.11 Mokp'o, principally a lighterage port, stands on the N side of the entrance of Yongsan Gang. Mokp'o Hang, S of the town, is a landlocked ice-free harbor entirely protected from wind and sea. It is bounded on the N by Muan Pando and on the S by Koha Do and Yongam Pando. The port is approached via Mokp'o Gu, lying between the N extremity of Hwawon Pando and the S extremity of Talli Do.

Winds—Weather.—At Mokp'o Hang the prevailing winds are N or NNW in winter, and S or SSW in summer. Gales are usually from directions between N and NW.

Fog will increase in frequency from April to June, and are most prevalent during the rainy season in July. In August the number decreases sharply.

Tides—Currents.—In Mokp'o Gu the tidal currents are very rapid and subject to considerable diurnal inequality. According to observations made in the autumn during spring tides, it appears that the current in this passage turns as soon as it is HW in Mokp'o Hang and flows W with the falling tide. During the next hour the velocity increases rapidly to 6 knots, and two hours later it has reached its maximum velocity of 10 knots. One hour before LW the velocity is 6 knots and during the next half hour it falls to 2 or 3 knots. About the time of LW in the harbor the tidal currents in Mokp'o Gu turns, without any period of slack water.

The velocity of the E current is less than that of the W current. It attains its maximum velocity of about 4 knots about two hours after LW. The velocity then decreases slightly, but it is still as much as 3 knots 1 hour before HW after which it decreases rapidly to 1 knot. At night, the E current appears to have the same characteristics as the W current during the day and attains a velocity of 10 knots. In summer when the Yongsan Gang is in flood, the W current is reported to attain a velocity of 13 knots. Many vessels proceed through Mokp'o Gu with the E current, and all avoid meeting the full strength of the W current.

After flowing through Mokp'o Gu, a branch of the E current forms an eddy around the S of the shoals between Talli Do and Hosa Do; the major part of the current flows SE. About 3 hours after LW at Mokp'o, this eddy spreads out and the tidal currents along the E side of Talli Do and the W side of Hosa Do attain a velocity of about 1 knot. This current runs N past Koha Do and, after rounding Yong Do with a velocity of 2 to 3 knots, flows E into Mokp'o Hang. Another branch of the E current sets N through the narrow channel E of Koha Do, with a maximum velocity of 2 to 3 knots, and enters the S side of Mokp'o Hang.

The W current flows down the Yongsan Gang, and part of it sets S through the channel E of Koha Do. The main branch strikes Koha Do and is deflected NW along this coast with a maximum velocity of 3 to 4 knots. The greater part sets W and then S along the E side of Changja Do at a maximum velocity of 3 knots. This branch then forms an eddy around the shoals W of Koha Do, gradually spreading out to the S, with the main current flowing SW to the S end of Talli Do and then through Mokp'o Gu. As a result of the above currents, there is an almost constant current running SW along the E side of Talli Do, and a N current up the W side of Koha Do.

In the middle of Mokp'o Hang, it appears, from observations made in the autumn at spring tides, that the tidal currents turn about 50 minutes after HW and LW. The time of the turn, however, is influenced by the state of the Yongsan Gang, and at times it has occurred before high and LW.

To the SW of Samhak To, the tidal currents are irregular because of the water emptying out of the passage W of the island.

Depths—Limitations.—Mokp'o Gu, about 0.3 mile wide, has depths of about 29m and is free from dangers. Talli Pakchi, the deep passage E of Talli Do, has a minimum width of about 0.2 mile. Another deep channel, with about the same minimum width, is between Hosa Do and Koha Do on the E and extensive shoals on the W. A dangerous rock, with a depth of 1.3m and marked by a buoy, lies in the vicinity of Shihado Light.

Vessels of 8,000 tons can enter the harbor, but because of the tortuous and narrow access channel, combined with the strong tidal currents, it is difficult. Samhak To Pier, to the E of the harbor, is 168m long with a depth alongside of about 9m. Navy Pier can be used by vessels of 600 grt and 1,000 grt simultaneously.

Aspect.—Talli Do (34°46'N., 126°19'E.), on the N side of Mokp'o Gu, is hilly and covered with pine trees; Sach'i San and Kumsong San are the highest points on the island. Oedal To, close W of Talli Do, is also hilly and covered with pine trees. Ch'onch'uk Pi, the NE extremity of Talli Do, is a conspicuous hillock, densely wooded and dark in appearance. Pak Pi is about mile SSW of Ch'onch'uk Pi. Changja Do, about mile NE of Ch'onch'uk Pi, has a densely wooded summit.

Yong Du, the N extremity of Koha Do, is a conspicuous headland.

Yudal San (34°47'N., 126°22'E.), close W of Mokp'o, is a good mark for determining the position of the city from a distance. It consists of two peaks to the N and S. The S peak is somewhat higher. They are rugged cliffs of peculiar shape and easily seen. A shrine stands on a hill about 0.2 mile ESE; a tower is about 183m farther E. The chimney, about 0.15 mile NE of Nam Gak, is conspicuous, as are the two tall white chimneys of the power station about 0.5 mile E of the same point. There are four radio signal masts, the most prominent is 58m in height with red lights at the top, middle, and bottom.

Taea San, on the S side of the harbor about 2 miles SE of Yudal San, is a conspicuous bare peak. Some conspicuous oil tanks stand on the shore about 1 mile W of Taea San. Several oil tanks also stand near the S end of the reclaimed land at the W end of Samhak To.

Pilotage.—Pilotage is compulsory; the pilot station is off **Kasa Do** (34°27'N., 126°04'E.). Vessels should radio a request for pilots at least 24 hours in advance. In rough weather, pilots sometimes have considerable difficulty in boarding; vessels have had to wait as much as 2 days before one could be embarked. Pilots are also available at **Pulmugido** (34°44'N.,

126°14'E.).

The pilots recommend that vessels depart on the flood as it is easier to avoid fishing craft.

Radiotelephone service is available on VHF channels 12 and 16. A signal station is about 183m N of Nam Gak. Storm signals are displayed at Mokp'o.

Vessel Traffic Service.—Mokp'o Vessel Traffic Service Center is in operation for the approaches and channel transit to Mokp'o. Vessels must continuosly monitor VHF channels 1 and 16. Participation in the VTS is compulsory for vessels greater than 300 grt, all foreign vessels, passenger vessels, and vessels with tows of 200m in length or greater. Vessels less than 300 grt, if equiped with VHF, should only report when entering or departing the VTS.

Vessels must send an entry report to Mokp'o VTS when passing the following points:

1. Siha Do Light (34°42.0'N, 126°14.5'E.).
2. Pulmugido Light (34°45.6'N, 126°13.4'E.).
3. Hanaptok To Light (34°48.5'N, 126°12.8'E.).

Vessels must also report upon arrival at the pier or anchorage, before and after shifting, if transiting the TSS, and upon departure. Both Chin Do VTS and the Mokp'o Port Traffic Management Service may be contacted on VHF channels 12 and 14.

Anchorage.—Vessels can anchor in the various sections of the harbor, which are best seen on the chart, as follows:

1. Section I—Vessels less than 30,000 gross tons, clear of the passage.
2. Section II—Vessels less than 30,000 gross tons.
3. Section III—Vessels carrying dangerous cargo.
4. Section IV—Vessels less than 30,000 gross tons, clear of the passage.
5. Section V—Vessels less than 200,000 gross tons.

The quarantine anchorage is situated at position 34°45'N, 126°20'E, in the outer harbor outside the harbor limits.

Vessels are advised not to anchor in mid-channel, where the tidal currents combine with the full strength of the river current. Vessels are also advised not to anchor in the area NNE of Munha Som because the tidal currents there are strong and irregular, although anchorage farther E is good.

Directions.—Mokp'o Gu should be approached on an ESE course in order to avoid the shoals lying W of the N end of Hwawon Pando. After passing through Mokp'o Gu, vessels should turn sharply N.

Keep the extremities of Pak Pi and Ch'onch'uk Pi in line bearng 016°, until clear N of the shoals E of the SE end of Talli Do. Then a course should be steered along the E coast of changja Do until Nam Gak bears about 115° and is open NE of Yong Du. Course can then be altered E, passing N of the shoals W of Yong Du. After rounding Yong Du a mid-channel course may then be steered for the anchorage.

Caution.—A number of obstructions are reported (2007) to exist in the anchorages.

During strong S and E winds there is an eddy in the opposite direction through Mokp'o Gu and off Yong Du, making it difficult to handle a vessel. It is also dangerous to approach the N end of Hwawon Pando before altering course to pass through Mokp'o Gu during spring tides at the middle of the ebb tide because the velocity of the tidal currents about 1 mile W of the entrance is about 9 knots. It is therefore better to steer for the middle of the entrance when about 1 mile off.

After passing through Mokp'o Gu about the middle of the flood current, vessels should not, when rounding the SE end of Talli Do, alter course too suddenly. For if the turn is made too sharply the vessel, because of the check in her speed and the eddy, may not answer her helm when put the other way, and her head may be gradually driven dangerously near the SE extremity of Talli Do. The vessel may also be carried toward this point by the reverse current setting SW along the E coast of the island.

An overhead cable, with a vertical clearance of 59m, span Mokp'o Gu in a NE and SW direction 0.5 mile SE of Hwawon Bando Light to Talli Do.

Overhead cables, with a vertical clearance of 12m, span the NE entrance between U Do and Changjwa Do and the S entrance between Talli Do and Oedal To with a vertical of 53m.

A dangerous wreck lies approximately 0.6 mile SSW of Oedal To.

During the flood tide inbound vessels will encounter the tidal current from NW when off the S end of Changia Do. Although the head may swing to starboard, it is advisable not to give her any helm to counteract this, as the current is only felt over a width of about 45m, and the vessel will naturally swing to port as the bow emerges from it.

During the ebb tide, no such precaution is necessary, but care is necessary in the vicinity of Yong Du. The harbor can be entered at night with attention to the tidal currents, but care is necessary to avoid the numerous unlighted junks usually found in or near the channel.

Myeondo Sudo to Kunsan Hang

3.12 The coast between **Kaum Do** (35°13'N., 126°19'E.), close offshore E of the N entrance of Myondo Sudo and Ch'ulp'o Hang, about 22 miles NNE, is mostly high. Its fringing bank is studded with rocks and islets, and depths of less than 11m are found as far as 7 to 9 miles offshore. The coast for a distance of about 25 miles farther NNE to Kunsan Hang is fronted by mud flats and shoals and should not be approached.

Anma Kundo (35°21'N., 126°00'E.), the SW group of the islands lying off this part of the coast, consists of seven islets, the coasts of most of which are cliffy. A conspicuous clump of pine trees stands on the N side of the summit of Anma Do, the largest of these islets. Above-water dangers lie within 5 miles E and 4 miles NE of Anma Do. A light is situated on the W end of **Hoeng Do** (35°20.1'N., 125°59.5'E.).

Wi Do (35°35'N., 126°17'E.), about 17 miles NE of Anma Kundo, is hilly and wooded. The summit of the island, in the NE part, is a conspicuous blunt peak. Sik To, consisting of two hills joined together by a low neck, lies close NW of the N end of Wi Do. Drying rocks lie within about 1 mile of the W side of Wi Do. An area fouled by the remains of a salvaged wreck lies about 5 miles W of the S end of Wi Do. A light is situated on the summit of Ch'aryun Do, close SW of Wi Do. A light is shown between Wi Do and Sik To.

Caution.—A military practice area, with a radius of 5 miles, is centered on Miyo-do, about 7 miles ESE of Wi Do.

3.13 **Sangwangdung Do** (35°39'N., 126°07'E.), with several smaller islets close E, lies about 8 miles NW of Wi Do.

Hawangdung Do, close S, has two peaks, the W one of which is higher. An area fouled by the remains of a salvaged wreck lies about 5 miles NE of Sangwangdung Do. A light is situated from the summit of Sangwangdung Do.

Kogunsan Kundo (35°50'N., 126°25'E.), about 12 miles NNE of Wi Do, consists of several islands lying in two chains, and separated by a channel about 1 mile wide. All the islands have mostly bare and precipitous hills. Kwallido, the W island of the S chain, has a conspicuous wooded peak at its N end. Mal To is the W island of the N chain. A light is situated on the W extremity of Mal To. Hoenggyong Do, 0.2 mile E of **Pangch'uk Do** (35°51.0'N., 126°22.6'E.), has a light at the W end of the islet.

Huk To, about 7 miles W of Mal To, is bare with a pointed summit. Chik To, about 4 miles farther WNW, is a precipitous rocky islet with a sharp summit.

Caution.—A military practice area, with a radius of 11 miles, is centered on Chik To.

Fishing nets are laid for a distance of about a mile SE from a position the same distance SSE of the W end of Mal To. To the S of Huk To and Chik To, buoys with red flags are found.

Sibidongp'a Do (35°59'N., 126°13'E.), about 9 miles NW of Mal To, is a group of about a dozen islets lying on a horseshoe-shaped reef. A light is situated on the largest island in Sibidongp'a Do. A dangerous wreck lies sunk about 7 miles E of this group, and an area fouled by the remains of a salvaged wreck lies about 1 mile W of the dangerous wreck. Another dangerous wreck lies sunk about 3 miles N of the group.

Kunsan (Gunsan) (35°59'N., 126°42'E.)

World Port Index No. 60330

3.14 Kunsan (Gunsan), of considerable importance as an outlet for rice exports, stands on the S side of the entrance of Kum Gang; Kunsan Hang is the anchorage off the city of Kunsan. Jang-hang, on the N side of the river opposite Kunsan, provides berthing in the port of Kunsan. The harbor is approached via a narrow channel between low-lying dangers which give a poor radar presentation.

Winds—Weather.—The prevailing winds are between NE and NW in winter, and between SE and SW in summer. The winds are generally light and gales are rare.

The handling of cargo is sometimes hindered or interrupted by NW winds, which are most frequent from September to February. There are about 30 days in a year when it is impossible to work cargo in the river mouth, and about 10 days when handling is prevented in the harbor.

Fog is most prevalent during June and July. It sometimes lasts for several days, but usually occurs around sunrise and is dissipated during the morning.

Tides—Currents.—Kunsan harbor has a greater range of tide due to the flow of the Kum Gang river. The tide is about 6.5m at MHWS and 4.8m at MHWN. In Kunsan Hang, the flood current slackens about 20 minutes after **Osik To** (Osig Do) (35°58'N., 126°34'E.), and ebbs about 30 minutes later. The flood current attains its maximum velocity of 3 knots midway between Chonmang San and Kunsan Hang, about 4 hours before the time of HW at Inchon. The ebb current is strongest off the S side of Yubu Do, where it attains a velocity of 4 knots about 2 hours after the time of HW at Inchon.

At the anchorage off the piers at Kunsan, the flood current runs for about 5 hours, with a maximum velocity of 2 knots; the ebb current runs for 6 hours, with a maximum velocity of 3 knots. The slack lasts for about 15 minutes. For several days after a freshet the ebb current may run at twice its usual velocity, and it runs for a longer period while the flood current runs for a correspondingly shorter period.

Off Osik To, slack water at the end of the rising tide occurs about 1 hour before the time of HW at Inchon, and at the end of the falling tide about 5 hours after HW.

Depths—Limitations.—There are several pontoons berths, each about 122m long with depths alongside of 7.6m. There is a T-head wharf, with a head 140m long, approximately 0.1 mile to the SW of Minya Am.

Vessels with a draft of 5.5 to 8.2m can enter the harbor depending on the height of the tide, the limiting factor being the bar at the river entrance. An underkeel clearance of 0.6m is required. The fairway over the bar is very narrow, and due regard for tide and wind set are of utmost importance. Vessels exceeding a draft of 4.6m should not attempt to enter if there is a heavy swell.

The maximum draft for vessels anchoring is about 9.1m. The maximum alongside depth inside the harbor is about 7.6m.

The outer harbor has a new container terminal that can accommodate vessels of up to 50,000 dwt with a maximum draft of 11.5m.

Aspect.—Piung Do (Bieung Do) (35°57'N., 126°32'E.), brown-colored and conspicuous, lies on the E side of the entrance of the approach channel. A light is situated on the W end of Piung Do. Osik To, about 1 mile NE of Piung Do, has a conspicuous clump of trees on the hill at the E end of the island; two groups of pine trees stand on the W side of the summit of the island. An overhead power cable, with a vertical clearance of 17m, is in position between Naecho Do and Piung Do. Towers with obstruction lights are at the ends and at the connecting point of the cable.

Ponghwa-Ryong, a sharp peak close SW of Kunsan, is the highest hill in the vicinity and is easily identified. Chonmang San stands on the N entrance of Kum Gang. A conspicuous stack, reported visible at a distance of 20 miles in clear weather, is on the summit of Chonmang San.

Pilotage.—Pilotage is compulsory. Pilots will board vessels in position 35°56'N., 126°26'E. Vessels should arrive at the bar at or about HW slack. Request for pilots should be made at least 24 hours in advance.

It is advisable to notify the pilot before entering and departing the harbor due to the variable change in tidal levels and the strong current with the outflow.

Regulations.—Vessels should make an estimated arrival report, an arrival report, a departure report, and a deviation report.

Vessels should not navigate at speeds exceeding 10 knots in Sections 1 and 2, the limits of which are best seen on the chart, nor at speeds in excess of 5 knots in Section 3.

Vessel Traffic Service.—Vessels should report to Kunsan Vessel Traffic Service (VTS) (35°58'N., 126°33'E.) before arrival and departure of the VTS limits and/or an anchorage. The VTS is compulsory for deep sea vessels, vessels over 300 grt,

Kunsan

vessels carrying dangerous cargo, passenger vessels, and vessels with tows more than 200m in length.

The area of the VTS is within the harbor limits and is bounded by lines joining the following positions:

a. 36°00.1'N, 126°25.9'E.
b. 36°01.0'N, 126°21.0'E.
c. 35°51.8'N, 126°21.0'E.
d. 35°53.0'N, 126°25.9'E.

Anchorage.—The quarantine anchorage lies in position 35°57'N, 126°27'E and has depths of 9 to 10m.

Anchorage A1 lies in position 35°59'N, 126°27'E and has depths of 10 to 11m.

Anchorage A2 (35°57'N., 126°27'E.) lies just E of the pilot boarding area and has depths of 8 to 10m. An obstruction, with a depth of 8.4m lies in the S part of the anchorage area.

Anchorage A3 lies in position 35°55'N, 126°27'E and has depths of 8 to 10m.

Anchorage A4 lies in position 35°59'N, 126°33'E and has depths of 5 to 8m. A rock, with a depth of 3.4m lies close N of the E part of the anchorage.

Caution.—A considerable amount of silting occurs in the main channel. As a result, depths in the bar, the entrance channel, and in the harbor are continually changing and constant dredging is required.

3.15 Och'ong Do (Eocheongdo) (36°07'N., 125°59'E.), about 28 miles WNW of the entrance of Kunsan Hang, is a high wooded island with either cliffy or rocky coasts. A sharp rock rises conspicuously about 0.3 mile off the SE extremity of the island. A dangerous wreck lies sunk about 8 miles WSW of the island. A light is situated on the NW end of Och'ong Do.

Och'ongdo Myoji, the inlet on the S side of Och'ong Do, affords sheltered anchorage, in 11 to 15m, sand and mud, good holding ground in its middle part.

Oeyon Yolto, lying to the N and NNE of Och'ong Do, consists of six islands and several rocky islets and dangers. **Hwang Do** (36°14'N., 125°58'E.), the W island of the group, is barren and rocky. Pyon Do, about 1 mile NE, is a conspicuous pointed rock of light brown color and covered with grass; a shoal lies about 183m off its NE side. A barren, round topped islet lies about 1 mile ESE of Hwang Do.

Oeyondo Myoji (36°13'N., 126°03'E.), enclosed by Hoenggyon Do, O Do, Oeyon Do, and Taech'ong Do can be entered from NW, the preferred approach, or SE. The N part of this ar-

ea has moderate depths and a sandy bottom, while the S part is deeper and the bottom is rocky.

Anchorage can be taken, in about 16.5m, with Hwang So, which lies about 1 mile N of O Do, bearing 152°. The approach should be made with the conspicuous hill on the SW end of Oeyon Do bearing 114°.

3.16 Ch'onsu Man (36°25'N., 126°28'E.) is a narrow bay lying between the mainland and Anmyon Do. The depths within the bay are convenient for anchoring, but the numerous islets and reefs in the entrance make the fairway tortuous. The approach from S is also encumbered with numerous islets and shoals. Songju San, E of the entrance of the bay, is a sharp and conspicuous peak.

Pilotage.—Pilotage is compulsory and the boarding station is situated about 2.5 miles W of the entrance channel fairway buoys No. 1 and 2. The pilot boards during daylight hours only.

Directions.—The main approach to Ch'onsu Man is along a dredged channel, with a least depth of 14.1m, entered 8 miles NW of Yon Do.

The channel, marked by lighted buoys, leads ENE for 2 miles then gradually turns NNE to pass W of **Soyo Am** (36°19'N., 126°29'E.). Between the entrance and Lighted Buoy No. 10 (36°13.7'N., 126°25.2'E.) the channel is 0.2 mile wide, then widens to 1 mile abreast Soyo Am.

A depth of 14.5m in the center of the channel is marked by a (isolated danger) lighted buoy, 0.75 mile WNW of Soyo Am. A fish haven extends 3 miles S of Soyo Am.

Gojeong Hang (Kojong Hang) (Boryeong) (36°24'N., 126°29'E.), at the mouth of Ch'onsu Man, is a private coal terminal feeding a power station. A T-headed pier lies in a N-S direction, where vessels up to 125,000 dwt with a maximum draft of 16.5m can berth at slack water.

Caution.—A dangerous wreck lies close E of the approach to the pilot boarding area in position 36°11'N, 126°19'E.

3.17 Yon Do (36°05'N., 126°26'E.), the S island in the approach to Ch'onsu Man, is a useful landmark. A light is situated on the summit of the island. Its SE extremity is a cultivated plateau, and a small village stands at the inner end of a wooded promontory on the E side of the island. Anchorage can be taken, in 9 to 11m, mud, NE of the island.

The recommended approach to Ch'onsu Man leads NNE from a position about 2 miles W of Yon Do, and between this island and the dangerous wreck about 3 miles NW.

Yong Do, on the W side of the approach about 11 miles NNW of Yon Do, has some low trees on its summit. Several shoals lie within 2 miles SE of Yong Do, and between the islet and the SE extremity of Wonsan Do, about 6 miles NNE.

Tabo Do (Tasurigii Amu), on the E side of the fairway, about 4.5 miles ENE of Yong Do, is a small rock with two peaks of a reddish-gray color.

Soyo Am (Soniyo Amu), about 2.5 miles N of Tasurigii Amu, consists of three rocks which dry, and which are marked by ripples except during the period of slack water. The recommended track leads about 0.5 mile W of these rocks. A light is situated on Soyo Am.

Wonsan Do lies on the W side of the entrance of Ch'onsu Man close S of the S end of Anmyon Do. A pine forest on a hill on the E extremity of the island is a useful mark when approaching the bay. Anchorage can be take, in 12.8m, sand and shells, about 1 mile E of Wonsan Do, with a group of conspicuous trees on Ponha San, about 1.8 miles E of Soru Somu, bearing 057°, and the summits of Mongdok To and Ch'u Do in line bearing 318°. This anchorage is sheltered from all except S winds, and the tidal currents are not strong.

The principal channel through the entrance of Ch'onsu Man leads NW between Hyoja Do and Mongdok To, and then N past the W sides of Samhyongje Do and Yuk To.

A quarantine anchorage is located mid-channel. It is centered in position 36°18'18"N, 126°27'25"E.

Gyeongryeolbi Yeoldo (Kyongnyolbi Yolto), (36°37'N., 125°34'E.), the outermost of a chain of islets extending nearly 30 miles W from the mainland consists of three islets about 1 mile apart. A light is situated on Pukkyongnyolbi Do, the middle island.

Sodung Do (Sodein) (36°38'N., 125°43'E.), E of Gyeongryeolbi Yeoldo, presents a conical appearance when seen from E or W, but shows two rounded hummocks of unequal height when seen from N. Sok To, about 0.5 mile NW of Sodung Do, has a rock close off its N end which resembles a junk when seen from E or W. Huk To, about 12 miles NE of Sodung Do, is easily identified because of its double summit. Kaui Do is the innermost of this chain of islets. A light is situated on **Ong Do** (36°38.8'N., 126°00.5'E.).

Caution.—A Traffic Separation Scheme (TSS), best seen on the chart, is located between Ong Do and Gungsi (Kungsi) Do, extending N to Heug Do and then NE to Gadae Am.

A dangerous wreck lies in the separation zone close SW of Gadae Am.

Approach to Inchon

3.18 The approach to Inchon from S leads W and N of Gyeongryeolbi Yeoldo, and then NE to a position about 1 mile NW of **An Do** (36°57'N., 126°10'E.). From N or NW vessels should pass S of **Moktokto** (36°56'N., 125°47'E.) and then ENE passing N of An Do. Tong Sudo and Seo Sudo, the two channels of approach, unite about 10 miles SW of Inchon.

An Do, with a double summit, lies near the SW end of Changan T'oe. A light is situated on An Do. This bank, on which there are several islets and drying sand patches, forms the SE side of the approach to Tong Sudo. The mainland to the SE is very irregular and indented by several large inlets.

Moktokto, small and conical, lies about 21 miles NE of Gyeongryeolbi Yeoldo and about 18 miles W of An Do. A light is situated on Moktokto. A sunken wreck exists in position 36°50'50"N, 125°54'45"E, SE of Mogjeog To.

This islet, together with Kadok To and Toeryong Do to the N, form the SW end of Tokchok Kundo.

Ul Do (Wi Do) and Son'gap To lie on the NW side of the approach to Seo Sudo, about 11 miles and 16 miles NE of Moktokto. So-som, a drying rock, lies about 1 mile S of Son'gap To. A light is situated on the S summit of Ul Do.

Tong Sudo (Dong Sudo) (37°06'N., 126°20'E.) is the passage used by deep-draft vessels because, even though the dangers are more numerous, the tidal currents are not as strong as in So Sudo, never exceeding 4 knots. It can be navigated at night. However, caution is still necessary in the approach.

The entrance of Tong Sudo, from a position about 1 mile

Taesan Hang

NW of An Do, should be approached on a NE course until on the 038° range, and then passing between Jangan Seo (Changan So) and the 8.5m shoal about 1 mile NW. In the vicinity of Jangan Seo, which dries 2.1m, vessels have reported strong sets and sudden fogs. A light, equipped with a racon, is situated on Jangan Seo.

3.19 Taesan Hang (Daesan Hang) (37°01'N., 126°25'E.) (World Port Index No. 60323) consists of a steel jetty and concrete dolphins, with a least charted alongside depth of 13m, capable of handling vessels up to 200m in length and 35,000 dwt. The jetty is aligned 110°-290° and has three berths. Taesan is a newly-developed industrial area.

Tides—Currents.—The tidal current runs at a rate of 4 knots; the tidal range at springs is 8m.

Depths—Limitations.—Sindo Fairway, the SW approach to Taesan, has a least depth of 22m. The NW fairway to Taesan Hang has a least depth of 19.1m.

A T-head pier, marked by a light on each end of its head, is situated 6 miles S of the S extremity of Pung Do. The pier extends NNW into Tong Sudo, with alongside depths of 13 to 16m. A second T-head pier, close NE of the oil berth, has charted depths of 11.9 to 15m alongside.

Pilotage.—Pilots board in position 36°51.8'N, 126°07.1'E.

Daesan Pilots
http://www.dspilot.co.kr

Regulations.—Two tugs assist with the berthing operations and meet vessels in the vicinity of No. 13 Lighted Buoy. Berthing and unberthing is done only during daylight hours.

Anchorage.—Anchorage A1, for vessels of 100,000 dwt or more, lies 1.25 miles NNW of Kain So Light, in depths of 27 to 38m.

Anchorage A2, in depths of 15 to 33m, lies 1.5 miles NW of Hugo Do Light (37°02'N., 126°23'E.).

Anchorage A3 lies 1.5 miles NNW of Hugo Do Light in depths of 13 to 27m.

Anchorage A4, for vessels of up to 20,000 dwt, lies 1.5 miles NNE of Hugo Do Light in depths of 10 to 23m.

Anchorage A5, for vessels of less than 10,000 tons, lies 1.25 miles NE of Hugo Do, in depths of 7 to 25m.

Anchorage A6 lies about 1 mile NE of Taesan Hang Light in depths of more than 20m.

Vessels of less than 6,000 tons can take anchorage in Anchorages A7, A8, A10, A12, and A19, best seen on the appropriate chart,

Vessels of less than 20,000 tons can take anchorage in Anchroage A11.

Vessels of less than 65,000 tons can take anchorage in Anchorages A15 and A16.

Caution.—Currents of up to 4 knots may be experienced at the Taesan Hang anchorages.

Pung Do (P'ung Do) (37°06'N., 126°23'E.), with two peaks, lies about 4 miles ENE of Jangan Seo at the entrance of the approach to Asan Man.

3.20 Asan Man (36°59'N., 126°49'E.) lies at the head of the narrow gulf which extends about 20 miles SE from P'ung Do, on the E side of Dong Sudo in the approach to Inchon. The islets and shoals extending E and SE from P'ung Do divide the gulf into two channels, the N one of which is the one generally used. The S passage, although greater in depth, requires local knowledge.

Imye Som (Ipp'a Do) (37°06'N., 126°32'E.), about 7 miles E of P'ung Do, is a good mark for the channel. Haksan So lies about 1 mile NW of Imye Som. A shoal lies in mid-channel, with a depth of 7.6m, 1 mile NNE of Haksan So. Yuk To, the largest of the islets between P'ung Do and Imye Som, has a small group of trees on its summit; the tidal currents among these islets are very strong. A light is situated on Yuk To.

Songmun San, on the peninsula about 2 miles S of Imye Som, is a pointed peak. The summit of the peninsula, about 0.8 mile WNW, is wooded with pine trees.

Tangjin Hwaryok (37°03'N., 126°30'E.) is a berth 2.5 miles SW of Imye Som. The berth consists of a 400m long jetty with a 350m T-head, which has an alongside depth of 18.5m.

There is a 5 mile long channel, with a least charted depth of 17.7m, leading SE to the berth. Approaches to this channel begin about 1 mile NW of Mallyuk To. An anchorage has been established 0.6 mile NW of the berth and has a radius of 450m.

Tori Do (37°07'N., 126°37'E.), on the NE side of the channel, lies at the W end of a drying shoal about 3 miles E of Imye Som; the W side of this islet is precipitous. A light is situated on Tori Do.

Pang Do, about 8.3 miles SE of Tori Do, consists of a group of rocks, above water, surrounded by shoals. The narrowest part of the channel lies between the shoal around Pang Do and the SE extremity of Chungang Ch'ont'oe. A depth of not more than about 7.3m can be carried through this very narrow passage.

Asan Myoji, to the SE of Pang Do, lies between Nae Do and the narrow peninsula terminating in Nomi Gak, about 2 miles ENE. Depths in the greater part vary between 12.8m and 18.3m, rock or sand bottom. The tidal currents are strong and sometimes attain a velocity of 3.5 knots. A shoal, with a depth of 4.5m, lies 0.75 mile SE of the highest rock of Pang Do.

Nae Do is marked by two orange range beacons and a red and white triangle about 183m WSW of the front range beacon. A conspicuous ancient fire beacon stands on the peak about 3 miles SW.

3.21 P'yongt'aek Hang (Dangjin) (37°00'N., 126°44'E.) (World Port Index No. 60325), a developing port with several land reclamation projects in progress, is situated approximately 30 miles SSE of Inchon.

Asan Man, with depths of 7.3 to 23m, extends about 8 miles WNW from **Nomi Gak** (37°00'N., 126°47'E.). Yong Am is a conspicuous pointed rock on the SW side of the channel in the vicinity of the naval base.

Tides—Currents.—About 2 miles N of a line between P'ung Do and Imye Som the tidal currents run E and W, turning at about the times of high and LW at Inchon. The maximum velocity is 4 knots. The tidal currents from 1 to 4 miles E of Imye Som run SE and NW.

P'yongt'aek Hang

At Asan Myoji, the tidal currents run ESE and WNW, turning at about the times of high and LW at Inchon. The maximum velocity is 3 knots. Within the harbor limits, the average tidal range is 6.4m at neaps to 8.6m at springs.

Depths—Limitations.—There is a deep-water oil berth, 300m long, and marked by six yellow lights that extends WSW from a position 0.5 mile NW of Nomi Gak. It can handle vessels up to 100,000 dwt. An LNG pier, with a depth alongside of 14m, lies close NW of the oil berth. Dongguk steel wharf is recently completed (2009). Several jetties with dolphins extend from Nomi Gak with average depths of 14m. The berths are marked by yellow lights and fog signals are sounded from several of the berths.

The Republic of Korea has a naval base, which consists of an E and W harbor, at the E end of the channel. The W harbor is for small patrol craft, while the E harbor can accomodate larger naval vessels with a maximum length of about 140m and drafts up to 8m. The naval harbor is protected by a breakwater with a light on the seaward end. The E harbor consists of a turning basin and six floating piers which accomodate the large tidal range; depths range from 12 to 14m inside the breakwater.

Pilotage.—Pilotage is compulsory from Lighted Buoy No. 1 to the port and is available 24 hours. For large and very large vessels carrying dangerous cargo, pilotage is recommended from Chang-anso (37°04'N, 126°18'E.).

The pilot boards in the following positions:

1. Ipp'ado—37°08.2N, 126°29.9'E.
2. Ipp'ado—37°06.2N, 126°36.0'E. (inclement weather or heavy sea)
3. Chang-anso—37°03.4'N, 126°17.3'E.
4. Chang-anso—37°07.7'N, 126°22.5'E (inclement weather or heavy sea).

P'yongt'aek Pilots

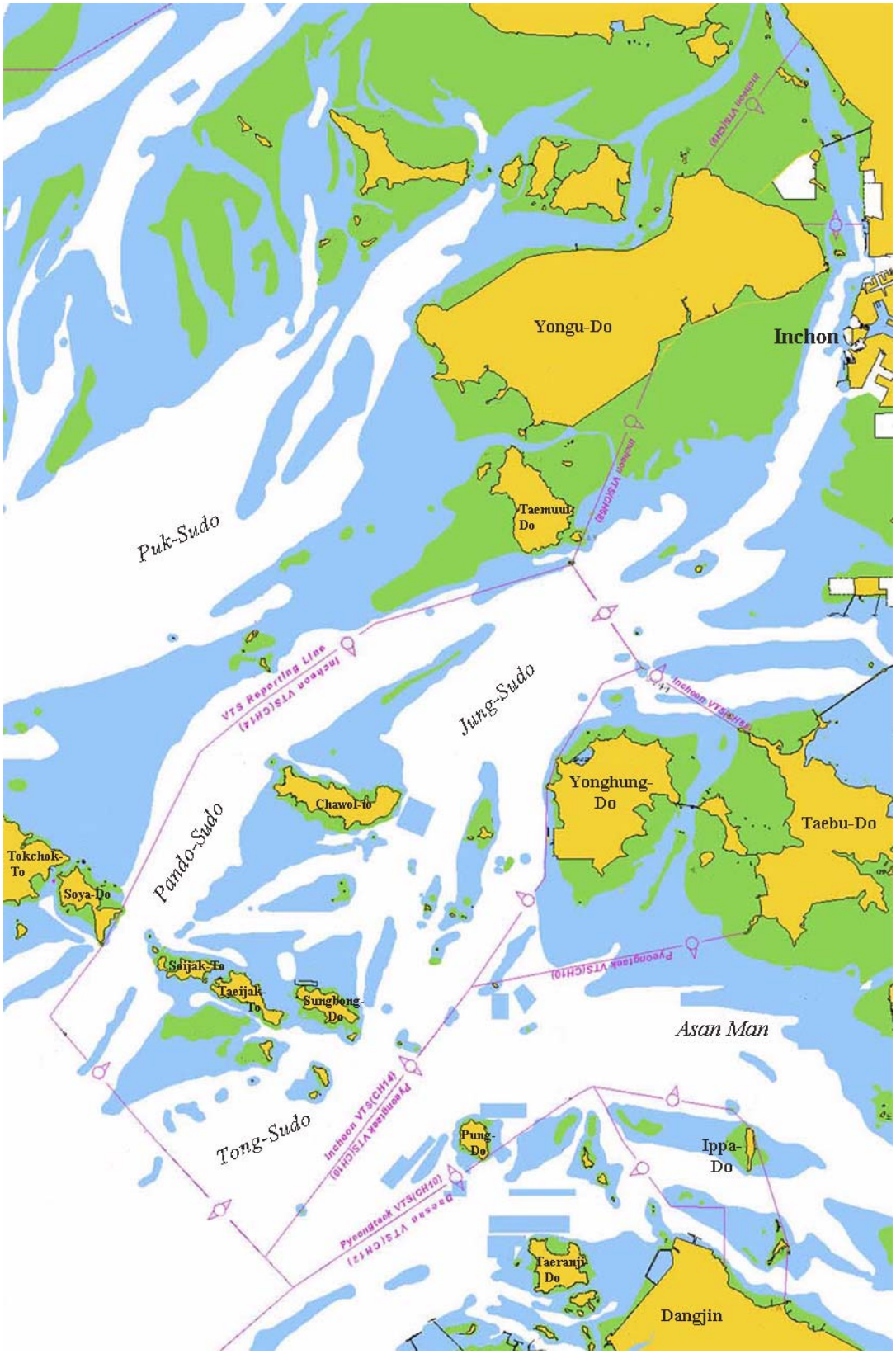
http://www.ptpilot.co.kr

Vessel Traffic Service.—There is a compulsory VTS for all foreign vessels. The VTS limits are from 2 miles SW of Chang-anso to P'yongt'aek Harbor. Vessels use VHF channel 10 or 16 to contact the VTS. Vessels must submit a preliminary notice of arrival 24 hours in advance. Reports must be made at the following times:

1. Initial Report—When passing 2 miles SW of Chang-anso.
2. Arrival Report—Upon arrival at the berth or anchorage.
3. Shifting Report—When shifting within the VTS.
4. Departure Report—When departing the port or anchorage.
5. When passing the P'yongt'aek VTS reporting lines as depicted in the chartlet titled **Inchon/P'yongt'aek Vessel Traffic Service**.

Anchorage.—An anchorage for vessels of less than 110,000 grt is situated 1.5 miles W of the oil berth. Additional anchorages are, as follows:

1. Bangdo Anchorage lies approximately in position 37°00'N, 126°45'E, in depths of 11 to 14m, mud and sand.
2. Ipp'ado Anchorage and Quarantine Area lies in position 37°09'N, 126°29'E.



Inchon/P'yongt'aek Vessel Traffic Service

3. Dorido Waiting anchorage lies centered approximately in position 37°05'N, 126°38'E, in depths of 13 to 17m.

Directions.—Vessels proceeding to Asan Man by the N channel should pass about 1 mile N of P'ung Do, and steer an E course to a position about 1 mile N of Haksan So. Then alter course to 118° to a position about 1 mile S of Tori Do, when course is altered again to 135° for the 0.9m rock at the SW end of Pang Do. Pass midway between the NW end of Pang Do and the SE end of Chungang Ch'ont'oe and fairly close SW of the above 0.9m rock on a course of 144°. A sector light can be observed along this leg of the channel. Course can then be shaped for the pipeline berth, taking care to avoid the shoals 0.5 mile SSE and 1 mile SE of Pang Do.

The summit of Sungbong Do, with some large pine trees, is a good landmark when passing W of Bu Do (Pu Do); vessels should pass about midway between Bu Do and the small islet lying off the SE end of Sungbong Do. There is a rock, which has less than 9m, E of the small islet. The bottom between Bu Do and Baeg Am (Paek Am), about 5 miles NNE, is foul, making it dangerous for anchorage in fog.

When approaching Baeg Am from S, its light structure does not show up well by day because of the dark background. Care is also necessary when passing E of Baeg Am, because of the 7.3m shoal about 0.5 mile E.

When abreast the N end of Yong-hung Do (Yeongheung Do), course should be altered to the NE when the light structure on **Pukchangja So** (37°20'N., 126°29'E.) is in line with the light on Palmi Do (P'almido).

Between Yeongheung Do and Pukchangja So, vessels are liable to be set E by the tidal current during the rising tide, and W during the falling tide; the effects of the falling tide is the stronger of the two.

Caution.—Numerous fishing havens lie near the entrance to the channel leading to P'yongt'aek Hang.

So Sudo (Seo Sudo)

3.22 So Sudo channel is designated as a channel for departing vessels of more than 500 tons from Inchon Hang (Incheon Hang). From about 0.5 mile S of Palmi Do (P'almido) at the junction of So Sudo and Tong Sudo, follow the outbound route of the traffic separation scheme in a general WSW, SW, and SSW direction to **Soya Do** (37°12'N., 126°11'E.) and to the end of the channel.

Tides—Currents.—The tidal currents in Tong Sudo and So Sudo run, in general, NE and SW, turning at about the times of high and LW at Inchon.

From observations made at spring tides, the currents in Tong Sudo attain a velocity of about 2 knots from 5 to 6 miles SW of Sanggongyong Do, 4 knots between Seungbong Do and Pung Do, and 3 knots off the W coast of Yeongheung Do.

Between Yeongheung Do and Daemueui Do (Taemuui Do), the tidal currents run E and W, turning at about the times of high and LW at Inchon, and attaining a velocity of 3 knots. In So Sudo, with observations at the same time, the currents attain a velocity of nearly 4 knots between Soya Do and Dongbaeg Do (Tongbaek To), and 2 knots about 2 miles NW of Jaweol Do (Chawol Do). In the narrow part of So Sudo, the currents may attain a velocity of 6 knots at times, but velocities of up to 8 knots have been reported.

Inchon (Incheon) (37°28'N., 126°37'E.)

World Port Index No. 60320

3.23 Inchon (Incheon), on the E side of the entrance of Yom Ha, is the harbor for the capital city of Seoul, about 15 miles inland. The port, which consists of an outer and inner harbor, is well sheltered and ice-free.

Inchon

Winds—Weather

The prevailing winds are, as follows:

1. January until March—NNW.
2. April and May—WSW, prevailing gradually to the S.
3. June until August—Frequent S to SW seasonal winds.
4. September and October—East winds prevailing to the N alternate with W winds prevailing to the N.
5. November and December—NW.

Fog occurs with greatest frequency from April through August. The foggiest season is in June and July. Fog is mostly accompanied by rain. Around dawn outside Inchon, fog is particularly frequent, making the afternoon the best time for entering.

Tides—Currents

The tidal range is considerable and reported to reach 10.7m.

In the outer harbor, the flood current sets N toward the W end of Wolmi Do from about 30 minutes after LW to about 30 minutes after HW. The S current runs the rest of the time. Both currents have a maximum velocity of about 3 knots. For about 15 minutes at each turn the velocity is less than 0.25 knot.

In the inner harbor, the tidal currents are weak, not exceeding 1 knot.

Depths—Limitations

The inner harbor has been built upon reclaimed land between the mainland coast and the former islands of **Wolmi Do** (37°28'N., 126°36'E.), on the N side of the lock gates, and Sowolmi Do, on the S side. Entrance to the inner harbor is by way

of two parallel locks. The large lock has a total length of 381m and is 36m wide. It can take vessels up to a maximum 50,000 tons. The secondary lock, which is for vessels 10,000 tons or less, is about 288m long and 22.5m wide. There are eight piers, with a total of 48 berths; alongside depths are best seen on the chart.

Outer Harbor Oil and Gas Terminals.—Vessels normally berth starboard side-to. Due to the range of tide, attention to berth moorings is essential. Honam terminal consists of a barge, to which a ship secures in a depth of 15.5m, moored 0.3 mile NNE of Seodu Am; a submarine pipeline is laid from the barge SSE to the shore.

A causeway and pier extends 0.5 mile W from the corner of Yul To. At the head of the pier there is a dolphin berth, with a depth of 13.1m, known as the Kyungin terminal. Another pier and dolphin berth extend 0.2 mile W from the W end of Yul To.

A second harbor lies approximately 0.5 mile due S of the S jetty head, of Inchon's outer harbor. It is enclosed by two breakwaters forming a tidal basin (the South Tidal Basin) with a width of approximately 160m between the two. The depths in the entrance are 4.4m, and fairly consistently remain at that depth throughout the harbor. There are a number of piers in the harbor, and two radio masts stand at the head of the bay.

There is a coal terminal on the N side of the entrance to this harbor. It is 350m long and vessels up to 100,000 dwt can berth there.

A cement terminal lies about 0.4 mile S of the S tidal basin. Two dolphin berths lie close quayside to the terminal. The channel to the S basin and the cement terminal is marked by lighted buoys.

A large tidal basin lies at the N end of the port. The basin is prohibited to navigation and lies N of **Ho-nam Oil Terminal** (37°29'N., 126°31'E.). A light, equipped with a racon, is shown from the oil terminal.

Inchon Container Terminal (ICT) has two berths in operation; each berth is 300m long, with a depth alongside of 14m. Another container berth, of the same length and depth alongside, will be completed in 2011.

Aspect

Yeongjong Do lies on the W side of the entrance of Yom Ha and, together with the extensive mud flats that are extending from it, forms the W side of the outer harbor. The Yeongjong span of the Inchon bridge has a vertical clearance of 35m.

Baegun San (37°29'N., 126°31'E.), the summit of the island, is surmounted by a conspicuous clump of trees. Sinbul Do, about 0.4 mile SW of Yeongjong Do, has two summits of about equal height and a pale yellow color.

The Lock Control Tower is conspicuous. A white tower, 7.6m high, stands about 280m NW of the lock control tower. A similar tower is located about 210m WSW of the same lock control tower.

There are numerous conspicuous black and red banded chimneys, located about 3 miles SE of the lock control tower.

Jagyag Do (Chagyak To), E of Yeongjong Do, lies on the S part of a drying mud bank, and is easily identified because it is more densely wooded than others. A light is situated on Jagyag Do (Chagyak To).

The Inchon Bridge, with a vertical clearance of 66m, crosses the main channel in the vicinity of position 37°23'N, 126°34'E.

The outer harbor consists of anchorages, some oil and gas terminals in the river, and two tidal basins, of which the S basin is still being developed. The W side of the outer harbor is bounded by islands and mud flats which spread SW. They connect with a shallow bank extending NE from **Tokchok To (Deogjeog Do)** (37°14'N., 126°07'E.), thus forming the W boundary of the port approach.

From the SW, inbound and outbound routes, about 20 to 22 miles in length, lead through the island studded approach to the S limit of the harbor at **Palmi Do** (P'almido) (37°21'N., 126°31'E.).

This harbor is endowed with many natural advantages, but has the single drawback of a very large tidal range, which may reach 10m at maximum. At LW it is impossible for large vessels to berth, and they have to be anchored in the outer harbor for cargo handling. In order to reduce this inconvenience, the inner harbor with lock facilities enables berthing of ocean vessels up to 50,000 tons.

The inner harbor is a nontidal basin which is entered through twin parallel locks. The two locks are situated between Wolmi do and Sowolmi do. The lock control tower, painted red and white in bands, stands between the locks.

At the NE end of the inner harbor there is a basin.

Pilotage

Pilotage is compulsory from Palmi Do to Inchon and is recommended from Changan So to Palmi Do.

Pilots board in the following positions:

a. 37°20.4'N, 126°28.3'E. (Palmi Do)
b. 37°22.7'N, 126°32.4'E. (Palmi Do—bad weather)
c. 37°08.0'N, 126°30.0'E. (Ippa Do)
d. 37°06.2'N, 126°36.0'E. (Ippa Do—bad weather)
e. 37°13.7'N, 126°13.2'E. (Tongbaek To)
f. 37°04.5'N, 126°16.2'E. (Changan So—Inchon)
g. 37°06.5'N, 126°19.2'E. (Changan So—bad weather)
h. 37°03.2'N, 126°17.4'E. (Changan So—P'yongt'aek)
i. 37°07.7'N, 126°22.5'E. (Changan So—bad weather)
j. 37°07.5'N, 126°26.8'E. (Mallyuk To)
k. 37°30.6'N, 126°35.9'E. (Chagyak-to)

Vessels approaching Inchon must radio to the port commander their position and estimated time of arrival 4 days and again 24 hours before arrival. If the estimated time of arrival changes more than 1 hour from the second report, it must be reported again 24 hours before arrival. Berths are assigned by radio.

Radiotelephone service is available on VHF channel 12; the calling channel is VHF channel 16.

Inchon Pilots

http://www.incheonpilot.co.kr

During fog or port congestion vessels are instructed to anchor off the outer pilot boarding position SW of Changan So Light. Vessels wait at the anchorage for the port to reopen or await the pilot to take the vessel to a designated anchorage for clearance.

Regulations

Speed Restrictions—Vessels approaching the Inchon Bridge should reduce their speed as follows when the vessel is 1 mile S of the bridge:

1. Vessels of more than 100,000 tons should reduce their speed to less than 7 knots
2. Vessels of less than 50,000 tons should reduce their speed to less than 10 knots.
3. All vessels not listed above should reduce their speed to less than 12 kntos.

All vessels approaching the Yeongmuseon wharf and dock areas should reduce their speed to less than 8 knots.

A traffic separation scheme has been established by Korean authorities for approaching and departing Inchon. This scheme is clearly shown on the chart.

Vessel Traffic Service

Inchon Vessel Traffic Service (VTS) is in operation within the Inchon harbor limits, Tong Sudo, and So Sudo. Participation in the VTS is compulsory for vessels over 300 grt, vessels transporting dangerous cargo, and vessels with a tow. Vessels must submit a preliminary notice of arrival before entering the harbor.

Vessels must also make the following reports:

1. Initial Report—When passing 2 miles SW of Changanso.
2. Arrival Report.
3. Departure Report.
4. Shifting Report.
5. When passing the Inchon VTS reporting lines lines as depicted in the chartlet titled **Inchon/P'yongt'aek Vessel Traffic Service** in paragraph 3.21.

Signals

Weather signals are displayed from a yellow framework tower on the N side of the entrance of the tidal basin.

There are four signal stations in the vicinity of the locks. The light signals used are listed in the accompanying table.

Inchon—Signals	
Signal	**Meaning**
At the control tower	
White letter I	Inbound vessels
White letter O	Outbound vessels
White letter X	Stop
At the signal stations	
GG	Enter
RR	Stop
GR	Wait
GG W	Enter left lock
GG W	Enter right lock
Both sides of the lock	
Lights at 10m intervals. The alignment of the locks is approximately 103°.	Berthing position

Anchorage

There is a quarantine anchorage about 5 miles SW of Sowolmi Do.

There are three inbound reserve anchorages, as follows:

1. Inbound No. 1 Anchorage (37°19'N., 126°24'E.) has depths of 27m.
2. Inbound No. 2 Anchorage (37°04'N., 126°11'E.) has depths of 7 to 35m. Changan So (37°03'N., 126°10'E.) lies in the SW part of Inbound No. 2 and has depths of 15 to 25m.
3. Inbound No. 3 Anchorage (37°11'N., 126°25'E.) lies NE of Changan So in depths of 7 to 20m, and is for use by vessels of less than 5,000 tons.
4. The quarantine anchorage (37°22'N., 126°33'E.) lies in depths of 6 to 12m and is for use by vessels of up to 50,000 gross tons.

Caution.—A dangerous wreck, marked by buoys, lies near the SE limit of Inbound No. 1 Anchorage.

A dangerous wreck prohibits anchorage in designated areas W-12, W-13, and W-14 (2009).

The anchorage is sheltered except from a strong S wind which raises a sea and makes cargo operations difficult. The holding ground S of Wolmi Do is good, but N of it the bottom is rocky and provides poor holding ground. Incoming vessels are anchored in one of the berths by the pilot as follows:

Anchorage Designation	Depth	Vessel Gross Tonnage
W-1	14.0m	50,000
W-2	11.6m	50,000
W-3	10.2m	50,000
W-4	10.3m	30,000
W-5	7.9m	30,000
W-9	11.5m	Emergency Reserved
W-10	11.5m	30,000
W-11	11.5m	20,000
W-12	12.0m	15,000
W-13	12.0m	15,000
W-14	12.0m	15,000
W-15	10.0m	2,000
E-1	14.0m	100,000

Anchorage Designation	Depth	Vessel Gross Tonnage
E-2	8.0m	10,000
E-3	6.1m	10,000
E-4	11.0m	5,000
E-5	11.0m	50,000
E-6	11.0m	Emergency Reserved
A-3	4.3m	2,000
A-4	4.3m	2,000
A-5	4.0m	2,000
A-6	6.0m	4,000
A-9	2.5 to 4.5m	As assigned
Y-1	20.3m	76,000

3.24 Yonp'yong Yolto (Yeonpyeong) (37°40'N., 125°42'E.), about 44 miles WNW of Inchon, lies on the SE side of the approach to Haeju Man. This area is under the control of the United Nations. The group consists of two islands and several islets and rocks. Soyonp'yong Do, the S island, has a very conspicuous summit. A light is situated on the SE point of the island. Taeyonp'yong Do, the larger of the two islands, has a level summit.

Yong'yong-ni, on the SE side of Taeyonp'yong Do, stands at the head of Yonp'yong-ni Hang, a shallow fishing harbor. Two radio towers, painted in red and white bands, stand near the shore at the village.

Tides—Currents.—About 3 miles S of Soyonp'yong Do, the tidal currents turn counter clockwise in 12 hours and attain their maximum velocity from 2.5 to 3.5 hours after HW at Inchon. Observations made during spring tides show that the current runs S at LW at Inchon with a velocity of nearly 1.5 knots, E at 3 hours 30 minutes after LW with a velocity of 2 knots, NNW at HW with a velocity of nearly 1 knot, and W at 2 hours 30 minutes after HW with a velocity of nearly 2 knots.

Caution.—A restricted area, reserved for military operations lies approximately 10 miles SW of Yonp'yong Yolto and is delimited by the following positions;

a. 37°25'N, 125°39'E.
b. 37°34'N, 125°30'E
c. 37°33'N, 125°30'E
d. 37°25'N, 125°39'E

U-do (37°36'N., 125°59'E.), 12 miles E of Yonp'yong Yolto, lies within a restricted area under the control of the United Nations. An area prohibited to navigation is delimited by the following positions:

a. 37°33'N, 126°00'E.
b. 37°33'N, 126°03'E
c. 37°30'N, 126°03'E
d. 37°30'N, 126°00'E

Haeju Man

3.25 Haeju Man (37°45'N., 125°40'E.) is an extensive bay, encumbered by shoals, extending about 20 miles N from its entrance NW of Yonp'yong Yolto. Haeju Hang, at the head of the bay, is the port for Haeju about 3 miles farther N. The bay is entered by three channels which unite N of **Sosuap To** (37°50'N., 125°45'E.).

So Gu, the W passage, is entered between Hari Sho and Yuk To, about 0.75 mile NW. A light is situated on Hari Sho. The channel, from 0.5 to nearly 1 mile wide, leads NE between the partly drying banks extending from the W shore and the narrow shoal about 2.5 miles NE of Hari Sho. There are depths of about 14.6m in So Gu, except at its N end, about 1 mile N of Wa Am, where there are depths of from 5.8 to 7.6m. A light is situated off the NE end of Wa Am.

Chungang Sudo, the middle passage, leads NE between the above narrow shoal NE of Hari Sho and the shoal between Changjae Do and Sosuap To, and then between Sosuap To and Wa Am, about mile WNW. This channel has depths of more than 9.1m in the fairway at its N end, where the tidal currents may exceed a velocity of 3 knots at spring tides.

Tong Gu, the E passage, is entered between **Kal To** (37°43'N., 125°39'E.) and Sok To, about 1 mile ESE; the former islet has two peaks, the higher one of which is sharp and conspicuous. This channel, which leads E of Taesuap To, is suitable for small vessels only. The summit of Taesuap To appears as a whales back when seen from S, and has a small group of trees on it.

Tides—Currents.—In Haeju Man the flood tidal current sets toward the head of the bay, and the ebb sets in the opposite direction. The turn occurs at about high and LW. In the W entrance the maximum velocities are about 2 knots on the flood and 4 knots on the ebb. In the E entrance the velocity is about 2 knots. Within the bay, a velocity of about 2 knots is to be expected between Taesuap To and Hyongje Do, about 7 miles N.

3.26 Yongdangp'o (38°00'N., 125°42'E.) (World Port Index No. 60310), the port for Haeju, stands on the N side of Haeju Hang at the N end of Haeju Man. The harbor, reported to be entirely frozen over from January to March, is only about 0.25 mile wide.

A quay, 610m long with a depth of about 4m alongside, exists in the harbor.

Pilotage.—Pilotage is compulsory. The pilotage anchorage position is 37°41.0'N, 125°33.5'E. The vessel should anchor and wait; otherwise, the authority will not board the vessel.

The tidal currents in the harbor are reported to attain a maximum velocity of about 4 knots. The winds are variable making great caution necessary at night. Storm signals are displayed.

Fairly good anchorage can be obtained, in 7 to 9m, rocky bottom, S of Chong Do, at single anchor with plenty of chain out. Vessels must anchor in mid-channel, where the tidal currents are very strong, because the space is so restricted.

Regulations.—The Korean Navy has advised vessels to keep the following routes because of special circumstances that exist between North Korea and South Korea.

Vessels enroute between a South Korean port and a Chinese port should navigate near the following trackline:

a. 37°03'N, 125°40'E.
b. 37°29'N, 124°43'E.
c. 38°00'N, 124°18'E.

Vessels enroute between Haeju and a Chinese port should navigate near the trackline:

a. 37°42'N, 125°34'E.
b. 37°29'N, 125°23'E.
c. 37°29'N, 124°43'E.
d. 38°00'N, 124°18'E.

Vessels enroute between Haeju and a South Korean port should navigate near the following rackline:

a. 37°42'N, 125°34'E.
b. 37°33'N, 125°32'E.
c. 37°03'N, 125°40'E.

Vessels seeking shelter from heavy weather should keep to the S of Soch'ong Do, and avoid the areas around Paengnyong Do and Taech'ong Do.

Caution.—Navigation in Haeju Man is seasonal. Aids to navigation may be withdrawn or extinguished in winter.

3.27 Sunwido Myoji (37°45'N., 125°20'E.) lies between the E side of Sunwi Do and the W side of the peninsula which terminates S in Tungsan Got. The channel formed is the S part of Kangnyong Gang which continues another 13 miles NE. Ong Do, and the drying shoal about 1 mile S, lying about 5 miles SW of Tungsan Got, are the outermost dangers in the vicinity.

Kari Got, the SW extremity of Sunwi Do, is a precipitous headland with a conspicuous peak on it.

In the entrance of Sunwido Myoji scattered reefs and shoals, many of which dry, reduce the approach to two narrow channels, the W one is preferred. Depths in the passage E of the NE side of Sunwi Do vary from 12.8 to 27.4m. To the N of Sunwi Do the depths are from 12.8 to 18.3m over a width not less than mile. Good anchorage is available off Yonghodo-ri, at the SE end of **Yongwi Do** (37°47'N., 125°20'E.), in 11 to 14.6m, sand and mud.

Vessels entering Sunwido Myoji should exercise extreme caution due to the strong, irregular tidal currents and the banks which constantly shift their positions. The E approach can be made between Un So and Ong Am, but Apchon, lying in mid channel must be avoided. The W channel, the one generally used, lies between Sunwi Do and Yohyong Ch'lloe. From E, a vessel should pass S of Ong Do and the shoal S of it, or NE of Ong Do, steering for the SW extremity of Sunwi Do. When the hillock on P'ogi Got bears 062°, course should be altered to that heading. This course leads about 0.15 mile SE of Suya So. When Tungsan Got bears 132°, course should be altered to 034°, proceeding to the anchorage in mid-channel.

Taech'ong Kundo

3.28 Taech'ong Kundo, lying 8 to 13 miles off the Korean coast, consists of three islands and several islets, rocks and shoals. The group is frequented each year by fishing vessels. **Soch'ong Do** (37°46'N., 124°45'E.), the S island of the group, is reported to afford the only shelter in the vicinity during the N gales of winter. The SE extremity of the islands consists of white cliffs.

A day signal station, the mast of which is conspicuous, is close WNW of the light structure on Soch'ong Do.

Soch'ong Ju, about 2 miles ESE of Soch'ong Do, is the outermost danger surrounding the island.

Taech'ong Do, about 2 miles NW of Soch'ong Do, appears conical when seen from W. The coasts are mostly cliffy, with the middle part of the S coast precipitous and the NE coast made up of a white sandy beach.

Anchorage can be obtained in the small bay with a shingle beach on the E side of the island, in 10.4 to 16.5m, sand, with the E extremity of Paengnyong Do in line with the NE end of Taech'ong Do.

Kapchug Am, about 1 mile W of the S end of Taech'ong Do, is high and precipitous.

Paengnyong Do (37°57'N., 124°40'E.), the largest of the Taech'ong Kundo, lies about 4 miles N of Taech'ong Do. The nearly flat summit of the island can be easily distinguished from SE. Yonggiwon San, the E extremity of the island, rises precipitously to an isolated hill. A light is situated on the E end of Paengnyong Do. Yon Bong consists of two conspicuous rocks lying close together between Paengnyong Do and Taech'ong Do; this vicinity is encumbered with shoals extending from each island.

The passage, between Taech'ong Kundo and the mainland E, leads between Soch'ong Ju and Paengnyong Ju on the W, and Kirin Ju and Chung Ju on the E. When a sea makes up, Chung Ju is marked by breakers and can be easily located, but under ordinary conditions it is not easily located because the water is uniformly discolored.

Tides—Currents.—In the vicinity of Taech'ong Kundo the tidal currents generally set N and S, with a maximum velocity of 3 to 4 knots. The turn of the currents occurs about 3 hours after high and LW at Inchon. It should be remembered that the tidal currents may be influenced by the direction and force of recent winds.

Approaches to Taedong Gang

3.29 Changsan Got (38°08'N., 124°39'E.), 32 miles SSW of the entrance of Taedong Gang, is the most prominent headland on the W coast of Korea. The peninsula rises to T'aesan Bong, about 5 miles E. A large rock lies close off Changsan Got. In the vicinity of this headland, the tidal currents set N with the rising tide and S with the falling tide; a velocity of 5 to 7 knots may be attained.

The coast NE, for a distance of about 16 miles to Oryuji Gi, consists of a bight with sandy beaches and backed by hilly ranges a few miles inland. Within Oryuji Gi, the land rises steeply to Kwangsok San, and then continues hilly for another 4 miles NE. Continuing to Naengjong Dong, about 9 miles farther N, the land is low.

Chang Ju, with depths of less than 3.7m, extends about 18 miles N from a position about 4 miles NNE of Changsan Got, and forms the W side of the approach to Ch'odo Sudo.

Ch'o Do (38°32'N., 124°50'E.), the large island lying on the SW side of the main entrance of Taedong Gang, serves as a good landmark for the river mouth. A prohibited entry area, with a 2 mile radius, covers an underwater obstruction that lies 13 miles W of Ch'o Do.

An area dangerous to navigation, with a radius of 13 miles centered on position 38°37.5'N, 124°04.9'E, lies about 32 miles W of Ch'o Do.

So Do (38°32.9'N., 124°45.9'E.) lying W of Ch'o Do, is an islet 89m high with a light is shown from its summit. Tok To, another islet, lies close W to the NW point of Ch'o Do.

Songmun Am (38°30.5'N., 124°54.5'E.), an islet close E of

Ch'o Do from which a light is shown, marks the 4 mile stretch of Nae Ju shoal, with a least depth of 0.4m. Ch'odo Sudo lies between Ch'o Do and the mainland E.

Pansong Ch'o, a rock with a depth of 1.8m, lies 2 miles NE of Songmun Am Light.

Sok To (Soku To) (38°39'N., 125°00'E.), about 9 miles NE of Ch'o Do, lies off the S side of the entrance of Taedong Gang, and, together with Chamae Do (Shimai To) lying close NW, lie on the S side of the main entrance channel of the river.

The People's Republic of Korean Regulations require foreign vessels to send their estimated arrival times at the pilot station 5 days, 24 hours, 12 hours, and 4 hours in advance; the arrival draft must be included in the ETA message. It was reported that foreign vessels are required to keep 15 miles off the Korean coast until near approach to the port-of-call in the People's Republic of Korea; vessels are also to report the position and speed prior to and on crossing the latitude of 37°N.

Pilotage.—Pilotage is available and compulsory. Pilots board at No. 1 Pilot Station and Waiting Area No. 1 for foreign vessels, centered at position 38°41.0'N, 125°02.5'E during daylight hours only. Health and Custom officials board together with the pilot.

When the estuary is covered in pack ice, during January and February, the pilots board inward at Waiting Area No. 2 for foreign vessels, centered at position 38°41.0'N, 125°02.5'E.

Regulations.—A TSS has been established in the approaches to Taedong Gang. This scheme is not IMO-adopted and it is not known what regulations are in force; mariners are advised to assume that Rule 10 of the 72 COLREGS applies.

Taedong Gang

3.30 Taedong Gang (Daido Ko) flows in a general W direction into the Yellow Sea through a large estuary encumbered by islands, banks, and shoals. The river is more discolored than any other in Korea, and with the ebb current the dirty water is carried far out to sea.

The entrance channel leads N of **Chamae Do** (Shimai To) (38°41'N., 124°59'E.) and Sok (Soku) To, SW of **Chiri To** (38°42'N., 125°08'E.), and then through P'ido Sudo (Pito Suido). A light is shown from Pido (38°41'N., 125°11'E.).

Caution.—Vessels must pass through a lock in the Western Sea Barrage located S of Pido to reach Namp'o. Vessels with a maximum length of 210m, a maximum beam of 30m, and a maximum draft of 10.5m can transit the lock. Transits take place during daylight hours only.

Namp'o stands on the N side of the river about 20 miles within the entrance, and can be reached by large vessels. Kyomip'o, on the E side of the river about 17 miles above Namp'o, can be reached by vessels of 5,000 tons; Posan on the W side of the river about 9 miles farther upriver, can be reached by vessels of 3,000 tons. P'yongyang (Pingyang) is about 37 miles above Nampo'o.

Namp'o (38°43'N., 125°24'E.)

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3.31 Namp'o (Chinnanpo), on the N bank of Taedong Gang, is the outlet for the industrial and mining region of P'yongyang. Namp'o Hang (Chinnanpo Hang), S of the city, is nearly 1 mile wide and has sufficient space to accommodate several large vessels at the same time.

Winds—Weather.—From December to May NW winds prevail, while during the remainder of the year W winds are common. Heavy fog is prevalent from June to August.

Ice.—From late December to the middle of March the Taedong Gang usually freezes over and is impassable above Namp'o. For about three weeks during this period Namp'o is liable to be cut off from the sea because of drift ice. At times the river mouth, particularly the channel in the vicinity of Chamae Do, may be blocked temporarily by dense packs of drift ice. These drift ice conditions between Chamae Do and P'i Do (Pi To), about 10 miles E, determine whether or not entry into the river is possible.

The color of the ice is important to notice. Green or white ice is easily broken and is not dangerous, but brown or gray ice, formed on the drying banks, is full of mud and sand, not easily broken, and dangerous.

Navigational warnings concerning drift ice and other conditions of the fairway are issued by the radio station on Chamae Do; the continually changing effects of the tidal currents and the wind must also be taken into account.

Tides—Currents.—In the entrance of Taedong Gang near Ch'o Do and Sok To, the tidal current runs N or NE with the rising tide from about 2 hours before to 4 hours after the time of HW at Inchon. With the falling tide, the tidal current runs S or SW from about 4 hours after to 2 hours before the next HW at Inchon.

Off Ch'o Do, the maximum velocities are 2 knots with the N current, and 3 knots with the S currents. Off Sok To, they are 2 and 3 knots, respectively.

In the river the tidal currents are, in general, regular in some features, but do vary considerably with the season, wind, and rainfall. Both the flood and ebb currents follow the course of the river in mid-channel; the flood current runs for a shorter period than the ebb current, and there is only a short period of slack water. The currents are also stronger in the lower reaches than in the upper reaches. It has been reported that the main incoming current runs down the middle of the channel, while the main outgoing current is on the S side of the channel.

In P'ido Sudo the E current has a maximum velocity of 3.5 knots and the W current 4.5 knots. The flood current turns about 4 hours after the time of HW at Inchon, and the ebb current turns about 2 hours before the time of HW, and runs for about 7 hours.

In mid channel, SW of the basin at Namp'o, the ebb current runs for 7 to 7 hours 30 minutes, the turn occurring shortly before HW and a 1.5 to 2 hours after LW. The flood current attains a maximum velocity of about 3.25 knots and the ebb about 4 knots. Off both banks of the river the ebb current begins to run 1 to 2 hours earlier than in the middle of the river. Near the basin the tidal currents are very complex because of the irregular contour of the banks W of the basin.

Depths—Limitations.—In the W approach to Taedong Gang the depths are deep and clear of dangers; in the passage between Tok Som (Toku Somu) and Chamae Do the depths decrease to about 13m. This latter track leads close N of the NE end of a shoal extending about 5 miles NE from Tok Som.

P'ido Sudo, the narrowest part of the passage, is about 0.3

mile wide between the shoals on either side, but is deep in the fairway.

East of P'ido Sudo, the relatively wide channel leading to Namp'o is free from dangers in its middle part. Depths of 9.8m and over are found in the fairway of this channel.

Ch'odo Sudo, with depths of 11 to 29m in its approach from S, has a least width of about 1 mile in the fairway between Pansong Ch'o (Banjo Sho), about 2.8 miles NE of Huibong Gap, the SE extremity of Ch'o Do, and the shoal W. The track passes close W of the 9.4m patch about 3 miles N of Pansong Ch'o.

The Port of Namp'o basin has facilities to handle vessels of 3,000 tons, with a dredged depth of 6m. The E side of the basin has a depth of 3m and the head of the basin has a depth of 1.5m, and used only by small craft.

During the ebb current, there is a strong eddy along the E wall of the basin and vessels are liable to be swung round by it. It is difficult to go alongside or leave this wall between 1 and 2 hours after HW and LW.

Vessels with too deep a draft for an alongside berth in the basin can lighten ship, or complete loading, by the use of lighters at the anchorage. There are seven berths, located ENE of the basin, as follows:

1. Berth No. 3 has a length of 220m and a depth of about 11m.
2. Berth No. 4 and Berth 5, inside a basin N of Berth No. 3, are used by barges and small craft.
3. Berth No. 6, equipped for handling bulk cargo, is about 150m long, with a depth of about 11.5m.
4. Berth No. 7 and Berth No. 8 are each about 340m long. Berth No. 7, the W part, has a minimum depth of 6m. Berth No. 8, the E part, has a minimum depth of 11m and has special facilities for loading cement.
5. Berth No. 9, with a length of about 180m and a depth of about 12m, is used for loading coal.

Mariners are advised that due to salinity variations the drafts shown alongside are subject to changes.

Aspect.—Excellent marks in the approach to the river include Ch'o Do, Sok To (Soku To), and **Tok To** (38°45'N., 124°58'E.). **Manryokiki** (38°43'N., 125°23'E.), close within the W limit of the harbor, has a flagstaff on it. A conspicuous white building stands on the shore about 0.5 mile E of Manryokiki, and about 0.5 mile farther NE are two conspicuous radio masts. Three chimneys, one very high, stand near the shore about 1 mile NE of the basin, and are particularly conspicuous. **Mangdalli Gi** (Botatsuri Saki) (38°43.0'N., 125°26.4'E.), the most prominent headland on the S shore, has a flattish summit and is easily identified.

Pilotage.—Pilotage is compulsory. Pilots board in a position about 3 miles NNW of **So Do** (38°33'N., 124°46'E.), but in rough weather, or at night, they board in the vicinity of Chamae Do, 13 miles NE. It has been reported (1994) that vessels enter or leave during daylight hours only.

Korean regulations require foreign vessels to send their estimated arrival times 5 days, 24 hours, 12 hours, and 4 hours in advance.

Anchorage.—Vessels can anchor, in 12.8 to 27.4m, mud or sand, outside the basin, at a distance of not less than 0.2 mile offshore. The holding ground, mud or sand over hard rock bottom, is not good, and caution should be exercised at the turn of the strong tidal currents. It is better to anchor in mid-river in about 18.3m, where the holding ground is better and the tidal currents are not so strong.

Taedong Gang (Continued)

3.32 The upper reaches of the Taedong Gang has not been reported on for quite some time, and information on this part of the river should therefore be used with caution.

Between Chinnanpo and **Aeam Gap** (38°39'N., 125°36'E.), the SW extremity of the peninsula formed by Taedong Gang where it changes its course to N, depths of 9.8m and over were reported. The tidal currents are very strong through this narrow part of the river.

Anchorage can be taken, although not recommended, in 15 to 17m, close off the SW bank of the river and W of **Ch'ol To** (38°39'N., 125°39'E.). The holding ground is good, but the tidal currents are strong and rotary.

Kyomip'o (38°44'N., 125°37'E.) (World Port Index No. 60290), on the E bank of the river, is the site of a large iron and steel works. The anchorage off the town can accommodate vessels of moderate size, in about 9.4m and greater. To the SW of the town, the rocky bottom affords poor holding ground, but farther downstream better holding of deep silt over rock was reported.

Posan (38°53'N., 125°34'E.), about 9 miles above Kyomip'o, is an anchorage off some coaling piers. Depths are from 8 to 9m, with good holding ground. Above this anchorage the river is reported to be unnavigable.

Taedong Gang to the Yalu River

3.33 Between the entrance of the Taedong Gang and Ch'olsan Pando, about 60 miles NNW, the coast forms a very extensive bay, which is encumbered with numerous shoals and drying banks. These narrow shoals lie more or less parallel to the E shore of the bay.

Nap-Som, with Chagunnap Som (Sorap To) close E and Mugi Do (Mungi Do) about 1 mile NNE, lie near the outer edge of these shoals. At night or in foggy weather the cries of the numerous sea birds that frequent these islets may indicate their positions.

Caution.—Unexploded ordnance lies in position 39°23'N, 123°45'E.

Ch'olsan Pando (39°40'N., 124°40'E.), on the E side of the approach to the entrance of the Yalu River, is rugged and hilly. The coastal area between the S extremity of Ch'olsan Pando and the Yalu River is fronted by broad tidal flats, beyond which are sand bars lying several miles offshore. Pae San (Chu San), about 2 miles N of the S end of the peninsula, has three peaks. Orang San, about 6 miles farther N, is also conspicuous, as is Yondae San, a sharp, isolated peak which rises steeply about 4 miles farther NW.

Taehwa Do, about 8 miles S of Ch'olsan Pando, is the southernmost of the group of islands extending S from the peninsula.

The Yalu River

3.34 The **Yalu River** (39°40'N., 124°15'E.), narrow and

shallow, is the boundary between North Korea and China. This river and estuary are encumbered with drying sand and mud banks intersected by constantly changing channels. Only small vessels of limited draft and with local knowledge can reach the cities of Antung and Sinuiju, about 15 miles upriver. Tong Sudo, the E passage, and So Sudo, the W passage, are the only practicable approaches to the river mouth. The former leads into Tasado Hang, the outer of the two ports at the entrance of the river, and the latter into Yongamp'o Hang.

Ice.—The river is practically closed to navigation from the end of October until the end of April or beginning of May.

Tides—Currents.—In Tong Sudo, the tidal currents run in the direction of the channel. The N current runs for about 5 hours, from 1 to 2 hours after LW until the time of HW. The S current runs for about 7 hours 30 minutes, from the time of HW until 1 or 2 hours after LW.

At Suun Do, the N and S current attain velocities of 2.25 and 2.75 knots, respectively; at Taedasa Do the currents attain velocities of 3.25 and 4.25 knots.

In So Sudo, the tidal currents set NE on the rising tide and SW on the falling tide. The times of change in direction are about the same as those in Tong Sudo, attaining maximum velocities of nearly 4 knots. Within the mouth of the river, the tidal currents are strong. They attain velocities of about 3 knots, but when the river is in flood the ebb current may attain a velocity of 5 knots.

Pilotage.—Vessels should notify the Pilots' Association at Sinuiju at least 24 hours prior to arrival off the estuary. Pilots board vessels off the entrance of So Sudo; pilots for Tong Sudo are usually picked up off the entrance of So Sudo. The limiting drafts of vessels are determined by the pilots.

Caution.—Vessels approaching the estuary should take soundings continuously, and should not attempt to enter the channels without a pilot. Extreme caution is also advised because the buoys and beacons that mark the shifting channels are moved without notice. During the ice season, the buoys are removed and the lights are extinguished.

Tong Sudo

3.35 Tong Sudo, which leads into Tasado Hang, was reported to have a depth of 6.1m in the fairway to the terminal at Kwakkot Ch'oe. **Suun Do** (39°41'N., 124°25'E.), on the E side of Tong Sudo, is the westernmost of the Pansong Yolto. It has a rounded top, and is connected to the next islet E by drying rocks. A light is situated on the summit of Suun Do. Won Do, the easternmost and largest of the group, has a somewhat pointed summit. The entire group lies on the extensive bank forming the E side of Tong Sudo.

Un Do, on the W side of Tong Sudo, about 2.5 miles N of Suun Do, is a useful mark for the channel. A light is situated on Un Do. Pyok Do, about 1.25 miles NW of Un Do, is a reddish, rocky islet. Se Do, about 3.5 miles farther NNW, appears pyramidal when seen from S.

Kach'a Do, on the E side of the fairway, about 3.5 miles NNE of Un Do, is nearly flat on top and bare. A beacon stands on the islet.

Tae-dasa Do (Tasa Do), about 1.8 miles NW of Kach'a Do, has two peaks, the N being slightly higher. Beacons mark the outer edge of the fringing reef.

Kwakkot Ch'oe (39°49'N., 124°25'E.) is a rocky headland, the E side of which is precipitous, and a village is on the W side. A seawall extends SW to Sodasa Do, while harbor works extend about 1 mile farther S. This artificial port lies between Sodasa Do and Tasa Do, and provides about 745m of berthing space with depths of 7.9 to 9.1m alongside. Another 610m of berthing space has depths of 3.7 to 4.9m alongside. The terminal is connected to the cities upriver by railroad.

Vessels, with a draft of about 4.8m, can anchor, in 5.8 to 10.1m, about 0.5 mile W of the N end of Tasa Do. Other vessels can anchor about 3 miles S of Tasa Do.

So Sudo

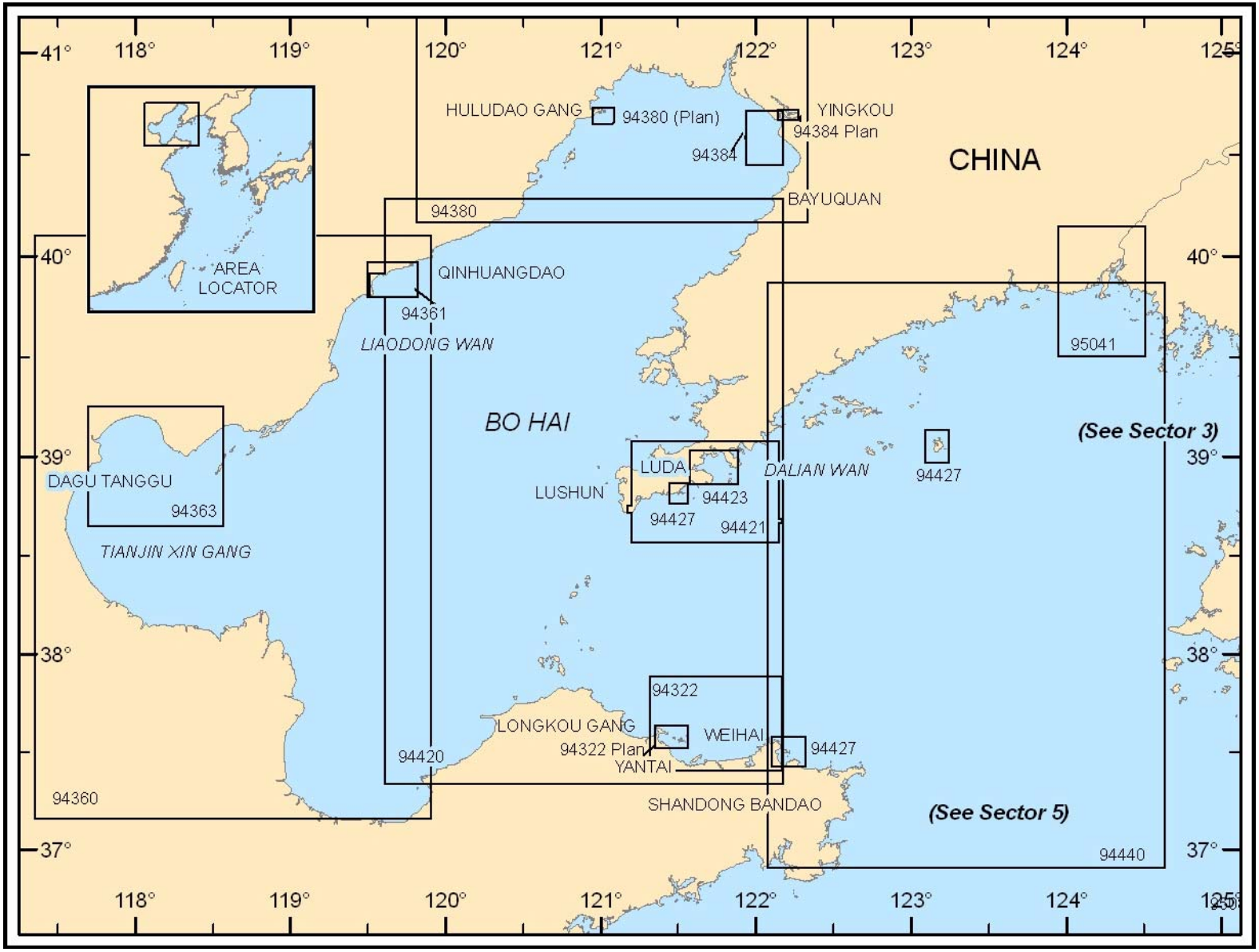
3.36 So Sudo, which leads into Yongamp'o Hang, is generally used by small vessels proceeding upriver. The passage is subject to great change, making local knowledge essential. The channel entrance is about 5 miles S of **Ku-lung Shan** (39°49'N., 124°01'E.), an isolated hillock on the low coast and which appears as an islet from the offing.

Two conspicuous red brick buildings stand at the SW end of the town about 6 miles NE of Ku-lung Shan. The channel runs between the coastline and the shoals and banks W and N of Sindo Yolto.

Maan Do (39°48'N., 124°11'E.) is the largest of the islets on the W side of Sindo Yolto. A light is situated on the SW peak of Maan Do. The light is not lit when the river is closed by ice. Sin Do, the largest islet of the group, rises to sharp peaks at its N and S ends. A large area of the bank N of Maan Do and Sin Do is covered with grass and only covers at HW spring tides.

Yongamp'o (39°56'N., 124°22'E.) stands on the E bank of the Yalu River just within its entrance. Small vessels with a draft not exceeding 4.1m can obtain indifferent anchorage off the town. Currents in the river are strong here.

Antung and Sinuiju, about 11 miles farther upriver, are connected by a railroad bridge, with a clearance of 10.1m.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **4** — CHART INFORMATION

SECTOR 4

CHINA—THE YALU RIVER TO SHANDONG BANDAO

Plan.—This sector describes the N coast of China between the W entrance point of the Yalu River and Chengshan Jiao, a point about 165 miles SSW. The description is W to Laotieshan Xijiao from the Yalu River. Liaoding Wan is described counterclockwise from Laotieshan Xijao to Bo Hai Strait. Bo Hai is also described counterclockwise.

General Remarks

4.1 Winds—Weather.—Winds are seasonal and largely conform to the Northeast Monsoon/Southwest Monsoon pattern typically for the waters adjacent to mainland China. The Northeast Monsoon sets in abruptly and, persisting between September and March, has winds predominantly from the N and NW and to a lesser extent, from the NE. Storms are frequent, particularly from November to March. Storms in Liaodong Wan are often from the E and NE. The Southwest Monsoon occurs between April and August and has largely light airs which, originating from the SW, tend to veer to the NW and N.

Typhoons are rare and tend to appear at infrequent intervals only during the peak expectancy months of July and August.

Fog is infrequent in Bo Hai Haixia and rare in Bo Hai and Liaodong Wan.

Ice.—Ice forms in November and continues to April. It reaches its greatest concentration in January and February. Drifting sea ice in light concentration occurs during the winter months. Landfast ice occurs only during the coldest months and generally only in the Yalu River and in the rivers entering the NE side of Liaodong Wan. Ice conditions tend to vary considerably from year to year.

Tides—Currents.—Ocean currents in general set E out of Liaodong Wan and Bo Hai and then through Bo Hai Haixia. Winter winds from then accentuate the set. Summer winds from the S tend to produce a variable set or, in the area S of the Yalu River, a counterclockwise set. Tidal currents tend to parallel the coast.

In the N approach to Bo Hai Haixia add SW of the Yalu River, the flood sets W to SW and the ebb NE at a maximum velocity of 3 knots, with the W current the stronger. Between Chengshan T'ou and Dalian Wan, the flood sets SW and the ebb NE at velocities of 1.5 to 2.5 knots. Between Dalian Wan and Lushun, the W current runs from 2 hours 30 minutes to 3 hours 30 minutes after LW until 3 hours 30 minutes to 4 hours 30 minutes after HW. The E current runs during the remainder of the tidal period.

In the S approach to Bo Hai Haixia, tidal currents are variable and subject to the influence of the wind. In general, the flood sets W and the ebb E with offshore and inshore currents frequently setting in opposite directions.

The W current begins about one hour after HW and the E current about 5 hours.

In Bo Hai and Liaodong Wan, tidal currents as well as tidal rise and fall are considerably affected by run off water carried seaward by the many rivers in the area. The flood sets W through Bo Hai Haixia into Bo Hai then NE along each side of Liaodong Wan, the ebb sets in the opposite direction. Maximum velocity for both flood and ebb ranges from 1 to 3 knots, depending on local conditions.

The several bodies of water confined by the coastline between the Yalu River and Chengshan Jiao consist of an approach waterway, Bo Hai Haixia, and an extensive inland sea to the W which, sometimes termed Pei Hai, is divided N into Liaodong Wan and S into Bo Hai. The many islets and islands of Miaodao Qundao lie in Bo Hai Haixia and encumber free access to Pei Hai.

Depths throughout the area are shoal and rarely exceed 54m.

The coast presents a general appearance of being low to hilly and only exceptionally of being mountainous. The N approaches to Bo Hai Haixia consist of low-lying coast rising inland to high hills and barren interior mountains and fronted seaward by scattered islands and drying mud flats. The S approaches are similarly low-lying and rise to interior peaks having the appearance of islands from a distance.

The islands of Miaodao Qundao are low-lying and hilly. The coast of Bo Hai is low throughout and consists largely of muddy coastal plains merging with swamps, marshlands and wide margins of drying mud flats. The coast of Liaodong Wan is, in general, hilly to the SE, flat and marshy to the NE, and low-lying to hilly to the NW.

The major deep water seaports of the area are Luda, in the N approach to Bo Hai Haixia, and Tianjin Xin Gang, on the NW side of Bo Hai. Several minor ports accommodate deep-draft vessels.

Caution.—Numerous wells or well heads, which may rise up to 2m above the sea bed, may be encountered in the waters described in this sector. Safety zones, usually having a radius of 500m, surround operational wells.

Bo Hai Haixia

4.2 The N approaches to Bo Hai Haixia comprise the S littoral of the extensive peninsula Liaodong Bandao between the Yalu River and Laotieshanxi Jiao, a point about 159 miles WSW. The coastline throughout is irregular and much indented.

Inland, coastal lowlands rise gently to high hills and the largely barren mountains forming the interior of Liaodong Bandao. Seaward, the nearshore area consists of wide margins of drying mudflats which front the coastline continuously for two-thirds of the distance from the Yalu River. The offshore area is reported to be generally shoal and contains numerous offlying islands and islets. The major seaport of Luda (Dalian) and the minor port of Lushun are located near the SW extremity of Liaodong Bandao.

The Yalu River to Nanshan Zui

4.3 The W entrance point of the **Yalu River** (Yalu Chiang) (39°55'N., 124°20'E.) is low, flat and swampy. The coastline between the river entrance and Nanshan Zui, about 131 miles WSW, is irregular and indented by numerous inlets, bays and coves which lie separated one from another by low, hilly peninsulas, bluff promontories, and reef-fringed, rocky headlands. A well-cultivated level to rolling coastal plain, crossed by many shallow streams, immediately backs the coastline. This continues inland to the high hills and barren mountains of the interior which lie some 15 to 25 miles inland near the Yalu River, but which reach the sea at **Chengshan Tou** (Terminal Head) (39°09'N., 122°09'E.), a rocky headland about 105 miles to the WSW. The nearshore area is encumbered by a coastal margin of drying mud and sand flats extending 1 to 3 miles offshore before disappearing with the rocky headlands SW of Chengshan Tou.

The offshore area is encumbered throughout by groups of large hilly islands and a scattering of lesser islands and isolated rocks.

Dalu Dao (Ta-lu Tao) (39°45'N., 123°44'E.), about 22 miles WSW of the entrance to the Yalu River, is a small, hilly island which, rising to a conspicuous double summit, lies near the seaward edge of the drying mud flats choking the entrance to the river Ta-yang Ho. A light is shown from the S side of the island.

Ta-Ku Shan, a 335m high hill, rises steeply on the N side of a town 10 miles NW of Dalu Dao, and is very prominent. There are two large shrines, and a dense growth of trees in a ravine, on the seaward side of the hill.

Anchorage can be obtained 3 miles SSE of the E part of Dalu Dao, in a depth of 8.6m. Smaller vessels can anchor 1.3 miles S of the same point, sheltered from NW winds, in depths of 5.5 to 6.7m, mud. Vessels handle cargo from lighters able to enter Ta-yang Ho at HW and proceed to berthing facilities for Ta-Ku-shan, a community lying within the W entrance point of the river.

4.4 **Haiyang Dao** (39°03'N., 123°12'E.), about 69 miles SW of the entrance to the Yalu River, is a large, mountainous, and steep-sided island which, rising steep-to from surrounding depths greater than 36m, constitutes the farthest seaward danger in the N approaches to Bo Hai Haixia.

Small vessels, seeking shelter from all but W winds and their accompanying swell, anchor, in 6.4 to 7.3m within a landlocked inlet indenting the W side of Haiyang Dao.

Local magnetic anomalies have been reported in the vicinity of Haiyang Dao.

Caution.—An area closed to foreign shipping, within a radius of 8 miles of Badouyinzi Light (39°04'N., 123°09'E.), is established at Haiyang Dao.

Zhuanghe (39°37'N., 122°57'E.) is a developing port (2007) located 15 miles N of Haiyang Dao. The port is protected by a breakwater which is marked by a light. There are two berths for vessels of up to 10,000 dwt. The buoyed approach channel to the harbor crosses an area prohibited to anchoring and fishing lying N of Shicheng Dao. The channel and turning basin have depths of 9m.

Wai-ch'ang-shan Shuidao (Blonde Group) (39°03'N., 122°47'E.), about 15 miles W of Haiyang Dao, is a group of hilly steep-sided islets of which Zhangzi Dao is the largest and westernmost.

Damoding, with the appearance of a small vessel under sail, is an isolated, steep-to rock 11m high standing about 4.5 miles S of the S extremity of Zhangzidao.

Vessels, seeking shelter from S through SW winds, anchor in 12.8 to 20.1m, sand and mud, at the entrance to a small bay on the NE side of Zhangzidao.

There is also anchorage in the bay on the W side of the island sheltered from E winds, in similar depths.

Changshan Qundao (Elliot Group) (39°15'N., 122°35'E.) is an extensive, hilly island group which, separated from the mainland at Chengshan Tou by a largely clear channel about 7 miles wide, consists of several larger islands, a number of lesser islands, and a scattered multitude of navigational dangers. Jiaoliu Dao (39°16.5'N., 122°42.8'E.) is marked by a light equipped with a racon. Dachangshan Dao is the largest and northernmost island.

Vessels anchor in 9.1 to 21.9m, mud, sand and shell, in a position between a peninsula extending S from Dachangshan Dao and Sai-li Tao (Suili Tao), a hilly islet about 2 miles farther to the S. The anchorage is best approached from the S through Ha-hsien Tao (Hasien Strait), the clear deepwater channel W of Sai-li Tao.

4.5 **Dalian Wan** (38°57'N., 121°45'E.) (World Port Index No. 60250) is a commodious deep-water bay having an irregular shoreline everywhere backed by high rolling hills except for populated, well-cultivated lowlands at the head of several arms and narrow inlets on the NW side of the bay. The entrance is encumbered by two hilly steep-sided islets. Dasanshan Dao (Ta-shan Tao), the larger islet, lies with its S extremity about 5.5 miles S of **Shanxi Tou** (Shan-hsi T'ou) (38°59'N., 121°49'E.), the precipitous reef-fringed E entrance point of the bay. A light, with a radiobeacon, is situated on the S end of Dashanshan Dao.

The main navigable entrance channel, Dasanshan Shuidao, lies between Dasanshan Dao and Huangbai Zui, the steep-to precipitous W entrance point of the bay which is marked by a light. Berthing facilities for Luda lie along the shore WNW of Huangbai Zui.

4.6 **Dalian** (38°55'N., 121°40'E.), a new port, is situated in Dalian Gang. Dayao Wan (39°01'N., 121°52'E.) and Dalian Xingang (38°59'N., 121°54'E.) are incorporated into the port.

Depths—Limitations.—Dayao Wan North Entrance Fairway has a minimum depth of 14.9m and can be navigated at high tide by vessels of up to 150,000 tons.

The port of Dayao Wan at Dalian has two container berths that can accommodate vessels of up to 35,000 dwt and two berths that can accommodate vessels of up to 25,000 dwt. The terminal can accommodate vessels of up to 70,000 tons at the combined quayage of Berths No. 17 and No. 18, which has a total length of 793m and an alongside depth of 16m. The turning area fronting these berths has a diameter of 600m and a depth of 15m. Vessels entering or leaving Berth No. 17 or Berth No. 18 should keep a radio watch on VHF channel 8.

A crude oil terminal, able to accommodate vessels of up to

300,000 tons, is under construction in Dalian Wan.

Pilotage.—Pilots may be boarded, as follows:

1. Dayao Wan Anchorage—centered on position 38°59'N, 122°01'E.
2. Oil Tanker Anchorage—centered on position 38°56'N, 122°01'E.
3. Cargo Vessel Anchorage—centered on position 38°54'N, 122°00'E.
4. Vessels proceeding directly to port—position 38°54'N, 121°56'E.

Regulations.—Harbor entry reports should be made 24 hours prior to arrival. Vessels departing or shifting berth must contact the VTS at least 4 hours prior to movement. Final reports should be made upon departure from the VTS area.

Commercial vessels are prohibited from transiting **Sanshan Shuidao** (38°54'N., 121°50'E.).

Foreign vessels are prohibited from transiting **Xiaosanshan Shuidao** (38°56'N., 121°50'E.), which lies between Xiaosanshan Dao and the mainland to the NNE.

Vessels should not exceed a speed of 8 knots within the harbor limits of Dalian.

Vessel Traffic Service.—Vessels entering Dalian Wan or Dayao Wan must report to Dalian Wan Vessel Traffic Service Center (VTS) and Dayao Wan Vessel Traffic Service Center (VTS), respectively. The position reporting line for both traffic reporting systems is a continuous line drawn in an arc with a 12-mile radius from Dasanshan Dao Light.

Dalian Wan VTS controls the area W of Dasanshan Dao Light. Dayao Wan Traffic Control directs vessels transiting the area E of Dasanshan Dao Light.

Anchorage.—Vessels of all classes can find shelter in Dalian Wan. Small vessels enter Dagushan Wan, a sheltered cove close N of Shanxi Tou, and, steering for a tomb at the head of the cove on a heading of 080°, come to anchor, in 10.1m, when Shanxi Tou bears 180°.

Yuan Dao (Yuan Tao) (38°40'N., 122°10'E.), about 19.5 miles SE of Dasanshan Dao, is a small steep-to isle which, reported radar conspicuous at a distance of 17 miles, constitutes the farthest seaward danger in the approaches to Dalian Wan.

The island, which is marked by a light and radiobeacon, has a rounded 60m high summit and is a yellow earthen color.

4.7 Luda (Ta-lien Chiang) (Dalian Gang) is a major sub-port contiguous with Dalian Wan. The principal alongside berthing facilities lie on the SW side of the bay and comprise several districts in which dredged basins, reclaimed land and breakwaters improve on natural features. Fou-t'ou Ch'u, the principal commercial district, lies sheltered behind breakwaters off the main part of Luda. Vessels up to 30,000 tons can be accommodated.

Winds—Weather.—Winds are from the N and NW during the year; in summer and spring, S and SE winds often occur.

Fog begins in the spring, usually occurring in the morning, and continues until September. July is the month of the most frequent occurrence of fog.

Ice.—The ice season normally lasts from the early part of January to the beginning of March. In very cold weather, ice floes may consolidate into a continuous sheet of ice over the whole of the outer harbor, but icebreakers have no difficulty in keeping the berthing area open.

Tides—Currents.—The tides in the harbor are usually semidiurnal with an average range of 2.3m at neaps and 2.9m at springs.

Tidal currents in Dasanshan Shuidao set SW on the flood tide and NE on the ebb tide, with rates up to 2.5 knots.

Depths—Limitations.—Siergou Qu (38°55'N., 121°41'E.) is the work area between 1.25 and 2.75 miles WNW of Huangbai Zui. Pier No. 2 lies near the E limit of the area. Pier No. 1, lying 0.35 mile W, is reserved for vessels loading and unloading dangerous goods and bean oil. The piers in this work area have reported depths alongside of 7.6 to 7.9m and can accommodate four 10,000 ton vessels.

Dagang Qu (38°56.5'N., 121°39.0'E.) is the work area immediately W of Siergou Qu and is the main berthing area. It is protected by breakwaters giving vessels access from the E. The N and W entrances, closed by ice booms from early December to the middle of March, are used by small craft.

Dagang Piers extend from the S shore of the area in succession from E to W and are separated from one another at their root by Pier A, Pier B, and Pier C. There are depths reported alongside the piers of 7.6 to 10.7m, which can accommodate eighteen 10,000 ton vessels. A container terminal for vessels up to 16,000 dwt and a draft of 9.1m is located at Pier C; the terminal has 270m of berthing space.

Xianglujiao Qu is the work area immediately W of Dagang Qu. A channel, in which there is a depth of 7m leads through Xianglujiao Qu to two large piers on its W side. The N pier is used mainly for timber products. The S pier is used for general cargo operations.

To the N of the piers lies a small shipbuilding yard with lay-by berths. Xianglujiao has two piers with eight berths having depths between 7 to 8m alongside, for ships up to 10,000 dwt.

Ganjingzi Qu (38°57.4'N., 121°38.0'E.) is the work area NW of Dagang Qu. Ganjingzi Oil Pier is situated on the W side of the breakwater head, and it extends from the N side of the work area. The oil pier has two berths, one for vessels up to 100,000 dwt and the other up to 50,000 dwt tankers. The Coal Pier lies parallel to the oil pier 0.15 mile W of it, and there are two small piers within 0.5 mile of the main piers. Reclamation work was in progress in the vicinity. There are also two special purpose coal piers for vessels up to 10,000 dwt.

Regulations.—A Traffic Separation Scheme has been established in the entrance to Dalian Wan; this scheme has not been adopted by the IMO. A separation zone 0.3 mile wide extends 3.5 miles N from a position 38°50.0'N, 121°46.2'E, to a semicircular precautionary area. Lighted Buoy HO is moored at the N end of the separation zone. A narrow zone separating traffic lanes, 0.15 mile wide, extends N from the precautionary area for 2 miles. Lighted Buoy H1 is moored in the separation zone 0.8 mile N of the precautionary area. Lighted Buoy H2 is moored about 0.3 mile N of the N end of this separation zone.

Vessels of less than 20m length should use the inshore traffic zone. Vessels should report to Dalian Harbor Administration, port superintendent on entering Dasanshan Shuidao.

Vessels entering harbor and proceeding to Ganjingzi or Xaianglujiao areas should navigate in the appropriate traffic lane and turn W at Lighted Buoy H2; vessels leaving these areas should reverse the process.

Vessels proceeding directly to Siergou or Dagang area or to No. 1 Quarantine Anchorage, should show the day signal,

which is First Substitute above flag W. The night signal to be shown is three all round lights, white, red, red, vertically disposed.

Pilotage.—Pilotage is compulsory for foreign vessels entering and leaving the port. Pilots embark at the quarantine anchorages, as follows:

1. Tankers—3 to 5 miles ESE of the Oil Pier light.
2. Other vessels—1 to 4 miles E of Luda East Harbor entrance.

Pilotage is undertaken 24 hours, daily. The vessel's ETA should be sent 24 hours in advance, or on departure, from the last port of call. Subsequently any changes or delays in the ETA should be reported. The port has eight tugs. Some are dispatched as pilot boats to bring information and a boarding party to vessels at the cargo vessel anchorage.

Vessels should maintain a continuous listening watch on VHF channel 6.

Outbound vessels should report when passing Lighted Buoy HO.

Regulations.—Vessels are only permitted to enter Dalian Wan through Dasanshan Shuidao, the channel between Dasanshan Dao and Huangbai Zui.

Dalian Wan Vessel Traffic Service regulations apply to the port. Vessels should report their positon when passing Lighted Buoy HO.

Signals.—A signal station stands at the NW corner of Pier No. 2. It was reported that the following night quarantine signals were in use:

Signal	Meaning
Red light over white light.	Normal request for pratique.
Three vertical red lights.	Quarantine inspection requested.
Red, red, white, red lights vertically disposed.	Infected vessel.

The following traffic signals are displayed:

Signal	Meaning
Ball over numeral pennant(s).	Vessel arriving for indicated berth.
Cone, point down, over numeral pennant(s).	Vessel leaving indicated berth.
International Code Flag N, with numeral pennant(s) above and below.	Vessel moving from above indicated berth to below indicated berth.

Anchorage.—Vessels can anchor, in 7.4 to 11m, mud, throughout Ta-lien Chiang. No. 1 Quarantine Anchorage (Cargo Vessels) is the area, indicated on the chart, lying between 3 miles NE and 3 miles NW of Huangbai Zui. It has depths of 8 to 12m, soft mud. The holding ground is not good, vessels must be aware of winds between SSE and ENE, which cause a long swell. Ships with a draft of more than 8m should not anchor W of the 10m depth line.

Small vessels anchor, in 7.4m close off the N breakwater sheltering Fou-t'ou Ch'u. Vessels are advised to use caution when using this anchorage; unmarked and unlit floats associated with seaweed cultivation may be encountered.

No. 2 Quarantine Anchorage, indicated on the chart, is centered in a position about 4.5 miles NNE of Huangbai Zui. It has depths of 9 to 12m and is sheltered from N to NE winds.

The Quarantine Anchorage (Oil Tankers) lies immediately W of No. 2 Quarantine Anchorage. It has depths of 8 to 9m and is also sheltered from N to NE winds.

Ships requesting anchorage should contact Dalian Xingang Signal Station 1 hour prior to entering the port and anchor as directed.

4.8 Daliangang Xingang Crude Oil Terminal (38°59'N., 121°54'E.) consists of a concrete platform connected to concrete dolphins flanking it on each side. The whole structure is 420m long. There are two berths; one is for VLCCs and the other for Suez-Max vessels.

No. 1 Berth, on the outside, is 360m long with an alongside depth of 17m and can accommodate one vessel up to 100,000 tons with a draft of 15m. Vessels berth port side to, letting go the starboard anchor about 30m off.

No. 2 Berth, on the inside, is 230m long with an alongside depth of 14m. It can accommodate one vessel up to 50,000 tons with a maximum draft of 12m.

Vessels intending to anchor here should notify Dalian Xingang Signal Station via VHF 1 hour in advance. Anchor berths have been established, as follows:

Berth	Position
1	38°57.8'N, 121°56.5'E.
2	38°57.7'N, 121°57.2'E.
3	38°57.2'N, 121°56.7'E.
4	38°57.0'N, 121°55.9'E.
5	38°56.6'N, 121°55.4'E.
6	38°56.5'N, 121°56.2'E.
7	38°56.0'N, 121°55.2'E.

Nanshan Zui to Laotieshandong Jiao

4.9 Nanshan Zui (Nan-shan Tsui) (38°52'N., 121°41'E.) is a low steep-to point lying at the SE extremity of the hilly peninsula sheltering the W side of Dalian Wan. Foul ground, on which there is an islet 14m high and a rock 10m high, extends 0.25 mile SW of the point. The coastline between Nanshan Zui and Laotieshandong Jiao, about 28 miles WSW, forms the S littoral of Kuan-tung Pan-tao (Kwantung Peninsula), the hilly SW extension of Liodong Bandao. The coast is steep-to and largely clear throughout, except for several steep-sided islets and off-lying rocks lying scattered to the E. Kuan-tung Pan-tao is reported radar conspicuous at a distance of 25 miles.

Yu Yan (Gu Gan) (38°35'N., 121°36'E.), marked by a light and racon, is a low steep-to islet which, appearing as a group of low rocks from the S, lies about 17 miles SSW of Nanshan Zui and constitutes the farthest seaward danger in the approaches

to Kuan-tung Pan-tao. A rocky shoal, with a depth of 5m, extends 1 mile NE of Yu Yan. The islet has been reported to lie about 0.5 mile SW of its charted position.

Lushun (Lu-shun) (38°47'N., 121°15'E.) (World Port Index No. 60240) is a minor port having an inner harbor consisting of a small landlocked bay well-sheltered throughout by low-lying hills and an outer harbor consisting of an open roadstead.

The inner harbor, entered through a narrow deepwater channel, is divided into two sections. Hsi Kang (Nishi Ko), the W section, is largely choked by drying mud flats. Tung Chiang, the E section, is an artificial basin which, quayed on all sides, is normally used by naval vessels.

Winds—Weather.—The basin has general depths of 7.3 to 8.8m which can be reduced by as much as 1.5m during continuous strong N winds.

Ice.—Ice occurs from January to March.

Depths—Limitations.— Nine vessels can be moored along the walls of the basin, with depths of 6.4 to 8.8m.

Aspect—Lu-shun (Ryojun) (Port Arthur) is a populous community lying on both sides of a small river entering the N side of Hsi Chiang.

Signals.—Vessels, intending to transit the entrance channel, are cautioned that natural features often screen vessel movement within the inner and outer harbors and, in consequence, are advised that traffic signals controlling vessel movement are displayed from the signal station atop Lao-hu-wei Shan, a barren rounded hillock backing the W entrance point of the channel.

Anchorage.—Vessels can obtain anchorage 0.5 to 0.75 mile S of the W entrance point to Lushan Gang, in a depth of 10m; however it is exposed and onshore winds can create a heavy sea. Pilotage is compulsory.

Liaodong Wan—Laotieshanxi Jiao to Ta-ch'ing Ho

4.10 Liaodong Wan (Liao-tung Wan) (40°30'N., 121°30'E.), the smaller constituent part of the extensive inland sea opening out to the W and N of Bo Hai Haixia, is a large body of water lying, by definition, to the N of a line between Laotieshanxi Jiao and the entrance to Ta-ch'ing Ho. Depths throughout are largely shoal and rarely exceed 29.2m.

Liaodong Bandao Bay is entered between Xizhong Dao and **Xiaolongshan Dao Light** (38°58'N., 120°59'E.) and is continued to the E by the inlet Pulantien Chiang.

Tides—Currents.—The current sets fair through the channel. Off Ch'ang Tao, the flood begins about 1 hour after LW and continues about 7 hours. The ebb begins about 2 hours after HW. Flood and ebb currents each reach maximum velocities of l.25 to 2.75 knots, occurring 3 hours 30 minutes and 4 hours after HW and LW water, respectively.

Pilotage.—The Suizhong pilot boarding area is located in position 40°00.6'N, 120°02.8'E.

Anchorage.—Vessels, seeking shelter from all but W wind, anchor as convenient throughout the bay. Smaller vessels anchor in the lee of the various islands. Vessels enter Liaodong Bandao and anchor, in 6.4 to 9.2m, close NW of Cb'ang Tao and, in 5.5 to 11.m, close W of Po-chi Tao. Vessels enter Liaodong Bandao channel with a draft of 5.5m at HW and 3.7m at LW. Gale force winds can cause a water level fluctuation of as much as 0.6m.

In Fuzhou Wan, vessels anchor, in 8.2m, mud bottom. Small vessels anchor farther to the E. Vessels seeking shelter from all but W winds, anchor as convenient, in less than 14.6m, good holding ground of sand and clay, S of Changxing Dao in Hulushan Wan.

Caution.—Work is in progress in Changxing Dao toward the construction of a large facility intended for shipbuiliding, ship repairs, and vessel dismantling; the facility is expected to become operational in 2012.

4.11 Laotieshanxi Jiao (Lao-t'ieh-shan-hsi Chiao) (38°44'N., 121°08'E.) is a steep-to rounded point lying at the SW extremity of Kuan-tung Pan-tao, the hilly SW extension of the larger peninsula Liodong Bandao. A light is situated on the SW slope of Laotieshanzi Jiao. The coastline between the point and the entrance to the river Ta-ch'ing Ho, about 110 miles WNW, recedes in general to the NE and delimits a coast diverse in character. The SE coast is largely low-lying and consists of a coastal plain which, interrupted by numerous bold headlands, rises to the rounded foothills on the foreslopes of the mountain range within the interior of Liaodong Bandao. There are numerous shoals in the offshore area. The NE coast is the low, swampy seaward limit of a vast level to undulating plain which, traversed by several large silt-laden streams, extends better than one hundred miles inland. The offshore area is shoal well seaward and has drying coastal mud flats extending as far as 12 miles offshore. The NW coast is predominantly low and consists of a well-cultivated coastal plain rising to hills some 5 to 11 miles inland. The offshore area is shoal and has, in its NE part, wide margins of drying coastal mud flats.

4.12 Yingkou (40°41'N., 122°14'E.) (World Port Index No. 60220), about 128 miles NNE of of Laotieshanxi Jiao, is a port lying close inside the entrance to Liao Ho (Ryo Ga), a sluggish river which, originating with the confluence of two rivers some 295 miles to the NNE, traverses the lowlands at the head of Liaodong Wan before reaching the sea through wide margins of drying mud flats. A bar of hard sand obstructs the river entrance about 13 miles downstream from the berthing facilities at Yingkou. Ice closes the river from about mid-November to mid-April.

River water levels fluctuate seasonally, being highest in the rainy season (July and August) and the period of melting snow (March and April) and then lowest in autumn. Water levels over the bar similarly fluctuate and, during the greater part of the navigation season (i.e. June to November), average 5.5m at HWS and 4.9m at HWN.

Winds—Weather.—Winds from the S raise the water level and from the N decrease it. Depths within the river and over the bar are affected by silting. In general, vessels able to cross the bar can proceed to Yingkou, provided it does not exceed a length of 143m during the months of June to September or exceed a length of 130m during April, May, and October.

Ice.—Floating ice and drift ice may affect vessels in the fairway and at anchor during the ice period. The port of Yingkou, which may be closed in extreme conditions, has icebreakers or ice-breaking resources, as well as rescue and assistance authorities.

Tides—Currents.—Seaward of Liao Ho bar, the flood sets

first NNW, then N and NNE. At the bar, the flood sets N and the ebb S with a velocity of 2 to 4 knots. The flood begins when the water level over the bar increases 0.3 to 0.6m and sets upstream 4 to 5 hours. The ebb begins when the water level decreases a similar amount and sets seaward 7 to 8 hours.

Depths—Limitations.—There are nine berths in Yingkou harbor. Four wharves with five general cargo berths are available. Three berths are capable of accommodating 3,000-ton class vessels and two berths for small vessels of the 500-ton class. Three new berths have recently been completed, two for 3,000-ton class vessels and one for 1,000-ton class vessels. Larger vessels can be handled at the outer anchorages.

Pilotage.—Pilotage is compulsory. Pilots board vessels in the quarantine anchorage, in the vicinity of **Yingkou Light Vessel** (40°31'N., 121°59'E.).

Vessel Traffic Service.—Yingkou Vessel Traffic Service (VTS) has been established in Yingkou. The VTS operates in the area extending a radius of 20 miles from Tazi Shan Light (40°18'N., 122°06'E.). The VTS is comprised of Tazi Shan Radar Station and Yingkou VTS Center. The VTS Center may be contacted on VHF channel 69. Participation in the VTS is mandatory.

Vessels should report to the Yingkou VTS on VHF channel 69, as follows:

1. Position Report—On entering the VTS area and on arrival at No. 1 Lighted Buoy (40°32'N., 122°01'E.), stating the following information:
   a. Vessel name.
   b. Nationality.
   c. Call sign.
   d. Draft.
   e. Vessel characteristics.
   f. Last port of call.
   g. Cargo.
   h. Pilotage required.
   i. Cargo operations plan.
   j. Navigational intentions.
2. Anchoring Report—Vessels should report their position and time of anchoring within the VTS area. This information should also be reported to Yingkou Maritime Department via VHF channel 9.
3. Plan Report—Vessels should report any intended action or movement within the area at least 30 minutes prior to commencement.
4. Variation Report—Vessels should report any change to navigation or anchoring plans.
5. Accident Report—Emergency situations, vessel traffic incidents, or conditions of pollution must be reported.
6. End Report—Vessels must report completion of action or departure from the VTS area.

Vessels in port must maintain a continuous listening watch on VHF channel 69.

Yingkou VTS will provide information regarding vessel movement, condition of aids to navigation, hydrology and meteorology, and navigation warnings upon request or when deemed necessary by the VTS Center.

Navigational or emergency assistance may also be rendered upon request by the VTS.

Anchorage.—The anchorage off Yingkou can accommodate vessels up to about 4,500 tons. Vessels moor in two lines parallel to the bank. The bottom is soft mud and the holding ground is not very good. The preferred holding ground is below the Customs House.

A general anchorage area lies in that part of the river between positions 1 mile below and 1 mile above the Customs House (40°40.7'N., 122°15.5'E.). The explosives and quarantine anchorage is situated 1 mile below this general anchorage.

Vessels carrying mineral oil anchor as directed by the harbormaster.

Directions.—The proximity of shoal water on each side of the approach, and the absence of landmarks, make it advisable to obtain a good landfall to the SSW before making the approach.

Angang Bayuquan (40°20'N., 122°08'E.) is an area undergoing development (2009) and lies close N of the Bayuquan harbor limits. A channel, marked by lighted buoys, with a least depth of 9.4m, leads 7 miles SE from Yingkou harbor to the new development.

4.13 Bayuquan (40°18'N., 122°05'E.) (World Port Index No. 60230), lies close SE of Yingkou on the E side of Liaodong Bay. The harbor handles cargoes of timber, various ores, and steel.

Depths—Limitations.—There is a least depth of 14.5m in the fairway and on the alignment of the leading lights in the approaches to Bayuquan.

There are 20 berths in Bayuquan harbor with alongside depths of 9.5 to 12.5m. Seventeen berths can handle vessels of 10,000 to 50,000 tons, two berths can accommodate vessels of up to 5,000 tons, and one berth is limited to vessels of up to 2,000 tons.

Pilotage.—Vessels board the pilot at the quarantine anchorage, which lies about 5.5 miles NW of the head of the N breakwater, and has depths of 6 to11m, mud. Pilots also board in the following positions:

a. 40°18'25"N, 121°54'03"E.
b. 40°17'49"N, 121°58'03"E.
c. 40°15'18"N, 121°48'33"E.

Anchorage.—Anchorage, in depths of 13 to 15m, mud and sand, may be taken in the anchorage area, marked by a buoy at its center, in position 40°21.7'N, 121°52.9'E. Lesser depths are found about 4 miles NE of the anchorage, due in part to the dumping area established in position 40°22.6'N, 121°59.3'E.

Xiamen Dao (40°13'N., 121°57'E.), an island of reclaimed land, lies 8 miles SW of Bayuquan. An oil pier, protected by a breakwater to its S, is marked by lights at its N and S ends. It is reported (2009) that the pier can accommodate tankers of up to 30,000 dwt.

4.14 Huludao Gang (Hu-lu-tao Chiang) (40°42'N., 120°59'E.) (World Port Index No. 60210), about 120 miles N of Laotieshanxi Jiao, is a small man-made seaport, enclosed by a breakwater, lying on the S side of a hilly finger of land extending several miles seaward and terminating in Huludaogao Jiao (Hu-lu-tao-kao Chiao), a precipitous rock-fringed promontory.

Winds—Weather.—Winds from the S and SW are common during spring and summer, E winds less so. Fresh winds from the E send a heavy swell into the harbor and frequently render alongside berths untenable.

Ice.—The harbor freezes over from December to March.

Depths—Limitations.—Berths are available alongside the quay wall at the W end of the harbor, or at the two piers extending E from the wall. A total berthing length of 1,707m is available, with alongside depths of 5.7 to 9.1m. A tanker berth, 101m long, with an alongside depth of 8.8m, lies on the N side of the breakwater.

Aspect.—A light is situated on Huludaogao Jiao. Range lights, aligned 324°, lead into the harbor.

Pilotage.—Pilotage is compulsory.

4.15 Jinzhou (40°45'N., 121°06'E.) (World Port Index No. 60215) is a new port with three 10,000 dwt class berths for general cargo ships and two 5,000 dwt class berths for tankers. As many as 30 new berths are now being built.

Depths—Limitations.—The entrance channel is reported to have a least depth of 11m, is 85m wide, and approximately 4 miles long. The channel is marked by range lights and buoys.

Pilotage.—Pilots board at the quarantine anchorage in the vicinity of 40°42.4'N, 121°06.5'E. Arrivals and departures are during daylight hours at HW.

Anchorage.—The No. 2 Anchorage is centered on position 40°33.0'E, 121°26.5'E, and has a 1 mile radius. Number 3 Anchorage, also 1 mile in radius, is centered in position 40°15'N, 121°22'E.

4.16 Qinhuangdao (Ch'in-huang-tao) (39°56'N., 119°37'E.) (World Port Index No. 60200) is a principal coal-exporting port which lies on a generally featureless coastal plain about 100 miles NW of Laotieshanxi Jiao.

Ice.—Ice conditions occur from January to mid-February. During this time, NE winds may bring a large amount of drift ice from the head of Liaodong Wan.

Tides—Currents.—The range of tides is 1.1 to 1.5m at springs and 0.7 to 1.1m at neaps. South of the harbor, the flood tide sets W and the ebb tide E, at a maximum velocity of 1 knot.

Depths—Limitations.—Big Pier, the outer breakwater, curves SW from a position 0.25 mile SW of **Nanshan Tou** (39°55'N., 119°37'E.), a bluff on the E side of the harbor. The inner side provides berthing facilities. Small Pier lies 0.15 mile NW of Big Pier.

The Original Fairway, which leads to these piers, starts 1.75 miles seaward of Big Pier, is 100m wide, 9.4 to 10.4m deep, and is marked by range lights, in line bearing 352.5°.

New Pier, an L-shaped wharf, lies 0.3 mile NW of the head of Big Pier. Range lights, bearing 310°, lead to the New Pier by way of the West Fairway. There are 13 berths for container and cargo vessels of 35,000 dwt.

Alongside depths in the main harbor area are reported to be from 4.9 to 9.7m. The bottom is very soft mud.

The East Fairway, 2 miles long and dredged to 10.7m, is marked by range lights bearing 011°. This channel leads in a NNE direction to the Oil Harbor.

The approach fairway has depths of 12 to 13.5m and is marked by range lights in line bearing 340°.

An oil jetty, extending 1 mile SSE from the shore 2 miles ENE of Nanshan Tou, forms the E side of Oil Harbor. Two piers with berths for tankers extend WSW and SSW from Oil Jetty and there is a berth on the W side of the jetty at its S end. A light is situated from the head of each pier.

Qinhuangdao Taishan Chemical quay has four berths. Berths Nos. 1 and 2 have a combined length of 368m and an alongside depth of 9.5m; vessels of up to 10,000 tons can be accommodated. Berths Nos. 3 and 4 have a total length of 264m and an alongside depth of 9.5m; vessels of up to 5,000 tons can be accommodated.

Berth 105 at Qinhuangdao Gang handles oil products and liquid chemical products. The berth is 200m long, has an alongside depth of 9.8m, and can accommodate vessels of up to 5,000 tons.

The port has a total of 11 coal berths, and 100,000 dwt vessels can be accommodated. Tankers up to 50,000 dwt can be accommodated.

Aspect.—Jinshan Zui, a low point about 7 miles SW, contains many large prominent buildings, is surrounded by wooded hills, and is marked by a light. **Damuzhi Shan** (40°07'N., 119°26'E.), 15 miles NNW of the harbor, is 1,350m high and is a good mark from the SE. If the peak is obscured, the bluffs at Jinshan Zui will be the first objects to be identified.

Ch'ang Ch'eng ("Great Wall of China") reaches the sea at the village Ninghai, about 9.5 miles ENE, and often shows up well before disappearing from view behind a coastal ridge.

Pilotage.—Pilotage is compulsory. Pilots board in the three anchorage areas and are available 24 hours.

Anchorage.—West Anchorage, East Anchorage, and Oil Tanker Anchorage lie just outside the harbor limit S and SE of Nanshan Tou. They are best seen on the chart.

Caution.—The tidal current on the falling tide appears to sweep around Qinhuangdao Wan and set across the entrance between New Pier and Big Pier. Care must be taken not to be swept onto the latter.

Bo Hai—Hai Ho Above Tianjin Xin Gang

4.17 Dagu Tanggu (38°58'N., 117°40'E.) (World Port Index No. 60180) is a port complex extending about 8 miles upstream from the entrance to Hai Ho. It joins the berthing facilities of the communities Dagu and Tanggu and includes Dagu Reach, Windy Reach, Tanggu Reach (Tanggu Chihtuan), Powder Reach (P'ou-ta Chih-tuan), Sinho Reach (Hsin-ho Chih-tuan) and part of Fa-men Chih-tuan (Farm Reach). Dagu, on the right bank of the river at Windy Reach, is of little commercial importance.

Tanggu, on the left bank upstream from Tanggu Reach, is a rail terminal with connections to Tianjin and Tianjin Xin Gang.

Depths—Limitations.—There are numerous wharves at Dagu and Tanggu, some of which have a berthing length of over 305m. This area includes wharves equipped for handling oil, coal, and salt. Depths alongside depend on the slices at the dam across the river mouth but are estimated to be from 4 to 5.2m. There is accommodation at Tanggu for three 5,000 ton vessels and two 3,000 ton vessels.

Tianjin Binhai (39°01'N., 117°34'E.) is an oil and chemical terminal with two berths having alongside depths of 4.5m. The terminal can accommodate vessels of up to 3,000 tons.

Signals.—Vessels wishing to turn around, proceed to the area of the customhouse in Tang-ku Reach and display, when intending to swing above the customhouse, a black ball over the code pennant from the International Code of Signals and, when

intending to swing below the customhouse, a black ball under the code pennant.

4.18 Huanghua (38°19'N., 117°40'E.) handles coal, cement, and construction materials. There are two channels leading to the port area.

Ice.—Ice forms from early December to March and usually extends approximately 3 miles from shore.

Depths—Limitations.—The channel within the harbor basin has a depth of 4.6m and a width of 60m. The channel leading seaward has depths of 3.8 to 4.6m.

The port has four berths; the largest is 280m in length, with a depth alongside of 14m. Two berths can accommodate vessels up to 3,000 dwt; two berths can handle barges up to 1,000 dwt.

Pilotage.—Pilotage is compulsory for foreign vessels. Pilots, who board in Anchorage No. 1 and Anchorage No. 2, are available 24 hours.

Regulations.—Huanghua VTS is in operation within the area of an arc extending a radius of 28 miles from the S breakwater beacon erected in position 38°20'N, 117°55'E.

Vessels must maintain a continuous listening watch on VHF channel 8 when within the VTS area. Communication with the control center is also made on VHF channel 8.

The Huanghua VTS Center must be contacted 24 hours before ETA or ETD and the following information reported:

1. Vessel name.
2. Nationality.
3. Call sign.
4. Draft, beam, loa, and grt.
5. Last port of call.
6. ETA.
7. Type and quantity of cargo.
8. Number of crew and passengers.

Vessels are required to subsequently report vessel name, nationality, ETA, and navigation intention to the Huanghua VTS Center prior to entering the VTS area.

A vessel's next port of destination must be reported prior to departure from Huanghua.

Vessels that anchor within this regulated area must report all of the information listed and, in addition, time of anchoring and anchored position relative to the S breakwater beacon.

Permission to execute operations must be granted by the VTS Center a minimum of 20 minutes in advance of arriving alongside the berth, shifting berth, departing from the berth, or engaging in any other operation related to safety of navigation. Completion of operations must subsequently be reported. Reports should state the following:

1. Vessel name.
2. Time of arrival or departure from the berth or anchorage.
3. Position.
4. Port of destination.

Vessels carrying passengers must report their updated sailing plan and include the number of passengers at least 20 minutes prior to departure.

Vessels must immediately report any changes to their sailing plan or anchoring position.

Vessels must report to the VTS when proceeding into or departing from the fairway within the area.

Vessels engaged in towing, bunkering, supplying water, or transhipment must make application, report a sailing plan, and obtain permission from the VTS 20 minutes in advance of commencing operations. A report is required upon completion of operations.

Vessels involved in a maritime accident, pollution accident, or other urgent situation within the VTS area must immediately report to the VTS Center via VHF channel 8 or other effective means.

Huanghua will provide vessel movement information, hydro/meteorological information, status on aids to navigaiton, navigation warnings, notices to mariners, or other pertinent information upon request.

Information is transmitted by scheduled daily broadcasts in both English and Chinese on VHF channel 8.

Anchorage.—Two anchorages, each pilot and quarantine anchorages, lie ENE of the harbor entrance. Dagukou North Anchorage has depths of 6 to 14m, mud. Dagukou South Anchorage has depths of 11 to 16m.

Caution.—Dangerous wrecks, each marked to the N by a lighted buoy, lie in the middle and on the SW edge of the anchorage.

A spoil ground, with a radius of 1,000m, is reported to temporarily established, until 6 July 2013, in position 38°34.6'N, 118°05.0'E.

Tianjin Xin Gang (39°00'N., 117°42'E.)

World Port Index No. 60190

4.19 Tianjin Xin Gang (T'ien-ching-hsin Chiang), lying close N of the dam closing the entrance to the river Hai Ho, is the deepwater harbor for Tianjin. It is one of the leading ports in North China, with more than 104 commercial berths.

Winds—Weather.—The winds in spring and autumn are usually from the SW. In the summer, SE winds prevail while in the winter, winds from the NW predominate. Wind velocities are stronger in April and May and subside from August to September. Fog sometimes hinders port operations in January.

Ice.—Ice conditions occur from early December to March, but usually does not interfere with port operations.

Tides—Currents.—The tidal range is about 3.5m at springs and 2m at neaps.

Tidal currents in the approach channel set in the direction of the channel when the mud flats in the approach are uncovered at an average rate of 0.75 knot.

When the flats are covered, currents set across the channel, approximately parallel to the coast, setting N during the flood tide and S during the ebb tide, with a maximum rate of 2 knots at springs and 1 knot at neaps.

Depths—Limitations.—Xingang main channel has a least depth of 13.8m. The channel, which is entered about 2 miles E of Dagu Light (38° 56'N, 117° 59E), is marked by lighted beacons and lighted bouys at regular intervals. Breakwaters, the outer parts of which are visible only at LW, flank each side of the channel. There are lesser depths in the approaches to the inner harbor.

There are 62 operational berths, with a total berthing length of 11,243m, having depths alongside of 7.1 to 22.5m. Tianjin can accommodate vessels of up to 80,000 dwt at the majority of the berths and 300,000 dwt at the crude oil terminal.

Tianjin Gang Jiayae Grain and Oil Terminal (38°56'N., 117°48'E.) has a berth 310m long, with an alongside depth of 16m; vessels of up to 100,000 dwt can be accommodated.

Beifang Ganghang Oil Quay is 300m long and has an alongside depth of 12.5m; vessels of up to 30,000 tons can be accommodated.

Tianjin Gang International Cruise Terminal (38°59'N., 117°49'E.) has two berths, Y1 and Y2, with a combined length of 625m amd a depth alongside of 11.5m. Passenger ships and ro-ro vessels of up to 200,000 grt can be accommodated at this terminal.

There is a container terminal, Pier No. 3, with a usable pier length of 361m and depths of 10.5 to 11.6m alongside.

Tianjin Gang Berth Nos. 27-29 have a combined length of 825m and an alongside depth of 16m; the turning area has a depth of 15.5m.

Tianjin Gang Sinochem Sinopec Terminal (38°57.5'N., 117°45.7'E.) is a crude oil and chemical pier with two berths. Berth S No. 32 is 180m long, with a depth alongside of 13.5m; vessels of up to 30,000 dwt can be accommdated. Berth S No. 33 is 329m long, with a depth alongside of 14.5m; vessels of up to 50,000 dwt can be accommdated.

Tianjin Gang Ou-Ya International Container Quay contains three berths. Each berth has a depth alongside of 18m. Berths N7, N8, and N9 have a total quay length of 1,100m; vessels of up to 150,000 dwt can be accommodated.

Tianjin Gang Global Roll On-Roll Off Quay has an alongside depth of 11.6m, is 580m long and contains two berths, N13 and N41; vessels of up to 50,000 dwt can be accommodated.

The general purpose berths in the Industrial Port have a combined length of 479m and depths of up to 7.8m alongside. Berth 1A, which extends from the general purpose berths, has a length of 200m and an alongside depth of 11m; vessels of up to 20,000 tons can be accommodated.

No. 5 Liquid Chemicals Quay, in the Industrial Port, is 121.5m long and can accommodate vessels of up to 5,000 dwt.

Heng Tou Wharf, on the E side of the Tianjin Gang Pier, has a length of 367m and a depth alongside of 5.5m. Tthe wharf is primarily used by tugs and pilot boats, water vessels, crane vessels, environmental protection vessels, fire-fighting vessels. and communication vessels.

Aspect.—The land in the vicinity of Tianjin Xin Gang is low, flat, and not readily identifiable.

The harbor consists of an artificial basin dredged out of the extensive margin of drying mud flats fronting the NW shore of Po Hai and the entrance to Hai Ho. The harbor is sheltered to the N by a mole extending about 2.8 miles seaward. A partially-submerged breakwater continues about 2 miles farther seaward. It is protected to the S by a short training wall and by a partially-submerged breakwater which lies about 6 miles ESE. Drying mud flats fill the area between the training wall and the breakwater.

Pilotage.—Pilotage is compulsory and available 24 hours. The master should forward the vessel's ETA 72 hours, 48 hours, and 24 hours prior to arrival. The pilots may be contacted on VHF channels 10 and 12.

Request for pilotage should include the vessel's salt water and fresh water drafts. The pilot boarding positions are, as follows:

1. Vessels of 100,000 gt and over—in the pilot and quarantine anchorage, centered approximately in position 38°50'N, 118°11'E.
2. Vessels with a draft of less than10.5m may—in Dagukou North Anchorage, centered approximately in position 38°57'N, 118°04'E.
3. Tankers and bulk carriers with a draft of less than 8m—in the tankers and bulk chemicals anchorage area, centered approximately in position 38°55'N, 117°58'E.
4. Vessels carrying dangerous cargo and having a draft of more than 8m, and other vessels having a draft of greater than 10m—in Dagukou S Anchorage, centered approximately in position 38°54'N, 118°03'E.
5. Vessels transiting Dengta Beihangdao to Tianjin Xin Gang main channel board, as follows:
   a. Position 38°53'15"N, 118°10'15"E.
   b. Pilot Boarding Area No. 1, in the vicinity of Lighted Buoy No. 27 (38°57'N., 117°57'E.).
   c. Pilot Boarding Area No. 2, in the vicinity of Lighted Buoy No. 19 (38°56'N., 118°01'E.).
   d. Pilot Boarding Area No. 3, in the vicinity of Lighted Buoy No. 11 (38°55'N., 118°06'E.).
6. Vessels bound for Dagusha Hangdao—in position 38°54'42"N, 117°54'15"E.

The pilot station may be contacted on VHF channels 10 and 12.

Regulations.—Xingang Fairway is available for two-way traffic for vessels up to 10,000 grt. Limitations are routinely imposed for larger vessels, in dangerous conditions, or during bad weather.

All vessels within the VTS area should maintain a continuous listening watch on VHF channel 9.

The following navigation rules are in effect in the main fairway:

1. Only one-way traffic is permitted in the Tianjin Main Fairway under the following circumstances:
   a. When winds are greater than force 7, and combined beam widths of vessels meeting and passing, exceeds 75m, or the beam width of any single vessel exceeds 45m.
   b. When winds are greater than force 7, and combined beam widths of vessels metting and passing, exceeds 60m, and includes a vessels carrying dangerous goods.
   c. When winds are greater than force 7, and the beam of any vessel carrying dangerous goods exceeds 35m.

   The rules listed above apply to, but are not limited to, the following dangerous cargo:
      i. Explosives of 100 tons or more.
      ii. Dangerous chemicals as listed in Annex I to MARPOL 73/78.
      iii. Flammable liquids, with flash points of 23°C or lower, carried in bulk.
      iv. Flammable gases carried in bulk.
      v. Nuclear powered vessels, or vessels carrying nuclear fuel or nuclear waste.
   d. Vessels towing and being towed having a length of greater thatn 200m, or beams greater than 40m.
2. Speed limits must be observed in the fairway, as follows:
   a. Vessels W of Milestone 18+000 must not exceed a speed of 13 knots.

b. Vessels E of Milestone 18+000 must not exceed a speed of 15 knots.

c. The minimum permissible speed in the fairway is 5 knots.

d. Vessels of 150,000 tons or more must not exceed a speed of 10 knots.

3. Underkeel clearances must be observed, as follows:

a. Vessels of 250,000 tons or more must have a least under keel clearance of 13 per cent of the vessel's draft.

b. Vessels of 250,000 tons or more may have a least under keel clearance of 10 per cent of the vessel's draft if the vessel's speed is less than 8 knots.

Vessel Traffic Service.—A Vessel Traffic Service (VTS) has been established in Bo Hai and Tianjin Xin Gang. Pariticipation in the VTS is compulsory. The VTS area is covered by an area within an arc, known as the Gate Line, centered on an arc extending a radius of 20 miles from position 38°58.52'N, 117°47.20'E.

Vessels within the VTS area are divided into two groups, as follows:

1. Larger vessels—all foreign vessels, Chinese vessels 60m loa and greater, towing vessels 50m loa and greater, towing vessels with a beam of 15m and over, and vessels with special requirements.

2. Smaller vessels—Chinese vessels less than 60m loa, towing vessels less than 50m loa, and towing vessels with a beam of less than 15m.

Upon arrival at the Gate Line, vessels must report to the VTS Center (call sign: Tianjin VTS Center), on VHF channel 9, stating the following information:

1. Vessel name.
2. Nationality.
3. Call sign.
4. Draft.

Vessels should also report to the VTS Center on VHF channel 9, as follows:

1. Before entering the port.
2. Before leaving Ship Lock.
3. After berthing.
4. Before preparing to leave the berth.
5. After passing through Haimen Bridge.
6. After anchoring.
7. Before turning around in Xingang Fairway.

Anchorage.—Anchorage may be obtained in positions relative to Dagu Light (38°56'N., 117°59'E.) as follows:

North Anchorage, which is also a quarantine anchorage, lies 4 miles ENE of Dagu Light in depths of 6 to 14m. Caution must be exercised to avoid an obstuction lying on the mid-section of the S boundary. This anchorage is designated for vessels with drafts of less than 10.5m.

Dagukou South Anchorage lies 4 miles ESE of Dagu Light in depths of 11 to 16m. Caution is necessary to avoid a dangerous wreck, marked by lighted buoys, lying in the middle of the area. The anchorage is designated for dangerous cargo carriers with drafts exceeding 8m and for other vessels with drafts exceeding 10m. A spoil ground lies close N of this anchorage.

Bulk Chemicals Anchorage lies 1.5 miles S of Dagu Light in depths of 8 to 11m. A dangerous wreck, marked by a lighted buoy, lies 0.4 mile S of this anchorage. The anchorage is designated for bulk chemical carriers with drafts of less than 8m.

Vessels exceeding 100,000 grt can anchor 12 miles ESE of Dagu Light, in depths of 19 to 22m.

Each of the above designated anchorages serves as a pilot boarding area for the associated class of vessels.

Anchorage No. 6 lies 9 miles SSE of Dagu Light, in a depth of 12m.

Anchorage within a 1-mile radius of Dagu Light is prohibited.

Anchorage suitable for vessels of more than 150,000 tons, and sheltered from NE gales, may be taken 4 miles SW of Caofeidian Light. See the anchorage description in paragraph 4.20 for more information on this anchorage.

Good holding ground was reported 3.1 miles bearing 098° from the light, but otherwise the holding ground is very poor, and it is advisable to allow at least half a mile clearance of all anchored vessels. Winds are liable to be strong all year round and dragging anchor is quite common. With strong offshore winds, depths at the inshore end of the anchorage may be considerably less than charted; deep draft vessels should not anchor W of Dagu light tower. When the anchorage ices over, vessels may drag anchor from 5 to 10 miles in a day owing to the movement of the ice with the tidal streams. There are numerous submerged wrecks in the anchorage area and these can be a hazard for vessels dragging anchor.

Directions.—Vessels intending to enter Tianjin Xin Gang arrive at the seaward entrance of the dredged entrance channel about 2 hours before HW. The best time for crossing the bar is about 1 hour 30 minutes before HW. Crossing the bar itself should always be considered a hazard because of the continuous silting, in spite of the constant dredging, and the poor rudder control experienced.

Buoys marking the channel are in accordance with IALA Maritime Buoyage System (Region A).

Caution.—Several wells marked by lights, best seen on the chart, lie SSE of the charted anchorage area. There is a restricted area surrounding these wells.

4.20 Caofeidian (38°56'N., 118°32'E.), about 39 miles E of the entrance to Hai Ho, is a low weed-covered sand dune which is liable to shift or wash away. Fishing stakes extend 1.5 miles WNW. It is marked by a light, equipped with racon, on its SW extremity.

Caofeidian Tan is an extensive area of drying banks, with several small islets, that lies between Caofeidian and the mainland about 14 miles N. It should be approached with caution as it is fringed with irregular steep-to shoal patches and numerous fishing nets.

Tides—Currents.—Tidal currents along the S side of Caofeidian Tan set WNW, at a maximum rate of 4.5 knots, on the flood tide, and SE, at a maximum rate of 3 knots, on the ebb tide. On the W side of the banks the tidal current sets N on the flood tide and at a lesser strength.

Depths—Limitations.—Caofeidian began work on extensive port development in 2006. The construction will include more than 20 deep water berths, including coal berths for vessels of up to 100,000 dwt and oil and LNG berths for vessels of 10,000 to 300,000 dwt.

The two operational berths (2009) handle iron ore carriers of up to 250,000 dwt having a maxmimum length of 370m and maximum draft of 35m.

Pilotage.—Pilotage is compulsory and restricted to daylight hours only. Pilots may be contacted on VHF channel 16.

Pilots board, as follows:

1. No.1—position 38°52'51"N, 118°29'48"E.
2. No.1—position 38°54'08"N, 118°25'05"E.

Vessel Traffic Service.—Caofeidian Vessel Traffic Service (VTS) is in operation in the approaches to Caofeidian. Participation in the VTS is compulsory for vessels exceeding 500 tons transiting or operating within a 20-mile radius of Caofeidian Light (38°55'N., 118°31'E.). Vessels should comply with Rule 10 of the International Regulations for Preventing Collisions at Sea, 1972 and also the rules listed below. Vessels transiting the Caofeidian VTS must maintain a continuous listening watch on VHF channel 8.

Vessels should report to Caofeidian VTS, in Chinese or English, on VHF channel 8, as follows:

1. Vessels arriving within 2 miles of the VTS area should report the following:
   a. Vessel name, nationality, call sign, and IMO code (if applicable).
   b. Latitiude and longitude or position relative to a landmark.
   c. Draft.
   d. Last port of call.
   e. Destination port of call.
   f. Navigation intentions. (Vessels operating AIS are exempted from this line of the report.)
   g. Type and quantity of dangerous goods.
   h. Defects and limitations.
2. Vessels must report the following immediately after anchoring:
   a. Vessel name, nationality, and call sign.
   b. Anchor time and true bearing from Caofeidian Light.
   c. Length overall, beam, and draft.
   d. Last port of call.
   e. Stowage of vessel cargo.
   f. Other information as requested by the VTS.
3. Vessesl must notify the VTS by VHF channel 8 or any other means at least 20 minutes prior to any of the following:
   a. Arrival at the berth.
   b. Shifting berth.
   c. Departing from the berth.
   d. Departing from the anchorage.
   e. Commencing the trans-shipment of cargo.
   f. Conducting operations that may affect safety of navigation.
4. A follow-up report must be made upon conclusion of any of the operations listed above.
5. Any changes to sailing schedules or anchorage positions must be reported to the VTS.
6. Any vessel engaged in towing, bunkering, or transferring water or cargo must report to the VTS 20 minutes prior to commencing operations. A follow-up report must be made upon completion of operations.
7. Passenger vessels must report their schedule and number of passengers. A follow-up report should be made prior to departure from the port.
8. Vessels are required to advise the VTS of any safety measures undertaken within the VTS area and should report at least 10 minutes prior to commencing any of the following activities:
   a. Maintenance of main engine, steering gear, windlass, GMDSS, boiler, or other equipment affecting the ship's maneuverability.
   b. Vessel trials, main engine testing, or compass correction.
   c. Life-saving or firefighting drills.
   d. Fumigation.
9. Vessels having a pilot aboard should report to the VTS 10 minutes prior to entering or departing the port and include the following information:
   a. Name of pilot on board.
   b. Times of pilot embarkation and disembarkation.
   c. Vessel's position.
   d. Maximum draft.
   e. Navigation route.
   f. Other information as requested by Caofeidian VTS.
10. Vessels involved in maritime accidents, pollution incidents, or other urgent matters within the VTS must immediately report the incident to Caofeidian VTS.
11. Vessels should report the following to the VTS immediately upon encountering:
   a. Changes to navigation channels.
   b. Aids to navigation or navigational facilities out of position, missing, damaged, or compromised.
   c. Obstructions, drifting objects, or other conditions affecting safety of navigation.
12. Vessels departing the VTS area must immediately report to the VTS on VHF channel 8.
13. Vessels departing the VTS need only report the vessel name upon reaching the reporting lines.

Vessel movements, navigational warnings, current condition of aids ot navigation, and related information is broadcast by Caofeidian VTS in Chinese and English on VHF channel 8 at the following times:

a. 1100 to 1110 daily.
b. 1600 to 1610 daily.

The VTS may also provide information regarding other vessel movements, hydrometeorological information, aids to navigation, navigation warnings and other related services on request.

Caofeidian VTS may also be contacted for information regarding navigation assistance or advice. The traffic service will serve as the communication center in the event of rescue, pollution, or salvage operations.

Anchorage.—Anchorage, sheltered from NE gales and suitable for vessels of more than 150,000 tons, may be taken 4 miles SW of Caofeidian Light, in depths of about 24m. This anchorage is shared with vessels awaiting passage to Tianjin Xin Gang. Vessels bound for this anchorage should contact the Caofeidian Maritime Bureau on VHF channel 8 prior to arrival. Vessels should subsequently report their anchored position to the Tianjin Vessel Traffic Service Center on VHF channel 9, by telephone (86-22-25700692), or by other effective means.

Caution.—A spoil ground, the limits of which are best seen on the chart, is established in position 39°03.6'N, 119°06.0'E.

Hai Ho to Teng-Chou T'ou

4.21 Hai Ho (Pai Ho) (38°59'N., 117°43'E.), the small commercially important river emptying into the NW port of Bo Hai, has its origin within the metropolis T'ien-ching where, at a distance of about 27 miles inland, it emerges from the confluence of the waterways Pei-yun Ho and Tzu-ya Ho and where, at a distance of about 1 mile downstream, it receives the major tributary Wei Ho.

Yun Ho (Grand Canal), the world's longest artificial waterway, proceeds N from **Hangzhou** (30°15'N., 120°10'E.), enters Wei Ho about midway along its length, continues to Hai Ho and Pei-yun Ho where it reaches, at a distance of about 86 miles upstream from T'ien-ching, **Pei-ching** (Beijing) (Peking) (39°56'N., 116°24'E.), the administrative capital of mainland China.

The entrance to Hai Ho is closed by a dam. Ocean vessels enter the river through a lock 180m long and 21m wide located N of the dam. Vessels with a draft of 5.6m have passed through. Smaller vessels enter through a lock W of the dam. A third lock is located at the juncture with Wei Ho. Navigation by ocean-going vessels is impracticable on the several rivers and numerous tributaries feeding Hai Ho.

Caution.—Several wellheads and obstructions, some unmarked, are located in SW Bo Hai, E and ENE of the entrance to Huang Ho. Vessels are prohibited from approaching within 500m of the drilling rigs.

4.22 Laizhou Wan (37°20'N., 119°22'E.) is the southernmostt bay of Bohai Wan. The bay indents the coast between the mouth of Huanghe river, at its NW point, and continues to Longkou Gang at its NE point.

Laizhou Gang (37°24'N., 119°56'E.) lies on the NW coast of Shandong Bandao. The terminal handles bulk, general, passenger, and ro-ro cargo. The outer fairway to the port facilities has depths of 9.2 to 12.8m. Vessels of up to 200m in length, with a maximum draft of 9.5m and up to 10,000 dwt, can be accommodated. Pilots are available 24 hours and may be contacted on VHF channel 16.

4.23 Weifang Gang (37°15'N., 119°22'E.) is a new commercial port (2009), on the SE side of Laizhou Wan. The harbor is open to foreign trade, and protected by breakwaters which exhibit lights.

Depths—Limitations.—The approach channel has depths of 4 to 5m and is marked by lighted buoys.

There are seven berths with alongside depths of up to 7m at the jetty extending 5.5 miles N from the shore. Vessels of up to 3,000 dwt can be accommodated.

Pilotage.—Pilots board at the Laizhou pilot boarding area in position 37°31'30"N, 119°59'24"E.

Anchorage.—Vessels may take anchorage, as follows:

1. Anchorage No. 2 is a small anchorage centered in position 37°24'20"N, 119°15'00"E.
2. Anchorage No. 3 lies N of the approach channel, in depths of about 7m, centered approximately in position 37°23'N, 119°17'E.

4.24 Longkou Gang (37°38'N., 120°17'E.) (World Port Index No. 60170), about 25 miles SW of Teng-chou T'ou, lies close within the bay Lung-k'ou Wan and serves as one of the principal seaports for the inland city **Huang Xian** (37°38'N., 120°30'E.). It consists of an inner and outer harbor lying S of a low sandy isthmus which, extending about 5 miles E, terminates in a hilly promontory of which Qimu Jiao (Ch'i-mu Chiao) is the reef-fringed steep-sided rocky seaward extremity.

A partly drying sand bank fringes the S side of Qimu Jiao, and from it a sand spit extends SE across the bay. A dredged channel, nearly 3.5 miles long, gives access to the port area.

The port of **Longkou** (37°39'N., 120°20'E.), which is open to foreign shipping, handles cargoes of coal, salt, sand and general goods. Vessels of 10,000 dwt can be accommodated.

The approach channel from No. 1 Lighted Buoy (37°38.5'N., 120°16.4'E.) is marked by buoys in accordance with IALA Maritime Buoyage System (Region A).

Tides—Currents.—Tidal currents generally set SE on the flood tide and W on the ebb tide. The maximum rate does not exceed 1 knot.

Depths—Limitations.—The fairway has a least depth of 12.2m.

Two piers extend W from the shore. Berths 1 and 2 are used by tugs. Berths 3 and 4 have depths of 6.8m alongside and are equipped to handle sand and coal, respectively. Berths 5 and 6, on the N side of the S pier, also have depths alongside of 6.8m and handle general cargo ships and passenger ships, respectively.

Berth 7 through Berth 10 are on the S side of the N pier. Berth 7 and Berth 8 have depths of 4.5m alongside. Berth 9 and Berth 10, equipped to handle salt, have depths of 7.5m alongside. A chimney, 31m high, at the N end of town, is a good mark. Two beacons stand on the marshy ground about 2.5 miles and 3.5 miles E of the extremity of Qimu Jiao.

Pilotage.—Pilotage is compulsory and available 24 hours. The pilot generally boards in the following positions:

1. No. 1 (37°38'13"N., 120°10'27"E.).
2. No. 2 (37°40'32"N., 120°11'35"E.).

Vessels should send the vessels's ETA to the agent 72 hours, 48 hours, and 24 hours prior to arrival.

Anchorage.—The quarantine anchorage is bounded by latitudes 37°37.0'N and 37°37.8'N, and by longitudes 120°12.5'E and 120°13.9'E. The bottom, sand and mud, provides good holding ground.

It is planned to dredge the approach channel to allow vessels of 10,000 dwt to use the port. The S pier will be extended to provide two additional berths and a coal terminal for vessels of 10,000 dwt will be constructed at the N end of the port.

4.25 Luan-chia-k'ou (Davenport Point) (37°47'N., 120°37'E.), about 7 miles SW of Teng-chou T'ou, is the offshore extremity of a low, rocky headland which, fronted by shoal water, projects seaward to form a small bay to the E. A village lies at the head of the bay.

Small vessels anchor, in 7.3m, stiff mud, with Luan-chia-k'ou Chiao bearing 270° and with a white tower standing within the village in range 191°, with an artificial mound atop a low hill close to the S.

Teng-chou T'ou (37°50'N., 120°44'E.) is a reef-fringed steep-sided rocky headland having close E and W the sheltered small craft berthing facilities for Penglai, a small community about 1 mile to the S.

Pilots for Penglai are available in daylight only, and board at the quarantine anchorage in position 37°53'N, 120°52'E.

The quarantine anchorage has depths of 16.1 to 17.2m. Vessels with local knowledge can anchor, in depths of 5.5 to 11m, off the camber on the E side of Penglai Tou, but N winds create a heavy breaking sea which renders the anchorage unsafe.

The coastline between Tengchou T'\'ou and Chenshan Jiao, a point about 96 miles ESE, is very irregular and much indented by several bights, inlets and lagoons and by numerous small bays and coves. Inland, the terrain is low and consists of a well-cultivated, level to rolling coastal plain which, extending inland as far as 10 miles, is interrupted throughout by barren foothills fronting, on the one hand, the mountain ranges of the interior, and, on the other, trending seaward to form a number of low-lying reef-fringed rocky headlands. Interior mountain range peaks appear as islands from the NW. The offshore area is largely shoal and clear of dangers, save for rocks and islets lying off headlands.

Bo Hai

4.26 Bo Hai (Gulf of Chihli) (38°30'N., 120°00'E.), the larger constituent part of the extensive inland sea opening out to the W and N of Bo Hai Haixia, is an expansive body of water lying, by definition, between Ta-ch'ing Ho, and to the S of a line of Laotieshanxi Jiao, the NNE limit of Bo Hai Haixia. Depths throughout are largely shoal and rarely exceed 27.4m. Nearshore water levels to the W are raised by S to SE winds and lowered by N winds.

The major river Huang Ho empties into the SW side of Bo Hai. The commercially important river Hai Ho empties into the NW side.

Both mobile drilling and permanent production platforms operate in the SW part of Bo Hai, the positions of which may be seen on the chart. In some instances the platforms have been removed and wellheads marked by a light; others are not marked. Vessels are prohibited from approaching within 500m of the drilling rigs.

QHD 32-6 Terminal (39°07'N., 119°12'E.) consists of FPSO Bohai Shiji. Pilotage is compulsory and provided by Tianjin Xin Gang. Berthing is allowed from 0600 to 1800. Unberthing and loading can be done 24 hours. Pilots monitor VHF channel 67 and board in the anchorage centered approximately in position 39°02'N, 119°15'E.S

Vessels of up to 120,000 dwt can secure to the stern of the FPSO to berth in a maximum depth of 20.2m.

4.27 Dongying Gang (38°05'N., 118°58'E.), a harbor on the SW side of Bo Hai, has 14 berths that can accommodate vessels of up to 30,000 dwt. The harbor limits include Bo Zhong BZ25-1 offshore oil terminal described in paragraph 4.28. The inner harbor is protected by breakwaters; the N breakwater extends 5 miles NE from the shore.

Depths—Limitations.—There are five wharves in Tianjin Bo Hai open to foreign vessels. The Bo Hai Oil Wharf capacities are, as follows:

1. Wharf No. 4 (Section 10 and Section 11) has a length of 180m, a width of 15m, and can accommodate vessels of up to 5,000 tons.
2. Wharf No. 5 (Section 12 and Section 13) has a length of 188m, a width of 33m, and can accommodate vessels of up to 5,000 tons.
3. Wharf No. 6 (Section 14 to Section 18) contains the following:
   a. Section 14 has a length of 206m, a width of 39m, and can accommodate vessels of up to 5,000 tons.
   b. Section 15 and Section 16 have a combined length of 260m, a width of 35m, and can accommodate vessels of up 10,000 tons.
   c. Section 17 and Section 18 have lengths of 228m and 137m, respectively, a width of 35m, and can accommodate vessels of up to 2,000 tons.
4. Wharf No. 7 (Section 19 and Section 20) has a length of 257m, a width of 10m, and can accommodate vessels of up to 3,000 tons.
5. Wharf No. 8 (Section 21) has a length of 166, a width of 12m, and can accommodate vessels of up to 5.000 tons.

Pilotage.—Vessels may board a pilot about 9 miles NE of Huanghe Kou in position 38°10.7'N, 119°07.3'E.

4.28 Bo Zhong BZ25-1 (38°14'N., 119°09'E.) consists of the FPSO Hai Yang Shi You 113. Berthing is allowed from 0600 to 1800. Unberthing and loading can be done 24 hours.

Pilotage is compulsory and provided by Tianjin Xin Gang. Pilots monitor VHF channel 67. The pilot boarding area lies approximately in position 38°20'N, 119°07'E.

Vessels of up to 120,000 dwt can secure to the stern of the FPSO to berth in a maximum depth of 18m.

An anchorage area, with a depth of 21m, lies about 3.5 miles ESE of the pilot boarding area.

Caution.—Vessels should exercise care to avoid a covered well, with a depth of 17.5m, lying approximately 3 miles SE of the anchorage area.

A dangerous wreck, marked by a lighted buoy, lies 8 miles WNW of Hai Yang Shi You 113.

Bo Hai Haixia

4.29 Bo Hai Haixia (Po Hai Hai-hsia) (38°24'N., 121°00'E.) is the narrowed body of water lying between Laotieshanxi Jiao, to the NNE and Teng-chou T'ou, about 57 miles to the SSW. The many scattered islands and islets of Miaodao Qundao encumber the strait and confine transit to a series of clear, deep water, and largely E-W channels.

Laotieshan Shuidao (38°30'N., 121°00'E.), between the N end of Miaodao Qundao and the mainland 22 miles NE, is the principal channel through Bohai Haixia. The channel is deep. Changshan Shuidao is the principal channel through Miaodao Qundao. An obstruction lies 11 miles S of Laotieshan Xijiao Light. There are wrecks lying approximately 20 miles and 30 miles W of the light and 14 miles SSW of the light; the positions of these wrecks may be seen on the chart.

Pilotage.—Pilots may be boarded in the quarantine anchorage in position 37°55'N, 120° 53'E.

Regulations.—Foreign vessels may use only the following three channels:

1. Laotieshan Shuidao N of Miaodao Qundao.
2. Changshan Shuidao through Miaodao Qundao.
3. Dengzhou Shuidao, S of Miaodao Qundao, for vessels of less than 200 tons only.

The Harbor Superintendent at Dalian should be informed of the intention to use Laotieshanxi Jiao at least 8 hours before the ETA at the mid-point of the channel, or immediately on leaving port if the steaming time is less than 8 hours. Voyage and vessel particulars should also be reported. If there is an appreciable change in ETA this should be reported to the Harbor Superintendent as soon as possible.

The following areas, indicated on the chart, are closed to foreign shipping:

1. An area, with a radius of 8 miles, centered on Beihuangchung Dao Light.
2. An area, with a radius of 10 miles, centered on Laotieshanxi Jiao Light.
3. The area W of a line drawn N from Yu Yan (38°34'N., 121°38'E.) to the coast, and N of a line drawn from Yu Yan tangentially to Area 1.

Vessel Traffic Service.—A Vessel Traffic Service (VTS) is in operation in **Changshan Shuidao (Beichangshan Shuidao)**. All vessels transiting the channel must navigate within the fairway and may only enter Changshan Shuidao at its E or W entrance. The VTS reporting lines are, as follows:

1. The E reporting line lies along an arc having a radius of 4 miles centered on position 37°58'N, 121°02'E.
2. The W reporting line lies along an arc having a radius of 5 miles centered on position 38°05'N, 120°25'E.

Vessels must maintain a continuous listening watch on VHF channels 8 and 16.

Vessels must report the following information to the Northern Changshan Radar Station 15 minutes before entering Changshan Shuidao on VHF channel 16:

1. Vessel name and call sign.
2. Nationality and port of registry.
3. Owner's name.
4. Draft and loa.
5. Last port of call and next port of call.
6. Course and speed.
7. Position.
8. Length of tow and what is being towed, if applicable.

Caution.—Anchoring and fishing are prohibited in the E and W approaches to Denzhou Shuidao, Bo Hai Haixia, and Changshan Shuidao.

4.30 Miaodao Qundao (Miao-tao Ch'u-tao) (38°10'N., 120°45'E.) is an island group which, consisting of numerous steep-sided hilly islands, many lesser islands and islets and a scattering of isolated above and below-water dangers, encumbers the S part of Bo Hai Haixia for a distance of about 35 miles between Teng-chou T'ou and Beichenghuang Dao, the N islet of the group.

Several deep-water channels separate the islands into a N, middle, and S sub-group.

Tuoji Dao (T'o-chi Tao) (38°10'N., 120°45'E.), the channel between the N and middle sub-groups, is deep and clear throughout save for Bei Jiao, a dangerous mid-channel rock with a depth of 1.9m, lying about 2.8 miles NE of the N extremity of Tuoji Dao, the largest island within the middle sub-group; a light is shown from the S shore of Tuoji Dao. There is usually a tide rip over Bei Jiao when the sea is smooth, but at slack water or in any sea its presence is not apparent. Tidal currents in this channel attain a maximum E rate of 2.25 knots and a maximum W rate of 2.75 knots.

Passage through the channel is not recommended. Vessels seeking shelter from N and NW winds anchor, in 7.6 to 12.2m, in a position close off the steep-sided S side of Tuoji Dao. Anchoring and fishing is prohibited in an area W of the island group as indicated on the chart.

Houji Dao (Hou-chi Tao) (38°02'N., 120°40'E.), the channel between the middle and southern sub-groups, is deep and clear throughout and is recommended as the best passage through Miaodao Qundao. A light, equipped with a racon, is shown from Houji Dao.

Dengzhou Shuidao (37°52'N., 120°45'E.), the channel between the S sub-group and the mainland, is deep and clear within the fairway. A light, equipped with a racon, is shown from Nanchangshan Dao.

Beichangshan Dao (37°57'N., 120°44'E.), the largest and S island of Miaodao Qundao, consists of two hilly well-cultivated islands which, joined by a low, single isthmus, is steep-to in the E and fronted to the W by shoal water and numerous hilly islands, islets and sunken dangers.

A signal station stands on the N extremity of Beichangshan Dao, the N island of Ch'ang-shan Tao, and it can challenge vessels transiting Changshan Shuidao.

Bo Hai Haixia Yantai to Chengshan Jiao

4.31 Yantai (Yen-t'ai) (37°33'N., 121°27'E.) (World Port Index No. 60160), about 63 miles W of Chenshan Jiao, is a well-populated community and is one of China's largest fishing bases.

Ice.—Ice can be experienced from mid-January to mid-February and normally does not hinder navigation.

Tides—Currents.—At the SE entrance to the inner harbor the flood current sets W at 0.5 knot while the ebb current sets E at 0.25 knot.

Depths—Limitations.—Deep draft vessels enter the outer harbor through **Bei Shuidao** (37°35'N., 121°27'E.). Foreign vessels enter the inner harbor through the entrance S of the E breakwater.

Entrance channels may be used when entering or leaving the harbor, as follows:

1. North Channel—all vessels.
2. South Channel—vessels less than 3,000 grt with drafts of 7m or less.

There is a total berthing frontage of 1,500m, providing 12 berths on the W breakwater and its extension, N Pier, for vessels of 3,000 to 10,000 tons. There are also two berths on the S shore.

Aspect.—Yantai comprises a large outer harbor with an artificial inner harbor in its SE part. The outer harbor is partly sheltered from E winds by off-lying islands, but gives little protection from N gales. It has depths of 4 to 13m. The inner harbor is protected by breakwaters.

Pilotage.—Pilotage is compulsory and is available 24 hours. Pilots board at quarantine Anchorage No. 1 in position 37°43.5'N, 121°30.0'E.

Inbound tankers can obtain a pilot in an area centered about 4.8 miles NNW of **Zhifudong Jiao** (37°36'N., 121°20'E.).

The following activities require a pilot on board:

1. Shifting between wharves, anchorages, or loading and

discharge stations.

2. Shifting within an anchorage.

3. Moving the full length of a vessel alongside a wharf.

Vessel Traffic Service.—Yantai VTS is in service to monitor and control traffic. Participation is mandatory for all vessels transiting, mooring, or operating within a 15 mile radius of Yantaishan Zui Light (37°32.9'N., 121°23.8'E..).

The working channel for Yantai VTS is VHF channel 9; this channel is dedicated to the VTS authority and must not be used for other purposes. Vessels must maintain a listening watch must be maintained on VHF channel 9 when navigating, moored, or otherwise operating in the VTS area. The languages to be used when communicating with Yantai VTS are standard Chinese and English.

Vessels must contact Yantai VTS upon entering the limit of the reporting area, as previously described. Inbound vessels must report via VHF channel 9 stating:

1. Vessel name.
2. Position.
3. Purpose for entering port.
4. Type and quantity of dangerous cargo.
5. Other information required by the VTS Center.

A second reporting line is established in the areas delimited as follows:

1. North Fairway, within a circle with a radius of 3 miles centered on Xiaoshanzi Light (37°35.6'N"121°25.9'E.).
2. East Fairway, within a circle with a radius of 2 miles centered on No. 0 Buoy (37°31.4'N., 121°33.8'E.).

Vessels entering or departing the port must report their name and position to Yantai VTS on VHF channel 9 when crossing this second reporting demarcation.

Yantai VTS must additionally be contacted by vessels within the reporting area as follows:

1. Vessels must report their name and position to Yantai VTS after berthing or anchoring,
2. Vessels must report their name, position, and port of destination prior to leaving berth or weighing anchor.
3. Vessels must immediately report any traffic incident, pollution incident, or other emergency discovered by or affecting the vessel.
4. Any observed abnormality affecting navigation marks or navigation aids, obstructions to safe passage, floating material, or other circumstances hindering safe navigation should be immediately reported.
5. Unless excepted from compliance by local authority, vessels shall ensure that their AIS is operational at all times and that their AIS information is correct.
6. Vessels shall report 30 minutes prior to commencing and 30 minutes after completing the following opeations:
   a. Dismantling or repairing boilers, main engines, anchor winches, steering gear or primary navigation equipment.
   b. Engine tests, vessel trials, etc.
   c. Lowering boats and rescue drills.
   d. Other operations that could affect vessel safety.

Yantai VTS broadcasts vessel movements, the condition of navigational aids, hydrologic and meteorological conditions, navigation warnings and notices, and other traffic safety information, regularly or when necessary. This type of information may be provided to vessels on request.

Yantai VTS may offer assistance, advice or issue warnings to vessels as necessary.

Vessels may request navigational assistance in severe weather or for other conditions affecting safety of navigation. Vessels must inform the VTS promptly, however, when assistance is no longer required.

Signals.—A signal station on **Yantai Shan** (37°33'N., 121°24'E.) may direct traffic entering and leaving the port.

Vessels wishing to enter the port should either hoist their call sign together with International Code Flag K or call the signal station by light or on VHF. Permission to enter and proceed to the indicated berth number is shown, as follows:

1. Day—Black conical shape, apex upwards, over a numeral pennant.
2. Night—All-round violet light, and number flashed in Morse Code or on VHF.

Anchorage.—The pilotage-quarantine anchorage, best seen on the chart, has depths of 7 to 15m, mud and sand. The holding ground is good throughout the harbor and it is unusual for vessels to drag.

Quarantine Anchorage No. 2 lies 5 miles NE of the outer harbor and the tanker loading and unloading anchorages lie 2.5 miles NW of Xiaoshanzi.

Caution.—A stranded wreck lies 2 miles NNE of the pilot boarding position in Quarantine Anchorage No. 2 (37°40”N., 121°30”E.).

The water is often discolored for some distance in the area of Xiaoshanzi.

There are many seaweed cultivation areas along the coast.

Yangma Dao (37°28'N., 121°37'E.), an island 4 miles long and connected SE to the mainland by extensive drying flats, lies 15 miles W of Chensan Jiao. A ridge of hills, rising to 107m at its SW end, runs the length of the island.

Yuanyao Zui (37°34.0'N., 122°03.5'E.) is the extremity of a tongue of land that forms the W side of P'u T'ao-T'an.

4.32 Weihai (37°30'N., 122°06'E.) (World Port Index No. 60150), about 28 miles W of Chenshan Jiao, is a well-populated community located on the shores of Wei-hai Mao-ti (Narcissus Bay), a small shoal cove in the NW part of Weihai Gang. Weihai Gang is a largely shoal water bay sheltered inland by three rings of high-rising barren hills. The bay is entered between **Zhaobei Zui** (Chao-pei Tsui) (37°28'N., 122°14'E.), located SE and marked by a light, and Pei-shan Tsui, a point about 5.5 miles NW of Zhaobei Zui. The bay is sheltered by Liugong Dao, a steep-to islet, which divides access to the bay into a N and S entrance. A light is situated on the E point. Anchorage is prohibited in the S entrance.

Depths—Limitations.—There are two wharves providing five berths; two berths are for 5,000 ton vessels, with the remaining berths for vessels of 1,000 tons, 500 tons, and 300 tons, respectively.

Huaneng Weihai Pier (37°27'N., 122°12'E.) serves the power plant and has an alongside depth of 11m. The channel leading to this pier is dredged to a least depth of 10.5m.

Pilotage.—Pilotage is compulsory for entering, leaving, or shifting berths within the port. The pilot boards in the pilotage-quarantine anchorage.

Anchorage.—A quarantine anchorage, with a depth of about

20m, mud, exists 1 mile NE of the N extremity of Liu-gong Dao. Anchoring and fishing are prohibited in an area extending NW from the W end of Liugong Dao towards the mainland. Small vessels can anchor in Wei-hai Mao-ti, in depths of 3.7 to 5.5m.

Directions.—To approach the N entrance steer to pass midway between Pei Chiao, the N extremity of Liugong Dao and the chain of islets and rocks extending SW from Yashi Dao. Then pass 0.2 mile W of Huang Tao, which is connected by a causeway to Liugong Dao. Continue on a S course and when Ri Dao bears 124° and is in line with an old fort close W of Zhaobei Zui, steer for it to enter the anchorage. Deep draft vessels must always use the N entrance.

Caution.—In addition to the charted prohibited areas, navigation and anchoring is prohibited within 500m of the coastline of Liugong Dao and within 500m of the mainland between Hei Dao and Weihai.

There are many seaweed cultivation areas along the coast.

4.33 To approach Weihai Gang using the S entrance, **Ri Dao** (37°28.7'N., 122°11.8'E.) can be passed N or S. Using the N channel, pass midway between Ri Dao and Dahong. When clear of Ri Dao alter course as necessary to avoid the shoals extending S from Luigong Dao. Using the S channel, give the rocks extending S of Ri Dao a berth of 0.25 mile. Within the bay there is a fairway leading to the wharf area marked by buoys in accordance with the IALA Maritime Buoyage System (Region A).

Caution.—On exceptional occasions during winter, the sea level in the harbor may fall as much as 1.7m below chart datum. This usually occurs after strong NW or N winds. It is prohibited for merchant vessels to navigate through the S entrance.

Zhaobei Zui (37°27.7'N., 122°14.3'E.) is a bluff point which exhibits a light. The coast in the vicinity is cliffy and rugged.

Jiming Dao (Chiming Tao), lying about 11 miles E of Zhaobei Zui, is a flat-topped island, 71m high, and fringed with reefs. Depths in the passage inshore of the island are irregular. A light is situated from a white round concrete tower on Jiming Dao.

Caution.—A prohibited anchorage area, with a radius of 1.1 miles, lies centered on a point about 5 miles NW of Jiming Dao.

4.34 Ma-lan Wan (37°25'N., 122°39'E.), about 2.5 miles NW of Chengsan Jiao, is a small, shoalwater cove sheltered by low-lying hills from all but N and NW winds, which send in a heavy swell. Hsiao-ch'eng Shan (Hai-lu Dao), a precipitous, flat-topped islet lying close N of the cove, is separated from the mainland by a channel in which rips and strong tidal currents make an evening passage unsafe. Hsiao-ch'eng Shan, showing a light to the NW, has submerged and drying rocks extending 0.3 mile NE and S of it. Small vessels obtain anchorage in the middle of Ma-lan Wan, during S winds, in depths of 9.1 to 10.4m, sticky mud.

4.35 Chengshan Jiao (37°24'N., 122°42'E.), a rugged precipitous point lying at the E extremity of the Shandong Bandao peninsula, is steep-to and culminates close W in a sharp conical hill with a storm signal station on its summit and a prominent temple on its S slope.

A light is situated and a racon transmits on Chenshan Jiao. Fog is frequent.

Tides—Currents.—Close off the point, tidal rips and eddies are strong. Tidal currents, influenced by the wind, attain a rate of 2.5 knots.

Regulations.—A Traffic Separation Scheme has been established off Chengshan Jiao with a precautionary area, having a radius of 5 miles, centered at position 37°34.5'N, 122°42.9'E at the N entrance. An Inshore Traffic Zone has been established between the TSS and the adjacent coast. The scheme is not IMO-adopted; however, the Chinese authorities recommend application of Rule 10 of the 72 COLREGS.

Vessel Traffic Service.—A Vessel Traffic System (VTS) has been established off Chengshan Jiao, encompassing a circle with a radius of 24 miles, centered on Chengshan Jiao Light, including the Traffic Separation Scheme.

Vessels must maintain a continuous listening watch on VHF channel 16 when operating within the VTS area. Vessels must report the following information to Chengshan Jiao VTS Center, on VHF channel 16, before entering the VTS area:

1. Vessel name and call sign.
2. Nationality and port of registry.
3. Owner's name.
4. Draft, grt, and loa.
5. Last port of call and next port of call.
6. Course and speed.
7. Position.
8. When towing—state length of tow and what is being towed.
9. State if using the TSS.
10. State if using the Rongcheng Wan Anchorage, including the length of stay.
11. On entering the Rongcheng Wan Anchorage, vessels must report the following information:
    a. Vessel name.
    b. Time and position of anchoring.
    c. Time of departure and next port of call.

Vessels must report the vessel name and position, as follows:

1. When entering the VTS area, upon crossing a circle 20 miles in radius centered on Chengshan Jiao Light.
2. When leaving the VTS area.

A mandatory Ship Reporting System is established for all fishing vessels 24m and above, cargo vessels 300 grt and above, and passenger vessels, in waters within a 24 mile radius of the VTS center (37°23.6'N., 122°42.2'E.).

Vessels are required to report the information listed in the table titled **Chengshan Jiao VTS—Reporting Format** when entering the ship reporting area. Reports are not required when departing the area.

Chengshan Jiao VTS—Reporting Format

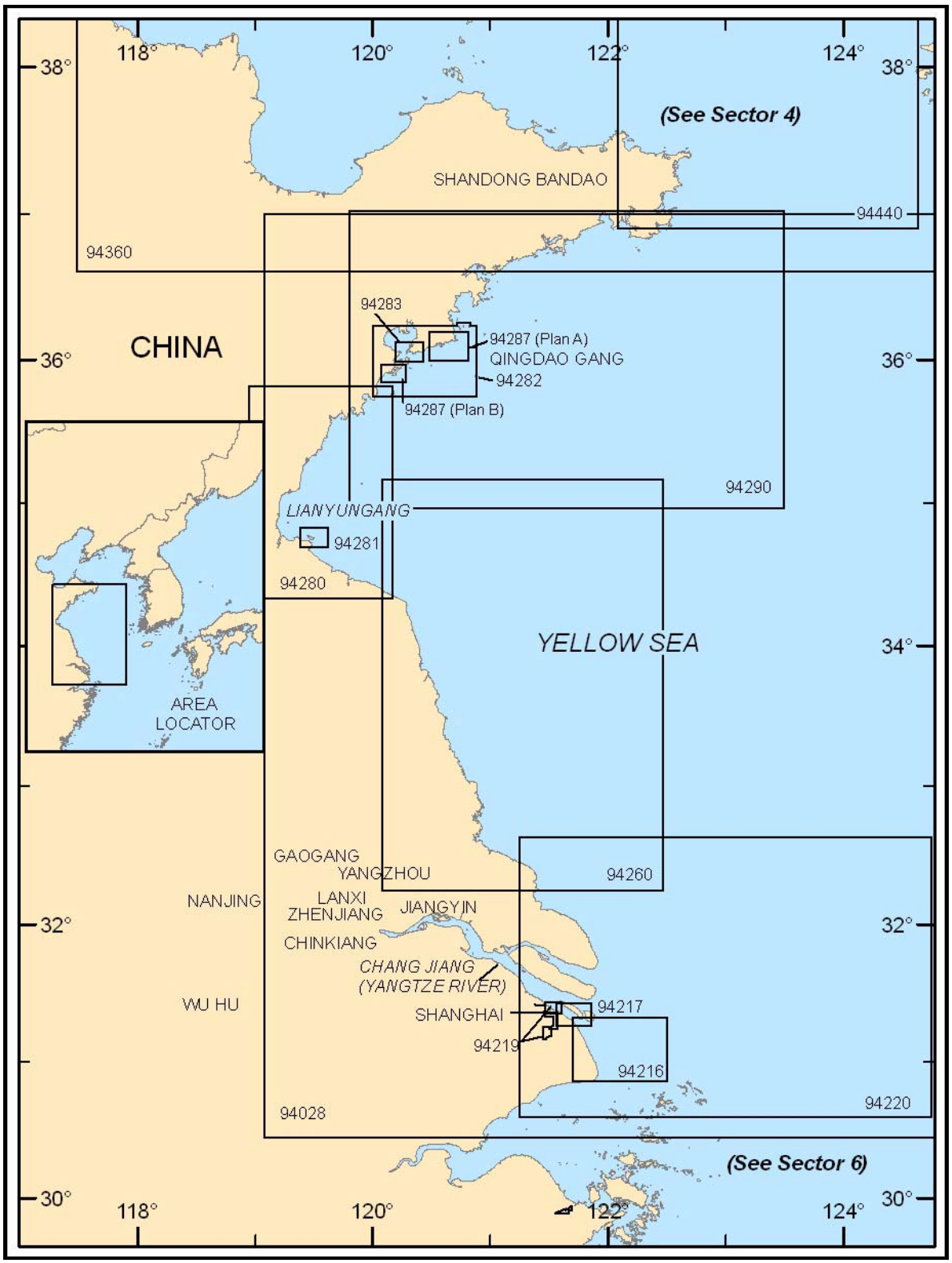
Designator	Meaning
A	Name of ship, call sign, and IMO number (if applicable).
C or D	Position (latitude and longitude or relation to a landmark).

Chengshan Jiao VTS—Reporting Format	
Designator	**Meaning**
E	Course.
F	Speed.
G	Port of departure.
I	Port of destination (optional).
Q	Defects and limitation (vessels towing are to report length of tow and name of object in tow).
U	Overall length and gross tonnage.

When departing a port located in the reporting area, participating vessels shall report their name, position, departure time, and port of destination.

Upon arriving at a port within the reporting area participating vessels shall report their name, position, and arrival time.

If a traffic incident or a pollution incident occurs within the reporting area the vessel or vessels shall immediately report the type, time of occurance, location of incident, extent of damage or pollution, and if assistance is needed.



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

SECTOR **5** — CHART INFORMATION

SECTOR 5

CHINA—SHANDONG BANDAO TO CHANG JIANG

Plan.—This sector describes the E coast of China between Chengshan Jiao, the NE extremity of Shandong Bandao, and Nanhuitsui, a point about 393 miles S, and includes the Chang Jiang to the head of navigation. The coastal description is N to S; the riverine description is inland from sea.

General Remarks

5.1 Winds—Weather.—Winds and climate conditions in general are largely determined in consequence of the seasonal fluctuation in barometric pressure occurring within the Siberian winter land. They blow between NE and NW during the winter monsoon (October through March) and SE and SW during the summer monsoon (June through August). They blow as much from one quadrant as from another during the spring transition (April and May) and the autumn transition (September).

During the winter monsoon season, wind velocity averages 17 to 21 knots over the open sea and may freshen to 28 to 33 knots. Storms are frequent in November to March. During the summer monsoon, velocity averages 4 to 10 knots. Storms are largely associated with typhoons. Calms are frequent along the coast when conditions are unsettled.

Typhoons occur between June and September, when about 20 pass close enough to influence coastal weather conditions, and reach a maximum frequency in July and August, when an average of two per year reach the coast. They enter from the SE and S and generally curve to the NE. Heavy rains caused by typhoon activity frequently induce widespread indentation of the alluvial plain bordering the river Chang Jiang.

Sea fog occurs between February and August and reaches a maximum frequency in July when it may occur everyday near the E extremity of Shandong Bando. Coastal areas become foggy with onshore winds.

Dust carried to the sea from the deserts of Mongolia may accompany winter storms and reduce visibility.

Ice.—Sea ice of no great hindrance to navigation occurs off the S side of Shandong Bando between November and April and extends as far S as the entrance to Jiaozhou Wan. Landfast ice occurs in some bays during January and February of most winters.

Tides—Currents.—Tides are mixed and show a marked inequality during maximum lunar declination, which progress from N to S.

Tidal currents are rotary offshore. They are reversing nearer shore and set W on a rising tide and E on a falling tide with a velocity reaching 1.5 knots.

Offshore ocean currents are weak and tend to set S throughout the greater part of the year. During the summer they become confused, or in August set to the N.

Aspect.—The coast of China, between Chengshan Jiao and Nanhuitsui, is distinctive by reason of the marked contrast of its features N and S of the 35th parallel of latitude at Haizhou Wan.

The coastline N of Haizhou Wan is very irregular and largely indented over a greater portion of its length by several extensive embayments, numerous large bays, and a multitude of smaller bays, coves, and inlets. Inland, the terrain consists of well-cultivated lowlands with level to rolling plains extending inland for distances from a few hundred meters to about 10 miles before encountering the slopes of a considerable network of hills and low-rising mountains which, progressing seaward, interrupt the coastline in rocky capes, low-lying headlands, and sandy promontories. Offshore, the 20m curve generally parallels the coast and tends to close salient points at distances precluding ample sea room. The near shore area within salient points, while shoaling regularly and generally offering open-sea anchorage, is much encumbered by rocks, shoals, reefs, scattered islets, kelp beds, fishing nets, fishing stakes, and fish traps. The shores of several embayments and many of the large bays are fronted by a wide margin of drying mud flats which extend well offshore.

Sea ice may be present most winters during January and February.

The coastline S of Haizhou Wan is quite regular and has but few gentle bights interrupting a general trend to the SSE. Inland the terrain is the flat low-lying featureless seaward portion of a vast alluvial plain extending over much of the N part of the hinterland behind the E coast of China. The plain is heavily cultivated and crossed by a plethora of waterways branching from the many rivers which interrupt the coastline throughout its length at regular intervals. Offshore, the 20m curve tends to arc well seaward for a distance of up to 85 miles and to delimit a near shore area which, though predominantly flat or sloping gently shoreward, is largely inadequately surveyed.

Chang Jiang, entered N of Nanhui Zui, is one of the major rivers of the world and the principal riverine waterway of China. Huangpu Jiang is a lesser stream entered from the S side of the estuary to Chang Jiang.

Ocean-going vessels normally proceed to Shanghai, on Huangpu Jiang, and customarily proceed to Hankou, some 575 miles up the Chang Jiang.

Regulations.—Some of the smaller harbors and anchorages on the coast of China may not necessarily be open to foreign shipping. If it is not known whether the harbor or anchorage is open, the master should contact the Chinese Harbor Superintendency Administration for permission to enter.

Off-lying Dangers

5.2 Socotra Rock (32°07'N., 125°11'E.), about 185 miles ENE of Nanhui Zui, is a patch of coral with a depth of no more than 5.5m. It lies atop a volcanic rock which rises abruptly from surrounding depths of 31 to 36m. The sea occasionally breaks and strongly setting tidal currents produce rips and overfalls.

Chengshan Jiao to Ya-Tao Chia

5.3 Chengshan Jiao (37°24'N., 122°42'E.), a rugged precipitous point lying at the E extremity of the peninsula Shan-

dong Bandao (Shan-tung Pantao), has been previously described in paragraph 4.35.

Information concerning the Traffic Separation Scheme and the Vessel Traffic Service off Chengshan Jiao is given in paragraph 4.35.

A series of sharp conical hills, culminating in Chung Shan about 5 miles W of the point, have the appearance of islands when viewed at a distance from the SE. A light is shown 183m within Chengshan Jiao (Ch'en-shan Jiao).

Caution.—Due to frequent fog and the tidal race close off Chengshan Jiao, wrecks have been numerous and navigation requires particular attention. Fog is frequent and, close off the point, tidal rips and eddies are strong.

5.4 The coastline between Chengshan Jiao and Ya-tao Chia, about 122 miles WSW, is very irregular and much indented by numerous bays and coves which, generally separated one from another by rock-fringed low-lying sand spits and hilly promontories, shoal gradually as they recede inland and become obstructed within their inner reaches by extensive margins of drying mud flats.

Offshore approaches are somewhat encumbered by the steep-to rocky islets. Near shore approaches are, in general, clear as far inshore as the close vicinity of the numerous spits and headlands interrupting the coast.

Fog is frequent offshore during spring and may obscure Ch'ien-li Yen, though completely absent closer inshore.

Rongcheng Wan (Jung-cheng Wan) (37°21'N., 122°38'E.), entered close SE of Chengshan Jiao, is a shoal bight backed to the N by a range of sharp conical hills and to the W by a low-lying sandy plain.

Vessels, seeking shelter from NW storms before proceeding around Chengshan Jiao, enter the bight and anchor in a depth of 18m.

Anchorage.—Some of the smaller harbors and some of the anchorages on the coast of China may not necessarily be open to foreign shipping. If it is not known whether the harbor or the anchorage is open, the master should contact the Chinese Harbor Superintendency Administration for Permission to enter.

An anchorage area has been established and marked by special buoys and beacons as shown on the chart. This area must be entered between the parallels of 37°20.8'N and 37°21.6'N, and meridians of 122°39.2'E, and 125°40.6'E. Mariners are warned not to anchor outside this anchorage area.

Foreign vessels wishing to anchor must report to Yanti Harbor Superintendency Administration (YHSA) 6 hours prior to their arrival with full details of the vessel and must report again upon arrival at the anchorage. In an emergency, the master should report as soon as the vessel intends making for the anchorage.

Smaller vessels, seeking protection from E winds, shelter in Lunghsutao Kou, a cove in the NE part of the bight.

5.5 **Mata Jiao** (Ma-ta Chiao) (37°12'N., 122°37'E.), a flat rocky headland about 9m high, lies about 13 miles SSW of Chengshan Jiao and is joined to the mainland by a narrow neck of land. There is usually a heavy tide race about 0.8 mile NE of Mata Jiao.

Waizhe Dao (37°15'N., 122°35'E.), two small islets 39 and 33m high, lie on a reef extending from the coast about 4 miles NNW of Mata Jaio. The N island has some reddish cliffs on its N and E sides and is marked by a light.

Litao Wan, a small cove entered between the N island of Waizhe Dao and a rocky reef about 1 mile further NNW, provides shelter to small vessels seeking anchorage, in a depth of 6.4m, with the S point of the N island of Waizhe Dao bearing 100° at a distance of about 0.3 mile. The bay is open to NE winds.

Ailian Wan (37°11'N., 122°34'E.) is a small bay entered close SW of Mata Jiao. Chung Chiao, a rocky low-lying headland, divides the bay into two shoal water coves.

Small vessels, seeking shelter from NE winds, anchor in the SW cove either W of Chung Chiao or, in a depth of 6.4m, close off the S side of the cove.

5.6 **Sanggou Wan** (37°06'N., 122°31'E.) is entered between Haimaozi Tou, the S entrance point of Ailun Wan, and Chu Dao, about 6 miles further S. It is a commodious shoal water bay sheltered to the N by low precipitous hills and backed elsewhere by low-lying sandy beaches rising to rounded hills. Boge Dao (Falang Shih), a group of large above-water rocks, lies about 4 miles W of Chu Dao.

Sanggou Wan affords shelter to small vessels except with E winds. However, with E winds vessels can obtain anchorage 0.8 mile NW of Chu Dao, in a depth of 7.3m, partly protected by a reef extending N from Chu Dao.

Moye Dao (36°55'N., 122°31'E.), 7 miles SSW of Chu Dao, is connected to the mainland N of it by a drying sandflat. The island is low, except for a 30m high bluff at its SW end.

Shidao Gang (36°54'N., 122°28'E.) is a small shoal bay entered close W of Moye Dao. A light is shown from the SW part of Moye Dao. Chaoyang Shan (Sharp Peak), 257m high, is a rugged hill at the head of the bay. A general purpose quay is open to foreign trade.

Vessels seeking shelter from N and NW winds anchor, in 11m in a position with the SE extremity of Moye Dao bearing 041°, distant about 0.7 mile.

Depths—Limitations.—There are eight berths at the quay. Berths No. 1 and No. 2 are each 143m long and have alongside depths of 9m; vessels of up to 10,000 tons can be accommodated. Berth No. 3 is 211m long and an alongside depth of 10.3m. Berths No. 4 to No. 8 have alongside depths of 8 to 8.3m; vessels of up to 5,000 tons can be accommodated.

Pilotage.—Pilotage is compulsory and is available 24 hours. Pilots board in the quarantine anchorage.

Anchorage.—Anchorage can also be obtained 1 to 2 miles offshore to the SW of the entrance to Shidao Gang, in depths of 14.6 to 18.3m. Small vessels seeking shelter from N winds can anchor 0.5 mile NW of the SW extremity of Moye Dao, in depths of 6.4 to 6.7m, mud. They also anchor in similar depths in a position about 1 mile N of the W entrance point of the bay.

5.7 **Cha Shan** (36°51'N., 122°17'E.), about 11 miles SSW of Moye Dao, is a sharp peak, 538m high, surmounted by a small temple. From the peak, a rugged range of mountains extends 3 miles E.

Sushan Dao (36°45'N., 122°15'E.), lying about 6 miles SW of Cha Shan, is marked by a light and rises to about 105m on its SE side. A number of islets and rocks lie close off its W and S sides. Above-water rocks lie up to 3 miles NNW of the is-

land. A 2.5m patch, which breaks heavily, lies about 3 miles NE of the island.

The stretch of coast between Cha Shan and Dingzihe Kou, about 65 miles WSW, is low and sandy with an occasional range of hills. Depths along it are generally less than 11m within 5 miles of the shore.

The flood current off this section of the coast flows W at 1 knot while the ebb current flows E at 1 knot. Both currents are affected by the wind.

Gulong Zui (Tau-tsui Head) (36°44'N., 121°38'E.), 31 miles WSW of Cha Shan, is the SE extremity of a bold, hilly peninsula connected to the mainland by a sandy isthmus. This hilly peninsula rises inland from the point and faces the seaward portion of the W side of the bay with a low-lying rock-fringed bluff, before falling away to the sandy beaches fronting the remainder of the bay.

Small vessels seeking shelter from N and NW winds anchor in a poor holding ground of soft mud in a position close N of Gulong Zui. NE winds send a bad sea into the anchorage.

Haiyang Dabuquan Gang (36°43'N., 121°24'E.) is a new heavy-lift terminal constructed at the site of a former fishing port. The main channel has a least depth of 5.5m. The berth at the terminal is 145m long, with an alongside depth of 6.5m.

Fengcheng (Hai-yang) (36°42'N., 121°14'E.), 14 miles E of Dingzihe Kou, lies on the W side of Laolong Tou, a small point of land fringed by drying reef and marked by a light. A channel, with a depth of 7.7m, and marked by lighted buoys, leads to Fengcheng. A jetty, which can accommodate vessels of up to 10,000 dwt, extends WSW from Laolong Tou and provides a berth on either side, each with a length of 398m and an alongside depth of 9.5m. Fengcheng Gang Light is shown from the head a pier lying S of the jetty.

Anchorage.—There are two anchorages for Fengcheng. Anchorage No. 1 lies 3 miles SW of Fengcheng Gang Light in depths of 4 to 6m. Anchorage No. 2 lies 8 miles SSE of the light in depths of about 13m.

Chanshan Tou (Cape Adkins) (36°23'N., 120°53'E.), 12 miles SW of Dingzihe Kou, is the cliffy SE extremity of a promontory and rises to a hill, 73m high. An above-water rock, 2m high, lies 1 mile S of the extremity.

5.8 **Laoshan Wan** (Lo Shan Bay) (36°20'N., 120°50'E.) is a large shoal-water embayment entered between Chanshan Tou, a hilly precipitous point about 43 miles WSW of Gulong Zui, and Laoshan Tao, a point about 17 miles SW. The coastline is very irregular and much indented by several bays, of which the largest and northernmost is Bei Wan (Great Bay). An extensive margin of drying mud flats front the shore of Bei Wan and the coves close to the S, before disappearing with the steep-to near shore area extending about 7 miles N from Laoshan Tou.

Laoshan Wan is much encumbered by many off-lying steep-sided islets and by numerous sunken, drying, and above-water rocks. Nu Dao (Mau Tau) is a 72m high grass-covered islet about 1 mile WSW of Chanshan Tou. It is joined to the E entrance point of Bei Wan by a stony ridge. Star Reef, about 1 mile WNW of Nu Dao, is a group of above-water rocks. Dong Jiao (East Reef), about 1 mile SW of Star Reef, is a sunken rock generally marked by breakers.

Vessels seeking shelter from NE winds anchor, in 9.4m, rocky bottom, in a position with the S extremity of Nu Dao bearing 086°, distant 1 mile. Small vessels can obtain shelter in a depth of 4m, about 0.3 mile NNW of Star Reef, which offers protection at LW but little shelter at HW.

Caution.—During the summer it is imprudent to anchor off the coast of Laoshan Wan as winds from ENE to SE are frequent and at times blow hard, though rarely lasting more than 12 hours.

Laoshan Tou to Dazhushan Zui

5.9 **Laoshan Tou** (Ya-tao Chia) (36°08'N., 120°43'E.), marked by a light and a racon, is a rugged, precipitious, point lying at the E extremity of a mountainous promontory which, steep-sided on its S face, rises inland to Laoshan, a conspicuous 1,130m summit about 5 miles to the WNW.

The coastline between Laoshan Tou and Dazhushan Zui, about 43 miles SW, is irregular throughout and largely backed by desolate, rugged hills and low-lying mountains which reach the sea in bold headlands separated by sandy beaches and intervening areas of flat land. In the near shore area, depths of 9.2m and more are common off the principal salient points and seaward of a line joining them. Offshore, depths are irregular. Numerous steep-sided islets lie scattered well to sea.

Chaolian Dao (Chao-lien Tao) (35°54'N., 120°52'E.), a desolate treeless rocky island of a yellow earthen color, rises to a summit 53m high and lies about 16 miles SSE of Laoshan Tou.

The island constitutes the farthest seaward danger in the approaches to Qingdao. A light is shown on the summit of Chaolian Dao.

A shoal patch, with a depth of 14.7m, lies 9 miles E of Chaolian Dao Light, close S of the E-W defined route entrance. Vessels with deep draft are advised to exercise care when making a landfall in this area.

Dense fog, though absent nearer inshore, occurs about the island in spring and early summer. Tidal currents are particularly strong during spring tides and require caution when approaching the island.

Xiaogong Dao (Hsiao-kung Tao) (36°00'N., 120°35'E.) is a flat-topped rocky islet, 35m high, lying about 10 miles SW of Laoshan Tou.

Dagong Dao (Ta-kung Tao) (35°58'N., 120°29'E.) is a readily-identifiable conical-shaped island, 118m high, lying about 5 miles WSW of Xiaogong Dao. A light, equipped with a racon, is shown from the summit of the island.

Xaio Yu, a 43m high islet, lies about 0.4 mile WNW of Dagong Dao. A drying reef lies 1 mile W of Dagong Dao. The passage between Dagong Dao and Xaio Yu is usually obstructed by fishing stakes and nets.

Qingdao Gang (36°02'N., 120°16'E.)

World Port Index No. 60140

5.10 Qingdao Gang (Chingtao) (Tsingtao), the harbor for the large metropolis of Qingdao, occupies the entrance and a portion of the SE side of Jiaozhou Wan, a broad inlet extending about 12 miles inland and fed by a number of rivers. Qingdao

Gang is one of China's principal ports of international trade.

The port occupies part of Jiaozhou Bay and has two sections, the inner harbor and the outer harbor. The boundary line separating the inner and the outer harbors runs from the Tuandao promontory to Jiaozishi Promontory.

On the W side of this promontory lies the inner harbor, and on the E the outer harbor.

The inner harbor lies along the shores of the Qingdao city, with three adjoining harbor basins locally known as the large, the middle, and the small harbors. Da Gang (Large Harbor), Zhong Gang (Middle Harbor), and Xiao Gang (Small Harbor), the latter two sections are used only by coasters and local craft.

The inner harbor has been extended to include the oil terminal in Huangdao and the new harbor area in the Qianwan Bay of Huangdao.

Winds—Weather

During the summer, S and SE winds are prevalent while N and NW winds occur during the winter. The port is occasionally affected by typhoons from July until September.

Fog occurs during the months of April to July, being thicker and most frequent in July.

Ice

From the end of January to the middle of February, ice is occasionally experienced in the harbor, but does not affect navigation or port activities.

Tides—Currents

Tidal currents setting in Jiaozhou Bay on the flood tide and running out on the ebb tide are reported to generally attain a rate of between 2 to 3 knots, but in the entrance rates of 3 to 4 knots have been reported.

Tide rips occur off Tuandao Zui, the SW point of Tuan Dao and also the N entrance point to the Jiaozhou bay, where a light is shown.

Depths—Limitations

The main channel has general depths of 15m and leads to all the harbors and to the Huangdao oil terminal. The inner channel leading to the larger harbor is 8 miles in length with depths of 9 to 30m. Vessels up to 50,000 grt can enter the port.

The passage, from the pilot and quarantine anchorage to Mati Reef entrance, is 8 miles with depths of 9 to 30m, and it is accessible any time to ships with a draft of 9m. Ships with drafts of about 12m must await high tide to enter the harbor.

The small harbor channel has two branches, the S and the N branch. The former is about 1 mile long, about 0.1 mile wide and 5 to 30m deep; the latter is 2 miles, 0.3 mile wide with depths of 5.5 to 1.4m.

There are five berths for ships of 10,000 dwt, two for ships of 5,000 dwt, and two for ships of 3,000 dwt at Lianyungang Piers. The coal berth WNW of Pier 2 is 160m long, with a depth of 9m alongside. In between Pier 2 and the coal berth a new Pier 3, similar in shape and size to Pier 2, was constructed. Piers 1 and 2 are connected to the railway system.

The Huangdao oil terminal channel, which circles around the Qianjiao shallow water area in the W section, is 150m wide and 10 to 15m deep. The S section is about 300m wide and 12m deep. There are three crude oil berths at Huangdao. The largest berth is 498m long, with an alongside depth of 20.2m. Vessels of up to 200,000 dwt can be accommodated.

Qianwan Gangpu, developed on the S side of Qianwan bay, handles coal, bulk cargo, and timber. An ore berth, with an alongside depth of 20m, can accommodate vessels of up to 200,000 dwt .

West Port has three container berths, each 169 to 385m long, with alongside depths of 11.6 to 14m. Vessels of up to 50,000 dwt can be accommodated.

Da Gang, which handles ore, steel, container, liquid chemical, general and passenger cargoes, is situated towards the N end of the town of Qingdao. There are eight piers, numbered 1 through 8, providing 52 berths for vessels of up to 50,000 tons.

The NW side of Da Gang is reserved for use by naval vessels.

An approach channel, Miaoling Hangdao, is dredged to a depth of 16.5m to Mialoing Gangqu, where it continues at dredged depths of 11 to 16m. Coal berths for ships of 16,000 tons and 35,000 tons, together with four berths for general cargo vessels up to 25,000 tons, were completed at Miaoling, 2 miles W of Lianyungang.

Huang Dao (36°04'N., 120°14'E.) has a pier extending 0.5 mile NNW that forms an oil terminal, providing berths for two 10,000 dwt tankers, with a reported draft of 12 to 13m.

Aspect

Signal Hill (36°04'N., 120°20'E.) is 121m high and lies about 2 miles NE of Tuandao Zui. Lights, which show green above red, are shown from the signal station on its summit.

A church, with two spires about 90m high, lies about 0.5 mile WNW of Guanhai Shan. Radio masts lie about 0.8 mile NNE of Tuandao Zui.

Taiping Shan (36°04'N., 120°21'E.), close S of the S entrance to Jiaozhou Wan, is 148m high with a large radar aerial on its summit.

Pilotage

Pilotage is compulsory and available 24 hours. The pilots board, as follows:

1. Vessels with a draft of less than 15m—about 1 mile ENE of Xiang Zui.
2. Vessels with a draft of 15m or more—abeam Xiaogong Dao (36°00'N., 120°35'E.).

Vessels should send their ETA 72 hours, 48 hours, and 24 hours prior to arriving at the pilot boarding position.

The message should include the following information:

1. Time and date of arrival
2. Salt water draft
3. Fresh water draft

Regulations

Quingdao Gang Traffic Separation Scheme (TSS) is in effect in the E approaches to Quingdao Gang from position 35°59'N., 120°31'E. to the Inner Harbor limit. The TSS consists of three

sections, with three precautionary areas, and is best seen on the chart. The scheme is not IMO-adopted; however the principles defined in Rule 10 of the International Regulations for Preventing Collisions at Sea (1972) apply.

The channels are divided into the inner harbor channel and the outer harbor channels; the latter is the main channel, with a Defined Route passage of up to 40 miles to seaward. Transit by means of the Defined Routes is compulsory for vessels exceeding 500 dwt.

Foreign vessels are only permitted to join the Defined Route by either of the following approaches:

1. Route 2—entered at position 35°56.2'N, 121°04.8'E and oriented E-W
2. Route 3—entered at position 35°43.2'N, 120°53.0'E and oriented ESE-WNW

The maximum allowable vessel speed in No. 1 Section is 12 knots. Overtaking is prohibited in this section.

Separation zones of the TSS must not be crossed without obtaining prior permission from the authorities. Inshore traffic lanes lie N and S of No. 1 Section.

Vessel Traffic Service

A Vessel Traffic Service (VTS) is in operation in Jiaozhu Wan and Qingdao Gang. All foreign vessels of 300 tons or more must contact Qingdao Maritime Traffic Control Center on VHF channel 8 and, if necessary, transfer to a frequency assigned by the Control Center. Vessels should maintain a continuous listening watch on VHF channel 8.

Vessels must report to the Control Center when passing either of the following reporting lines:

1. When passing the line joining Dagong Dao (35°58'N., 120°29'E.) and Xiaogong Dao (36°00'N., 120°35'E.).
2. When passing a line drawn due E and W through Zhucha Dao Light (35°56N., 120°19'E.).

Inbound vessels passing either of the above reporting lines must communicate the following information:

1. Vessel name, call sign, and IMO number.
2. Location/Position.
3. Heading.
4. Speed.
5. Constraints or defects. Towing vessels should report length and type of tow.
6. Nationality.
7. Type of vessel.
8. Total tonnage.
9. Original port of departure.
10. Draft.
11. Type and quantity of dangerous cargo onboard.

Outbound vessels passing the reporting lines should report the following information:

1. Vessel name.
2. Position.
3. Time.
4. Destination port.

Vessels should report their name and time of operation, as follows:

1. Prior to departure from the berth.
2. After berthing.
3. Prior to weighing anchor.
4. After anchoring.
5. When abeam Tuan Dao Light (36°02'N., 120°17'E.).

Vessels should report any traffic accidents or pollution incidents withn the reporting area, stating the following:

1. Type of accident or incident.
2. Time of occurrence.
3. Location of accident or occurrence.
4. Extent of damage or pollution.
5. If any assistance is required .

Signals

Berthing signals are displayed from the head of Pier No. 5 to direct vessels berthing in Da Gang and in the anchorage.

The following signals are in use at night:

Signal	Meaning
White light over green light	Vessel may enter Da Gang.
White light over red light	Vessel may leave Da Gang.

By day shapes are displayed. Vessels are not permitted to enter or leave the harbor until the appropriate signal is hoisted.

Vessels subject to quarantine inspection before berthing hoist the following signals on entering the harbor and anchor in the quarantine anchorage.

The following signals are hoisted:

By day	By night	Meaning
Flag Q	Three red lights, vertically disposed	Arriving from an infected port, normal health on board.
Flags QQ	Four lights (red, red, white, red) vertically disposed	Suspicion of infection on board.
Flags QL	Four lights (red, white, red, white) vertically disposed	If death has occurred during voyage or there is a corpse on board.

Anchorage

There is a temporary anchorage area outside the harbor entrance, 2 to 3 miles E of **Xiang Zui** (36°01'N., 120°18'E.). This anchorage has reported depths of 27 to 40m, sand.

Quarantine Anchorage No. 22, about 1 mile square, is centered on a position about 2 miles NNW of Tuandao Zui, in depths of 7 to 34m, mud and sand, with good holding ground. Shallow draft vessels should anchor in its E part.

Oil Tanker Anchorage No. 23 is situated 1 mile N of the N end of Huang Dao. The anchorage is reported to have depths of 14 to 36m, mud.

Caution

Lesser depths than charted have been reported in Da Gang and its immediate approaches.

A prohibited area, best seen on the chart, surrounds Dagong Dao and lies parallel to the traffic separation scheme.

Xiang Zui to Cape Nelson

5.11 Xiang Zui (36°01'N., 120°18'E.) is the S entrance point to Qingdao Gang.

Daqaio Dao (Ta-chiao Tao), a small islet marked by a light, lies about 1 mile SE of Xiang Zui. Xiaoqiao Dao is a reef that dries about 3m, about 1 mile SW of Daqaio Dao.

Zhucha Dao (35°57'N., 120°19'E.) is an island about 35m high with a flat summit, and marked by a light on its SW side. Islets and rocks extend 0.5 mile E, while a 2m shoal lies 1 mile WNW of the island.

Haixi Bandao (35°57'N., 120°14'E.) is a peninsula extending SW from Xiang Zui to **Kaiser Point** (35°54'N., 120°10'E.), the NE entrance point to Lingshan Wan. The two extremities of the peninsula are hilly, while the middle part is low with sandy beaches separated by rocky points.

Lingshan Wan (35°50'N., 120°05'E.) is an open bay lying between Kaiser Point and an unnamed point 9 miles SW. An inlet in the NE corner of the bay provides anchorage to small vessels with local knowledge and a draft of less than 4m. It is sheltered from all but S winds.

Dazhushan Zui (35°44'N., 120°00'E.) is a high steep-sided headland rising to a 510m summit about 5 miles to the NNW. The coastline between the point and Cape Nelson, about 260 miles SSE, first describes an indentation of considerable extent then continues regular for the remainder of its length with but few gentle bights interrupting a general trend to the SSE.

Inland, a terrain of hills and low-lying mountains declines and merges with a vast, flat, featureless plain that extends over much of the N part of the hinterland lying behind the E coast of China. The entrances to numerous shallow rivers interrupt the coastline.

Offshore, the 20m curve leaves the coast close aboard Ta-chu-shan Tsui and tends to arc well seaward for a distance of about 85 miles before closing the coast once more off the entrance to Chang Jiang. Several off-lying islands lie in the approaches to the N coastal indentation. Numerous shoals lie scattered throughout the offshore area.

Caution.—Caution is recommended when navigating a partially surveyed area which, strewn with many shoal patches of sand and hard mud, extends about 140 miles NNW of the entrance to Chang Jiang and continues offshore for a distance of about 50 miles.

5.12 Lingshan Dao (35°45'N., 120°10'E.) lies about 7 miles ENE of Dazhushan Zui. The S end of the island rises precipitously to a height of 511m, then slopes to its N extremity. A light is shown from the SW side of the island. Vessels with local knowledge can obtain anchorage on the W sides of the island.

Ligen Wan (35°42'N., 119°57'E.), about 6 miles wide, is a small bay lying between Dazhushan Zui and the N point of Zhaitang Dao, a 26m high island lying close off the mainland. A 3.7m patch, marked by a lighted buoy, lies in the approach to Ligan Wan, about 5 miles E of Zhaitang Dao.

Huangjiatang Wan (35°33'N., 119°40'E.), entered between Dongjia Kou Zui (Dongjiakou Zui) and a bluff point about 8 miles SW, is comparatively shallow. Its inner part is filled with drying mud and sandflats.

Anchorage, suitable for small craft during N and NW winds, can be obtained about 1 mile SW of Dongjia Kou Zui, in depths of 6 to 8m, mud.

A prohibited area extends offshore from a position 7 miles SSE of Dongjiakou Zui, to the shoal area of Qingshi Lan, then to the SW extremity of Haixi Bandao.

Shijiusuo (Shijiu Zui) (35°23'N., 119°34'E.), marked by a light, situated about 15 miles SW of Dongjia Kou Zui. Close W of the point. It is the biggest deep water coal terminal in China. The terminal is a pier 1,144m in length, each side of which can accommodate vessels of over 100,000 dwt. The terminal has China's most advanced coal-handling equipment, able to move 15 million tons of coal a year.

In the S end of the harbor there are two 10,000 dwt timber berths and five 10,000 dwt general cargo berths.

Range lights, in line, bearing 345°45' lead into Shijiusuo Harbor.

Pilotage.—Pilotage is compulsory and is available 24 hours. Vessels of less than 100,000 dwt board pilots within the pilot and quarantine anchorage area. Vessels of 100,000 dwt and greater board a pilot in position 35°16.5'N, 119°46.7'E, about 11.5 miles SE of Shijiu Light.

The vessel's ETA should be sent via the agent 72 hours, 48 hours, and 24 hours prior to arriving at the pilot boarding position. The message should include the following information:

1. Time and date of arrival
2. Salt water draft
3. Fresh water draft

Anchorage.—There are five designated anchorage berths, established as follows, with bearings and distances from **Shijiu Light** (Rizhao Light) (35°22.7'N., 119°33.5'E.), as follows:

Berth	Bearing	Distance (miles)	Depth
1	130°	5.3	19m
2	120°	7.0	19m
3	142°	6.8	18m
4	135	8.2	19m
5	112.5°	15	22m

Vessels should avoid transiting the anchorages unless proceeding to or departing from the port.

Haizhou Wan (34°55'N., 119°20'E.) is a shallow bay indenting the mainland coast between Lanshan Tou, about 19 miles SSW of Shijiu Zui, and Lianyun Gang, about 20 miles further S.

Qinshan Dao (34°52'N., 119°17'E.), a 55m high islet, lies close seaward of the extensive drying mud flats at the head of the bay.

Anchorage is available for small vessels with the summit of the island bearing 310°, distant 1 mile, in a depth of 3.7m, mud.

5.13 Lanshan (35°05'N., 119°21'E.) (World Port Index No. 60125) is a new port at Lanshantou on the N side of Haizhou Wan, approached through an unlit buoyed fairway with reported depths of 12 to 15m. Range lights, aligned 341°40', lead into the port.

Depths—Limitations.—There are two berths for small vessels up to 1,000 dwt, and two larger berths, one for vessels up

to 5,000 dwt, 180m in length, and a draft of 7.5m and one for vessels up to 20,000 dwt, 210m in length, and a draft of 10.2m. New wharves under construction include one berth that is 240m long, for 50,000 dwt class ships, and a container berth 250m in length with a depth alongside of 9.5m. Tugs are available.

Pilotage.—Pilotage is compulsory and is available 24 hours except, as follows:

1. Large vessels—pilotage is available during daylight hours only.
2. Pilotage is suspended if wind reaches force 4-5.

The pilot boards between 3 and 5 miles SE of the berth.

Vessels should send their ETA via the agent 72 hours, 48 hours, and 24 hours prior to arriving at the pilot boarding position. The message should include the following information:

1. Time and date of arrival
2. Salt water draft
3. Fresh water draft

Anchorage.—There are three designated anchorage areas that may best be seen on the chart. There are depths of 8.5 to 18m at the anchorages.

Anchorage is prohibited in an area centered on position 35°04'N, 119°55'E due to unexploded ordnance on the sea bed; this area, which is best seen on the chart, and lies approximately 15 miles E of the entrance to Lanshan Gang approach channel.

Caution.—It is reported that a 6.2m shoal lies approximately 30m off the 20,000 dwt berth, and as a result larger vessels berth at HW.

Cultivation areas exist in the vicinity of Lanshan Gang. Vessels should not approach the port without local knowledge.

All vessels must approach the port through the approach channel, best seen on the chart.

Lianyungang (Lianyun Gang) (Lien Yun Chiang) (34°44'N., 119°27'E.)

World Port Index No. 60130

5.14 Lianyungang is one of China's main coastal ports, a key port in international trade. It has the capacity to handle general bulk and containerized cargo. It is located on the mainland shore opposite Dongxilian Dao, a bare rocky island which, having a prominent sharp summit and a conspicuous light on its E extremity, lies close off the S side of Haizhou Wan.

Winds—Weather.—In winter and spring the prevailing winds are from the NW, while in summer and autumn, the prevailing winds are from the SE. Fog occurs in the morning from March until May.

Tides—Currents.—Tides are semidiurnal, rising 5m at springs and 4m at neaps.

Tidal currents at the harbor entrance are rotary in a counterclockwise direction. The flood current sets successively NW, W, and SW at a maximum rate of 1 knot, while the ebb current sets successively SE, E, and NNE at a maximum rate of 0.8 knot.

Within Lianyungang, the tidal currents are reported to be reversing, setting W through the passing on the flood tide and E on the ebb tide. During the flood tide, there are rough seas and swells at the harbor entrance.

Depths—Limitations.—Bulk carriers of up to 150,000 dwt and container vessels of up to 100,000 dwt may be accommodated at the port according to tide. The approach channel, Zhuhangdao Jiaduan, is 230m wide and is dredged to a depth of 16.5m.

There are 22 berths for ships of 10,000 dwt, two for ships of 5,000 dwt, and two for ships of 3,000 dwt in Lianyungang. The coal pier, WNW of Pier No. 3, is 160m long, with alongside depths of 8.9 to 9.1m.

New quays have been constructed (2010) the E of Lianyungang with alongside depths of 14.7 to 18.1m. The construction of an ore terminal that will accommodate vessels of up to 250,000 dwt is in progress.

Coal berths for ships of 16,000 and 35,000 tons, together with four general cargo berths for vessels up to 25,000 tons, are situated at Miaoling, 1 mile W of Lianyungang.

Xugou, 1 mile W of Miaoling, is a harbor for smaller vessels. The channel to Xugou has a least depth of 7.2m and is navigable for vessels of up to 50,000 tons having a maximum draft of 10.5m.

A 6,700m long breakwater is under construction connecting the mainland at **Beiying Zui** (34°46'N., 119°22.1'E.) with **Jiangjia Zui** (34°41'N., 119°26.'E.) on the W side of Dongxilian Dao, forming an artificial bay.

The East China Sea Rescue Bureau Terminal, 200m long, with alongside depths of 6.5m, is situated on the S side of Lianyungang in position 34°45'N, 119°28'E.

Aspect.—On the S side of Lianyungang, there is an artificial harbor protected by two low, stone breakwaters, which are either awash or just below water. A fishing harbor, protected by a breakwater, is situated close SE of the root of the E breakwater of the artificial harbor.

A conspicuous white tower, 35m high, stands near the root of the E breakwater.

Pilotage.—Pilotage, which is compulsory for all foreign vessels entering and leaving the harbor, is available 24 hours. Pilots board at Quarantine and Pilot Anchorage No. 1 in position 34°48.5'N, 119°37.5'E or at Quarantine and Pilot Anchorage No. 2 in position 34°46.5'N, 119°38.8'E. For vessels under 5,000 gross tons, pilots board at Quarantine Anchorage No. 3 in position 34°45.3'N, 119°31.6'E.

Regulations.—Vessels should send ETA 72 hours, 48 hours, and 24 hours prior to arriving at the pilot boarding position. The message should include the following information:

1. Time and date of arrival
2. Salt water draft
3. Fresh water draft

Two-way traffic in the main fairway is permissible for oil, gas, and chemical tankers and also for ro-ro vesssels having a maximum length of 150m, and for all other vessels of up to 200m in length. There is however, a restriction of combined beams of 47m or 57m, respectively. For larger vessels, one-way traffic operation is enforced. Vessels should avoid meeting in the fairway in visibility conditions of less than 2 miles, or in winds of force 6 and higher.

Vessel Traffic Service.—There is a VTS in operation in the harbor limits within a line joining the following points:

1. Yangwo Tou
2. 3 miles N of Yangwo Tou

3. Cheniushan
4. Danianshan.
5. Position 34°50.5'N, 120° 01.9'E.
6. Position 34°40.6'N, 119° 45.0'E.
7. Position 34°40.6'N, 119° 27.2'E.

Participation in the VTS is compulsory for all foreign vessels and Chinese vessels greater than 300 grt. Vessels should report upon entry to the VTS, when shifting berths, or when passing Lighted Buoy No. 23 and Lighted Buoy No. 36.

Anchorage.—The quarantine and pilot anchorage lies 11 miles ENE of Yangwo Tuo and has depths of 13 to 16m.

The anchorage is exposed and dragging may occur in winds over force 7. Tha anchorage is unsuitable in a typhoon and more sheltered anchorage should be sought on Qingdao, 90 miles NNE.

A tide gauge lighted beacon (black beacon, red band with topmark) lies in position 34°45.9'N, 119°35.9'E, 1 mile E of Quarantine and Pilot Anchorage No. 2.

From Lianyungang, the flat, featureless coast extends 220 miles SSE to the vicinity of Cape Nelson (Changjiangkou Beijiao) and is intersected by numerous streams. For the last 110 miles it is fronted by an unsurveyed area of changing shoals and flats which extend as much as 50 miles offshore.

Caution.—A dangerous wreck lies within the harbor limits, 14 miles SW of Dashan Dao.

A spoil ground lies close S of the traffic separation scheme and is centered in approximate position 34°44'N, 119°30'E.

Chang Jiang Approaches

5.15 Changjiang Kou Beijiao (Cape Nelson) (31°40'N., 121°51'E.), the N entrance point of the estuary to Chang Jiang, is low. Nanhui Zui, the S entrance point, lies about 49 miles to the S. The intervening water area is largely choked by numerous low-lying highly cultivated well-populated islands and by a substantial series of shoals and drying flats of sand and mud which, resulting from the continued deposit of downstream, riverborne sediment, are subject to constant change in character, position, and depth. Several channels lead through the estuary. The N lane of the estuary has a least depth of 7m. The S channel has three shoal areas with a least depth of 6m. The Huangpu River Channel has a depth of 10m up to Zhang-huabang, 8m up to Longhua, and 7m up to Minhang.

Nan Shuidao (South Channel), the principal navigable channel through the entrance to Chang Jiang, leads between the drying mud flats fronting the coastline NNW of Nanhui Zui and the numerous islets, shoals, and drying mud flats extending upstream from T'ung-sha Ch'ien-t'an (Tungsha Banks), the most extensive danger in the seaward approaches to the river.

Changjiang Kou Light Vessel (31°06'N., 122°32'E.) equipped with an automatic identification system (AIS), and racon, is located 9 miles SE of Jigu Jiao.

Nanzhi Lanby (30°58'N., 122°11'E.), equipped with an AIS, is moored in the S approach to Chang Jiang, 16 miles ENE of Nanhui Zui.

Three channels are used by shipping entering Changjiangkou. These are Nanzhi Hangdao, close to the S shore of Nan Shuidao; Nancao Hangdao, N of Nanzhi Hangdao, in the deeper part of Nan Shuidao; and Beicao Hangdao, which passes between Jiuduan Sha and Tongsha Qiantan, two extensive drying banks, and then through Bei Cao to merge with Nancao Hangdao.

Nanzhi Hangdao is entered at Nanzhi Lanby. It is used by inbound and outbound shallow draft vessels.

Nancao Hangdao is entered at Changjiangkou Light Vessel and provides a deep water route for two-way traffic. The channel through Nancao Hangdao, **Nancao Shuidao**, is buoyed. The inbound channel lies N of the centerline, and has a least charted depth of 4.8m; the outbound channel has a least charted depth of 5m and lies S of it. Each channel is 500m wide. Located at the NW end of the passage is **Jiuduan Light Float** (31°07'N., 121°57'E). This marks the intersection with Nanzhi Hangdao. A dredging program is in progress (2011) to deepen the Changjiang Kou Deep Water Channel to a depth of 12.5m from position 31°06.1'N, 122°29.7E, in the vicinity of Changjiang Kou Light Vessel, to position 31°22.5'N, 121°36.4E, abreast Changxing Dao.

Nancao Light Float (31°03'N., 122°16'E.) is moored in the S approach to Chang Jiang 10 miles SSW of Jigu Jiao.

Beicao Hangdao is also entered at the Changjiang Kou Light Vessel. It is a deep water channel for vessels which cannot use the channels through Nan Shuidao because of their draft.

Yawosha Hangcao is a narrow part of the deep water channel that is dredged to a depth of 7.3m.

Tides—Currents.—Tidal currents in the seaward approach to Chang Jiang are rotary and turn in a clockwise direction. Rates vary from 1 knot at neaps to 4 knots at springs.

At the entrance to **Nan Shuidao** (31°02'N., 122°11'E.), the tidal currents are rotary and turn in a clockwise direction. Rates vary from 1 knot at neaps and 2 to 3 knots at springs. There is a dangerous set on to the S bank of the river from about 5 to 7 hours after HW. During strong N winds, this set persists well within Nan Shuidao.

In this same area, with fresh S winds, the tidal currents after HW set N of E much longer than in calm weather; with a fresh N wind the reverse is the case. During NE winds, the tidal currents set NW for a longer period and the water level is higher than usual; during SW winds the reverse is the case.

Within Nan Shuidao, the tidal currents become mainly reversing with only a brief period of slack water. At strength, they follow the direction of the channel.

In the narrow part of the channel (31°07'N., 122°00'E,.) the flood current attains a maximum rate of 2 knots at neaps and 3 knots at springs, while the ebb current attains a maximum rate of 3 knots at neaps and 6 knots at springs.

Between the narrow part of the channel and the entrance to Huangpu Jiang, the rates of the tidal currents tend to be less, attaining a maximum rate of about 3 knots on the flood current and about 5 knots on the ebb current.

Depths—Limitations.—The least depth in Nan Shuidao was reported to be 4.6m. Deep draft vessels have reported touching bottom in the vicinity of position 31°12'N., 121°52'E.

Vessels with a draft of 8.9m ordinarily transit Nan Shuidao at HW. Vessels with a draft of 9.4m are able to transit the channel during the HW of spring tides. A vessel was reported to have transited Nan Shuidao and to have berthed at Huangpu Jiang with a draft of 9.6m.

Vessels with a draft of less than 4.9m enter Nan Shuidao at about LW, having regard for a current set to the S and SW. Vessels with a draft greater than 4.9m arrive at the entrance 2 to 3 hours before HW so as to take advantage of a current setting to

the W and NW.

Pilotage.—Pilotage is compulsory for vessels both entering and leaving the river delta and is available 24 hours. Pilotage should be requested 72 hours prior to arrival. The pilot vessel can be contacted on VHF channels 6, 9, 15, 16, and 69.

The Chang Jiang Pilot Center may be contacted, as follows:

1. Telephone: 86-51086848808
   86-51086848810
2. Facsimile: 86-51086824246
3. E-mail: pilots@public4.sta.net.cn
4. Web site: http://www.cj-pilot.com.cn

The North Channel pilots for deep draft vessels approaching Beicao Hangdao board in position 31°05'N, 122°25'E.

The South Channel pilots for vessels bound for Nancao Hangdao board in position 31°05'N, 122°35'E .

The river pilots to all ports on the Chang Jiang board S of Baoshan anchorage in position 31°26.3'N, 121°29.2'E.

Vessels outbound from Chang Jiang exchange pilots in position 31°26.2'N, 121°28.8'E.

Harbor pilots will relieve the river pilots to dock the vessel in some ports on the Chang Jiang.

Vessel Traffic Service.—Shanghai Vessel Traffic Service (VTS) is mandatory for all foreign vessels, of 1,000 grt and over, vessels of excessive beam or length, tankers of 500 dwt and over, and passenger vessels carrying 12 or more passengers. The VTS monitors all traffic on the Chang Jiang up to Huango Jiang.

Vessels report to VTS Wusong Center on VHF channel 9 or 71 for arrival, departure, or movements within the VTS limits. Vessels should also contact Shanghai MSA the day before arrival and a day before departure.

Inbound vessels report to Wusong VTS on VHF channel 9 when passing the following points:

1. Vessels transiting Beicao Hangdao (North Channel):
   a. Changjiang Kou Light Vessel.
   b. Between Lighted Buoy D9 (31°06'N., 122°21'E.) and Lighted Buoy D11 (31°06'N., 122°19'E.) .
   c. Lighted Buoy D42 (31°18'N., 121°45'E.) or Lighted Buoy D43 (31°19'N., 121°44'E.).
   d. Yuanyuansha Light Vessel (31°19'N., 121°42'E.).
2. Vessels transiting Nancao Hangdao (South Channel):
   a. Nancao Light Vessel (31°00'N., 122°28'E.).
   b. Lighted Buoy S7 (31°03'N., 122°16'E.).
   c. Between Lighted Buoy S16 (31°05'N., 122°02'E.) and Lightd Buoy 18 (31°06'N., 121°59'E.).
   d. Juduan Light Vessel (31°08'N., 121°55'E.).
   e. Yuanyuansha Light Vessel (31°19'N., 121°42'E.).
3. Vessels transiting Chang Jiang to Wusong should radio a position report at the following points on VHF channel 71:
   a. Lighted Buoy A56 (31°20'N., 121°40'E.).
   b. Lighted Buoy 60 (31°23'N., 121°35'E.).
   c. Lighted Buoy 101 (31°24'N., 121°32'E.).
   d. Lighted Buoy 66 (31°25'N., 121°31'E.).
4. Vessels proceeding to Baoshan, or changing to river pilotage, should radio a position report at the following points on VHF channel 71:
   a. Lighted Buoy 72 (31°28'N., 121°27'E.).
   b. Lighted Buoy 74 (31°29'N., 121°26'E.).
   c. Baoshan Superbuoy (31°32'N., 121°21‘'E.).
   d. Lighted Buoy 84 (31°32'N"121°20'E.).

Outbound vessels should also report at the reporting points stated above.

Vessels should report vessel name, present berth or anchorage, and intended destination to Wusong VTS when commencing shifting or berthing operations. A completion of operations should subsequently be reported, including vessel name, time of anchoring or securing, and name of berth or anchorage.

Signals.—Inbound vessels using Beicao Hangdao should exhibit a black cylinder by day or two all round violet lights in a vertical line by night until reaching Lighted Buoy No. 270. Outbound vessels should exhibit the same signals between Lighted Buoy H46 and Lighted Buoy No. 261.

When arriving at the quarantine anchorage at night, a vessel seeking immediate clearance shall display three vertical red lights. When clearance is not required until morning, the vessel will display a red light over a white light.

Anchorage.—There are four designated anchorages in Chang Jiang Kou, the positions of which may best be seen on the appropriate chart.

Vessels, with a draft of 7.6m or less, may proceed directly to the pilot station and there anchor to await either the pilot or a favorable tide. Vessels, with a draft greater than 7.6m, proceed to a position about 1 mile NE of position 31°03'N, 122°20'E and anchor there to await instructions. Vessels of any draft also proceed to this anchorage when they are unable to reach the pilot station at their announced ETA or when tidal conditions are generally unfavorable. Vessels carrying dangerous cargo anchor in the designated area centered on position 30°57.3'N, 122°27.5'E.

Vessels are cautioned to exercise particular care when navigating within the sea anchorages off the entrance to Chang Jiang in so far as tidal currents are rotary and imperfectly predictable and sunken wrecks or other obstructions are numerous and dangerous, especially within a radius of 5 miles E through S of position 31°03'N, 122°20'E.

Caution.—Vessels are cautioned that the prevailing winds and weather modify to a great extent the regularity of both the times of high and LW, and the duration, direction, and rate of the tidal currents.

A dangerous wreck lies in the vicinity of the intersection of Nanzhi Hangdao and Nancao Hangdao, in 13m of water.

A dangerous wreck lies 0.8 mile ENE of Nanzhi Lanby.

Vessels are cautioned that, during periods of fog or thick weather, navigation within the estuarine approaches to Chang Jiang is accompanied with great danger in consequence of the constant shifting of shoals, the continual change in channel limits and the frequent displacement of aids to navigation.

A power cable, with a vertical clearance of 40m, crosses Hengsha Tongdao in position 31°21'N, 121°48'E.

Jigu Jiao (Chi-ku Chiao) (Amherst Rocks) (31°10'N., 122°23'E.), a group of dark-colored above-water rocks which are reported radar conspicuous at 9 miles, lie about 31 miles NE of Nanhui Zui and constitute the most seaward danger in the immediate approaches to Chang Jiang. The largest rock is 12m high and is marked by a light shown from a white square concrete structure on the rocks; a racon transmits from the light structure.

Vessels are recommended to give the rocks a wide berth during nighttime and periods of poor visibility.

Shanghai (31°13'N., 121°30'E.)

World Port Index No. 59970

5.16 Shanghai, the largest and most important port in China, lies on the banks of the river Huangpu Jiang at a distance of about 12 miles from the juncture of Huangpu Jiang with the S side of the estuary to Chang Jiang. The port has a vast hinterland at its back which covers the nation's central area from E to W, and the highly-developed Yangtze River Delta and coastal area. The average sea level elevation of the alluvial plain of this river delta is 4m.

Winds—Weather

In the summer, winds from the SE are frequent. In the winter, winds are usually from between NW and NE. Gales from the NE, with a wind strength averaging 20 knots or more, sometimes last as long as a week during the winter. The winters are damp and temperatures sometimes fall below freezing.

During spring or autumn, sudden changes of temperature occur, often as much as 16.7°C, in a relatively short period of time. Summers are hot, especially between the middle of July and the middle of September. Typhoons can occur occasionally from July through September, although work in the harbor is rarely affected due to the shelter provided by the tall buildings of the city.

Fog occurs from October through May. It is the most frequent in December and is generally dispersed by 1000.

Ice

The port is ice-free year round.

Tides—Currents

Tides are semidiurnal, with a range of 2.5 to 4m. In the anchorage close within the entrance to Huangpu Jiang, the flood current begins from 20 to 40 minutes after LW at springs and from 1 to 1.5 hours after LW at neaps. The ebb current begins from 1 to 2 hours after HW at springs and from 1 to 2 hours after HW at neaps. The tidal currents start on both banks before they commence at mid-channel.

At Shanghai, under normal weather conditions, there is practically no slack water between the end of the ebb current and the start of the flood current at spring tides. Both currents attain a rate of 3 to 4 knots at springs.

At Shanghai, the flood current runs from about 2 hours after LW until about 3 hours after HW at the entrance to Huangpu Jiang. The ebb current runs the remainder of the tidal period. After heavy rains, the flood current runs from about 3 hours after LW until about 3 hours after HW at the entrance to Huangpu Jiang, and may attain a rate of 4 knots.

Depths—Limitations

The port has undergone considerable development and modernization in recent years and expansion is continuing. There is more than 15,500m (over 8.5 miles) of berthing space between Wusong and the upper limit of the harbor, with alongside depths of 8.8 to 11.4m, providing berthing for 98 vessels. Mooring buoys provide an additional 25 berths for ships of 25,000 tons, 28 berths for ships of 4,000 tons, and 18 berths for smaller vessels.

Lujong Terminal consists of 33 berths which handle iron ore, coal, and steel. An LNG terminal is in operation at Yangshan port.

A loading/unloading platform, made from a 100,000 ton ore carrier, is established near the junction of the Chang Jiang and Huangpu Jiang to permit deep draft ore and grain carriers to partially unload to reduce their draft before entering the harbor.

The port is divided into 12 work areas or districts and one passenger terminal. These areas are not in geographical sequence.

There is a container wharf, 424m long, in Work Area No. 9 on the W bank below Wusong, and another, 400m long, in Work Area No. 10 on the E bank. There are depths of 10.5m at each wharf.

Shanghai Puhang Chuyun Quay handles aviation fuel, is 380m long, and located on the S shore of the Chang Jiang Kou. The quay accommodates vessels of 30,000 to 50,000 tons.

Shanghai Caojing Power Plant Wharf (30°44'N., 121°24'E.) extends 1 mile SSE from the shore. The coal wharf at the head of the F-shaped jetty is 270m long, with an alongside depth of 12m; vessels of up to 35,000 dwt can be accommodated. The channel leading to the wharf has a width of 500m.

Aspect

Huangpu Jiang (Whangpoo River) is an important tidal stream which is entered through an extensive and periodically submerged training wall at Wusong Kou. This river wanders through the soft mud of a low, adjacent alluvial plain for a distance of about 74 miles to a juncture with Yun Ho, a lengthy inland waterway. The W or left bank is often referred to as the Shanghai side, while the E or right bank is referred to as the Pudong side.

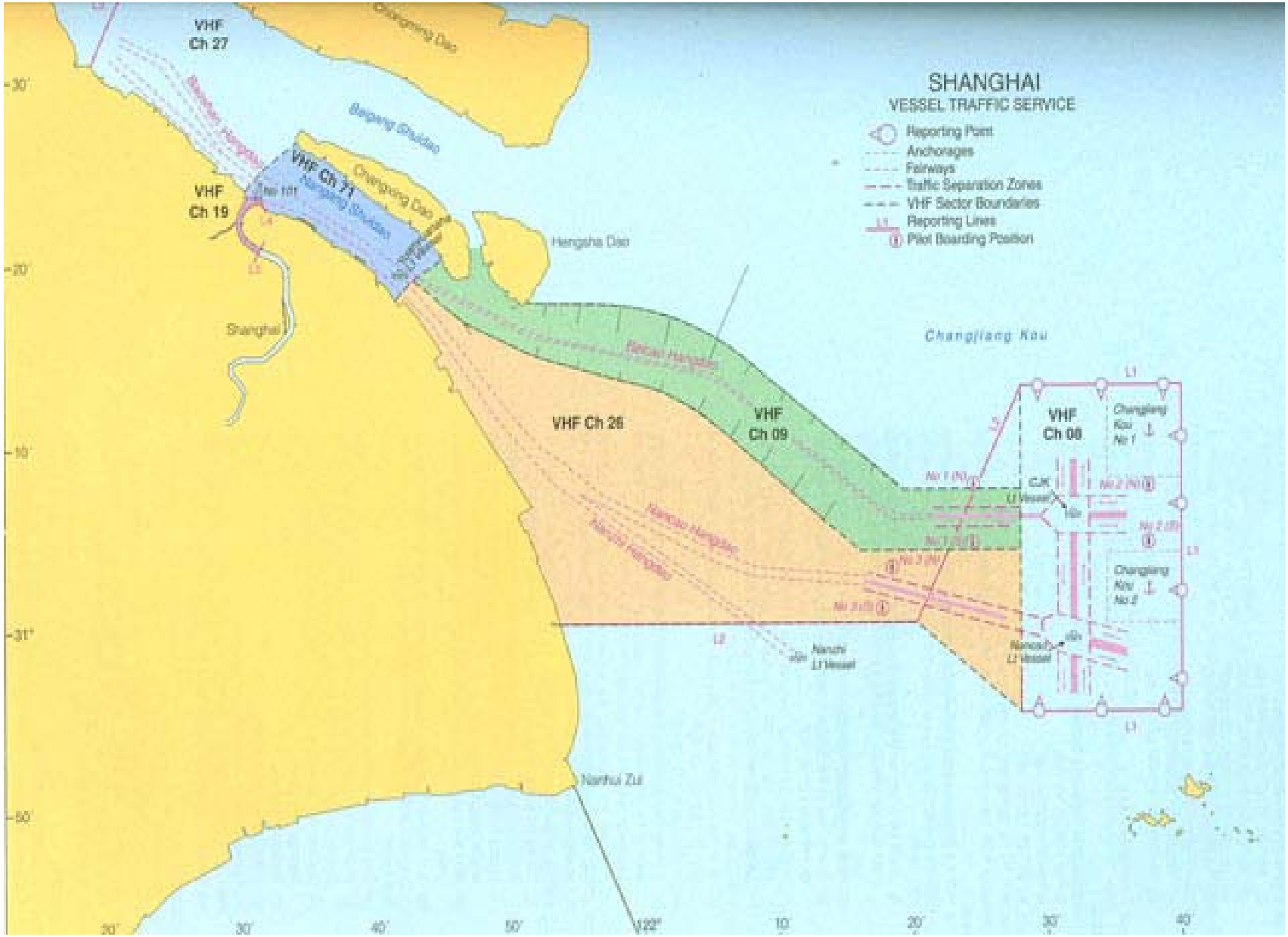
Wusong Kou (31°23'N., 121°31'E.), the entrance to Huangpu Jiang, lies between training walls 0.4 mile apart. On the S side, the area backing the training wall has been reclaimed. On the N side, the training wall is backed by a drying flat. A conspicuous tower stands near the N entrance point of the river. Range lights in line, bearing 250°, and leading through the entrance channel, are shown from the W bank of the river, about 0.7 mile SW of the head of the N training wall.

For the first 7 miles within the entrance to Huangpu Jiang, a good deal of reclamation has taken place. This is particularly so on the W bank opposite the entrance to **Gaoqiao Gang** (31°20'N., 121°33'E.), where the river along that stretch is narrowed to 0.3 mile in places. There is a conspicuous chimney on the E bank about 1 mile above Gaoqiao Gang.

A coal storage dock is situated at the Gaoqiao power plant. The dock is 240m long and has an alongside depth of 5.9m.

Donggou Gang (31°17'N., 121°34'E.) is a creek on the E bank, 2 miles above Gaoqiao Gang. The wharves of oil installations and the entrance to a dry dock are situated along the bank between 1 and 2 miles above Donggou Gang.

Lujiazui (31°14'N., 121°29'E.) is a point on the E bank around which the river turns sharply SE. In this vicinity and in parts of the river above this point, the width of the navigation



Courtesy of United Kingdom Hydrographic Office

Shanghai Vessel Traffic Service

channel is 0.3 mile or less.

The Bund is on the W bank 0.3 mile SW of Lujiazui. Along it are many fine buildings, including the Customs House, with its high clock tower.

Pilotage

Pilotage is compulsory. See paragraph 5.15 for further information.

Pilots for Yangshan LNG Terminal board in the following positions:

1. No. 1 Anchorage (30°25'24"N., 122°45'42"E.)
2. No. 1 Quarantine Anchorage (30°29'00"N., 122°29'18"E.)
3. No. 2 Pilot Boarding Position (30°33'00"N., 122°22'00"E.), in the vicinity of Lighted Buoy Y1 and Lighted Buoy Y2 .

Regulations

Speed must be regulated so that no damage is done to the wharves, banks, any kind of structure, or other vessels, and reduced to a minimum when in the vicinity of vessels berthing, discharging, or loading dangerous cargo, salvaging, or dredging.

Vessels traveling against the tidal current must give way to those traveling with the current.

Vessels are prohibited to overtake another vessel in Huangpu Jiang. Meeting situations in the bends of the river should be avoided.

Vessels undergo quarantine inspections at the quarantine anchorage at the entrance to Huangpu Jiang. This inspection is not required if arriving from another Chinese port.

In very bad weather, the inspection may be postponed until the vessel has berthed, in which case the quarantine flag is flown while the vessel is proceeding in an upriver direction.

Vessel Traffic Service

For information on the Shanghai Vessel Traffic Service, see paragraph 5.15.

Signals

Tidal signals.—Tidal signals are displayed from a dial standing near the training wall extending from the N entrance point of Huangpu Jiang. A radial arm pointing to Arabic numerals arranged from 0 to 6 indicates the tidal rise in meters. A neon indicator shows whether a falling or rising tide.

Traffic signals.—A large red flag hoisted at the Wusong Kou signal station indicates that a large number of small craft are maneuvering within the entrance to Huangpu Jiang. This signal should be taken to mean navigate with extreme caution.

Dredge signals.—Dredges operating in the center of the river display a red flag over a black triangle during the day and three red lights, forming a triangle, at night. Pump vessels operating along the bank of the river display a red flag over a black triangle during the day, and three white lights, forming a triangle, at night.

Dredges operating on the Pudong side of the river display a red flag over a black ball during the day. At night, three lights, forming a triangle, with the apex being a white light and the base being red lights, are shown.

Dredges operating on the Shanghai side of the river display a red flag over two black balls by day. At night, three lights, forming a triangle, with the apex being a red light and the base being white lights, are shown.

Salvage vessel signals.—By day, salvage vessels display a square green flag. When working, they also display appropriate signals from the International Code of Signals and, when a diver is working below the surface, a square red flag.

At night, salvage vessels when working display a green light over a white light or, when a diver is working below the surface, two green lights displayed vertically.

Shanghai—Port Signals	
Signal	**Meaning**
Flag B	Dangerous or inflammable cargo on board. At night, a red light is to be hoisted.
Flag D	Vessels entering or leaving a dockyard. At night, three lights, white, red, red, vertically disposed, are to be hoisted.
Flag G	Pilot required.
Flag H	Pilot on board.
Flag I	Fumigation officer required.
Flag L	Customs officer required.
Flag N	Harbor officers required.
Flag P	To sail soon.
Flag U	Tug required.
Flag R	Water boat required.
Flag W	Medical officer required. In case of emergency a black ball should be hoisted under the flag. At night, three lights, white, red, white, vertically disposed, should be hoisted, and one short and two long blasts on the siren or whistle should be sounded.
Flag Y	Mail on board.
Second substitute	Ship's surveyors required.
Flags DV	Leakage on board, pumping boat required. At night, three lights, red, green, green, vertically disposed, should be hoisted.
Flags DW	Mooring sampan required. Two long blasts on the siren or whistle may also be used.
Flags FS	Ash boat required.
Flags NQ	Fire tender required. At night, three lights, green, white, red, vertically disposed, should be hoisted; also continuous whistling.

Shanghai—Port Signals	
Signal	**Meaning**
Flags ST	Police officers required. At night, three lights, red, white, red, vertically disposed, should be hoisted.
Flags HG	Pilot ferry boat required.
Flags TE	Vessels passing are requested to reduce speed.
Flag F below answering pennant	Ferry boat required by vessel lying outside. Wusong Kou. At night, two red lights, horizontally disposed.

Quarantine signals.—A vessel arriving at the quarantine anchorage at night seeking immediate clearance will display three red lights in a vertical line. If the vessel is not seeking clearance until the morning, a red light over a white light is displayed.

Anchorage

Hengsha (31°18'N., 121°48'E.), situated N of the channel between Zhongsha Light Vessel and Yuanyuansha Hangcao, can be used by large vessels as a typhoon anchorage. Depths are from 9.7 to 14.5m, mud and sand bottom.

Anchorage No. 1 and Anchorage No. 2 are temporary anchorages for large vessels situated in the vicinity of position 31°22'N., 121°38'E. which is about 5 miles NW of Yuanyuansha Hang-cao, as shown on the chart. It has depths of from less than 2 to over 19m, mud and sand bottom.

Quarantine Anchorage No. 1 and Quarantine Anchorage No. 2 are situated about 2.3 miles NNE of the entrance to Huangpu Jiang and NW of the large vessels temporary anchorage.

Eleven designated anchorage areas are located NW and ESE of Huangpu Jiang and may best be seen on the chart.

Directions

The tide indicator at Wusong should be consulted to obtain the height of tide at the time of entering the river.

It was reported that the track followed by pilots indicated that considerable dredging had been carried out in the river.

From the entrance at Wusong Kou, the track within the river lies about 130m off the W bank, until abreast the Harbor Superintendent's Office (31°21.4'N., 121°29.9'E.), passing W of the lighted buoys marking the shoal water fringing the E bank. The fairway at Wusong is E of any vessel moored there, and it is advisable not to enter the river while such vessels are swung across the channel. About 1 mile upstream of the Harbor Superintendent's Office, the track is N of the lighted buoys marking the shoal bank on the SW side of the river. Then the greatest depths in the fairway lie towards the E and SE side of the river until within 1 mile of Lujiazui. Rounding Lujiazui on the flood current, especially at spring tides, requires great attention to steering.

Pilots have found that the handling of deep draft ships is facilitated by taking them up with the flood current, turning, and berthing them bows down river.

At the top of spring tides, however, it is prudent to time entry to avoid turning on the full strength of the flood current. As soon as HW has made, the strength of the stream decreases and turning can be affected with navigational safety.

A vessel, 213m in length, was reported to have turned in the harbor.

When leaving the harbor, deep draft vessels should sail at the very commencement of the flood stream, even if this entails anchoring outside Huangpu Jiang to await the next flood tide before making the passage through Nan Shuidao.

With expert local knowledge it is possible, except at neaps, to leave berths below Lujiazui on the last of the ebb current and make the passage through Nan Shuidao on the one tide.

Caution.—Submarine cables are laid across the harbor in several places. Their shore ends are usually marked by illuminated notice boards. A number of submarine cables are landed on the south side of the entrance of the Huangpu Jiang. Three submarine cables cross the river in the vicinity of the Harbormaster's Office. A submarine cable crosses the river, about 1 mile southward of Gaoquio Gang entrance. A pipeline crosses the river about 1 mile NW of the entrance of Gaoquio Gang.

The harbor is crowded with all types of native craft, from large junks to sampans. Cross-river ferry traffic may be encountered about 1.4 miles upriver of Yang-ching Chiang.

5.17 Chang Jiang (Yangtze River) (31°48'N., 121°10'E.), meaning the Great River, is the largest river in China and the world's third longest river after the Amazon and the Nile. It extends 3,828 miles providing abundant water sand favorable navigation systems along with the rich soil and plentiful growth of its river valleys that sustains 250 million inhabitants.

The Yangpu Bridge spans Huangpu Jiang at position 31°15'N, 121°32'E and has a vertical clearance of 44m above MHWS.

It constitutes a major commercial waterway for approximately one-half its total length. The river can be navigated with local knowledge and charts. The Jiangyin pilot station regulates Yangtze River traffic, and particularly restricts night navigation between 2200 and 0600.

The port of Qihai, harboring 11 berths, is an industrial waterfront established at the mouth of the Yangtze and extending N to the Chongming delta. The port is a multi-functional and secondary port to Nantong.

Pilotage.—Pilotage for Chang Jiang is compulsory. Pilots board, as follows:

1. Sea Pilots board at the Chang Jiang Kou Pilot Anchorages and generally disembark at Baoshan Anchorage. Pilot exchanges at Baoshan Anchorage are in the following positions:
   a. 31°26'N, 121°30'E.
   b. 31°32'N, 121°23'E.
2. River Pilots to all river ports board at Baoshan Anchorge.
3. Harbor pilots will relieve the river pilots to dock the vessel at certain ports.

Chang Jiang pilots serve the following ports:

1. Anqing.
2. Changsha.
3. Changshu (Jiangsu).

Nanjing

4. Changzhou.
5. Chenglingji.
6. Chizhou.
7. Chongqing.
8. Hankou.
9. Huangshi.
10. Jiangyin.
11. Jingzhou.
12. Jujiang.
13. Ma'anshan.
14. Nanjing.
15. Nantong.
16. Shanghai.
17. Taicang.
18. Taizhou.
19. Wanzhou.
20. Wuhan.
21. Wuhu.
22. Yangzhou.
23. Yichang.
24. Yueyang.
25. Zhangjia Gang.
26. Zhenjiang.

Chang Jiang Pilot Center

http://www.cj-pilot.com.cn

Regulations.—Vessels proceeding upriver must report to the appropriate Vessel Traffic Service (VTS), as follows:

1. Nantong VTS on VHF channel 69 upon passing Liuhe Kou (31°31'06"N., 121°18'00"E.).
2. Zhangjia Gang VTS on VHF channel 69 upon arrival at the reporting line between Chang Jiang Red Buoy No. 39 and Chang Jiang Green Buoy No. 39.
3. Jiangyin VTS on VHF channel 69 upon arrival at the reporting line between Pangqigang and Dahegang (31°57'36"N., 120°19'51"E.).
4. Taizhou VTS on VHF channel 69 upon arrival at the reporting line between Wushiwuwei triangulation point and Wuwei crossing mark.
5. Zhenjiang VTS on VHF channel 9 upon arrival at the reporting line between Simashu Lighted Beacon (32°19'41"E., 119°44'38"E.) and the opposite bank.

6. Zhenjiang VTS on VHF channel 9 upon arrival at the reporting line between Maanji Red Lighted Buoy (32°13'06"N., 119°40'24"E.) and Fengguwei Triangulation Point.

7. Nanjing VTS on VHF channel 69 upon arrival at the reporting line between Sh'ier Wei chimney and Xinhekou.

8. Wuhu VTS on VHF channel 10 upon arrival at the reporting line joining Pengxing No. 173 Black Buoy and Pengxingzhou Beacon (Jiangxinzhou Shuidao).

9. Wuhu VTS on VHF channel 10 upon arrival at the reporting line joining Baimao Shuidao No. 193 Red Buoy and Dahewei Beacon (Baimao Shuidao).

10. Nanjing VTS on VHF channel 69 upon arrival at the reporting line between the two towers for Dashengguan cross-river cable.

11. Zhenjiang VTS on VHF channel 9 upon arrival at the reporting line between Sh'ier Wei chimney and Xinhekou.

12. Zhenjiang VTS on VHF channel 9 upon passing THE Runchang Bridge (32°12'27"N., 119°21'46"E.).

13. Taizhou VTS on VHF channel 69 upon arrival at the reporting line between Simashu Lighted Beacon (32°19'41"N., 119°44'38"E.) and the opposite bank.

14. Jiangyin VTS on VHF channel 69 upon arrival at the reporting line between Jiagang (31°57'50"N., 120°05'28"E .)and Ligang (31°56'43"N., 120°04'23"E.).

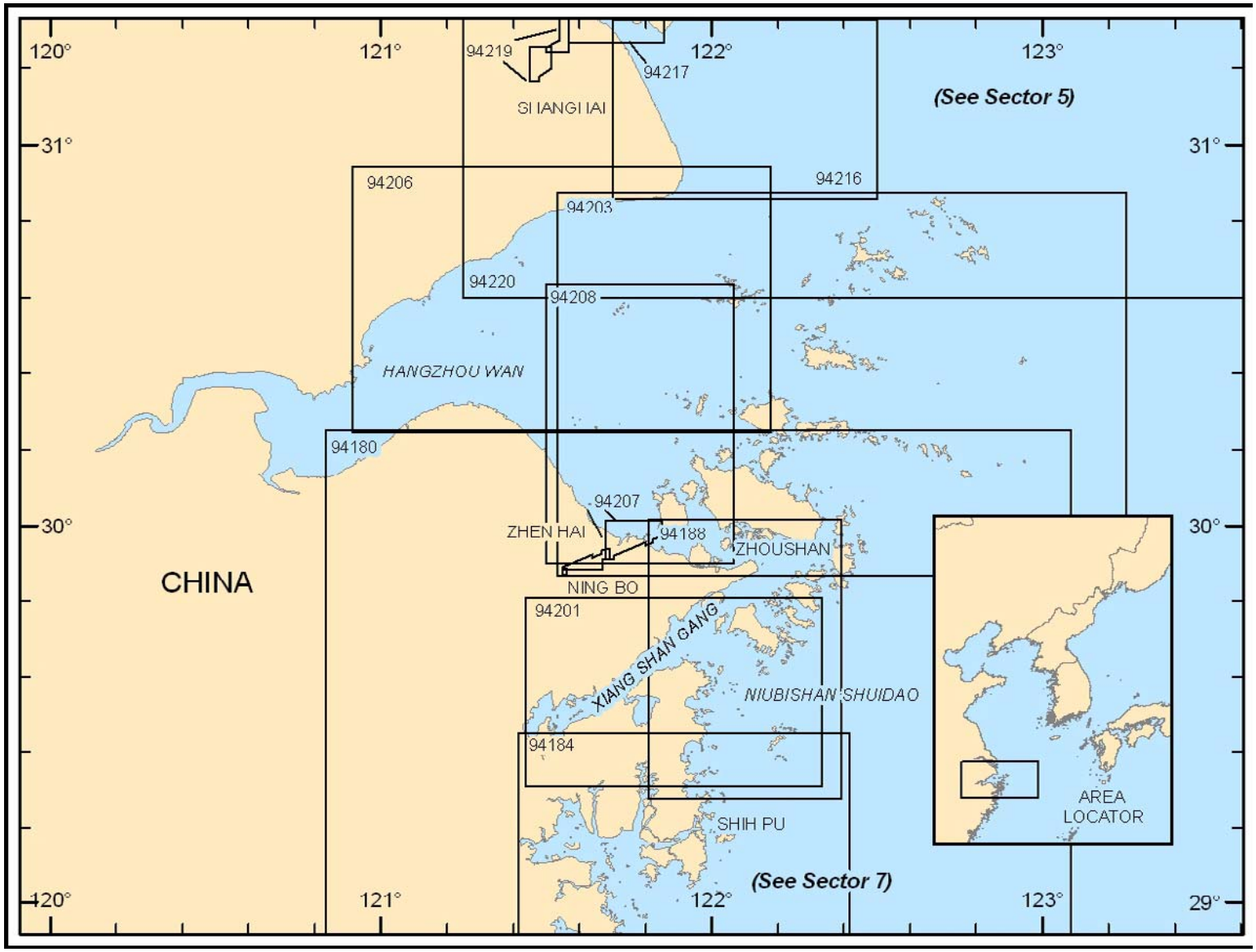
15. Zhangjia Gang VTS on VHF channel 69 upon passing the Jiangyin River Bridge (31°56'47"N., 120°16'00"E.).

16. Nantong VTS on VHF channel 69 upon passing the reporting line between No. 33 Black Lighted Buoy (32°01'55"N., 120°25'58"E.) and the Xijigang river mouth (32°03'05"N., 120°24'57"E.).

17. Wuhan VTS (30°34'N., 114°18'E.) on VHF channel 84 upon passing the reporting lines as follows:

a. Wuhan Yangtze River Bridge.
b. Dunkou overhead power lines.
c. Han Shui river mouth.

Caution.—Traffic routes, buoys, and anchorages in the Chang Jiang are adapted according to the constantly changing banks and channels of the river. Timber rafts and concentrations of river craft may be encountered.



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

SECTOR **6** — CHART INFORMATION

SECTOR 6

CHINA—HANGZHOU WAN AND APPROACHES

Plan.—This sector describes the E coast of China between Nanhui Zui, the N entrance point of Hangzhou Wan, and T'ung-t'ou Shan, an islet about 98 miles to the S, and includes off-lying islands and Hsiang-shan Chiang. The description is N to S.

General Remarks

6.1 Winds—Weather.—Monsoon conditions prevail. The Northeast Monsoon season (September-March) has winds that blow as moderate breezes from NW through N to NE about 70 per cent of the time. The Southwest Monsoon season (June-July) has irregular winds blowing from S to SW. September is the wettest month with July being the driest.

Tides—Currents.—Ocean currents come largely under the influence of monsoon winds. September through April, currents set to the S. From about May through August they set N. Currents in Hangzhou Wan generally set seaward.

Hangzhou Wan (Hangchow Bay) (30°25'N., 121°00'E.) is a large shoal bay whose shores are fronted by an extensive margin of drying mud flats. The N shore is low and flat and lies on the S limit of a vast, cultivated plain which extends well inland from the N part of the E coast of China.

The S shore continues low and flat for a short distance inland, then rises to hills and mountains which, trending NE in parallel ridges, reach the coast at the S entrance point of the bay in an elongated, bold promontory and then continue seaward to form an archipelago of characteristically scattered off-lying islands.

The near shore is level and has extensive areas of drying mud flats. The numerous off-lying islands rise steeply from surrounding shoal water which extends well offshore.

Ports of interest to shipping are **Dinghai** (30°01'N., 122°06'E.), **Zhenhai** (29°57'N., 121°43'E.), and **Ningbo** (29°53'N., 121°53'E.), located in the general area around the S entrance point of Hangzhou Wan.

An inside passage for moderate-size vessels of suitable draft leads between the mainland and off-lying islands. Vessels, having arrived W of Fodu Dao enter Fo-to-kang-tao, and proceeding through Luotou Shuidao and Cezi Shuidao transit either E or W of Cezi Shan.

A vessel then passes W of Wushi, then steers through the channel E of Yuxing Nao.

Hangzhou Wan—North Side

6.2 Nanhui Zui (30°53'N., 121°53'E.), the N entrance point of Hangzhou Wan, is low and reported extending seaward. A low embankment extends irregularly to the W.

Daji Shan (Ta-ch'i Shan) (30°49'N., 122°10'E.), about 16 miles ESE of Nanhui Zui, is an isolated islet rising to a height of about 79m from surrounding shoal water and adjacent rocks. The island is covered with vegetation and appears cone-shaped from the NE. Rocks extend 0.2 mile from its W, S, and E sides; those on the E side end in a prominent 3m high black rock. A signal station can be contacted by means of the International Code of Signals. Vessels anchor, in 11m, about 0.4 mile off the W side of the islet, and clear of the many submarine cables in the area, with a lighthouse bearing 064°, and just open S of a white hut on the SW side of the islet. A light is shown on the summit of Daji Shan; an automatic identification system (AIS) is situated at this light.

Donghai Bridge, with a vertical clearance of 40m, connects Nanhui Zui with Xiaoyang Shan, 15 miles SSE.

Caution.—Numerous dangerous wrecks, best seen on the chart, lie from N through SW of Daji Shan.

6.3 The coastline between Nanhui Zui and the metropolis of Hangzhou (Hangchow), about 97 miles WSW, is fronted by drying mud flats and several islets, and backed by low-lying land interrupted by hilly promontories of Ch'eng Shan and Chin Shan, about 43 miles and 55 miles, respectively, WSW of Nanhui Zui. Cha-p'u, a community close W of Ch'eng Shan, is the former seaport of Hangzhou. Chiu-wang-wei Shan, a small islet close E of Chin Shan, is the head of navigation for ocean vessels.

Jianshan Tanker Terminal (30°43'N., 121°20'E.) has two berths that can accommodate tankers with a draft of 6.5m. Pilots board in position 30°38'N., 121°20.3'E.

Tanker terminals serve the Shanghai Petrochemical Plant. One tanker pier accommodates vessels up to 25,000 dwt with crude oil. Three berths take 5,000 dwt class ships and are designed to handle chemical products. Two berths are 126m long, with depths alongside of 8.6m and 9m respectively, and the other is 76m long, with a depth of 5.2m.

Plans are in progress to build a number of 10,000 dwt general cargo berths to ease congestion at Shanghai.

Zhapu (Chapu), the former port of Hangzhou has undergone a major change with construction of deep water, offshore berths for vessels of 1,000 dwt and 10,000 dwt. These offshore berths are connected to the shore by a pier 1,134m in length. The port has 24 berths of various types.

Facilities have been developed to accommodate vessels 30,000 to 50,000 dwt.

Qiantang Jiang (Ch'ien-t'ang Chiang), a narrow estuary largely dry at low water, winds WSW from Chin-wang-wei Shan for a distance of about 42 miles to Hangzhou.

Small vessels, with a draft not greater than 0.9m, can proceed through Qiantang Jiang to Hangzhou.

Pilotage.—Pilot is compulsory. Pilots board at Luhuashan anchorage during daylight hours.

Pilots for Zhapu board in the vicinity of position 30°33'N, 121°05'E.

Caution.—A tidal bore exists in Qiantang Jiang. It begins near the time of low water about 12 miles WSW of Chiu-wang-wei Shan and advances as far as Hangzhou at a rate of 12 to 15 knots. A Hai-ning, a community about 23 miles upstream from Chiu-wang-wei Shan, the bore appears as a wall of water a

mile wide and may reach a height of 0.6m at neaps and 3.4m at springs. All navigation between Hai-ning and Hangzhou begins after the bore has passed and ends 2 hours after high water, a period of 2 to 4 hours.

The extreme tidal range reaches about 8.5m in Hangzhou Wan. At Hai-ning, the mean range is 4.7m and the spring range is 5.8m.

Hangzhou Wan—North Approach—Off-lying Islands and Deep Water Channels

6.4 The islands in the N approaches to Hangzhou Wan are grouped N and S of Huang-tse Yang, an intervening deep water channel. The N islands consist of three groups: Ma-an Liedao, Sijiao Shan and its adjacent islands, and Qiqu Qundao (Ch'i-ch'u Lieh-to). The S group consists of Daqu Shan and adjacent islets.

Hai Jiao (Tung Tao) (Barren Islands) (30°44'N., 123°09'E.), about 66 miles E of Nanhui Zui, consists of a group of several islets and rocks which constitute the farthest seaward danger in the N approaches to the bay. The W and highest islet is reported radar conspicuous at 16 miles. A light is shown from the W islet of Hai Jiao, and a racon transmits from it.

Foul ground extends 0.6 mile SE of the E islet, with a drying 3m high rock, on which the sea breaks heavily, on the extremity of the foul ground. An obstruction, with a depth of 8.6m, lies 1 mile N of Hai Jiao.

Caution.—An explosives dumping area, 2 miles square, is centered 3 miles WNW of Hai Jiao.

6.5 **Ma-an Liedao** (30°44'N., 122°45'E.), the E group of islands N of Huang-tse Yang, extends about 15 miles NW-SE and consists of several larger islands with numerous islets, isolated rocks, and smaller islands scattered among them. The larger islands are inhabited.

Huaniao Shan (30°51'N., 122°41'E.), the N of the larger islands, is grass-covered and characteristically steep-sided, bold, and rugged. It rises to a saddle shaped summit, 236m high, and is reported to be radar conspicuous at 20 miles. A light is shown on the N extremity of Huaniao Shan. Tide rips form on the E side of the island.

Anchorage.—Vessels usually anchor in moderate depths in a bay on the N side of the island, but must clear for sea with short notice during spring and late fall, when N winds set in without much advance warning. Anchorage in a bay on the SE side of the island is subject to a heavy swell when winds blow from S through E to NNE. Tidal currents are strong.

Luhua Shan (30°49'N., 122°38'E.), about 2 miles SW of Huaniao Shan, consists of Dongluhuashan and Xiluhuashan, two rugged precipitous islands joined together by a rocky ledge.

Anchorage.—Luhuashan Maodi is a designated anchorage, 2 miles wide and extends between 1 mile and 4 miles S of Xiluhuashan. It is used for lightening vessels before proceeding up Chang Jiang. The anchorage has thick mud sea bed with good holding ground.

The anchorage is sheltered from all winds except S and can be used for shelter on the approach of a typhoon. In strong S winds it is advisable to anchor to the N of Xiluhuashan. A clear approach to the anchorage can be made from the NE. The anchorage is under the jurisdiction of the Fagang Harbormaster. Areas of the anchorage are subject to strong tidal currents, particularly the center, with the strongest being during the ebb. The anchorage is also used for the trans-shipment of LPG. LPG vessels are not permitted to anchor within 1.1 miles of the transshipment bulk carrier.

Caution.—Care must be taken to avoid the submarine cable lying 2 miles N and NW of Huaniao Shan.

6.6 **Yemaodong** (30°48'N., 122°47'E.), lying about 6 miles SE of Huaniao Shan, has a saddle shaped summit, 158m high. A chain of islets and rocks extends 2 miles NW and 1 mile SE of the island. In strong winds, there are heavy tide rips off the end of the SE chain.

Anchorage.—Anchorage can be taken in 7.4 to 11m, mud, sheltered from winds between E and NW, in the bay on the S side of Yemaodong.

Caution.—Unexploded ordnance has been reported (2008) to lie in position 30°44'06"N, 122°49'05"E.

Chengian Shan (30°44'N., 122°49'E.), about 3 miles SSE of Yemaodong, is the SE island of Ma'an Liedao. The coast is rocky and precipitous, and its highest peak, 211m high, lies in the middle of the island. Gouqi Shan, close W, has a double summit, 197m high, in its N part that is considerably higher than the rest of the island.

Tides—Currents.—Tidal currents reach a velocity of 3 knots at springs, but their effect is lessened the farther within the anchorage. During spring tides, the current is strong enough to swing a vessel against a moderate breeze.

Anchorage.—Between the SW side of Chengian Shan and the SE side of Gouqi Shan, anchorage, sheltered from winds E through N to W, can be obtained. The approach to the anchorage is made from the SW by keeping the center of a prominent beach in range, bearing 032°, with a prominent boulder at an elevation of 206m about 0.4 mile from the highest peak on Chengian Shan. Vessels anchor, in 12.8 to 18.2m, stiff mud, in the E part of the anchorage where the bottom is free of known dangers and shelves gradually shoreward.

6.7 **Sijiao Shan** (Shengsi Liedao) (30°42'N., 122°30'E.), the middle group of islands N of Huang-tse Yang, consists of a larger island with smaller islands and clustered islets scattered in a general SW direction for a distance of about 10 miles.

Sijiao Shan, the largest island in the group, is rugged, steep-sided, and has a very irregular shoreline which for the greater part rises precipitously from the surrounding shoal water; the island has many peaks, the highest of which, 217m high, stands at its SW end. A sandy beach within a bay on the E side of the island is conspicuous and one of the few features visible during periods of misty weather.

Anchorage.—Anchorage can be obtained all around the island, except on the S side.

Caution.—Tide rips form off the NE point of the island and also off the S side of an islet lying 1 mile further NW.

A dangerous wreck is reported (2000) to lie approximately 3.5 miles N of Banyang Jiao Light; another wreck is reported (2008) to lie in position 30°39.7'N., 122°31.7'E..

6.8 **Baijie Shan** (30°37'N., 122°25'E.), about 5 miles S of

the SW extremity of Sijiao Shan, is a rugged precipitous island surrounded by islets and shoal water. Vessels anchor, in 11 to 16.4m, sheltered from NW winds, off the S extremity of the island and in similar depths, sheltered from N and NE winds, off the W side, with the light on the S extremity of the island bearing 132°, 0.2 to 0.4 mile distant. Tidal eddies are troublesome.

Chuanhu Liedao (30°36'N., 122°20'E.), close WSW of Baijie Shan, is a group of steep-sided smaller islands and islets largely joined by an area of shoal water. Vessels anchor, in 18.2m, sheltered from typhoon winds, with the summit of Shangchuan Shan, the W island of the group, bearing 357°, and Bitou Jiao, an isolated precipitous rock W of the group, bearing 275°. Care must be taken to avoid Webb Rock (Weipei Shih), a pinnacle rock with a depth of 2.1m lying on the W side of the anchorage. There is no indication of this rock except when tide rips occur during calm weather. Currents are troublesome but no swell is felt.

Baijie Xia (30°36'N., 122°25'E.), the 2-mile wide channel between Biajie Shan and the several islets NE of Chuanhu Liedao, is the passage most commonly used by vessels bound to and from the entrance to the river Chang Jiang. Vessels steer through the channel on a track defined by the light on Banyangshan, a black rocky islet lying 2 miles WNW of Baijie Shan, in line bearing 315°, with the light on Daji Shan. Tidal currents are strong and require a timely course change to N so as to pass at least 0.5 mile E of Banyangshan and the area close around the islet in which ship handling often becomes quite unmanageable.

Caution.—An anchorage and fishing prohibited area NNW of Baijie Shan can be best seen on chart.

6.9 Qiqu Qundao (Ch'i-ch'u Lieh-tao) (30°36'N., 122°05'E.), the W group of islands N of Huang-tse Yang, extends about 10 miles NW-SE and consists of some 30 islets clustered around and generally N of **Dayangshan** (30°35'N., 122°04'E.), the largest and highest islet of the group. Vessels anchor, in 7.3 to 11m, sand and mud, about 0.75 mile SE of the head of a bay on the SE side of Dayangshan. Huini Jiao, a pinnacle rock with a depth of 0.6m, lies in the SW approaches to the anchorage. It is safely cleared to port by approaching the anchorage from the SSE with the highest peak on Xiaoyang Shan, an island about 2 miles NNW, bearing 337° and just open E of the S entrance point of the bay.

6.10 Maji Shan (Majishan) (30°34'N., 122°34'E.), a subport to Zhoushan (30°01'N., 122°06'E.), consists of an ore-transfer terminal.

Depths—Limitations.—The E channel is navigable for vessels having a maximum draft of 18.5m. Vessels of up to 350,000 dwt can be accommodated at the berths.

Vessel Traffic Service.—Zhoushan Vessel Traffic Servfice (Maji Shan Service Area) is in effect in the approach to Shengsi Liedo. The area encompasses Shengi Liedo and applies to the passage between No.1 and No. 2 anchorage and pilot boarding areas, best seen on the chart. The VTS may be contacted on VHF channels 16 and 12.

Participation in the Maji Shan VTS is mandatory for the following vessels:

1. All foreign vessels.
2. All passenger vessels.
3. All Chinese vessels exceeding 300 grt.
4. Vessels carrying dangerous cargo.
5. Pilot boats and tugs operating within the area.
6. Towing vessels having a combined length of more than 50m.
7. Other vessels as stipulated by the VTS.

Vessels must report vessel name, flag, draft, and course to the VTS on VHF channel 12 upon arrival at the following Reporting Lines:

1. L-1—The line joining Qian Xiao Shan and Daluan Shan.
2. L-2—The line joining Daluan Shan, Banyang Jiao Light and Baijieshan Light.
3. L-3—The line joining Zhongkui Dao Light and Fengchao Yan Light.
4. L-4—The line joining Dahuanglong and Tianluo Jiao.

Vessels must additionally report the vessel's name and position to the VTS after completing anchoring or mooring operations.

Vessels should report their intention to weigh anchor or depart a berth or mooring at least 20 minutes in advance of commencing operations.

Vessels may not leave the port without permission.

Vessesl should advise the VTS by VHF channel 12 or other effective means of the following:

1. Encountering a traffic accident, pollution, injury to personnel, or other emergency.
2. Discovering a failure of equipment relevant to safety of navigation.
3. Discovering any failure of aids to navigation, obstacles, or other situations affecting safety.

Vessels must maintain a continuous listening watch on VHF channels 11 and 16 when within the Maji Shan VTS area.

Anchorage.—Anchorage can be taken in position 30°38.1'N, 122°22.5'E.

6.11 Tangnao Shan (30°36'N., 121°58'E.), lying 4 miles W of Dayangshan and marked by a light on its summit, is the W island in this group. **Daqu Shan** (Ch'u Shan) (30°27'N., 122°20'E.) is the principal island among the severals islands and islets scattered along the S side of Huang-tse Yang. It is hilly, rugged, and has a characteristically irregular coastline much indented by mud-filled bay, inlets, and small coves. A bay on the S side of the island has been reclaimed and given over to cultivation by a considerable population inhabiting the W and N parts of the island. Vessels anchor in convenient depths, mud and sand, W of the conspicuous peninsula extending N from the central part of the N coast.

Anchorage.—Anchorage is sheltered by off-lying islands and is a safe refuge during typhoons. Anchorage off the SW extremity of the island is troubled by tidal currents which attain a velocity of 5 to 6 knots at springs.

Sanxing Liedao (30°26'N., 122°31'E.) is a group of islands and islets extending 5 miles E of Daqu Shan. Good anchorage, sheltered from E through N to NW, can be obtained, in depths of 9.1 to 12.8m, with the W extremity of Shulanghu, the W and largest island of the group, bearing 334°, distant 0.75 mile. Anchorage can also be obtained SE of Xiaoshulang, in depths of 9.1 to 11m. A light is shown from the summit of Xiao-shulang.

Langgang Shan (30°26'N., 122°55'E.), a small group of

Tangnao Shan Light

Xiasanxing Dao Light

three barren rocks, lie about 26 miles E of the E side of Daqu Shan and constitute the farthest seaward danger on the S side of Huang-tse Yang. They are reported radar conspicuous at 12 miles. The group is marked by a light.

Fengchao Yen (Wu Chiao) (30°22'N., 122°41'E.), 15 miles WSW of Langgang Shan and marked by a light, is a black rugged rock 14m high; a flat-topped rock, which dries 2m, lies 0.15 mile SE. A pinnacle rock, with a depth of 2.7m, lies 0.4 mile NNW.

Hangzhou Wan—Central Approach—Off-lying Islands and Deep Water Channels

6.12 The islands in the central approaches to Hangzhou Wan are separated from those in the N approaches by the clear channel Ch'u Chiang and are grouped N and S of Huang-ta Yang, an intervening deep water channel somewhat restricted in its W part before it gains access to the bay under the name of Huipieh Yang.

The N islands consist of Zhongjieshan Qundao, Chang-tushan, and Dai Shan, as well as numerous intervening and adjacent islands, scattered islets and isolated rocks. The S group consists of the N and NE coasts of Zhoushan Dao and the off-lying islands N of **Cambria Point** (Ta-peng Chiao) (29°50'N., 122°25'E.).

Zhoushan Qundao, an angle-shaped archipelago consisting of a multitude of islands, islets, and scattered dangers to navigation, lies off the S entrance point of Hangzhou Wan, between the parallels 30°20'N and 29°38'N and the meridians 122°46'E and 121°50'E. The islands on the N side of Huangta Yang constitute the N part of the archipelago. The islands on the S side of the channel lie in the S part of the archipelago.

Zhongjieshan Qundao (30°11'N., 122°40'E.), the E main group of islands N of Huang-ta Yang, consists of four hilly islands and there are numerous adjacent islets and rocks.

Anchorage.—Anchorage for one vessel can be obtained in a depth of 18.3m, mud, with the summit of Xifu Shan, the SE island of the group, bearing 147°, distant 0.5 mile. Vessels also anchor, in 11 to 12.8m, mud, in the entrance to a bay on the SW side of Miaozihu Dao, the central island of the group. A rock, drying 3.7m and steep-to, lies in the middle of the bay; other rocks extend N from it to the shore.

Caution.—A dangerous wreck reported (2000), lies 3 miles WNW of Waimati Jiao.

6.13 **Dongfu Shan** (30°08'N., 122°46'E.), about 3 miles SE of Xifu Shan, is a high steep-sided island, reported radar conspicuous at 21 miles, is an excellent landmark from the S. A dome-shaped white patch on the N side of the island is a good mark. Vessels approach the anchorage on the SW side of the island by steering for the island's summit on a heading of 057° and come to anchor, in 23.7 to 31m, sheltered from N and E winds, when the summit of **Qingbin Dao** (30°12'N., 122°42'E.) bears 327°.

Liangxiongdi Dao (30°10'N., 122°57'E.), consisting of two islets, 25m high, lies about 9 miles ENE of Dongfu Shan, and is the farthest seaward danger on the N side of Huang-ta Yang.

Sizimei Dao (30°10'N., 122°52'E.), 3 miles W of Liangxiondi Dao, consists of a group of four islets 24m high; a rock, with a depth of 4.3m, lies 0.8 mile S of them. Other dangers may best be seen on the chart.

Hsiao-pan Men (Xiaoban Men) (30°12'N., 122°36'E.), the deep and clear body of water between Huangxing Dao and two islets about 2 miles to the W, is the passage most commonly used by deep-draft vessels seeking to transit the many scattered

islets between Zhongjieshan Qundao and Daxizhai Dao. The passages W of Daxizhai Dao are not recommended because of numerous dangers and strong tidal currents.

Daxizhai Dao (30°14'N., 122°29'E.) is a 185m high saddle-shaped island lying about 8 miles W of Zhongjieshan Qundao.

Anchorage.—Anchorage sheltered from N and E winds, can be obtained 0.5 mile off the SE side of the island, in a depth of 18.3m, soft mud. Vessels also anchor, in 18 to 26m, mud, seaward of a small inlet on the N side of the island.

6.14 Changtushan (30°15'N., 122°20'E.), the middle main group of islands N of Huang-ta Yang, consists of two rugged and largely mountainous islands whose coastline is indented by numerous bays, coves, and inlets the greater number of which are fronted by drying mud flats. Xiachangtu Shan, the W island, and Dachangtu Shan, the E island, are separated by Changtu Gang, a narrow landlocked channel which provides a good anchorage and typhoon refuge. There is room for several medium size vessels, in depths of 9.1 to 23.8m.

Under ordinary conditions, little swell sets into **Changtu Gang** (30°15'N., 122°17'E.), but during typhoons a swell from the E rounds the SW extremity of Dachangtu Shan and breaks on a drying mud flat on the S side of the W entrance to the channel. Tidal currents set in the axis of the channel and reach a velocity of 5 knots in the W entrance. Small vessels drawing 4.9m enter the channel from either entrance at any stage of the tide.

Larger vessels, over 61m long and drawing not more than 7.3m, use the W entrance at slack water, in preference to the E entrance where a sharp turn and strong currents make ship handling difficult. Vessels anchor in the middle part of the channel where the drying mud flats extending offshore are steep-to. Vessels sheltering from a typhoon keep one anchor upstream and one downstream and ride with 75 to 90m of chain on each anchor as the currents may cause single anchors to foul.

Chu-hsu Chiang (30°14'N., 122°14'E.), the narrow body of water W of Xiaochangtu Shan, is a deep water channel between Huang-ta Yang and Ch'u Chiang, and is navigable with caution by deep-draft vessels. The sides of the channel are fronted by large areas of steep-to, drying mud flats which extend offshore from adjacent islands. The N and S entrances are encumbered by scattered islets, shoal water, and several dangerous underwater rocks.

Directions.—Approaching Chu-Hsu Chiang from the S, steer to pass about 1 mile N of **Jiaobeishan** (30°11.0'N., 122°18.5'E.) and then midway between the islet **Wen-ch'ung Sham** (30°12.0'N., 122°14.8'E.) and a 4.9m patch lying 1 mile NNE of it. When the W extremity of **Dazhuxu** (30°17.3'N., 122°14.8'E.) is in line with a 6m high rock (30°14.4'N., 122°15.0'E.) close of SW point of Xiaochangtu Shan, bearing 353°, alter course NNW to pass W of **Bayliss Rock** (30°14.3'N., 122°14.8'E.). The summit of **Ta-yuan Shan** (30°13.7'N., 122°16.1'E.) must be kept open S of a 2m high rock lying NW of it until the E extremity of a 36m high islet (30°17.1'N., 122°15.4'E.) is open on the W side of Xiao-changtu Shan. After passing Bayliss Rock, steer to bring the E extremity of Dai Shan to bear 000° and just open W of the W extremity of Dazhuxu. When the summit of the 36m high islet bears 030° steer for it on that bearing until the W extremity of Wen-ch'ung Shan is just open W of the W extremity of Xiaochangtu Shan, bearing 184° then steer 062°. When the N sides of Dazhuxu and the 36m high islet are in line bearing 292°, alter course NNE and keep the NW extremity of Xiaochangtu Shan bearing 214° astern.

Vessels approaching the channel from the N follow these directions in the reverse order.

For the W entrance of Changtu Gang, enter the channel W of Dachangtu Shan as previously directed. When the 2m high rock (30°14.0'N., 122°15.3'E.) is abeam to the starboard, alter course ENE for the harbor entrance and pass 91 to 183m N of the rock. The navigable channel abreast this rock is only 0.15 mile wide. After passing the rock, bring it to bear 226°, astern, so as to pass 137m off a rocky point on the N shore, 0.75 mile NE. Then keep to the N shore, which is mud and steep-to, until clear of a rock, which dries 3m, lying close within the SE entrance point. Thereafter, a mid-channel course can be steered to the anchorage.

The E entrance to Changtu Gang lies close W of the bluff NW point of Dachangtu Shan and is difficult to identify. The entrance is about 0.3 mile wide with a least depth of 5.8m in the fairway. If approaching from the E, care must be taken that the N extremity of Duozi Shan does not bear less than 090° until W of the Hornets. To enter, keep close to the bluff NW point Dachangtu Shan and then maintain a mid-channel course to the harbor.

Great care and attention is required when negotiating the sharp bend around the SE corner of Xiaochangtu Shan, where the channel is only about 0.2 mile wide. Numerous fishing boats and nets will be encountered before reaching the anchorage.

6.15 Jiaobei Shan (30°11'N., 122°18'E.), 3 miles S of the W part of Dachangtu Shan, is a double rock 23m high, covered with grass on top. Tidal currents around the rocks are strong and variable and vessels should give it a berth of at least 0.5 mile. Hsiao-chiao-pei, 8m high, lies 0.5 mile WNW of Jiaobeishan. It has a gap in the middle which is prominent when seen from SE or NW.

A steep-to pinnacle rock, lying 1 mile NNE of Jiaobeishan, has a depth of 3.7m; another pinnacle rock, with a depth of 6.4m, lies 2 miles W of Jiaobeishan. Neither rock gives any visible indication of their existence.

Dai Shan (30°17'N., 122°10'E.), largest of the main group of islands on the N side of Huang-ta Yang, consists of two rugged and hilly islands which, rising from large surrounding areas of drying mud flats, have been joined together by heavily cultivated fields of reclaimed land to form a single island with an irregular, indented coastline.

Numerous islets and rocks lie scattered in all approaches. Yanwo Dao (Castle Rock), the outermost of several islets and rocks extending NNW from the N point of the island, is a high conspicuous rock. Tidal currents in the vicinity of this rock attain a rate of 4 to 6 knots at springs, causing whirlpools and eddies. It is advisable to give the rock a berth of at least 0.5 mile.

Dajiao Shan (30°13'N., 122°08'E.), lying centrally in the channels S of Dai Shan, consists of two hills, 72m and 105m high, connected by a low, narrow isthmus. Kuan Shan, 1 mile E, has a prominent dome shaped summit 182m high.

6.16 Kuanshan Chiang (30°13'N., 122°12'E.), a deep wa-

ter navigable channel between Kuan Shan and **Xiu Shan** (30°10'N., 122°10'E.), is the preferred passage among several in the W access to Huang-ta Yang and is used by full-powered vessels as the most direct route to Chu-hsu Chiang. Several above and below-water dangers on the S side of the channel as well as strong currents and eddies that require caution in transiting. Kao-t'ing Chiang, a deep water, navigable channel W of Kuan Shan, is an encumbered passage leading to Daishan (Kao-t'ing-chen), a small community on the SE extremity of Tai Shan. Tidal currents in both Kao-t'ing Chiang and Kuan-shan Chiang reach a maximum rate of 5 knots at neaps and 8 knots at springs.

Anchorage may be taken approximately 6 miles ESE of Xiushan Dao, in depths of 12.4 to 19.2m.

Huoshan Liedao (30°20'N., 121°55'E.), a group of islets W of Dai Shan, constituting the W extremity of the islands and groups of islands N of Huang-ta Yang, consists of two larger islets joined by an extensive drying mud flat, and numerous smaller islets, isolated rocks, and underwater dangers.

Dayu Shan (30°19'N., 121°58'E.), the E island of the group, rises to a ridge with several well-defined peaks of similar height; the highest peak, 121m high, is at its N end. Xiaoyu Shan, 1 mile W of Dayu Shan, has a 123m high hill in its center; a chain of islets and rocks extends 2 miles NW to Dachen Shan, 57m high.

Yuxingnao (30°21'N., 121°52'E.), a black rock, 19m high, split in two and marked by a light, lies on the W end of the scattered dangers in the W part of Huoshan Liedao. Other dangers may best be seen on the chart.

Caution.—Fishing stakes may be encountered within 4 miles ENE of the N end of Dayu Shan and within 5 miles S of Yuxingnao.

6.17 Zhoushan Dao (30°05'N., 122°06'E.), the principal island in Chou-shan Ch'un-tao and the largest island of the several islands and numerous islets S of Huang-ta Yang, has a largely mountainous surface alternating with several well-cultivated coastal plains and an irregular much-indented coastline of which the N and NE sections are fronted by extensive areas of drying mud flats, large areas of shoal water, and numerous smaller islands, islets, and scattered offshore rocks.

Zhoushan Dao is emerging as a new offshore harbor area in SE China. Several berths have been constructed at various locations around the island. Xiushandao Ferry Quay (30°12'N., 122°10'E.) has a dredged depth of 6.5m alongside.

Pilotage.—The vessel should send its ETA 72 hours, 48 hours, and 24 hours prior to arrival pilot station.

Pilots board, as follows:

1. Qii Zhi Anchorage (30°00'39"N., 121°46'43"E.).
2. Xiazhi Men Northern Anchorage (29°45'30"N., 122°21'30"E.).
3. In position 29°51'35″N, 122°12'57″E.
4. Yeyashan Inspection Anchorage (30°00'37"N., 121°59'25"E.).
5. Jintang Maodi Anchorage (30°00'48"N., 121°49'24"E.).

Dongting Shan (Waiyang'an Dao) (29°52'N., 122°35'E.) is a bare, rocky islet which, reported radar conspicuous at 22 miles, constitutes the farthest seaward natural danger in the approach to the S side of Huang-ta Yang. The islet, 49m high, is cleft in two from N to S and is bare and rocky except for some cultivated plots. A light is shown from the summit of the islet.

Caution.—Several areas, dangerous due to unexploded ordnance, lie approximately 13 to 18 miles SSE of Dongting Shan. Through traffic should stay seaward of these areas.

Zhujiajian (29°56'N., 122°23'E.), a mountainous island with large areas of drying mud flats and extensive areas of well-cultivated reclaimed land on its W sides, lies almost joined to the SE extremity of Zhoushan Dao. It is separated N from Putuo Shan, a smaller mountainous islet, by the deep water channel Lien-hua Yang. The coastline on the E side of the island is indented by many shoal bays fronted by several scattered islets and off-lying rocks.

Anchorage.—Small vessels obtain anchorage, during the Northeast Monsoon, within the entrance to Wolf Bay (Nan-sha Wan), the largest bay on the SE side of Zhujiajian.

Vessels anchor, in 21.9 to 25.6m, good holding ground, close off the S extremity of Putuo Shan, where the maximum rate of the tidal current is reported to be 3 knots at neaps.

6.18 Hulu Dao (30°02'N., 122°26'E.), 88m high, lies off the NE end of Putuo Shan, from which it is separated by a deep channel.

Huaping Shan (30°04'N., 122°29'E.) is a scattered group of four prominent and five smaller above water rocks surrounded by foul ground lying 2 miles ENE of Hula Dao. These rocks are steep-to and soundings give no warning of their proximity.

Wai-huo Hsu (30°04'N., 122°27'E.), a grass covered islet with a well-defined 46m summit, lies 1 mile WNW of Huaping Shan.

Lihuo Yu (30°06'N., 122°22'E.), 35m high, lies 6 miles WNW of Huaping Shan. A light is shown from the summit.

Vessels bound N for Chu-hsu Chiang pass close W of Wai-huo Hsu to clear the scattered underwater dangers fronting Putuo Shan, and usually pass NE of Lihuo Yu, although the passage SW is safe for vessels of any draft.

The channels among the several islets and rocks W of Lihuo Yo are not recommended.

The S side of the W access to Huang-ta Yang is obstructed by several islands having surrounding margins of drying mud flats. It is dotted by numerous islets and scattered underwater dangers which, lying close offshore, are separated from the N coast of Zhoushan Dao by a tortuous, intricate channel, not recommended without local knowledge of the many dangers and strong tidal currents.

Hangzhou Wan—Southeast Approach

6.19 The SE approaches to Hangzhou Wan are fronted by the larger island Chou-shan Tao and the remaining smaller off-lying islands of the S portion of Chou-shan Ch'un-tao. The approaches are traversed by several deep water access channels which, leading from sea, pass through the smaller off-lying islands and, once inside, unite to form a broad channel trending W from the S entrance point of Hangzhou Wan, as well as branching N to pass W of Zhoushan Dao. The principal ports in the area are Dinghai and Zhenhai.

Chuanshan Bandao (29°53'N., 122°08'E.), the S entrance point of Hangzhou Wan, is the SE extremity of a long, moun-

tainous promontory which terminates to the E, the generally low and flat S side of Hangzhou Wan.

Hangzhou Wan—Southeast Approach—Off-lying Islands and Deep Water Access Channels

6.20 The off-lying islands in the SE approaches to Hangzhou Wan extend about 20 miles NE-SW between Zhujiajian and Liuheng Dao, and consist of several large mountainous islands and a multitude of lesser islands, clustered islets, and scattered above and below-water dangers. Most of the islands rise from surrounding shoal water and have irregular, indented coastlines, extensive portions of which are fronted by large areas of drying mud flats and backed by well-cultivated areas of lowland. The water area forming the channels among the larger islands is deep.

Wu-sha Men (29°49'N., 122°22'E.), the N access channel, lies between Zhujiajian and Taohua Dao and trends NW before branching N into **Chu-chia Kang** (Fremantle Channel) (29°54'N., 122°24'E.) or WNW into **Che'ng-tzu Man** (Rambler Channel) (29°51'N., 122°17'E.). The latter channel is partially blocked at its E entrance by **Hsuan-po-ku Shan** (29°50'N., 122°19'E.) and several adjacent islets. At times, it is entirely obstructed by fishing nets. Stonecutters Bridge, with a vertical clearance of 63m, spans the S end of Rambler Channel. The passage between Hsuan-po-ku Shan and Taohua Dao is not recommended because of strong tidal currents.

Vessels enter Wu-sha Men either N or W of the steep-sided islet Wuzhu Shan, the farthest seaward danger in the entrance, and passing NE of the drying rock **Pan-ch'ao Yen** (29°48.4'N., 122°21.3'E.), shape a course so as to pass between Shou-hsien Yu, a small island close SW of Zhujiajian, and the low-lying Channel Rocks (Tung-chien Shih), located about 0.5 mile W. Then they enter Chu-chia Kang and steer a mid-channel course until reaching Tung-shan Tao, an islet N of the island Dengbu Dao. They clear the drying mud flats on the N side of the channel by keeping **Lujiazhi** (29°55'N., 122°18'E.), about 2.5 miles NW of Tung-shan Tao, on a heading of not less than 295°.

Tidal currents at the S entrance to the channel have a maximum rate of 3 knots.

Small vessels, seeking shelter from typhoon winds, can obtain anchorage, in 10.1m, in the channel N of Lujiazhi, however, the depths approaching the anchorage may be less than charted. Larger vessels can anchor about 1.3 miles SW of **Xiaogan Shan** (29°57'N., 122°14'E.). The holding ground is good, but the anchorage is unsheltered. Tidal currents are sufficiently strong enough to prevent the ship swinging to the wind.

6.21 **Hsia-chi Men** (Shih-peng Chiang) (Vernon Channel) (29°46'N., 122°15'E.), the middle channel, lies between T'ao-hua Dao and Xiaqi Dao and trends NW from the clear E entrance for about 8 miles to the several islands and many scattered rocks obstructing the W entrance. The E entrance is reported radar conspicuous at 22 miles.

Tidal currents within the channel reach a maximum velocity of 5 knots at neaps and springs. Vessels can obtain anchorage, in 7.3m, in a large shoal bay on the NE side of Xiaqi Dao and also in 12.8m close S of Ta-shuang Shan, the highest of the several islands in the W entrance to the channel.

T'iao-chou Men (Beak Head Channel) (29°43'N., 122°16'E.), the SW access channel, lies between Xiaqi Dao and Liuheng Dao. Vessels transit the channel in deep water throughout by passing between Tsou-ma-t'ang and Ta-liang-t'ou, two smaller islands among a group of dangers about 4 miles inside the E entrance.

Vessels anchor, in 18.2m, NW of Chin-po-yu, an island surrounded by shoal water located about 2 miles NW of Tsou-ma-t'ang, or proceed to the W entrance. A NW current tends to set onto Hsi-ho-tsui (Ta-men Shan), the outermost danger on the E side of the entrance.

Vessels that transit Hobart Channel (Hsia-ma Men), the passage NE of Tsou-ma-t'ang leading to Hsia-chi Men, is not recommended without local knowledge. Vessels also anchor in appropriate depths, mud and sand, in Port Rouse (Mo-t'ou Kan), an anchorage off the SE coast of Liu-heng Tao convenient for awaiting tidal conditions in T'iao-chou Men.

Hangzhou Wan—Southeast Approach—Inside Channels and Harbors

6.22 **Fo-to-kang-tao** (Ch'i-t'ou Yang) (29°48'N., 122°04'E.) is the body of water lying between Liuheng Dao and Meishan Dao, a large, rather low and well-cultivated island which, rising from surrounding areas of drying mud flats, lies to the NW and separated from the mainland by a narrow, unnavigable channel.

Vessels anchor, in 23.7m, mud, midway between the entrance points of a bight formed on the N side of Liuhend Dao and in convenient depths, clear of fishing stakes, on the NW side of Fo-to-kang-tao, between Meishan Dao and **Ch'i-t'ou Chiao** (29°53'N., 122°08'E.), the W extremity of Chuanshan Bandao.

Luotou Shuidao (Pai-ya Yang) (29°55'N., 122°03'E.), the continuation W of the NE reaches of Fo-to-kang-tou, is largely encumbered N by the numerous islands and dangers fronting the S coast of Zhoushan Dao and narrowed to a deep, clear channel about 1 mile wide in its W part by the outermost island fronting Zhoushan Dao and by the islands and dangers lying off the mainland coast.

6.23 **Hsiao-yang-mo-Yu** (Roundabout Island) (29°54'N., 122°09'E.), 1 mile E of the extremity of Chuanshan Bandao, is steep, rocky, and has a grass covered round summit, marked by a light, 37m high. The passage inshore of the island is deep, but has heavy tide rips and strong eddies. It should not be attempted by vessels unable to maintain a speed of 10 knots against the spring tidal current. Tidal currents near the island vary from 2 to 6 knots.

Cezi Shuidao (T'se-tzu Shu-tao) (Bell Channel) (30°00'N., 121°57'E.), the continuation N of Luotuo Shuidao, lies between the drying mud flats fronting the SW coast of Zhoushan Dao and the largely mountainous off-lying island of Chin-t'ang Shan, and trends N as far as the island of **Cezi Shan** (30°06'N., 121°56'E.), where it divides into an E and W branch. The E branch, is free of tide rips and has its better passage E of the mid-lying islet Ku-tz'u Shan, the W passage being recommended with local knowledge only. Xihou (Hsi-hou) Men, the W branch, is wide and generally deep but has a rocky, uneven bottom.

Vessels proceed through Cezi Shuidao on a track passing

midway between Jintang Shan and **Banyang Jiao** (Pan-yang Chino) (30°01'N., 121°58'E.), a steep-to islet lying near the center of the S entrance.

The Zhoushan Haiqu Taoyaomen Bridge, with a vertical clearance of 32m, crosses the channel between Cezi Dao and Fuchi Dao (30°06'N., 121°58'E.).

Pilotage.—Pilotage through Cezi Shuidao is mandatory for all foreign vessels. Pilotage is available 24 hours. Notice of ETA should be sent 72 hours, 48 hours, and 24 hours prior to arrival.

Southbound vessels board a pilot in the vicinity of position 30°13'N, 121°51'E.

Vessel Traffic Service.—Participation in the Zhoushan Vessel Traffic Service (Cezi Service Area) is mandatory for the following:

1. All foreign vessels.
2. All passenger vessels.
3. Vessels carrying dangerous cargo.
4. Vessels restricted in their ability to maneuver.
5. Chinese vessels of 300 tons or more.

The Zhoushan VTS Cezi Service Area encompasses the following areas:

1. Cezi entrance channel.
2. Cezi harbor and Yeyashan anchorage.
3. The Xihoumen Bridge (30°04'N., 121°55'E.).
4. An area bounded by lines joining the following positions:
   a. Dapeng Shan Light (30°05'N., 121°49'E.).
   b. Donghuo Shan (30°15'N., 121°43'E.).
   c. Dayu Shan S (30°17'N., 121°57'E.).
   d. Zhoushan Dao (30°10'N., 121°56'E.).
   e. Luotou (30°00'N., 122°01'E.).
   f. Damao Dao W (29°57'N., 122°01'E..)
   g. Luotou Jiao Light (29°56'N., 122°02'E.).
   h. Gong Shan Light (30°0'N., 121°56'E.).
   i. Jintang Dao N (30°05'N., 121°52'E.).

There are four reporting lines in the Cezi VTS Service Area, as follows:

1. C1 Reporting Line—Extending from the NW tip of Zhoushan Dao to Xiaocaihua Light.
2. C2 Reporting Line—Extending from Xiaocaihua Light to the NE tip of Jintang Dao.
3. C3 Reporting Line—Extending from Gong Shan Light to Damao Dao.
4. C4 Reporting Line—Extending N from Damao Dao to Zhoushan Dao.

Southbound vessels intending to pass under the E span of the Jintang Great Bridge, the Xihoumen Bridge, or the Taoyaomen Bridge are required to report their course, speed, maximum height above water, and the name of the bridge under which they will pass to Cezi VTS 30 minutes prior to arrival at the C1 reporting line.

Communication with the VTS is made on VHF channel 11 in Mandarin Chinese or English.

Vessels within the Cezi Service Area should maintain a continuous listening watch on VHF channel 16.

Anchorage.—Vessels anchor on the E side of Cezi Shuidao in convenient depths and out of strong tidal currents anywhere within 1 mile of the mud flats extending off Zhoushan Dao, and on the W side of the channel, in 14.6 to 18m, in a position sheltered from currents with the W extremity of Cezi Shan not yet open E of the NW extremity of Jingtang Shan. They moor in 16 to 27m in the S entrance of Xihou Men, with **Lao-hu Shan** (30°04'N., 121°55'E.), an islet off the SW extremity of Czi Shan, in line bearing 274° with the 281m summit in the N part of Jintang Shan.

6.24 Jintang Shuidao (29°57'N., 121°52'E.) is entered between the SE point of Jintang Shan, and the N point marked by a light, of Daxie Dao, about 3 miles SE. The passage is the westward continuation of Luotou Shuidao and has a least charted depth of 15.1m along its centerline. It lies between the S shore of Jintang Shan and the drying mud flats fronting the mainland coast, and leads W into the approaches to the river Yung Chiang and N into the deep water area along the W side of Jintang Shan. It is deep and, in general, clear except for **Huangniu Jiao** (29°58'N., 121°54'E.), a black steep-to above-water rock lying near the middle of the E entrance, and **Dahuangmang** (29°59'N., 121°48'E.), a steep-sided islet with several adjacent dangers lying on the S side of the W entrance. Both islets are marked by lights.

6.25 Beilun Ore Terminal (29°56'N., 121°53'E.), situated on the S side of Jintang Shuidao, has been built for deep-draft vessels to partially unload before proceeding to Chang Jiang estuary. An F-shaped pier provides at its head berths 351m and 500m long, with depths of 18m and 12m, to accommodate one 100,000 ton and two 25,000 ton ore carriers.

Beilun Oil Terminal (29°57'N., 121°49'E.), situated 4 miles W of Beilun Ore Terminal, has a T-shaped pier, with a berth 612m long at its head and a depth alongside of 11m.

The terminal can accommodate one 150,000 dwt and two 25,000 dwt tankers. The VLCC Beilum is anchored about 1 mile off the terminal, and is used for storing crude oil and other products delivered by smaller tankers from onshore oilfields.

Beilum Port, the new harbor area of Ningbo, is undergoing development as a major deep water port for handling bulk oil, ore, timber, container, and general cargo.

Coal container and multi-purpose berths can accommodate vessels of 50,000 dwt; general cargo berths can accommodate vessels up to 25,000 dwt. New berths have been constructed to handle timber, bulk ore, and general cargo.

Anchorage.—It has been reported that vessels bound for these terminals should proceed from position 30°10.2'N, 123°03.3'E, steering 218° to position 29°45.0'N, 122°40.6'E, then steer 270° to the pilot anchorage, bounded by latitudes 29°44'N and 29°46'N, and longitudes 122°20.5'E and 122°22.5'E.

It was reported that the tidal currents set strongly through this anchorage in a NE and SE direction.

There vessels should anchor and await a pilot.

The ETA at the pilot anchorage should be sent 1 hour before arrival on VHF channel 16. A listening watch should be maintained on that channel until the pilot has boarded.

6.26 Daxie Dao (29°55'N., 121°58'E.) is a large hilly island with cultivated plains protected by reclamation walls. Its SE part rises to a double peak, 333m and 329m high. A narrow passage separates the island from the mainland to the S. The E part is encumbered with islets, rocks, and fishing nets and

should not be attempted.

Dixie (29°55'N., 121°59'E.), a sub-port to Ningbo, is situated on the W coast of Daxie Dao and consists of an LPG terminal and a crude-oil trans-shipment terminal.

The LPG terminal contains two berths, with a combined length of 260m and a depth alongside of 13m. Vessels of up to 50,000 dwt can be accommodated.

The crude oil trans-shipment terminal has a length of 490m, with an alongside depth of 21m, and can accommodate vessels of up to 300,000 dwt.

Between Dapeng Shan (30°04'N., 121°55'E.) and Jantang Shan (Chin-t'ang) lies a narrow channel convenient for typhoon refuge. Small vessels, with a draft not greater than 4.9m, moor in convenient depths where they may experience a surge due to strong eddies created during spring tides.

6.27 Zhoushan (Dinghai) (Ting-hai) (30°00'N., 122°06'E.) (World Port Index No. 59960), about 8 miles NNW of the S entrance point of Hangzhou Wan, is a small harbor and naval station on the S coast of Zhoushan Dao. It is fronted by numerous hilly islands, rugged islets, and scattered above and below-water rocks which rise abruptly from generally deep water. Access to the harbor is reduced to two approaches. Mach'in Shui-to, the W approach, is the recommended approach for large deep-draft vessels. Melville Channel, the S and most direct approach, is not recommended for large or low-powered vessels because strong currents at times form dangerous eddies, especially around the several underwater dangers in the N part of the channel.

Anchorage.—There is good anchorage, in depths of 20 to 22m, towards the E side of the main channel of the W approach route, about 1 mile NNE of Damao Shan. In this position the tidal currents are not strong and run more regularly than in mid-channel.

Anchorage can be obtained between **Nab Rock** (30°00'N., 122°04'E.), with a depth of 3m, and Chu Shan, an island lying 0.5 mile ESE of Nab Rock, in depths of 29 to 31m, but is not recommended as the tidal currents and eddies are strong.

The outer anchorage, situated NE of the N end of Melville Channel, affords anchorage to large vessels in a depth of 22m, with **Cap Rock** (29°59'N., 122°05'E.), 5m high, in line with the NW side of **Sa-a Tao** (29°59'N., 122°06'E.), bearing 228°, and **Lao-shu Chiao** (30°00'N., 122°06'E.) bearing 332°. In this position the tidal currents are fairly steady and there are few eddies, but to the W of the anchorage the bottom is very uneven and heavy swirls and eddies occur.

The inner anchorage affords anchorage, in a depth of 11m, with Lao-shu Chiao bearing 130°, 0.4 mile distant. This is the best anchorage, although encumbered by junks, they usually anchor on the W side of Middle Ground. The tidal current and eddies are very strong here.

Directions.—Enter Melville Channel midway between Zhairuo Shan and Pi-chia Shan, 1 mile E, and steer to pass close E of Yen Tao. Then bring the E side of Yen Tao into line with Trunk Point, the E extremity of Zhairuo Shan, bearing 184° astern. This alignment leads between Black Rock, 0.6m high, and a drying ledge to the E and between Melville Rock, with a depth of 2.7m and Dundas Rock, with a depth of 1.8m to the E. When clear of the two islands NE of Dundas Rock, course can be set for the inner or outer anchorage at Dinghai as required.

When using Ta-chu Shui-tao, which branches NE from Melville Channel, favor the E shore to avoid Melville Rock and the mud flat fringing the two islands NNE of it.

There is no range mark for clearing **Elliot Patch** (29°58.9'N., 122°06.3'E.), which has a least depth of 5.4m, but the channel SE is wider and deeper than that NW.

Yeh-chu Chiao, a drying rock, can be passed on either side but caution must be used to avoid a 2.7m patch that lies 183m further NE.

Tidal currents in the middle of Melville Channel attain a rate of 3 to 5 knots. It is preferable to enter this channel with a N tidal current.

The channel leading SW past Cap Rock should not be used, as there are dangers at each end and the tidal currents in it attain a rate of 3 to 5 knots.

Ma-Ma-ch'in Shui-tao the safest and best route for large, deep draft vessels passes between Damao Shan and Hsieh Hsu 0.75 mile N. This deep, clear route leads to the outer anchorage. Local vessels enter by using Lo-tou Meng, NW of Hsieh Hsu, but this passage should not be attempted without local knowledge as a vessel may be set onto dangers by strong tidal eddies.

Tidal currents in Ms-Ma-ch'in Shui-tao attain a maximum rate of 2 to 3 knots. While those in Lo-tou meng attain a rate of 2 to 5 knots.

6.28 Zhenhai (Chen-hai) (29°57'N., 121°42'E.) (World Port Index No. 59950), about 22 miles WNW of the S entrance point of Hangzhou Wan, is a small river port located, principally, on the W side of the entrance to the river Yong Jiang. Several off-lying steep-sided islets, with adjacent dangerous underwater rocks, lie in the approaches while extensive areas of drying mud flats flank the entrance to the river and the mud bars which obstruct it.

Depths are subject to constant change. The W entrance point of the river is a precipitous hillock surmounted by two large temples. The E side of the river entrance is largely low land alternately with hilly ridges.

Tides—Currents.—Tidal currents in the river off Zhenhai attain rates of 1 knot at neaps and 3 knots at springs. After heavy rains inland, the ebb current often runs for 12 hours, and vessels do not swing to the flood current at all.

Strong winds between N and NE usually raise the water level about 0.5m above normal. From December to March, the water level is usually about 0.5m lower than in the months of August and September.

Depths—Limitations.—There are five berths for 10,000 ton bulk carriers/general cargo, one berth for 10,000 ton tankers, and one berth for liquid chemical tankers. An overhead power cable, with a minimum vertical clearance of 44m, is between Zhaebeo Shan and Jingi Shan.

Pilotage.—Vessels upon prior arrangements with the harbor master at Ningbo, usually board pilots NE of **Dayoushan** (Wai-yu Shan) (29°59'N., 121°45'E.), two precipitous islets on the E margin of a drying mud flat lying about 1 mile ENE of the W entrance point of the river. They cross the bar and enter the river with a maximum draft of 6.1m at high water springs and 5.6m at high water neaps.

A breakwater extends 0.275 mile E from Dayoushan, with a

light shown on its head.

Xialaotaipo Jiao, drying 1.2m, lies 0.175 mile ENE of Dayoushan.

Anchorage.—Anchorage can be obtained, in a depth of 9.1m, at the NE end of a deep water pool SE of Zhenhai, but it is necessary to moor. The quarantine anchorage, also used by vessels with dangerous cargo, is situated on the N side of the channel, about 1 mile further upriver.

Directions.—The N part of this route passes through an area that has a number of stranded wrecks and shoal soundings which can best be seen on the chart.

To avoid the shallower to the W, pass about 0.4 mile W of Dapeng Shan and Kan-ch'ih, a small islet NW of it. Steer a course S until the SE side of Waiyoushan comes into line with two large temples on Zhaebeo Shan 1.5 miles further SW. Then steer SW for the pilotage-quarantine anchorage.

To use the E approach, pass 0.5 mile S of **Huangnic Jiao** (29°58'N., 121°54'E.) and the same distance S of a beacon close S of the S extremity of Ganchi Shan. Then pass 0.5 mile N of E Jiao and steer W for the pilotage-quarantine anchorage.

Ningbo (29°53'N., 121°33'E.)

World Port Index No. 59940

6.29 Ningbo (Ning-po), about 30 miles W of the S entrance point of Hangzhou Wan, is a large metropolis situated about 12 miles up Yong Chiang and stands in the E part of Chekiang Province. The port handles crude oil, coal, bulk cargo, and containers. Ningbo is comprised of the five following port areas:

1. Beilun Harbor.
2. Zhenhai Harbor.
3. Ningbo Harbor.
4. Daxie Harbor.
5. Chuanshan Container Terminal.

Port of Ningbo Home Page

http://www.nbport.com.cn

Tides—Currents.—The tidal currents at Ningbo have a maximum rate of 2 knots on the flood current and 2 to 3 knots on the ebb current.

During the flood and ebb currents, there is a strong set on to concave banks in the winding areas of the channel. Vessels should not pass too close to the banks.

Depths—Limitations.—Xiazhimen Kou outer deep water channel is dredged to a depth of 22.1m. Another deep water channel, between Liuheng island and XiaZhi island is planned; the channel will be 22 miles long and available to vessels of up to 150,000 dwt.

Beilun Harbor handles iron ore, coal, bulk, oil, containerized, chemical and LPG cargo. The crude oil berth has a length of 346m and a depth alongside of 25m. There are three coal piers, one for 30,000 dwt vessels and two for 10,000 dwt vessels. Two additional 10,000 dwt coal piers are under construction and so are facilities for 100,000 dwt, 50,000 dwt, and 10,000 dwt ships.

Zhenhai Harbor has a chemical berth 350m long with an alongside depth of 13m. There is a general cargo berth with an alongside depth of 9m.

Ningbo Harbor handles general cargo and has alongside depths of 9m.

Daxie Harbor contains the following facilities:

1. A crude oil terminal with a berthing length of 400m and alongside depths of 25m; vessels of up to 300,00 dwt can be accommodated.
2. A container terminal with 400m of berthing space and alongside depths of 17.5m.
3. An LPG terminal with 232m of berthing space and alongside depths of 13m.
4. A general cargo terminal with 220m of berthing space and alongside depths of 17.5m.

Chuanshan Container Terminal has 400m of berthing space with alongside depths of 17m. There are eight berths which can accommodate vessels of 3,000 dwt. These facilities extend along the W bank of Yong Jiang for about 1 mile downstream from the city, with a total berthing length of 1,194m and alongside depths of 3.7 to 7.3m. The longest berth has a length of 108m.

Pilotage.—Pilotage is compulsory for vessels entering and leaving the port.

Foreign vessels making an initial call and vessels greater than 1,000 dwt must have a pilot to pass under the Jintang Bridge. Vessels that have previously called at Ningbo and are less than 10,000 dwt may transit the river without a pilot.

Pilots board, as follows:

1. Qii Zhi Anchorage (30°00'39"N., 121°46'43"E.).
2. Xiazhi Men Northern Anchorage (29°45'30"N., 122°21'30"E.).
3. In position 29°51'35″N, 122°12'57″E.
4. Yeyashan Inspection Anchorage (30°00'37"N., 121°59'25"E.).
5. Jintang Maodi Anchorage (30°00'48"N., 121°49'24"E.).

Regulations.—Vessels should forward their ETA 78 hours, 48 hours, and 24 hours prior to arrive. The message should communicate the vessel's date and time of arrival, freshwater and saltwater drafts, and cargo particulars.

Traffic Separation Scheme (TSS) is established for the deepwater route to the ports of Ningbo and Zhoushan. The scheme is not IMO-adopted; however, the authorities advise that vessels comply with Rule 10 of the International Regulations for Preventing Collisions at Sea (1972).

Vessels traveling downstream must not exceed a speed of 16 knots. High-speed passenger vessels traveling downstream are restricted to a maximum speed of 22 knots.

Vessels traveling upstream must not exceed a speed of 14 knots. High-speed passenger vessels traveling upstream are restricted to a maximum speed of 20 knots.

Vessel Traffic Service.—Ningbo Vessel Traffic Service (VTS) provides vessel traffic reports, status of aids to navigation, weather information, navigational warnings, and other information pertinent to safety.

Ningbo VTS operates in an area bounded by the following:

1. The S channel to Ningbo.
2. The N and S anchorages.
3. The oil-transferring area of Xiazhi Men.
4. The water area along the coast of Daxie Dao.

5. The water encompassing the following area:
   a. South of a line between Da-pengshan Light and Xiepuniluoshan.
   b. East of a line from Yong Jiang to Changtiao Light.
   c. West of a line between the SE coast of Jintang Dao and Tuni Haikou Light (29°57'N., 121°58'E.).

Ningbo VTS Center may be contacted by email:

nbvts@cnzjmsa.gov.cn

Participation in Ningbo VTS is mandatory for the following vessels:
1. All foreign vessels.
2. Passenger vessels.
3. Vessels carrying dangerous cargo.
4. Vessels restricted in their ability to maneuver.
5. Chinese vessels of 300 gt or more.

Information in the VTS is communicated in Mandarin Chinese and English.

Ningbo Vessel Traffic Service

http://www.msa.nb.gov.cn

Vessels should report upon entering, shifting within, or departing the VTS limits. Reports should include vessel type and nationality and the following information, as well as any additional information requested by Ningbo VTS:
1. Vessel name, call sign, and IMO number.
2. Position.
3. Course and speed.
4. Last port of call.
5. Port of destination.
6. Draft.
7. Vessel defects and restrictions. Vessels towing should report the length of tow and name the object being towed.
8. Dangerous goods.
9. Gross tonnage and loa.

Vessels equipped with an operational AIS need only report the following:
1. Vessel name and call sign.
2. Last port of call.
3. Port of destination.
4. Draft.
5. Vessel defects and restrictions.
6. Dangerous goods.

The Ningbo VTS reporting lines and their designated VHF reporting channels are, as follows:
1. L-1—The line joining Taohua Dao light and Dongtao Zui on Xiasi Dao (VHF channel 8).
2. L-2—The line joining Shangliuwang Chong Dao light and the SW point of Taohua Dao on (VHF channel 8).
3. L-3—The line joining Gong Shan at the SE end of Jintang Dao and Tuni Zui Light (VHF channel 6).
4. L-4—The line joining position 30°05'12″N, 121°35'54″E and position 30°07'03″N, 121°49'15″E (VHF channel 6).
5. L-5—The line joining Minjiang Kou North Training Wall Light and Changtao Zui Light (VHF channel 6).
6. L-6—The line joining Daxie No. 1 Lighted Buoy and Xiehe No. 1 Lighted Spar Buoy (VHF channel 6).
7. L-7—The line joining Chuanshan Beikou-Daxie Dao Lighted Spar Buoy and Chuanbi Dao Lighted Buoy on (VHF channel 8).
8. L-8—Chuanshan Dongkou at points S of Liangmaoshan along the meridian 122°01'27″E on (VHF channel 8).
9. L-9—A line from Daochu Shan Light, drawn E along the parallel of latitude 30°03'N, to Jintang Dao (VHF channel 6).
10. Vessels should report their name, course, and speed when abeam Yangxiaomao Dao (29°54'N., 122°09'E.) on VHF channel 8.

Vessels between Reporting Lines L-3, L-4, L-5, L-6, and L-9 should report to the VTS using VHF channel 6 and maintain a radio watch on VHF channel 8.

The use of VHF channels 6 and 8 is prohibited for communications unrelated to Ningbo VTS.

Vessels intending to pass under the main or W spans of the Jintang Great Bridge, which connects the NW coastline of Jintang Dao and Zhenai, should report the following information to Ningbo VTS on VHF channel 6:
1. Vessel course and speed.
2. Maximum height above the waterline.
3. Name of the bridge span vessel intends to pass under.

Vessels intending to pass under the E span of the Jintang Great Bridge, Xihoumen Bridge or Taoyaomen Bridge should report the following information to Zhoushan VTS on VHF channel 11:
1. Vessel course and speed.
2. Maximum height above the waterline.
3. Name of the bridge span vessel intends to pass under.

Traffic information, assistance, and navigational warnings are available on request.

Vessels involved in a traffic incident or pollution incident within the VTS area should immediately report the type, time, and location of the incident. The estimated extent of damage or pollution should be reported and any request for assistance made.

Xiazhi Men Deep Water Channel.—Participation in Ningbo VTS is complsory for vessels transiting the deep-water channel. Vessels weighing anchor in the oil tanker or mineral carrier anchorages outside of Xiazhi Men, and using the deep-water channel to enter Ningbo, must report to the VTS prior to weighing anchor.

Vessels planning on approaching Ningbo through the deep-water channel must report to Ningbo VTS at least 72 hours prior to arrival, or prior to departure of the previous port. Any amendments to the sailing plan should be subsequently reported.

Vessels must confirm their approach to Ningbo VTS at least 30 minutes prior to entering the channel. Vessels within 2 miles of the channel must maintain a continuous listening watch on VHF channels 8 and 16 and comply with VTS instructions.

Vessels are required to maintain an underkeel clearance of 10 percent of the vessels's draft, and a minimum clearance of 2m. It is also reported that vessels having drafts exceeding 20.5m may transit only on spring tides.

Ningbo VTS broadcasts vessel movement reports, condition of aids to navigation, meteorological information, navigational

warnings, and other safety of navigation information on VHF channel 20.

Anchorage.—Xiazhi Men Northern Anchorage (29°45.5'N., 122°21.5'E.) is the pilotage-quarantine anchorage established in depths of 16 to 25m, mud.

Caution.—An obstruction lies close W of this anchorage (29°45.5'N., 122°20.0'E.).

Qilizhi Shan (30°00.0'N., 121°45.6'E.) is marked by a light equipped with AIS. A tanker anchorage, with depths of 14.4 to 21.5m, mud, lies approximately 3 miles ENE of Qilizhi Shan.

Vessels up to 98m long moor, in 6.4 to 9.2m, in one of four mid-channel berths spaced within the lower harbor limits. With a swinging room of only 182m available in the berths, vessels ride with four shots of chain on the upriver anchor and with three shots of chain on the down river anchor. Vessels longer than 92m must use their engines when swinging to the tide.

Hangzhou Wan—South Approach—Ch'i-t'ou Chiao to T'ung-t'ou Shan

6.30 The coastline between Ch'i-t'ou Chiao and T'ung-t'ou Shan, about 39 miles SSW, is extremely irregular and indented by coves and bays, which throughout are largely fronted by extensive areas of drying mud flats. Inland, mountains predominate and reach the shore in bluff headlands with cultivated marginal plains intervening.

Close offshore, numerous islands and islets lie scattered in water which, often discolored by mud, contains many hidden sunken dangers. Farther offshore, the many islands and islets lie grouped, in general, to the E of the seaway channel Niubishan Shuidao where they shelter the approaches to the SW entrance to Fu-to-kang-tao and the extensive inlet Xiangshan Gang.

Niubishan Shuidao (29°37'N., 122°06'E.) is a broad open-sea fairway which leads N to the inside passage W of the islands fronting Hangzhou Wan and W to the entrance to Xiangshan Gang. During the winter months when N winds predominate and typhoons seldom occur, vessels with a draft not greater than 6.1m transit the deeper parts of the fairway. When typhoons occur in the offing, an E swell sets in which occasionally rises about 2.4m above mean sea level. At such times, vessels with a draft greater than 4.9m are not recommended to transit the fairway.

Jiushan Liedao (Chiu-shan Lieh-tao) (29°26'N., 122°12'E.), consisting of a group of high steep-sided islands and islets, constitutes the principal danger on the E side of Nuibishan Shuidao. Nanjiu Shan, the largesicuous from the E.

Anchorage.—Anchorage, sheltered from SW winds, lies off the E side of **Shuang Shan** (29°27'N., 122°12'E.), in depths of 10 to 16m, mud and sand.

Shelter from W to N winds can be obtained in depths of 7 to 10m, mud, S of the E part of Nanjiu Shan. Off the E side of **Wenchong Shan** (29°24'N., 122°10'E.), shelter from N winds can be obtained in depths of 8 to 10m, mud.

Anchorage sheltered from NE and SW winds can be obtained about 1 mile SW of **Guanchuanao** (29°27'N., 122°11'E.), in depths of 6 to 9m, mud.

Vessels are cautioned that depths of 1.9m less than those charted are reported to exist in an area between limits extending 3 miles NE and NW from **Tung-hsu Shan** (29°37'N., 122°02'E.).

6.31 The entrance to **Fo-to-kang-tao** (29°48'N., 122°04'E.), lying between Liuheng Dao and Meishan Dao, about 2 miles NW, has several channels leading through the many islands and scattered rocks that encumber free access. Compass adjustment ranges are established on the NE shore of Qinglong Shan (29°48'N., 122°02'E.), an island located close E of Meishan Dao.

Fodu Dao (Fo-tu Shan) (29°44'N., 122°01'E.), a hilly irregularly-shaped island rising from a surrounding margin of drying mud flats, lies separated from Liuheng Dao by Shuang-hsu Chiang, the E and widest but most encumbered channel leading to Fo-to-kang-tao. Ting-tzu Shan lies between Meishan Dao and Fodu Dao. Ting-tzu Chiang, the narrow and deep passage between Ting-tzu Shan and Meishan Dao, is not recommended because the drying mud flats rising steep-to off Meishan Dao offer little indication of their presence, especially when covered during high water. Gough Pass (Ching-lung Men), the deep and clear passage between Ting-tzu Shan and Fodu Dao, is the recommended channel leading to Fo-to-kang-tao. Tidal currents reach a maximum velocity of 3 knots at neaps and 5 knots at springs.

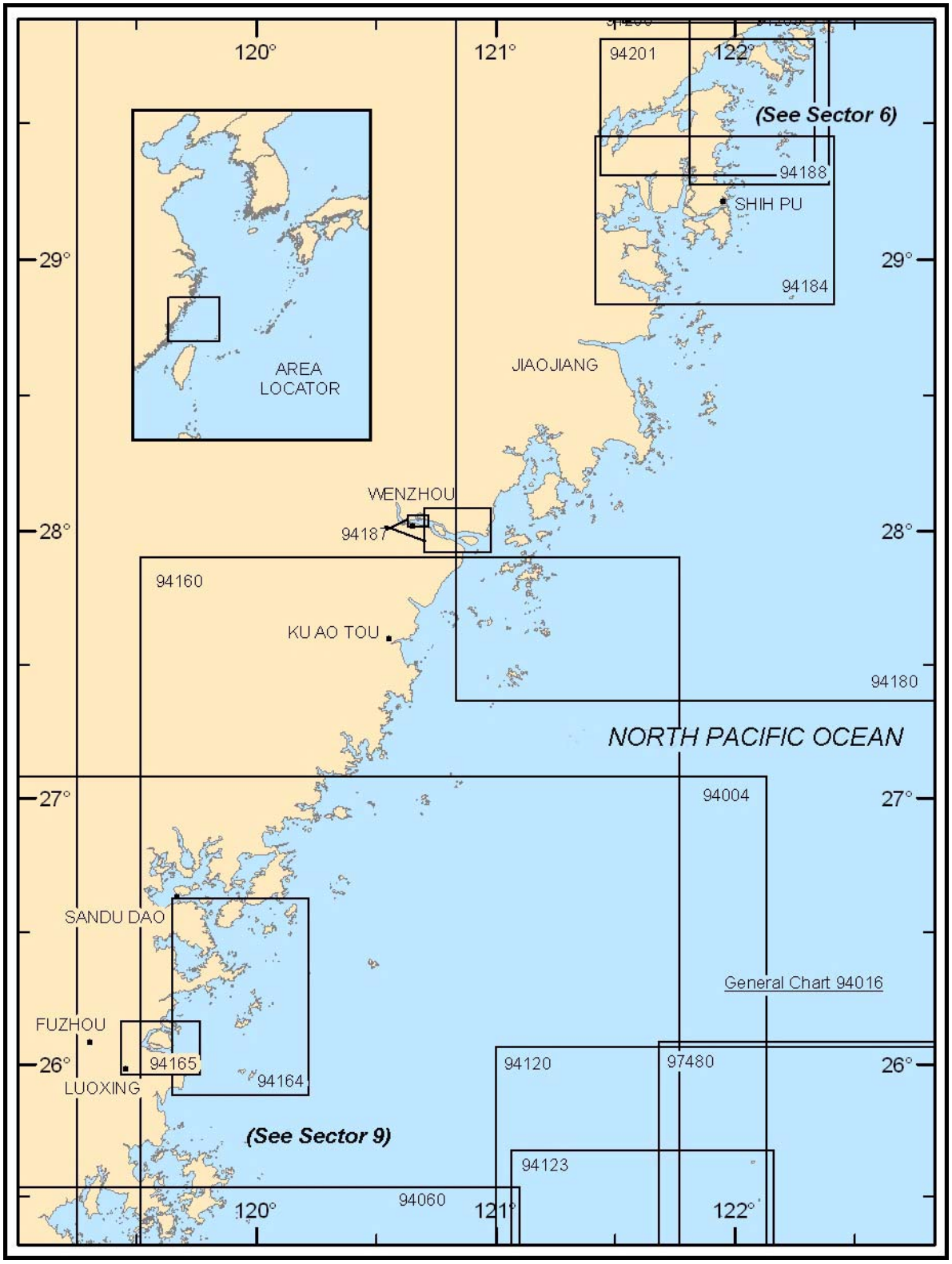
6.32 **Xiangshan Gang** (Hsiang-shan Chiang) (29°38'N., 121°48'E.) is an extensive inlet entered between **Chi Chiao** (Pearl Rock) (29°39.7'N., 121°54.3'E.) and **Huang-nui Chiao** (Sail Rock) (29°42'N., 121°52'E.), an above-water rock standing about 4 miles NW and near the outer edge of a drying mud flat extending seaward from the shore. The sound extends about 25 miles SW and has a very irregular shoreline much indented by inlets and large bays, the greater portion of which are filled with drying mud flats. The seaward half is deep and largely clear. The inner half is much encumbered by off-lying islets and extensive areas of drying mud flats. The sound offers well-sheltered anchorage during the typhoon season.

Tides—Currents.—The tidal currents in Xiangshan Gang have a maximum rate at springs of 3 knots in the entrance and 4 knots in the inner part of the inlet.

Anchorage.—Anchorage can be obtained near the entrance to Xiangshan Gang in a position 2 miles WSW of Pearl Rock, in depths of 6.4 to 8.2m.

Well-sheltered typhoon anchorage can be obtained about 1 mile WSW of the S point of **Entrance Island** (29°32'N., 121°40'E.), in a depth of 9.1m. There is also good holding ground about 1 mile S of the W extremity of **Harlequin Island** (29°32'N., 121°34'E.), in depths of 8.2 to 11.9m.

Small vessels with local knowledge can obtain good anchorage, in a depth of about 9.1m, out of the strength of the tidal currents, between the **Pa Za Islets** (29°30'N., 121°36'E.) and the S shore of Xiangshan Gang.



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

SECTOR **7** — CHART INFORMATION

SECTOR 7

CHINA—SAN-MEN WAN TO MIN JIANG

Plan.—This sector describes the SE coast of China between Banzhao Liedao (T'ung-t'ou Shan), an islet NE of Sanmen Wan, and Shafeng Jiao, a point about 193 miles to the S. The description is N to S.

General Remarks

7.1 Winds—Weather.—Winds are seasonal and blow largely NE and SW in consequence of the influences which create the characteristic monsoons of the SE coast of China. From September through May winds from the NE predominate and commonly exceed 22 knots. During October, November, and January, winds will likely exceed 34 knots. In August winds are transitional and blow with equal frequency from the SW and NE.

Typhoons, created well to the SE by forces other than those giving rise to monsoon winds, may occur at anytime of the year. From November to April, they seldom if ever occur. In May, the frequency of occurrence increases until during June and July at least one typhoon occurs each year while in August at least two typhoons annually occur. During September and October, though frequent well to sea, they seldom reach the mainland coast.

Tides—Currents.—Offshore ocean currents are seasonal in set and velocity. From October to March the set is SW and parallels the coast. In April the set becomes confused or counterclockwise. From May to August the set is NE and parallels the coast. In September, current flow once more becomes irregular and sets SW as far as Ou Chiang where it becomes confused or counterclockwise. The SW current reaches a maximum of 1.7 knots in January. The NE current reaches a maximum of 2 knots in August.

Tidal currents in general flood S on a rising tide and ebb N on a falling tide. Tidal rise is everywhere considerable and reaches extremes in excess of 6.1m near the entrances to the rivers Ou Jiang and Min Jiang.

Aspect.—The coastline of China, between Banzhao Liedao (T'ung-t'ou Shan) and Shafeng Jiao, is extremely irregular and indented by numerous bights, large bays, and lengthy inlets. The inshore area is generally shoal and flat, and provides large portions of the coastline with extensive areas of drying mud flats which, in places, extend well to sea. The offshore area contains many large islands and a multitude of smaller islands, clustered islets, and scattered dangers, most of which rise abruptly from surrounding shoal water and afford good landmarks for coastal navigation. The 40m curve, in general, parallels the coast at a distance of 10 to 22 miles. Inland, the coastline is backed throughout by mountainous terrain which, characteristically for the SE coast of China, reaches the sea in isolated rock-fringed promontories with intervening coastal plains extending 20 miles inland.

Caution.—Fish stakes and fishing nets encumber the approaches and entrances to many of the bays indenting this portion of the Chinese coast. Weather observation buoys may also be encountered and adrift in the waters described in this sector.

Off-lying Islands

7.2 The many offshore islands lie within the 40m line. Several islands and isolated islets lie outside the curve and rise abruptly from the sea floor at a distance as far as about 30 miles offshore where they present a danger to vessels standing off the coast for destinations N or S. The outermost of these dangers are described below.

Yu-shan Lieh-tao (Yushan Liedao) (28°52'N., 122°15'E.) consists of a group of several islets and three steep-sided inhabited islands offering little shelter. Yu-san Chiao, the N islet, is mushroom-shaped. Pei-yu Shan, a large island in the middle of the group, is precipitous on its SE side, which is marked by a light. Wuhu Jiao, 0.5 mile E of Pei-yu Shan, consists of a group of rocks like saw teeth that are easy to identify. Nan-yu Shan, the southernmost island of the group, is saddle-shaped and reported radar conspicuous at 25 miles.

Caution.—A rock, awash, lies 0.25 mile N of Yu-san Chiao; another rock, with a depth of 2.1m, lies 2 miles NE of the same islet. Other dangers may best be seen on the chart.

Numerous dangerous wrecks lie SW of these islands.

7.3 Ta-ch'en Tao (Taizhou Liedao) (28°30'N., 121°53'E.) is a group of islands consisting of two large inhabited and mountainous islands and several islets and adjacent above and below-water dangers. Shang Hsu (Xia Yu), the 113m high S islet with a prominent yellow streak on its SW side, is reported radar conspicuous at 23 miles. Finger Rock, a remarkable stack 52m high, stands close off the S point of Shang Hsu.

Xiadanchen Shan (28°26'N., 121°53'E.), about 2.3 miles NNW of Shang Hsu, is 225m high and inhabited.

Zhu Yu (Chu Hsu), a 53m high islet, lies 0.4 mile W of the SW end of Xiadanchen Shan; the passage between is dangerous. Other islets lie close S and SW of Zhu Yu; foul ground extends 0.15 mile E and 0.25 mile N of the E end of the islet. A light is shown on the N side of the islet.

Anchorage.—Dachen Western Anchorage, located about 0.8 mile N of the light on Zhu Yu, affords anchorage, in depths of 7 to 13m, mud, sheltered from winds between NE and SE. A bank, on which there are depths of less than 9.1m, extends from the N side of Xiadachen Shan to within 0.5 mile NE of the anchorage. Near the extremity of this bank is a dangerous wreck, the position of which is doubtful.

Fishing stakes may be encountered when approaching from the W. Tidal currents flow NW at 2 knots on the flood and SE at 1.5 knots on the ebb.

7.4 Xiaojiaotou (28°28'N., 121°55'E.) is the N islet of a group of three islets that extend nearly 1 mile N from the E end of Xiadachen Shan; a light is shown from the islet.

Dachen Middle Anchorage, 0.75 mile W of the light, affords

anchorage, in depths of 10 to 26m, mud, sheltered from winds between NW and NE, and between SW and SE. Tidal currents flow SW at 1.75 knots on the flood and NE at 1.5 knots on the ebb.

Shangdachen Shan (28°30'N., 121°53'E.), 203m high, is separated to the N from Xiadachen Shan by a 0.75 mile wide channel; foul ground extends 0.2 mile from the NW, N, and E sides of the island.

A light is shown from a small islet 0.15 mile SW of the SW end of Shangdachen Shan.

Sheshan Dao (Ch'ing Hsu) (28°33'N., 121°55'E.), the N island of Ta-ch'en Tao, is 62m high with two rocky islets close S of it, and lies 2 miles NE of the NE end of Shangdachen Shan. The channel between the two islands is reported to be deep.

Caution.—Several islets lie within 0.5 mile S and SW of the Shangdachen Shan; a reef, with a depth of 3.8m, lies 1.25 miles SW of the SW extremity of the islet.

7.5 Tung-yin Tao (26°23'N., 120°30'E.), a high precipitous inhabited island reported radar conspicuous at 27 miles, is a weather station with two white buildings standing on the slope rising behind the lighthouse on the E extremity of the island. Small vessels, seeking shelter during the Northeast Monsoon, can obtain anchorage, in 7.3 to 11m, in Bertha Cove, a small body of water formed SW by Tung-yin Tao and an islet lying close NW. Vessels best approach the anchorage from the S and clear of off-lying fish stakes during daylight hours only.

Tung-yin Tao Light

Tung-sha Tao (26°10'N., 120°24'E.), about 13 miles SSW of Tung-yin Tao, is a barren rock which, rising abruptly from the sea floor, is reported radar conspicuous at 15 miles.

T'ung-t'ou Shan to Zhaitou Jiao

7.6 T'ung-t'ou Shan (29°14'N., 122°00'E.) is a 171m high steep-sided islet lying off the coast and on the N side of a tortuous channel leading inland. The coastline between the islet and Zhaitou Jiao, about 74 miles SSW, continues extremely irregular and much indented by shoal bays and several lengthy inlets which throughout are fronted by extensive areas of drying mud flats. Inland, the coastline is backed by mountains which reach the shore in a multitude of long narrow rugged peninsulas or promontories, except in the middle part where the land is low and in places swampy. Offshore, the coastline is fronted by numerous clustered islands and many scattered islets, rocks, and isolated underwater dangers.

Tantou Shan (29°10'N., 122°02'E.), lying about 3.3 miles SE of T'ung-t'ou Shan, is an irregular-shaped island that is wooded and almost divided into two parts by a low isthmus. Wu Jiao (Niao Chiao), about 0.8 mile NE of the E point of the island and marked by a light, and Jilong Jiao (Chilong Chiao), 38m high and lying 1 mile NE of the N point of the island, are the outermost islets marking the dangers extending from the NE side of Tantou Shan.

A shallow bank, on which there are a number of fishing stakes and other dangers, extends 3 miles W from Tantou Shan to two islands lying in the entrance to the channel between the N side of Niutou Shan and the mainland. Deep, but narrow and intricate, passages lead N and S of these latter two islands to **Shih-p'u** (29°13'N., 121°57'E.) (World Port Index No. 59935), a coastal trading center; there are least depths of 4.9m in the approach to the N channel and 7m in the approach to the S channel.

Niluo Yu (Ni-lo Chiao) (29°08'N., 122°03'E.), about 3.3 miles S of Tantou Shan, appears as two islets, of which the N part is 48m high. There are fishing stakes in the area between 5 miles E and 5 miles S of the islet. A depth of 6.4m lies 6 miles ESE of Niluo Yu.

Niutou Shan (Niu-T-ou) (29°07'N., 121°56'E.), a large island 387m high, is separated from Tantou Shan by a 1.75 mile wide passage. Nanshan, 154m high and wooded, lies close off the S point of Niutou Shan.

Nuying (Chiao) Jiao, 3 miles SE of Nanshan, dries 1m. Youcaihuazhi (Tsai-hua-chi), 46m high, lies 1.75 miles NE of Nuying Jiao; foul ground extends 0.5 mile W from it to another islet. Mituo Dao, 42m high, lies 1.2 miles NNW of Youcaihuazhi.

Anchorage.—Indifferent anchorage can be obtained, in depths of 6.4 to 10.1m, mud, between the SW side of Tantou Shan and the E side of Niutou Shan, but the tidal currents may attain a rate of 2.5 knots and there is usually a heavy swell. Anchorage can also be obtained in the sheltered waters N of Niutou Shan, in depths of 5.5 to 40.2m, mud.

7.7 Sanmen Wan (29°00'N., 121°45'E.) is a large inlet entered between Nanshan and **Niushan Zui** (29°01'N., 121°43'E.), a point lying about 12 miles further SW. The coastline is extremely irregular and recedes about 20 miles inland to form several arms which throughout are almost completely filled by extensive areas of drying mud flats. It is generally backed by low-lying land within the inlet and by rugged mountains without. Several large, mountainous islands lie on the N

side of the entrance while elsewhere numerous islets and dangers largely encumber clear access through the approaches from sea.

The principal fairway into Sanmen Wan passes between **Ts'ao-hsieh-pa Yu** (29°00'N., 121°54'E.), a steep-sided islet divided into three parts, and Sanmen Tao, a 53m high island about 5.5 miles further SW; rocks, islands, and other dangers extend 3.5 miles NW from Sanmen Tao. The fairway, in general, trends NW. It enters the inner part of the inlet by passing through the channel **Man-t'ou Kang-tou** (29°05'N., 121°40'E.) and rounding the steep-to point **Mao-t'ou-shan Tsui** (29°06'N., 121°39'E.).

The coast between Niushan Zui and **Ketangshan** (28°54'N., 121°41'E.), an islet rising to a height of 212m, and lying 6.5 miles S, is very broken and is composed of a number of bays filled with drying flats. A number of islets and dangers, which are best seen on the chart, lie within 2 miles NE and 3.5 miles ESE of Ketangshan.

The coast between Ketangshan and Baishashan, the N entrance point of T'ai-chou Wan, about 10 miles S, is fringed by a drying flat extending up to 4 miles offshore, with a shallow coastal bank extending seaward to the off-lying islands.

7.8 **T'ai-chou Wan** (28°40'N., 121°37'E.) is a shoal bay entered between Baishashan, 76m high and **Langjishan** (28°32'N., 121°37'E.), a 243m high island lying 10 miles further S. The shoreline is low, regular, and fronted throughout by an extensive margin of drying mud flats except for the area in the entrance to the river Jiao Jiang. Numerous rugged islands, clustered islets, and isolated above and below-water rocks lie in the offshore approaches.

Toumen Shan (28°41'N., 121°47'E.), inhabited and rising to a sharp cone 202m high, rises from surrounding shoal water about 15 miles E of the entrance to Jiao Jiang (Chiao Chiang). Good anchorage can be obtained between the S point of Toumen Shan and a 19m high islet lying 0.5 mile S of the point. Islands and other dangers, which may best be seen on the chart, extend from 7.5 miles NE to 6 miles ESE of Toumen Shan.

Navigation within the area N of the island is not recommended.

Baijiashan (28°37'N., 121°52'E.), 6 miles SE of Touman Shan, is 75m high and cliffy, with a reef at its E end. Yijiangshan, 2 miles W of Baijiashan, consists of two islands, very close together, of which the N island is 127m high.

Caution.—Fishing stakes exist in the area around Yijiangshan, Baijiashan, Touman Shan, and the islands E of Touman Shan.

7.9 **Haimen** (28°41'N., 121°27'E.) (World Port Index No. 59930), a coastal trading center of some importance, is a community with about forty berths. It is capable of handling vessels of 3,000 to 5,000 dwt, located on the S bank of the area close within the entrance to the river.

A berth for 10,000 dwt ships is now in operation. Vessels with a draft not exceeding 6.8m can be led through the channel to the berths. Haimen Gang No. 1 Lighted Buoy is equipped with a racon.

Pilotage.—Pilotage is compulsory and available at all times. The pilot boards in position 28°39.8'N, 121°46.2'E for the No. 1 Pilot and Quarantine Anchorage and in position 28°27.4'N, 121°52.5'E for the No. 2 Pilot and Quarantine Anchorage.

Anchorage.—The quarantine anchorage has a depth of 9m, mud and good holding ground. It lies within the following bounded area:

a. 28°40.2'N, 121°45.3'E.
b. 28°40.2'N, 121°47.3'E.
c. 28°39.2'N, 121°47.3'E.
d. 28°39.2'N, 121°45.3'E.

Anchorage can also be obtained in the narrows at the entrance to Jiao Jiang, where there is an area 1 mile long and 0.5 mile wide, with depths of 4 to 8.2m, soft mud.

7.10 The coast between Langjishan and **Heshang Tou** (28°21'N., 121°40'E.), about 14 miles SSE, is fringed by a shallow and partly drying bank extending up to 6 miles offshore and on which there are a considerable number of islets and rocks, with heights up to 243m, of which only the outer dangers are described.

Jigushan (Chiku Shan) (28°23'N., 121°43'E.), the southeasternmost of these dangers, lies 3 miles NE of Heshang Tou. It is cone-shaped and 228m high, with a broad yellow stripe on its SE side, which is an excellent landmark.

Jigushan from SE, distant 2 miles

Luo Yu (Lo Hsu) (28°16'N., 121°44'E.) is an islet lying about 5.5 miles SE of Heshang Tou; a light is shown from a 4m high white square brick structure located at an elevation of 76m. Niu Shan, 162m high, lies 2 miles WNW of Luo Yu.

The coast between Heshang Tou and **Liudou Zui** (Litou Zui) (28°16'N., 121°25'E.), the E entrance point of Aiwan Wan, about 7.5 miles further SW, is composed of many shallow bays. Islets and other dangers extending off this coast may best be seen on the chart.

Yisuan Shan (28°13'N., 121°40'E.), marked by a light, lies 4.5 miles SE of Liudou Zui; a reef lies 0.2 mile NE of the islet. Daqi Jiao and Xiaoqi Jiao, also known as The Stragglers, are two groups of above and below water rocks lying between 2.5 and 3 miles NE of Yisuan Shan. Sansuanshan, 111m high, lies 1.25 miles NW of Yisuan Shan; a 100m high islet lies between these two islands.

An unmarked dangerous wreck lies at approximately 1 mile SW of Sansuanshan.

7.11 **Aiwan Wan** (28°16'N., 121°30'E.) is entered between Liudou Zui and Maocaoshan, 9 miles WSW; the bay is generally shallow with a drying flat extending about 2.5 miles offshore.

Tidal currents in Aiwan Wan set NW on the flood current and SE on the ebb current, at a rate of 1.5 knots.

Wailongyan (28°13'N., 121°33'E.), a flat rock, about 5m high, and marked by a light equipped with a racon, lies in the approach to Aiwan Wan, about 3 miles SW of Liudou Zui. Neilongyan, 10m high, lies about 1 mile NNW of Wailongyan.

Anchorage.—Anchorage sheltered from NW to NE winds,

can be obtained in Aiwan Wan, in depths of 4 to 5m, mud, NW of Neilongyan.

Maocaoshan (28°12'N., 121°25'E.), 81m high, is the W entrance point of Aiwan Wan, and is the outermost of a group of islets lying close offshore. The coast continues SW for 5 miles to Zhaitou Jiao (Hebe Head).

Caution.—Fishing nets and stakes may be encountered in the area extending 5.5 miles NE of Wailongyan. A dangerous wreck lies about 3.5 miles ENE of Wailongyan.

Zhaitou Jiao to Shi Jiao

7.12 Zhaitou Jiao (Hebe Head) (28°08'N., 121°21'E.) is the S extremity of a rugged mountainous headland. The coast line between the headland and Shi Jiao, about 112 miles SW, continues rather irregular and is indented by many inlets and the estuaries of several large rivers. It is backed throughout by mountainous terrain which reaches the sea everywhere in bold promontories and headlands, except in the N central part where the land is low and well-cultivated. The inshore area as far S as P'ing-yang Tsui fronts the coastline with an extensive margin of drying mud flats, while the offshore area contains numerous islands and islets well-scattered throughout.

Xialangtan (28°04'N., 121°31'E.), a small islet marked by a light, with another islet close NW, lies 9.5 miles SE of Zhaitou Jiao. Pi Shan, 1.25 miles NW of Xialangtan, is 174m high and has several rocks and islets within 0.5 mile of its shores. Two other small islets lie 1 mile WNW and 2.5 miles NW, respectively, of Pi Shan.

Qian Shan (28°03'N., 121°24'E.), 86m high and marked by a light on its W end, is the N of a group of three islets, close together, lying 4.5 miles WSW of Pi Shan. Other islands, rocks, and dangers, best be seen on the chart, lie between Qian Shan and Zhaitou Jiao.

The coast between Zhaitou Jiao and Wenzhou Jiao, about 23 miles WSW, recedes N to form a large bay whose very irregular shoreline is fronted by extensive margins of drying mud flats and whose offshore area is considerably blocked by the large mountainous island **Yuhuan Dao** (28°08'N., 121°12'E.) and numerous smaller islands and lesser islets. The river **Ou Chiang** (28°01'N., 120°44'E.), with the port of Wenzhou, has its entrance about 23 miles SW of Zhentou Jiao.

Anchorage.—Vessels, seeking shelter from typhoon winds, anchor in 9.1 to 14.6m about 1.25 miles off the salient point on the SW side of Yuhuan Dao. This anchorage, in the deeper part of the bay Leqing Wan (Lo-ch'ing Wan), is at times obstructed by fishing stakes.

7.13 Wenzhou Wan (27°55'N., 121°15'E.) is an extensive open roadstead lying SE of Yuhuan Dao and E of the numerous large, mountainous islands which, rising abruptly from surrounding areas of shoal water and westward trending margins of drying mud flats, lie in the E and SE approaches to Ou Chiang. A DGPS station is situated on the N coast of Lingkun Dao (27°59'N., 120°54'E.).

Dongtou Shan (27°50'N., 121°08'E.) is a large irregularly-shaped island about 223m high; there are a number of dangers within 0.75 mile of the E end of the island. Dazhu Shan, about 2 miles E of the SE point of Dongtou Shan, is 75m high; islets and rocks extend 0.5 mile S from this islet. Another small group of islets and rocks lies 0.4 mile NW of Dazhu Shan.

Hutou Yu (Hu-tou Hsu) (27°50'N., 121°15'E.) is 99m high, with several islets extending almost 0.8 mile NW from it; a light is exhibited from the summit of Hutou Yu.

Caution.—This group of islets resembles Dazhu Shan and its surrounding islets, about 1.5 miles SW; these two groups of islets may be confused in thick weather.

A dangerous wreck reported in the approach to Wenzhou Wan in approximately position 28°01.7'N, 121°21.4'E.

7.14 Chongshan Shuidao (27°54'N., 121°04'E.) is the channel between the N side of Zhuangyuanao and Niyu Shan, and the S side of Qingshan Dao and Chongshan Shazui, a drying bank extending 3 miles W from Qingshan Dao. There are depths of as little as 2.2m in the W part of this channel.

Shatou Shuidao (28°01'N., 121°02'E.) leads SW between two groups of islets lying close NW of Xiaomen Dao and the drying mud flats fronting the mainland. There is a least charted depth of 2.6m in the channel.

Huangdao Shuidao (27°56'N., 121°07'E.) is the only channel available to shipping entering Ou Jiang. The channel leads W between Qingshan Dao and Chongshan Shazui to the S and the coast of Damen Island to the N; the channel then continues N of Zhong Sha, an extensive bank which dries in places and lies between 0.6 mile and 2 miles S of the SW end of Damen Island. The channel then continues NW, passing between the extensive drying bank of **Wenzhou Qiantan** (27°56'N., 120°57'E.) to the SW and Sanjiao Sha to the NE.

Aspect.—The S coast of Damen Island between Dong Tou, its E extremity, and **Rock Point** (27°56'N., 121°05'E.), about 3 miles WSW, is bold and cliffy. From Rock Point to Huangda Zui, the SW point of Damen Island, about 1.5 mile E, the coast consists of a bay which dries completely.

Qingling Yu, a small islet about 0.6 mile W of Rock Point, has a 43m high summit and is marked by a light. Lights are also exhibited on Huangdu Zui and Dong Tou.

7.15 Qingshan Dao (27°55'N., 121°07'E.) is 224m high and remarkable in appearance. From its E, N, and W sides it rises gradually in long spurs until nearly halfway to the summit, where its rocky sides then rise abruptly.

Tides—Currents.—The flood current near Qingling Yu has a maximum rate of 2 knots; the ebb current has a rate of 2.5 knots.

Off the S end of Damen Island, the tidal current is rotary and changes from flood to ebb gradually through N, and from ebb to flood gradually through S.

Anchorage.—The Wenzhau Pilotage and Quarantine Anchorage is designated within the area enclosed by lines bounded by the following positions:

a. 27°56'04"N, 121°06'06"E.
b. 27°55'50"N, 121°06'06"E.
c. 27°55'50"N, 121°07'05"E.
d. 27°56'41"N, 121°07'15"E.

The anchorage has depths of 7 to 10m, mud and sand bottom. It is protected from winds and heavy swell except from E and S winds and swell.

Vessels anchor with little shelter, in 7.4 to 21.9m, hard mud, anywhere in Wenzhou Wan according to draft. Vessels seeking refuge from typhoon winds anchor, in 5.5 to 12.8m in **Heiniu Wan** (27°48'N., 121°07'E.), sheltered by Dongtou Shan to the

N, but open to S and SW winds which send heavy swells into the anchorage.

Vessels seeking shelter from the predominating winds of the Southwest Monsoon season anchor, in 7.4 to 9.2m, in a position N of Dasanpan Shan, an island close N of Dongtou Shan. The anchorage is approached from the E. The approach from the W through Dongtou Xia (Tung-t'ou Hsia) (Tungtow Strait) is obstructed by a bar and is not recommended without local knowledge. Vessels also anchor, in 11 to 36.5m, clear of fish stakes, in a position close S of Qingshan Dao, a lofty islet lying S of Damen Island. The anchorage lies in a deep pool in Chong-shan Shuidao, a secondary access channel to Ou Chiang used only by junks.

Above Qingling Yu, the water changes from clear and salty to muddy and brackish.

Caution.—Dangerous wrecks, best seen on the chart, lie in the approaches to Wen-zhou Wan.

Wenzhou (28°01'N., 120°39'E.)

World Port Index No. 59910

7.16 Wenzhou, a large metropolis and important coastal trade center, lies on the S bank of Ou Chiang at about 17 miles upstream from Wenzhou Jiao, the hilly N entrance point of the river.

Tides—Currents.—At the river entrance, flood duration is 5 hours 30 minutes and the ebb is 7 hours 30 minutes. Currents reach 5 knots and continue to run about 25 minutes after the time of H and LW.

At Wenzhou, flood duration is 4 hours 45 minutes; ebb, 7 hours 30 minutes. Currents continue to run about 38 minutes after the time of HW and LW. From April to June, freshets occur which may cause ebb currents to persist throughout the day at a maximum velocity of 6 knots, but may reach 7 knots for short periods.

Depths—Limitations.—The harbor is divided into two sections, Shuo Men and An Lan. There is 540m of wharf space, with an alongside depth of 6m, capable of taking vessels of 500 to 1,500 dwt. A new floating wharf is now in operation. Two berths for 10,000 dwt ships have been completed in the Longhai area. Five new coal-handling berths are to be constructed.

Vessels can ordinarily reach Wenzhou with a draft of 4.6m during neap tides and with 5.5m during springs. It was reported that an ocean-going vessel, with a draft of 5.1m, entered Ou Chiang and proceeded to the port of Wenzhou.

At **Panshi** (27°59.3'N., 120°49.6'E.), there are mooring buoys for vessels of 10,000 and 20,000 dwt for berthing ; at **Longwan** (27°58.3'N., 120°48.2'E.), there are general cargo berths for vessels of 10,000 dwt. The main channel leading to these berths has depths of between 2 to 10m; vessels enter the port area with a favorable tide.

Aspect.—The river banks are generally low and maintained for considerable lengths by dikes. The N bank is backed by rugged hills while the S bank, within the river entrance, is largely flat and well-cultivated. Several low, diked, and cultivated islands, as well as extensive areas of drying mud flats and shifting sand banks encumber the river between the entrance and alongside berthing facilities at Wenzhou. River depths and the navigable channel change constantly and require local knowledge to ensure safe navigation.

Wenzhou

Pilotage.—Vessels board pilots in the quarantine anchorage at Huangdao in position 27°56.7'N, 121°09.8'E. Pilotage is compulsory and available during daylight hours only.

Caution.—The navigable channel from the quarantine anchorage is marked by buoys and beacons; these are altered as necessary to conform with the constant changes which take place in the river bed.

A rock, with a depth, of 2.1m lies close NW of the fairway from Panshi to Long-wan-Tou. Laohu Yan Dike projects 0.6 mile S from the shore 0.5 mile NW of Qidu Zui. Two lights are shown from near the dike.

7.17 **Ku-ao-t'ou** (27°36'N., 120°33'E.), about 32 miles SW of the N entrance point of Ou Chiang, is a community on the N bank of the river Ao Chiang which, lying about 2 miles within the river entrance, is reached by small vessels with a draft of 3m.

Beijshan Liedao (27°38'N., 121°12'E.), consisting of several rugged islands and islets, lies about 34 miles E of the entrance to Ao Chiang and constitutes the farthest seaward danger in the approaches to Ku-ao-t'ou. Beiji Shan, 120m high and the largest of these islands, has several islets lying close together about 1 mile SE. Numerous other mountainous islands and lofty islets lie scattered to the W and reach the coast off the entrance to **Feiyun Jiang** (27°42'N., 120°40'E.), a river which small vessels with a draft of 3.7m are able to ascend at HW for a distance of about 5 miles to the community of Ruian. The Feiyun Jiang Bridge, which has a vertical clearance of 17.5m at MHW, spans the river in position 27°47'N, 120°36'E.

Nanjishan Liedao (27°27'N., 121°04'E.), about 12 miles SW of Beijshan Liedao, consists of the large mountainous island Nanji Shan and the several islets and the many underwater dangers which surround it. Small vessels anchor, in 14.6 to 16.4m, in Nan-chi Chiang, a small inlet on the S side of Nanji Shan. A swell sets into the anchorage with winds occurring during the Northeast Monsoon season and with winds from the SE.

Shacheng Gang Approaches

7.18 **Pingyang Zui** (27°28'N., 120°40'E.), about 9 miles SE of the entrance to Ao Chiang, is a point at the NE extremity of a bold headland. The coastline between the point and Shi Jiao, about 57 miles SSW, is very irregular and indented by numerous bays and a multitude of small coves. It is everywhere backed by high hills and mountains which, in general, rise

abruptly from a foreshore largely clear of the characteristic margins of drying mud flats.

Qixing Dao (27°03'N., 120°51'E.), about 26 miles SSE of Pingyang Zui, is a group of small high-rising rocks lying at the seaward extremity of a string of islands and islets stretching WSW to the mainland. The SW and largest islet is 61m high and split in two. The above-water rocks at the N end of the group are low and have a number of rocks awash within 0.5 mile E and 1 mile W of them; it is recommended that this group be given a wide berth. **Lie Yan** (Cleft Rock) (27°06'N., 120°49'E.), 15m high, lies 3 miles NW of Qixing Dao.

Caution.—Discolored water has been reported to the SE of Qixing Dao.

7.19 Taishan Liedao (27°00'N., 120°42'E.), marked by a light and a racon, consists of two islets and a number of rocks. Dongtai Shan, the SE islet, has a table top summit 165m high. Above and below-water rocks extend 2.5 miles W of Xitai Shan, the NW island. A reef, awash, lies about 4.5 miles NW of the same island.

Nan Yu (Strawstack Island) (26°56'N., 120°21'E.), about 3.3 miles SSW of Xitai Shan, is 86m high. A rock, awash, whose position is doubtful, lies 4.5 miles W of the islet; a depth of 11.6m lies about 2.5 SW of Nan Yu.

Xingdao Dao (26°59'N., 120°28'E.) and Dongxing Dao, together with their off-lying rocks, form a small group of islands sometimes known as Ying-ko-ku Lieh-tao, lying about 20 miles WSW of Qixing Dao. Small vessels, seeking shelter from the Northeast Monsoon, can obtain anchorage, in a depth of 11m, mud, 0.2 mile off the SW side of Xixing Dao, with two white masts in line, bearing 058°. Vessels also anchor, in 12.8m, off the NW side of the islet in a position at the juncture of two ranges indicated by beacons standing E and W of the disused lighthouse at the W end of the islet. Vessels transiting the passage between Yin-ko-ku Lieh-tao and Taishan Leidao, a group of high steep-sided islands about 11 miles to the E, are recommended to favor the W side of the passage.

Riyue Yu (Solitary Rock) (27°02'N., 120°25'E.), 81m high with a reef extending 0.2 mile E of it, lies 3.5 miles NW of Xixing Dao.

Three dangerous wrecks lie within 2.5 miles NE and NW of the rock.

7.20 Shacheng Gang (27°10'N., 120°24'E.), about 22 miles SSW of Pingyang Zui, is a narrow deep fjord-like inlet which, winding through sheltering mountainous terrain, recedes irregularly inland for a distance of about 17 miles. The inlet has not been thoroughly examined above Kin-sho, an islet lying about 5 miles inland from Fu-chien T'ou, the hilly steep-to S entrance point of the inlet. Depths in the fairway through the entrance are generally deep but irregular; shoal depths of 9.1 to 12.8m have been reported.

Vessels seeking shelter during the Northeast Monsoon season and having a draft no greater than 4.6m can obtain anchorage between **Beiguan Dao** (27°10'N., 120°31'E.) and Nankuan Shan, 1.25 miles W, but local knowledge is required. They also anchor, in 12.8 to 18.2m, clear of fishing nets, off the W side of Nankuan Shan.

Vessels of all classes seeking refuge from typhoon winds enter Shacheng Gang between Fu-chien T'ou and Nankuan Shan and anchor, in 11 to 25.6m in a position in the fairway, clear of bamboo moorings, NW of Lung-mu Yen (Bate Island), a small islet on the N side of the channel about 1.5 miles W of Fu-chien T'ou. A drying reef extends about 0.3 mile NW from the islet. Small vessels anchor, in 5.9 to 9.2m, mud, in a position on the shore bank SE of Tree Islet, an islet lying in the middle of the fairway about 1.8 miles NW of Lung-mu Yen. The channel on the E side of the islet is foul. The tidal range in Shacheng Gang is extreme.

Caution.—A dangerous wreck lies approximately 2 miles SW of the entrance to Sacheng Gang, in 11m of water.

7.21 Dayu Shan (Fu-yao Shan) (26°57'N., 120°21'E.), about 6 miles WSW of Ying-ko-ku Lieh-tao, is a large mountainous island lying at the seaward end of a number of lesser islands and scattered islets extending E from the N entrance point of the partially examined bay Funing Wan. Transit of the several narrow rocky passages between Dayu Shan and the mainland is not recommended without local knowledge.

Anchorage.—Good anchorage, in a depth of 11m, sand, is reported about 1 mile W of Dayu Shan. Good anchorage is also reported, in 11m, 1 mile N of the E point of Dayu Shan.

Caution.—Less water than charted has been reported in an area 2 miles N of Dayu Shan.

Funing Wan (26°51'N., 120°07'E.) is shoal and has a number of islets and rocks in it. **Beiao Dao** (26°53'N., 120°13'E.), 136m high, is the largest of a group of islands lying within 2.25 miles S of the N entrance point of the bay. The village of **Sansha** (26°55'N., 120°13'E.) situated close W of the N entrance point.

Good anchorage has been obtained off Sansha, in a depth of 8.2m, with the N entrance point of the bay bearing 043° at 0.35 mile. The anchorage is approached, after passing 0.5 mile N of Beiao Dao on a W course, on a course of 003° with a ruined castle, standing on one of the islets fronting the village, a little on the port bow.

Many of the inshore areas along this portion of coast have been partially surveyed. Vessels must use caution.

Dajin Jiao (26°43'N., 120°09'E.) lies about 4.5 miles S of the E end of Changbiao Dao, the S entrance point of Funing Wan; the bay between these two points contains a number of islets and dangers.

Several islets, one of which is marked by a light, lie up to 1 mile SSE of Dajin Jiao.

Caution.—Fishing stakes may be encountered up to 2.5 miles SE of Dajin Jiao.

Shi Jiao to Beijiao Zui

7.22 Shi Jiao (26°39'N., 120°07'E.), lying about 4.5 miles SSW of Dajin Jiao, is a steep-sided headland which, backed by high-rising hills and mountains, rises abruptly from a sea floor lying in depths in excess of 18.2m. The coastline between the headland and Beijiao Zui, about 19 miles SSW, is irregular and considerably indented by Sansha Wan and Loyuan Wan, two extensive inlets whose several arms are largely filled with wide areas of drying mud flats. It is backed by mountainous terrain which reaches the shore in bold headlands with a multitude of intervening coves. The offshore area is relatively deep and en-

cumbered by several large islands and many lesser islands and scattered underwater dangers.

Sishuang Liedao (26°40'N., 120°21'E.) is a group of islets and rocks lying 9 to 14 miles E of Shi Jiao; the S danger of the group is **Nanquan** (Bare Rock) (26°37.5'N., 120°19.5'E.). Nanshuang Dao, 1.75 miles NE of Nanquan is 182m high; Dongshuang Dao, 2 miles farther NE, is 101m high and has a reef marked by breakers extending 0.5 mile E from it. Beishuang Dao, 139m high and the largest in the group, lies 4 miles NNE of Nanquan. Other islets and dangers may best be seen on the chart.

Caution.—Fishing stakes may be encountered between Nanshuang Dao and Dongshuang Dao, and on the N side of Beishuang Dao.

Hsi-yin Tao (Lang Tao) (26°20'N., 120°12'E.), about 19 miles SSE of Shi Jiao, is a lofty islet which, with underwater rocks lying close NE and SW, constitutes the farthest seaward danger in the immediate approaches to the considerable inlets indenting this area of the coast. **Tung-yin Tao** (26°23'N., 120°30'E.) and **Tung-sha Tao** (26°10'N., 120°24'E.) are both described in paragraph 7.5.

7.23 Sansha Wan (26°25'N., 120°00'E.) is an extensive island-filled bay located between Shi Jiao and Beijiao Zui, about 19 miles SW. **Sandu Ao** (26°35'N., 119°50'E.) is described in paragraph 7.24.

Fuying Dao (26°35'N., 120°08'E.) is a large mountainous steep-sided island lying close S of Shi Jiao; the island has two remarkable peaks near its NE end, the higher being 363m high. Maci Dao is an island, 255m high, lying 0.75 mile S of the SW end of Fuying Dao.

Another island lies close off the SE side of Fuying Dao, to which it is joined by a shallow ridge. An isolated rock, 18m high, lies 0.75 mile NW of the W end of Fuying Dao.

In the Northeast Monsoon, good anchorage can be obtained, in a depth of 12.8m, mud, SW of Fuying Dao, sheltered from the E swell by Maci Dao and the island N of it.

Kuishan Dao (26°30'N., 120°08'E.), rising to a cone 233m high, is the outer island of a group of islands lying on the N side of the approach to Sandu Ao. A rock, with a depth of less than 1.8m, lies 1 mile SE of Kuishan Dao; a reef, awash, lies about 3.8 miles further SE.

Xiyang Dao (26°30'N., 120°03'E.), lies 3.5 miles WNW of Kuishan Dao; fishing stakes may be encountered S of the island. Other islets, rocks, and dangers extending W and NW from Xiyang Dao may best be seen on the chart.

7.24 Sandu Ao (San-tu Ao) (26°35'N., 119°50'E.) is an extensive inlet entered between **Mouth Point** (26°27'N., 119°50'E.) and the extremity of a rugged and steep-to peninsula about 4.5 miles NE. The inlet provides anchorage in a typhoon with good holding ground. Within its entrance the inlet divides into several arms and is encumbered with a number of islands and islets; the land around the inlet is well cultivated and the hills are terraced.

Tidal currents in Sandu Ao turn at the times of HW and LW; the currents follow the directions of the channels, dividing where there are islands and running at a greater rate past their salient points. In the entrance channel rates of 4 to 7 knots may be obtained, and heavy tide rips occur during the ebb current. The mean spring tidal range in Sandu Ao is 6.6m.

The W sides of the entrance channel, between the entrance to Luoyuan Wan and **Town Point** (26°33'N., 119°48'E.), the extremity of a steep-to peninsula about 7 miles NNW, is rugged and indented with several bays mostly filled with drying mud flats. The peninsula rises NW to become part of the rugged mountain range which backs this coast.

The E side of the entrance channel is also rugged and indented with bays filled with drying mud flats. **Castle Point** (26°32'N., 119°50'E.), jutting out close within the entrance of the channel, is steep-to and marked by a light. Channel Rock, lying near mid-channel about 0.6 mile WSW of Castle Point, dries 4.3m.

Chi-chiao Shan (26°34'N., 119°48'E.) lies near mid-channel at the N end of the entrance. Rocks, some awash and some as much as 18m high, extend 0.4 mile SSE of the island. The passage W of the island is reported deep and clear, but during spring tides, the tidal currents may attain a rate of 6 to 7 knots; tide rips and swirls may form off Hail Point, the W extremity of the island.

Qingshan Dao (Yen Tao) (26°37'N., 119°47'E.), the second largest island in Sandu Ao, lies 2 miles NNW of the inner end of the entrance channel. The island has several peaks of similar elevation, the highest rising to 390m high in its W part.

Waterwitch Channel (26°36'N., 119°46'E.) leads NW between the SW side of Qingshan Dao and the mainland; the latter is much indented with small bays filled by mud flats. The E part of the channel is free of dangers except for a rock, with a depth of 0.2m, lying 0.25 mile SE of the S point of Qingshan Dao; at the W end of the channel foul ground extends 0.3 mile from the SW side of Qingshan Dao.

Caution.—Tidal currents in the fairway between the dangers are strong; there are tide rips and swirls. The ebb current sets towards the S side of the channel.

7.25 Sandu Dao (26°39'N., 119°41'E.) is the largest island in Sandu Ao. It has several summits, with Mount MacAllum, 457m high and situated in its W part, being the highest. Mount Stevens, 1.5 miles SE, is 367m high.

Customs Point (26°38'N., 119°40'E.), at the SW end of Sandu Dao, has a Customhouse, stone jetty, and pier; storm signals are displayed from a flagstaff nearby. The town of **Sandu** (26°38'N., 119°40'E.) (World Port Index No. 59880) stands on the W side of a mud filled bay, 0.5 mile NE of Customs Point; it is a port of call for coastal shipping.

Vessels anchor, in 14.6 to 18.2m, 0.5 mile SE of Customs Point with King Point, lying 0.5 mile W of Customs Point, bearing 293° and open N of Lay Rocks (Pai Chiao) and with Mount Stevens, about 1.3 miles ENE of Customs Point, bearing 043°.

Kaiser Rock (26°37'N., 119°44'E.), awash and steep-to, lies about 1 mile W of the W end of Qingshan Dao. The tidal currents swirl around this rock at a great rate.

Between **Ridge Point** (26°35'N., 119°51'E.) and Pu-lo-wu Chiao, 4 miles NE, the SE shore of the inlet is slightly indented and has a number of wooded spurs descending steeply to the shore from the mountain range close inland. The best position to anchor to ride out a typhoon is in **Algerine Roads** (26°37'N., 119°53'E.), about 0.8 mile W of Pu-lo-wu Chiao, in a depth of about 22m.

7.26 Loyuan Wan (Luoyuan Wan) (26°25'N., 119°43'E.), entered close S of the entrance to Sandu Ao, is an irregularly shaped bay which, reached through a narrow deep islet-obstructed entrance channel about 4 miles long, has extensive margins of drying mud flats and areas of deep water in which large vessels find an excellent refuge from typhoon winds. Tidal rise in the bay is extreme, while tidal currents in the entrance channel reach a velocity of 1.75 knots and form rips.

Anchorage can be obtained about 1 mile SW of the inner end of the entrance channel, Kemen Shuidao, in depths of 11 to 12.8m. Anchorage can also be obtained about 1.8 miles N within the N arm of the channel, in depths of 7.3 to 9.1m.

Dongluo Dao (26°25'N., 119°55'E.), the larger islets of a group of three, lie 4 miles and 2.75 miles E of the S entrance point to Loyuan Wan; other islets and below-water rocks lie in the bay to the S and W of them. A drying rock lies 0.75 mile N of Dongluo Dao. Tidal currents in the vicinity of these islets sometimes attain a rate of 3 knots.

Caution.—Fishing stakes extend up to 2.75 miles NE of Dongluo Don.

Beijiao Zui to Shafeng Jiao

7.27 Beijiao Zui (26°23'N., 119°57'E.) is the seaward extremity of a mountainous finger of land extending about 15 miles NE from the mainland. Pei Hsu is a small islet about 0.3 mile ESE of Beijiao Zui; heavy tide rips and seas form off the islet during the Northeast Monsoon.

The coastline between Beijiao Zui and Shafeng Jiao, about 25 miles SSW, recedes irregularly inland and forms a large bay in the S portion of which lies the estuary to the river Min Jiang. The coastline is everywhere backed by mountainous terrain, except in the area of Shafeng Jiao, where the land is low, sandy, and light in color. The area close offshore in shoal and has extensive margins of drying mud flats. A number of rugged islands, surrounded by drying mud flats, lie in the estuary and create several tortuous channels leading to the river entrance. Farther offshore, several groups of high and generally conspicuous islands with numerous lesser islands and scattered above and below-water dangers extend S from Beijiao Zui as far as Shafeng Jiao.

Mazu Liedao (Ma-tsu Liehtao)

7.28 Gaodeng Dao (Kao-teng Tao) (26°17'N., 119°59'E.), the N island of Ma-tsu Liehtao, is 173m high. There are rocks within 0.75 mile E and W of Kao-teng Tao; another rock, about 11m high, lies 1.5 miles NE of the island.

Hsiao-ch'iu (26°15'N., 120°01'E.), 79m high and Ta-ch'iu, close SW and 93m high, lie about 1.3 miles SE of Kao-teng Tao; the channel between is encumbered with above and below water rocks.

Beigantang Dao (Pei-kan-t'ang Tao) (26°13'N., 119°59'E.) rises in the NE to two prominent peaks; Bi Shan, the NE and higher peak, is 293m high. Islets and rocks extend 0.75 mile SE from the S point of the island to Yan Shi, which has a depth of 0.9m. Anchorage, providing good shelter from NE winds, can be taken in the NE part of Ma-pi Wan, in a depth of 8.2m, mud, with the summit of **Pang Shan** (26°13'N., 120°01'E.) bearing 126°, distant 1 mile.

San-lien Yu (26°14'N., 120°03'E.), widely spaced and up to 31m high, lie between 1.75 and 2.5 miles E of Pei-kan-t'ang Tao.

Mazu Haixia (Matsu Strait) (26°11'N., 119°57'E.), separating Pei-kan-t'ang Tao from Matsu Dao, has a navigable width of nearly 1 mile. Tung Shih (Dong Shi), a pinnacle rock with a depth of 6.4m, lies in the central part of the strait.

Matsu Dao (26°09'N., 119°56'E.), a large hilly and cultivated island, rises in its SW part to the prominent summit of Yuantai Shan, 246m high. Hou Ao, a bay on the N side of Matsu Tao, affords shelter with winds from E through S to WNW, in a depth of 9m, but is a bad anchorage due to its rocky bottom.

Caution.—Fishing stakes may be encountered off the S and SW side of the island.

7.29 Tai Shih (Dai Shi) (26°08'N., 119°58'E.), about 1 mile SE of Matsu Dao, is a group of rocky heads with depths of 1.5 to 5.4m; a 3m high rock lies about 0.5 mile N of Tai Shih.

Pei-chuan Chiao (Beiquan Jiao) (26°07'N., 119°58'E.), 1.5 miles SSE of Hsieh Chiao, is a prominent black rock 6m high; other dangers surrounding this rock may best be seen on the chart.

Yin-shui Chiao (Pilot Rock) (26°07'N., 120°02'E.), 3 miles E of Pei-chuan Chiao, is a pinnacle rock with a depth of 0.3m. The sea breaks over this rock, except at LW. A prohibited area and an explosives dumping ground lie 2 and 7 miles E, respectively, of Yin-shui Chiao. Other prohibited areas lie up to 7 miles ENE of Yin-shui Chiao.

Liu-ch'uan Chiao (Liuquan Jiao) (26°05'N., 119°58'E.), 2 miles SSW of Pei-chuan Chiao, is a precipitous black rock about 50m high; dangers extend 0.4 mile N from it to Kau-chiu Chiao, a 7m high rock.

Hsi-pi Shih (Xipi Shi) (26°04'N., 119°57'E.), about 1.5 miles SSW of Liu-ch'uan Chiao, is a group of pinnacle rocks with a least depth of 3m. The sea rarely breaks on them, even with strong NE winds, nor is there any surface disturbance to indicate their presence.

Chu-Kuang Lieh-Tao

7.30 Baiquan Liedao (Pai-ch'uan Lieh-tao) (25°58'N., 119°55'E.), lying about 11 miles S of Matsu Liehtao, consists of two islands and several islets and rocks.

Dongquan Dao (Tung-chu Tao) (25°58'N., 119°58'E.), the E island of the group, is 114m high and precipitous; islets and dangers lie within 0.75 mile NW and 1 mile NE of the island.

A light is shown from a round tower on the NE end of the island and a signal operates from the tower.

Xiquan Dao (Hsi-chu Tao) (25°59'N., 119°56'E.), the W island of the group, is 191m high. Its summit consists of three rounded hummocks, on the center and highest of which is a boulder; the SW slopes of the ridge are strewn with sand and show white in misty weather when little else of the island is visible. P'o-lang Shih, 16m high, lies at the outer end of a rocky ridge which extends 0.5 mile SW from the W point of the island; this rock and a 13m high rock on the ridge are prominent. Sand banks, with charted depths of 5.4 to 10m, extend up to 4 miles SW of Hsi-chu Tao.

Caution.—A prohibited area, which may be fouled by fish-

ing stakes, lies about 4 miles SE of Tung-chu Tao.

Min Jiang

7.31 The estuary to Min Jiang, lying between Shafeng Jiao and a point of land about 11 miles NNW, is obstructed by a number of mountainous islands, extensive areas of drying mud flats, and many shifting bars of mud and sand. The several channels leading through these obstructions are tortuous and, at times, subject to displacement in consequence of the shifting banks which border them. Muddy water, discharged from Min Jiang, flows well seaward and tends to obscure sunken dangers unless these are marked by breakers when the seas are high.

The buoyage system conforms to IALA Maritime Buoyage System (Region A).

Wu-chu Chiang (26°10'N., 119°36'E.), the northernmost entrance channel to Min Jiang, is an impassable stone-blocked channel leading N of Culu Dao, a large mountainous island, 229m high, lying in the N part of the estuary.

Wei-tou Shui-tao (25°31'N., 119°38'E.), a passage used by small craft, leads between the E side of Culu Dao and Chuan-shi Dao, a small rugged island rising to a prominent 183m high peak, lying close E of Culu Dao.

Mei-hua Chiang (26°03'N., 119°37'E.), the southernmost entrance channel, is the partially examined and little used passage S of Langqi Dao, the largest island in the estuary.

The main entrance channel passes about 2.5 miles NW of **Qixing Jiao** (26°05'N., 119°50'E.), a group of pinnacle rocks which, covered at HW, lie about 8 miles ENE of Shafeng Jiao. A light is exhibited on Qixing Jiao. The channel then continues WSW about 6 miles, passing over **Wai Langjiangsha** (26°07'N., 119°46'E.), the outer bar, and between the drying mud flats Yaozi Sha and Tieban Sha on the N and the drying mud flats of Foshua Sha on the S. Range lights, situated on the E side of Langqi Dao, in line bearing 265.5°, lead over the outer bar and into the estuary. It continues WNW over the inner bar **Nei Langjiangsha** (26°07'N., 119°41'E.) and, passing between Culu Dao and the low islets close off the N side of Langqi Dao, enters Jinpai Men, the deep, narrow channel between the N extremity of this latter island and the mainland.

7.32 **Dieshidui Lighted Buoy** (26°08.0'N., 119°37.2'E.), close W of the pilotage-quarantine anchorage, marks the extremity of a stone barrier extending from the S shore of the channel. Mazuyin Lighted Buoy marks a similar area of foul ground extending from the N shore. The channel between these two lighted buoys is only 0.15 mile wide.

Shoal depths of 1.3m and 3.9m exist close NE and 0.15 mile WNW from Dieshidui Lghted Buoy.

Tides—Currents.—The tide is mainly semi-diurnal, with a spring rise of 6.2m and a neap rise of 5m. These levels are affected by the wind; the water level is relatively high during the Northeast Monsoon and low during the Southwest Monsoon. Tidal currents seaward of the outer bar are quite weak. Tidal currents at the entrance to Min Jiang set W from 1 hour 30 minutes after LW to 1 hour 30 minutes after HW. They set E from 1 hour 30 minutes after HW to 1 hour 30 minutes after LW.

During the rainy season (April to June), freshets cause the W current to run for a shorter period of time, while the E current begins earlier and runs longer. Rates are from 1 to 4 knots. During heavy freshets vessels do not swing to the W current.

In **Jinpai Men** (26°08'N., 119°35.5'E.), 0.2 mile wide, the tidal currents are strong and set W through the channel on the flood current, with a branch setting SW at the W end of the narrows; the ebb current sets in the reverse direction. During spring tides, or during a freshet period, the ebb current usually exceeds a rate of 7 knots; a similar rate is experienced in **Min'an Men** (29°03'N., 119°30.5'E.), a 3 mile long and 0.2 mile wide narrow channel beginning about 6 miles SSW of Jinpai Men.

Depths—Limitations.—Depths over the bars in the main entrance channel to Min Jiang, while subject to change, are generally greatest during the Northeast Monsoon season and least during the Southwest Monsoon season. During gale winds, a heavy swell, which quickly subsides, may set across the bars. The least depth over the outer bar was 3.7m while the least depth over the inner bar was about 3m. The deepest reported draft of vessels transiting the bars and entering Min Jiang during the same year was 7.6m.

Vessels with a draft of more than 3m should enter on the flood tide. Tide rips and cross sets should be guarded against.

An overhead power cable, with a vertical clearance of 55m, spans the W end of Jinpai Men. Anchoring is prohibited in this area.

Pilotage.—Pilotage is compulsory above the pilotage-quarantine anchorage. The vessel's ETA and request for a pilot should be signaled 48 hours in advance, through radio station Fuzhou. Vessels, awaiting quarantine inspection, display the flag "Q" from the International Code of Signals by day and three red lights, disposed vertically, at night.

Anchorage.—Vessels anchor, in 6.4 to 9.2m, in a position within the deep water pool lying between the outer and inner bars of the main entrance channel. The anchorage reportedly offers no shelter during HW.

The pilotage-quarantine anchorage is located 0.75 mile E and 1 mile NW of the light on **Hujiang Dao** (26°07.4'N., 119°38.5'E.) and has depths from 2 to 17m.

Caution.—Underwater obstructions extending from either bank restrict the channel width to less than 183m close W of the pilotage-quarantine anchorage. A shoal depth of 1.1m exists in the SE corner of the anchorage close to the entrance channel. Vessels transiting Jinpai Men are further cautioned that, because of strong currents and eddies, the most favorable time for transit is slack water. At other times, they should avoid meeting in the passage. Vessels proceeding with the current have precedence over those proceeding against it.

The continuation of the main entrance channel inland from Jin-pai Men to Lo-hsing-t'a Mao-ti, about 12 miles SSW, consists of a 1 mile-wide body of water extending about 6 miles along the W side of Langqi Dao and the 6 mile long seaward reach of Min Jiang proper. The channel favors the mainland coast as far as Min Jiang, when it lies fair between each shore for about 3 miles before tending to favor the E mainland shore. The Qingzhou Bridge, with a vertical clearance of 43m, crosses the channel in positon 25°59'29″N, 119°28'01″E.; this section of the channel is navigable to vessels of up to 20,000 tons.

7.33 **Lo-hsing-t'a Mao-ti** (25°59'N., 119°27'E.) is a general anchorage in Min Jiang close downstream from a position where the large island Nan-t'ai Tao causes the river to branch

N and continue as Pei Chiang and S as Wu-lung Chiang. It lies in deep water on the E side of the river and under high hills which extend NE from Hai-kuan Chiao (Customs Point), a point about 0.8 mile SE of the village Lo-hsing-t'a which marks the N entrance point of Pei Chiang. The W side of the anchorage is shoal and encumbered by large areas of drying mud flats extending from the W shore of the river. Hsiao-ma Chiao, a rock that covers at HW, lies about midway between Customs Point and Lo-hsing-t'a. Vessels that cross the outer bar can reach the anchorage.

Vessels board licensed pilots from a motor sampan, painted yellow, which is on station either in the vicinity of Qixing Jiao or in the deep water pool between the outer and inner bars across the main entrance channel. Vessels should arrive at the outer bar at HW so as to have slack water all the way to Lo-hsing-t'a Mao-ti.

Vessels anchor off the N bank of the river between Hsiao-ma Chiao and Ta-ma Chiao, in depths of 3 to 10m, mud. There is insufficient room for large vessels, which should seek shelter E of Hsiao-ma Chiao. Ma-wei Mao-ti, situated SE of Lo-hsing-t'a, close off the SE bank of the river between Kiang-hsi Chiao and Hai-kuan Chiao, has depths of 8 to 15m, mud and sand.

Both anchorages provide shelter from all strong winds, but holding ground is poor and dragging can occur during freshets. Tidal rise in the anchorage is 4.8m at MHWS and 4m at MHWN. Tidal currents reach a velocity of 3 to 4 knots, but during freshets the ebb current can reach 5 knots and sometimes overcomes the flood current altogether.

Fuzhou (26°05'N., 119°18'E.)

World Port Index No. 59860

7.34 Fuzhou is a large metropolis lying on the Pei Chiang branch of Min Jiang at a distance of about 11 miles upstream from Lo-hsing-t'a Mao-ti.

Fuzhou harbor consists of two districts, Fuzhou and Ma-wei, separated by about 8 miles. The Ma-wei work area affords good space and provides a deep-water basin. All large vessels can berth and work cargo here.

Depths—Limitations.—The fairway is approximately 10 miles long and has depths of 11 to 12m. Vessels of up to 70,000 tons can navigate the channel at high tide.

Ma-wei has a total wharfage length of 592m, and can accommodate two 10,000 dwt vessels and two 5,000 dwt vessels. Recent dredging now is reported to allow a depth of 9m in the harbor.

Pilotage.—Pilotage is compulsory and is available during daylight hours only. Pilots board vessels of 20,000 dwt and greater at Minjiang Kou Lighted Buoy D1 (26°05'N., 119°48'E.). Pilots normally board vessels of less than 20,000 dwt in the quarantine anchorage in position 26°07.6'N, 119°38.6'E, however vessels in this class may request that the pilot board at Minjiang Kou Lighted Buoy D1.

The ETA and request for a pilot should be sent 48 hours in advance through Fuzhou. The ETA should be confirmed 24 hours and 12 hours in advance.

Vessels proceeding to Fuzhou must contact Fuzhou Port Radio on VHF channel 16 to confirm the pilotage request.

Vessel Traffic Service.—Fuzhou Vessel Traffic Service (VTS) is in effect in the approaches to Fuzhou, Luoyuan, and Songxia. The Fuzhou Maritime Bureau Control Center may be contacted on VHF channel 12.

Participation in the VTS is compulsory for the following vessels:

1. Foreign vessels, including those registered in Hong Kong, Macau, or Taiwan.
2. Vessels carrying dangerous cargo.
3. Passenger vessels, with the exception of ferries.
4. Vessels of limited maneuverability.
5. Chinese vessels of 300 dwt or greater.

Vessels willing to participate in the VTS, though not required to do so by the criteria listed above, may contact the maritime control center regarding voluntary participation.

Vessels must report to Fuzhou VTS from the following established delimited areas:

1. Luoyuan Wan Harbor.—An arc with a radius of 5 miles centered on Kemen Jiao Light (26°26'N., 119°50'E.).
2. Minjang Kou Inner Harbor—
   a. First Reporting Line—An arc with a radius of 5 miles centered on Qixing Jiao Light (26°05'N., 119°50'E.).
   b. Second Reporting Line—A line joining Beigui Dao and Nangui Dao. Reports may be made up to 1 mile upstream or downstream of this line.
3. Songxia Harbor, Jiangyin Harbor, and Haitan Strait—
   a. North Reporting Line—An arc with a radius of 10 miles centered on Zhupai Yu Light (25°43'N., 119°44'E.).
   b. South Reporting Line:—Lines commencing at position 25°15'N, 119°45'E and extending due W to the W shore of the Nanri Channl and due N to Haitan Dao.

Vessels should contact Fuzhou Maritime Bureau Control Center 24 hours prior to arrival and provide the following information:

1. Vessel name and call sign.
2. Type of vessel.
3. Nationality.
4. Port of registration.
5. Vessel LOA, dwt, beam, and maximum height.
6. Type and quantity of cargo.
7. Maximum draft upon arrival.
8. ETA.
9. Purpose of entry.
10. Previous port.
11. Other pertinent information.

An arrival report should be sent to Fuzhou VTS on VHF channel 12 when passing the reporting lines listed above and should include the following:

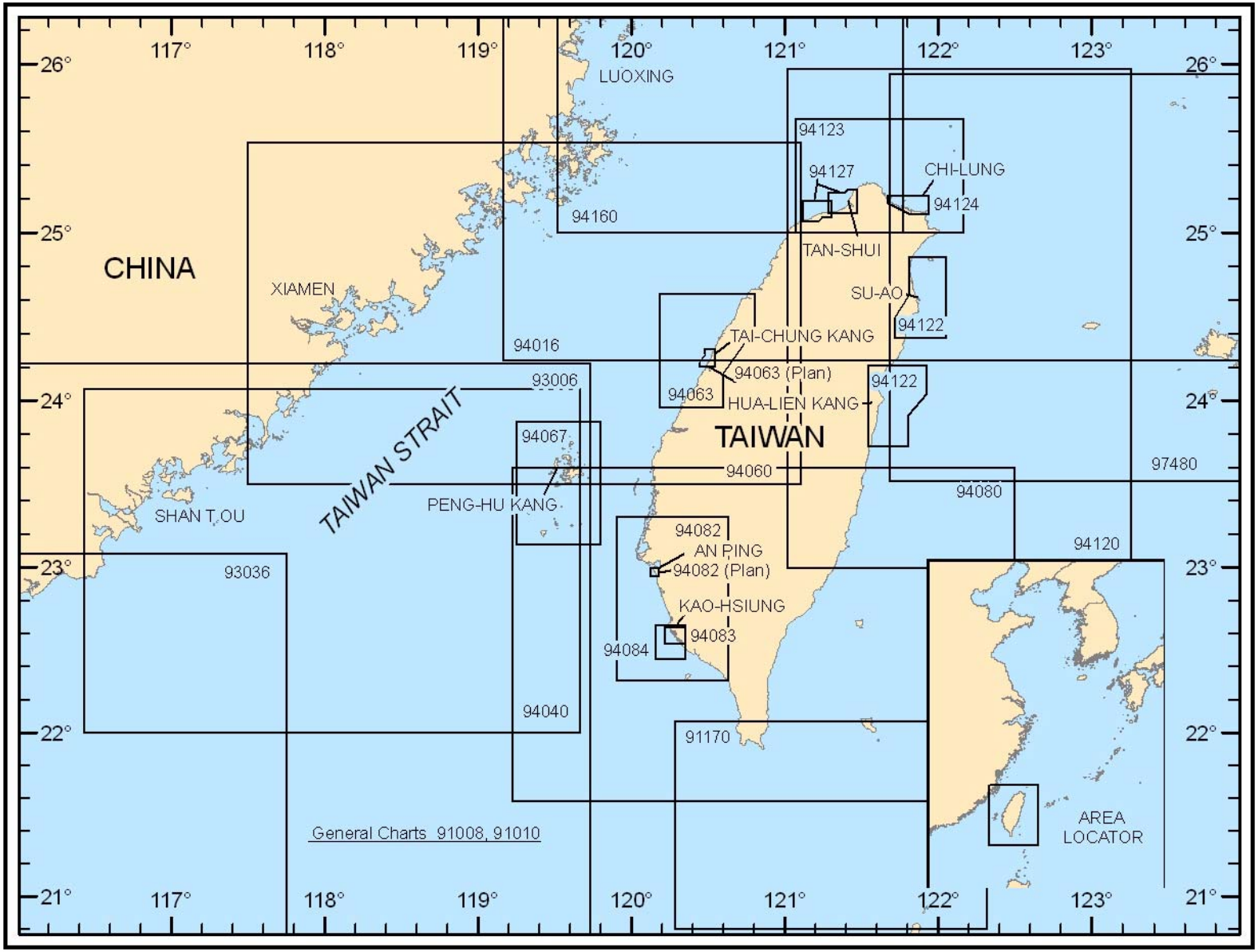
1. Vessel name and call sign.
2. Present position.
3. Purpose of entry.
4. Information as requested by tthe control center.

Vessels should forward a report to Fuzhou VTS after berthing or anchoring and include the following information:

1. Vessel name and call sign.
2. Berth or anchored position.

Anchorage.—The quarantine anchorage, with depths of 12.8 to 14.6m, mud and sand bottom, is centered on position 25°44'12"N, 119°40"30"E.

The anchorage for large vessels, with a depth of 21m, lies centered on position 25°47'12"N, 119°49"00"E.



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

SECTOR **8** — CHART INFORMATION

SECTOR 8

TAIWAN AND TAIWAN STRAIT

Plan.—This sector describes in order Taiwan, Taiwan Strait, P'eng-hu Ch'un-tao, and adjacent islands. The description is N to S and, for Taiwan, from the E coast to the W coast.

General Remarks

8.1 Taiwan (Formosa), located off the SE coast of China, is a large sub-tropical island about 210 miles long by 80 miles wide. A central range of mountains, with peaks rising to 3,944m, extends the length of the island. Volcanic peaks dot the N part of the island. A coastal range rises abruptly from the middle portion of the E coast. The W coast is mostly considered to be low and sandy and has a few isolated hills. It is fronted by a coastal bank which is reported to have large areas of tidal flats.

The E coast is rocky and steep-to and has few indentations, save along the N part where there are some small bays with offlying islets and rocks. In places, cliffs rise abruptly to a height of 457m. The principal harbors are Chi-lung Kang, on the N coast of the island, and Kao-hsiung Kang, on the SW coast.

Taiwan Strait (Formosa Strait) is the body of water lying between the W coast of Taiwan and the mainland coast. It has a least width of about 70 miles.

The strait is navigable by all classes of vessels, but strong currents require careful attention and prudent seamanship.

The strait has not been fully surveyed; there are a number of isolated shoals and dangerous wrecks, with depths of less than 20m which can best be seen on the chart.

P'eng-hu Ch'un-tao (Pescadores Islands), described in paragraph 8.28, is an extensive archipelago of rocks and low-lying islands lying off the W central coast of Taiwan. The islands are irregular, fronted by reefs, and difficult to make out in poor visibility.

Limited shelter is available at P'eng-hu Kang and at Makung Kang.

There are numerous fishing harbors along the coast of Taiwan, most of which are marked by minor navigation lights.

Winds—Weather.—Winds and weather for Taiwan are strongly under the influence of the seasonal monsoon winds which alternately circulate clockwise out of the area of high barometric pressure in Siberia and from the high in the North Pacific Ocean. The Northwest Monsoon season (October to March) has cool, moist NE to E winds which, blowing at an average rate of 10 to 15 knots, produce clouds, rain and low visibility on the N and E coasts of the island and, because of the barrier imposed by the central mountain range, clear, dry, and warmer weather on the W and SW coasts. The Southwest Monsoon season (June to August) has warm moist S to SW winds which blowing at an average of 6 knots, produce clouds and characteristically heavy intermittent showers on the W and SW coast of the island and, once over the central range, clear, dry and hot weather on the E coast. Winds of the Southwest Monsoon season are never as strong or as constant as those of the NE and often become subordinate to local land and sea breezes.

During the transitional months of April, May and September, the prevailing weather is a combination of that produced during the Northwest Monsoon and Southwest Monsoon seasons.

From October to April the sea and swell is high, especially in Taiwan Strait and is predominantly from the NE. From April to September it is low to calm, except when acted upon by typhoons.

Storms with winds in excess of 25 knots occur most frequently during the winter months, with the greatest frequency occurring in December. Few storms, other than those associated with typhoons occur during the summer. Typhoons may occur at any time of the year, though few if any, pass near enough in January and February to produce an adverse effect. They are most frequent from June to September, with August being the peak month when on the average more than two every year reach the E coast.

Low ceiling and poor visibility occur chiefly during the heavy showers of the Southwest Monsoon season and during the Northwest Monsoon season when moisture-laden air moves up the E slopes of the central mountain range. Haze extending to considerable heights often reduces visibility from October to December.

In the N part of the island, fog occurs 5 per cent of the time from January to April and less than 1 per cent from May to December. Fog does not occur in the S part of the island.

Tides—Currents.—The clockwise circulation of the N equatorial current flowing N and NE, reaches the E coast of Taiwan as the dark Kuroshio or Japan Current. The main axis of the current flows N, 12 to 20 miles off the S part of the island and trends generally parallel to the coast until off the N part of the island where it swings NE. Current velocity and set remain the same throughout the year, though the velocity in the summer is somewhat greater than in winter due probably to the retarding effect of the Northwest Monsoon. The rate varies between one knot to over 3 knots. Nearer the coast currents are variable and greatly influenced by the wind. Vessels can expect abrupt changes in velocity and set when rounding San-tiao Chiao.

Tidal currents are weak and irregular. Along the S part of the E coast they are uncertain. Along the N part, they set N on a rising tide and S on a falling tide, with a maximum velocity of less than 1.5 knots.

Taiwan East Coast—Fu-kuei Chiao to San-tiao Chiao

8.2 **Fu-kuei Chiao** (25°18'N., 121°32'E.), the N extremity of Taiwan, is a steep-to rock-fringed low-lying point which rises gradually to a 1,103m summit about 5 miles to the SSE. The lighthouse standing on the point is reported difficult to distinguish against the dark mountains rising behind it.

Caution.—A dangerous wreck lies approximately 1.8 miles ENE of Fu-kuei Chiao Light.

Fu-kuei Chiao should be given a wide berth as N and NE winds cause strong tide races and heavy seas off the point.

The coastline between Fu-kuei Chiao and San-tiao Chiao, about 31 miles ESE, is irregular and consists of several large bights indented by a number of small bays and lesser coves. Inland, the coastline is backed by rugged hills which, forming the foreslopes of the mountainous ridge of the interior, reach the sea in a series of bold rock-fringed steep-to promontories. Offshore, the 20m curve parallels the coastline at a distance of approximately one mile.

The bold and rugged N coast of Taiwan, reported radar conspicuous at 28 miles, contains several anchorages for small vessels and the major seaport Chi-lung Kang. It is fronted by a number of extending islands well offshore.

P'eng-chia Yu (25°38'N., 122°04'E.), about 36 miles NE of Fu-kuei Chiao, with two rounded peaks, is a grassy steep-sided island which rises steep-to on its E side and elsewhere shelves gradually to depths greater than 20m at a distance of about 0.3 mile. The island is reported radar conspicuous at about 16 miles.

A light is situated on the summit of P'eng-chia Yu. A rocky shoal, with a depth of 16m, lies 1.75 miles S of P'eng-chia Yu. A depth of 23m was reported to lie about 25 miles E of P'eng-chia Yu.

Caution.—Mariners are advised to avoid the oil exploration area in the vicinity of position 25°36'N, 121°53'E. Volcanic activity, along with tide rips and discolored water, has been reported about 40 miles NNE of P'eng-chia Yu.

8.3 **Mien-hua Yu** (25°29'N., 122°06'E.), about 8 miles SSE of P'eng-chia Yu, is an islet with three rounded summits and there is an area of foul ground that fronts Mien-hua Yu's N side.

Hua-p'ing Yu (25°25'N., 121°57'E.), a 47m high rock with black perpendicular sides, is the tallest of a group of rocks on a steep-to reef lying about 14 miles SSW of P'eng-chia Yu.

Caution.—An unmarked islet lies WNW of Hua'p-ing Yu. There is also an obstruction which lies 2.25 miles SSW of Hua'p-ing Yu.

Shih-tzu-t'ou Pi (25°14'N., 121°39'E.), about 7 miles ESE of Fu-kuei Chiao, is a precipitous point distinguished close S by a conspicuous round-topped low hill. A drying rocky reef lies about 1 mile E of the point. A high prominent rock stands on the reef.

Small vessels with local knowledge anchor with limited shelter close SE of Shih-tzu-t'ou Pi.

Chi-lung Kang (Keelung) (25°09'N., 121°46'E.)

World Port Index No. 57890

8.4 Chi-lung Kang consists of a small landlocked inlet divided into an outer and an inner harbor. The outer harbor is sheltered seaward by breakwaters and a group of three islets. There is berthing for deep-draft vessels in the SW part of the outer harbor. The inner harbor continues the outer harbor to the SW and has extensive alongside berthing facilities for deep-draft ocean-going vessels.

Chi-lung, lying at the head of Chi-lung Kang, is the shipping center for the N part of Taiwan and the N terminus of the railroad connecting with T'ai-pei, the administrative capital of the island.

Keelung Harbor Bureau
http://www.klhb.gov.tw

Winds—Weather.—In the winter, from October to March, the winds are strong from the NE, usually causing a constant heavy sea and swell in the outer harbor. In the summer, the winds are lighter and are from the W and SW. The typhoon threat lasts from June until late in the year. The heaviest rainfall occurs from November to January.

Fog, which can last all day, sometimes occurs from March until May. The rest of the year, a morning fog and haze, which can reduce visibility in the port to less than 1 mile, and which usually burns off 1 to 2 hours after sunrise, is common.

Tides—Currents.—The tidal range is irregular; the maximum range is 1.9m. The tidal currents outside the harbor entrance have a maximum rate of 2 to 3 knots, with the E current stronger in the winter and the W current stronger in the summer.

At the harbor entrance the flood current sets SW and the ebb current sets NE, at a maximum rate of 1.75 knots. In the winter, the ebb current is stronger than the flood current, while during the summer the reverse is true. The tidal curren8.16t velocities usually reach their peak about 1 to 2 hours after high or LW.

Tidal currents are negligible inside the breakwater.

Depths—Limitations.—The harbor is entered through a 0.2 mile wide channel between two breakwaters. The least charted depth in the approach channel is 16.3m. There are 37 deep water berths and 21 shallow draft berths; they are described in the accompanying table.

Vessels up to 30,000 grt can be accommodated.

Hsin Lai (25°12'N., 121°44'E.), a rocky shoal with a depth of 18m, lies 2 miles N of the harbor entrance.

Chi-lung Kang—Harbor Facilities

Berth No.	Length	Depth	Remarks
Northwest side of harbor			
1A/1B	250m	2.4-6.7m	—
2-3	387m	8.7m	Passengers
4	—	8.6m	Quick dispatch
5-6	191m	4.6m	Private
7-10	520m	5.5-10.9m	General cargo
11-12	350m	8.2-10.5m	Tankers
12B	260m	7.5-8.5m	Bulk
14-15	340m	8.1-8.7m	Cranes
16-18	600m	—	Containers
19-20	486m	10.4-11.3m	Containers
21	250m	8.0-11.0m	Containers
22-26	1,130m	7.3-14.4m	Containers

Chi-lung Kang—Harbor Facilities			
Berth No.	**Length**	**Depth**	**Remarks**
27-28	260m	7.0m	LASH terminal
29-32	690m	7.0-11.1m	Grain
33A-33B	305m	8.8-11.1m	Tankers
Southeast side of harbor			
2-4	670m	6.8-9.7m	—
5-7	550m	8.4-9.4m	—
8-9	—	—	Containers
10-11	510m	11.0-13.0m	Containers
15-17	520m	Less than 5.0m	—
19-22	540m	4.6-8.2m	—

Aspect.—Chi-lung Tao (25°12'N., 121°47'E.) is a precipitous black rocky island, 182m high, and is an excellent mark for making Chi-lung Kang. Hsiao-chi, a 30m high islet, lies close off its NW side. A spit of sand and gravel, on which there are strong tide races and which should not be crossed, extends 1 mile SW of Chi-lung Tao.

Wan-jen-tui Pi (25°10'N., 121°44'E.) is the W entrance point to the harbor. On the seaward side of the point are several patches of perpendicular stratified cliffs.

A conspicuous white statue stands on the hillside 1 mile S of Wan-jen-tui Pi, in position 25°08'N, 121°45'E.

Ho-p'ing Tao (25°09'N., 121°46'E.), the largest island at the harbor entrance, is joined to the NE shore of the harbor by a bridge.

Inner Harbor is entered between a short breakwater extending from No. 2 Pier, and An Lan breakwater, 0.2 mile ENE. Niu-chou Kang, the basin which extends 0.3 mile from the NW side of the Inner Harbor, is fronted entirely by wharves.

Three conspicuous power station chimneys, marked by obstruction lights are reported to be situated W of the harbor entrance. A large white building stands close in the vicinity.

Pilotage.—Pilotage is compulsory for foreign vessels greater than 500 grt and Taiwanese vessels greater than 1,000 grt. Pilots can be contacted on VHF channel 11. Pilots board 1 to 2 miles N of the breakwater. Pilots are available for vessels arriving from overseas between 0700 and 2300. Departures can be made 24 hours. Berthing and unberthing can be done 24 hours.

Pilots board for Chi-lung 1.5 miles NNW of the outer breakwater. Vessels with dangerous cargo board the pilot 2 miles NNW of the outer breakwater. Vessels bound for Shen-ao Oil Terminal board pilots approximately 1 mile from Shen-ao Wan.

Chi-lung Kang

Regulations.—There is a VTMS which provides information for the safe navigation of vessels within 20 miles of the port. The following vessels must report to the VTMS:

1. Power driven vessels 500 grt and greater.
2. Power driven vessels 50m in length or greater.
3. All passenger vessels.
4. Vessels with tows of 500 grt and over or 50m in length or greater.

Vessels should contact Keelung Port Radio on VHF channel 16 or 68 when 10 miles from the harbor entrance, stating:

1. Vessel name.
2. Nationality.
3. Call sign/letters.
4. ETA outside the harbor.

Before arrival, vessels should contact Keelung Port Radio on VHF channel 11 to obtain the exact time of pilot boarding. Permission to enter the harbor must be obtained through the traffic control signal station, described later.

At the harbor entrance, the traffic separation scheme shown on the chart, is not approved by the International Maritime Organzation (IMO). Rule 10 of 72 COLREGS is to be followed.

Stopping or anchoring in the fairway is prohibited. Entry without a pilot after dark or in poor visibility is not recommended.

Signals.—Traffic signals for control of vessel traffic in the entrance are displayed from a signal station at the root of the outer E breakwater.

Vessels proceeding into Nui-ch'ou Kang must sound one long blast on entering the Inner Harbor. Those vessels leaving the basin should make a similar signal not more than 1 minute after getting underway.

Anchorage.—It has been reported that anchorage with good holding ground can be obtained SE of **Yeh-liu Pan-tao** (25°13'N., 121°42'E.) and W of longitude 121°43'E.

Vessels anchored here are hardly affected by tidal currents and lie head to wind.

The quarantine anchorage lies on the E side of the Outer Harbor, clear of the fairway, in depths of about 7.3 to 13.1m. It is usually congested and precautions are necessary to prevent swinging on to other vessels on a change of wind direction. Anchorage is prohibited in the central and W parts of the fairway in the Outer Harbor.

Directions.—In the approaches to Chi-Lung Kang, the 700m wide entrance fairway leads on heading 170° towards the entrance through position 25°12.6'N., 121°44.0'E. The exit fairway leads outward on heading 012° from the entrance over position 25°12.2'N., 121°45.3'E.

Vessels are prohibited to anchor or stop in the fairways. The national authorities also advise that Rule 10 of 72 COLREGS be followed in the fairways.

Caution.—Depths less than charted exist in the E and W approaches to Chi-Lung.

Ships leaving the harbor, irrespective of the existing weather conditions, may encounter heavy swells.

A stranded wreck lies about 0.5 mile SW of Chi-lung Tao. A dangerous wreck lies about 5 miles ENE of the light on Chi-lung Tao.

8.5 Shen-ao Wan (25°08'N., 121°49'E.) is a small bay about 4 miles S of Chi-lung Kang; the intervening coast is fringed with rocks and reefs. An oil terminal exists in the bay which can accommodate tankers up to 36,000 grt, secured to dolphins, with a maximum length of 224m and a maximum draft of 10.8m. Smaller tankers secure to a wharf fronting a reclaimed area with depths of 6m alongside. The oil company's master acts as a pilot and will normally board the vessel at position 25°09'N, 121°50'E, about 1 mile NE of Fan-Tzu-Ao Pi, the N entrance point of the bay.

Vessels are requested to advise their agents, by radio, at least 24 hours prior to arrival, of ETA, draft, quantity, and description of cargo carried aboard. A copy of the above information sent to CHINOL, Keelung for entry arrangements. On arrival, vessels should report to Keelung Port Radio Station by VHF or to Keelung Harbor Signal Station by flash signal to apply for anchorage and berthing instructions. Water and provisions are available. A conspicuous round-topped high hill rises abruptly from the coastline about 1 mile to the E. The lights of a mine near the summit of a 750m peak, about 3 miles SE of the bay, are visible on clear nights for a distance of about 30 miles. A light is situated from the head of the reclaimed land on the SE side of the entrance. Range lights at the head of the bay lead into it on a SW course.

Vessels, seeking shelter from all but NE winds, enter Shen-ao Wan and anchor, in depths of 11 to 13m.

The coast from Shen-ao Wan to San-tiao Chiao, 12 miles SE, is mostly mountainous.

Pi-t'ou Chiao (25°08'N., 121°55'E.), situated 5 miles E of Shen-ao Wan and marked by a light, is a steep cliffy headland about 121m high; from a distance the point appears to be an island.

Taiwan—East Coast—San-Tiao Chiao to San-Hsien-t'ai

8.6 San-tiao Chiao (25°01'N., 122°00'E.), the NE extremity of Taiwan, is a bold steep-to promontory topped by a plateau. Several prominent summits, rising close inland, are good landmarks for identifying the promontory from a distance. Submerged rocks extend up to 0.5 mile offshore. A light is situated on San-tiao Chiao.

An oceanographic observation platform is situated 6.8 miles NNE of **San-tiao Chiao** (25°07'N., 122°02'E.) The platform shows two white flashing warning lights. All vessels are to keep clear.

Caution.—A tidal race extends 0.15 mile offshore; the cape should be given a wide berth.

The coastline between San-tiao Chiao and San-hsien-t'ai, about 118 miles SSW, is regular with but few indentations interrupting the general trend to the S. Bold, rugged hills rise abruptly from the shore and throughout, with rare exception, continue inland to the mile-high peaks of the central mountain range.

Areas of low land lie only at the entrances to rivers which, mostly enter the sea through gorges and steep-sided valleys.

Large alluvial plains lie adjacent to two major rivers which reach the sea 20 and 63 miles SSW of San-tiao Chiao. Offshore, depths are considerable. The 20m curve parallels the coastline at a distance of about one mile while the 200m curve lies throughout at a distance of about 4 miles, with the excep-

tion in the N part where depths tend to shoal.

From San-tiao Chiao to **T'ou-ch'eng Ch'uan** (24°51'N., 121°49'E.), an estuary about 14 miles to the SW, the mountains approach the coast which is steep and rocky with foul ground extending 0.3 mile off it in places. A submarine cable extends from T'ou-ch'eng to a submerged seismometer moored approximately 24 miles SE of the coastline.

Kuei-shan Tao (24°51'N., 121°57'E.), about 10 miles SSW of San-tiao Chiao, is a steep-to precipitous volcanic island having a group of sunken pinnacle rocks about 2 miles to the SW. White vapor rises from the S shore. Sulfur, rising from the ocean floor, discolors the water to the S of the W extremity of the island.

From N and S the island resembles a tortoise with the pointed summit at its E point resembling the head and a pebble bank extending W from the W end of the island resembling the tail. A light is shown from the W side of the island.

Vessels anchor, in depths of less than 20m, sand, in a position about 0.3 mile off a small village at the head of a small bay on the NW side of the island. A prohibited anchorage, best seen on the chart, surrounds Kuei-shan Tao.

Kuei-luan Yen (24°49'N., 121°56'E.), 2.5 miles S of the W end of Kuei-shan Tao, is a group of rocks 9m high. Another isolated rock, 1m high, lies 1.5 miles ENE of Kuei-luan Yen.

The coast from Tou-ch'eng Ch'uan to **Pei Chiao** (24°36'N., 121°53'E.), the N entrance point to Su-ao Kang, about 15 miles S, consists of a sandy beach with sand dunes 6m high; behind the dunes there is a broad fertile plain irrigated by numerous rivers.

Su-Ao Kang (24°36'N., 121°52'E.)

World Port Index No. 57900

8.7 Su-ao Kang is the only natural harbor on the E coast of Taiwan with sheltered anchorage for large vessels during the season of the Northwest Monsoon.

A group of rocks lies about one mile E of the head of the N promontory. The body of water between the rocks and the foul ground extending about 0.5 mile ENE from the promontory head is deep, but passage is not recommended.

Winds—Weather.—NE winds predominate in winter. SE winds in summer send in a dangerous sea.

Su-Ao Kang—Harbor Facilities

Pier	Length	Max. vessel length	Depth	Remarks
1	200m	150m	8.0m	
2	170m	140m	10.3m	Break bulk
3	210m	170m	10.5m	Cement
4	300m	190m	11.1m	Cement
5	200m	180m	10.0m	Break bulk
6	290m	240m	15.1m	Containers
7	240m	200m	12.5m	Containers
8	125m	110m	7.0m	Logs
9	125m	110m	7.0m	Logs
10	175m	150m	8.5m	General
11	175m	150m	8.0m	General
12	200m	150m	7.5m	Break bulk
13	180m	150m	8.5m	Break bulk

Tides—Currents.—Tidal currents along the coast in the vicinity of Su-ao Kang have a maximum rate of less than 1 knot; they set N on the flood tide and S on the ebb tide. A weak tidal current sets into Su-ao Kang along its N shore on the flood tide.

When approaching N of the E coast of Taiwan, abrupt changes can be experienced in the rate and direction of tidal currents after passing San-tiao Chiao.

Depths—Limitations.—The approach channel has a minimum depth of 15.4m. Pier facilities are described in the accompanying table titled **Su-Ao Kang—Harbor Facilities**.

Aspect.—Su-ao Kang is entered between South Breakwater, extending ENE then NE for about 0.7 mile, and North Breakwater, which is 183m long and detached. Another breakwater extends 0.25 miles SW from the E entrance point of **Pei-fang Wan** (24°36'N., 121°53'E.).

Lights are situated from the heads of North Breakwater and South Breakwater. A directional light, the white sector of which indicates the harbor approach, is situated at the head; the light is equipped with a racon.

San-hsien-t'ai (24°36'N., 121°54'E.), 0.8 mile E of Pei Chiao, is a group of above water rocks, of which the W and largest is 29m high. Mi Tao, another group of above water rocks, lies 0.2 mile NE of San-hsien-t'ai; the two largest rocks in this group are 11 and 20m high.

Pilotage.—Pilotage is compulsory. The pilot boards, in daylight only, about 1.5 miles ESE of the head of the S outer breakwater. Communication is by VHF channel 16. Local agents must give 24 hours notice of a vessel's ETA to Chi-lung. Pilots and immigration officials are dispatched from Chi-lung. Permission to enter must be granted by the naval station.

Anchorage.—Ships anchor, in 21m, sand, with Hou-hou Pi, the head of the S promontory, bearing 178°, and the 9.5m rock on Chung-hsin-t'ou bearing 278°. Vessels also anchor farther NW, in 12.8 to 14.6m, or off the entrance to Pei-fang Wan, a small cove close W of the head of the N promontory. There are several mooring buoys west of the north promontory, the positions of which are best shown on the chart. Small craft anchor in the lee of Chung-hsin-t'ou or enter the fishing harbor where there is shelter from all winds.

Ho-p'ing Kang (24°18'N., 121°45'E.) is an artificial harbor situated S of the entrance to Ho-p'ing Hsi. Range lights, aligned 010°, lead into the harbor.

Caution.—A 4.6m shoal lies close S of the S breakwater head (24°17.7'N, 121°45.0'E.) to Ho-p'ing Kang. This shoal lies in an otherwise clear channel having a least charted depth of 11.7m.

8.8 **Nan-shan-chiao Pi** (24°16'N., 121°44'E.), is a rocky point. Close W of the point there is an isolated peak, 1,383m high, which is easily identified as it is seldom obscured by clouds.

There is a harbor situated 38 miles SSW along the coast between Su-ao Kang and Hua-lien Kang. The coast is steep-to and backed for the first 28 miles by a coastal range rising to elevations of 1,220 and 2,440m; the remaining 10 miles consists of widening coastal plains. Prominent red cliffs are visible at intervals along this stretch of coast.

Caution.—A wreck is located in the approaches to Su-ao in position 24°36'55"N, 121°55'12"E.

Hua-lien Kang (24°00'N., 121°38'E.)

World Port Index No. 57910

8.9 Hua-lien Kang, about 64 miles SSW of San-tiao Chi-ao, is the principal port on the E coast of Taiwan. It consists of an open roadstead off the town of Hua-lien and an artificial harbor, sheltered E by a breakwater, lying about 2 miles NE of the town.

Winds—Weather.—West winds predominate from April to June and raise little sea inshore. At other times, all onshore winds send a swell into the roadstead. The artificial harbor is sheltered from all weather, but typhoons frequently damage the breakwater.

Tides—Currents.—Tidal currents set N on the flood tide and S on the ebb tide; they are weak in the roadstead.

Depths—Limitations.—The limiting dimensions for a vessel entering the harbor at HW are a length of 200m and a draft of 10.5m.

There are 24 berths in operation, with alongside depths ranging from 6.1 to 12m. The harbor and the entrance channel are protected from the E by a long breakwater running SSW almost parallel with the coast. The entrance channel to the inner harbor has a charted depth of 10.1m. The outer harbor is dredged to a depth of 14m for ships up to 50,000 dwt to enter.

Several rocks, with a depth of 12.5m, lies 0.25 mile E of the E breakwater elbow.

Aspect.—Mei-lun Shan, an isolated, 106m high hill, stands close inland of the town and is a prominent landmark. Lights are situated at the head of the W breakwater and close NE of the head of the E breakwater. Range lights are positioned at the inner end of the breakwater 0.3 mile apart apart; these lights in line lead through the entrance channel. A number of fixed lights are positioned on both sides of the entrance channel.

Pilotage.—Pilotage is compulsory and is available during daylight hours only. Vessels are berthed only from 0700 to 2400, but may be unberthed at any time.

The pilot boards in the anchorage area 1 to 2 miles S of the W breakwater. In bad weather, the pilot boards within the harbor breakwaters.

Regulations.—The harbor is closed to all vessels from 0000 until 0500. Large vessels are not allowed to enter after sunset. The vessel's ETA should be sent, via the agent, 24 hours in advance. Vessels should establish contact on VHF channel 14, when 10 miles from the port, stating the nationality, name, call sign, and ETA.

Signals.—A signal station on the W side of the entrance to the artificial harbor controls entry and departure by means of the International Code of Signals. Storm signals are displayed from a signal mast standing atop a low hill on the E side of Hua-lien.

Anchorage.—Vessels find temporary anchorage, in about 18m, sand, with the navigation light on the hill E of Hua-lien bearing 309°, distant about 0.7 mile. The quarantine anchorage is about 1 mile ESE of Hua-lien Light.

Caution.—Anchorage is prohibited within 183m of the range line between the quarantine anchorage and the entrance to Hua-lien. The inner channel is fairly narrow and only 80m wide.

Taiwan—East Coast—Hua-lien Kang to O-luan Pi

8.10 Between Hua-lien Kang and San-hsien-t'ai, 53 miles SSW, the coast is relatively straight and backed by a coastal range which is broken only in the vicinity of Hua-lien Kang; in places it is very steep-to.

San-hsien-t'ai (23°08'N., 121°24'E.) is a small rock-fringed islet which, lying close offshore, rises to three summits, of which the central and highest rises to 74m. A light is situated on the islet.

The coastline between San-hsien-t'ai and O-luan Pi, about 80 miles SSW, continues regular with but few indentations interrupting a general trend to the S. Inland, the terrain is everywhere mountainous save for a large alluvial plain adjacent to rivers reaching the sea about 27 miles SW of San-hsien-t'ai. Offshore, depths are considerable and increase rapidly seaward of the 20m curve which parallels the coastline at a distance of less than one mile.

Cheng-kung Po-ti (23°06'N., 121°22'E.) is an open roadstead within a small bay about 3 miles SW of San-hsien-t'ai. Small vessels seeking shelter from NE winds can obtain anchorage, in 12.8m, sand, in a position about 0.2 mile W of an above-water rock standing on a reef extending S from the N entrance point of the bay. Larger vessels anchor farther offshore. A light is situated on Mao-hai Pi, close N of the anchorage. **Tu-lan Wan** (22°50'N., 121°12'E.), a bay entered about 20 miles SSW of San-hsien-t'ai, has depths too great for convenient anchorage except on its SW side where, with an offshore wind, small vessels anchor, in 10.9 to 18.2m, sand, clear of rocks extending about 0.5 mile offshore.

Hou-tzu Pi (22°48'N., 121°12'E.) is a rocky point extending 0.5 mile from the coast. Hou-tzu Shan stands 126m high on this landhead.

T'ai-tung Kang (22°45'N., 121°09'E.), about 27 miles SSW of San-hsien-t'ai, is an open roadstead fronting the N part of an extensive alluvial plain and the large community of T'ai-tung. Li-yu Shan, a high hill close W of T'ai-tung, is a conspicuous landmark visible 15 miles seaward.

Vessels anchor, in 12.8m, on a narrow coastal bank, with the summit of Li-yu Shan bearing 297°, distant about 1 mile.

Pa-yao Wan (22°08'N., 120°53'E.), about 66 miles SSW of San-hsien-t'ai, is a small bay backed by a sandy beach and rugged hills. Small vessels, with offshore wind, anchor, in 12.8 to 18.2m, sand.

Kang-k'ou Wan (21°59'N., 120°51'E.), about 75 miles SSW of San-hsien-t'ai, is a wide bay backed by high, wooded hills

Photo courtesy of Sophia McHarney

O-Luan Pi Light

rising everywhere steeply from the shore except in the mouth of a river which enters the NW part of the bay. Vessels, seeking shelter from SW winds, anchor, in 12.8 to 36.5m, sand, anywhere within the bay clear of dangers off the entrance to the river and in the S part of the bay.

O-luan Pi (21°54'N., 120°51'E.), the S extremity of a high steep-faced scrub-covered promontory extending well seaward, is the southernmost point of Taiwan. A light is situated on the SW side of O-luan Pi. It can be identified from the offing by Ta-chien-shih Shan, a high finger-shaped peak about 5.3 miles NW, and by a conspicuous black-domed structure standing about 2 miles NNW of the seaward extremity of the headland.

Caution.—There are tide rips in the area SE of the point.

8.11 Nan-liao (Lu Tao) (22°40'N., 121°29'E.) is a steep-to volcanic islet with two peaks, 277 and 274m high; the higher peak is named Huo-shao Shan. The islet is grass covered with only a few trees. Chung-liao (Pi-t'ou Chiao), the NW extremity of the islet, is marked by a light. Nan-liao Wan and Chung-liao Wan are two small bays lying close S and E, respectively, of Chung-liao. Small vessels, seeking shelter from NE winds, anchor in Nan-liao Wan, in 23.7m, sand and rock. a good holding ground, with the highest summit of the island bearing 117°, and a conspicuous building, standing in a village on the N side of the bay, bearing 356°. Vessels should enter the anchorage from NW, with the peak bearing 117°, and avoiding the dangerous wreck that lies about 1 mile S of the NW entrance point.

Tidal currents set N in the bay and can attain a maximum rate of 4 knots. Small vessels also anchor in Chung-liao Wan, in 31m, sand and rock, clear of dangers extending about 0.5 mile off each entrance point of the bay.

An ammunition dumping ground lies off the N coast of Nan-liao.

Lan Yu (22°04'N., 121°32'E.), a mountainous, steep-to, and densely-wooded island, lies about 33 miles S of Nan-liao. It is often shrouded by low-lying mist and, in winter, obscured by continuous rain. A light, with a radiobeacon, is situated on the NW point of the island. Vessels anchor in Pa-tai Wan, a small bight indenting the SW side of the island, in a depth of 18.2m, fine sand and good holding ground, with an above-water rock close off the NW entrance point of the bight bearing 270°, and a conspicuous white building, about 0.5 mile E of the same point, bearing 027°. Small vessels seeking shelter from all but E winds anchor in Tung-ch'ing Wan, a small bay on the E side of the island, in a depth of 20.1m, sand, in a position 0.3 mile offshore and midway between two villages at the head of the bay.

Hsiao-lan Yu is a high largely rock-fringed island lying about 3 miles SSE of Lan Yu. Vessels transit the deep water fairway between the two islands by keeping in mid-channel and taking into account the existence of tide rips.

Caution.—Lan Yu is frequently shrouded by low-lying mist; in winter it is sometimes obscured by rain. Caution is required in approaching it, especially at night.

8.12 Kao-t'ai Shih (Gadd Rock) (21°44'N., 121°37'E.), about 91m in diameter, steep-to, and with a least known depth of

2.7m, lies about 12 miles SSE of Hsiao-lan Yu. At low water, the sea probably breaks on this reef; the vicinity is generally marked by violent tide rips and whirls, which extend most of the way to Chi-hsing Yen, about 45 miles WNW. As these indications are not always present, Kao-t'ai Shih should be given a wide berth. A dangerous wreck lies close N of the shoal.

A bank, marked by heavy overfalls and sometimes by discolored water, and with several shoal depths, lies between 8 miles SW and 12 miles S of Kao-t'ai Shih.

Ch'i-hsing Yen (21°46'N., 120°49'E.) consists of a group of steep-to, above and below-water rocks lying about 8 miles S of O-luan Pi. The sea breaks heavily over them during periods of bad weather. The channel N of the rocks is clear of all dangers to navigation except for tide rips S of O-luan Pi.

Taiwan—West Coast—Fu-kuei Chiao to Tai-Chung

8.13 The W coast of Taiwan between Fu-kuei Chiao, the N extremity of the island, and Kao-hsiung Kang, about 175 miles SSW, is uniformly low and flat, except in the N part where mountains and high hills reach the sea and alternate with low-lying land between Fu-kuei Chiao and **Lu-chiang** (Rokko) (24°03'N., 120°25'E.), a populated coastal trading center about 98 miles SW. Numerous shallow rivers cross the coastal plain and enter the sea over bars passable only by small boats. A drying flat fronts the greater part of the coastal plain and extends as far as 8 miles offshore at **Wai-san-ting Chou** (23°31'N., 120°02'E.), a low sand cay about 40 miles SSW of Lu-chiang. Coastal shipping may anchor in exposed, open roadsteads off several of the commercially unimportant towns along the coast.

The principal shipping centers are Tan-shui Kang, in the N, and An-p'ings Kang, and Tso-ying Kang, in the S.

There is a wreck, dangerous to navigation, lying 2.5 miles W of Tan-Shui Kang Light and 0.5 mile S of the entrance channel.

Caution.—Vessels should approach the low-lying W coast of Taiwan with caution since marginal mud flats continue to develop seaward, landmarks are few, and currents set strongly onshore.

An explosives dumping ground, the limits of which are best seen on the chart, lies centered approximately 6 miles NW of the entrance to Tan-shui Ho.

8.14 Tan-shui Kang (T'aipei) (25°09'N., 121°23'E.) (World Port Index No. 57935), is situated 34 miles W of Keelung. The city of Taipei lies approximately 8 miles upriver of Tan-shui Kang. The port is under extensive development. The newer facilities, on the W shore of Pali, are protected by breakwaters, and expected to be fully operational in 2012.

Port of Taipei

http://www.tpport.gov.tw

Depths—Limitations.—The harbor has wharves for handling oil and bulk cargoes. The oil wharf can accommodate vessels up to 230m long having a maximum draft of 11.8m; tankers of up to 50,000 dwt can be accommodated. The bulk cargoes wharf can accommodate vessels up to 265m in length having a maximum draft of 13.8m; vessels of up to 80,000 dwt can be accommodated.

Coastal vessels, with a draft of not more than 3m, cross the bar and enter the riverine harbor. Small craft only can berth alongside the facilities at Tan-shui.

Aspect.—The Tan-shui Kang river delta lies in the entrance to the river Tan-shui Ho which extends upstream about 1.5 miles to the community of Tan-shui. The channel over the bar shifts, but trends generally along the N bank of the river until, once inside the bar, it turns S at Tan-shui and favors the W bank.

Pilotage.—Pilotage is compulsory. Pilots board about 3 miles W of the entrance to Tan-shui Ho.

Regulations.—T'ai-pei VTS is in operation in the area within a 20 mile radius of T'ai-pei. Vessels should report to the VTS when entering the area.

Vessels must report their ETA 7 days, 5 days, 3, days and 2 days prior to arrival and confirm their ETA 24 hours and 12 hours in advance.

A traffic separation scheme (TSS) is in effect in the approaches to the port. The scheme is not IMO-adopted, however compliance with Rule 10 of the International Regulations for Preventing Collisions at Sea (1972) is advised.

Contact Information.—The pilots can be contacted, as follows:

1. VHF: VHF channels 11 and 16
2. Telephone: 2-26196291
3. Facsimile: 2-86301719

T'ai-pei port authorities may be contacted on VHF channels 16 and 68.

Anchorage.—Vessels anchor outside the bar, in 12.8m, sand and mud, in a position about one mile W of the N entrance point. A signal mast, for contacting vessels at anchor outside the bar, stands about 1 mile ESE of the N entrance point. Smaller vessels anchor inside the bar, according to draft, in a position not more than about 0.5 mile upstream from the signal mast.

Caution.—The anchorage outside the bar to Tan-shui Ho lies exposed to winds and strong currents which may require vessels to clear for sea at short notice. The anchorage inside the bar may become unsafe during the period when the river is at flood stage because of eddies and churned-up sand and mud. There is a foul ground dangerous to navigation 3 miles WSW of the Second Entrance breakwater.

Fish havens lie WSW and NE of Tan-shui Kang, the limits of which can best be seen on the chart.

An explosives dumping ground, the limits of which are best seen on the chart, lies centered across the traffic separation scheme in the approach to T'aipei Kang.

8.15 Sha Lung Oil Terminal (25°09'N., 121°11'E.) consists of two single point mooring buoys lying at the seaward end of submarine pipelines extending 2.5 miles NW and NNW from a point on the NW coast.

The terminal can accommodate 250,000 dwt tankers supplying the T'ao-yuan Refinery 10 miles SSE. Terminal operations cease between 15 October and 31 March owing to Northwest Monsoon.

The vessel's ETA is requested 24 hours in advance on VHF channel 16. Pilotage is obtained from Chi-lung Kang (see para-

graph 8.4). The pilot boards 1 mile off the SBMs.

Anchorage is prohibited within the operational areas of the offshore oil terminals and the submarine cables connecting them to the shore.

Pai-sha Chia (25°03'N., 121°04'E.), about 9 miles WSW from Sha Lung Oil Terminal, is the NW point of Taiwan. The coast is almost straight, and the point does not project. A light is situated on the point.

Yen-shui Kang (24°45'N., 120°54'E.) is a small harbor formed by the entrance to a small river. In the vicinity of Hsiang-shan, a small village 0.5 mile N of Yen-shui Kang, there are several offshore oil platforms, well heads, and buoys.

8.16 CBK Oil Field (24°48'N., 120°40'E.) consists of several offshore oil structures, well heads, and buoys, the positions of which may best be seen on the chart. A light (24°33'N., 120°44'E.), reported to be an excellent navigational aid, is situated on a hill approximately 30 miles SW of Pai-sha Chia. A seawater pipeline, 3 miles WNW of this light, is marked at its outer end by a lighted buoy.

Caution.—A submarine oil pipeline extends W from Hsiang-shan to a position 15 miles offshore.

Fish havens, in 20 to 30m, are located 3 miles WNW of Hsiang-shan and 1 mile N of the submarine oil pipeline.

A wreck lies 9 miles W of Hsiang-shan.

Tai-Chung (24°17'N., 120°30'E.)

World Port Index No. 57955

8.17 Tai-Chung is a new port which lies on the central W coast of Taiwan. It is entered between two breakwaters on the range light line of 115°18', in a dredged depth of 11m. Unpredictable sets and strong winds can make handling difficult when approaching the breakwaters.

Winds—Weather.—The weather is generally good from April to September except during passage of a typhoon. However, SW gales occur occasionally. During the winter, the prevailing winds are from N to NNE direction, usually about force 4, but sometimes reaching, or even exceeding force 8. Rainfall is minimal.

Tai-Chung—Harbor Facilities

Berth	Length	Depth	Remarks
1	250m	13m	Grain
2-3	500m	13m	Bulk cargo
4	200m	11m	Liquid cargo
4A	185m	9m	Cement
5-8	800m	11m	General cargo
5A	220m	11m	General cargo
8A	260m	11m	General cargo
9	260m	14m	Bulk cargo
10-11	640m	13m	Containers
12-15	760m	10-11m	General cargo
23-26	760m	10-11m	General cargo
27-28	345m	11m	Cement
29-30	600m	14m	General cargo
31-32	640m	14m	Containers
101-102	680m	18m	Coal
99	250m	12m	Scrap iron
W1-W4	1,000m	13-14m	Oil

Tides—Currents.—The mean tidal range is 3.7m. The spring range is 4.6m. During the Southwest Monsoon, from April to September, the main current is from the S at 1 to 2 knots. During the winter months, the current is from the N and can reach 4 to 5 knots.

Depths—Limitations.—At present, a vessel is limited to a draft of 13m. There are no length or beam restrictions. The turning basin inside the breakwater has dredged depths of 11.9 to 13m.

Pier facilities are described in the accompanying table titled **Tai-Chung—Harbor Facilities** .

Aspect.—A light is shown from a white structure on top of a silo. Range lights on the E side of the harbor, aligned 065°, lead through the entrance channel.The harbor entrance lights are situated on the outer and inner breakwater heads. A light is shown from the head of a groin about 1.5 miles NE of the harbor entrance. Also, a lighted buoy is moored 1 mile N of this light.

Tai-Chung

Pilotage.—Pilotage is compulsory and is available 24 hours. The pilot boards in position 24°17.6'N, 120°28.9'E, about 0.5 mile SW of the head of North Breakwater. In bad weather, the pilot boards off either Keelung or Kao-hsiung. The ETA should be sent to the agent 24 hours and 12 hours in advance. ETA must also be sent to the harbormaster about 20 miles from port or when 2 hours from the pilot boarding area.

Anchorage.—Anchorage berths, best seen on the chart, extend SW from the harbor entrance, sand bottom. During the

Tai-Chung Light

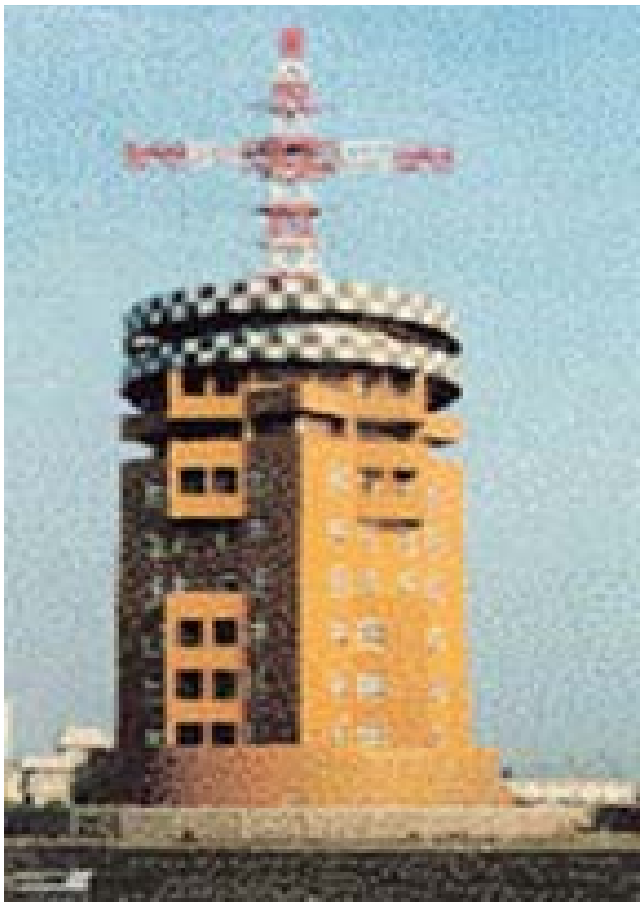
Tai-Chung Inner Breakwater N Light

Tai-Chung Inner Breakwater S Light

Northwest Monsoon, the holding ground is poor.

Anchorage is prohibited in an area which extends NW from a position about 0.5 mile N of the harbor entrance.

Caution.—Caution must be exercised when approaching the breakwater, as unpredictable sets and strong winds make handling difficult. The pilot vessel may be unable to leave the shelter of the breakwaters in strong winds.



Tai-Chung Signal Station

8.18 Mai-liao Kung-yeh-kang (23°47'N., 120°10'E.) (World Port Index No. 57953), a port established on reclaimed land, lies on the W coast of Taiwan between the Hsin-hu-wei Hsi and Cho-shui Hsi rivers.

Tides—Currents.—Strong tidal currents are present in the harbor approaches.

Depths—Limitations.—The entrance channel is dredged to a least depth of 22.5m. The port can handle VLCC's up to 200,000 dwt, with a maximum loa of 310m and a 19.5m draft. The harbor entrance is 380m wide; there is a turning basin 900m in diameter.

Mai-liao Kung-yeh-kang—Harbor Facilities

Berth	Length	Depth	Max. LOA	Max. draft	Remarks
N1/N2	280m	16m	220m	11.8m	Chemicals/ LPG
N5	115m	9.5m	85m	6.7m	Chemicals
N6	130m	9.5m	100m	7.2m	Chemicals

Mai-liao Kung-yeh-kang—Harbor Facilities					
Berth	Length	Depth	Max. LOA	Max. draft	Remarks
N7	115m	9.5m	85m	6.7m	Chemicals
W1	270m	16.5m	205m	11.0m	Naptha
W2/W3	410m	24m	310m	19.5m	Crude oil
E1	230m	16m	180m	10.3m	Multi-purpose
E2	320m	19m	240m	14.2m	Bulk cargo/ salt
E3/ E4	375m	21m	285m	14.7m	Bulk cargo/ coal
E5	375m	21m	—	—	Bulk cargo
E6	320m	19m	—	—	Bulk cargo
E7/E8	300m	19m	—	—	Chemical/ LPG/oil
E9/E10	300m	15.5m	—	—	Chemical/ LPG/oil

Aspect.—Two breakwaters protect the harbor, with the N breakwater extending SW for 1.5 miles and the S breakwater extending N for 0.75 mile. Several chimneys exist in the port complex; many of them are lighted. The N berths lie at the N end of the harbor, the W berths lie at the N end of the N breakwater, and the E berths lie at the N end of the E side of the harbor.

Pilotage.—Pilotage is compulsory and is available 24 hours. The pilot boards approximately 3 miles SW of the W breakwater. For VLCCs, pilots board approximately 6 miles SW of the W breakwater.

Regulations.—A TSS is reported to exist in the approach channel.

Anchorage.—Two anchorages, Anchorage No. 1 to the NW of the approach channel and Anchorage No. 2 to the SE of the channel, are used for waiting and quarantine.

Caution.—It has been reported that many fishing boats and nets are in the area around the anchorages and near the approach channel.

Wai-sheng Chiao to Kao-Hsiung Kang

8.19 Wai-sheng Chiao (23°42'N., 120°10'E.), about 40 miles SW of Tai-chung, is a mud point. The coast for 7 miles S of Wai-sheng Chiao consists of sand hills. A light is situated on the end of a drying spit 5 miles SW of Wai-sheng Chiao. A shoal, with a depth of 1.8m, exists 1.8 miles WSW of the light.

Tung Shih Kang, about 15 miles SSW of Wai-sheng Chiao, is a small town frequented by junks. A light is situated 7 miles W of the town. Ts'eng-wen Hsi enters the sea about 25 miles SSW of Tung Shih Kang; the mouth of the river lies between sand dunes. A light is situated off a cay 3.5 miles NNW of the mouth of the river.

An-p'ing Kang (23°00'N., 120°09'E.), about 7.5 miles SSE of the entrance to Ts'eng-wen Hsi, is the roadstead off the entrance to a small boat canal that leads first to the community of An-p'ing and then inland about 2.5 miles to T'ai-nan, the third-most populated city on the island. The roadstead is sheltered from the prevailing winds of the Northwest Monsoon season, but exposed to SW winds which predominate from March to December. Black chimneys in Anp'ing, radio towers in T'ai-nan, and a large white house about 5 miles SE of An-p'ing are conspicuous landmarks in distinguishing the roadstead from surrounding low land, salt pans, and lagoons.

Vessels anchor, in 9.1m, mud and sand, in a position about 1.3 miles W of the entrance to the canal. Cargo is transferred by lighter. Lights are situated from the heads of the breakwaters protecting the entrance to the canal. Tidal currents in the anchorage are weak, setting S on the flood tide and N on the ebb tide.

Caution.—Several submarine cables exist near the entrance to An-p'ing Kang.

8.20 An-p'ing New Harbor (22°58'N., 120°09'E.), the entrance to the inner harbor, situated 1 mile SE of the old entrance and has a depth of 7.5m for vessels up to 6,000 dwt. It is entered between the N and S breakwaters where lights are shown from the heads.

There is a deep water wharf, 480m long and a shallow water wharf, 320m long. Three lighted beacons are situated from the S wharf, and also from the N wharf.

Fish havens lie in 20 to 25m, 3 miles and 4 miles SW, respectively, of An-p'ing New Harbor.

The coast from An-p'ing to Tso-ying, 19 miles SSE, consists of a straight sandy beach, along which some small shallow rivers discharge. Close within, some beach areas, the marshes and lagoons are separated from the sea by narrow sand bars, covered with shrubs and grass in places. These sand bars, populated by fishermen with rows of rafts hauled on the beach, forms a characteristic feature of the coast.

Between An-p'ing New Harbor and Kao-Hsiung, there are numerous fish havens which are best shown on the chart.

A tanker mooring buoy lies 3.3 miles WNW of the entrance to Tso-ying Kang, and a pipeline is laid ENE from the buoy to the shore. Three conical lighted buoys are situated close to the mooring buoy.

Anchoring in the vicinity of the pipeline is reported prohibited.

8.21 Yun-An LNG Terminal (22°48.8'N., 120°10.6'E.) is situated on a reclaimed land 7.8 miles NNW of Tso-ying Kang. A breakwater extending 0.4 mile WSW then 0.8 mile NNW from the shore provides protection to the unloading platform lying between it and the terminal.

A light is shown from the terminal tug berth. A light is shown from the breakwater head. A light is shown from the unloading platform control room. Dolphins stand 220m N and 280m S; each shows a light.

A lighted buoy is moored 1 mile NNW of the breakwater head. Fish havens lie in 20 to 35m depths, within a radius of 500m, 2.6 miles SSW and 4.5 miles NNW of the breakwater head. A wave recorder lies 0.5 mile SW of the breakwater head to which it is connected by submarine cable.

Three dangerous wrecks lie 3.7 miles S of the breakwater head.

8.22 Tso-ying Kang (22°42'N., 120°15'E.), a small naval harbor entered about 4 miles N of Kao-hsiung Kang, is entered between two breakwaters.

A net gate is between the breakwaters. A light is situated from the head of each breakwater. Another light is situated from the head of the net gate. Range lights lead into the harbor on a bearing of 103°.

The entrance channel, with a minimum depth of 7.9m, accommodates vessels 154m long and drawing 7.3m. A signal station stands on the S entrance point of the harbor. Pilotage is compulsory.

Tidal range is about 0.8m. Tidal currents set N on a rising tide and S on a falling tide at a rate of less than one knot.

Vessels anchor, in 9.1 to 14.6m, sand, in an area between 0.5 and 1.3 miles W of the harbor entrance. They board pilots from a tug on station in the anchorage area. This anchorage is not recommended except in offshore winds.

Kao-Hsiung Kang (Kaohsiung) (22°37'N., 120°15'E.)

World Port Index No. 57920

8.23 Kao-Hsiung Kang, the harbor for Kao-hsiung, is one of the largest seaports in Taiwan, with 67 deep water wharves and 27 mooring buoys with the capacity to accommodate 102 ships at the same time. Kao-Hsiung, lying adjacent to the confluence of a small river and the N side of the inner harbor, is the largest industrial center of the island and the secondmost populated city.

Winds—Weather.—Winds from W to NW predominate between October and March, while winds from S to SW predominate the remainder of the year. Typhoons occur without much warning from June to October and can create waves in the harbor entrance reaching a height of 8.9m. The outer harbor may become untenable during storms and periods of the Southwest Monsoon seasons. The inner harbor is safe in all weathers.

Fog occurs most frequently from November to April. The rainy season occurs during the summer when on the average, rain falls 18 days a month. Heaviest rainfalls occur in August.

Tides—Currents.—The tides have a large diurnal inequality and often, though a marked seiche exists, only one tide a day occurs. Tidal rise averages usually less than about 1m.

Off the coast, tidal currents set S on a rising tide and N on a falling tide. At the entrance to the outer harbor, they set SE toward the S breakwater on a rising tide and NW on a falling tide. At the entrance to the inner harbor, they set in the axis of the channel. Current velocity generally ranges between 1 and 1.5 knots, but under certain conditions, it reaches 3 knots.

Depths—Limitations.—The harbor is divided into two entrances.

First Entrance (22°37'N., 120°15'E.) lies between the heads of two breakwaters extending 1 mile SW and NW from the shore. The fairway, which is dredged to 11m, narrows to a width of 122m about 0.5 mile within the breakwaters. Vessels are advised to navigate in the center of the traffic separation lanes as closely as possible due to the effects of typhoons, tide and, swell in this entrance. The harbor limits have been extended. New dimensions and works in progress (2011) can best be seen on the chart.

Second Entrance (22°33'N., 120°18'E.) is situated about 5 miles SE of First Entrance and is a man-made cut through the narrow sandy strip fronting the harbor. A dredged channel, about 183m wide, leads between the breakwater heads into the entrance into the Inner Harbor.

It is reported (2011) that Second Entrance has a least depth of 16m and can handle fully-loaded tankers of 100,000 dwt.

There are no length or beam restrictions; the largest vessel that has been accommodated had a length of 290m and a beam of 32.3m.

Kao-Hsiung Harbor is subject to silting. The depths alongside the major berths quoted below and the depths shown on the chart are approximate and are not reliable.

Kao-Hsiung Kang—Harbor Facilities

Berth	Length	Depth	Remarks
Penglai Commercial Harbor			
1	259m	9.0m	Passenger
2	137m	9.0m	General
3	150m	9.0m	Work boats
4	150m	9.0m	General
5	150m	9.0m	General
6	150m	9.0m	General
7	150m	9.0m	General
8	150m	10.5m	General
9	142m	10.5m	General
10	150m	10.5m	General
	123m	6.5m	Repairs
Yencheng Commercial Harbor			
1	160m	5.5m	Work boats
	102m	6.5m	General
2	291m	6.5m	General
3	378m	4.5m	Work boats
11-12	322m	9.0m	General
Lingya Commercial Harbor			
14	150m	9.0m	Cement
15-16	330m	9.0m	General
17	150m	9.0m	Cement
18-20	452m	9.0m	Bunker
21	123m	5.0m	Barges
22	120m	10.5m	Inactive
25	250m	10.5m	Fertilizer
Chungtao Commercial Harbor			
27	222m	10.5m	Private
28-30	586m	10.5m	Private

Kao-Hsiung Kang—Harbor Facilities			
Berth	**Length**	**Depth**	**Remarks**
31-39	1,806m	10.5m	General
40-43	636m	10.5m	Containers
44	199m	10.5m	Grain
45	200m	11.0m	Bulk
46-47	400m	10.0-11.0m	Sugar
48-55	1,660m	10.5m	Bulk
56-57	384m	10.5m	Dangerous cargo
58	306m	4.5m	Work boats
Chienchen Commercial Harbor			
59	164m	6.5m	Work boats
60-62	611m	6.5-10.5m	Petrochemicals
63-66	1,204m	12.0m	Container Terminal 2
Hsiaokong Commercial Harbor			
68-70	1,082m	14.0m	Container Terminal 3
71-72	630m	14.0m	Grain
Tajen Commercial Harbor			
74	314m	13.0m	Cargo
75-81	2,130	14.0-15.0m	Containers
Chunghsing Commercial Harbor			
115-122	2,213m	14.0m	Containers

A tunnel under the main channel connects this area with the mainland at NW end of Container Terminal No. 3. There are mooring buoys for 24 ocean-going vessels.

Photo courtesy of Sophia McHarney

Ch'i-Hou Shan

Aspect.—Wan-shou Shan (Shou Shan) (22°39'N., 120°15'E.), about 1 mile N of the First Entrance, is 358m high and is the best landmark in the area. It is composed of coral with a crater-like summit. On N bearings it appears like a truncated cone; there is a large white patch on its seaward side. In clear weather it can be seen from a distance of 35 miles, when it appears like an island. The peak is reported to be radar conspicuous at a distance of 21 miles.

Ch'i-hou Shan (22°37'N., 120°15'E.) is a flat-topped cliffy ridge on the S side of the narrowest part of the First Entrance. A light is shown at an elevation of 58m from a white octagonal brick tower on the N and highest part of this ridge; a radio tower and a white round tower stand nearby. A tall lattice tower stands near the lighthouse; a similar tower stands on the N side of the entrance. Lights are shown from the breakwaters at First Entrance. Range lights lead through the Second Entrance.

Pilotage.—Pilotage is compulsory and is available 24 hours. The pilots board in the following positions:

1. No. 1 Pilot Station (First Entrance)—Position 22°37.45'N, 120°12.80'E.
2. No. 2 Pilot Station (Second Entrance)—Position 22°32.47'N, 120°15.40'E.
3. In any Quarantine Anchorage.

Tankers over 15,000 grt and 200m long must take two pilots. Vessels should contact Kao-Hsuing Port Radio 1 hour before arriving in the roads. Vessels should then contact the pilots on VHF channel 13 and maintain a continuous listening watch until the pilot boards.

Regulations.—Upon completion of making arrangements for berthing and off-loading, the pilot, customs and immigration authorities, and the ship's agent will board. The quarantine flag should be flown until clearance is granted, at which time the pilot will notify the signal tower (by walkie-talkie) of that fact and request permission to enter port. The ship should again hoist the international call sign. Permission to enter is granted by radio and also visually by the signal tower.

Vessels carrying dangerous cargo must be in possession of effective documents for examination (IMO, SOLAS) to enter and sail from the port at night except in circumstances where there is fog and hazardous weather and then, under no conditions will a vessel carrying dangerous cargo enter or sail from Kao-hsiung.

Vessels carrying dangerous cargo berthed at Pier 29 can only be shifted at night when weather is good and the vessel is equipped with a bow thruster.

When vessels berth at Pier No. 57, Pier No. 60, Pier No. 61, and Pier No. 62 for loading or discharging dangerous cargo, they must enter the First Harbor entrance and sail out from the Second Entrance after operations.

Vessel Traffic Service.—Kao-Hsiung Kang Vessel Traffic Service (VTS) operates within 20 miles of the port. The traffic area has been divided into the First Entrance (North Sector) and the Second Entrance (South Sector).

Reports to the VTS are compulsory for the following:

1. Power driven vessels 500 grt or greater.
2. Power driven vessels 50m in length or greater.
3. All passenger vessels.
4. Vessels with tows of 500 grt and over or 50m in length or greater.
5. Any vessel, equipped with VHF, less than 50m in length or 500 grt navigating the fairway and having an emergency.

The following are reporting points for Kao-Hsiung Port Control:

1. Upon approach to within 20 miles of the port.
2. Upon approach to within 12 miles of the port.
3. Upon crossing the N end of the seperation lane isolation area.
4. Upon crossing the S end of the separation lane isolation area.
5. At No. 1 Pilot Station.
6. At No. 2 Pilot Station.
7. Before or after a vessel lays or raises anchor.
8. Upon passing the mouth of the Ch'ien Chen.
9. Upon an approach or departure from a wharf.
10. Prior to the entrance of First Entrance two-way traffic lane, when departing.
11. Prior to the entrance of Second Entrance two-way traffic lane, when departing.
12. Upon disembarking the pilot outbound.
13. In cases of emergency.

The following information should be signaled at least 24 hours in advance to the VTS:

1. Name of vessel.
2. Nationality.
3. ETA.
4. Draft.
5. Description of cargo.
6. Number of passengers.

Signals.—Signal stations are situated on the N shore of the narrows at the First Entrance (22°37'N., 120°16'E.) and on the N shore of the Second Entrance (22°33'N., 120°19'E.). A storm signal station is located 0.2 mile N of the narrows at the First Entrance.

Anchorage.—Large vessels anchor, in 25.6m, sand and mud, in a position about 2 miles W of the light on Ch'i-hou Shan, a flat ridge forming the S side of the entrance to the inner harbor. Vessels also anchor, in 7.4 to 18.2m, NW of the head of the N breakwater. Smaller vessels anchor within the outer harbor, in 5.5 to 7.4m, and clear of the fairway. Anchorage is prohibited within the fairway in the inner and outer harbor.

Both the first and second harbor entrances have separate quarantine anchorages. The limits of these anchorages are best shown on the chart.

During the Northwest Monsoon season, vessels are recommended to anchor NW of the N breakwater where a lee from the prevailing NE winds is provided by Shou Shan. During the Southwest Monsoon season, they anchor W of Ch'i-hou Shan where ample sea room is available off a lee shore. The holding ground is good and vessels seldom drag anchor except when in ballast during Southwest Monsoon gale winds.

A prohibited anchorage area extends 1.6 miles WSW of the Second Entrance breakwater heads.

The area between the First and Second Entrance Quarantine Anchorages (22°35.3'N., 120°16.7'E.) is a prohibited area where a submerged pipeline extends 1 mile SW of the shore at Ta-shan-t'ou. Anchoring is prohibited within 200m on either side of the pipeline. Six lighted buoys are moored around the head of the pipeline.

Anchoring is also prohibited in the area 50m on either side of the center line of the Cross Harbor Tunnel between Berth No. 68 and Berth No. 117.

Directions.—To obtain the deepest water, approach the First Entrance from a position about 1 mile WNW, steering to pass midway between the breakwater heads; then follow a mid-channel course through the entrance to the Inner Harbor.

The best time to enter is reported to be at the end of the flood current.

Signal stations stand at the First and Second Entrance points.

Caution.—Unexploded ordnance lies NW of Kao-hsiung Kang First Entrance in position 22°40.2'N, 120°10.9'E.

Small fishing vessels often lie just seaward of the entrance to Kao-hsiung Kang. There is a dangerous wreck lying close NW of the breakwater.

A dangerous wreck lies 2.5 miles SW of the First Entrance S breakwater.

A S tidal current, augmented by a strong N wind, tends to set entering vessels onto shoals near the S breakwater. Several groundings have been attributed to this set.

A submarine net, supported by several buoys painted gray, extends between the N and S breakwater heads at the seaward entrance to the outer harbor. During periods when current velocity is strong, vessels will require careful attention and prudent seamanship to clear the net and buoys with safety.

There is a foul ground dangerous to navigation 3 miles WSW of the Second Entrance breakwater.

A dumping ground has been established 7 miles WSW of the Second Entrance breakwater. Limits can be best seen on the chart.

A dangerous wreck lies 0.8 mile SW of the light at the head of the S breakwater of Kao-Hsiung Kang Second Entrance.

Taiwan—West Coast—Kao-hsiung Kang to O-luan Pi

8.24 The coast between Kao-hsiung Kang and O-luan Pi, about 55 miles SE, continues in general low-lying for a distance of about 27 miles then, as far as the S extremity of Taiwan, it becomes progressively more mountainous and bold. The off-lying island Liu-ch'iu Hsu, an offshore oil terminal, and several exposed anchorages for small vessels are of principal interest to navigation along this stretch of coast.

Ta-lin-pu Offshore Oil Terminal (22°30'N., 120°17'E.) consists of four SPM berths that lie between 2 and 4 miles off the SW coast of **Ta-lin-pu** (22°32'N., 120°20'E.). All SPMs are connected by submarine pipelines leading NE to the shore at Ta-lin-pu, marked at the shore landing points.

SPM Lighted Buoy No. 1 has a least depth of 21m and can moor tankers up to 250,000 dwt with a maximum draft of 18m.

SPM Lighted Buoy No. 2 has a least depth of 29m and can moor tankers up to 250,000 dwt. SPM Lighted Buoy No. 3 has a least depth of 32m and can moor tankers up to 300,000 dwt.

Pilots board by arrangement in the vicinity of the SPMs. Vessels awaiting a pilot and arrival clearance, anchor 1.5 miles W of the terminal. If for some reason a vessel is unable to enter a berth directly, it anchors off Kao-hsiung Kang, in a position about 2 miles W of the light on Ch'i-hou Shan.

Anchoring is prohibited within 1.5 miles of the SPMs.

Caution.—A wreck, with a depth of 5m, lies about 0.8 mile NE of SPM Lighted Buoy No. 1.

Berthing may not be possible during periods of bad weather; moreover, when wind speeds reach 35 knots the berths must be

vacated. Passage is prohibited within 1,200m of these moorings and within 100m of the pipelines.

8.25 Liu-ch'iu Yu (22°21'N., 120°22'E.), about 17 miles SSE of Kao-hsiung Kang, is a small partially reef-fringed island which, rising to low flat-topped summits in the NE and SW portions, has a sandy beach on the SE side and cliffs on the NW.

A small breakwater-sheltered fishing harbor lies on the NE side.

A light is situated on the hill at the SE end of the island. The island is reported radar conspicuous at 28 miles.

Vessels anchor, in 36.5m, sand, about 0.4 mile off the sandy beach on the SE side of the island. Anchorage is prohibited between the NE end of the island and the land about 7 miles NE.

A submarine cable and a pipeline are laid NW from Liu-ch'iu Yu to the mainland. The cable is laid midway along the SE side of the island and the pipeline at the NE extremity. The cable locations on both island and mainland are marked by beacons. Anchoring is prohibited in the vicinity of both cable and pipeline.

Tung-Kang Po-ti (22°27'N., 120°26'E.) is the roadstead off Tung-Kang, a small community lying on the S side of the confluence of Tung-chiang Ch'i and Hsia-tan-shui Ch'i, two shallow rivers which, accessible to small boats, reach the sea about 13 miles SE of Kao-hsiung Kang.

Vessels, seeking shelter from NE winds, anchor, in 17.3m with a dark clump of trees about 1.8 miles SSE of Tung-Kang, bearing 090°, distant about 1.5 miles.

Fang-liao Kang (22°22'N., 120°35'E.), an open roadstead off Fang-liao, a small community about 24 miles SE of Kao-hsiung Kang, is the best offshore shelter, even in winter, on the W coast of Taiwan.

Vessels anchor, in 12.8m about 1.5 miles NW of a conspicuous white bridge which crosses a stream about 1 mile SSE of Fang-liao.

An experimental fishing area, marked by four lighted buoys, lies within 1 mile of position 22°13.1'N., 120°38.2'E.

Fish havens, in depths of 60 to 80m, lie between 1 to 2 miles W of **Ch'e-ch'eng Chiao** (22°05'N., 120°42'E.).

A floating fish farm, with a radius of 800m, marked by two flashing white lights with radar reflectors, is located in position 22°07.7'N., 120°31.6'E.

8.26 Hai-k'ou Wan (22°06'N., 120°42'E.), a small reef-fringed bay with a breakwater-sheltered fishing harbor on the SE side, is located about 40 miles SE of Kao-hsiung Kang. Li-lung Shan, about 4 miles NNE, is a high, wooded, and cone-shaped summit which, during clear weather, is a conspicuous landmark in approaching the bay.

Small vessels anchor, in 8.2m, sand, in a position about 0.3 mile WNW of the entrance to the fishing harbor and with Chien Shan, a high, sugarloaf hill near the N entrance point of the bay, bearing 018°. The best approach to the anchorage is on a bearing of 112° and heading for the S breakwater head.

Ta-pan-lieh Mao-ti (21°57'N., 120°45'E.), a reef-fringed inlet at the head of Nan Wan, a broad bay extending about 7 miles WNW from O-luan Pi, is the safest anchorage on the S coast of Taiwan and is sheltered from all but S winds.

Vessels anchor, in 12.8 to 36.5m, sand, about 0.5 mile off Ta-pan-lieh, a small whaling community at the head of the inlet. There is an auxiliary port to Kao-hsiung Kang at **Tapeng** (21°57.5'N., 120°45.4'E.). It is reported that breakwaters exist and a berth with 5m depths is in use.

O-luan Pi (21°54'N., 120°51'E.), the S point of Taiwan, is described in paragraph 8.10.

Caution.—There are strong tidal races off Mao-pi T'ou, the W entrance point of Nan Wan.

8.27 Taiwan Strait (Formosa Strait) (24°00'N., 119°00'E.), the body of water between Taiwan and the mainland, may be defined as lying between the W coast of Taiwan and a stretch of the mainland coast between the entrance to the river **Min Jiang** (26°05'N., 119°32'E.), in the N, and the vicinity of **Lien-hua-feng Chiao** (22°56'N., 116°29'E.), in the S. It has a least width of 70 miles between Pai-sha Chia, the NW extremity of Taiwan, and **Hai-t'an Tao** (25°33'N., 119°48'E.), an island off the mainland coast. The principal underwater danger is **Taiwan Banks** (23°00'N., 118°35'E.), an extensive shoal area lying in the S reaches of the strait.

The least known depth is 8.2m, but turbulent surface agitation would seem to indicate that lesser depths may exist. Elsewhere, the strait is deep and clear, save for the islands of P'eng-hu Lieh-tao, reported dangers lying N of the islands, and the off-lying dangers fronting the mainland coast.

Caution.—New shoals are reported to emerge continually off the W coast of Taiwan, especially rising between 23°N and 24°20'N, and often with an onshore set. Mariners should give this portion of the coast a wide berth.

The charted depths in the vicinity of position 23°15'N, 117°45'E are derived solely from ships reports which indicate sand waves. In addition, unreported shoals may exist. The presence of sand waves was also reported in the vicinity of position 24°20'N, 119°30'E.

Numerous oil installations, exploratory rigs, and oil service traffic exist in an area bounded by latitudes 24°47'N and 24°51'N and longitudes 120°36'E and 120°45'E.

Peng-Hu Ch'un-Tao

8.28 Peng-Hu Ch'un-Tao (Pescadores Islands) (23°23'N., 119°30'E.) is a scattering of islands divided into a N group and a S group by Wang-An Kang-Tao, a clear deep water channel with a least width of about 5 miles. The islands are flat, barren, and similar in appearance. The highest elevation is about 79m and, as they are all similar in appearance, it is very difficult to identify any of them in bad weather.

The N group of islands consists of three closely juxtaposed larger islands and several adjacent smaller islands. P'eng-hu Kang, with Ma-kung Kang, is the harbor formed by the larger islands. The S group consists of numerous scattered islets, reddish in color. Radar returns are unreliable.

P'eng-hu Kang-tao (Pescadores Channel) is the body of water lying between P'eng-hu Tao and the W coast of Taiwan. It has a least width of about 17 miles between Wai-san-ting Chou, off the Taiwan coast, and Ch'a-mu Yu, two small islets lying about 2 miles SE of the largest island in the N group of P'eng-hu Ch'un-tao. The fairway is deep in mid-channel.

Directions.—Vessels approaching from the W and S should proceed to a position about 2 miles S of Ch'ih-tzu Wei then

steer ENE through the SW approach channel with the two lights N of Ma-Kung in range 063.75°, keeping clear if the submerged obstruction extending S from the S side of Hsi Yu and the shoal spit extending NW from T'ung-p'an Yu.

Vessels approaching from the E should clear Liu-ch'ih Shih and proceed to a position about 1 mile E of Hu-ching Yu, then steer WNW through the SE approach channel with the light on Ch'ih-tzu Wei on a heading of 308°, keeping S of the shoal patches in the middle of the channel. When Fou-wen, a drying rock lying W of the W extremity of P'eng-hu Tao, falls abaft the starboard beam vessels haul gradually to starboard and join the lighted range for the SW approach channel on a heading of 063°.

Caution.—Close attention should be paid to the several underwater dangers lying in the approaches to P'eng-hu Kang and to tidal currents which set athwart the axis of the SW approach channel and parallel to the axis of the SE approach channel at a velocity greater than 5 knots on the flood and 3 knots on the ebb.

Depths, sand banks, and cays within an area from 23°20'N to 23°45'N and up to 10 miles off the coast are subject to continual change. Vessels should navigate with caution.

8.29 P'eng-bu Tao (23°34'N., 119°37'E.) and Pai-sha Tao, on the E, and Hsi Yu, on the W, are the three main islands of the group. The two islands to the E are joined by extensive areas of drying flats which continue intermittently N for a distance of about 8 miles. Hsiao-men Yu lies close off the N end of Hsi Yu and is connected to it by a causeway.

Hsiao-men Yu Light

Numerous above and below-water dangers lie scattered off the E side of the group. The farthest seaward dangers are Wai-ch'ien Shih, with a depth of 1.2m, and Liu-ch'ih Shih, with 0.9m, which lie 4 miles NE and 5 miles SE, respectively, of the SE extremity of P'eng-hu Tao. Liu-ch'ih Shih is marked by rips; Wai-ch'ien Shih is marked by strong whirlpools.

Small vessels, seeking shelter from NE winds, anchor, in 8.2 to 11m in either of two bays indenting the W side of Hsi Yu, the hilly reef-fringed W island of the group.

8.30 P'eng-hu Kang (23°36'N., 119°32'E.) (World Port Index No. 57950), the principal anchorage for P'eng-hu Ch'un-tao, lies sheltered from the prevailing winds of the Northwest Monsoon season. It is entered between the SE extremity of Yu-weng Tao and the dangers lying off Feng-kuei-wei Chiao, a point near the W extremity of P'eng-hu Tao. The S approaches are in deep water, but partially blocked by the islets. Hu-ching Yu and T'ung-p'an Yu and the shoal spit extending NW from the latter. Anchorage is prohibited in an area where submarine cables are laid. The area is best shown on the latest chart, and it begins between pecked lines drawn across the harbor entrance. A SE approach channel, swept clear to a depth of 8.9m, lies between Hu-ching Yu and P'eng-hu Tao. The SW approach and principal channel lies between Hsi Yu and the spit NW of T'ung-p'an Yu.

8.31 Ma-kung (23°34'N., 119°33'E.) has a quay wall, 655m long, with depths of 3.7 to 5.5m alongside, which can handle cargo and passenger ships up to 5,000 dwt. There is a basin for fishing craft, with depths of 1.5 to 3.7m.

Ma-kung Kang, an inlet continuing P'eng-hu Kang to the SE from Feng-kuei-wei Chiao, lies sheltered from most all weather conditions. The community of P'eng-hu lies near the N entrance point of the inlet. Vessels anchor clear of charted dangers, in 9.2 to 25.6m, sand and mud, in a position about 2 miles NNW of the S entrance point of Makung Kang. Vessels usually moor to buoys in Makung Kang. Small vessels also berth along facilities at P'eng-hu and the S side of T'se-t'ien Tao.

T'se-t'ien Tao, an island close inside the entrance, is the site of a naval station and repair facilities for small vessels.

Traffic signals are displayed from the N entrance point of the inlet. Berthing signals are displayed from a mast standing in the SW part of T'se-t'ien Tao.

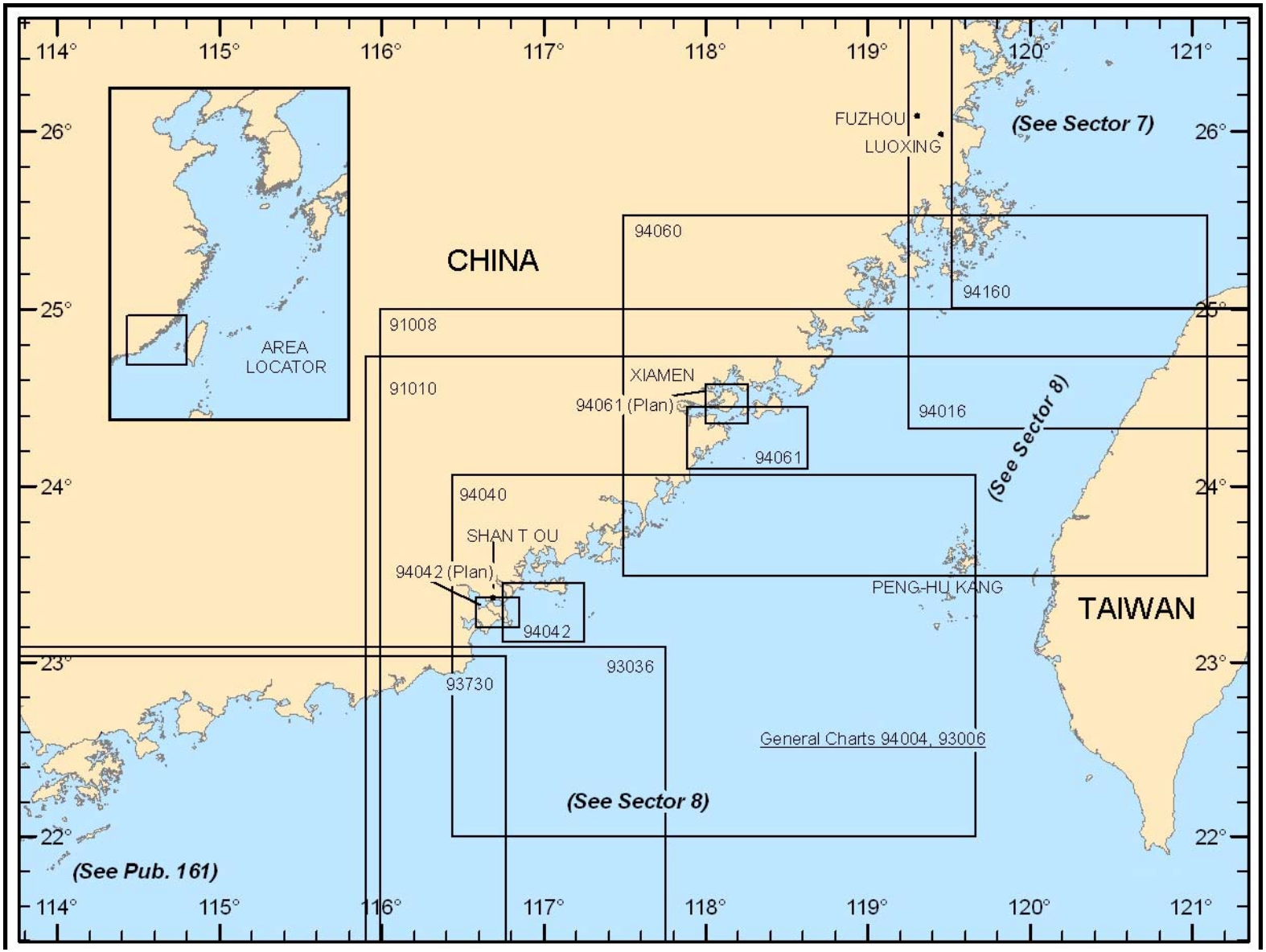
Vessels anchor clear of charted dangers, in 9.2 to 25.6m, sand and mud, in a position about 2.5 NNW of the S entrance point of Makung Kang. Vessels usually moor to buoys in Makung Kang.

Only small vessels berth along facilities at P'eng-hu and the S side of T'se-t'ien Tao.

P'eng-hu Ch'un-tao S Group consists of two main islands, Wang-an Tao and Ch'i-mei Yu, and numerous scattered islets and underwater dangers lying E and W.

Anchorage.—Vessels seeking a NE lee anchor, in 11 to 14.6m, sand and shell, in a position clear of dangers fronting a small cove in the N part of the W side of Wang-an Tao. Vessels seeking a SW lee anchor, in 16.4 to 18.2m, in a position about 0.3 mile S of an above-water rock lying on the outer part of a reef extending NE from the NE extremity of the same island.

Small vessels seeking shelter during the summer months have been reported to anchor off the N side of Ch'i-mei Yu.



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

SECTOR **9** — CHART INFORMATION

SECTOR 9

CHINA—MIN JIANG TO DAPENG JIAO

Plan.—This sector describes the SE coast of China between Shafeng Jiao, the S entrance point of the river Min Jiang, and Dapeng Jiao (Mir Point), a point about 365 miles SW. The description is N to S.

General Remarks

9.1 Winds—Weather.—Winds are seasonal and blow largely NE and SW in consequence of the influence which create the characteristic monsoons of the SE coast of China. From September through May, winds from the NE predominate and commonly exceed a velocity of 22 knots. During October, November and December, wind velocity is likely to exceed 34 knots, with December having the greatest likelihood of strong winds. April has the greatest percentage of calms. In June, winds are transitional and blow with equal frequency from the SW and NE. In the months of July and August, winds blow from the SW predominate and seldom exceed a velocity of 21 knots. August has the greater percentage of calms. The transition from the summer, Southwest Monsoon season to the winter, Northeast Monsoon season is abrupt and may occur within a week's time.

Typhoons created well to the SE by forces other than those giving rise to monsoon winds, may occur at any time of the year. From October through April, they seldom if ever occur. In May and June, they increase in frequency until in July and August they occur at a rate better than twice a year. In September, they commence their decline in frequency and tend to concentrate on the S portions of the mainland coast.

Tides—Currents.—Ocean currents are seasonal in set and velocity. From September to March, the set is SW and parallels the coast. In April, the set becomes confused or counterclockwise. From May through August, the set is NE and parallels the coast. The SW current reaches a maximum velocity of 1.5 knots in January and February. In July the NE current reaches a maximum of 2 knots.

Tidal current characteristics occur in consequence of the interaction between tidal wave propagation emanating from a position near Shibeishan Jiso with tidal wave propagation progressing around either extremity of Taiwan and culminating in about 24°30'N. Thus, between Shibeishan Jiso and Hong Kong the flood sets W and ebbs E. While N of 24°30'N, the flood sets S and ebbs N. An onshore set accompanies a N current. Tidal rise is similarly largely a function of interaction between opposing tidal wave progression. Thus, tidal rise increases progressively from less than 1m at Shibeishan Jiao to about 6.1m at Shafeng Jiao.

The coastline of China between Shafeng Jiao and Dapeng Jiao is extremely irregular and much indented by numerous large bays, smaller coves, lesser inlets and extensive estuaries. It is immediately backed by a level to rolling coastal plain which, extending inland in places as far as 20 miles, rises gradually to a NE trending range of mountains that reaches the sea in the N and S portions of the coastline as bold, rocky headlands. Elsewhere, steep hill and mountain spurs enter the coastal plain and, continuing seaward in several isolated ridges, generally terminate only a short distance from the shore. Offshore, the approaches are predominantly clear and several large off-lying islands are, in general, found to lie within a line joining the principal salient points extending forth from the shore. The large island, Haitan Dao, in the N part of the coastline, is a notable exception. Several isolated off-lying islets lie well scattered throughout the area. Closer inshore, the sea floor is level and has the gradual slope, without the extensive coastal margins of drying mud flats, characteristic of the SE coast of China. Above and below-water dangers are widely scattered. The principal ports are Xiamen and Shantou.

Caution.—During each monsoon season, an inshore set of considerable strength has been experienced along the coast, especially in the vicinity of the entrance to Xiamen Gang (Hsiamen Chiang) and in the area around Nanpeng Liedao. Vessels have stranded at various times on the off-lying islands between Chin-men Tao and Fu-chi Chiao. Many lighthouses on these islands are of considerable elevation and often the upper parts are obscured by fog while the lower part is clear. When a light is not seen, although within range of visibility, soundings should be taken and the vessel hauled out to deeper water until the position is ascertained.

Off-lying Islets

9.2 The several widely scattered off-lying islets lie, in general, within the 40m curve and within a distance of about 20 miles from the coast. They rise abruptly from the sea floor and constitute a danger to vessels standing off the coast for destinations N or S. These dangers are described below.

Niuashan Dao (Niu-shan Tao) (25°26'N., 119°56'E.) is described in paragraph 9.3.

Wuqiu Yu (Wu-ch'iu Hsu) (25°00'N., 119°27'E.) is a small, steep-to, inhabited island rising to a rounded summit surmounted by a lighthouse. Xia Yu (Hsai Hsu), close SE, is a smaller, rather low, inhabited island having sandy hummocks. The two islands are reported radar conspicuous at a distance of 19 miles. Vessels, when proceeding NE in clear weather during the Northeast Monsoon season, usually pass about 2 miles NW of Wuqiu Yu. Heavy fogs occur in April and May.

In a position about 8 miles S of Wuqiu Yu, the monsoon current (July to September) sets to the NE at a rate varying with tidal effect. The monsoon current predominates except when spring tide sets SW and counterbalances its affect. From September to July the tidal current becomes dominant; however, it is largely affected by the wind.

Xiongdi Yu (Hsiung-ti Yu) (23°33'N., 117°40'E.) consists of two small rather low-lying islets separated by a channel reported clear and 1 mile wide. Dagan Shan, the SE islet, has a bluff on its S side and a reef extending about 0.3 mile W from the side. Xiaogan Shan, the NW islet, has a prominent square summit. The two islets are reported radar conspicuous at a distance

of about 16 miles. A light is exhibited from Dagan Shan.

Nanpeng Liedao (23°16'N., 117°17'E.) is an islet group consisting of two larger islets prolonged NE and SW by several smaller islets and a number of underwater rocks. Nanpeng Dao, one of the larger islets lying near the center of the group and reported radar conspicuous at a distance of about 25 miles, is partially covered by vegetation and is marked by a light on its summit. Vessels reportedly anchor, in depths of less than 18m, in a position about 0.5 mile W of the islet.

Tidal currents in the vicinity of the islets set NE on the flood and SW on the ebb; maximum rates are less than 1 knot.

Zhenyan Tou (Pedro Blanco) (Chen Yen-t'ou) (22°19'N., 115°06'E.) consists of two rocks with a passage between them 2m in width and 4.5m in depth. The passage can be viewed from N or S of the rocks. The E and larger rock appears conical on some bearings. The W rock has a shelf extending NW with a rock drying 1.5m at its seaward extremity; other than this shelf, both rocks are steep-to.

Shafeng Jiao to P'ing-hai Chiao

9.3 **Shafeng Jiao** (26°01'N., 119°42'E.) is a low-lying sandy point backed by a hilly ridge extending about 2 miles SW and fronted by a drying spit that extends several miles to the E.

Qi Shan (Chin Feng) (26°00'N., 119°41'E.), the summit of a hilly ridge, has sandy E slopes which show brilliantly in misty weather when little else in the vicinity is visible.

The coastline between Shafeng Jiao and P'ing-hai Chiao, about 56 miles SSW, is very irregular and lies divided by a considerable peninsula into two large embayments whose shoreline is similarly irregular and indented by numerous inlets and a multitude of small bays and lesser coves which, throughout, are fronted by wide and extensive margins of drying mud flats. The land inland is generally low or rises to low-lying hills.

Offshore, the large island Haitan Dao, along with several lesser islands, numerous islets, and a vast multitude of above- and below-water dangers, lies within the 40m curve which roughly parallels the salient points of the mainland coast at a distance of about 14 miles. The larger islands are cultivated and generally low or rise to low hills.

Haitan Haixia is the channel between Haitan Dao and the mainland. Xinghua Shuidao and Nanri Shuidao are the two main channels leading through off-lying islands fronting the bay Xinghau Wan.

Haitan Dao (25°33'N., 119°48'E.) is a large island lying close off the mainland coast in a position with its N extremity about 22 miles S of Shafeng Jiao. The shoreline is very irregular and indented by numerous bays which, receding well inland between bluff promontories, are generally deep on the E side of the island and filled with drying mud flats on the W side.

Niushan Dao (Niu-shan Tao) (25°26'N., 119°56'E.) is a barren steep-sided islet which, surrounded by above and below-water dangers on all sides except the E, rises abruptly to a 66m high summit surmounted by a lighthouse. The islet, which is the seawardmost islet on this part of the coast, should be cleared at a distance of not less than 0.75 mile and is reported radar conspicuous at a distance of 22 miles.

Vessels, seeking shelter during winds of the Northeast Monsoon season, can obtain anchorage within **Guanyin Ao** (25°28'N., 119°50'E.), in a depth of 9.4m, sand, about 0.2 mile W of the E entrance point to Guanyin Ao, with the light on Niushan Dao bearing 105° and just open S of that point. The holding ground is good, but a heavy swell sets in during the Northeast Monsoon.

9.4 **Haitan Haixia** (25°27'N., 119°38'E.), the narrow channel between Haitan Dao and the mainland, is considerably encumbered in its N and S entrances by numerous, largely steep-sided islands while, within the entrances, it has several fairways that are further encumbered by many islets and extensive shoal banks of sand. The principal channel, of the several deep-water channels, leading through the islands lying in the N entrance passes NW of the steep-to **Haitan Shi** (Norton Rock) (25°46'N., 119°48'E.), the most seaward danger in the approaches. The channel trends SW between the islet group Dongluo Liedao (Ta-lao Shan) and the reef-fringed Zhu Pai (Red Rock), and then enters the inner fairway between the islands Ku Hsu and Tangyu Dao.

Dongnan Kou (25°23'N., 119°44'E.), the SE entrance, is entered between the S extremity of Haitan Dao, and the steep-sided island Cao Yu (Ts'ao Hsu).

Nan K'ou (25°20'N., 119°40'E.), the SW entrance, branches N from Xinghua Shuidao and continues NNE between the island Tang Yu (Chung-lou Shan) and the mainland to the W.

Vessels, seeking refuge from typhoon winds, enter the S part of Haitan Dao and anchor, in 7.3m, sand, in a position with Ting Tao (Station Islet), about 3 miles WNW of the S extremity of Haitan Dao, bearing 072° and with the W side of Junksail Islet (Chuang-tan Yu) bearing 328°. They also anchor, in 11m, mud and sand, in a position about mile NNW of Low Islet (Oi Yu) with the W sides of Low Islet and Junksail Islet in rang bearing 155°.

Caution.—Vessels are cautioned that the middle part of Haitan Dao is obstructed by shoals and a bar which is subject to displacement in consequence of strong tidal currents acting on a bottom of sand and mud. Vessels with a draft greater than 6.7m run the risk of grounding should they incur delay while seeking to take advantage of the extreme tidal rise customary to the channel.

9.5 **Xinghua Wan** (25°20'N., 119°20'E.) is an extensive, partially-examined, and largely shoal bay entered between Fort Hill Point, about 8 miles NE of Pinghai Chiao, and the SW extremity of a narrow finger of land about 9 miles NE. It is a refuge for large vessels seeking shelter from typhoon winds.

Tide—Currents.—Tidal rises are extreme, as follows:

1. Lo-shan Chun-tao—6.1m at MHWS.
2. Ren Yu—6.3m at MHWS.
3. Baifu (Pai-tou Hsu)—6.4m at MHWS and 4.9m at MLWN.

Well offshore, currents vary in consequence of monsoon winds, but, in general, they set SW at about 1 knot. Inshore, tidal currents generally set W on a rising tide and E on a falling tide and attain a velocity of about 3 knots. The flood current of a rising tide bifurcates E of Haitan Dao and set S through the N entrance to Haitan Haixia and NW through the SE entrance. The two currents meet near Lao-lo Shan (Middle Islet), where heavy rips and overfalls occur, and attain velocities of 2 to 3 knots in the wider portions of the fairway and 4 to 5 knots in

the narrow portion at Ta Yu (Pass Island). The flood current setting NW through Tung-nan K'ou bifurcates NW of Ts'ao Yu and sends a SSW setting branch through Nan K'ou which, in turn, divides into a W setting and S setting branch on reaching Xinghua Shuidao. Current velocity reaches 2 to 3 knots. The ebb current of a falling tide is, in general, the reverse of the flood current. The tidal current in the seaward entrance to Xinghua Shuidao set SW on a rising tide and SE on a falling tide with a velocity of about 2.3 knots.

Tidal currents at the juncture of Xinghua Shuidao and Nanri Shuidao set W on a rising tide and E on a falling tide. They reach a velocity of 5 to 7 knots at spring and form a race.

Pilotage.—Pilotage is compulsory in Xinghua Wan. Pilots board in the Xinghua Shuidao Outer Anchorages, as follows:

1. Pilot Anchorage centered in position 25°13.6'N, 119°41.4'E, in depths of about 23m.
2. Pilot and Quarantine Anchorage (reserved) centered in position 25°17.1'N, 119°39.7'E, in depths of 18 to 27m.
3. Pilot Anchorage (reserved) centered in position 25°19.9'N, 119°32.4'E, in depths of 15 to 22m.
4. Reserve Pilot Boarding area centered in position 25°18.8'N, 119°32.2'E.

Directions.—Vessels having arrived in a position about 1 mile NE of **Da Jiao** (25°21'N., 119°46'E.), steer so as to pass about 0.3 mile off the N extremity of Cao Yu and continue NW until Junksail Islet (Chuang-tan Yu) bears 353°. When the E islet of Tung-cheng bears 270°, they haul to port so as to pass about 0.4 mile W of Junksail Islet.

9.6 Inside Passage.—Vessels, having arrived in a position about 0.4 mile W of Junksail Islet, steer NNW so as to pass about 0.2 mile E of the tripod beacon surmounted by a black spherical topmark standing on several rocks close E of Ta Yu (Pass Island), when they haul to port and, bringing the E side of Junksail Islet in range 136°, astern, with the W side of Ting Tao (Station Islet), steer 316° so as to pass between the beacon and the several sunken Ashuelot Rocks (Yo Shih), they haul to starboard and, bringing the two pyramid beacons on Ta Yu in range 159°, astern, steer 339° so as to pass W of Flag Islet (Chi Yu) and to enter the recommended Wilson Channel (Weishen Shuidao) with the small island Ming-chiang Yu visible ahead between Pei-tou Yu (Charles Islet) and the several black rocks. Vessels favor the W side of Wilson Channel until the white stone cairn on a rock close N of Lao-lo Shan (Middle Islet) comes in range 084° with a similar cairn on the largest of the Saxby Islets (Pai-tou Chiano), when they haul to starboard and, passing W of a 3.2m pinnacle rock lying in mid-channel, steer on a heading of 359° with the rock close W of T'a Chiao (Tower Rock) in range with the SW extremity of Tangyu Dao. When Talisman Peak (Te-li-men Feng) bears 270°, they haul to port and, bring a light-colored patch on the W shoulder of Ku Hsu in range with the conspicuous conical peak Niu-chiao Shan (Yu-kuo Shan), carefully steer 352° until Inner Rock bears 089°, when they ease to starboard and steer on a heading with the two white pyramid beacons on the SE slope of Ku Hsu in range 351° so as to pass fair between Mitre rock and the several dangers about 0.75 mile ESE. When Mitre Rock bears 270°, they haul to starboard and bring Mitre rock in range 217° astern, with a break in the hills SW steer fair between Ku Hsu and Tangyu Dao so as to pass NW of the 4.6m patch on Simpson Spit (Hsin-shen Sha-tsui).

Pi-nang Shuidao (Blind Channel) is a narrow secondary channel used by vessels able to navigate the 4.1m crossover between the N part of the channel and the fairway N of Wilson Channel. Vessels having arrived in a position about 0.5 mile N of Ta Yu, steer to pass about 0.2 mile E of Flag Islet and then continue NNW with the E side of the islet in range 170°, astern, with the W side of Ta Yu, until the white stone cairn on a rock close N of Lao-lo Shan come in range 084° with a similar cairn on the largest of the Saxby Islet, when they ease to starboard and favor the E side of the channel by steering with the E side of Flag Islet in range 174°, astern, with the W side if the islet close W of Ta Yu. When the drying rock Hua Chiao (Tricker Rock) come in range 034° with Pillar Rock (Chu Chiao) be covered, when Pie-tou Yu comes in range 244° with a pagoda standing on the mainland WSW, vessels steer NNW in transit of the crossover and proceed through the fairway N of Wilson Channel as described above.

9.7 Nan K'ou.—Vessels having entered Xinghua Shuidao and arriving in a position about 1 mile N of **Tung-Yueh Yu** (Shuang-jih Tao) (25°16'N., 119°40'E.), steer for No-pass Rock on a NNW heading until Douglas Islet bears NW, distant 1 mile, and the S extremity of Tang Yu (Chung-lou Shan) bears 112°, when they haul to starboard and steer for a conspicuous sand patch on the S side of Haitan Dao on a heading of 027°. When Junksail Islet bears 353°, they haul to port and proceed as described above.

9.8 Xinghua Shuidao.—Vessels, having arrived in a position S of **Sheng-t'u-li Tao** (25°15'N., 119°45'E.), steer NW so as to pass fair between the sunken dangers lying off the inlet groups Heng Shan Yu and Tung-yueh (Shuang-jih Tao), then WNW so as to pass about 0.75 mile N of Hsiang-kan Yen (Hong Kong Rock) and Tung-pri-jih Yen (NE Yit Rock), then N or S of Baifu (Pai-tou Hsu) and then fair through the deep, 0.5 mile wide channel between the islet Lu Hsu and Kao-fu Yu, the small precipitous northernmost islet of the islet group Ta-she Yu.

Xinghua Shuidao (25°18'N., 119°39'E.), the E entrance channel to Xinghua Wan, is entered between **Shitang Yan** (Sheng-t'u-li Tao) (25°15'N., 119°45'E.), a sunken pinnacle rock, with a depth of 1.6m, and Shuiluo (Scattered Yits), a group of above and below-water dangers about 5 miles WSW.

The channel is deep throughout and trends generally W between the dangers fronting the mainland coast and the many islets and dangers lying NE and N of Nanri Dao (Nanjih Tao), the largest island in the approaches to Xinghua Wan.

9.9 Nari Shuidao.—Vessels, having arrived in a position about 1 mile E of **Lu-tz'u Yen** (25°08'N., 119°23'E.), steer N so as to pass about 1 mile E of Ta Hsu and Middle Islet and than steer either NE of Knob Islet (La-tu-ke Tao) and enter Hsing-hua Wan or, steering for the W side of Yeh-ma Hsu, enter Xinghua Shuidao between Lu Yu and Kao-fu Yu when this latter islet bears 090°.

Nanri Shuido (25°12'N., 119°25'E.), the S entrance channel to the bay, is entered between the 6.1m high pinnacle rock **Nanding** (Loutz Rock) (25°08'N., 119°23'E.) and the shoal coastal bank extending SW from Nanri Dao. It is deep through-

out and trends N between Nanri Dao and the dangers fronting the mainland.

Anchorage.—During the Northeast Monsoon, there is good anchorage about 1 mile E of **Ren Yu** (25°20'N., 119°36'E.), with **Punchard Islet** (25°20'N., 119°37'E.) bearing 351° at a distance of 0.6 mile. However, the bottom is reported to be very uneven and vessels should use caution when anchoring.

Anchorage can also be obtained 0.2 mile W of **Lu Hsu** (25°19.6'N., 119°28.5'E.) in a depth of 22m, mud, out of the strength of the tidal current.

Vessels seeking refuge from typhoon winds anchor, in 9.1m, good holding ground, in a position with Pitou Point bearing 066° distant about 1 mile. Less water than charted has been reported.

Caution.—During the flood tide, a portion of the current enters the N side of Xinghua Shuidao from the S entrance to Haitan Haixia and divides, one part flowing S along the channel and the other part flowing W. At the W end of Xinghua Shuidao, the W current may attain rates of 5 to 7 knots at springs and frequently causes overfalls and eddies.

A dangerous wreck lies approximately 3 miles S of Nanri Dao, in 16.2m of water.

P'ing-hai Chiao to Wei-t'ou Jiao

9.10 P'ing-hai Chiao (25°10'N., 119°16'E.) is the S extremity of a large peninsula projecting SE from the mainland. The coastline between P'ing-hai Chiao and Weitou Jiao, about 55 miles SW, is extremely irregular and indented by a number of large bays which, extending well inland, are rather shoal and have a shoreline fronted by extensive areas of drying mud flats. Inland, the terrain is low-lying and largely cultivated.

Offshore, the 20m curve parallels the salient coastal points at a distance of 2 to 3 miles and contains all the natural obstructions constituting a danger to navigation.

The principal larger bays are Meizhou Wan and Quanzhou Wan. Shenhu Wan is the principal smaller bay.

Pinghai Wan (25°11'N., 119°10'E.) is entered between P'ing-hai Chiao and Xiao Yu, about 6 miles SW, the town of Pinghai stands close NNW of P'ing-hai Chiao. During the Northeast Monsoon, vessels with local knowledge can obtain anchorage, in depths of 5.5 to 9.1m, off Pinghai, but the holding ground is poor and vessels often drag in strong winds.

Meizhou Wan (Mei-chou Wan) (25°05'N., 119°02'E.) is an extensive, partially examined, and largely shoal bay entered between Hsiao-tso Chiao, a rather low-lying headland about 18 miles SW of P'ing-hai Chiao, and Rogues Point which, forming the S extremity of the island Meizhou Dao, lies about 6 miles NE.

The shoreline of the bay is extremely irregular and, largely fronted by wide margins of drying mud flats, recedes about 20 miles NNW in a series of coves, inlets, and lesser bays. Several islets and numerous above and below-water dangers encumber the deeper, navigable portion of the fairway in the entrance to the bay.

The three primary ports in Meizhou Wan and its approaches are **Qinglanshan** (25°03'N., 119°01'E.), **Xiacuo** (25°10'N., 118°59'E.), and **Xiuyu** (25°13'N., 118°59'E.),. They are described, as follows:

1. **Qinglanshan** crude oil terminal, at the W entrance to the bay includes a crude oil pier for the Fujian Refinery, which can accommodate vessels of up to 300,000 tons.. The pier is approached by a fairway, 500m wide, with depths of 21 to 23m.
2. **Xiacuo**, includes Fujian Oil Terminal (25°10'N., 118°59'E.) and a container terminal in the upper waters of the bay.

Fujian oil and petrochemical terminal extends 240m from the shore. The terminal has a total berthing length of 609m, and can accommodate two crude oil carriers of up to 100,000 dwt; the inner side of the pier has two berths that can accommodate product tankers of 3,000 to 5,000 dwt.

3. **Xiuyu** (25°13'N., 118°59'E.), is located on Meizhou Dao and includes Fujian LNG Terminal at the E and upper part of Meizhou Wan.

Xiuyu port can accommodate vessels up to 304m long, with a maximum draft of 13.8m, and up to 30,000 dwt,

The channel to Fujian LNG Terminal is dredged to a depth of 14.5m; the terminal can accommodate vessels of up to 100,00 dwt.

Talin(25°09.8'N., 119°01.4'E.), a jetty lying on the E side of the bay, opposite Fujian Terminal, can be approached by a channel which has a least depth of 2.5m, and is marked by lighted buoys.

Depths—Limitations.—A buoyed channel, 300 to 400m wide and having a depth of 14.5m, leads NNW through Meizhou Wan. Vessels with drafts of up to 15.5m can transit the channel at spring tides.

Pilotage.—Pilotage is compulsory and available during daylight hours only. The pilot boards in the following positions:

1. In position 24°59.1'N, 119°05.0'E for vessels bound for Xiuyu.
2. Approximately 0.4 mile NW of lighted buoy No. 3 for vessels bound for Fujian oil terminal.
3. The quarantine anchorage in position 24°51.8'N, 119°00.5'E for vessels bound for the cruide oil terminal.

Regulations.—All vessel navigation for Meizhou Wan should be reported to Quanzhou Traffic Safety Shore Station on VHF channel 10.

Anchorage.—Meizhou Wan has two inspection and quarantine anchorages in the vicinity of position 25°02.6'N, 119°03.3'E. Both anchorages are in depths of 20m; each has a radius of 550m. One anchorage, No. 1 Anchorage, has good holding ground, sand, and can accommodate vessels up tp 100,000 dwt. The No. 3 Anchorage lies in position 25°01.2'N, 119°05.3'E, has a least depth of 13m, and a radius of 550m.

There is a lightering anchorage, which also serves as LNG Temporary Emergency Anchorge, No. 1, in depths of about 16m, in position 25°07.5'N, 119°00.6'E; a lighted buoy marks the center of this anchorage. LNG Temporary Emergency Anchorage No. 2 lies in position 25°09'N, 119°00'E.

Caution.—Uncharted dangers may exist within the bay.

As directions are sparse, vessels should exercise caution in their approach due to the presence of fishing vessels.

9.11 Dadian (Sorrel Rock) (25°02'N., 119°11'E.), 19m high, lies 3 miles E of Rogues Point. Ninepin Rock, about 2 miles WNW of Rogues Point, stands on the N end of a reef lying midway in the fairway.

Dazhu Dao (Ta-te Hsu) (25°05'N., 119°02'E.), an islet 85m

high, rising from surrounding areas of foul ground, lies about 5 miles NW of Rogues Point.

Currents attaining velocities of up to 4.5 knots may be experienced in Dazhu Hangmen.

In the Northeast Monsoon, anchorage can be obtained by small vessels with local knowledge between Rogues Point and rocks awash, lying about 0.8 mile E of Ninepin Rock. Small vessels, seeking shelter from winds of the Southwest Monsoon season, anchor close NW of Dazhu Dao.

Da Gang (24°55'N., 118°57'E.) lies between Hsiao-tso Chiao and Dashi Yu, 3 miles SSW. It affords good shelter to small vessels with local knowledge during offshore winds.

Quanzhou Wan (Ch'uan-chou Wan) (24°50'N., 118°43'E.) is a large, shoal bay which, receding about 12 miles E to the mouth of the river Jin Jiang (Chin Chiang), is entered between Mazuyin (Ta-tso Chiao), about 34 miles SW of P'ing-hai Chiao, and Xiangzhi Jiao (Hsiang-chih Chiao), a precipitous headland about 13 miles farther SW. A light is exhibited from a rock 22m high connected to the SE extremity of Mazuyin. About 3 miles W of the above mentioned light is the city of Chongwu (Ch'ung-wu), with a light situated SE of the city. The shoreline is fronted throughout by a margin of drying mud flats which, in the inner reaches of the bay, becomes extensive. Several islands, numerous islets, and a multitude of above and below-water dangers lie scattered throughout. The bay is subject to a heavy swell with any wind and is dangerous at LW for vessels with drafts of more than 3m.

Xiaozhui Dao (24°49'N., 118°46'E.), 12m high, is the eastermostmost and largest of a group of rocks lying on a reef 2 miles NNW of Xiangzhi Jiao. The S passage into the harbor is between Xiaozhui Dao and an extensive group of above and below-water rocks close S of it.

Dazhui Dao (24°50'N., 118°46'E.), 1 mile N of Xiaozhui Dao, is 101m high. The N passage into the harbor is between Dazhui Dao and Xiaozhui Dao.

9.12 Quanzhou (Ch'uan Chou) (24°54'N., 118°35'E.), a city 12 miles within the entrance, stands on a bank of Jin Jiang. There are extensive drying flats across the mouth of Jin Jiang.

The port of Quanzhou is situated 6 miles ESE of the city.

Depths—Limitations.—Quanzhou Wan Deep Water Fairway leads to Quanzhou from the anchorage and has a least depth of 12m.

There are four general cargo berths and one tanker berth: one berth for vessels of 10,000 dwt, two berths for 5,000 dwt, one berth for 3,000 dwt, and one berth for tankers of 3,000 dwt. In addition, there are two mooring buoy berths for vessels of 10,000 dwt and 13 berths for coasters up to 1,000 dwt.

Pilotage.—Pilotage is compulsory. Pilots board in the following positions:

1. Quanzhou Wan—position 24°51.8"N, 119°00.9'E.
2. Fujian Shishi Hongshan Thermal Power Plant—position 24°40.9"N, 118°46.2'E.
3. Weitou Port area—position 24°29.5"N, 118°31.9'E.
4. Shenhu Port area:
   a. Position 24°38.5"N, 118°42.1'E.
   b. Position 24°39.1"N, 118°41.7'E.

The port operates day and night, however entry and departure are made during daylight hours only.

Regulations.—All vessel navigation for the port of Quanzhou should be reported to Quanzhou Traffic Safety Shore Station on VHF channel 10.

Anchorage.—Anchorage can be obtained off the port or in the channel WNW of Xiaozhui Dao. Anchorage can also be obtained about 1 mile NW of Dazhui Dao, where there is smooth water in any weather. The anchorage is approached by a channel between Dazhui Dao and the mainland to the N.

The outer anchorage, has a depth of 18m, and lies 2.8 miles ESE of Xiangzhi Jiao Light (24°46'N., 118°47'E.).

Anchorage for LNG vessels can be taken in an area, with a radius of 600m, centered on approximate position 24°59'N, 119°04'E.

Vessels waiting to berth at Fujian Oil Refinery, awaiting a pilot, quarantine inspection, or tide, can take anchorage in position 24°52'N, 119°00'E.

9.13 Shenhu Wan (24°39'N., 118°40'E.) is a small shoal bay with barren shores about 9 miles NE of Wei-t'ou Chiao.

Depths—Limitations.—A bouyed channel, with a depth of 12.2m and a width of 240m, leads into the harbor.

Aspect.—Kusau Hill, 209m high and surmounted by a pagoda, is located about 4 miles NNW of Yungning Tsui and is a conspicuous landmark in the approaches to Shenhu Wan.

Pilotage.—Pilotage for the bay may be taken at the quarantine anchorage (24°39'N., 118°42'E.), close E of the entrance.

Anchorage.—Working anchorages lie in depths of 5 to 9m in the central part of the bay. Vessels awaiting a berth may anchor, in depths of 15 to 19m, in the quarantine anchorage, centered on position 24°40'N, 118°46'E.

Caution.—The bay is reported to be unsafe during the Southwest Monsoon season.

Weitou Jiao to Zhenhaio Jiao

9.14 Weitou Jiao (Wei-t'ou Chiao) (24°31'N., 118°34'E.) is a low, sandy point which rises to a 24.3m hill surmounted by a light-colored and poorly-discernible obelisk. A rock, with a depth of less than 1.8m, is reported to lie about 0.7 mile SE of Weitou Jiao. There is another rocky shoal about 0.6 mile farther SE of this position. The sea breaks heavily on the dangers around the point, and it should be given a wide berth.

The coastline between the point and Zhenhaio Jiao, about 28 miles SW, describes an extensive bay which, giving access to a number of estuaries, inlets, and lesser bays, is largely shoal and encumbered by several large islets and scattered above and below-water dangers. Inland, the terrain is generally low and well cultivated throughout, save on the SW side where steep sided, rugged hills descend to the shore in bold headlands with lowland and sandy beaches intervening. Offshore, several deep water channels lead from sea and, passing through wide areas of shoal water and extensive margins of drying mud flats, proceed well into the inner reaches of the bay.

9.15 Weitou Wan (Wei-t'ou Ao) (24°33'N., 118°30'E.), a large expanse of mostly shoal water, entered between Weitou Jiao and the E side of Chinmen Tao, recedes about 10 miles NW. A deep water channel, having a least known depth of 8.2m, trends about 7 miles WNW from Weitou Jiao, and passes between the several scattered islets and areas of drying reefs and mud flats which extend offshore from the mainland and

Chin-men Tao. The SW side of the channel is steep-to and soundings give little warning of its approach.

Pilotage.—Pilotage may be obtained at the quarantine anchorage in position (24°29'30"N., 118°31'54"E.).

Anchorage.—The quarantine anchorage, which has depths of 17 to 21m, lies centered in position 24°29.5, 118°31.9”E.

Oyster Islet is a low flat rock about 2 miles NW of Weitou Jiao. Ta-po Hsu is a small islet about 7 miles WNW of the same point.

Vessels, seeking shelter from winds of the Northeast Monsoon season, anchor, in 6.4m, in a position about 0.5 mile SW of Oyster Islet or, in 9.1m, about 0.8 mile W of the islet. Care must be taken to avoid a rocky ledge, 0.6 mile WNW of Oyster Islet.

9.16 Jinmen Dao (Quemoy) (24°27'N., 118°23'E.) is a large well-cultivated island which, rising to a rather high summit in the E part, has an irregular shoreline somewhat steep-to seaward and encumbered landward by shoal water and an extensive margin of drying mud flats. Chin-men-pei-tung Shui-tao is an encumbered deep-water passage which, leading from the entrance to Weitou Wan, passes around the N extremity of the island. Chin-men Shui-tao is a deep water channel which enters Chin-men Chiang, a shoal and reef-encumbered embayment on the W side of Chin-men Tao, by trending N from the sea between the many underwater dangers extending S from the SW extremity of Chin-men Tao and from the S side of Hsiao-chin-men Tao (Lieh Hsu) (Little Quemoy), a hilly islet close to the W. A swell usually breaks over these dangers at times other than HW

An offshore oil terminal situated with the seaward extremity of a submarine pipeline in a position about 1.8 miles WNW of **Liaoluo Tou** (24°25'N., 118°26'E.), a peaked islet joined by a reef to the SE extremity of Chin-men Tao. A marker buoy and several mooring buoys are moored in the vicinity. Pilotage may be taken at the quarantine anchorage (24°29'N., 118°32'E.). A fish haven lies 3 miles S of Liaolou Tou. The S pier and breakwater, lit by a beacon, extend from the point of Lialuo Tou in depths of approximately 5 to 7m; the breakwater protects the harbor of Zigan.

Vessels, seeking shelter from lesser winds of the Northeast Monsoon season, anchor, in 8.5m, mud and sand, in a position, with Liao-lo T’ou bearing 095° and Ta-wu Shan, the summit of Chin-men Tao, bearing 015°. When winds of the Northeast Monsoon season become stronger, a heavy swell sets in and renders the anchorage untenable. Vessels find shelter from all winds in Chin-men Chiang.

Caution.—Anchorage is prohibited in an area SE of the island, best seen on the chart. Additional restricted and prohibited areas are established around the coastline of Jinmen Dao and the adjacent islands. Vessels must keep to the main shipping channels unless prior permission to enter the restricted areas is obtained from the Taiwanese authorities.

Caution must be exercised due to the possible existence of mines in these waters. Surveys may be adequate in determining that formerly mined areas may be charted as doubtful; however, meteorological and hydrographic conditions prevent certainty.

Pei-t’ing Tao (Beiding Dao) (Dodd Island) (24°26'N., 118°30'E.), 3 miles ENE of Liao-lo T’ou, is 21m high; a light, from which a fog signal is sounded occasionally, is shown from a 13m high, metal framework tower. Reefs and shoals, on which the sea sometimes breaks, extend 1.3 miles E of the island, and also across the passage NW of the island.

Tidal currents inshore of the island set SW and W around the S tip of Chin-men Tao on the flood, and in the reverse direction on the ebb.

Xiamen (24°27'N., 118°04'E.)

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9.17 Xiamen (Hsia-men) (Amoy) is a well-populated metropolis approached from sea through several deep water channels passing between the many low islets, above-water rocks, and drying reefs which lie scattered between Hsiao-chin-men Tao and Chen-hai Chiao. Hsia-chin-men Shui-tao and Xiamen Dongce Shuidao (Hsia-men-tung-ts’e Shui-tao), the two E channels, pass NW of Hsiao-chin-men Tao where they unite and join a channel which trends SE into Chin-men Chiang and NW around the E side of the large hilly island Xiamen Dao.

Xiamen Port Authority

http://www.portxiamen.gov.cn

Winds—Weather.—Northeast winds predominate throughout the year. From May to August, SE or SW winds usually blow in the afternoon. July to September is the typhoon season.

Tides—Currents.—Tidal currents set NW on the flood current and SE on the ebb current in the E part of the outer harbor, and set W and E in that part of the outer harbor S of **Gulang Yu** (Ku-lang Hsu) (24°27'N., 118°04'E.).

In the channel W of Gulang Yu, tidal currents set N on the flood and S on the ebb, with a maximum rate of 2 to 3 knots at springs and 1 knot at neaps.

In Xiamen Nei Gang (Inner Harbor), the tidal currents set NW and SE at rates of 2 to 3 knots. Each current runs for about 6 hours. In the middle of the harbor, the NW flood current runs from 45 minutes before LW to 15 minutes after HW.

During the flood current, a strong E set may be experienced in the S entrance, and a W set may sometimes occur soon after the ebb current has begun in Xiamen Nei Gang.

Depths—Limitations.—Deep draft vessels await HW to transit the channel W of Gulang Yu, but may enter the E channel at any state of the tide.

The harbor draft limits are generally over 10m at HW and 8m at LW.

Aspect.—A light is shown from the NE point of Xiamen Dao. Ta-tan Tao, a high hilly islet with a low-lying center portion, lies on the W side of the S entrance to Hsia-men-tao-tung-ts’e and serves as a landmark for vessels navigating the principal channel.

Zhu Hangdao (Dongdu Hangdao) (24°27'N., 118°04'E.), the principal entrance channel, has a least depth of 11.8m as far as Xiang Bi (24°27'N., 118°02'E.). This channel passes between the small low above-water rock **Wutan** (Jih Hsu) (24°22'N., 118°08'E.) and Qing Yu (Ch’ing Hsu), lying about 1 mile to the SW, which rises steep-to on its channel side. A light is shown from the NE slope of Qing Yu. An outgoing current

sets strongly onto the island.

Zhu Hangdao passes W of Gulang Yu and has a least depth of 10.8m in the fairway leading N of Xiang Bi to the turning area 0.6 mile NNE of the Haicang Bridge (24°30'N., 118°04'E.); this bridge has a vertical clearance of 57m. The channel continues, with a least depth of 7.2m in the fairway, to the second turning area (24°32'N., 118°05'E.).

The channel from Xiang Bi to the Xiamen International Container Port, 2 miles W, has a least charted mid-channel depth of 11.2m.

Zhangzhougang Jingang Hangdao (24°24'N., 118°06'E.) leads from the vicinity of No. 19 Lighted Buoy and the pilot boarding area, 0.5 mile ENE, to the berths at Zhangzhou Gang (24°25'N., 118°03'E.).

Lujiang Shuidao, the channel passing E of Gulang Yu, has a least mid-channel depth of 7.6m.

There is a least swept depth of 10.5m in the channel for vessels passing W of **Hou Yu** (24°28'N., 118°03'E.). Care should be taken to avoid a shoal patch, with a depth of 8.6m, lying close ENE of Hou Yu. Power cables having a vertical clearance of 54m cross the channel N of this island.

The port is divided into three areas, as follows:

1. Donghu—the new harbor.
2. Xiamen—the old harbor, located on the SW tip of the peninsula facing Gulang Yu.
3. Gaoqi—the small craft harbor, located on the NW coast of Xiamen Dao.

The port contains more than 30 berths for vessels of various sizes, in addition to ten anchorage berths and five mooring berths. Heping Wharf, on the E bank of Xiamen Nei Gang, is used as an overseas passenger terminal. The channel to Heping Terminal is dredged to a depth of 16m. A fishing boat harbor can accommodate up to 100 boats of up to 2,000 tons.

Pilotage.—Pilotage is compulsory for foreign vessels and for Chinese vessels that are 230m in length and greater. Pilotage is available 24 hours. Vessels board pilots in the quarantine anchorage and, in general, enter Xiamen Nei Gang during daylight hours only. The ETA of the vessel and the request for a pilot should be sent 48 hours in advance on VHF channel 6.

Regulations.—Foreign vessels and vessels exceeding 500 tons must enter port through Quingyu Shuidao.

Vessels must keep to the main shipping channels. Permission must be obtained from the Taiwanese authorities prior to transiting any areas other than these.

Vessels of less than 500 tons, fishing vessels. and sailing vessels should use Wu'an Shuidao (24°20'N., 118°08'E.) although there are a number of unmarked dangers in this channel.

Vessel Traffic Service.—Xiamen Vessel Traffic Service (VTS) is in effect in an area delineated, as follows:

1. Within the area of an arc drawn having a radius of 12 miles from Zhenhai Light (24°16'N., 118°08'E.) and lying between the bearings of 011° and 230.
2. From the N coast of Jiulongjiang estuary along a line drawn due S on meridian 117°58'E to the parallel of latitude 24°26'N, then E to longitude 118°00'E, then S to the coast.

Participation is mandatory for the following vessels:

1. All foreign vessels.
2. Chinese vessels 300 grt or greater.
3. Vessels carrying more than 50 passengers; ferries are excepted.
4. Vessels carrying dangerous goods.
5. Vessels engaged in towing.

All other vessels are encouraged to participate in Xiamen VTS on a voluntary basis.

Xiamen VTS may be contacted on VHF channel 8 and by e-mail, as follows:

vtsxm@fjmsa.gov.cn

Anchorage.—Anchorage may be taken in depths of up to 29m in the SE approaches to Xiamen. Anchorage No.1 lies 4 miles SE of Qing Yu Light and has depths of 20 to 29m, mud; this anchorage is best seen on the chart.

The quarantine anchorage, Anchorage No. 4, serves as the pilot boarding area. This anchorage lies 2.5 miles NNW of Qing Yu Light, in depths of 8 to 12m, mud, good holding ground. The N and E limits of the anchorage are marked by lighted buoys. Caution should be exercised as the SE boundary of this anchorage adjoins a formerly mined area. This anchorage is best seen on the chart.

Anchorage No. 5 lies 1 mile SSW of Qizi Wei Light (24°26.5'N., 118°03.5'E.) and has depths of 6.8 to 11m.

Anchorage No. 7 lies 1.5 miles SW of Qizi Wei Light, in depths of 5.4 to 9m.

Good anchorage may be taken in the area lying 1.5 miles S of Qing Yu Light , in a depth of approximately 7m.

Caution.—Anchoring and fishing are prohibited in several charted areas containing submarine cables and also in several channels between the mainland and adjacent islands.

A prohibited area surrounds the floating dock in position 24°25.2'N, 118°01.2'E; this area is best seen on the chart.

9.18 Dongdu (24°30'N., 118°04'E.), a new facility, is situated on the W side of Xiamen Dao, 2 miles N of Xiamen Nei Gang. Vessels enter this new port area by taking the W approach channel, W of Gulang Yu, then pass E of Lighted Buoy No. 34 to E of Hou Yu Light, then adjusting course and turning N to pass W of the light on Manyu Jiao. Then passing W of Lighted Buoy No. 36 and E of Lighted Buoy No. 37, vessels proceed to the berths. An alternate channel, dredged to a depth of 10.5m, passes W of Hou Yu. The channel is marked by lighted buoys. Local authorities should be contacted for more details.

Depths—Limitations.—At Dongdu, there are four deep-water berths, with a total of 776m frontage and alongside depths of 10.9 to 12.6m. The general cargo Berth No. 4 handles vessels up to 10,000 dwt. Berth No. 3 handles break bulk cargo vessels of 15,000 dwt. Berth No. 2 handles bulk carriers up to 50,000 dwt. At the S end of the terminal, Berth No. 4 handles container vessels of 10,000 dwt.

At Donghu, port expansion is in progress for a container berth to handle vessels of 35,000 dwt, a coal wharf for vessels of 25,000 dwt, and two berths for 25,000 dwt general cargo carriers.

Aspect.—Xiamen Gang (Hsia-men Chiang) (Amoy Harbor), the harbor area for Xiamen, extends from the principal entrance between Wu-tan and Qing Yu to a line joining the SW extremity of Xiamen Dao with Sung-hsu Pan-tao, a hilly promontory close to the W.

Hsia-men Wai-chiang, the outer harbor, comprises all of Xiamen Gang not included in the inner harbor. Xiamen Nei Gang, the inner harbor, consists of the narrow, encumbered channel between Xiamen Dao and the well-populated islet Gulang Yu, as well as the N part of the channel passing W of Gulang Yu.

Dapan Jiao (Hsu-tzu Wei) (24°24.5'N., 118°04.0'E.) is a point on the mainland 3 miles NW of Zhenhai Jiao. Ji Yu (Chi Hsu), an island, lies about 3 miles WNW of Dapan Jiao. Yunding Yan (Hung-wan Feng) is a conspicuous peak lying about 2 miles NNE from the S point of Xiamin Dao. It reaches a height of 342m. Yen-tzu-ting (Riguang Yan), 90m high and prominent with boulders on top, is the summit of Gulang Yu. Hou Hsu (Hou Yu), 18m high, marked by a light on its summit, lies about mile NW of the N point of Gulang Yu.

Pilotage.—Pilotage is compulsory. Vessels board pilots in the quarantine anchorage and, in general, enter Xiamen Nei Gang only in daytime. The ETA of a vessel and the request for pilot should be signaled 48 hours in advance through Xiamen coast radio station.

Anchorage.—The outer anchorage is S of Gulang Islet and the Xiamen Peninsula. The pilotage and quarantine anchorage lies between Gulang Islet and Gangziwei, with a depth of 10m, mud and sand bottom.

Caution.—Numerous cables exist in the inner harbor. Care should be taken when anchoring.

A submarine pipeline is laid across Xiamen Nei Gang, 0.25 mile NW of Pang Shi.

A stranded wreck, dangerous to navigation, lies in approximate position 24°24’N 118°05’E.

Several wrecks, positions of which are best seen on the chart, has been reported (1998) in the vicinity of position 24°28’N, 128°03’E.

A submerged rock with depth of 4.7m lies in approximate position 24°25.4'N, 118°01.9'E.

The Haicang Bridge, with a vertical clearance of 55m, spans the channel between Xiamen Dao and Huoshan Yu.

An overhead power cable, with a vertical clearance of 57m, spans the channel between Huoshao Yu and Xiament Dao.

A dangerous wreck, hazardous to navigation, has been reported (1999) to lie in approximate position 24°28.1'N, 118°03.8'E.

An area, prohibited to anchoring and fishing, lies centered in position 24°32.3'N, 118°05.2'E, and has a radius of 140m.

Depths less than charted exist in the channel between Xiamen Gang and the turning area at the head of the passage.

Ships are advised to keep to the swept channel as mines in these areas may still present a hazard to navigation. Anchoring and fishing are prohibited in areas extending from position 24°26'N, 118°05'E, as follows:

1. An area 0.6 mile wide extending SW to Dapan Jiao.
2. An area about 0.5 mile wide extending SSE to the edge of the mined area, passing clear of the pilotage and quarantine anchorage, as shown on the chart.

Zhenhaio Jiao to Lien-hua-feng Chiao

9.19 Zhenhaio Jiao (Chen-hai Chiao) (24°16'N., 118°08'E.) is a low-lying point which rises to a lofty conspicuous summit about 5.5 miles NW. Zhenhaio Jiao Light is shown from the summit. A reef, which should be given a wide berth, extends 0.8 mile ENE of the point. Discolored and broken water has been reported to extend a considerable distance from the coast between Zhenhai Jiao and Dingtai Tou, 3 miles SW. A pair of range lights is shown from the N and S points of the headland at Zhenhai Jiao.

The coastline between the point and Lien-hua-feng Chiao, about 121 miles SW, continues irregular and much indented by numerous bays and inlets and several estuaries which, in general, are backed by a low to rolling well-cultivated coastal plain. Lofty hills and low mountains become more common near the S part of the coast. Offshore, the 10m curve tends to close the salient coastal points and to contain, with rare exception, the several scattered and isolated dangers to navigation.

The many bays and inlets offer shelter against monsoon winds. The principal harbor in the area is Shantou Gang.

9.20 Dongding Dao (Tung-ting Tao) (24°10'N., 118°14'E.), lying 8 miles SE of Zhenhai Jiao, is 55m high and steep-to. It is grassy on top and perforated at its S end; there is also a remarkable mound at each end of the island. A light is shown from the summit of the island.

Lanbai Qiantan (Rambler Shoal), a small patch with a depth of 8m, and Erjin Qiantan (Erl King), with a least depth of 5m, lie 3 miles and 5 miles NW of Dongding Dao.

Tidal currents near Dongding Dao, during the Southwest Monsoon, have been observed to set N during the flood tide at Xiamen, with a maximum rate of 1 knot; during the ebb tide at Xiamen, the currents near Dongding Dao set SW, with a maximum rate of 2 knots.

Caution.—Three unmarked dangerous wrecks lie approximately 17 miles and 19 miles E, and 21.5 miles SE of Dong-ding Dao.

Linmengao (North Merope) (24°11'N., 118°05'E.), 8 miles WNW of Dongding Dao, is a reef of pinnacle rocks, the highest of which dries 2.4m; the sea breaks on this reef, which is marked close E by a lighted buoy.

Nanding Dao (Lamtia Island) (24°08'N., 118°02'E.), 4 miles SW of Linmengao and marked by a light, is 60m high and appears yellow in color when seen at a distance; a racon transmits from it.

The island has a round top and the S side is very steep.

Nan Sha (South Merope) (24°06'N., 118°06'E.), 4 miles ESE of Nanding Dao, is a shoal with a least depth of 1.3m; depths of less than 9m extend 5 miles from it.

9.21 Jiangjun Tou (24°02'N., 117°54'E.), 19 miles SW of Zhanhai Jiao, is the E extremity of a headland. Zao Shan, 578m high, stands 6 miles NW of Jiangjun Tou and is a good landmark. A light is shown on Jiangjun Tou.

Black Point (24°00'N., 117°49'E.), 5 miles WSW of Jiangjun Tou, is dark, table-topped, and rugged. A remarkable peaked sandhill lies 0.8 mile W of the point.

Jiangjun Ao (Red Bay), lying between these two points, is backed by low red sand hills.

Anchorage.—Anchorage can be obtained by small vessels during the Northeast Monsoon, but the N part of the bay is shoal.

Biao Jiao (23°55'N., 117°52'E.), about 5 miles E of Da’ou Jiao and marked by a light, is an isolated 18m high rock with a large boulder on its summit.

Caution.—Islets and submerged dangers extend up to 2 miles seaward of the coast between Jiangjun Tou and Da'ou Jiao, about 5 miles SW.

9.22 Futou Wan (23°51'N., 117°42'E.) is a large shoal basin entered between Da'ou Jiao and Xingzi Jiao (Hsing-tsu Chiao), about 8 miles further SW. Lishi Hangmen is a narrow, deep water channel passing between Lishih Chiao and the partially examined off-lying barren islet group Lishi Liedao.

Vessels seeking shelter from strong N winds may anchor, in 7.3 to 11m, 0.4 mile SW of Da'ou Jiao, the SE extremity of the peninsula forming the E side of Futou Wan.

Anchorage is also available in a depth of 11m, 0.9 mile SW of the same point. They also anchor, in 11m, in Lishi Hangmen, with the S extremity of the NW islet of Lishi Liedao bearing E, distant 1 mile.

Dongshan Wan (T'ung-shan Chiang) (23°46'N., 117°32'E.) is an excellent storm refuge with entrance between the steep-to, rock-fringed headland **Gulei Tou** (Ku-lei Tou) (23°43'N., 117°34'E.), reported radar conspicuous at about 32 miles, and a point about 3 miles WNW. A light is exhibited 0.2 mile within Gulei Tou.

Ta Yu, a hilly islet with a low-lying center portion, lies about 2 miles WNW of Gulei Tou. The several rock and mud-fringed islets Huyu Dao and the islet group Tsu-mei Lieh-tao lie 2 miles NW and 3 miles N, respectively, of the same point.

Pilotage.—Pilotage is compulsory for foreign vessels. Pilots board in position 23°44'N, 117°34'E.

Anchorage.—Anchorage can be obtained between the N end of Ta Yu and Youshui Yan, about 0.7 mile NE of Ta Yu, in depths of about 25 to 30m, mud and sand. In this position the tidal currents have a rate of 1 knot, and a heavy swell may be experienced. Vessels should use caution.

9.23 Dongshan Dao (Tung-shan Tao) (23°40'N., 117°25'E.) is a large rather low well-cultivated island. Close within **Yuanzhui Jiao** (Cone Point) (23°40'N., 117°29'E.), about midway down the E side of the island, stands the prominent cone-shaped peak of Sufeng Shan, 273m high.

The bay SW of Yuanzhui Jiao is separated from Zhaoan Wan by only a low sandy isthmus.

Shi Yu (23°35'N., 117°27'E.), about 5.5 miles SSW of Yuanzhui Jiao, is 45m high. The passage between it and Dongshan Dao, 0.8 mile NW, is clear. A light is exhibited at an elevation of 55m on the N end of the island. Tidal currents attain a rate of 1 to 2 knots and form tide rips.

The S shore of the island, consisting of several bights and headlands, extends W from **Chou-k'o-k'o Chiao** (Jokako Point) (23°36'N., 117°26'E.), the hilly, precipitous SE extremity of the island. Chengzhou Dao is a hilly islet lying in the entrance to Zhao'an Wan (Chao-an Wan), a large shoal bay defining the W side of Dongshan Dao.

Anchorage.—Off the S coast of Dongshan Dao, anchorage can be obtained in the bay W of **Hou Jiao** (23°34'N., 117°22'E.), the extremity of a small peninsula rising to 32m, in a depth of 6.4m, mud, with a 3m rock close S of the point bearing 135°. This anchorage is sheltered from N winds, but is unsafe with S winds. The bay should not be approached with a depth of 9.1m after dark, as the distance from land is deceptive.

A dangerous wreck lies 6 miles S of Shi Yu.

Anchorage can also be obtained 1 mile W of **Long Yu** (23°34'N., 117°25'E.), in depths of 12 to 16m, mud. The anchorage is sheltered from N and E winds, but is open to the swell.

9.24 Zhao'an Wan (Chao-an Wan) (23°37'N., 117°17'E.), entered between Zhaoan Tou and Gangkou Tou, about 5 miles WNW, affords good shelter during the Southwest Monsoon, but in the Northeast Monsoon a short, steep sea arises when the wind is strong and makes the anchorage uncomfortable. The bottom is soft mud and the holding ground is bad.

Zhelin Wan (Che-lin Wan) (23°36'N., 117°03'E.) is a shoal bay entered between **Ch'en-ch'i T'ou** (Fort Head) (23°33'N., 117°05'E.), the S extremity of a rather high headland joined to the mainland NE by a sandy isthmus, and two hilly, larger islands to the W. A narrow, deep water channel leads NE of the high barren rock Ch'ing Hsu and then into the bay between the hilly, smaller islands Hsin-chou Shan and Che-lin Tao (Hsi-ao Shan).

Vessels, seeking shelter from NE and SE winds, steer for the NW side of Hsin-chou Shan on a heading of 326° so as to pass about 0.2 mile NE of Ch'ing Hsu. When the rock bears SSE, distant about 1 mile, alter course to starboard and steer 340° to the anchorage.

Anchorage.—Vessels anchor, in 9 to 11m, mud bottom, in a position within the deep water channel with the NW extremity of Che-lin Tao bearing 064°. The maximum rate of the flood and ebb currents in the entrance to the bay is 2 knots at springs.

Caution.—A stranded wreck, marked by a light, lies about 2 miles SE of the E entrance point of Zhelin Wan.

9.25 Nan'ao Dao (23°26'N., 117°03'E.) is a large, mountainous, and barren but well-inhabited island which is reported radar conspicuous at about 20 miles. It has numerous above and below-water dangers extending about 8 miles S and SE from the SE extremity of the island. A clear, deep water channel passes along the N and W sides of the island. Vessels entering the channel from the E usually pass N of the drying reef Liu-niu Chiao. The island has several prominent summits of over 500m; at its SE point there is a bold headland rising to an elevation of 118m. A light is shown from the SE coast of the island.

Vessels seeking shelter from winds of the Southwest Monsoon season anchor, in 9 to 11m, good holding ground,, within Ch'ang Shan Poti, a roadstead lying within the deep water channel off the W side of Nan'ao Dao.

The tidal currents N of Nan'ao Dao run parallel to the coast at a rate of 1 to 3 knots.

Anchorage.—Anchorage No. 1 lies approximately 4 miles SW of Nan'ao Dao and has a minimum depth of 13.4m. Anchorage No. 2 lies approximately 2 miles off the NE coast and has depths ranging from 7.8 to 11.4m.

Caution.—An unexploded depth charge is reported to lie 2 miles E of the NE point of Nan'ao Dao.

Large fishing stakes exist off the coast.

An exposed wreck, marked by a lighted beacon, lies in the channel 2.5 miles N of Nan'ao Dao.

Zhisong Yan (Gibson Rock) (23°26'N., 117°18'E.), 8 miles E of the NE point of Nan'ao Dao, has a depth of 5.6m.

Chi-hsing Chiao (23°29'N., 117°14'E.), a group of rocks 1.5

to 2m high, lie 4 miles NW of Zhisong Yan; from E and W they appear as large boulders some distance apart. There is a detached drying rock lying 3 miles farther NW, which vessels usually pass N of when using the channel N of Nan'ao Dao.

Shantou (23°22'N., 116°41'E.)

World Port Index No. 57860

9.26 Shantou (Shan-t'ou) (Swanton) is a densely populated metropolis on the E bank of a branch of the river Han Chiang, located at a distance of about 5 miles from the river entrance. Shantou Gang, the harbor area within the estuary, is entered through a narrow channel about 6 miles NNW of Biao Jiao (Hao-wang Chiao), the NE extremity of a hilly peninsula.

Tides—Currents.—The tide is irregular and considerably influenced by prevailing winds. East winds, with a velocity greater than 10 knots, may cause higher water levels, later HW, and earlier LW than predicted. West winds tend to have the opposite effect. Tidal rise may amount only to 0.6 to 0.9m for a number of days during the Southwest Monsoon season. After 1 or 2 days of calm, the water level falls, with the consequence of more water than charted usually found on the bar.

Tidal currents set directly through Luyu Shuidao (Te Chou Men), the entrance channel to Shantou Gang, except during the ebb current, when a branch sets along the N side of **Lu Yu** (23°19'N., 116°46'E.), 57m high, lying in the entrance to Shatou Gang. The flood current occurs from 1 to 2 hours after LW until 1 to 2 hours after HW; the ebb current occurs from one to two hours after HW until 1 to 2 hours after LW. Eddies form NW of Lu Yu, particularly with the flood current.

The flood current within the anchorage off Shantou occurs from 1 hour 30 minutes after LW until 45 minutes after HW; the ebb current occurs from 45 minutes after HW until 1 hour 30 minutes after LW. The current on the S side of the anchorage turns before that on the N side. The flood current attains a rate of 2 knots, while the ebb current can attain a rate of 4 knots.

Depths—Limitations.—The least depth over the bar is 9.1m, with the range lights aligned bearing 322°; however, depths of from 6.3m, a dangerous wrectk, and the 5m curve lie close to this alignment. The main channel continues to the harbor, with a least depth of 8.2m.

Depths in the approaches to Shantou Gang are subject to change. The sea breaks heavily on the bar after strong winds.

Luyu Shuidao, the entrance channel to Shantou Gang, passes W of Lu Yu. It extends about 8 miles, has a minimum width of 0.15 mile, and depths in the fairway of 7.8 to 27m, mud and sand bottom.

A vessel with a draft of 6m must enter on the high tide, but a vessel with a draft of 4m can usually enter and depart anytime.

There are two berths for 5,000-ton ships, one for 3,000-ton ships, one coal berth for 3,000-ton ships, and one overseas passenger terminal for ships up to 5,000 tons.

Mooring buoys off the wharves can secure two 10,000-ton ships, two 5,000-ton ships, one 2,000-ton ship, and one 1,000-ton ship.

The **Shantou Bay Bridge** (23°20'N., 116°45'E.) has a vertical clearance of 46m. The Dangshi Bridge, 4.8 miles W, has a vertical clearance of 38m.

Two new berths are under construction for vessels of 5,000 tons. In Tuolin Bay, two anchorage-lighterage berths are being made available for vessels up to 16,000 dwt.

Plans for a major port development at **Guang'ao** (23°14'N., 116°47'E.), S of Shantou, are underway and include construction of 22 berths for vessels of between 20,000 and 1,000,000 dwt. Range lights, aligned 359°52', lead into the bay.

Aspect.—Biao Jiao (23°14'N., 116°48'E.) is the steep-to E extremity of a hilly peninsula. A light, from which a radiobeacon and a racon transmit, is exhibited on Biao Jiao. Leikou Shan, the highest summit on the peninsula, is flat-topped and conspicuous from the SW. Biao Jiao is reported radar conspicuous at about 22 miles and is apt to be confused in thick weather because of a similarity in summits and sandy beaches, with Haimen Jiao, a point about 10 miles WSW.

Shuan Sha (The Bar) lies between Chi Yu, a low-lying islet about 2 miles NNW of Biao Jiao, and Tai-hsia-chin Sha-tsui, a shoal sand spit which, marked by heavy breakers after strong winds, lies with its S extremity about 1.8 miles NNW of Chi Yu. A light is exhibited on Chi Yu.

Inside the bar, the narrow deep water channel Luyu Shuidao leads into the harbor S of Lu Yu and Ma Yu, two hilly islets. On the E part of Lu Yu, a light is exhibited; in the middle and W parts, there are lights in line bearing 127°, astern. A light is also exhibited on the E peninsula of Ma Yu. The channel N of the islets is navigable by small craft.

Niang Jiao (23°19'N., 116°50'E.), a rock with a least depth of 2.3m, lies on the N side of the approach, 3 miles NE of Chi Yu. A lighted buoy is moored about 0.5 mile S of the rock.

Pilotage.—Pilotage is compulsory. Vessels board pilots, as follows:

1. Pilot and Quarantine Anchorage (23°17'N., 116°48'E.)
2. Anchorage No. 1 (23°21'N., 117°00'E.)
3. Anchorage No. 2 (23°30.5'N., 117°05'E.)
4. Haimen Wan (23°07.4'N., 116°36.0'E.)
5. Explosives Anchorage (23°20.9'N., 116°41.8'E.)
6. In position 23°15.3'N. 116°50.9'E.

The ETA of a vessel, and the request for a pilot, should be sent 48 hours in advance through Shantou Gang.

Signals.—Storm signals are displayed from a flagstaff near the conspicuous Customhouse when a typhoon is within 100 miles. When a gale or typhoon is expected to strike the port, the following additional signals are hoisted:

Day	Night	Meaning
One black ball	One red light	Gale
Two black balls	Two red lights	Typhoon

Anchorage.—The pilotage and quarantine anchorage is situated E of Chi Yu, in a depth of about 6.5m. The above mentioned anchorage is the quarantine anchorage No. 1 of this port. Quarantine Anchorage No. 2 and Lower Reach Anchorage are situated between Lighted Buoy No. 1 and Lighted Buoy No. 2, lying 0.75 mile NNW of Ma Yu, and Lighted Buoy No. 3 and Lighted Buoy No. 4, lying 2 miles WNW of Ma Yu.

Upper Reach Anchorage occupies that portion of the harbor extending from S of Shantou to **Gui Yu** (23°20.3'N., 116° 38.4'E.); the W part of this anchorage is used for tankers.

These anchorages can be used to ride out typhoons and provide 11 berths for moderate-size vessels lying at anchor or working cargo, in depths of from 5 to 13m, mud bottom.

Caution.— A dangerous wreck, marked by a lighted buoy, lies about 1.5 miles ENE of the light on Biao Jiao. A wreck, dangerous to navigation, lies about 0.75 mile NE of Chi Yu; a stranded wreck lies almost 1.5 miles N of Chi Yu. A dangerous wreck lies almost 2 miles E of the stranded wreck, while an obstruction with 1.6m, lies close N of the stranded wreck.

Shibeishan Jiao to Ta-p'eng Chiao

9.27 Shibeishan Jiao (22°56'N., 116°29'E.), about 25 miles SW of Biao Jiao, is a low rock-fringed sandy point that rises close inland to a rounded hill about 114m high.

A light is shown from a height of 68m and a racon transmits from the light structure on Shibeishan Jiao.

The coastline between the point and Ta-p'eng Chiao, about 115 miles WSW, is irregular and indented at fairly equal intervals by a series of bights and bays. Inland, the terrain is low-lying for about half of the distance along the coast and then, rising in the remaining half, hilly and mountainous. The shore line throughout has extensive sandy beaches backed in places by areas of sand dunes.

Offshore, the 20m curve continues to close the salient coastal points and to contain, with few exceptions, the several scattered and isolated dangers to navigation.

The several bays indenting the coast are largely of importance as anchorages during the monsoon seasons.

Shenquan Gang (22°57'N., 116°18'E.) is an open roadstead lying within the larger of two bights indenting the coastline between Shibeishan Jiao and Jiazi Jiao. Mianqian Qunjiao, a rock with a depth of 1.6m, lies 3 miles SE of Shequan Gang.

Shenquan (22°58'N., 116°09'E.) is a village situated about 8 miles WNW of Shibeishan Jiao. The village is on the E entrance point of a river with a bar on which the sea breaks at LW. A pagoda stands on a hill 2 miles N of the village.

Aspect.—A conspicuous square stone stands on the shore about 3.8 miles W of Shibeishan Jiao. A pagoda stands in a village on the E entrance point of a river entering the sea about 11.5 miles W of Shibeishan Jiao.

Anchorage.—Anchorage can be obtained at Shenquan Gang during the Northeast Monsoon, in a depth of 9.4m, with the pagoda bearing 348°. The holding ground is good, but there is often a heavy swell.

9.28 Jiazi Jiao (22°49'N., 116°06'E.), 14 miles SW of Shenquan Gang, is prominent with a rugged summit where a light stands at a height of 78m. Several islets and rocks extend S and SE of Jiazi Jiao and the point should be given a wide berth. Dongbaijiao, a rock 5.4m high, is the outer exposed danger and lies 1 mile S of the point. Rocks, with depths of less than 5.5m, extend 1 mile ENE of Dongbaijiao.

Black Mount (22°52'N., 116°09'E.), a 56m high conspicuous black conical hill that can often be seen at night, rises from surrounding red sand dunes about 4 miles NE of Jiazi Jiao.

Vessels, seeking shelter from winds of the Northeast Monsoon season, steer not greater than 320° for the square rock W of Shibeishan Jiao, so as to pass W of above and below-water dangers, and anchor, in 10.1m, about 0.5 mile WSW of a 15.8m islet, about 2 miles W of Shibeishan Jiao. They also anchor, in 9.4m, good holding ground, with the pagoda at the river entrance W of Shibeishan Jiao bearing 348°. A heavy swell often sets into the anchorage from the S.

Caution.—A dangerous wreck (22°44.2'N., 116°06.8'E.), lies about 5 miles S of Jiaze Jiao.

9.29 Jiazi Gang (Chia-tzu Kang) (22°51'N., 116°04'E.), with a shallow bar at its entrance, is situated 2 miles NNW of Jiazi Jiao. Wu Jiao, lying in the approach to the harbor, is 2m high; other rocks fringe the coast to the W. A light is shown from a white, round masonry structure at the head of a breakwater (22°50.5'N., 116°04.5'E.).

During the Northeast Monsoon, small vessels can obtain anchorage about 0.6 mile SSW of Wu Jiao, in a depth of 9m, but there is usually a heavy ground swell. The currents in the anchorage set NE at a rate of 1 knot on the flood and SE at a rate of 1.5 knots on the ebb.

Hudong Jiao (Hutung Chiao) (22°48'N., 115°57'E.) is situated about 8 miles E of Jaizi Jiao; on it there is a fort and a prominent dome-shaped building resembling a beehive. A rock, peculiar in shape when seen from the E, lies close off a small islet 1 mile SE of Hudong Jiao.

Heiyan Jiao (Black Rock Point) (22°47'N., 115°54'E.), which is distinguished by a conspicuous mound 32m high close NW of it, lies about 3 miles W of Hudong Jiao. The coast between Heiyan Jiao and **Tianwei Jiao** (Tien-wei Chiao) (22°45'N., 115°49'E.), about 5 miles WSW, is a sandy plain.

Jieshi Wan (Chieh-shih Wan) (22°46'N., 115°40'E.) is a bay of quite regular dimensions, whose flat sandy shore is densely populated and whose approaches in moderate weather are crowded with fishing craft. Tianwei Jiao, the E entrance point, is the S extremity of a promontory which, rising to a sharp, conspicuous summit about 1 mile NW, is reported radar conspicuous at about 15 miles. It is marked by a light.

The E part of the bay, between Tainwei Jiao and Jinxiang Jiao, a conspicuous 48m high hillock about 9 miles NW, is encumbered with several remarkably precipitous rocky islets, rocks, and shoals; these shoals are not always visible due to the muddy color of the water.

Xijie Jiao (Hsi-chieh Chiao) (Siki) (22°42'N., 115°47'E.), lying 3 miles SW of Tianwei Jiao, is a rugged islet 14m high with two granite hummocks. A rock, with a depth of 5.5m, lies 0.5 mile NW of Xijie Jiao.

9.30 Dongjie Jiao (Tungki Rocks) (22°46'N., 115°50'E.), a group of black rocks up to 7m high, lies about 1.2 miles SE of Tianwei Jiao; the passage N of the rocks should not be used.

Bi Tou (22°45'N., 115°36'E.), situated about 8 miles SW of Jinxiang Jiao, is the NE extremity of Baisha Bandao, a hilly peninsula connected to the mainland SW by a narrow sandy isthmus. A number of drying rocks extend up to 0.5 mile off the coast between Bi Tou and Zheling Jiao, about 6 miles SSW.

Jin Yu (22°43'N., 115°37'E.), 38m high, with a precipitous rocky summit at its N end, lies on the W side of the entrance to the bay, about 3 miles SSE of Be Tou.

Zhelang Jiao (Che-lang Chiao) (22°39'N., 115°34'E.), the W entrance point of Jeieshi Wan, is marked by a light. The point is the S extremity of a rather low, rocky finger of land which, reported radar conspicuous at about 16 miles, is re-

markable for its areas of red sand and black mounds extending for some distance on either side of the point. A conspicuous boulder, on which there is a white-washed mark, is located at an elevation of 31m, 0.2 mile N of the point. A wreck, in 16m of water, is in position 22°31'41"N., 115°54'42"E.

Anchorage.—Anchorage, protected from all but S winds, can be obtained in Jieshi Wan by choosing a berth on either side of the bay according to the prevailing monsoon; however, vessels of deep draft must anchor well out in the bay.

Shallow draft vessels can obtain anchorage NW of Bi Tou, protected from S winds; and during the Northeast Monsoon in a position 2 miles NW of Tianwei Jiao, or in a position about 0.8 mile W of a prominent block of granite, with an elevation of 18m, which stands on a hillock near the shore about 3 miles N of Tianwei Jiao. The latter anchorage should be approached with the block of granite bearing 075°, to clear the dangers on each side.

Small vessels, with drafts of less than 3m, can anchor 0.5 mile NW of Jinxiang Jiao.

Anchorage with good holding ground and sheltered from the Northeast Monsoon, may be obtained about 0.2 mile W of Zhelang Jiao, in depths of 11 to 12.8m, sand and mud, in a position with the conspicuous boulder N of Zhelang Jiao bearing 044° and with the lighthouse standing on an islet close S of Zhelang Jiao bearing about 132°. Tidal currents are strong in the anchorage.

Caution.—The swell is felt throughout the bay during the Northeast Monsoon. During moderate weather, the bay and its approaches are crowded with fishing boats.

9.31 Honghai Wan (Hung-hai Wan) (22°40'N., 115°10'E.) is a large islet-encumbered, shoal bay lying at the head of an extensive bight which recedes inland between Zhelang Jiao and Fu-chi Chiao, about 37 miles WSW. A light is exhibited 0.5 mile NNW of Fu-chi Chiao. The bay is but partially examined, often crowded with fishing craft in fair weather, and commonly under the influence of a long ground swell. Strong tidal currents are reported to set N and S according to the state of the tide. The tidal range is slight.

Numerous dangers lie off the coast between Zhelang Jiao and Saozhou Wei (Chou-pa Wei), about 10 miles W.

Shui-ya Shih (Flat Rock), 6m high, lies 1 miles W of Zhelang Jiao.

9.32 Daya Wan (Ta-Ya Wan) (22°37'N., 114°40'E.) is a large islet-cluttered, deep water bay whose shoreline, backed throughout by mountainous terrain, recedes inland in an irregular series of lesser bays and inlets which form the major portion of a considerable coastal embayment.

Depths—Limitations.—A pier extends from the Guanzhou Petrochemical Complex on **Mabian-zhou Island** (22°40.2'N., 114°39.3'E.). The pier is approached through a 175 to 205m wide buoyed channel, which has a controlling depth of 16.1m.

Pilotage.—Pilots may be boarded in the following positions:

1. 22°23'N, 114°49'E.
2. 22°30'N, 114°46'E.
3. 22°33'N, 114°41'E.
4. Anchor Berth No. 8 (22°29'N., 114°42'E.) for oil tankers greater than 100,000 tons but less than 150,000 tons.
5. No. 7 Tanker Anchorage (22°32'N., 114°41'E.) for oil tankers greater than 30,000 tons but less than 100,000 tons.
6. No. 6 Tanker Anchorage (22°35'N., 114°40'E.) for oil tankers greater than 10,000 tons but less than 30,000 tons.
7. Anchor Berth No. 4 (22°36'N., 114°38'E.) for oil tankers and liquified gas carriers less than 10,000 tons.
8. Anchor Berth No. 3 (22°36'N., 114°36'E.) for cargo vessels less than 10,000 tons.
9. Position 22°34'N, 114°36'E for Daya Bay Nuclear Power Plant.

Anchorage.—Two anchorages lie on the E side of Daya Wan. The LNG Anchorage lies centered approximately in position 22°30.5'N, 114°28.0"E. Anchorage No. 2 is located about 1 mile N of the LNG Anchorage.

9.33 Ta-ya Chiao (Daya Jiao) (22°35'N., 114°45'E.), the E en-trance point of the bay is the W extremity of a small peninsula with three peaks; the E and highest peak has an elevation of 116m. A rocky ridge extends 0.6 mile SSW from Ta-ya Chiao; two rocks, 4m and 12m high, lie near the outer end of this ridge.

Fa Shan, 89m high and wooded, lies 1.2 miles W of Ta-ya Chiao. A bare 17m high rock lies 0.3 mile further SE. Foul ground extends 0.2 mile N of Fa Shan; a rock awash lies 0.6 mile NNE of Fa Shan.

Caution.—Vessels should not use the channel between Ta-ya Chiao and Fa Shan.

9.34 Pi-chia Chou (Triple Islet), 45m high at its S end, lies on the outer edge of a coastal bank, 2 miles NNW of Ta-ya Chiao and 0.6 mile offshore. Good anchorage may be obtained W of Pi-chia Chou in the Northeast Monsoon, in a depth of 11m, or anywhere on the E side of Daya Wan, according to draft.

Ta-liu-chia Tao (Lokaup Island) (22°35'N., 114°39'E.), about 2.8 miles NE of Hsi-chi Chiao, the W entrance point of Daya Wan, is the southernmost and largest of a group of islands extending N into Daya Wan. This island has three summits, the highest of which rises to an elevation of 111m in its N part.

Anchorage.—Anchorage may be obtained on either side of the island, according to the direction of the wind.

9.35 Ta-p'eng Ao (Tai Pang Wan) (22°35'N., 114°30'E.) lies at the head of a large bay in the SW part of Daya Wan.

The bay, although restricted by a coastal bank with depths of less than 5m, affords good anchorage to moderate-sized vessels, sheltered from all but E winds. Vessels entering the bay should keep to the S side of the bay.

Hsi-hi Chiao (22°33'N., 114°36'E.), the W entrance point of Daya Wan, is 48m high.

Teng-huo-pai (Middle Rocks) (22°31'N., 114°41'E.), which dry 1.8m, lie 3.3 miles of Hsi-chi Chiao. A rock, with a depth of less than 2m and on which the sea breaks, lies 0.3 mile SW of Teng-huo-pai.

9.36 Huizhou (22°42'N., 114°34'E.), located in Daya Wan, is primarily an industrial product port which handles steel, petroleum, and chemical products. Vessels of up to 160,000 dwt with a maximum draft of 19.8m can be accommodated.

Pilotage.—Pilotage is compulsory for foreign vessels. Pilots

board in the following positions:

1. Huizhou Port—position 22°31'30″N, 144°44'48″E.
2. Daya Bay Nuclear Power Plant—position 22°34'20″N, 144°36'05″E.

Tuoning Liendao (22°27'N., 114°38'E.) is a group of islands S of Hsi-chi Chiao that is separated from the mainland by a deep clear channel 1.5 miles wide.

Sanmen Dao (22°28'N., 114°38'E.), 301m high, with a conical summit at its S end, is the N islet of the group. Islet and rocks, with foul ground around them, extend about 1 mile W from the N extremity of Sanmen Dao.

Kuel-wan, 52m high, with Ta-heng Chou, a smaller islet, 42m high, 0.15 mile W of it, lie between To-ning Tao and Xiaosanmen Dao, 84m high, 1 mile to the SE.

Anchorage.—The best anchorage is in Sanmen Po-ti (Sanmen Road), W of the S extremity of Kuel-wan, in depths of 13 to 15m, sheltered from all winds except from SW or S.

During SW winds, there is anchorage off the N side of Sanmen Dao, in depths of 16 to 18m, and also NE of Kuel-wan, in depths of 18 to 22m.

9.37 Qing Zhou (Single Islet) (22°24'N., 114°40'E.), with a rounded summit 91m high, is the S islet of Tuoning Liedao and lies 1 mile SSE of Xiaosanmen Dao. A light is shown from Qing Zhou.

Akong, a remarkable pyramidal rock 30m high, lies 0.6 mile NE of Qing Zhou, with deep water reported between. A rock, with a depth of 4.5m, and which rises abruptly from a depth of 24m, lies 1 mile NE of Akong; an 8m depth lies about a mile N of the 4.5m patch.

Dapeng Jiao (Mirs Point) (22°27'N., 114°30'E.), about 8 miles WSW of Hsi-chi Chiao, is a reef-fringed steep-sided point which rises to an elevation of 391m close inland. A rock, 15m high, lies close off the point.

Anchorage.—Dapeng Wan quarantine anchorage lies in position 22°25'N, 114°34'E.

The coast W of Dapeng Jiao is described in Pub. 161, Sailing Directions (Enroute) South China Sea and Gulf of Thailand.

Chinese

CHINESE	English
A	
ai	a saddle between hills
an	embankment, shore, cliff, coast riverbank
an-chiao	submerged rock, reef
ao	bay, cove, inlet, dock
C	
cha	lock, dam, flood barrier
chai	camp, house
chan	railroad station
chang	mountain
chao	bog, marsh
chau	island, islet(s)
ch'e-chan	railroad station
chen	town, market town
ch'eng, chin	town, city, walled town
chi	obstruction, ledges in river
ch'i	stream, point, river, head, cape, mountain, seven
chia	cape, bluff, point
ch'ia	custom's barrier
chiang	bay, harbor, inlet, sound, lagoon
chiang-k'ou	estuary, stream, anchorage, river, shoal
chiang-tao	channel, strait, sound, river mouth
chiao	point, cape, promontory, headland, reef, rock, bank
ch'iao	bridge
chien	mountain, peak, island
ch'ien	shallow, shoal, rock
ch'ien-lai	bank, shoal
ch'ien-t'an	sandbanks; bank, shoal
ch'ien-tui	bank
ch'ih	lake, pool, pond
chih-chiang-tao	reach
chih-k'ou	river mouth
chih-liu	channel, tributary
ching	capital city, isthmus, ford, ferry
chiu	nine
chou	island, bank, islet, shoal
chow-chow	rippling and swirling water
ch'uan	stream, river
chuang	village
chueh	cape, point
chung	middle, center, mountain
chung-yuan	mainland
ch'un-tao	archipelago, group of islands
E	
erh	two
F	
fang	hamlet, house, shore, street
feng	peak, mountain, hill
fon	wind
fou	port
fow fu	buoy
fu	province, capital, peak
H	
hada	mountain
hai	sea, gulf, ocean
hai-ching	strait, channel
hai-hsia	do
hai-kau	bight, creek
hai-k'ou	channel entrance
hai-pin	seashore, beach
hai-tao	island
hai-wan	bay, gulf
hang	dry
hang-lu	fairway
hang-men	pass navigable to ships
hao	ditch, crane
hei, heh	black
hiang tsun	village
ho	river, waterway
hoi	channel, bay, anchorage, inlet
ho-k'ou	river mouth
ho tun	lighthouse
hsi	west, mountain, stream, swamp
hsia	strait, gorge, lower
hsiang	rural area, village
hsiao	small
hsien	district, district capital, steep hill
hsin	new
hsu	islet(s), island, village
hsuan	eddies
hu	lake, reservoir
huang	yellow
hung	red, desert
K	
kan	dry, harbor, port
kang	mound, hill, bridge
kao	high
kao-chiao	promontory
kao-yuan	plateau
khi, ki	river
king	capital, city
kok	point, corner, angle, horn, peninsula
kou	stream, ravine, gully, ditch
k'ou	bay, cove, inlet, river mouth, mountain pass
ku	valley, gorge
ku-k'ou	ravine
kuan	barrier, customs
kuo	country, kingdom, state
kwai	cliff
kwan	customhouse

CHINESE	English
L	
lai	shaol, submerged rock
lan	blue, marketplace
lao	old, tower
leng	chain of hills, mountain pass
li	inner, one-third of a mile, gravel, shingle
liao	distant
lieh-hsu	reef
lieh-tao	group of islands, islands
lieh-yen	group of rocks
lin	forest
ling	chain of hills, mountain pass, mountain, mountain range
liu	stream, current, six
lu	road
M	
mao-ti	anchorage
ma tao	jetty, strait
men	gate, pass, entrance, channel
miao	temple
miu	bay, cove
mu	a wood, trees, grave
N	
nan, nam	south, southern
nei, nui	inner
nei-ao	basin
ngam, ngaam	point, cliff, rock
n'i	mud
P	
pa	embankment, quay, eight
pai, peh	rock, shoal, islet, white
pan-tao	peninsula
pao	hill, town, village, rampart
p'ao-t'ai	fort
pei (peh, pak)	north, northern
peng	stream, creek
pi	point, cape, nose
piao	rock, islet
ping-chou	level shoals
p'o	arm of the sea, port, sound
po-ti	anchorage, roadstead
p'u	citadel, commercial village, inlet, creek
pwang shih	rocks
S	
sampan	boat
san, (see shan)	three
san-chiao-chou	delta
sha	sand, sandbank, sand island, low sandy point, sand cay
sha-chiao	sandspit
sha-ch'iu	sand dune
sha-kan	banks
shan	hill, mountain, island
shang	upper
shan-hu	coral
shan-hu-chiao	coral reef
shan-mo	mountain range
shan-sha	bar, sandbar
shan-t'ien	mountain summit
shan-tau	bluff, cliff, island
shan-tzu	island
shao	upper, small, few
sha-sien	shoal
sha-t'an	sandy shoal, sandflats
sha-tsui	sandspit
sha-tui	sandbank
she tan	reef
shen	deep
sheng	province
shih	stone, rock, hill, ten, city, market
shih-t'ai	ridge of rocks
shih-ti	swamp
shu	tree
shu-lin	forest
shuan-chou	bar
shui	small river, water, stream
shui-kuan	customs
shui-lu	channel passage
shui-tao	reach, channel, strait, passage
si	west, western
sia	lower
siao	small, little
siao ho	small river, rivulet
sing	spring
so	town, village
ssu	temple, monastery, four
su (also, see hsu)	island, islet
T	
ta	great, large
t'a	pagoda
tai (also, see tui)	plateau
tam	cove, pool, lake
tan, t'an	rapids, shoal, bar, bank flat
tang, t'ang	pond, embankment, canal, stream
tang lao	lighthouse
tao	island, island group, road, paddy field
t'ao	bay
tao tu	clay
tao-tzu	islet
teng lao	lighthouse
than	rapids
ti	low, point, cape, head, embankment, dike, earth, ground
t'ien	arable land, field, swamp
ting	peak, summit
t'o	stone, rocky eminence
to mu	wooded
tong	cove, pool, lake, bay
t'o-tzu	stone, rocky knob, islet
tou or t'ou	cape, headland, point
tsi	ravine

CHINESE	English
tsui	cape, point, spit, mouth
tsui sha	gravel
ts'un	village
tu	ferry, ford
tui	sandbank, bank
tung	east, eastern, mountain
tui-tsui, see tui	bank, spit

W

wa	swamp
wai	outer
wan	bay, gulf, bend in river
wei	headland, walled town, bay, cove
wen	rock

Y

yai	cliff
yang	bay, inlet, wide water, ocean
yeh	moorland
yen	embankment, rock, reef, dike, cliff
yen-ch'ang	salt works
yen-t'an	salt pan
yen tun	beacon, buoy
yu	island, islet
yun-ho	canal

Korean

KOREAN	English
A	
ae	cliff
ag	mountain
am	rock, temple
amcho	reef
amchwi	point
amja	temple
amseogjidae	rocky
apateu	apartment buildings
B	
baesuji	filtration bed
baljeonso	power plant
bando	peninsula
bangchug	causeway
bangjoje	causeway
bangjug	causeway
bangpaje	breakwater
bangsaje	groin
bangsong-gug	broadcasting station
bau	rock
bawi	rock
beol	plains
bi	monument, cape
bihaengjang	airport
bingha	glacier
bong	mountain, peak
bonghwa	beacon
budu	pier, quay, wharf
bunj	basin
bunsuryeong	watershed
burag	populated place
byeog	cliff
byeong-weon	hospital
byeonjeonso	transformer station
C	
chaeseogjang	quarry
chang-go	warehouse
chaseon	lane
chedo	island
cheoldo	railroad
cheon	stream
chi	pass
cho	reef
choho	lagoon
choweon	grassland
chunghontab	monument to the loyal dead
chwi	point
D	
dae	plateau, hill, tableland
daehag	college, university
dam	pond, lake
dan	cape, point
dang	shrine
dari	bridge
ddaem	dam
deog	hill
deogi	hill
deul	field, plains
deung	mountain, hill
deungdae	lighthouse, beacon
do	islande
dolchulje	jetty
dong	populated place, copper
dong-gul	cave
dongmulweon	zoo
doseo	archipelago
doseogwan	library
du	cape, point
E	
eocho	fishing bank
eojang	fishery
eun	silver
G	
gab	cape, point
gae	stream
gaecheogji	reclaimed land
gaecheon	ditch
gaeganji	reclaimed land
gae-ul	stream
gag	cape, point
gan	gorge
gang	stream, river
gang-gu	estuary
geomyeogso	quarantine station
geum	gold
geumgwang	gold mine
ggeut	cape, point
god	cape, point
gog	gorge, valley
gogae	pass
gogagyo	viaduct
gogyo	high school
gol	populated place, valley
golpujang	golf course
gong-eobhaggyo	engineering school
gong-gogyo	technical school
gongjang	factory
gosogdoro	superhighway
goweon	plateau
gubi	bend
guggyo	elementary school
gugribgong-weon	national park
gul	cave, tunnel
gulddug	chimney

KOREAN	English
gundo	archipelago
gung	palace
gwan	historical hall
gwangjang	square
gwangsan	mine
gwasuweon	orchard
gye	gorge, stream
gyegog	valley
gyeongmajang	horse race track
gyo	bridge
gyocharo	interchange
gyodoso	prison
gyohoe	church

H

ha	stream, river
hae	sea, sound
haean	coast, shore
haehyeob	strait, narrows
haeman	bay
haesuyogjang	beach
haggyo	school
hang	harbor, port
hang-gu	harbor
hangro	passage
ho	lake
hoesa	company
hwaryeogbaljeonso	thermoelectric power plant
hwasan	volcano
hyang-gyo	confucian school
hyeol	cave
hyeon	pass
hyeobgog	canyon
hyon	mountain, pass

J

jadongchagongjang	car factory
jae	pass
jagal	gravel
jang	market place
jangsatoe	sandbank
jan-gyo	jetty, pier, suspension bridge
je	reservoir
jebang	embankment, dike
jedo	island group
jeol	temple
jeolbyeog	cliff
jeon	hall
jeomogjang	log dump, lumber yard
jeoncheol	electric railroad
jeong	pavilion
jeongbagji	anchorage roads, roadstead
jeongja	pavilion
jeong-yugongjang	oil refinery
jeosuji	reservoir
ji	pond
jihadogwan	underground aqueduct
jin	ferry, inlet, fort
jinheug	mud
joseondae	patent slip, slipway
joseonso	shipyard
ju	sand bank
jujeonghang	boat harbor
jung-gogyo	middle and high school
jung-gyo	middle school

M

maeng-ahaggyo	school for the deaf and dumb
mal	point
man	bay
mangru	watchtower
meori	point
mi	point
mi reung	statue
mod	pond
moe	mountain
mogjang	stock farm
morae	sand
mudeom	tomb
mun	gate
myo	tomb
myoji	anchorage, cemetary

N

nae	stream
naru	ferry
neup	marsh, swamp
non	rice paddy
nongdae	agricultural college
nongjang	plantation
nongsasiheomjang	agricultural experimental station
nung	tomb
neup	pond

O

ol	mountain
oncheon	hot spring
oreum	mountain
oyejang	dump

P

po	bay, inlet, falls, lake
pogpo	falls
poji	fortress, ruins
pokpo	waterfall
ponae	stream mouth
pu, bu	city
pyeong-ya	plain

R

reung	royal tomb
ri	populated place
rim	forest
roe, noe	reef
ryeong	pass

KOREAN	English
S	
sa	temple
sagyeogjang	firing range
saju	sand bar
samag	desert
san	mountain
sanag	mountains
sangdae	commercial college
sang-gogyo	trade school
sanho	coral
sanmaeg	mountain range
sanjulgi	mountain range
sanseong	fort
sataeg	company housing
satoe	sandbank
segwan	customshouse
seo	island
seoggul	cave
seogtan	coal
seom	island
seon	railroad
seonchang	dock, wharf
seong	fort
seon-geo	dock
seongji	ruins
sesa	sand
seupji	marsh, swamp
skijang	ski ground
so	marsh, swamp
su	stream
sudo	channel, strait
sudoseon	aqueduct
sudoweon	monastery
sumun	lock
suryeogbaljeonso	hydroelectric power plant
susan-gogyo	fisheries school
suweon	reservoir
suweonji	reservoir

KOREAN	English
T	
tab	tower, pagoda
taeg	pond
tan	rapids, shoal
tan-gwang	coal mine
teo	ruins
toe	sandbank
tondae	beacon site
U	
uchegug	post office
undongjang	playground, stadium
unha	canal
W	
wangreung	royal tomb
Y	
yagsuteo	mineral spring
yang	ocean
yang-eojang	fish farm
yangsujang	water pumping station
yeo	island
yeog	railroad station
yeodae	womens college
yeog	railroad station
yeoldo	archipelago
yeomjeon	salt pan
yeom	stoney island
yeon	lake, pond, lead
yeon-gwang	lead mine
yeoul	rapids, shoal
yeoulmog	ford
yoyangso	sanatorium
yujo	oil tank

Wade-Giles to Pinyin

WADE-GILES	PINYIN
Ai Chou	Ai Zhou
Ai-ch'i Shan	Aiqishan
Ai-chou Lieh-tao	Aizhou Liedao
Ai-wan Wan	AiWan
An-hai	Anhai
An-p'u	Anpu
Ao Shan	Aoshan
Ao-shan T'ou	Aoshan Tou
Chu Shan	Ju Shan
Chun Pi Chiao	Junbi Jiao
Chun Shan	Jun Shan
Chun-ying Ling	Junying Ling
Ch'uan-chou	Quanzhou
Ch'uan-chou Wan	Quanzhou Wan
Ch'uan-chow	Quanzhou
Ch'un-tao	Qundao
Ch'-hsing Chiao	Qixing Jiao
Ch'a shan	Cha Shan
Ch'a-mu Yu	Chamu Yu
Ch'ai Shan	Chaishan
Ch'ai Yu	Chai Yu
Ch'ang Chou	Chang Zhou
Ch'ang Tao	Changdao
Ch'ang Tsui	Chang Zui
Ch'ang Tsui-tzu	Chang Zuizi
Ch'ang Yu	Chang Yu
Ch'ang-chiang K'ou	Changjiang Kou
Ch'ang-chiang Tsui	Changjiang Zui
Ch'ang-chiang-k'ou Mao-ti	Changjiangkou Maodi
Ch'ang-chiang-k'ou-pei Chiao	Changjiangkou Beijiao
Ch'ang-chih Shan	Changzhishan
Ch'ang-erh Chien	Changer Jian
Ch'ang-hsing Ch'ien-t'an	Changxing Qiantan
Ch'ang-hsing Dao	Changxing Dao
Ch'ang-hsing Tao	Changxing Dao
Ch'ang-hua-ta Ling	Changhua Daling
Ch'ang-le	Changle
Ch'ang-li	Changli
Ch'ang-ma-Teng	Changmadeng
Ch'ang-men Yen	Changmen Yan
Ch'ang-pai Shan	Changbaishan
Ch'ang-piao Tao	Changbiao Dao
Ch'ang-shan Shui-tao	Changshan Shuidao
Ch'ang-yao Shan	Changyaoshan
Ch'ao-yang	Chaoyang
Ch'ao-yang Shan	Chaoyang Shan
Ch'e-cb'r Ting	Cheqi Ding
Ch'e-yu Tao	Cheyou Dao
Ch'en-ch'ien Shan	Chenqianshan
Ch'en-chia Tsui	Chenjia Zui
Ch'eng Shan	Cheng Shan
Ch'eng-chou Tao	Chengzhou Dao
Ch'eng-hai	Chenghai
Ch'eng-mai Chiao	Chengmai Jiao
Ch'eng-mai Wan	Chengmai Wan
Ch'eng-p'u Shan	Chengpu Shan
Ch'eng-shan Chiao	Chengshan Jiao
Ch'e Niu Shan	Cheniushan
Ch'i Shan	Qi Shan
Ch'i-ao Tao	Qiao Dao
Ch'i-chia-tseng	Qijiazeng
Ch'i-chou Lieh-tao	Qizhou Liedao
Ch'i-hsing Chiao	Qixing Jiao
Ch'i-hsing Ling	Qixing Ling
Ch'i-hsing Tao	Qixing Dao
Ch'i-jen Chiao	Qiren Jiao
Ch'i-k'an	Chikan
Ch'i-lin-tou	Qilintou
Ch'i-niang Shan	Qiniang Shan
Ch'i-p'ai Chiao	Qipai Jiao
Ch'i-p'ai Shih	Qipai Shi
Ch'i-t'ai Tsui	Qitai Zui
Ch'i-t'ai-shan	Qitaishan
Ch'i-tzu-mei	Qizimei
Ch'iao-liu-tao	Jiaoliudao
Ch'ien Shan	Qian Shan
Ch'ien-ku Shan	Qiangu Shan
Ch'ih-shan-chi	Chishan Ji
Ch'ih-t'ou Shan	Chitoushan
Ch'ih-tzu-wei	Chixai Wei
Ch'in-chou Wan	Qinzhou Wan
Ch'in-huang-tao	Qinhuangdao
Ch'in-huang-tao Kang	Qinhuangdao Gang
Ch'in-huang-tao Wan	Qinhuangdao Wan
Ch'in-p'eng Tao	Qinpeng Dao
Ch'in-shan Tao	Qinshan Dao
Ch'ing Chou	Qing Zhou
Ch'ing Yen	Qing Yan
Ch'ing-chou Shui-tao	Qingzhou Shuidao
Ch'ing-feng	Qingfeng
Ch'ing-lan T'ou	Qinglan Tou
Ch'ing-niu Shan	Niuqing Shan
Ch'ing-pin Tao	Qingbin Dao
Ch'ing-shan Chiao	Qingdao Jiao
Ch'ing-shan Tao	Qingshan Dao
Ch'ing-shan Tsui	Qingshan Zui
Ch'ing-shih-lan	Qingshi Lan
Ch'ing-t'ai-tun	Qingtaidun
Ch'ing-tao	Qingdao
Ch'ing-tao Kang	Qingdao Gang
Ch'ing-yuan Shan	Qingyuan Shan
Ch'ing-yuan Shan	Qingyuan Shan
Ch'ip'an Shih	Qipan Shi
Ch'iung-chou Hai-hsia	Qiongzhou Haixia
Ch'u-shui Shih	Chushui Shi
Ch'uan Chiao	Chuan Jiao
Ch'uan-hu Lieh-tao	Chuanhu Liedao
Ch'uan-pi	Chuanbi
Ch'uan-pi Tao	Chuanbi Dao
Ch'uan-sha	Chuansha

WADE-GILES	PINYIN
Ch'uan-shan Pan-tao	Chuanshan Bandao
Ch'uan-shih Tao	Chuanshi Dao
Ch'uang-niu Shan	Chuangaiushan
Ch'ung Shan	Chongshan
Ch'ung-ming	Chongming
Ch'ung-ming Ch'ien-Tan	Chongming Qiantan
Ch'ung-ming Tao	Chongming Dao
Ch'ung-wu	Chongwu
Cha-p'o	Zhapo
Cha-p'u	Zhapu
Chai Tai	Zhai Dao
Chai-jo Shan	Zhairuoshan
Chai-t'ang Tao	Zhaitang Dao
Chai-tzu Shan	Zhaizishan
Chan-chiang	Zhanjiang
Chan-chiang Kang	Zhanjiang Gang
Chang Chiang	Zhang Jiang
Chang-chou	Zhangzhou
Chang-p'u	Zhangpu
Chang-tzu Tao	Zhangzi Dao
Chang-tzu-tao Shui-tao	Zhanzidao Shuidao
Chao-an	Zhaoan
Chao-an T'ou	Zhaoan Tou
Chao-an Wan	Zhaoan Wan
Chao-lien Tao	Chaolian Dao
Chao-pei Tsui	Zhaobei Zui
Che-lang Chiao	Zhelang Jiao
Che-lang Yen	Zhelang Yan
Che-lin	Zhelin
Che-lin Wan	Zhelin Wan
Chen-hai	Zhenhai
Chen-hai Chiao	Zhenhai Jiao
Chen-hai Wan	Zhenhai Wan
Chen-Yen-T'ou	Zhenyantou Yan
Cheng Chou Tao	Changzhou Dao
Cheng-ch'i Shan	Zheng qi Shan
Chiu-jung-ch'eng	Jiurong Cheng
Chi lung Chiao	Jilong Jiao
Chi Yu	Ji Yu
Chi-hsin	Jixin
Chi-ku Chiao	Jigu Jiao
Chi-ku Shan	Jigushan
Chi-kuan Shan	Jiguanshan
Chi-lung Kang	Jilong Gang
Chi-lung Shan	Jilong Shan
Chi-mei	Jimei
Chi-ming Tao	Jiming Dao
Chi-mo	Jimo
Chi-mu Chiao	Qimu Jiao
Chi-pei Yu	Jibei Yu
Chia-p'eng Liedao	Jiapeng Liedao
Chia-shan Ling	Jiashan Ling
Chia-tzu	Jiazi
Chia-tzu Chiao	Jiazi Jiao
Chia-tzu Kang	Jiazi Gang
Chia-tzu Shan	Jiazi Shan
Chiang-chun Ao	Jiangjun Ao
Chiang-chun T'ou	Jiangjun Tou
Chiang-chun-ao Yu	Jiang Junao Yu
Chiang-chun-Mao	Jiangjunmao
Chiang-erh-ao	Jiangerao
Chiang-hung Hsu	Jianghong Xu
Chiang-k'ou	Jiangkou
Chiang-mu Tao	Jiangmu Dao
Chiang-p'ing Hsu	Jiangping Xu
Chiang-ya Hang-tao	Jiangya Hangdao
Chiang-yin Tao	Jiangyin Dao
Chiang-Yun Ting	Jiang Yun Ding
Chiao Shan	Jiao Shan
Chiao-chou Wan	Jiaozhou Wan
Chiao-lieh Tao	Jiao Liedao
Chiao-nan	Jiaonan
Chiao-pei Shan	Jisobeishan
Chiao-t'ou Pi	Jiaotou Bi
Chiao-wei Chiao	Jiaowei Jiao
Chiao-wei Wan	Jiaowei Wan
Chieh-shih Wan	Jieshi Wan
Chien-feng Ling	Juantang Ling
Chien-huang-p'ing	Jianhuang Ping
Chien-yang Tao	Jianyang Dao
Chih Yu	Chi Yu
Chih-chih Men	Zhizhi Men
Chih-fu Tao	Zhifu Dao
Chih-kung	Zhigong
Chih-mao-wan	Zhimao Wan
Chih-shih Tzu	Chishizai
Chih-sung Yen	Zhisong Yan
Chih-wan Tao	Zhiwan Dao
Chin men	Jinmen
Chin Chiang	Jin Jiang
Chin Yu	Jin Yu
Chin-chi Ling	Jinji Ling
Chin-chi Shan	Jinjishan
Chin-chiang	Jinqiang
Chin-chou Wan	Jinzhou Wan
Chin-hsien	Jin Xian
Chin-men Dao	Jinmen Dao
Chin-men Wan	Jinmen Wen
Chin-mu Chiao	Jinmu Jiao
Chin-shan Kang	Jinshan Gang
Chin-shan Tsui	Jinshan Zui
Chin-shan-wei	Jinshanwei
Chin-t'ang Shan	Jintang Shan
Chin-t'ang Shui-tao	Jintang Shuidao
Chin-t'ou Wan	Qitou Wan
Ching-hai Wan	Jinghai Wan
Ching-hai-wei	Jinghaiwei
Ching-tzu T'ou	Jingzi Tou
Ching-yu Yen	Jingyu Yan
Chiu-hua Shan	Jiuhua Shan
Chiu-lau Shan	Jiulou Shan
Chiu-lung Chiang	Jiulong Jiang
Chiu-shan Lieh-tao	Jiushan Liedao
Chiu-ts'un Ling	Jiuaun Ling
Chiu-tuan Sha	Jiudan Sha
Chiu-tung Shan	Jiudongshan

WADE-GILES	PINYIN
Chou-shan Tao	Zhoushan Dao
Chou-Shan Chun-tao	Zhoushan Qundao
Chu Shan	Zhu Shan
Chu Tao	Zhu Dao
Chu Yu	Zhu Yu
Chu-ch'a Tao	Zhucha Dao
Chu-chia Chien	Zhujiajian
Chu-chiang K'ou	Zhujiang Kou
Chuang-yuan-ao	Zhuangywanao
Chuang-yuan-Ao	Zhuangyuanao
Chui Shan	Zhui Shan
Chung Shui-tao	Zhong Shuidao
Chung-chieh-shan Chun-tao	Zhongjieshan Qundao
Chung-chu Men	Zhongzhu Men
Chung-chu Shan	Zhongzhushan
Chung-k'uei Shan	Zhongkui Dao
Chung-p'eng Tao	Zhengpeng Dao
Chung-yang Sha	Zhongyang Sha
Da-heng-ch'in Tao	Dahengqin Dao
Erh Chou	Er Zhou
Erh-chin-ch'ien T'an	Erjin Qiantan
Erh-huo	Erhua
Erh-lung Shan	Erlong Shan
Erh-mu-luan-tzu	Ermuluanzi
Erh-shan-tzu Tao	Ershanzi Dao
Erh-suan Shan	Ersuanshan
Erh-t'o-tzu Tao	Ertuozi Dao
Erh-tan	Erdan
Fan-kuei Chou	Fangui Zhou
Fan-pi	Fanbi
Fang-ch'eng	Fangcheng
Fang-ch'eng Kang	Fangcheng Gang
Fei-huang-he K'ou	Feihuanghe Kou
Fei-yun-chiang Kou	Feiyhujiang Kou
Feng-ch'ao Yen	Fengchao Yan
Feng-ch'iu Sha	Fenggiu Sha
Feng-huang Shan	Fenghuang Shan
Feng-huang Tsui	Fenghuang Zai
Feng-huang-wei	Fenghuangwei
Feng-men Ling	Fengmen Ling
Feng-ming Tao	Fengming Dao
Feng-shui Chiao	Fengshui Jiao
Feng-t'ing	Fengting
Feng-tung Shan	Fengdong Shan
Feng-wei Tsui	Fengwei Zui
Fo Ting	Fo Ding
Fo-lo	Foluo
Fo-tu Tao	Fodu Dao
Fu Shan	Fu Shan
Fu-ch'ing	Fuqing
Fu-ch'ing Wan	Fuqing Wan
Fu-chou	Fuzhou
Fu-chou	Fuzhou Gang
Fu-chow Wan	Fuzhou Wan
Fu-hu Ling	Fuhu Ling
Fu-ning Wan	Funing Wan
Fu-t'ou Wan	Futou Wan
Fu-ting	Fuding
Fu-wen	Fuwen
Fu-yao Tao	Fuyao Liedao
Fu-ying Tao	Fuying Dao
Hai Chiao	Hai Jiao
Hai Wei	Ha Wei
Hai-an	Haian
Hai-an Wan	Haian Wan
Hai-chia Shan	Haijia Shan
Hai-chou Wan	Haizhou Wan
Hai-feng	Haifeng
Hai-huang Shan	Haihuangshan
Hai-k'ang	Haikang
Hai-k'ou	Haikou
Hai-k'ou Kang	Haikou Gang
Hai-k'ou Wan	Haikou Wan
Hai-lu Tao	Hailu Dao
Hai-ling-shan Kang	Hailingshan Gang
Hai-ling-shan Tao	Hailingshan Dao
Hai-lu Tao	Hailu Dao
Hai-mao Tao	Haimao Dao
Hai-mao-tzu T'ou	Haimaozi Tou
Hai-men	Haimen
Hai-men Chiao	Haimen Jiao
Hai-men Tao	Haiman Dao
Hai-men Wan	Haimen Wan
Hai-nan Tao	Hainan Dao
Hai-ning	Haining
Hai-t'an Chiao	Haitan Jiao
Hai-t'an Hai-hsia	Hailan Haixia
Hai-t'an Shih	Haitan Shi
Hai-t'an Wan	Haitan Wan
Hai-yang	Hai Yang
Hai-yang Tao	Haiyang Dao
Hai-yen	Haiyan
Haing-hua Shui-tao	Xinghua Shuidao
Han-chiang	Han Jiang
Han-ku	Hangu
Hang-chou Wan	Hangzhou Wan
He pao Tao	Hebao Dao
Hei Chiao	Hei Jiao
Hei Chou	Hei Zhou
Hei Yen	Hei Yan
Hei-shi-chiao Wan	Heishijiao Wan
Hei-ts'un Chiao	Heicun Jiao
Heng Chou	Heng Zhou
Heng Sha	Heng Sha
Heng Shan	Heng Shan
Heng-chih Shan	Hengzhishan
Heng-kang Tao	Henggang Dao
Heng-mien Sha	Heng Mian Sha
Ho Shan	He Shan
Ho-chung Chiao	Ha Zhong Jiao
Ho-chung Chiao	Hezhong Jiao
Ho-hua-sheng Shan	Hehuashan Shan
Ho-kang Shan	Hegang Shan
Ho-lien-ya	Helian Ya
Ho-p'u	Hepu
Ho-t'ao-yuan-tzu	Hetaoyuanzi

WADE-GILES	PINYIN
Hong Kong	Xiang Gang
Hou Chiao	Hou Jiao
Hou-ch'ing Yu	Houqing Yu
Hou-chi shan	Houjishan
Hou-chi Shui-tao	Houji Shuidao
Hou-chi Tao	Houji Dao
Hou-erh-shih Tsui	Houershi Zui
Hou-hai Sha	Houhai Sha
Hou-shui Wan	Houshui Wan
Hou-to Chiao	Houduo Jiao
Hsu-kung Tao	Xugong Dao
Hsu-wen	Xuwen
Hsuan Shan	Xuanshan
Hsueh-chia-tao	Xuejiadao
Hsi K'uei Shan	Xikui Daio
Hsi Yu	Xi Yu
Hsi-ao Chiao	Xiao Jiao
Hsi-ch'uan Tao	Xiquan Dao
Hsi-ch'ang	Xichang
Hsi-chi Yu	Xiji Yu
Hsi-chieh Chiao	Xijie Jiao
Hsi-chung Tao	Xizhong Dao
Hsi-fang Ch'ien t'an	Xifang Qiantan
Hsi-fu Shan	Xifushan
Hsi-hsing Tao	Xixing Dao
Hsi-hu Tsui	Xihu Zui
Hsi-huo Shan	Xihuoshan
Hsi-ku Tao	Xigu Dao
Hsi-lu hua Shan	Xiluhuashan
Hsi-lien Tao	Xilian Dao
Hsi-lo Tao	Xiluo Dao
Hsi-ma-i Tao	Ximayi Dao
Hsi-mao Chou	Ximao Zhou
Hsi-mo-p'an	Ximopan
Hsi-nan Ch'ien-t'an	Xinan Qiantan
Hsi-pan-yang Chiao	Xibanyang
Hsi-pei Chiao	Xibei Jiao
Hsi-t'ai Shan	Xitaishan
Hsi-tan Tao	Xidan Dao
Hsi-ting Yu	Xiding Yu
Hsi-yang Tao	Xiyang Dao
Hsi-yin Chiao	Xiyin Jiao
Hsi-yin Tao	Xiyin Dao
Hsi-yu-P'ing Yu	Xiyuping Yu
Hsia Yu	Xia Yu
Hsia-an	Xiaan
Hsia-ch'i Tao	Xiaqi Dao
Hsia-ch'ien Shan	Xiaqianshan
Hsia-ch'uan Shan	Xiachuanshan
Hsia-ch'uan Tao	Xiachuan Dao
Hsia-chu Shan	Xiazhushan
Hsia-hai Shan	Xiahaishan
Hsia-kan Shan	Xiaganshan
Hsia-lang T'ang	Xialangtang
Hsia-lang-t'ang	Xialangtang
Hsia-ma-an Shan	Xiamanshan
Hsia-men	Xiamen
Hsia-men Kang	Xiamen Gang
Hsia-men Tao	Xiamen Dao
Hsia-p'u	Xiapu
Hsia-san-hsing	Xiasanxing
Hsia-ssu Chiao	Xissi Jiao
Hsia-ta-ch'en Shan	Xiadachenshan
Hsia-wan Shan	Xiawanshan
Hsiang Chiao	Xiang Jiao
Hsiang Shan	Xiangshan
Hsiang Tsui	Xiang Zui
Hsiang Yu	Xiang Yu
Hsiang-chih Chiao	Xiangzhi Jiao
Hsiang-p'an Chiao	Xiangpan Jiao
Hsiang-shan Kang	Xiangshan Gang
Hsiao-an Shui-Tao	Xiaoan Shuidao
Hsiao-ch'u Shan	Xiaoguishan
Hsiao-ch'uan tsui-Tzu	Xiaoquan Zuizi
Hsiao-ch'ang-t'u Shan	Xiaochangtushan
Hsiao-ch'ing Tao	Xiaoging Dao
Hsiao-ch'uan Tsui-tzu	Xiaoquan Zuizi
Hsiao-chi Shan	Xiaojishan
Hsiao-chih-chu Tao	Xiaozhi Zhu Dao
Hsiao-chin	Xiaojin
Hsiao-chin-men Tao	Xiaojinmen Dao
Hsiao-chu Chou	Xiaozhu Zhou
Hsiao-chu Shan	Xiaozhu Shan
Hsiao-chu-shan Tao	Xiaoshanzi
Hsiao-hao Tao	Xiaohao Dao
Hsiao-heng-chin Tao	Xiao heng Qin Dao
Hsiao-hsi-fan Shih	Xiaoxifan Shi
Hsiao-hsi-yang Tao	Xiaoxiyang Dao
Hsiao-hsing Shan	Xiaoxingshan
Hsiao-huang-lung Shan	Xiaohuanglongshan
Hsiao-jih Tao	Xiaori Dao
Hsiao-kan Shan	Xiaoganshan
Hsiao-kuang Tao	Xiaoguan Dao
Hsiao-kung Tao	Xiaogong Dao
Hsiao-lung-shan Tao	Xiaolongshan Dao
Hsiao-mao Shan	Xiaomao Shan
Hsiao-men Tao	Xiaomen Dao
Hsiao-ming-fu Tao	Xiaomingfu Dao
Hsiao-mu Tao	Xiaomu Dao
Hsiao-o-kuan	Xiaoeguan
Hsiao-p'u-t'ai	Xiaoputai
Hsiao-pan Men	Xiaoban Men
Hsiao-pan Pab	Xiaban Dao
Hsiao-san-shun Tao	Xiaosanshan Dao
Hsiao-shih Tao	Xiaoshi Dao
Hsiao-shu-lang	Xiaoshulang
Hsiao-t'ang Kang	Xiaotang Gang
Hsiao-teng Tao	Xiaoding Dao
Hsiao-yu Shan	Xisoyushan
Hsiao-yang Shan	XiaoyangShan
Hsieh-p'u Shan	Xiepushan
Hsieh-yang Tao	Xieyang Dao
Hsien T'ang	Xian Tang
Hsien-chiao Yu	Xianjiao Yu
Hsien-mai	Xianmai
Hsien-o Chiao	Xian'e Jiao

WADE-GILES	PINYIN
Hsien-yu	Xianyou
Hsin-hsing	Xinxing
Hsin-huai-ho K'ou	Xinhuaihe Kou
Hsin-liao Tao	Xinliao Dao
Hsin-ta Yen	Xinda Yan
Hsin-K'ai K'ou	Xin Kai Kou
Hsing-hua Wan	Xinghua Wan
Hsing-Ts'un	Xing Cun
Hsiu Shan	Xiushan
Hsiu-ying	Xiuying
Hsiung-ti Yu	Xiongdi Yu
Hsueh-chia Tao	Xuejia Dao
Hu-ching Yu	Hujing Yu
Hu-hsiao-she	Huxiaoshie
Hu-kung Shan	Hugong Shan
Hu-lu Dao	Hulu Dao
Hu-lu Tao	Hulu Dao
Hu-lu-shan Wan	Hulushan Wan
Hu-p'ing Tao	Huping Dao
Hu-shih	Hushi
Hu-t'ou Yu	Hutou Yu
Hu-tung Chiao	Hudong Jiao
Hu-yu Tao	Huyu Dao
Hua Yu	Hua Yu
Hua-niao Shan	Huaniaoshan
Hua-p'ing Shan	Huapingshan
Huan-hai-ssu Ti-tsui	Huanhaisi Dizui
Huang Chiao	Huang Jiao
Huang Hai	Huang Hai
Huang Ho	Huang He
Huang Shan	Huang Shan
Huang Tao	Huang Dao
Huang-ch'eng	Huangcheng
Huang-ch'eng Shan	Huangchengshan
Huang-ch'i	Huangqi
Huang-chia-t'ang Wan	Huangjiatang Wan
Huang-chiao Shan	Huangjia Shan
Huang-ching Ling	Huangjing Ling
Huang-chu Chiao	Huangzhu Jiao
Huang-ho K'ou	Huanghe Kou
Huang-hsien	Huang Xian
Huang-hsing Tao	Huangxing Dao
Huang-hua	Huanghua
Huang-kan Tao	Huanggan Dao
Huang-kua Yu	Huanggua Yu
Huang-liu	Huangliu
Huang-lung-wei Tsui	Hunglongwei Zui
Huang-mao Shan	Huangmao Shan
Huang-mao Tao	Huangmao Dao
Huang-men Shan	Huangmenshan
Huang-meng Tao	Huangmeng Dao
Huang-niu Chiao	Huangniu Jiao
Huang-pai Tsui	Huangbai Zui
Huang-shih Shan	Huangshi Shan
Huang-ta-ao Shui-tao	Huangdaao Shuidao
Huang-tiung-kou Chen	Huatonggou Zhen
Huang-tse Shan	Huangze Shan
Huang-tsui-tzu Wan	Huangzuizi Wan
Huang-yang Chien	Huangyang Jian
Huang-yen	Huangyan
Huang-Pai-Tsui-Li Ho	Huangbaizuiliho
Hui Shan	Hui Shan
Hui Tao	Hui Dao
Hui-an	Huian
Hui-lai	Hui-lai
Hui-tung	Huidong
Hung Shan	Hong Shan
Hung Yu	Hung Yu
Hung-chien Shan	Hengjian Shan
Hung-hai Wan	Honghai Wan
Hung-yu P'ai	Hongyu Pai
Huo-shan Lieh-tao	Huoshan Liedao
I Tao	Yi Dao
I-chiang-shan Tao	Yijiangshan Dao
I-suan Shan	Yisuan Shan
I-tung Chiao	Yidong Jiao
Jao-p'ing	Raoping
Jih-chao	Rizhao
Jih-yueh Yu	Riyue Yu
Jui Shan	Rushan
Jui-an	Ruian
Jui-shan K'ou	Rushan Kou
Jung-ch'eng	Rongcheng
Jung-ch'eng Wan	Rongcheng Wan
Jung-ch'eng-ma Shan	Rongcheng Mashan
K'ai-ping	Kaiping
K'ai-shan Tao	Kaishan Dao
K'an-man	Kanmen
K'an-wei Sha	Kanwei Sha
K'ao-tao	Gao Dao
K'o-t'ang Shan	Ketangshan
K'o-tzu Shan	Kezi Shan
K'uei-shan Tao	Kuishan Dao
K'ung-k'o Yu	Kongke Yu
K'ung-tung Tao	Kongtong Dao
Kah-en Chiao	Gadon Jiao
Kan-ch'eng	Gan Chang
Kan-en Sha	Gan'en Sha
Kang Shan	Gang Shan
Kang-wei	Gangwei
Kao Shan	Gao Shan
Kao-ch'iao	Gaoqiso
Kao-chiao	Gao Jiao
Kao-lan Lieh-tao	Gaolan Liedao
Kao-lan Tao	Gaolan Dao
Kao-nao-tzu Chiao	Gaonaozi Jiso
Kao-shan Ling	Gaoshen Ling
Kao-shan Tao	Gaoshan Dao
Kao-shang Ling	Gaoshan Ling
Kao-teng Tao	Gaodeng Dao
Ko-hung Shan	Gehong Shan
Ko-li Yen	Geli Yan
Ko Yu	Luo Yu
Kou-ch'i Shan	Gouqishan
Ku lei Shan	Gulei Shan
Ku-lei-t'ou	Guleitou

WADE-GILES	PINYIN
Ku-lung Tsui	Gulong Zui
Ku-p'o Yu	Gopo Yu
Ku-t'ou Shan	Gutou Shan
Kua-lien Shan	Gualianshan
Kuan-ch'ien-ts'un	Gengoian Cun
Kuan-ch'uan-ao	Guanchuanao
Kuan-ho K'ou	Guanghe Kou
Kuan-men Shan	Guaymen Shan
Kuan-shan Tao	Guanshan Dao
Kuan-t'ou Ling	Guantou Ling
Kuan-yun	Guanyun
Kuan-yin Chiao	Guanyin Jiao
Kuan-yin Ling	Guanyin Ling
Kuan-yin Shan	Guanyin Shan
Kuan-yin-peng Ling	Guanyanbeng Ling
Kuang-hai	Guanghai
Kuang-hai Wan	Guanghai Wan
Kuei Yu	Gui Yu
Kuei-ling Tao	Guiling Dao
Kuei-shan Tao	Guishan Dao
Kuei-t'ien Shan	Kuitian Shan
Kung-k'ou T'ou	Gongkou Tou
Lu-shun	Lushun
Lu-ta Ta-lien	Luda Dalian
Lan-ku Shan	Langu Shan
Lan-Ts'un	Lan Cun
Lang-ch'i Tao	Langqi Dao
Lang-chi Shan	Langji Shan
Lang-kang-shan Lieh-tao	Langgangshan Liedao
Lanpai-ch'ien T'an	Laibai Qtuntan
Lao Shan	Lao Shan
Lao-hu Shan	Laohu Shan
Lao-p'ien Tao	Laopian Dao
Lao-shan T'ou	Laoshan Tou
Lao-shan Wan	Laoshan Wan
Lao-t'ieh Shan	Laotie Shan
Lao-t'ieh-shan-hsi Chiao	Laotieshan Xijiao
Lao-t'ieh-shan-tung Chiao	Laotieshan Dongjiao
Lao-t'ieh-Shan Hsi	Laotieshan Xijiao
Lao-t'iek-shan Shui-tao	Laotieshan Shuidao
Lao-tung Chiao	Laodong Jiao
Le-ch'ing	Leqing
Le-ch'ing Wan	Leqing Wan
Le-men Lieh-tao	Lemen Liedao
Lei-chou	Leizhou
Lei-chou Wan	Leizhou Wan
Lei-kung Sha	Leigong Sha
Li-cheng Chiao	Lizheng Jiao
Li-huo Yu	Lihuo Yu
Li-ken Wan	Ligen Wan
Li-shih Lieh-tao	Lishi Liedao
Li-ssu-kuai	Lisikuai
Li-t'ou Tsui	Li-tou Zui
Li-tao	Lidao
Li-tzu Tao	Lizi Dao
Li-tzu-Tu	Lizatu
Li-yu pei Chiao	Liyubei Jiao
Liang-ch'eng	Liang Cheng
Liang-heng Shan	Lianghengshan
Liang-hsiung-ti Tao	Liangxiongdi Dao
Liang-t'ou-tung	Liangtoudong
Liang-wen Kang	Liangwengang
Liao-lo T'ou	Liaoluo Tou
Liao-lo Wan	Liaoluo Wan
Liao-pan-t'ian	Liaobantian
Liao-tung Wan	Liaodong Wan
Lieh Yen	Lie Yan
Lieh-tzu K'ou	Liezi Kou
Lieh-chiang	Lianjiang
Lien-feng Shan	Lianfeng
Lien-hua Shan	Lianhua Shan
Lien-tui Chiao	Liandui Jiao
Lien-tzu Chiao	Lianzi Jiao
Lien-yun-kang	Lianyungang
Lin-ch'ang Tao	Linchang Dao
Lin-hai	Linhai
Lin-kao	Lingao
Lin-kao Chiao	Lingao Jiao
Lin-men-kao	Linmangao
Ling-ch'ang Tao	Linchang Dao
Ling-feng Shan	Lingfeng Shan
Ling-shan Shui-tao	Lingshan Shuidao
Ling-shan Tao	Lingshan Dao
Ling-shan Wan	Lingshan Wan
Ling-t'ou-ma-an Ling	Lingtouman Ling
Liu ch'uan Chiao	Liuquan Jiao
Liu-heng Tao	Liuheng Dao
Liu-kung Tao	Liugong Dao
Liu-sha Wan	Liusha Wan
Lo Yu	Luo Yu
Lo Yen	Luo Yan
Lo-ch'in Shan	Laoqua Shan
Lo-chia Shan	Luojiashan
Lo-ssu T'ou	Luosi Tou
Lo-t'ou Shui-tao	Luotou Shuidao
Lo-tou Sha	Luodou Sha
Lo-yuan	Luoyuan
Lu Tao	Lu Dao
Lu-chia Chih	Lujiazhi
Lu-feng	Lufeng
Lu-feng Shan	Lufeng Shan
Lu-hsi Tao	Luxi Dao
Lu-hui-t'ou Chiao	Luhuitou Jiao
Lu-ssu Yu	Lusi
Luan-ho K'ou	Luanhe Kou
Luan-ma Chiao	Luanmo Jiao
Luan-yen-Tou	Luanyantou
Lung Men	Longmen
Lung Yu	Long Yu
Lung-erh-t'an-ta Ling	Longertan Daling
Lung-hsu Tao	Longxu Dao
Lung-k'ou	Longkou
Lung-k'ou Kang	Longkou Gang
Lung-kao Shan	Longgao Shan
Lung-kou Kang	Longkou Gang
Lung-mu Chiao	Longmu Jiao

WADE-GILES	PINYIN
Lung-ni ch'an Shih	Longnichan Shi
Lung-she	Longshe
Lung-shui Ling	Longshu Ling
Lung-tung Tsui	Longdong Zui
Ma Ling	Ma Ling
Ma-an Lieh-tao	Maan Liedao
Ma-an Ling	Maan Ling
Ma-an Shan	Maanshan
Ma-chi Shan	Majishan
Ma-erh Shan	Maer Shan
Ma-erh Tao	Maer Dao
Ma-hsieh	Maxie
Ma-t'a Chiao	Mata Jiao
Ma-tsu Hai-hsia	Mazu Haixia
Ma-tsu Lieh-tao	Mazu Liedao
Ma-tsu Tao	Mazu Dao
Ma-tsu-yin	Mazuyin
Ma-tz'u Tao	Maci Dao
Ma-wei	Mawei
Ma-wei Chou	Mawei Zhou
Macao	Macao
Mai Tao	Mai Dao
Man-yu T'ou	Manyu Tou
Mang Chou	Mang Zhou
Mao Yu	Mao Yu
Mao-chiao Tsui	Maojiao Zui
Mao-ming	Maoming
Mei-chou Wan	Meizhou Wan
Mei-san Lieh-tao	Meisan Liedao
Mei-shan Tao	Meishan Dao
Mi-t'o Tao	Mituo Dao
Mi-yu-li Shui	Miyudi Sha
Miao Tao	Miao Dao
Miao-tao Ch'un-tao	Miaodao Qundao
Miao-tzu-hu Tao	Miaozibu Dao
Miao-wan Tao	Miaowan Dao
Mien-hua Shan	Mianhua Shan
Min Chiang	Min Jiang
Min-chiang K'ou	Minjiang Kou
Mo-hsin Kang	Moxin Gang
Mo-yeh Tao	Moye Dao
Mu-p'ing	Muping
Mu-tou Yu	Mudou Yu
Nu Tao	Nu Dao
Nu-ying Chiao	Nuying Jiao
Nan shan	Nanshan
Nan Chiao	Nan Jiao
Nan Hai	Nan Hai
Nan Shuitao	Nan Shuidao
Nan Yu	Nan Yu
Nan-ao	Nanao
Nan-ao Tao	Nan'ao Dao
Nan-ch'ang-shan Tao	Nanchangshan Dao
Nan-chi Shan	Nanjishan
Nan-chi-shan Lieh-tao	Nanjishan Liedao
Nan-chih	Nanzhi
Nan-chiu Shan	Nanjiushan
Nan-chiu-shan Mao-ti	Nanjiushan Maodi

WADE-GILES	PINYIN
Nan-fang Ch'ien-t'an	Nanfang Qiantan
Nan-huang-ch'eng Tao	Nanhuangeheng Dao
Nan-hui	Nanhui
Nan-jih Ch'un-tao	Nanri Qundao
Nan-jih Shui-tao	Nanri Shuidao
Nan-jih Tao	Nanri Dao
Nan-k'u-tang Tao	Nankudang Dao
Nan-kang	Nankang
Nan-p'ai Shan	Nanpaishan
Nan-p'eng Lieh-Tao	Nanpeng Liedao
Nan-p'eng Tao	Nanpeng Dao
Nan-pu	Nan Pu
Nan-san Tao	Nansan Dao
Nan-sha	Nansha
Nan-shan Chiao	Nanshan Jiao
Nan-shan Ling	Nanshan Ling
Nan-shan Tsui	Nanshan Zui
Nan-shih	Nanshi
Nan-shuang Tao	Nanshuang Dao
Nan-shui Tao	Nanshui Dao
Nan-t'ai	Nantai
Nan-t'o-chi Shui-tao	Nantuoji Shuidao
Nan-ting	Nanding
Nan-ting Tao	Nanding Dao
Nan-ts'ao-chi	Nancpoji
Nan-ts'e	Nance
Nanyushan	Nanyushan
Nao-chou Tao	Naozhou Dao
Nei-ling-ting Tao	Neilingding Dao
Ni-lo Yu	Niluo Yu
Ni-yu Shan	Niyushan
Niang Chiao	Niang Jiao
Niang-niang Ting	Niangniangding
Niao-tsui	Niaozua
Niao-yu	Niao Yu
Ning-chin-so	Ningjinsuo
Ning-hai	Ninghai
Ning-po	Ningbo
Ning-po Kang	Ningbo Gang
Niu Shan	Niushan
Niu Shan Tao	Niushan Dao
Niu-ch'ing Shan	Niuqing Shan
Niu-chiao Shan	Niujiao Shan
Niu-fen Chiao	Niufen Jiao
Niu-hsin Tao	Niwxin Dao
Niu-ku Ling	Niugu Ling
Niu-lung Tsui	Niulong Zui
Niu-o Men	Niue Men
Niu-o Shan	Niueshan
Niu-p'i Chiao	Niupi Jiao
Niu-pi-shan Shui-tao	Niubishan Shuidao
Niu-shan Tsui	Niushan Zui
Niu-t'ou Shan	Niutou Shan
Niu-t'ou Tao	Niutou Dao
O-feng Chang	Ehuang Zhang
O-hao Ling	Ehuo Ling
O-mei Chang	Emei Zhang
Ou-chiang-nan K'ou	Oujiang Nankou

WADE-GILES	PINYIN
Ou-chiang-pei K'ou	Oujiang Beikou
Ou-i Ling	Ouyi Ling
P'ai Shih	Pai Shi
P'ai-wei Chiao	Paiwei Jiao
P'an-shih	Pamshi
P'ao-lu Chiao	Paolu Jiao
P'eng Chiao	Peng Jiao
P'eng-hu	Penghu
P'eng-hu Kang	Penghu Gang
P'eng-hu Lieh-Tao	Penghu Liedao
P'eng-lai	Penglai
P'eng-lai T'ou	Penglai Tou
P'i p'a Shan	Pipashan
P'i Shan	Pishan
P'ing Chou	Ping Zhou
P'ing Tao	Ping Dao
P'ing-hai	Pinghai
P'ing-hai Wan	Pinghai Wan
P'ing-shih	Pingshi
P'ing-t'an	Pingtan
P'ing-yang	Pingyang
P'ing-yang Tsui	Pingyang Zui
P'o-li	Poli
P'u-ch'ien Chiao	Puqian Jiao
P'u-ch'ien Wan	Puqian Wan
P'u-chen	Pu Zhen
P'u-lan-tien Wan	Pulandian Wan
P'u-t'ien	Putian
P'u-t'o	Putuo
P'u-t'o Shan	Putuoshan
Pa Chiao	Ba Jiao
Pa-chao Lieh-tao	Bazhao Liedao
Pa-chao Shui-tao	Bazhao Shuidao
Pa-chao Tao	Bazhao Dao
Pa-so Kang	Basuo Gang
Pai Chiao	Bai Jiao
Pai Shan	Baishan
Pai-ch'uan Lieh-tao	Baiquan Liedao
Pai-chia Shan	Bajiashan
Pai-chieh Hsia	Baijie Xia
Pai-chieh Shan	Bayieshan
Pai-fen Ling	Beifen Ling
Pai-hu Chiao	Baihu Jiao
Pai-hu T'ou	Baihu Tou
Pai-hu t'ou Sha	Baihutou Sha
Pai-k'eng Shan	Baikeng Shan
Pai-kuo Shan	Beiguoshan
Pai-li Tao	Baili Dao
Pai-li-sha Tsui	Beili Shaxui
Pai-lung Yen	Bailong Yan
Pai-lung-wei	Bailong Wei
Pai-ma Shan	Baima Shan
Pai-mien-chiang-chun	Baimianjiangjun
Pai-mu-t'ien Chiao	Baimutian Jiao
Pai-mu-ti Chiao	Baimudi jiao
Pai-pu-lou	Baibulou
Pai-se Yen	Baise Yan
Pai-sha Shan	Baishashan

WADE-GILES	PINYIN
Pai-sha Tao	Baisha Dao
Pai-shui-lin	Baishuilin
Pai-su Yen	Baisu Yan
Pai-t'a Sham	Baitasham
Pai-t'ou	Baitou
Pai-yu-wan Tao	Baiyuwan Dao
Pai-yun Shan	Baiyun Shan
Pai-ya P'ai	Baiya Pai
Pai-Sha Ch'ien-t'an	Baisha Qiantan
Pan-ch'ao Chiao	Banchao Jiao
Pan-chao Lieh-tao	Banzhao Liedao
Pan-lu Shih	Banlu Shi
Pan-mian Shan	Banmian Shan
Pan-mien-shan	Banmian Shan
Pan-t'ian Shan	Bantian Shan
Pan-yang Chiao	Banyang Jiao
Pan-yang Shan	Banyangshan
Pang-hu Shan	Benghu Shan
Pao-hu Chiao	Baohu Jiao
Pao-hu Shan	Baohu Shan
Pao-kai Shan	Baogai Shan
Pei Chiao	Bei Jiao
Pei Shui-tao	Bei Shuidao
Pei Ts'ao	Bei Cao
Pei Wan	Bei Wan
Pei-ao Tao	Beiao Dao
Pei-ch'uan Chiao	Beiquan Jiao
Pei-ch'ang-shan Tao	Beichangshan Dao
Pei-ch'i Yen	Beiqi Yan
Pei-chi shan	Beijishan
Pei-chi-shan Lieh-tao	Beijishan Liedao
Pei-chia Ling	Bingma Shan
Pei-chiao Pan-tao	Beijiao Bandao
Pei-chiao Tsui	Beijiao Zui
Pei-chien Tao	Beijian Dao
Pei-fang Ch'ient'an	Beifang Qiantan
Pei-hai	Beihai
Pei-hai Kang	Beihai Gang
Pei-huang-ch'eng Tao	Beihuangcheng Dao
Pei-kan-t'ang Dao	Beigantang Dao
Pei-kan-t'ang Tao	Beigantang Dao
Pei-kang Shan	Beigangshan
Pei-kou-t'o	Beigoutuo
Pei-kuan Tao	Beiguan Dao
Pei-li	Beili
Pei-li Wan	Beili Wan
Pei-li-ch'ien T'an	Baili Qiantan
Pei-lung Shan	Beilongshan
Pei-pai	Beibai
Pei-pu Wan	Beibu Wan
Pei-sha Tao	Beisha Dao
Pei-shih	Beishi
Pei-shuang Tao	Beishuang Dao
Pei-shuang-yang K'ou	Beishuangyang Kou
Pei-t'ai-wu Shan	Beitaiwu Shan
Pei-t'ang	Beitang
Pei-t'ien-wei	Beitian Wei
Pei-t'ing Shan	Beitingshan

WADE-GILES	PINYIN
Pei-t'o-chi Shui-tao	Beituoji Shuidao
Pei-ting Tao	Beiding Dao
Pei-ting-hsin	Beidingxin
Pei-tse	Beize
Pei-yu Shan	Beiyushan
Pei-Chian Pan-tao	Beijiao Bandao
Pi-chia Ling	Bijia Ling
Pi-chia Shan	Bijia Shan
Pi-t'ou Chiao	Bitou Jiao
Piao Chiao	Biao Jiao
Piao-tan	Biaodan
Pien-yu T'ou	Pianyu
Ping-hu Tao	Pinghu Dao
Ping-ma Chiao	Bingma Jiao
Ping-ma Shan	Bingma Shan
Po Hai	Bo Hai
Po-hai Hai-hsia	Bohai Haixia
Po-hai Wan	Bohai Wan
Po-tao Tsui	Bodaozui
San Sha	San Sha
San-chia Ling	Sanjia Ling
San-chia Tseng	Sanjiazeng
San-chia-tseng	Sanjiazeng
San-chiang Shan	Sanjiang Shan
San-chiao-shan Tao	Sanjiaoshan Dao
San-hsia Kou	Sanxia Kou
San-hsing Lieh-tao	Sanxing Liedao
San-liang-ch'e	Sanliang Che
San-men Dao	Sanmen Dao
San-men Lieh-tao	Sanmen Liedao
San-men Tao	Sanmen Dao
San-men Wan	Sanmen Wan
San-niang Wan	Sanniang Wan
San-pei-chiu	Sanbeijin
San-sha	Sansha
San-shan-tzu Tao	Sanshanzi Dao
San-suan Shan	Sansuanshan
San-t'a Ting	Santa Ding
San-tou Chiao	Sandou Jiao
San-tsao Tao	Sanzao Dao
San-tu	Sandu
San-tu Ao	Sandu Ao
San-tu Tao	Sandu Dao
San-tun	Sandun
San-ya Kang	Sanya Gang
San-ya Pai	Sanya Pai
San-ya Shih	Sanya Shi
San-Yueh Shan	Sanyueshan
Sang Tao	Sang Dao
Sang-kou Wan	Sanggou Wan
Sao-chou-wei	Saozhou Wei
Sha-ch'eng	Shacheng
Sha-ch'eng Kang	Shacheng Gang
Sha-t'o-tzu	Shatuozi
Sha-wai-hang Shui-t'ao	Shawaihang Shuidao
Shan-chu Ling	Shanzhu Ling
Shan-chiang-yuan Ling	Shanjiang Yuan Ling
Shan-hai-kuan	Shanhaiguan
Shan-pai	Shanbai
Shan-t'ou	Shantou
Shan-t'ou Kang	Shantou Gang
Shan-tzu Shih	Shanzi Shi
Shan-wei	Shanwei
Shan-wei Kang	Shanwei Gang
Shan-wei T'ou	Shanwei Tou
Shan-Tzu Shih	Shanzi Shi
Shang-ch'uan Chiao	Shangchuan Jiao
Shang-ch'uan Shan	Shangchuan Shan
Shang-ch'uan Tao	Shangchuan Dao
Shang-chu Shan	Shangzhushan
Shang-hai	Shanghai
Shang-hai Kang	Shanghai Gang
Shang-kan Shan	Shangganshan
Shag-ma-an Shan	Shangmaanshan
Shang-p'an Shan	Shangpanshan
Shang-tao-ch'en Shan	Shangdachenshan
She-p'an Shan	Shepanshan
She-shan Tao	Sheshan Dao
She-yang-ho K'ou	Sheyanghe Kou
Shen-chien	Shanjian
Shen-hu Wan	Shenhu Wan
Sheng-ssu	Shengsi
Sheng-ssu Lieh-tao	Shengsi Liedao
Shi-chiu Tsui	Shijiu Zui
Shih Ling	Shi Ling
Shih Yu	Shi Yu
Shih-chiao	Shi Jiao
Shih-chiu-t'o	Shi Jiut To
Shih-chiw-So	Shijiusuo
Shih-li Ling	Shili Ling
Shih-mao Ling	Shimao Ling
Shih-pei Shan Chiao	Shibeishan Jiao
Shih-pi	Shibi
Shih-t'ang Yen	Shitang Yan
Shih-t'ou Sha	Shitou Sha
Shih-tao Kang	Shidao Gang
Shih-tzu T'ou	Shizi Tou
Shou Shih	Shou Shi
Shu-lang-hu	Shulanghu
Shu-wei Yu	Shuwei Yu
Shuang Chou	Shuang Zhou
Shuang Shan	Shuangshan
Shuang-fan	Shuangfan
Shuang-fan Shih	Shuangfan Shi
Shuang-shan Men	Shuangshan Men
Shuang-shan Tao	Shuangshan Dao
Shuang-ting Shan	Shuangding Shan
Shuang-yu Tsui	Shuangyu Zui
Shui-lo	Shuiluo
Shui-tao	Shuidao
Shui-tao-ch'ien T'an	Shuidao Qiantan
Shui-wei	Shuiwei
Shui-wei Chiao	Shuiwei Jiao
Ssu Shan	Si Shan
Ssu-chiao Shan	Sijiaoshan
Ssu-keng-sha Chiao	Sigangsha Jiao

WADE-GILES	PINYIN
Ssu-mu Yu	Simu Yu
Ssu-p'ing Shan	Siping Shan
Ssu-tzu-mei Tao	Sizimei Dao
Su-shan Tao	Sushan Dao
Sui-hsi	Suixi
SSu-shuang Lieh-tao	Sishuang Liedao
T'a Shan	Ta Shan
T'a-yu	Ta Yu
T'ai-chou Lieh-tao	Taizhou Liedao
T'ai-chou Wan	Taizhou Wan
T'ai-p'ing Chiao	Taiping Jiao
T'ai-p'ing Shan	Taipeng Shan
T'ai-p'ing-lan	Dapinglan
T'ai-ping Wan	Taiping Wan
T'ai-shan	Taishan
T'ai-tzu Shan	Taizi Shan
T'ai-wu Shan	Taiwu Shan
T'ai-Wan ch'ien T'an	Taiwan Qiantan
T'aip'ing Shan	Taiping Shan
T'an-hu Shan	Tanxushan
T'an-t'ou Shan	Tanoushan
T'an-wan Hai-hsia	Taiwan Haixia
T'ang Yu	Tang Yu
T'ang-ku	Tanggu
T'ang-nao Shan	Tangnososhan
T'ao-erh-ho K'ou	Taoerhe Kou
T'ao-hua Tao	Taohua Dao
T'ao-tzu Wan	Taozi Wan
T'e-ch'eng Tao	Techang Dao
T'eng-ch'iao	Tengqiao
T'ieh-chueh Shan	Tiejue Shan
T'ieh-lu Chang	Tielu Zhang
T'ieh-Tun	Tiedun
T'ien-an-hou-ta Ling	Tianuatou Daling
T'ien-ch'ih Kang	Tianchi Gang
T'ien-chin-hisn Kang	Tianjin Xingang
T'ien-chu Shan	Tianzhou Shan
T'ien-heng Tao	Tianheng Dao
T'ien-t'u	Tiantu
T'ien-wei Chiao	Tianwei Jiao
T'o-chi Tao	Tuoji Dao
T'o-ning Lieh-tao	Tuoning Lidao
T'ou-chin Yu	Toujin Yu
T'ou-men Shan	Toumenshan
T'u Chiao	Tu Jiao
T'u-erh Shan	Tuer Shan
T'u-erh Tao	Tuer Dao
T'u-pu Shan	Tubu Shan
T'ung Shan	Tongshan
T'ung-an	Tongan
T'ung-ku Chiao	Tonggu Jiao
T'ung-p'an Shan	Tongpan Shan
T'ung-p'an Yu	Tongpan Yu
T'ung-sha Ch'ian T'an	Tongsha Qiantan
T'ung-sha Hang-Tao	Tongsha Hangdao
T'ung-sha Sha-tsui	Tongsha Shazui
T'ungh'ang	Tengjiang
Ta Chiao	Dajiao
Ta Kang	Da Gang Channel
Ta Ling	Da Ling
Ta P'ai	Da Pai
Ta Shan	Da Shan
Ta Shan Ling	Dashan Ling
Ta Yu	Da Yu
Ta-ao Tsui	Daao Zui
Ta-chui Tao	Dashui Dao
Ta-ch'u Shan	Daqushan
Ta-ch'a-hua	Dachahua
Ta-ch'ang-t'an	Dachangtan
Ta-ch'ang-t'u Shan	Dachangtushan
Ta-ch'en Shan	Dachenshan
Ta-ch'i Chiao	Daqi Jiao
Ta-ch'iao Tao	Daqiao Dao
Ta-ch'in Tao	Daqin Dao
Ta-ch'ing Shan	Daqingshan
Ta-ch'ing-ho K'ou	Daqinghe
Ta-ch'u Shan	Daqushan
Ta-chi Shan	Dajishan
Ta-chia Shan	Dajiaoshan
Ta-chiao Shan	Dajiao Shan
Ta-chiao T'ou	Dajiao Tou
Ta-chien Feng	Dajian Feng
Ta-chien Feng	Dalian Feng
Ta-chih-chu Tao	Dazhizhu Dao
Ta-chin	Dajin
Ta-chin Chiao	Dajin Jia
Ta-chin Shan	Dajin Shan
Ta-chu Chou	Dazhu Zhou
Ta-chu Shan	Dazhushan
Ta-chu shan Tao	Dazhushan Dao
Ta-chu-shan Tsui	Dazhushan Zui
Ta-chui Tao	Dazhui Dao
Ta-feng Chiang	Dafeng Jiang
Ta-fo Tao	Dafo Dao
Ta-hei-shan Tao	Daheishan Dao
Ta-ho-shang Shan	Daheshang Shan
Ta-hsi Shui-tao	Daxi Shuidao
Ta-hsi-chai Tao	Daxizhai Dao
Ta-hsi-fan Shih	Daxifan Shi
Ta-hsieh Tao	Daxie Dao
Ta-hsing-shan Chiao	Daxingshan Jiao
Ta-hsing-tsan Yen	Daxingzan Yan
Ta-hua	Dahua
Ta-hua Shan	Dahua Shan
Ta-huang-lung Shan	Dahuanglong Shan
Ta-huo Pai	Denghuo Pai
Ta-kan Shan	Dagan Shan
Ta-kang	Dagang
Ta-kang Ting	Dagang Ding
Ta-kou Tsui-tzu	Dagou Zuizi
Ta-ku	Dagu
Ta-ku K'ou Mao-ti	Dagukou Maodi
Ta-kuan Tao	Daguan Dao
Ta-kung Tao	Dagong Dao
Ta-lao-chi	Dalaoji
Ta-lieh Tao	Dalie Dao

WADE-GILES	PINYIN
Ta-lien Kang	Dalian Gang
Ta-lien Tao	Dalian Dao
Ta-lien Tao-tzu	Dalian Daozi
Ta-lien Wan	Dalian Wan
Ta-lo	Daluo
Ta-lu Shan	Dalushan
Ta-lu Tao	Dalu Dao
Ta-ma-i Tao	Damayi Dao
Ta-mai Yu	Damai Yu
Ta-mai-i Tao	Damayi Dao
Ta-mang	Damang
Ta-mao Shan	Damao Shan
Ta-men Tao	Damen Dao
Ta-ming-fu	Daming fu
Ta-ming-Fu	Damingfu
Ta-mo Shan	Damoshan
Ta-mu Tao	Damu Dao
Ta-nan Shan	Danan Shan
Ta-nien Shan	Danianshan
Ta-ou Chiao	Daou Jiao
Ta-p'ai Chiao	Dapai Jiao
Ta-p'eng Shan	Dapengshan
Ta-p'i-kai	Dapikai
Ta-p'ing Yu	Daping Yu
Ta-p'ing-lan	Dapinglan
Ta-p'u-ho K'ou	Dapuhe Kou
Ta-pan Tao	Daban Dao
Ta-pao-hsing	Dabaoxing
Ta-pei Lieh-tao	Dabei Liedao
Ta-pei Shan	Dabei Shan
Ta-san-p'an	Dasanpan
Ta-san-shan Shui-tao	Dasanshan Shuidao
Ta-san-shan Tao	Dasanshan
Ta-shan-ting Chien	Dashanding Jiao
Ta-shu Tao	Dashu Dao
Ta-t'ang	Datang
Ta-t'u-ch'an Shih	Datuchan Shi
Ta-tan	Dadan
Ta-teng Tao	Dading Dao
Ta-tien	Dadian
Ta-ts'ai-hua Shan	Dacaihuashan
Ta-tung-ling	Dadongling
Ta-wan-shan Tao	Dawanshan Dao
Ta-wen-ch'ung	Dawenchong
Ta-yu	Da Yu
Ta-yu Chiao	Dayu Jiao
Ta-yu Shan	Dayushan
Ta-yu-ts'ang Shan	Dayucang Shan
Ta-ya Wan	Daya Wan
Ta-yang Shan	Dayangshan
Ta-yang T'ou	Dayang Tou
Ta-yao Chiao	Dayao Jiao
Tafang-chi Tao	Dafangji Dao
Tai Shan	Daishan
Tai-hu Shan	Taihu Shan
Tai-pang Wan	Dapeng Wan
Tai-shan Lieh-tao	Taishan Liedao
Tan Shui	Dan Shui
Tan-kan Lieh-tao	Dangan Liedao
Tan-kan Shui-tao	Dangan Shuidao
Tan-kan Tao	Dangan Dao
Tan-men Shan	Danmenshan
Tan-shui	Danshui
Tan-wei Chiao	Danwei Jiao
Tao-lo	Taoluo
Tao-mo Ting	Damoding
Tao-tou-ao	Daodouao
Teng-chou Ch'ien-t'an	Dengzhouqianian
Teng-chou Ch'ien-tan	Dengshou Qiautan
Teng-chou Shui-tao	Dengzhou Shuidao
Teng-pu Tao	Dengbu Dao
Ti Chiao	Di Jiao
Ti-chiao-chen	Dijiao Zhen
Ti-liu Hsing	Diliuxing
Tiao-erh Shan	Diaoer Shan
Tien-ch'eng	Diancheng
Tien-pai	Dianbai
Ting-hai	Dinghai
Ting-shih	Dingshi
Ting-t'ai T'ou	Dingtai Tou
Ting-ts'ao Yu	Dingcao Yu
Ting-tzu-ho K'ou	Dingzihe Kou
To Shan	Duo Shan
To-ku Shan	Dougu Shan
To-tzu Shan	Duozishan
Tou-chin Shui-tao	Toujin Shuidao
Tou-luan Tao	Douluan Dao
Ts'ai-hua Ling	Caihua Ling
Ts'ao Yu	Cao Yu
Ts'ao-fei-tien	Caofeidian
Ts'ao-fei-tien Tan	Caofeidian Tan
Ts'e-tzu Shan	Cezishan
Ts'en-kang	Cengang
Ts'u-lu Tao	Culu Dao
Ts'Ai Yu	Cai Yu
Ts'Ao Yu	Cao Yu
Tsao shun	Zao Shan
Tsen-chih-fu	Zengzhifu
Tsou-ma-Teng	Zoumadeng
Tsui-tung	Zaidong
Tsung Chiao	Zong Jiao
Tuan-piao Tao	Duanbiao Dao
Tui-ta T'ou	Duida Tou
Tung shang Wan	Dongshan Wan
Tung Chou	Dongzhou
Tung Hai	Dong Hai
Tung Shan	Dong Shan
Tung-an Tao	Dongan Dao
Tung-an Yen	Dongxiang Yan
Tung-ao Tao	Dongao Dao
Tung-ch'uan Tao	Dongquan Dao
Tung-ch'ang Wan	Dong Chang Wan
Tung-chi Lieh-tao	Donji Liedao
Tung-chi Shan	Dongjishan
Tung-chi Yu	Dongji Yu
Tung-chia Tao	Dongjia Dao

WADE-GILES	PINYIN
Tung-chia-k'ou Tsui	Dongjiakou Zui
Tung-chieh Chiao	Dongjie Jiao
Tung-chien	Dongjian
Tung-fang	Dongfang
Tung-fu Shan	Dongfushan
Tung-hai Tao	Donghai Dao
Tung-hai-tzu	Donghaizai
Tung-hsiang Tao	Dongxiang Dao
Tung-hsing	Dongxing
Tung-hsing Kang	Dongxing Gang
Tung-huo Shan	Donghuoshan
Tung-k'uei Shan	Dongkui Dao
Tung-ka Yu	Donggua Yu
Tung-kua Yu	Donggua Yu
Tung-lu-hua Shan	Dongluhuashan
Tung-lien-Tao	Dongxilian Dao
Tung-lo Lieh-Tao	Donglu Liedao
Tung-lo Tao	Dongluo Dao
Tung-ma-i Tao	Dongmayi Dao
Tung-mao Chou	Dongmao Zhou
Tung-men Yu	Dongmen Yu
Tung-mo-p'an	Dongmopan
Tung-nan K'ou	Dongnan Kou
Tung-pan Shan	Dongban Shan
Tung-pan-yang Chiao	Dongpanyang Jiao
Tung-pi Tao	Dongbi Dao
Tung-sha Tao	Dongsha Dao
Tung-shan Tao	Dongshan Dao
Tung-shan-wan Mao-ti	Dongshanwan Maodi
Tung-shuang Tao	Dongshuang Dao
Tung-t'ai Shan	Dongtaishan
Tung-t'ing Shan	Dongtingshan
Tung-t'ou Shan	Dongtoushan
Tung-t'ou-shan Tao	Dongtoushan Dao
Tung-ta-fan Shih	Dongdafan Shi
Tung-ting Tao	Deagding Dao
Tung-ts'e	Dongce
Tung-tsui Chiao	Dongzui Jiao
Tung-wang Sha	Dongwang Sha
Tung-yu-p'ing Yu	Donyuying Yu
Tung-yin Tao	Dongyin Dao
Tung-yu Shan	Dongyushan
Tung-Ting Yu	Dongding Yu
Tz'u Shan	Ci Shan
Tz'u-hsi	Cixi
Tzu-lo Shan	Ziluo Shan
Tzu-mao Shan	Zimao Shan
Wai Chiao	Wai Jiao
Wai Lan-chiang-sha	Wai Lanjiang Sha
Wai Sha	Wai Sha
Wai-chu Men	Waizhoumen
Wai-lan-chiang Sha	Wei Lanjiangshi
Wai-ling-ting Tao	Wailingding Dao
Wai-lung-yen	Wailongyan
Wai-p'u Sham	Waipusham
Wai-pai-chiao	Waipaijiao
Wai-pai-mu-t'ien Chiao	Waibaimutian Jiao
Wai-ssu Chiao	Waisi Jiao
Wai-ssu-k'uai	Waisikuai
Wai-ssu-k'uai Chiao	Waisikuai Jiao
Wai-t'a Chiao	Waita Jiao
Wai-t'ou	Weitou
Wai-t'ou Shan	Waitou Shan
Wai-tiao Shan	Waidiaoshan
Wai-ting-tzu Shan	Waidingzi Shan
Wai-tung Tsui	Waidong Zui
Wai-T'ou Shan	Waitou Shan
Wan-shan	Wanshan
Wang Lan	Henglan
Wang-chia Tao	Wangjia Dao
Wang-fu Chou	Wangfu Zhou
Wang-p'an Shan	Wangpan Shan
Wang-t'ien Ting	Wangtian Ding
Wei-chia Tao	Weijia Dao
Wei-chou Tao	Weizhou Dao
Wei-hai	Weihai
Wei-hai Kang	Weihai Gang
Wei-t'ou Chiao	Weitou Jiao
Wei-t'ou Wan	Weitou Wan
Wen Chou	Wen Zhou
Wen-ch'ung Shan Men	Wenchongshan Men
Wen-ch'ung-shan	Wenchongshan
Wen-chou Tao	Wenzhou Dao
Wen-chou Wan	Wenzhou Wan
Wen-chou-ch'ien T'an	Wenzhou Qiantin
Wen-kuan Tao	Wenquan Dao
Wen-ling	Wenling
Wen-teng	Wendeng
Wen-wei Chou	Wenwei Zhou
Weng-kung Chiao	Wenggong Jiao
Wo-lung Ling	Wolong Ling
Wu Jiao	Wu Jiao
Wu Shan	Wu Shan
Wu Yu	Wu Yu
Wu-ch'i Chou	Wuqi Zhou
Wu-ch'iu Yu	Wuiqiu Yu
Wu-ch'uan	Wuchuan
Wu-chu Chou	Wuzhu Zhou
Wu-chu Shan	Wuzhushan
Wu-hu Chiao	Yuhu Jiao
Wu-mien Ling	Wumen Ling
Wu-p'eng Yu	Wupeng Yu
Wu-shih	Wu Shi
Wu-shih-lien	Wushilian
Wu-sung	Wusong
Wu-sung K'ou	Wusong Kou
Wu-tao-kou Tsui-tzu	Wudagouzuizi
Yu-ch'ih Shih	Yuchi Shi
Yu-huan Tao	Yuhuan Dao
Yu-huang Shan	Yuhuang Shan
Yu-ling Chiao	Yulia Jiao
Yu-san Chiao	Yusan Jiao
Yu-t'ou Tao	Yutou Dao
Yu-weng Tao	Yuweng Dao
Yu-yao	Yuyao
Yu-Shah Lieh-tao	Yushan Liedao

WADE-GILES	PINYIN
Yuan Yu	Yuan Yu
Yuan-sha	Yuansha
Yuan-tzu Chiao	Yaunzi Jiao
Yuan-yang Tao	Yuanyang Dao
Yun-feng Shan	Yufeng Shan
Yun-hsiao	Yunxiao
Yun-nan Yen	Yunnan Yan
Yun-t'ai Shan	Yuntai Shan
Yun-ting Shan	Yunding Shan
Yun-ting-Yan	Yundingyan
Ya-lung Chiao	Yalong Jiao
Ya-lung Wan	Yalong Wan
Yai-ch'eng	Yacheng
Yai-chou Wan	Yazhou Wan
Yai-hsien San-ya	Xian Sanya
Yai-men-wai K'ou	Yamen Waikou
Yang-chia Shih	Yangjia Shi
Yang-chiao Chiao	Yangjiao Jiao
Yang-ho K'ou	Yanghe Kou
Yang-kang	Yangjiang
Yang-lan Shih	Yanglan Shi
Yang-ma Tao	Yangma Dao
Yang-p'u Wan	Yangpu Wan
Yang-p'u-pi	Yang pu Bi
Yang-pi	Yang-bi
Yang-shan Tao	Vangshan
Yang-yu Tao	Yangyu Dao
Yang-yu-ch'ih Wan	Yangyuchi Wan
Yeh-ma Yu	Yema Yu
Yeh-mao-tung	Yemaodong
Yen Yen	Yan Yan
Yen-lou Chiao	Yanlou Jiao
Yen-t'ai	Yanta
Yen-t'ai Kang	Yantai Gang
Yen-t'ou Shan	Yantou Shan
Yen-tang Shan	Yangdang Shan
Yen-tou Shan	Yandou Shan
Yen-wei Kang	Yanweigang
Yen-wo Tao	Yanwo Dao
Yin-kang Chiao	Yingang Jiao
Ying-ko Tsui	Yingge Zui
Ying-ko-hai	Yinggehai
Ying-p'an	Yingpan
Ying-tsui Shih	Yangzui Shi
Yu Yen	Yu Yan
Yu-shui Yen	Youshui Yan
Yu-Ts'ai-hua-chi	Youcaihuazhi
Yuan-chiu Chiao	Yuanzhui Jiao
Yuan-t'ou Ling	Guangtou Ling
Yung Chiao	Yong Jiang

Pinyin to Wade-Giles

PINYIN	WADE-GILES
Ai Zhou	Ai Chou
Aiqishan	Ai-ch'i Shan
Aizhou Liedao	Ai-chou Lieh-tao
AiWan	Ai-wan Wan
Anhai	An-hai
Anpu	An-p'u
Aoshan	Ao Shan
Aoshan Tou	Ao-shan T'ou
Bayieshan	Pai-chieh Shan
Ba Jiao	Pa Chiao
Bai Jiao	Pai Chiao
Baibulou	Pai-pu-lou
Baihu Jiao	Pai-hu Chiao
Baihu Tou	Pai-hu T'ou
Baihutou Sha	Pai-hu-t'ou Sha
Baijie Xia	Pai-chieh Hsia
Baikeng Shan	Pai-k'eng Shan
Baili Dao	Pai-li Tao
Baili Qiantan	Pei-li-ch'ien T'an
Bailong Wei	Pai-lung-wei
Bailong Yan	Pai-lung Yen
Baima Shan	Pai-ma Shan
Baimianjiangjun	Pai-mien-chiang-
Baimudi jiao	Pai-mu-ti Chiao
Baimutian Jiao	Pai-mu-t'ien Chiao
Baiquan Liedao	Pai-ch'uan Lieh-tao
Baise Yan	Pai-se Yen
Baisha Dao	Pai-sha Tao
Baisha Qiantan	Pai-Sha Ch'ien-t'an
Baishan	Pai Shan
Baishashan	Pai-sha Shan
Baishuilin	Pai-shui-lin
Baisu Yan	Pai-su Yen
Baitasham	Pai-t'a Sham
Baitou	Pai-t'ou
Baiya Pai	Pai-ya P'ai
Baiyun Shan	Pai-yun Shan
Baiyuwan Dao	Pai-yu-wan Tao
Bajiashan	Pai-chia Shan
Banchao Jiao	Pan-ch'ao Chiao
Banlu Shi	Pan-lu Shih
Banmianshan	Pan-mien-shan
Banmian Shan	Pan-mian Shan
Banmian Shan	Pan-mien-shan
Bantian Shan	Pan-t'ian Shan
Banyang Jiao	Pan-yang Chiao
Banyangshan	Pan-yang Shan
Banzhao Liedao	Pan-chao Lieh-tao
Baogai Shan	Pao-kai Shan
Baohu Jiao	Pao-hu Chiao
Baohu Shan	Pao-hu Shan
Basuo Gang	Pa-so Kang
Bazhao Dao	Pa-chao Tao
Bazhao Liedao	Pa-chao Lieh-tao
Bazhao Shuidao	Pa-chao Shui-tao

PINYIN	WADE-GILES
Bei Cao	Pei Ts'ao
Bei Jiao	Pei Chiao
Bei Shuidao	Pei Shui-tao
Bei Wan	Pei Wan
Beiao Dao	Pei-ao Tao
Beibai	Pei-pai
Beibu Wan	Pei-pu Wan
Beichangshan Dao	Pei-ch'ang-shan Tao
Beiding Dao	Pei-ting Tao
Beidingxin	Pei-ting-hsin
Beifang Qiantan	Pei-fang Ch'ient'an
Beifen Ling	Pai-fen Ling
Beigangshan	Pei-kang Shan
Beigantang Dao	Pei-kan-t'ang Dao
Beigantang Dao	Pei-kan-t'ang Tao
Beigoutuo	Pei-kou-t'o
Beiguan Dao	Pei-kuan Tao
Beiguoshan	Pai-kuo Shan
Beihai	Pei-hai
Beihai Gang	Pei-hai Kang
Beihuangcheng Dao	Pei-huang-ch'eng Tao
Beijiao Dao	Pei-chien Tao
Beijiao Bandao	Pei-chiao Pan-tao
Beijiao Zui	Pei-chiao Tsui
Beijishan	Pei-chi shan
Beijishan Liedao	Pei-chi-shan Lieh-tao
Beili	Pei-li
Beili Shaxui	Pai-li-sha Tsui
Beili Wan	Pei-li Wan
Beilongshan	Pei-lung Shan
Beiqi Yan	Pei-ch'i Yen
Beiquan Jiao	Pei-ch'uan Chiao
Beisha Dao	Pei-sha Tao
Beishi	Pei-shih
Beishuang Dao	Pei-shuang Tao
Beishuangyang Kou	Pei-shuang-yang K'ou
Beitaiwu Shan	Pei-t'ai-wu Shan
Beitang	Pei-t'ang
Beitian Wei	Pei-t'ien-wei
Beitingshan	Pei-t'ing Shan
Beituoji Shuidao	Pei-t'o-chi Shui-tao
Beiyushan	Pei-yu Shan
Beize	Pei-tse
Benghu Shan	Pang-hu Shan
Biao Jiao	Piao Chiao
Biaodan	Piao-tan
Bijia Ling	Pi-chia Ling
Bijia Shan	Pi-chia Shan
Bingma Jiao	Ping-ma Chiao
Bingma Shan	Pei-chia Ling
Bingma Shan	Ping-ma Shan
Bitou Jiao	Pi-t'ou Chiao
Bo Hai	Po Hai
Bodaozui	Po-tao Tsui
Bohai Haixia	Po-hai Hai-hsia

PINYIN	WADE-GILES
Bohai Wan	Po-hai Wan
Cai Yu	Ts'Ai Yu
Caihua Ling	Ts'ai-hua Ling
Cao Yu	Ts'ao Yu
Caofeidian	Ts'ao-fei-tien
Caofeidian Tan	Ts'ao-fei-tien Tan
Cengang	Ts'en-kang
Cezishan	Ts'e-tzu Shan
Cha Shan	Ch'a shan
Chai Yu	Ch'ai Yu
Chaishan	Ch'ai Shan
Chamu Yu	Ch'a-mu Yu
Chang Yu	Ch'ang Yu
Chang Zhou	Ch'ang Chou
Chang Zui	Ch'ang Tsui
Chang Zuizi	Ch'ang Tsui-tzu
Changbaishan	Ch'ang-pai Shan
Changbiao Dao	Ch'ang-piao Tao
Changdao	Ch'ang Tao
Changer Jian	Ch'ang-erh Chien
Changhua Daling	Ch'ang-hua-ta Ling
Changjiang Kou	Ch'ang-chiang K'ou
Changjiang Zui	Ch'ang-chiang Tsui
Changjiangkou Beijiao	Ch'ang-chiang-k'ou-pei Chiao
Changjiangkou Maodi	Ch'ang-chiang-k'ou Mao-ti
Changle	Ch'ang-le
Changli	Ch'ang-li
Changmadeng	Ch'ang-ma-Teng
Changmen Yan	Ch'ang-men Yen
Changshan Shuidao	Ch'ang-shan Shui-tao
Changxing Dao	Ch'ang-hsing Dao
Changxing Dao	Ch'ang-hsing Tao
Changxing Qiantan	Ch'ang-hsing Ch'ien-t'an
Changyaoshan	Ch'ang-yao Shan
Changzhishan	Ch'ang-chih Shan
Changzhou Dao	Cheng Chou Tao
Chaolian Dao	Chao-lien Tao
Chaoyang	Ch'ao-yang
Chaoyang Shan	Ch'ao-yang Shan
Cheng Shan	Ch'eng Shan
Chenghai	Ch'eng-hai
Chengmai Jiao	Ch'eng-mai Chiao
Chengmai Wan	Ch'eng-mai Wan
Chengpu Shan	Ch'eng-p'u Shan
Chengshan Jiao	Ch'eng-shan Chiao
Chengzhou Dao	Ch'eng-chou Tao
Cheniushan	Ch'eNiu Shan
Chenjia Zui	Ch'en-chia Tsui
Chenqianshan	Ch'en-ch'ien Shan
Cheqi Ding	Ch'e-cb'r Ting
Cheyou Dao	Ch'e-yu Tao
Chi Yu	Chih Yu
Chikan	Ch'i-k'an
Chishan Ji	Ch'ih-shan-chi
Chishizai	Chih-shih Tzu
Chitoushan	Ch'ih-t'ou Shan
Chixai Wei	Ch'ih-tzu-wei
Chongming	Ch'ung-ming
Chongming Dao	Ch'ung-ming Tao
Chongming Qiantan	Ch'ung-ming Ch'ien-Tan
Chongshan	Ch'ung Shan
Chongwu	Ch'ung-wu
Chuan Jiao	Ch'uan Chiao
Chuanbi	Ch'uan-pi
Chuanbi Dao	Ch'uan-pi Tao
Chuangaiushan	Ch'uang-niu Shan
Chuansha	Ch'uan-sha
Chuanshan Bandao	Ch'uan-shan Pan-tao
Chuanshi Dao	Ch'uan-shih Tao
Chushui Shi	Ch'u-shui Shih
Ci Shan	Tz'u Shan
Cixi	Tz'u-hsi
Culu Dao	Ts'u-lu Tao
Da Gang Channel	Ta Kang
Da Jiao	Ta Chiao
Da Ling	Ta Ling
Da Pai	Ta P'ai
Da Shan	Ta Shan
Da Yu	Ta-yu
Daao Zui	Ta-ao Tsui
Daban Dao	Ta-pan Tao
Dabaoxing	Ta-pao-hsing
Dabei Liedao	Ta-pei Lieh-tao
Dabei Shan	Ta-pei Shan
Dacaihuashan	Ta-ts'ai-hua Shan
Dachahua	Ta-ch'a-hua
Dachangtan	Ta-ch'ang-t'an
Dachangtushan	Ta-ch'ang-t'u Shan
Dachenshan	Ta-ch'en Shan
Dadan	Ta-tan
Dadian	Ta-tien
Dading Dao	Ta-teng Tao
Dadongling	Ta-tung-ling
Dafangji Dao	Tafang-chi Tao
Dafeng Jiang	Ta-feng Chiang
Dafo Dao	Ta-fo Tao
Dagan Shan	Ta-kan Shan
Dagang	Ta-kang
Dagang Ding	Ta-kang Ting
Dagong Dao	Ta-kung Tao
Dagou Zuizi	Ta-kou Tsui-tzu
Dagu	Ta-ku
Daguan Dao	Ta-kuan Tao
Dagukou Maodi	Ta-ku K'ou Mao-ti
Daheishan Dao	Ta-hei-shan Tao
Dahengqin Dao	Da-heng-ch'in Tao
Daheshang Shan	Ta-ho-shang Shan
Dahua	Ta-hua
Dahua Shan	Ta-hua Shan
Dahuanglong Shan	Ta-huang-lung Shan
Daishan	Tai Shan
Dajian Feng	Ta-chien Feng
Dajiao	Ta Chiao
Dajiao Shan	Ta-chiao Shan
Dajiao Tou	Ta-chiao T'ou
Dajiaoshan	Ta-chia Shan

PINYIN	WADE-GILES
Dajin	Ta-chin
Dajin Jia	Ta-chin Chiao
Dajin Shan	Ta-chin Shan
Dajishan	Ta-chi Shan
Dalaoji	Ta-lao-chi
Dalian Dao	Ta-lien Tao
Dalian Daozi	Ta-lien Tao-tzu
Dalian Feng	Ta-chien Feng
Dalian Gang	Ta-lien Kang
Dalian Wan	Ta-lien Wan
Dalie Dao	Ta-lieh Tao
Dalu Dao	Ta-lu Tao
Daluo	Ta-lo
Dalushan	Ta-lu Shan
Damai Yu	Ta-mai Yu
Damang	Ta-mang
Damao Shan	Ta-mao Shan
Damayi Dao	Ta-ma-i Tao
Damayi Dao	Ta-mai-i Tao
Damen Dao	Ta-men Tao
Daming fu	Ta-ming-fu
Damingfu	Ta-ming-Fu
Damoding	Tao-mo Ting
Damoshan	Ta-mo Shan
Damu Dao	Ta-mu Tao
Dan Shui	Tan Shui
Danan Shan	Ta-nan Shan
Dangan Dao	Tan-kan Tao
Dangan Liedao	Tan-kan Lieh-tao
Dangan Shuidao	Tan-kan Shui-tao
Danianshan	Ta-nien Shan
Danmenshan	Tan-men Shan
Danshui	Tan-shui
Danwei Jiao	Tan-wei Chiao
Daodouao	Tao-tou-ao
Daou Jiao	Ta-ou Chiao
Dapai Jiao	Ta-p'ai Chiao
Dapeng Wan	Tai-pang Wan
Dapengshan	Ta-p'eng Shan
Dapikai	Ta-p'i-kai
Daping Yu	Ta-p'ing Yu
Dapinglan	T'ai-p'ing-lan
Dapinglan	Ta-p'ing-lan
Dapuhe Kou	Ta-p'u-ho K'ou
Daqi Jiao	Ta-ch'i Chiao
Daqiao Dao	Ta-ch'iao Tao
Daqin Dao	Ta-ch'in Tao
Daqinghe	Ta-ch'ing-ho K'ou
Daqingshan	Ta-ch'ing Shan
Daqushan	Ta-ch'u Shan
Dasanpan	Ta-san-p'an
Dasanshan	Ta-san-shan Tao
Dasanshan Shuidao	Ta-san-shan Shui-tao
Dashan Ling	Ta Shan Ling
Dashanding Jiao	Ta-shan-ting Chien
Dashu Dao	Ta-shu Tao
Dashui Dao	Ta-chui Tao
Datang	Ta-t'ang
Datuchan Shi	Ta-t'u-ch'an Shih
Dawanshan Dao	Ta-wan-shan Tao
Dawenchong	Ta-wen-ch'ung
Daxi Shuidao	Ta-hsi Shui-tao
Daxie Dao	Ta-hsieh Tao
Daxifan Shi	Ta-hsi-fan Shih
Daxingshan Jiao	Ta-hsing-shan Chiao
Daxingzan Yan	Ta-hsing-tsan Yen
Daxizhai Dao	Ta-hsi-chai Tao
Daya Wan	Ta-ya Wan
Dayang Tou	Ta-yang T'ou
Dayangshan	Ta-yang Shan
Dayao Jiao	Ta-yao Chiao
Dayu Jiao	Ta-yu Chiao
Dayucang Shan	Ta-yu-ts'ang Shan
Dayushan	Ta-yu Shan
Dazhizhu Dao	Ta-chih-chu Tao
Dazhu Zhou	Ta-chu Chou
Dazhui Dao	Ta-chui Tao
Dazhushan	Ta-chu Shan
Dazhushan Dao	Ta-chu-shan Tao
Dazhushan Zui	Ta-chu-shan Tsui
Deagding Dao	Tung-ting Tao
Dengbu Dao	Teng-pu Tao
Denghuo Pai	Ta-huo Pai
Dengshou Qiautan	Teng-chou Ch'ien-tan
Dengzhou Shuidao	Teng-chou Shui-tao
Dengzhouqianian	Teng-chou Ch'ien-t'an
Di Jiao	Ti Chiao
Dianbai	Tien-pai
Diancheng	Tien-ch'eng
Diaoer Shan	Tiao-erh Shan
Dijiao Zhen	Ti-chiao-chen
Diliuxing	Ti-liu Hsing
Dingcao Yu	Ting-ts'ao Yu
Dinghai	Ting-hai
Dingshi	Ting-shih
Dingtai Tou	Ting-t'ai T'ou
Dingzihe Kou	Ting-tzu-ho K'ou
Dong Chang Wan	Tung-ch'ang Wan
Dong Hai	Tung Hai
Dong Shan	Tung Shan
Dongan Dao	Tung-an Tao
Dongao Dao	Tung-ao Tao
Dongban Shan	Tung-pan Shan
Dongbi Dao	Tung-pi Tao
Dongce	Tung-ts'e
Dongdafan Shi	Tung-ta-fan Shih
Dongding Yu	Tung-Ting Yu
Dongfang	Tung-fang
Dongfushan	Tung-fu Shan
Donggua Yu	Tung-ka Yu
Donggua Yu	Tung-kua Yu
Donghai Dao	Tung-hai Tao
Donghaizai	Tung-hai-tzu
Donghuoshan	Tung-huo Shan
Dongji Yu	Tung-chi Yu
Dongjia Dao	Tung-chia Tao

PINYIN	WADE-GILES
Dongjiakou Zui	Tung-chia-k'ou Tsui
Dongjian	Tung-chien
Dongjie Jiao	Tung-chieh Chiao
Dongjishan	Tung-chi Shan
Dongkui Dao	Tung-k'uei Shan
Dongluhuashan	Tung-lu-hua Shan
Dongluo Dao	Tung-lo Tao
Dongluo Liedao	Tung-lo Lieh-Tao
Dongmao Zhou	Tung-mao Chou
Dongmayi Dao	Tung-ma-i Tao
Dongmen Yu	Tung-men Yu
Dongmopan	Tung-mo-p'an
Dongnan Kou	Tung-nan K'ou
Dongpanyang Jiao	Tung-pan-yang Chiao
Dongquan Dao	Tung-ch'uan Tao
Dongsha Dao	Tung-sha Tao
Dongshan Dao	Tung-shan Tao
Dongshan Wan	Tung shan Wan
Dongshanwan Maodi	Tung-shan-wan Mao-ti
Dongshuang Dao	Tung-shuang Tao
Dongtaishan	Tung-t'ai Shan
Dongtingshan	Tung-t'ing Shan
Dongtoushan	Tung-t'ou Shan
Dongtoushan Dao	Tung-t'ou-shan Tao
Dongwang Sha	Tung-wang Sha
Dongxiang Dao	Tung-hsiang Tao
Dongxiang Yan	Tung-an Yen
Dongxilian Dao	Tung-lien-Tao
Dongxing	Tung-hsing
Dongxing Gang	Tung-hsing Kang
Dongyin Dao	Tung-yin Tao
Dongyushan	Tung-yu Shan
Dongyuying Yu	Tung-yu-p'ing Yu
Dongzhou	Tung Chou
Dongzui Jiao	Tung-tsui Chiao
Donji Liedao	Tung-chi Lieh-tao
Douluan Dao	Tou-luan Tao
Duanbiao Dao	Tuan-piao Tao
Duida Tou	Tui-ta T'ou
Duo Shan	To Shan
Duogu Shan	To-ku Shan
Duozishan	To-tzu Shan
Ehuang Zhang	O-feng Chang
Ehuo Ling	O-hao Ling
Emei Zhang	O-mei Chang
Er Zhou	Erh Chou
Erdan	Erh-tan
Erhua	Erh-huo
Erjin Qiantan	Erh-chin-ch'ien T'an
Erlong Shan	Erh-lung Shan
Ermuluanzi	Erh-mu-luan-tzu
Ershanzi Dao	Erh-shan-tzu Tao
Ersuanshan	Erh-suan Shan
Ertuozi Dao	Erh-t'o-tzu Tao
Fanbi	Fan-pi
Fangcheng	Fang-ch'eng
Fangcheng Gang	Fang-ch'eng Kang
Fangui Zhou	Fan-kuei Chou

PINYIN	WADE-GILES
Feihuanghe Kou	Fei-huang-he K'ou
Feiyuajiang Kou	Fei-yun-chiang Kou
Fengchao Yan	Feng-ch'ao Yen
Fengdong Shan	Feng-tung Shan
Fenggiu Sha	Feng-ch'iu Sha
Fenghuang Shan	Feng-huang Shan
Fenghuang Zai	Feng-huang Tsui
Fenghuangwei	Feng-huang-wei
Fengmen Ling	Feng-men Ling
Fengming Dao	Feng-ming Tao
Fengshui Jiao	Feng-shui Chiao
Fengting	Feng-t'ing
Fengwei Zui	Feng-wei Tsui
Fo Ding	Fo Ting
Fodu Dao	Fo-tu Tao
Foluo	Fo-lo
Fu Shan	Fu Shan
Fuding	Fu-ting
Fuhu Ling	Fu-hu Ling
Funing Wan	Fu-ning Wan
Fuqing	Fu-ch'ing
Fuqing Wan	Fu-ch'ing Wan
Futou Wan	Fu-t'ou Wan
Fuwen	Fu-wen
Fuyao Liedao	Fu-yao Tao
Fuying Dao	Fu-ying Tao
Fuzhou	Fu-chou
Fuzhou Gang	Fu-chou
Fuzhou Wan	Fu-chow Wan
Gadon Jiao	Kah-en Chiao
Gan Chang	Kan-ch'eng
Gan'en Sha	Kan-en Sha
Gang Shan	Kang Shan
Gangwei	Kang-wei
Gao Dao	K'ao-tao
Gao Jiao	Kao-chiao
Gao Shan	Kao Shan
Gaodeng Dao	Kao-teng Tao
Gaolan Dao	Kao-lan Tao
Gaolan Liedao	Kao-lan Lieh-tao
Gaonaozi Jiso	Kao-nao-tzu Chiao
Gaoqiso	Kao-ch'iao
Gaoshan Dao	Kao-shan Tao
Gaoshan Ling	Kao-shang Ling
Gaoshen Ling	Kao-shan Ling
Gehong Shan	Ko-hung Shan
Geli Yan	Ko-li Yen
Gengoian Cun	Kuan-ch'ien-ts'un
Gongkou Tou	Kung-k'ou T'ou
Gopo Yu	Ku-p'o Yu
Gouqishan	Kou-ch'i Shan
Gualianshan	Kua-lien Shan
Guanchuanao	Kuan-ch'uan-ao
Guanghai	Kuang-hai
Guanghai Wan	Kuang-hai Wan
Guanghe Kou	Kuan-ho K'ou
Guangtou Ling	Yuan-t'ou Ling
Guanshan Dao	Kuan-shan Tao

PINYIN	WADE-GILES
Guantou Ling	Kuan-t'ou Ling
Guanyanbeng Ling	Kuan-yin-peng Ling
Guanyin Jiao	Kuan-yin Chiao
Guanyin Ling	Kuan-yin Ling
Guanyin Shan	Kuan-yin Shan
Guanyun	Kuan-yun
Guaymen Shan	Kuan-men Shan
Gui Yu	Kuei Yu
Guiling Dao	Kuei-ling Tao
Guishan Dao	Kuei-shan Tao
Gulei Shan	Ku lei Shan
Guleitou	Ku-lei-t'ou
Gulong Zui	Ku-lung Tsui
Gutou Shan	Ku-t'ou Shan
Ha Wei	Hai Wei
Ha Zhong Jiao	Ho-chung Chiao
Hai Jiao	Hai Chiao
Hai Yang	Hai-yang
Haian	Hai-an
Haian Wan	Hai-an Wan
Haifeng	Hai-feng
Haihuangshan	Hai-huang Shan
Haijia Shan	Hai-chia Shan
Haikang	Hai-k'ang
Haikou	Hai-k'ou
Haikou Gang	Hai-k'ou Kang
Haikou Wan	Hai-k'ou Wan
Hailan Haixia	Hai-t'an Hai-hsia
Hailingshan Dao	Hai-ling-shan Tao
Hailingshan Gang	Hai-ling-shan Kang
Hailu Dao	Hai-lu Tao
Haiman Dao	Hai-men Tao
Haimao Dao	Hai-mao Tao
Haimaozi Tou	Hai-mao-tzu T'ou
Haimen	Hai-men
Haimen Jiao	Hai-men Chiao
Haimen Wan	Hai-men Wan
Hainan Dao	Hai-nan Tao
Haining	Hai-ning
Haitan Jiao	Hai-t'an Chiao
Haitan Shi	Hai-t'an Shih
Haitan Wan	Hai-t'an Wan
Haiyan	Hai-yen
Haiyang Dao	Hai-yang Tao
Haizhou Wan	Hai-chou Wan
Han Jiang	Han-chiang
Hangu	Han-ku
Hangzhou Wan	Hang-chou Wan
He Shan	Ho Shan
Hebao Dao	He pao Tao
Hegang Shan	Ho-kang Shan
Hehuashan Shan	Ho-hua-sheng Shan
Hei Jiao	Hei Chiao
Hei Yan	Hei Yen
Hei Zhou	Hei Chou
Heicun Jiao	Hei-ts'un Chiao
Heishijiao Wan	Hei-shi-chiao Wan
Helian Ya	Ho-lien-ya
Heng Mian Sha	Heng-mien Sha
Heng Sha	Heng Sha
Heng Shan	Heng Shan
Heng Zhou	Heng Chou
Henggang Dao	Heng-kang Tao
Hengjian Shan	Hung-chien Shan
Henglan	Wang Lan
Hengzhishan	Heng-chih Shan
Hepu	Ho-p'u
Hetaoyuanzi	Ho-t'ao-yuan-tzu
Gezhong Jiao	Ho-chung Chiao
Hong Shan	Hung Shan
Honghai Wan	Hung-hai Wan
Hongyu Pai	Hung-yu P'ai
Hou Jiao	Hou Chiao
Houduo Jiao	Hou-to Chiao
Houershi Zui	Hou-erh-shih Tsui
Houhai Sha	Hou-hai Sha
Houji Dao	Hou-chi Tao
Houji Shuidao	Hou-chi Shui-tao
Houjishan	Hou-chi shan
Houqing Yu	Hou-ch'ing Yu
Houshui Wan	Hou-shui Wan
Hua Yu	Hua Yu
Huang Dao	Huang Tao
Huang Hai	Huang Hai
Huang He	Huang Ho
Huang Jiao	Huang Chiao
Huang Shan	Huang Shan
Huang Xian	Huang-hsien
Huangbai Zui	Huang-pai Tsui
Huangbaizuiliho	Huang-Pai-Tsui-Li Ho
Huangcheng	Huang-ch'eng
Huangchengshan	Huang-ch'eng Shan
Huangdaao Shuidao	Huang-ta-ao Shui-tao
Huanggan Dao	Huang-kan Tao
Huanggua Yu	Huang-kua Tu
Huanghe Kou	Huang-ho K'ou
Huanghua	Huang-hua
Huangjia Shan	Huang-chiao Shan
Huangjiatang Wan	Huang-chia-t'ang Wan
Huangjing Ling	Huang-ching Ling
Huangliu	Huang-liu
Huanglongwei Zui	Huang-lung-wei Tsui
Huangmao Dao	Huang-mao Tao
Huangmao Shan	Huang-mao Shan
Huangmeng Dao	Huang-meng Tao
Huangmenshan	Huang-men Shan
Huangqi	Huang-ch'i
Huangshi Shan	Huang-shih Shan
Huangxing Dao	Huang-hsing Tao
Huangyan	Huang-yen
Huangyang Jian	Huang-yang Chien
Huangze Shan	Huang-tse Shan
Huangzhu Jiao	Huang-chu Chiao
Huangzuizi Wan	Huang-tsui-tzu Wan
Huanhaisi Dizui	Huan-hai-ssu Ti-tsui
Huaniaoshan	Hua-niao Shan

PINYIN	WADE-GILES
Huapingshan	Hua-p'ing Shan
Huatonggou Zhen	Huang-tiung-kou Chen
Hudong Jiao	Hu-tung Chiao
Hugong Shan	Hu-kung Shan
Hui Dao	Hui Tao
Hui Shan	Hui Shan
Hui-lai	Hui-lai
Huian	Hui-an
Huidong	Hui-tung
Hujing Yu	Hu-ching Yu
Hulu Dao	Hu-lu Dao
Hulu Dao	Hu-lu Tao
Hulushan Wan	Hu-lu-shan Wan
Hung Yu	Hung Yu
Huoshan Liedao	Huo-shan Lieh-tao
Huping Dao	Hu-p'ing Tao
Hushi	Hu-shih
Hutou Yu	Hu-t'ou Yu
Huxiaoshie	Hu-hsiao-she
Huyu Dao	Hu-yu Tao
Ji Yu	Chi Yu
Jiang Junao Yu	Chiang-chun-ao
Jiang Yun Ding	Chiang-Yun Ting
Jiangerao	Chiang-erh-ao
Jianghong Xu	Chiang-hung Hsu
Jiangjun Ao	Chiang-chun Ao
Jiangjun Tou	Chiang-chun T'ou
Jiangjunmao	Chiang-chun-Mao
Jiangkou	Chiang-k'ou
Jiangmu Dao	Chiang-mu Tao
Jiangping Xu	Chaing-p'ing Hsu
Jiangya Hangdao	Chiang-ya Hang-tao
Jiangyin Dao	Chiang-yin Tao
Jianhuang Ping	Chien-huang-p'ing
Jianyang Dao	Chien-yang Tao
Jiao Liedao	Chiao-lieh Tao
Jiao Shan	Chiao Shan
Jiaoliudao	Ch'iao-liu-tao
Jiaonan	Chiao-nan
Jiaotou Bi	Chiao-t'ou Pi
Jiaowei Jiao	Chiao-wei Chiao
Jiaowei Wan	Chiao-wei Wan
Jiaozhou Wan	Chiao-chou Wan
Jiapeng Liedao	Chia-p'eng Liedao
Jiashan Ling	Chia-shan Ling
Jiazi	Chia-tzu
Jiazi Gang	Chia-tzu Kang
Jiazi Jiao	Chia-tzu Chiao
Jiazi Shan	Chia-tzu Shan
Jibei Yu	Chi-pei
Jieshi Wan	Chieh-shih Wan
Jigu Jiao	Chi-ku Chiao
Jiguanshan	Chi-kuan Shan
Jigushan	Chi-ku Shan
Jilong Gang	Chi-lung Kang
Jilong Jiao	Chi-lung Chiao
Jilong Shan	Chi-lung Shan
Jimei	Chi-mei
Jiming Dao	Chi-ming Tao
Jimo	Chi-mo
Jin Jiang	Chin Chiang
Jin Xian	Chin-hsien
Jin Yu	Chin Yu
Jinghai Wan	Ching-hai Wan
Jinghaiwei	Ching-hai-wei
Jingyu Yan	Ching-yu Yen
Jingzi Tou	Ching-tzu T'ou
Jinji Ling	Chin-chi Ling
Jinjishan	Chin-chi Shan
Jinmen	Chin men
Jinmen Dao	Chin-men Dao
Jinmen Wen	Chin-men Wan
Jinmu Jiao	Chin-mu Chiao
Jinqiang	Chin-chiang
Jinshan Gang	Chin-shan Kang
Jinshan Zui	Chin-shan Tsui
Jinshanwei	Chin-shan-wei
Jintang Shan	Chin-t'ang Shan
Jintang Shuidao	Chin-t'ang Shui-tao
Jinzhou Wan	Chin-chou Wan
Jisobeishan	Chiao-pei Shan
Jiuaun Ling	Chiu-ts'un Ling
Jiudan Sha	Chiu-tuan Sha
Jiudongshan	Chiu-tung Shan
Jiuhua Shan	Chiu-hua Shan
Jiulong Jiang	Chiu-lung Chiang
Jiulou Shan	Chiu-lau Shan
Jiurong Cheng	Chiu-jung ch'eng
Jiushan Liedao	Chiu-shan Lieh-tao
Jixin	Chi-hsin
Ju Shan	Chu Shan
Juantang Ling	Chien-feng Ling
Jun Shan	Chun Shan
Junbi Jiao	Chun Pi Chiao
Junying Ling	Chun-ying Ling
Kaiping	K'ai-ping
Kaishan Dao	K'ai-shan Tao
Kanmen	K'an-man
Kanwei Sha	K'an-wei Sha
Ketangshan	K'o-t'ang Shan
Kezi Shan	K'o-tzu Shan
Kongke Yu	K'ung-k'o Yu
Kongtong Dao	K'ung-tung Tao
Kuishan Dao	K'uei-shan Tao
Kuitian Shan	Kuei-t'ien Shan
Luda Dalian	Lu-ta Ta-lien
Lushun	Lu-shun
Laibai Qtuntan	Lanpai-ch'ien T'an
Lan Cun	Lan-Ts'un
Langgangshan Liedao	Lang-kang-shan Lieh-tao
Langji Shan	Lang-chi Shan
Langqi Dao	Lang-ch'i Tao
Langu Shan	Lan-ku Shan
Lao Shan	Lao Shan
Laodong Jiao	Lao-tung Chiao
Laohu Shan	Lao-hu Shan

PINYIN	WADE-GILES
Laopian Dao	Lao-p'ien Tao
Laoqua Shan	Lo-ch'in Shan
Laoshan Tou	Lao-shan T'ou
Laoshan Wan	Lao-shan Wan
Laotie Shan	Lao-t'ieh Shan
Laotieshan Dongjiao	Lao-t'ieh-shan-tung Chiao
Laotieshan Shuidao	Lao-t'iek-shan Shui-tao
Laotieshan Xijiao	Lao-t'ieh-shan-hsi Chiao
Laotieshan Xijiao	Lao-t'ieh-Shan Hsi
Leigong Sha	Lei-kung Sha
Leizhou	Lei-chou
Leizhou Wan	Lei-chou Wan
Lemen Liedao	Le-men Lieh-tao
Leqing	Le-ch'ing
Leqing Wan	Le-ch'ing Wan
Li-tou Zui	Li-t'ou Tsui
Liandui Jiao	Lien-tui Chiao
Lianfeng	Lien-feng Shan
Liang Cheng	Liang-ch'eng
Lianghengshan	Liang-heng Shan
Liangtoudong	Liang-t'ou-tung
Liangwengang	Liang-wen Kang
Liangxiongdi Dao	Liang-hsiung-ti Tao
Lianhua Shan	Lien-hua Shan
Lianjiang	Lien-chiang
Lianyungang	Lien-yun-kang
Lianzi Jiao	Lien-tzu Chiao
Liaobantian	Liao-pan-t'ian
Liaodong Wan	Liao-tung Wan
Liaoluo Tou	Liao-lo T'ou
Liaoluo Wan	Liao-lo Wan
Lidao	Li-tao
Lie Yan	Lieh Yen
Liezi Kou	Lieh-tzu K'ou
Ligen Wan	Li-ken Wan
Lihuo Yu	Li-huo Yu
Linchang Dao	Lin-ch'ang Tao
Linchang Dao	Ling-ch'ang Tao
Lingao	Lin-kao
Lingao Jiao	Lin-kao Chiao
Lingfeng Shan	Ling-feng Shan
Lingshan Dao	Ling-shan Tao
Lingshan Shuidao	Ling-shan Shui-tao
Lingshan Wan	Ling-shan Wan
Lingtouman Ling	Ling-t'ou-ma-an Ling
Linhai	Lin-hai
Linmangao	Lin-men-kao
Lishi Liedao	Li-shih Lieh-tao
Lisikuai	Li-ssu-kuai
Liugong Dao	Liu-kung Tao
Liuheng Dao	Liu-heng Tao
Liuquan Jiao	Liu Ch'uan Chiao
Liusha Wan	Liu-sha Wan
Liyubei Jiao	Li-yu pei Chiao
Lizatu	Li-tzu-Tu
Lizheng Jiao	Li-cheng Chiao
Lizi Dao	Li-tzu Tao
Long Yu	Lung Yu
Longdong Zui	Lung-tung Tsui
Longertan Daling	Lung-erh-t'an-ta Ling
Longgao Shan	Lung-kao Shan
Longkou Gang	Lung-k'ou Kang
Longmen	Lung Men
Longmu Jiao	Lung-mu Chiao
Longnichan Shi	Lung-ni ch'an Shih
Longshe	Lung-she
Longshu Ling	Lung-shui Ling
Longxu Dao	Lung-hsu Tao
Lu Dao	Lu Tao
Luanhe Kou	Luan-ho K'ou
Luanmo Jiao	Luan-ma Chiao
Luanyantou	Luan-yen-Tou
Lufeng	Lu-feng
Lufeng Shan	Lu-feng Shan
Luhuitou Jiao	Lu-hui-t'ou Chiao
Lujiazhi	Lu-chia Chih
Luo Yan	Lo Yen
Luo Yu	Ko Yu
Luo Yu	Lo Yu
Luodou Sha	Lo-tou Sha
Luojiashan	Lo-chia Shan
Luosi Tou	Lo-ssu T'ou
Luotou Shuidao	Lo-t'ou Shui-tao
Luoyuan	Lo-yuan
Lusi	Lu-ssu Yu
Luxi Dao	Lu-hsi Tao
Ma Ling	Ma Ling
Maan Liedao	Ma-an Lieh-tao
Maan Ling	Ma-an Ling
Maanshan	Ma-an Shan
Macao	Macao
Maci Dao	Ma-tz'u Tao
Maer Dao	Ma-erh Tao
Maer Shan	Ma-erh Shan
Mai Dao	Mai Tao
Majishan	Ma-chi Shan
Mang Zhou	Mang Chou
Manyu Tou	Man-yu T'ou
Mao Yu	Mao Yu
Maojiao Zui	Mao-chiao Tsui
Maoming	Mao-ming
Mata Jiao	Ma-t'a Chiao
Mawei	Ma-wei
Mawei Zhou	Ma-wei Chou
Maxie	Ma-hsieh
Mazu Dao	Ma-tsu Tao
Mazu Haixia	Ma-tsu Hai-hsia
Mazu Liedao	Ma-tsu Lieh-tao
Mazuyin	Ma-tsu-yin
Meisan Liedao	Mei-san Lieh-tao
Meishan Dao	Mei-shan Tao
Meizhou Wan	Mei-chou Wan
Mianhua Shan	Mien-hua Shan
Miao Dao	Miao Tao
Miaodao Qundao	Miao-tao Ch'un-tao
Miaowan Dao	Miao-wan Tao

PINYIN	WADE-GILES
Miaozibu Dao	Miao-tzu-hu Tao
Min Jiang	Min Chiang
Minjiang Kou	Min-chiang K'ou
Mituo Dao	Mi-t'o Tao
Miyudi Sha	Mi-yu-li Shui
Moxin Gang	Mo-hsin Kang
Moye Dao	Mo-yeh Tao
Mudou Yu	Mu-tou Yu
Muping	Mu-p'ing
Nuying Jiao	Nu-ying Chiao
Nan Hai	Nan Hai
Nan Jiao	Nan Chiao
Nan Pu	Nan-pu
Nan Shuidao	Nan Shuitao
Nan Yu	Nan Yu
Nan'ao Dao	Nan-ao Tao
Nanao	Nan-ao
Nance	Nan-ts'e
Nanchangshan Dao	Nan-ch'ang-shan Tao
Nancpoji	Nan-ts'ao-chi
Nanding	Nan-ting
Nanding Dao	Nan-ting Tao
Nanfang Qiantan	Nan-fang Ch'ien-t'an
Nanhuangeheng Dao	Nan-huang-ch'eng Tao
Nanhui	Nan-hui
Nanjishan	Nan-chi Shan
Nanjishan Liedao	Nan-chi-shan Lieh-tao
Nanjiushan	Nan-chiu Shan
Nanjiushan Maodi	Nan-chiu-shan Mao-ti
Nankang	Nan-kang
Nankudang Dao	Nan-k'u-tang Tao
Nanpaishan	Nan-p'ai Shan
Nanpeng Dao	Nan-p'eng Tao
Nanpeng Liedao	Nan-p'eng Lieh-Tao
Nanri Dao	Nan-jih Tao
Nanri Qundao	Nan-jih Ch'un-tao
Nanri Shuidao	Nan-jih Shui-tao
Nansan Dao	Nan-san Tao
Nansha	Nan-sha
Nanshan	Nan shan
Nanshan Jiao	Nan-shan Chiao
Nanshan Ling	Nan-shan Ling
Nanshan Zui	Nan-shan Tsui
Nanshi	Nan-shih
Nanshuang Dao	Nan-shuang Tao
Nanshui Dao	Nan-shui Tao
Nantai	Nan-t'ai
Nantuoji Shuidao	Nan-t'o-chi Shui-tao
Nanyushan	Nanyushan
Nanzhi	Nan-chih
Naozhou Dao	Nao-chou Tao
Neilingding Dao	Nei-ling-ting Tao
Niang Jiao	Niang Chiao
Niangniangding	Niang-niang Ting
Niao Yu	Niao-yu
Niaozua	Niao-tsui
Niluo Yu	Ni-lo Yu
Ningbo	Ning-po
Ningbo Gang	Ning-po Kang
Ninghai	Ning-hai
Ningjinsuo	Ning-chin-so
Niubishan Shuidao	Niu-pi-shan Shui-tao
Niue Men	Niu-o Men
Niueshan	Niu-o Shan
Niufen Jiao	Niu-fen Chiao
Niugu Ling	Niu-ku Ling
Niujiao Shan	Niu-chiao Shan
Niulong Zui	Niu-lung Tsui
Niupi Jiao	Niu-p'i Chiao
Niuqing Shan	Ch'ing-niu Shan
Niuqing Shan	Niu-ch'ing Shan
Niushan	Niu Shan
Niushan Dao	Niu Shan Tao
Niushan Zui	Niu-shan Tsui
Niutou Dao	Niu-t'ou Tao
Niutou Shan	Niu-t'ou Shan
Niwxin Dao	Niu-hsin Tao
Niyushan	Ni-yu Shan
Nu Dao	Nu Tao
Oingyuan Shan	Ch'ing-yuan Shan
Ouanzhou	Ch'uan-chow
Oujiang Beikou	Ou-chiang-pei K'ou
Oujiang Nankou	Ou-chiang-nan K'ou
Ouyi Ling	Ou-i Ling
Pai Shi	P'ai Shih
Paiwei Jiao	P'ai-wei Chiao
Pamshi	P'an-shih
Paolu Jiao	P'ao-lu Chiao
Peng Jiao	P'eng Chiao
Penghu	P'eng-hu
Penghu Gang	P'eng-hu Kang
Penghu Liedao	P'eng-hu Lieh-Tao
Penglai	P'eng-lai
Penglai Tou	P'eng-lai T'ou
Pianyu	Pien-yu T'ou
Ping Dao	P'ing Tao
Ping Zhou	P'ing Chou
Pinghai	P'ing-hai
Pinghai Wan	P'ing-hai Wan
Pinghu Dao	Ping-hu Tao
Pingshi	P'ing-shih
Pingtan	P'ing-t'an
Pingyang	P'ing-yang
Pingyang Zui	P'ing-yang Tsui
Pipashan	P'i p'a Shan
Pishan	P'i Shan
Poli	P'o-li
Pu Zhen	P'u-chen
Pulandian Wan	P'u-lan-tien Wan
Puqian Jiao	P'u-ch'ien Chiao
Puqian Wan	P'u-ch'ien Wan
Putian	P'u-t'ien
Putuo	P'u-t'o
Putuoshan	P'u-t'o Shan
Qi Shan	Ch'i Shan
Qiangu Shan	Ch'ien-ku Shan

PINYIN	WADE-GILES
Qian Shan	Ch'ien Shan
Qiao Dao	Ch'i-ao Tao
Qijiazeng	Ch'i-chia-tseng
Qilintou	Ch'i-lin-tou
Qimu Jiao	Chi-mu Chiao
Qing Yan	Ch'ing Yen
Qing Zhou	Ch'ing Chou
Qingbin Dao	Ch'ing-pin Tao
Qingdao	Ch'ing-tao
Qingdao Gang	Ch'ing-tao Kang
Qingdao Jiao	Ch'ing-shan Chiao
Qingfeng	Ch'ing-feng
Qinglan Tou	Ch'ing-lan Tao
Qingshan Dao	Ch'ing-shan Tao
Qingshan Zui	Ch'ing-shan Tsui
Qingshi Lan	Ch'ing-shih-lan
Qingtaidun	Ch'ing-t'ai-tun
Qingyuan Shan	Ch'ing-yuan Shan
Qingzhou Shuidao	Ch'ing-chou Shui-tao
Qinhuangdao	Ch'in-huang-tao
Qinhuangdao Gang	Ch'in-huang-tao Kang
Qinhuangdao Wan	Ch'in-huang-tao Wan
Qiniang Shan	Ch'i-niang Shan
Qinpeng Dao	Ch'in-p'eng Tao
Qinshan Dao	Ch'in-shan Tao
Qinzhou Wan	Ch'in-chou Wan
Qiongzhou Haixia	Ch'iung-chou Hai-hsia
Qipai Jiao	Ch'i-p'ai Chiao
Qipai Shi	Ch'i-p'ai Shih
Qipan Shi	Ch'ip'an Shih
Qiren Jiao	Ch'i-jen Chiao
Qitai Zui	Ch'i't'ai Tsui
Qitaishan	Ch'i-t'ai-shan
Qitou Wan	Chin-t'ou Wan
Qixing Dao	Ch'i-hsing Tao
Qixing Jiao	Ch'i-hsing Chiao
Qixing Ling	Ch'i-hsing Ling
Qizhou Liedao	Ch'i-chou Lieh-tao
Qizimei	Ch'i-tzu-mei
Quanzhou	Ch'uan-chou
Quanzhou Wan	Ch'uan-chou Wan
Qundao	Ch'un-tao
Raoping	Jao-p'ing
Riyue Yu	Jih-yueh Yu
Rizhao	Jih-chao
Rongcheng	Jung-ch'eng
Rongcheng Mashan	Jung-ch'eng-ma Shan
Rongcheng Wan	Jung-ch'eng Wan
Ruian	Jui-an
Rushan	Jui Shan
Rushan Kou	Jui-shan K'ou
San Sha	San Sha
Sanbeijin	San-pei-chiu
Sandou Jiao	San-tou Chiao
Sandu	San-tu
Sandu Ao	San-tu Ao
Sandu Dao	San-tu Tao
Sandun	San-tun
Sang Dao	Sang Tao
Sanggou Wan	Sang-kou Wan
Sanjia Ling	San-chia Ling
Sanjiang Shan	San-chiang Shan
Sanjiaoshan Dao	San-chiao-shan Tao
Sanjiazeng	San-chia Tseng
Sanjiazeng	San-chia-tseng
Sanliang Che	San-liang-ch'e
Sanmen Dao	San-men
Sanmen Liedao	San-men Lieh-tao
Sanmen Wan	San-men Wan
Sanniang Wan	San-niang Wan
Sansha	San-sha
Sanshanzi Dao	San-shan-tzu Tao
Sansuanshan	San-suan Shan
Santa Ding	San-t'a Ting
Sanxia Kou	San-hsia Kou
Sanxing Liedao	San-hsing Lieh-tao
Sanya Gang	San-ya Kang
Sanya Pai	San-ya Pai
Sanya Shi	San-ya Shih
Sanyueshan	San-Yueh Shan
Sanzao Dao	San-tsao Tao
Saozhou Wei	Sao-chou-wei
Shacheng	Sha-ch'eng
Shacheng Gang	Sha-ch'eng Kang
Shanbai	Shan-pai
Shangchuan Dao	Shang-ch'uan Tao
Shangchuan Jiao	Shang-ch'uan Chiao
Shangchuan Shan	Shang-ch'uan Shan
Shangdachenshan	Shang-tao-ch'en Shan
Shangganshan	Shang-kan Shan
Shanghai	Shang-hai
Shanghai Gang	Shang-hai Kang
Shangmaanshan	Shang-ma-an Shan
Shangpanshan	Shang-p'an Shan
Shangzhushan	Shang-chu Shan
Shanhaiguan	Shan-hai-kuan
Shanjian	Shen-chien
Shanjiang Yuan Ling	Shan-chiang-yuan Ling
Shantou	Shan-t'ou
Shantou Gang	Shan-t'ou Kang
Shanwei	Shan-wei
Shanwei Gang	Shan-wei Kang
Shanwei Tou	Shan-wei T'ou
Shanzhu Ling	Shan-chu Ling
Shanzi Shi	Shan-tzu Shih
Shanzi Shi	Shan-Tzu Shih
Shatuozi	Sha-t'o-tzu
Shawaihang Shuidao	Sha-wai-hang Shui-t'ao
Shengsi	Sheng-ssu
Shengsi Liedao	Sheng-ssu Lieh-tao
Shenhu Wan	Shen-hu Wan
Shepanshan	She-p'an Shan
Sheshan Dao	She-shan Tao
Sheyanghe Kou	She-yang-ho K'ou
Shi Jiao	Shih-chiao
Shi Jiut To	Shih-chiu-t'o

PINYIN	WADE-GILES
Shi Ling	Shih Ling
Shi Yu	Shih Yu
Shibeishan Jiao	Shih-pei Shan Chiao
Shibi	Shih-pi
Shidao Gang	Shih-tao Kang
Shijiu Zui	Shi-chiu Tsui
Shijiusuo	Shih-chiw-So
Shili Ling	Shih-li Ling
Shimao Ling	Shih-mao Ling
Shitang	Shih-t'ang
Shitang Yan	Shih-t'ang Yen
Shitou Sha	Shih-t'ou Sha
Shizi Tou	Shih-tzu T'ou
Shou Shi	Shou Shih
Shuang Zhou	Shuang Chou
Shuangding Shan	Shuang-ting Shan
Shuangfan	Shuang-fan
Shuangfan Shi	Shuang-fan Shih
Shuangshan	Shuang Shan
Shuangshan Dao	Shuang-shan Tao
Shuangshan Men	Shuang-shan Men
Shuangyu Zui	Shuang-yu Tsui
Shuidao	Shui-tao
Shuidao Qiantan	Shui-tao-ch'ien T'an
Shuiluo	Shui-lo
Shuiwei	Shui-wei
Shuiwei Jiao	Shui-wei Chiao
Shulanghu	Shu-lang-hu
Shuwei Yu	Shu-wei Yu
Si Shan	Ssu Shan
Sigangsha Jiao	Ssu-keng-sha Chiao
Sijiaoshan	Ssu-chiao Shan
Simu Yu	Ssu-mu Yu
Siping Shan	Ssu-p'ing Shan
Sishuang Liedao	SSu-shuang Lieh-tao
Sizimei Dao	Ssu-tzu-mei Tao
Suixi	Sui-hsi
Suhan Dao	Su-shan Tao
Ta Shan	T'a Shan
Ta Yu	T'a-yu
Taihu Shan	Tai-hu Shan
Taipeng Shan	T'ai-p'ing Shan
Taiping Jiao	T'ai-p'ing Chiao
Taiping Shan	T'aip'ing Shan
Taiping Wan	T'ai-ping Wan
Taishan	T'ai-shan
Taishan Liedao	Tai-shan Lieh-tao
Taiwan Haixia	T'an-wan Hai-hsia
Taiwan Qiantan	T'ai-Wan ch'ien T'an
Taiwu Shan	T'ai-wu Shan
Taizhou Liedao	T'ai-chou Lieh-tao
Taizhou Wan	T'ai-chou Wan
Taizi Shan	T'ai-tzu Shan
Tang Yu	T'ang Yu
Tanggu	T'ang-ku
Tangnsoshan	T'ang-nao Shan
Tantoushan	T'an-t'ou Shan
Tanxushan	T'an-hu Shan

PINYIN	WADE-GILES
Taoerhe Kou	T'ao-erh-ho K'ou
Taohua Dao	T'ao-hua Tao
Taoluo	Tao-lo
Taozi Wan	T'ao-tzu Wan
Techang Dao	T'e-ch'eng Tao
Tengjiang	T'ungh'ang
Tengqiao	T'eng-ch'iao
Tianchi Gang	T'ien-ch'ih Kang
Tianheng Dao	T'ien-heng Tao
Tianjin Xingang	T'ien-chin-hsin Kang
Tiantu	T'ien-t'u
Tianuatou Daling	T'ien-an-hou-ta Ling
Tianwei Jiao	T'ien-wei Chiao
Tianzhou Shan	T'ien-chu Shan
Tiedun	T'ieh-Tun
Tiejue Shan	T'ieh-chueh Shan
Tielu Zhang	T'ieh-lu Chang
Tongan	T'ung-an
Tonggu Jiao	T'ung-ku Chiao
Tongpan Shan	T'ung-p'an Shan
Tongpan Yu	T'ung-p'an Yu
Tongsha Hangdao	T'ung-sha Hang-Tao
Tongsha Qiantan	T'ung-sha Ch'ian T'an
Tongsha Shazui	T'ung-sha Sha-tsui
Tongshan	T'ung Shan
Toujin Shuidao	Tou-chin Shui-tao
Toujin Yu	T'ou-chin Yu
Toumenshan	T'ou-men Shan
Tu Jiao	T'u Chiao
Tubu Shan	T'u-pu Shan
Tuer dao	T'u-erh Tao
Tuer Shan	T'u-erh Shan
Tuoji Dao	T'o-chi Tao
Tuoning Lidao	T'o-ning Lieh-tao
Vangshan	Yang-shan Tao
Wai Jiao	Wai Chiao
Wai Lanjiang Sha	Wai Lan-chiang-sha
Wai Sha	Wai Sha
Waibaimutian Jiao	Wai-pai-mu-t'ien Chiao
Waidiaoshan	Wai-tiao Shan
Waidingzi Shan	Wai-ting-tzu Shan
Waidong Zui	Wai-tung Tsui
Wailingding Dao	Wai-ling-ting Tao
Wailongyan	Wai-lung-yen
Waipaijiao	Wai-pai-chiao
Waipusham	Wai-p'u Sham
Waisi Jiao	Wai-ssu Chiao
Waisikuai	Wai-ssu-k'uai
Waisikuai Jiao	Wai-ssu-k-uai Chiao
Waita Jiao	Wai-t'a Chiao
Waitou Shan	Wai-t'ou Shan
Waizhoumen	Wai-chu Men
Wangfu Zhou	Wang-fu Chou
Wangjia Dao	Wang-chia Tao
Wangtian Ding	Wang-t'ien Ting
WangPanshan	Wang-p'an Shan
Wanshan	Wan-shan
Wei Lanjiangshi	Wai-lan-chiang Sha

PINYIN	WADE-GILES
Weihai	Wei-hai
Weihai Gang	Wei-hai Kang
Weijia Dao	Wei-chia Tao
Weitou	Wai-t'ou
Weitou Jiao	Wei-t'ou Chiao
Weitou Wan	Wei-t'ou Wan
Weizhou Dao	Wei-chou Tao
Wen Zhou	Wen Chou
Wenchongshan	Wen-ch'ung-shan
Wenchongshan Men	Wen-ch'ung Shan Men
Wendeng	Wen-teng
Wenggong Jiao	Weng-kung Chiao
Wenling	Wen-ling
Wenquan Dao	Wen-kuan Tao
Wenwei Zhou	Wen-wei Chou
Wenzhou Dao	Wen-chou Tao
Wenzhou Qiantan	Wen-chou-ch'ien T'an
Wenzhou Wan	Wen-chou Wan
Wolong Ling	Wo-lung Ling
Wu Jiao	Wu Jiao
Wu Shan	Wu Shan
Wu Shi	Wu-shih
Wu Yu	Wu Yu
Wuchuan	Wu-ch'uan
Wudaogouzuizi	Wu-tao-kou Tsui-tzu
Wumen Ling	Wu-mien Ling
Wupeng Yu	Wu-p'eng Yu
Wuqi Zhou	Wu-ch'i Chou
Wuqiu Yu	Wu-ch'iu Yu
Wushilian	Wu-shih-lien
Wusong	Wu-sung
Wusong Kou	Wu-sung K'ou
Wuzhu Zhou	Wu-chu Chou
Wuzhushan	Wu-chu Shan
Xi Yu	Hsi Yu
Xia Yu	Hsia Yu
Xiaan	Hsia-an
Xiaban Dao	Hsiao-pan Pab
Xiachuan Dao	Hsia-ch'uan Tao
Xiachuanshan	Hsia-ch'uan Shan
Xiadachenshan	Hsia-ta-ch'en Shan
Xiaganshan	Hsia-kan Shan
Xiahaishan	Hsia-hai Shan
Xialangtang	Hsia-lang T'ang
Xialangtang	Hsia-lang-t'ang
Xiamanshan	Hsia-ma-an Shan
Xiamen	Hsia-men
Xiamen Dao	Hsia-men Tao
Xiamen Gang	Hsia-men Kang
Xian Sanya	Yai-hsien San-ya
Xian Tang	Hsien T'ang
Xian'e Jiao	Hsien-o Chiao
Xiang Gang	Hong Kong
Xiang Jiao	Hsiang Chiao
Xiang Yu	Hsiang Yu
Xiang Zui	Hsiang Tsui
Xiangpan Jiao	Hsiang-p'an Chiao
Xiangshan	Hsiang Shan
Xiangshan Gang	Hsiang-shan Kang
Xiangzhi Jiao	Hsiang-chih Chiao
Xianjiao Yu	Hsien-chiao Yu
Xianmai	Hsien-mai
Xianyou	Hsien-yu
Xiao heng Qin Dao	Hsiao-heng-chin Tao
Xiao Jiao	Hsi-ao Chiao
Xiaoan Shuidao	Hsiao-an Shui-Tao
Xiaoban Men	Hsiao-pan Men
Xiaochangtushan	Hsiao-ch'ang-t'u Shan
Xiaoding Dao	Hsiao-teng Tao
Xiaoeguan	Hsiao-o-kuan
Xiaoganshan	Hsiao-kan Shan
Xiaoging Dao	Hsiao-ch'ing Tao
Xiaogong Dao	Hsiao-kung Tao
Xiaoguan Dao	Hsiao-kuang Tao
Xiaoguishan	Hsiao-ch'u Shan
Xiaohao Dao	Hsiao-hao Tao
Xiaohuanglongshan	Hsiao-huang-lung Shan
Xiaojin	Hsiao-chin
Xiaojinmen Dao	Hsiao-chin-men Tao
Xiaojishan	Hsiao-chi Shan
Xiaolongshan Dao	Hsiao-lung-shan Tao
Xiaomao Shan	Hsiao-mao Shan
Xiaomen Dao	Hsiao-men Tao
Xiaomingfu Dao	Hsiao-ming-fu Tao
Xiaomu Dao	Hsiao-mu Tao
Xiaoputai	Hsiao-p'u-t'ai
Xiaoquan Zuizi	Hsiao-ch'uan tsui-Tzu
Xiaoquan Zuizi	Hsiao-ch'uan Tsui-tzu
Xiaori Dao	Hsiao-jih Tao
Xiaosanshan Dao	Hsiao-san-shun Tao
Xiaoshanzi	Hsiao-chu-shan Tao
Xiaoshi Dao	Hsiao-shih Tao
Xiaoshulang	Hsiao-shu-lang
Xiaotang Gang	Hsiao-t'ang Kang
Xiaoxifan Shi	Hsiao-hsi-fan Shih
Xiaoxingshan	Hsiao-hsing Shan
Xiaoxiyang Dao	Hsiao-hsi-yang Tao
Xiaoyang Shan	Hsiao-yang Shan
Xiaozhi Zhu Dao	Hsiao-chih-chu Tao
Xiaozhu Shan	Hsiao-chu Shan
Xiaozhu Zhou	Hsiao-chu Chou
Xiapu	Hsia-p'u
Xiaqi Dao	Hsia-ch'i Tao
Xiaqianshan	Hsia-ch'ien Shan
Xiasanxing	Hsia-san-hsing
Xiawanshan	Hsia-wan Shan
Xiazhushan	Hsia-chu Shan
Xibanyang	Hsi-pan-yang Chiao
Xibei Jiao	Hsi-pei Chiao
Xichang	Hsi-ch'ang
Xidan Dao	Hsi-tan Tao
Xiding Yu	Hsi-ting Yu
Xiepushan	Hsieh-p'u Shan
Xieyang Dao	Hsieh-yang Tao
Xifang Qiantan	Hsi-fang Ch'ien t'an
Xifushan	Hsi-fu Shan

PINYIN	WADE-GILES
Xigu Dao	Hsi-ku Tao
Xihu Zui	Hsi-hu Tsui
Xihuoshan	Hsi-huo Shan
Xiji Yu	Hsi-chi Yu
Xijie Jiao	Hsi-chieh Chiao
Xikui Dao	Hsi K'uei Shan
Xilian Dao	Hsi-lien Tao
Xiluhuashan	Hsi-lu hua Shan
Xiluo Dao	Hsi-lo Tao
Ximao Zhou	Hsi-mao Chou
Ximayi Dao	Hsi-ma-i Tao
Ximopan	Hsi-mo-p'an
Xin Kai Kou	Hsin-K'ai K'ou
Xinan Qiantan	Hsi-nan Ch'ien-t'an
Xinda Yan	Hsin-ta Yen
Xing Cun	Hsing-Ts'un
Xinghua Shuidao	Haing-hua Shui-tao
Xinghua Wan	Hsing-hua Wan
Xinhuaihe Kou	Hsin-huai-ho K'ou
Xinliao Dao	Hsin-liao Tao
Xinxing	Hsin-hsing
Xiongdi Yu	Hsiung-ti Yu
Xiquan Dao	Hsi-ch'uan Tao
Xisoyushan	Hsiao-yu Shan
Xissi Jiao	Hsia-ssu Chiao
Xitaishan	Hsi-t'ai Shan
Xiushan	Hsiu Shan
Xiuying	Hsiu-ying
Xixing Dao	Hsi-hsing Tao
Xiyang Dao	Hsi-yang Tao
Xiyin Dao	Hsi-yin Tao
Xiyin Jiao	Hsi-yin Chiao
Xiyuping Yu	Hsi-yu-P'ing Yu
Xizhong Dao	Hsi-chung Tao
Xuanshan	Hsuan Shan
Xuejia Dao	Hsueh-chia Tao
Xuejiadao	Hsueh-chia-tao
Xugong Dao	Hsu-kung Tao
Xuwen	Hsu-wen
Yacheng	Yai-ch'eng
Yalong Jiao	Ya-lung Chiao
Yalong Wan	Ya-lung Wan
Yamen Waikou	Yai-men-wai K'ou
Yan Yan	Yen Yen
Yandang Shan	Yen-tang Shan
Yandou Shan	Yen-tou Shan
Yang pu Bi	Yang-p'u-pi
Yang-bi	Yang-pi
Yanghe Kou	Yang-ho K'ou
Yangjia Shi	Yang-chia Shih
Yangjian	Yang-kang
Yangjiao Jiao	Yang-chiao Chiao
Yanglan Shi	Yang-lan Shih
Yangma Dao	Yang-ma Tao
Yangpu Wan	Yang-p'u Wan
Yangyu Dao	Yang-yu Tao
Yangyuchi Wan	Yang-yu-ch'ih Wan
Yangzui Shi	Ying-tsui Shih
Yanlou Jiao	Yen-lou Chiao
Yanta	Yen-t'ai
Yantai Gang	Yen-t'ai Kang
Yantou Shan	Yen-t'ou Shan
Yanweigang	Yen-wei Kang
Yanwo Dao	Yen-wo Tao
Yazhou Wan	Yai-chou Wan
Yema Yu	Yeh-ma Yu
Yemaodong	Yeh-mao-tung
Yi Dao	I Tao
Yidong Jiao	I-tung Chiao
Yijiangshan Dao	I-chiang-shan Tao
Yingang Jiao	Yin-kang Chiao
Yingge Zui	Ying-ko Tsui
Yinggehai	Ying-ko-hai
Yingpan	Ying-p'an
Yisuan Shan	I-suan Shan
Yong Jiang	Yung Chiang
Youcaihuazhi	Yu-Ts'ai-hua-chi
Youshui Yan	Yu-shui Yen
Yu Yan	Yu Yen
Yuan Yu	Yuan Yu
Yuansha	Yuan-sha
Yuanyang Dao	Yuan-yang Tao
Yuanzhui Jiao	Yuan-chiu Chiao
Yuanzi Jiao	Yuan-tzu Chiao
Yuchi Shi	Yu-ch'ih Shih
Yufeng Shan	Yu-feng Shan
Yuhu Jiao	Wu-hu Chiao
Yuhuan Dao	Yu-huan Tao
Yuhuang Shan	Yu-huang Shan
Yulia Jiao	Yu-ling Chiao
Yunding Shan	Yun-ting Shan
Yundingyan	Yun-ting-Yan
Yunnan Yan	Yun-nan Yen
Yuntai Shan	Yun-t'ai Shan
Yunxiao	Yun-hsiao
Yushan Liedao	Yu-Shan Lieh-tao
Yutou Dao	Yu-t'ou Tao
Yuweng Dao	Yu-weng Tao
Yuyao	Yu-yao
Zaidong	Tsui-tung
Zao Shan	Tsao shun
Zengzhifu	Tsen-chih-fu
Zhai Dao	Chai Tai
Zhairuoshan	Chai-jo Shan
Zhaitang Dao	Chai-t'ang Tao
Zhaizishan	Chai-tzu Shan
Zhang Jiang	Chang Chiang
Zhangpu	Chang-p'u
Zhangzhou	Chang-chou
Zhangzi Dao	Chang-tzu Tao
Zhanjiang	Chan-chiang
Zhanjiang Gang	Chan-chiang Kang
Zhanzidao Shuidao	Chang-tzu-tao Shui-tao
Zhaoan	Chao-an
Zhoan Tou	Chao-an T'ou
Zhaoan Wan	Chao-an Wan

PINYIN	WADE-GILES
Zhaobei Zui	Chao-pei Tsui
Zhapo	Cha-p'o
Zhapu	Cha-p'u
Zhelang Jiao	Che-lang Chiao
Zhelang Yan	Che-lang Yen
Zhelin	Che-lin
Zhelin Wan	Che-lin Wan
Zheng qi Shan	Cheng-ch'i Shan
Zhengpeng Dao	Chung-p'eng Tao
Zhenhai	Chen-hai
Zhenhai Jiao	Chen-hai Chiao
Zhenhai Wan	Chen-hai Wan
Zhenyantou Yan	Chen-Yen-T'ou
Zhifu Dao	Chih-fu Tao
Zhingong	Chih-kung
Zhimao Wan	Chih-mao-wan
Zhisong Yan	Chih-sung Yen
Zhiwan Dao	Chih-wan Tao
Zhizhi Men	Chih-chih Men
Zhong Shuidao	Chung Shui-tao
Zhongjieshan Quando	Chung-chieh-shan Chung-tao
Zhongkui Dao	Chung-k'uei Shan
Zhongyang Sha	Chung-yang Sha
Zhongzhu Men	Chung-chu Men
Zhongzhushan	Chung-chu Shan
Zhoushan Dao	Chou-shan Tao
Zhoushan Qundao	Chou-Shan Chun-tao
Zhu Dao	Chu Tao
Zhu Shan	Chu Shan
Zhu Yu	Chu Yu
Zhuangyuanao	Chuang-yuan-Ao
Zhuangywanao	Chuang-yuan-ao
Zhucha Dao	Chu-ch'a Tao
Zhui Shan	Chui Shan
Zhujiajian	Chu-chia Chien
Zhujian Kou	Chu-chiang K'ou
Ziluo Shan	Tzu-lo Shan
Zimao Shan	Tzu-mao Shan
Zong Jiao	Tsung Chiao
Zoumadeng	Tsou-ma-Teng

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 Chart Information diagram for the Sector. Plot the approximate position of the feature on this diagram and note the approximate chart number.

To use as an Index of features described in the text note the paragraph number at the right. To locate this feature on the best scale chart use the Gazetteer procedure above.

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	Position °	'	°	'	Sec. Para
A					
AEAM GAP	38	39 N	125	36 E	3.32
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AIWAN WAN	28	16 N	121	30 E	7.11
AL SOM	40	39 N	129	33 E	2.40
ALGERINE ROADS	26	37 N	119	53 E	7.25
AMHAE DO	34	51 N	126	16 E	3.10
AMHERST ROCKS	31	10 N	122	23 E	5.15
AMNYONG KKUT	39	08 N	127	45 E	2.27
AMYONG KKUT	39	08 N	127	45 E	2.27
AN DO	36	57 N	126	10 E	3.18
ANMA KUNDO	35	21 N	126	00 E	3.12
AN-P'ING KANG	23	00 N	120	09 E	8.19
AN-P'ING NEW HARBOR	22	58 N	120	09 E	8.20
ANSONG GAP	39	53 N	127	53 E	2.32
ASAN MAN	36	59 N	126	49 E	3.20
AYAJIN NI	38	16 N	128	33 E	2.23
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BAEG SEO	34	38 N	128	00 E	1.22
BAEGIL HANG	34	18 N	126	34 E	1.10
BAEGUN SAN	37	29 N	126	31 E	3.23
BAIJIASHAN	28	37 N	121	52 E	7.8
BAIJIE SHAN	30	37 N	122	25 E	6.8
BAIJIE XIA	30	36 N	122	25 E	6.8
BAIQUAN LIEDAO	25	58 N	119	55 E	7.30
BANG SEO	33	55 N	126	24 E	1.8
BANYANG JIAO	30	01 N	121	58 E	6.23
BARREN ISLANDS	30	44 N	123	09 E	6.4
BAYLISS ROCK	30	14 N	122	15 E	6.14
BAYUQUAN	40	18 N	122	05 E	4.13
BEAK HEAD CHANNEL	29	43 N	122	16 E	6.21
BEI SHUIDAO	37	35 N	121	27 E	4.31
BEIAO DAO	26	53 N	120	13 E	7.21
BEICHANGSHAN DAO	37	57 N	120	44 E	4.30
BEIDING DAO	24	26 N	118	30 E	9.16
BEIGANTANG DAO	26	13 N	119	59 E	7.28
BEIGUAN DAO	27	10 N	120	31 E	7.20
BEIJIAO ZUI	26	23 N	119	57 E	7.27
BEIJING	39	56 N	116	24 E	4.21
BEIJSHAN LIEDAO	27	38 N	121	12 E	7.17
BEILUN OIL TERMINAL	29	57 N	121	49 E	6.25
BEILUN ORE TERMINAL	29	56 N	121	53 E	6.25
BEIQUAN JIAO	26	07 N	119	58 E	7.29
BEIYING ZUI	34	46 N	119	22 E	5.14
BELL CHANNEL	30	00 N	121	57 E	6.23
BI TOU	22	45 N	115	36 E	9.30
BIAO JIAO	23	14 N	116	48 E	9.26
BIAO JIAO	23	55 N	117	52 E	9.21
BICHI DO	35	13 N	125	55 E	3.10
BIEUNG DO	35	57 N	126	32 E	3.14
BIHAG SAN	36	09 N	129	16 E	2.15
BIJIN DO	34	43 N	128	28 E	1.34
BINGJANG MAL	36	41 N	129	28 E	2.16
BIYANG DO	33	24 N	126	14 E	1.2
BIYANG DO	33	25 N	126	15 E	1.5
BLACK POINT	24	00 N	117	49 E	9.21
BLACK ROCK POINT	22	47 N	115	54 E	9.29
BLONDE GROUP	39	03 N	122	47 E	4.4
BO HAI	38	30 N	120	00 E	4.26
BO HAI HAIXIA	38	24 N	121	00 E	4.29
BOGIL DO	34	09 N	126	32 E	1.9
BOGSA CH'O	34	06 N	126	10 E	3.7
BORYEONG	36	24 N	126	29 E	3.16
BU DO	35	06 N	128	39 E	1.45
BUDO SUDO	35	05 N	128	39 E	1.45
BUGPYEONG HANG	37	29 N	129	09 E	2.20
BULGEUN DO	34	09 N	126	45 E	1.11
BUSAN	35	06 N	129	02 E	1.52
BYEONGSAN YEOLDO	35	01 N	128	46 E	1.42
C					
CAMBRIA POINT	29	50 N	122	25 E	6.12
CAOFEIDIAN	38	56 N	118	32 E	4.20
CAP ROCK	29	59 N	122	05 E	6.27
CAPE ADKINS	36	23 N	120	53 E	5.7
CAPE NELSON	31	40 N	121	51 E	5.15
CASTLE POINT	26	32 N	119	50 E	7.24
CEZI SHAN	30	06 N	121	56 E	6.23
CEZI SHUIDAO	30	00 N	121	57 E	6.23
CH'ANGSON DO	34	51 N	128	02 E	1.32
CH'E-CH'ENG CHIAO	22	05 N	210	42 E	8.25
CH'EN-CH'I T'OU	23	33 N	117	05 E	9.24
CH'I-CH'U LIEH-TAO	30	36 N	122	05 E	6.9, 6.10
CH'I-HOU SHAN	22	37 N	120	15 E	8.23
CH'I-HSING YEN	21	46 N	120	49 E	8.12
CH'ILBAL TO	34	47 N	125	47 E	3.4
CH'ING HSU	28	33 N	121	55 E	7.4
CH'IN-HUANG-TAO	39	56 N	119	37 E	4.16
CH'I-T'OU CHIAO	29	53 N	122	08 E	6.22
CH'I-T'OU YANG	29	48 N	122	04 E	6.22
CH'O DO	38	32 N	124	50 E	3.29
CH'OL TO	38	39 N	125	39 E	3.32
CH'OLSAN PANDO	39	40 N	124	40 E	3.33
CH'ONGSAN DO	34	11 N	126	53 E	1.11
CH'ONSU MAN	36	25 N	126	28 E	3.16
CH'U DO	34	55 N	128	05 E	1.33
CH'U SHAN	30	27 N	122	20 E	6.11
CH'UAN CHOU	24	54 N	118	35 E	9.12
CH'UAN-CHOU WAN	24	50 N	118	43 E	9.11
CH'UKSAN HANG	36	31 N	129	27 E	2.16
CH'UNGMU	34	50 N	128	26 E	1.35
CH'UNGMU HANG	34	50 N	128	25 E	1.35
CH'AHO	40	12 N	128	39 E	2.36
CH'ONGJIN	41	46 N	129	49 E	2.44
CHA SHAN	36	51 N	122	17 E	5.7
CHAEWONSO SUDO	35	06 N	126	00 E	3.10
CHAG TO	34	25 N	127	54 E	1.21
CHAGWI DO	33	19 N	126	09 E	1.2
CHAMAE DO	38	41 N	124	59 E	3.30

CHANG JIANG	31	48 N	121	10 E	5.17
CHANGDOK TO	39	10 N	127	26 E	2.29
CHANGGI GAP	36	04 N	129	34 E	2.13
CHANGGUN DO	34	44 N	127	44 E	1.23
CHANGJIANG KOU LIGHT VESSEL	31	06 N	122	32 E	5.15
CHANGJIANGKUO BEIJIAO	31	40 N	121	51 E	5.15
CHANGJON MAN	38	44 N	128	12 E	2.26
CHANGJUK SUDO	34	19 N	126	07 E	3.7
CHANGPO MAL	36	25 N	129	26 E	2.15
CHANGSAN GOT	38	08 N	124	39 E	3.29
CHANGSEON DO	34	51 N	128	02 E	1.32
CHANGSHAN QUNDAO	39	15 N	122	35 E	4.4
CHANGSHAN SHUIDAO	38	00 N	120	40 E	4.29
CHANGSO LIGHT	34	50 N	128	26 E	1.35
CHANGTU GANG	30	15 N	122	17 E	6.14
CHANGTUSHAN	30	15 N	122	20 E	6.14
CHANSHAN TOU	36	23 N	120	53 E	5.7
CHAO-AN WAN	23	37 N	117	17 E	9.24
CHAOLIAN DAO	35	54 N	120	52 E	5.9
CHAO-LIEN TAO	35	54 N	120	52 E	5.9
CHAO-PEI TSUI	37	28 N	122	14 E	4.32
CHE'NG-TZU MAN	29	51 N	122	17 E	6.20
CHEJU	33	31 N	126	32 E	1.6
CHEJU DO	33	25 N	126	30 E	1.2
CHEJU HAEHYOB	33	50 N	126	40 E	1.7
CHEJU HANG	33	31 N	126	32 E	1.6
CHE-LANG CHIAO	22	39 N	115	34 E	9.30
CHE-LIN WAN	23	36 N	117	03 E	9.24
CHEN YEN-T'OU	22	19 N	115	06 E	9.2
CHENGIAN SHAN	30	44 N	122	49 E	6.6
CHENG-KUNG PO-TI	23	06 N	121	22 E	8.10
CHENGSHAN JIAO	37	24 N	122	42 E	4.35
CHENGSHAN TOU	39	09 N	122	09 E	4.3
CHENGSU DO	33	55 N	126	38 E	1.7
CHEN-HAI	29	57 N	121	42 E	6.28
CHEN-HAI CHIAO	24	16 N	118	08 E	9.19
CHEONGSAN DO	34	11 N	126	53 E	1.11
CHEONSEONG MAN	35	01 N	128	49 E	1.42
CHI CHIAO	29	40 N	121	54 E	6.32
CHIA-TZU KANG	22	51 N	116	04 E	9.29
CHI-CHIAO SHAN	26	34 N	119	48 E	7.24
CHIEH-SHIH WAN	22	46 N	115	40 E	9.29
CHI-HSING CHIAO	23	29 N	117	14 E	9.25
CHI-KU CHIAO	31	10 N	122	23 E	5.15
CHIKU SHAN	28	23 N	121	43 E	7.10
CHI-LUNG KANG	25	09 N	121	46 E	8.3
CHI-LUNG TAO	25	12 N	121	47 E	8.4
CHIN DO	34	27 N	126	15 E	3.4
CHIN FENG	26	00 N	119	41 E	9.3
CHINHAE	35	09 N	128	40 E	1.46
CHINHAE MAN	35	00 N	128	34 E	1.44
CHINJUDOK SAN	41	30 N	129	37 E	2.43
CHIRI TO	38	42 N	125	08 E	3.30
CHISE P'O	34	50 N	128	43 E	1.37
CHIU-SHAN LIEH-TAO	29	26 N	122	12 E	6.30
CHOAM DO	35	26 N	129	22 E	2.6
CHODO	34	56 N	128	02 E	1.33
CHODO	35	04 N	129	06 E	1.52
CHODO GUNDO	34	14 N	127	15 E	1.14
CHONGDUNG HAE	34	27 N	126	04 E	3.8
CHONGHA HANG	37	26 N	129	12 E	2.19
CHONGSHAN SHUIDAO	27	54 N	121	04 E	7.14
CHOSAN MAN	42	17 N	130	30 E	2.48
CHOU-K'O-K'O CHIAO	23	36 N	117	26 E	9.23
CHUANHU LIEDAO	30	36 N	122	20 E	6.8
CHUANSHAN BANDAO	29	53 N	122	08 E	6.19
CHU-CHIA KANG	29	54 N	122	24 E	6.20
CHUGSAN HANG	36	31 N	129	27 E	2.16
CHU-HSU CHIANG	30	14 N	122	14 E	6.14
CHUJA KUNDO	33	57 N	126	20 E	1.8
CHUK TO	34	13 N	125	51 E	3.4
CHUKPYON MAN	37	03 N	129	25 E	2.17
CHUMUNJIN DAN	37	54 N	128	50 E	2.22
CHUMUNJIN HANG	37	53 N	128	50 E	2.22
CHUN DO	35	26 N	129	21 E	2.7
CHUNGMU	34	50 N	128	26 E	1.35
CHWASARI DO	34	34 N	128	21 E	1.30
CLEFT ROCK	27	06 N	120	49 E	7.18
COAL PIER LIGHT	34	54 N	128	07 E	1.31
CONE POINT	23	40 N	117	29 E	9.23
CRUDE OIL WHARF	34	51 N	127	47 E	1.26
CUSTOMS POINT	26	38 N	119	40 E	7.25

D

DA GANG	24	55 N	118	57 E	9.11
DA JIAO	25	21 N	119	46 E	9.5
DADIAN	25	02 N	119	11 E	9.11
DAE AM	34	17 N	127	26 E	1.15
DAEBANG SAN	34	51 N	127	59 E	1.32
DAEBON MAL	35	45 N	129	30 E	2.11
DAEBYEON	35	13 N	129	14 E	2.5
DAEBYEON HANG	35	13 N	129	14 E	2.4
DAEHEUGSAN GUNDO	34	42 N	125	26 E	3.3
DAEJIN RI	38	30 N	128	26 E	2.24
DAEJUG DO	35	08 N	128	41 E	1.47
DAESAN HANG	37	01 N	126	25 E	3.19
DAGANG QU	38	56 N	121	39 E	4.7
DAGONG DAO	35	58 N	120	29 E	5.9
DAGU TANGGU	38	58 N	117	40 E	4.17
DAHUANGMANG	29	59 N	121	48 E	6.24
DAI SHAN	30	17 N	122	10 E	6.15
DAI SHI	26	08 N	119	58 E	7.29
DAJI SHAN	30	49 N	122	10 E	6.2
DAJIAO SHAN	30	13 N	122	08 E	6.15
DAJIN JIAO	26	43 N	120	09 E	7.21
DAJIN MAN	41	16 N	129	45 E	2.42
DALIAN XINGANG	38	59 N	121	54 E	4.6
DALIAN	38	55 N	121	40 E	4.6
DALIANGANG XINGANG OIL TERM.	38	59 N	121	54 E	4.8
DALMAN GAP	36	06 N	129	26 E	2.12
DALU DAO	39	45 N	123	44 E	4.3
DAMUZHI SHAN	40	07 N	119	26 E	4.16
DANGGANG MAL	35	03 N	129	01 E	1.51
DANGSADO LIGHTHOUSE	34	06 N	126	36 E	1.9
DAPAN JIAO	24	24 N	118	04 E	9.18
DAPENG JIAO	22	27 N	114	30 E	9.37
DAQU SHAN	30	27 N	122	20 E	6.11
DAVENPORT POINT	37	47 N	120	37 E	4.25
DAXIE DAO	29	55 N	121	58 E	6.26
DAXIZHAI DAO	30	14 N	122	29 E	6.13
DAYA JIAO	22	35 N	114	45 E	9.33
DAYA WAN	22	37 N	114	40 E	9.32
DAYANGSHAN	30	35 N	122	04 E	6.9
DAYAO WAN	39	01 N	121	52 E	4.6
DAYOUSHAN	29	59 N	121	45 E	6.28
DAYU SHAN	26	57 N	120	21 E	7.21
DAYU SHAN	30	19 N	121	58 E	6.16
DAZHU DAO	25	05 N	119	02 E	9.11
DAZHUI DAO	24	50 N	118	46 E	9.11
DAZHUSHAN ZUI	35	44 N	120	00 E	5.11
DAZHUXU	30	17 N	122	15 E	6.14
DENGZHOU SHUIDAO	37	52 N	120	45 E	4.30
DEOGJEOG DO	37	14 N	126	07 E	3.23
DEOGPO DAN	38	22 N	128	31 E	2.24
DEOGU DO	34	15 N	127	01 E	1.14
DEUGRYANG MAN	34	35 N	127	05 E	1.16
DIESHIDUI LIGHTED BUOY	26	08 N	119	37 E	7.32
DINGHAI	30	00 N	122	06 E	6.27
DINGHAI	30	01 N	122	06 E	6.1
DIXIE	29	55 N	121	59 E	6.26
DO TO	34	13 N	127	00 E	1.14
DODD ISLAND	24	26 N	118	30 E	9.16
DOJANG PO	34	46 N	128	41 E	1.37
DOK TO	37	15 N	131	52 E	2.2
DONAE HAE	34	03 N	127	18 E	1.12
DONG SUDO	37	06 N	126	20 E	3.18
DONGDU	24	30 N	118	04 E	9.18
DONGDU HANGDAO	24	27 N	118	04 E	9.17
DONGDUMAL	34	59 N	128	50 E	1.41
DONGFU SHAN	30	08 N	122	46 E	6.13
DONGGOU GANG	31	17 N	121	34 E	5.16
DONGJIE JIAO	22	46 N	115	50 E	9.30
DONGLUO DAO	26	25 N	119	55 E	7.26
DONGNAN KOU	25	23 N	119	44 E	9.4
DONGQUAN DAO	25	58 N	119	58 E	7.30
DONGSHAN DAO	23	40 N	117	25 E	9.23
DONGSHAN WAN	23	46 N	117	32 E	9.22
DONGTING SHAN	29	52 N	122	35 E	6.17
DONGTOU SHAN	27	50 N	121	08 E	7.13
DRY CARGO HARBOR	34	44 N	127	45 E	1.25
DU DO	35	03 N	129	01 E	1.51

E

ELLIOT GROUP	39	15 N	122	35 E	4.4
ELLIOT PATCH	29	59 N	122	06 E	6.27
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EOCHEONGDO	36	07 N	125	59 E	3.15

F

FANG-LIAO KANG	22	22 N	120	35 E	8.25
FEIYUN JIANG	27	42 N	120	40 E	7.17
FENGCHAO YEN	30	22 N	122	41 E	6.11
FENGCHENG	36	42 N	121	14 E	5.7
FIRST ENTRANCE	22	37 N	120	15 E	8.23
FODU DAO	29	44 N	122	01 E	6.31
FORMOSA STRAIT	24	00 N	119	00 E	8.27
FORT HEAD	23	33 N	117	05 E	9.24
FO-TO-KANG-TAO	29	48 N	122	04 E	6.22
FO-TU SHAN	29	44 N	122	01 E	6.31
FREMANTLE CHANNEL	29	54 N	122	24 E	6.20
FU-KUEI CHIAO	25	18 N	121	32 E	8.2
FUNING WAN	26	51 N	120	07 E	7.21
FUTOU WAN	23	51 N	117	42 E	9.22
FU-YAO SHAN	26	57 N	120	21 E	7.21
FUYING DAO	26	35 N	120	08 E	7.23
FUZHOU	26	05 N	119	18 E	7.34

G

GADD ROCK	21	44 N	121	37 E	8.12
GADEOG DO	35	00 N	128	50 E	1.41
GADEOG SUDO	35	00 N	128	48 E	1.41
GAE DO	34	34 N	127	40 E	1.20
GAGEODO	34	04 N	125	07 E	3.2
GAJO DO	34	58 N	128	32 E	1.44
GALSAN DO	34	58 N	128	46 E	1.40
GALSAN MAL	37	17 N	129	19 E	2.18
GAMCHEON	35	03 N	129	00 E	1.51
GAMPO HANG	35	48 N	129	31 E	2.11
GANGGU HANG	36	21 N	129	24 E	2.15
GANJEOL GAP	35	21 N	129	22 E	2.5
GANJINGZI QU	38	57 N	121	38 E	4.7
GAODENG DAO	26	17 N	119	59 E	7.28
GAOQIAO GANG	31	20 N	121	33 E	5.16
GEOGEUM DO	34	27 N	127	10 E	1.17
GEOGEUM SUDO	34	26 N	127	16 E	1.16
GEOJE DO	34	50 N	128	40 E	1.37
GEOJIN DAN	38	27 N	128	28 E	2.24
GEOJIN HANG	38	27 N	128	28 E	2.24
GEOMUN DO	34	02 N	127	19 E	1.12
GEUMDANG SUDO	34	25 N	127	07 E	1.16
GEUMO DO	34	32 N	127	45 E	1.18
GEUMO SUDO	34	33 N	127	45 E	1.19
GEUMO YEOLDO	34	30 N	127	47 E	1.18
GIBSON ROCK	23	26 N	117	18 E	9.25
GO AM	34	30 N	128	29 E	1.30
GODONG MAL	35	19 N	129	18 E	2.5
GOHEUNG BANDO	34	33 N	127	20 E	1.16
GOJEONG HANG	36	24 N	126	29 E	3.16
GU GAN	38	35 N	121	36 E	4.9
GUANCHUANAO	29	27 N	122	11 E	6.30
GUANG'AO	23	14 N	116	47 E	9.26
GUANYIN AO	25	28 N	119	50 E	9.3
GUDOL SEO	34	37 N	128	07 E	1.21
GUI YU	23	20 N	116	38 E	9.26
GULANG YU	24	27 N	118	04 E	9.17
GULEI TOU	23	43 N	117	34 E	9.22
GULF OF CHIHLI	38	30 N	120	00 E	4.26
GULONG ZUI	36	44 N	121	38 E	5.7
GUNDO KUNDO	33	57 N	126	20 E	1.8
GUNDO KUNDO	34	10 N	126	27 E	1.9
GUNSAN	35	59 N	126	42 E	3.14
GURYONGPO HANG	35	59 N	129	34 E	2.12
GWANCHEONG MAL	35	29 N	129	23 E	2.8
GWANGGYE MAL	35	14 N	129	15 E	2.5
GWANGYANG HANG	34	51 N	127	48 E	1.29
GYE DO	34	18 N	126	37 E	1.10
GYE DO	34	30 N	127	14 E	1.16
GYEONGRYEOLBI YEOLDO	36	37 N	125	34 E	3.17

H

HA DO	34	49 N	128	14 E	1.32
HABAEG DO	34	03 N	127	35 E	1.13
HABAEK TO	34	03 N	127	35 E	1.13
HACHUJA DO	33	57 N	126	20 E	1.8
HAEAM YEO	33	40 N	126	18 E	1.7
HAEJU MAN	37	45 N	125	40 E	3.25
HAENAM GAG	34	18 N	126	31 E	1.10
HAENGAM MAN	35	08 N	128	41 E	1.47
HAGNIM DO	34	45 N	128	25 E	1.34
HAI HO	38	59 N	117	43 E	4.21
HAI JIAO	30	44 N	123	09 E	6.4
HAI-K'OU WAN	22	06 N	120	42 E	8.26
HAI-MEN	28	41 N	121	27 E	7.9
HAI-T'AN TAO	25	33 N	119	48 E	8.27
HAITAN HAIXIA	25	27 N	119	38 E	9.4
HAITAN SHI	25	46 N	119	48 E	9.4
HAIXI BANDAO	35	57 N	120	14 E	5.11
HAIYANG DAO	39	03 N	123	12 E	4.4
HAI-YANG	36	42 N	121	14 E	5.7
HAIZHOU WAN	34	55 N	119	20 E	5.12
HANG DO	34	11 N	126	56 E	1.11
HANGCHOW BAY	30	25 N	121	00 E	6.1
HANGNIM DO	34	45 N	128	25 E	1.34
HANGZHOU	30	15 N	120	10 E	4.21
HANGZHOU WAN	30	25 N	121	00 E	6.1
HANRIM HANG	33	25 N	126	16 E	1.5
HARLEQUIN ISLAND	29	32 N	121	34 E	6.32
HASA MAL	36	50 N	129	27 E	2.17
HATAEDO	34	25 N	125	17 E	3.2
HEBE HEAD	28	08 N	121	21 E	7.12
HEINIU WAN	27	48 N	121	07 E	7.15
HEIYAN JIAO	22	47 N	115	54 E	9.29
HENGSHA	31	18 N	121	48 E	5.16
HESHANG TOU	28	21 N	121	40 E	7.10
HEUGIL DO	34	17 N	126	33 E	1.11
HIMUKI SHO	33	57 N	124	36 E	3.2
HO DO	39	20 N	127	33 E	2.28
HODO PANDO	39	20 N	127	33 E	2.28
HOENG DO	35	20 N	125	59 E	3.12
HOENGGAN SUDO	34	16 N	126	35 E	1.10
HONAM OIL TERMINAL	37	29 N	126	36 E	3.23
HONG DO	34	32 N	128	44 E	1.30
HONG DO	34	42 N	125	12 E	3.2
HONGHAI WAN	22	40 N	115	10 E	9.31
HO-P'ING TAO	25	09 N	121	46 E	8.4
HO-P'ING KANG	24	18 N	121	45 E	8.7
HOU DO	34	24 N	127	07 E	1.16
HOU JIAO	23	34 N	117	22 E	9.23
HOU YU	24	28 N	118	03 E	9.17
HOU-CHI TAO	38	02 N	120	40 E	4.30
HOUJI DAO	38	02 N	120	40 E	4.30
HOU-TZU PI	22	48 N	121	12 E	8.10
HSIA-CHI MEN	29	46 N	122	15 E	6.21
HSIANG-SHAN CHIANG	29	38 N	121	48 E	6.32
HSIAO-CH'IU	26	15 N	120	01 E	7.28
HSIAO-KUNG TAO	36	00 N	120	35 E	5.9
HSIAO-PAN MEN	30	12 N	122	36 E	6.13
HSIAO-YANG-MO-YU	29	54 N	122	09 E	6.23
HSI-CHIEH CHIAO	22	42 N	115	47 E	9.29
HSI-CHU TAO	25	59 N	119	56 E	7.30
HSI-HI CHIAO	22	33 N	114	36 E	9.35
HSIN LAI	25	12 N	121	44 E	8.4
HSI-PI SHIH	26	04 N	119	57 E	7.29
HSIUNG-TI YU	23	33 N	117	40 E	9.2
HSI-YIN TAO	26	20 N	120	12 E	7.22
HSUAN-PO-KU SHAN	29	50 N	122	19 E	6.20
HSU-TSU WEI	24	24 N	118	04 E	9.18
HUA-LIEN KANG	24	00 N	121	38 E	8.9
HUANG DAO	36	04 N	120	14 E	5.10
HUANG XIAN	37	38 N	120	30 E	4.24
HUANGDAO SHUIDAO	27	56 N	121	07 E	7.14
HUANGHUA	38	19 N	117	40 E	4.18
HUANGJIATANG WAN	35	33 N	119	40 E	5.12
HUANGNIC JIAO	29	58 N	121	54 E	6.28
HUANGNIU JIAO	29	58 N	121	54 E	6.24
HUANG-NUI CHIAO	29	42 N	121	52 E	6.32
HUANIAO SHAN	30	51 N	122	41 E	6.5
HUA-P'ING YU	25	25 N	121	57 E	8.3
HUAPING SHAN	30	04 N	122	29 E	6.18
HUDONG JIAO	22	48 N	115	57 E	9.29

HUGIL TO	34	17 N	126	33 E	1.11
HUIZHOU	22	42 N	114	34 E	9.36
HUJIANG DAO	26	07 N	119	38 E	7.32
HULU DAO	30	02 N	122	26 E	6.18
HULUDAO GANG	40	42 N	120	59 E	4.14
HU-LU-TAO CHIANG	40	42 N	120	59 E	4.13, 4.14
HUNG DAN	42	18 N	130	35 E	2.48
HUNG-HAI WAN	22	40 N	115	10 E	9.31
HUNGNAM	39	50 N	127	37 E	2.31
HUOSHAN LIEDAO	30	20 N	121	55 E	6.16
HUP'O HANG	36	41 N	129	27 E	2.16
HU-TOU HSU	27	50 N	121	15 E	7.13
HUTOU YU	27	50 N	121	15 E	7.13
HUTUNG CHIAO	22	48 N	115	57 E	9.29
HWA DO	34	49 N	128	28 E	1.35
HWANG DO	36	14 N	125	58 E	3.15
HWANGAMDONG MYOJI	40	49 N	129	34 E	2.40
HWANGJE DO	34	11 N	127	05 E	1.14
HWANGJIN MAN	41	06 N	129	44 E	2.42
HWASUN HANG	33	14 N	126	28 E	1.3
HYEONG DO	33	12 N	126	19 E	1.3
HYEONGJEDO MOYJI	33	13 N	126	20 E	1.3

I

IJIN MAN	42	04 N	130	07 E	2.46
IMUN MAL	37	14 N	129	21 E	2.18
IMYE SOM	37	06 N	126	32 E	3.20
INCHEON	37	28 N	126	37 E	3.23
IPP'A DO	37	06 N	126	32 E	3.20
IRARI GAK	39	09 N	127	36 E	2.26
IRARI GAK	39	10 N	127	36 E	2.27
ISU DO	34	58 N	128	44 E	1.40
IWON HANG	40	17 N	128	39 E	2.37

J

JAEWEONSEO SUDO	35	06 N	126	00 E	3.10
JAM DO	35	03 N	128	40 E	1.45
JANGGI GAB	36	04 N	129	34 E	2.13
JANGSEUNGPO HANG	34	52 N	128	44 E	1.38
JEJU	33	31 N	126	32 E	1.6
JEJU DO	33	25 N	126	30 E	1.2
JEJU HAEHYEOB	33	50 N	126	40 E	1.7
JEJU HANG	33	31 N	126	32 E	1.6
JEO DO	35	01 N	128	45 E	1.43
JEOLMYEONG SEO	33	52 N	126	19 E	1.8
JIANGJIA ZUI	34	46 N	119	26 E	5.14
JIANGJUN TOU	24	02 N	117	54 E	9.21
JIANSHAN TANKER TERMINAL	30	43 N	121	20 E	6.3
JIAOBEI SHAN	30	11 N	122	18 E	6.15
JIAOBEISHAN	30	11 N	122	18 E	6.14
JIAZI GANG	22	51 N	116	04 E	9.29
JIAZI JIAO	22	49 N	116	06 E	9.28
JIESHI WAN	22	46 N	115	40 E	9.29
JIGU JIAO	31	10 N	122	23 E	5.15
JIGUSHAN	28	23 N	121	43 E	7.10
JIH HSU	24	22 N	118	08 E	9.17
JIMA DO	34	20 N	127	22 E	1.15
JIN YU	22	43 N	115	37 E	9.30
JINDO	34	27 N	126	15 E	3.4
JINHAE	35	09 N	128	40 E	1.46
JINHAE HANG	35	08 N	128	39 E	1.46
JINHAE MAN	35	00 N	128	34 E	1.44
JINMEN DAO	24	27 N	118	23 E	9.16
JINMI MAL	36	54 N	129	25 E	2.17
JINPAI MEN	26	08 N	119	35 E	7.32
JINTANG SHUIDAO	29	57 N	121	52 E	6.24
JINZHOU	40	45 N	121	06 E	4.15
JISE PO	34	50 N	128	43 E	1.37
JITSUKO SHO	33	57 N	124	36 E	3.2
JIUDUAN LIGHT FLOAT	31	07 N	121	57 E	5.15
JIUSHAN LIEDAO	29	26 N	122	12 E	6.30
JOAM DO	35	26 N	129	22 E	2.6
JOKAKO POINT	23	36 N	117	26 E	9.23
JUG DO	34	13 N	125	51 E	3.4
JUGBYEON MAN	37	03 N	129	25 E	2.17
JUNG-CHENG WAN	37	21 N	122	38 E	5.4
JWASARI DO	34	34 N	128	21 E	1.30

K

K'URESA CH'O	35	05 N	128	38 E	1.45
KA DO	34	42 N	125	28 E	3.3
KADOK	35	00 N	128	48 E	1.41
KADOK TO	35	00 N	128	50 E	1.41
KAE DO	34	34 N	127	40 E	1.20
KAIDAE MAN	42	15 N	130	23 E	2.48
KAISER POINT	35	54 N	120	10 E	5.11
KAISER ROCK	26	37 N	119	44 E	7.25
KAJO DO	34	58 N	128	32 E	1.44
KAL TO	37	43 N	125	39 E	3.25
KALMA BANDO	39	11 N	127	29 E	2.29
KALSAN DO	34	58 N	128	46 E	1.40
KALSAN MAL	37	17 N	129	19 E	2.18
KAMCH'ON	35	03 N	129	00 E	1.51
KAMNAEP'O	35	03 N	129	00 E	1.51
KAMPO HANG	35	48 N	129	31 E	2.11
KANGGU HANG	36	21 N	129	24 E	2.15
KANG-K'OU WAN	21	59 N	120	51 E	8.10
KANJOL GAP	35	21 N	129	22 E	2.5
KANSHIN TAN	37	34 N	129	07 E	2.22
KANYO AM	34	17 N	127	51 E	1.21
KAO-HSIUNG KANG	22	37 N	120	15 E	8.23
KAOHSIUNG	22	37 N	120	15 E	8.23
KAO-T'AI SHIH	21	44 N	121	37 E	8.12
KAO-TENG TAO	26	17 N	119	59 E	7.28
KASA DO	34	27 N	126	04 E	3.11
KAUM DO	35	13 N	126	19 E	3.12
KEELUNG	25	09 N	121	46 E	8.4
KEMEN SHUIDAO	24	24 N	119	48 E	7.26
KETANGSHAN	28	54 N	121	41 E	7.7
KIDONG MAN	41	54 N	129	56 E	2.45
KIMCH'AEK	40	40 N	129	12 E	2.39
KIWA PAU	40	01 N	128	02 E	2.32
KODONG MAL	35	19 N	129	18 E	2.5
KOGUM SODO	34	26 N	127	16 E	1.16
KOGUNSAN KUNDO	35	50 N	126	25 E	3.13
KOHUNG BANDO	34	33 N	127	20 E	1.16
KOJE DO	34	50 N	128	40 E	1.37
KOJIN DAN	38	27 N	128	28 E	2.24
KOJO P'O	38	58 N	127	53 E	2.27
KOJONG HANG	36	24 N	126	29 E	3.16
KOL-SOM	42	10 N	130	19 E	2.47
KOMUN DO	34	02 N	127	19 E	1.12
KUANSHAN CHIANG	30	13 N	122	12 E	6.16
KU-AO-T'OU	27	36 N	120	33 E	7.17
KUDOK SAN	35	07 N	129	00 E	1.52
KUDOL SO	34	37 N	128	07 E	1.21
KUEI-LUAN YEN	24	49 N	121	56 E	8.6
KUEI-SHAN TAO	24	51 N	121	57 E	8.6
KUISHAN DAO	26	30 N	120	08 E	7.23
KU-LEI TOU	23	43 N	117	34 E	9.22
KU-LUNG SHAN	39	49 N	124	01 E	3.36
KUMDANG SUDO	34	25 N	127	07 E	1.16
KUMGOL SAN	34	32 N	126	18 E	3.6
KUMO SAN	34	35 N	127	48 E	1.19
KUMO SUDO	34	33 N	127	45 E	1.19
KUMO SUDO	43	33 N	127	45 E	1.19
KUMO YOLTO	34	30 N	127	47 E	1.18
KUMODO	34	32 N	127	45 E	1.18
KUNDO GUNDO	34	14 N	127	15 E	1.14
KUNSAN	35	59 N	126	42 E	3.14
KUREISSER CHO	35	05 N	128	38 E	1.45
KURYONGP'O HANG	35	59 N	129	34 E	2.12
KWAE DO	40	27 N	129	00 E	2.38
KWAKKOT CH'OE	39	49 N	124	25 E	3.35
KWANCH'ONG MAL	35	29 N	129	23 E	2.8
KWANGGYE MAL	35	14 N	129	15 E	2.5
KWANGYANG HANG	34	51 N	127	48 E	1.29
KWANGYANG STEEL MILL	34	54 N	127	45 E	1.29
KYOMAEK TO	34	31 N	125	41 E	3.4
KYOMIP'O	38	44 N	125	37 E	3.32
KYONGNYOLBI YOLTO,	36	37 N	125	34 E	3.17
KYONGSONG MAN	41	35 N	129	50 E	2.43

L

LAIZHOU GANG	37	24 N	119	56 E	4.22
LAIZHOU WAN	37	20 N	119	22 E	4.22
LAMTIA ISLAND	24	08 N	118	02 E	9.20

LAN YU	22	04 N	121	32 E	8.11
LANG TAO	26	20 N	120	12 E	7.22
LANGGANG SHAN	30	26 N	122	55 E	6.11
LANGJISHAN	28	32 N	121	37 E	7.8
LANSHAN	35	05 N	119	21 E	5.13
LAO-HU SHAN	30	04 N	121	55 E	6.23
LAOSHAN TOU	36	08 N	120	43 E	5.9
LAOSHAN WAN	36	20 N	120	50 E	5.8
LAO-SHU CHIAO	30	00 N	122	06 E	6.27
LAO-T'IEH-SHAN-HSI CHIAO	38	44 N	121	08 E	4.11
LAOTIESHAN SHUIDAO	38	30 N	121	00 E	4.29
LAOTIESHANXI JIAO	38	44 N	121	08 E	4.11
LIANCOURT ROCKS	37	15 N	131	52 E	2.2
LIANGXIONGDI DAO	30	10 N	122	57 E	6.13
LIANYUNGANG	34	44 N	119	27 E	5.14
LIAODONG WAN	40	30 N	121	30 E	4.10
LIAOLUO TOU	24	25 N	118	26 E	9.16
LIAO-TUNG WAN	40	30 N	121	30 E	4.10
LIE YAN	27	06 N	120	49 E	7.18
LIEN YUN CHIANG	34	44 N	119	27 E	5.14
LIEN-HUA-FENG CHIAO	22	56 N	116	29 E	8.27
LIGEN WAN	35	42 N	119	57 E	5.12
LIHUO YU	30	06 N	122	22 E	6.18
LINGSHAN DAO	35	45 N	120	10 E	5.12
LINGSHAN WAN	35	50 N	120	05 E	5.11
LINMENGAO	24	11 N	118	05 E	9.20
LITOU ZUI	28	16 N	121	25 E	7.10
LIU-CH'IU YU	22	21 N	120	22 E	8.25
LIU-CH'UAN CHIAO	26	05 N	119	58 E	7.29
LIUDOU ZUI	28	16 N	121	25 E	7.10
LIUQUAN JIAO	26	05 N	119	58 E	7.29
LO HSU	28	16 N	121	44 E	7.10
LO SHAN BAY	36	20 N	120	50 E	5.8
LO-HSING-T'A MAO-TI	25	59 N	119	27 E	7.33
LOKAUP ISLAND	22	35 N	114	39 E	9.34
LONG YU	23	34 N	117	25 E	9.23
LONGKOU	37	39 N	120	20 E	4.24
LONGKOU GANG	37	38 N	120	17 E	4.24
LONGWAN	27	58 N	120	48 E	7.16
LOUTZ ROCK	25	08 N	119	23 E	9.9
LOYUAN WAN	26	25 N	119	43 E	7.26
LU HSU	25	20 N	119	29 E	9.9
LU TAO	22	40 N	121	29 E	8.11
LU YU	23	19 N	116	46 E	9.26
LUAN-CHIA-K'OU	37	47 N	120	37 E	4.25
LU-CHIANG	24	03 N	120	25 E	8.13
LUDA	38	57 N	121	40 E	4.7
LUHUA SHAN	30	49 N	122	38 E	6.5
LUJIANG SHUIDAO	24	27 N	118	04 E	9.17
LUJIAZHI	29	55 N	122	18 E	6.20
LUJIAZUI	31	14 N	121	29 E	5.16
LUO YU	28	16 N	121	44 E	7.10
LUOTOU SHUIDAO	29	55 N	122	03 E	6.22
LUOYUAN WAN	26	25 N	119	43 E	7.26
LU-SHUN	38	47 N	121	15 E	4.9
LUSHUN	38	47 N	121	15 E	4.9
LU-TZ'U YEN	25	08 N	119	23 E	9.9

M

MAAN DO	34	45 N	128	05 E	1.32
MAAN DO	39	48 N	124	11 E	3.36
MA-AN LIEDAO	30	44 N	122	45 E	6.5
MABIANZHOU ISLAND	22	40 N	114	39 E	9.32
MADO	35	56 N	128	02 E	1.33
MAEMUL DO	34	38 N	128	34 E	1.30
MAEMUL TO	34	13 N	127	00 E	1.14
MAEMUL TO	34	31 N	125	41 E	3.4
MAEMUL TO	34	38 N	128	34 E	1.30
MAENGGOL KUNDO	34	13 N	125	51 E	3.4
MAENGGOL SUDO	34	14 N	125	53 E	3.5
MAJI SHAN	30	34 N	122	34 E	6.10
MA-KUNG	23	34 N	119	33 E	8.31
MA-LAN WAN	37	25 N	122	39 E	4.34
MANGWA DO	35	02 N	128	43 E	1.43
MANRYOKIKI	38	43 N	125	23 E	3.31
MAN-T'OU KANG-TOU	29	05 N	121	40 E	7.7
MAOCAOSHAN	28	12 N	121	25 E	7.11
MAO-T'OU-SHAN TSUI	29	06 N	121	39 E	7.7
MARA DO	33	07 N	126	16 E	1.2
MARO HAE	34	23 N	126	25 E	3.6
MASAN	35	11 N	128	34 E	1.48
MA-TA CHIAO	37	12 N	122	37 E	5.5
MATA JIAO	37	12 N	122	37 E	5.5
MATSU DAO	26	09 N	119	56 E	7.28
MATSU STRAIT	26	11 N	119	57 E	7.28
MAYAN DO	40	00 N	128	11 E	2.33
MAYANG DO	40	00 N	128	11 E	2.33
MAZU HAIXIA	26	11 N	119	57 E	7.28
MEI-CHOU WAN	25	05 N	119	02 E	9.10
MEI-HUA CHIANG	26	03 N	119	37 E	7.31
MEIZHOU WAN	25	05 N	119	02 E	9.10
MI PO	35	31 N	129	27 E	2.10
MIAODAO QUNDAO	38	10 N	120	45 E	4.30
MIAO-TAO CH'U-TAO	38	10 N	120	45 E	4.30
MIDDLE ROCKS	22	31 N	114	41 E	9.35
MIEN-HUA YU	25	29 N	122	06 E	8.3
MIN JIANG	26	05 N	119	32 E	8.27
MIN'AN MEN	29	03 N	119	30 E	7.32
MIPO	35	31 N	129	27 E	2.10
MIRS POINT	22	27 N	114	30 E	9.37
MOG DO	34	59 N	129	00 E	1.43
MOGP'O GU	34	46 N	126	18 E	3.6
MOK TO	34	59 N	129	00 E	1.43
MOKP'O HANG	34	47 N	126	23 E	3.6
MOKP'O	34	47 N	126	23 E	3.11
MOKTOKTO	36	56 N	125	47 E	3.18
MORUN MAL	35	02 N	128	58 E	1.50
MOUNT BLACK	22	52 N	116	09 E	9.28
MOUTH POINT	26	27 N	119	50 E	7.24
MOYE DAO	36	55 N	122	31 E	5.6
MUKHO HANG	37	33 N	129	07 E	2.21
MUN DO	34	07 N	127	31 E	1.13
MUN SEO	34	08 N	127	34 E	1.13
MUN SO	34	08 N	127	34 E	1.13
MUSU DAN	40	50 N	129	43 E	2.41
MYO DO	34	53 N	127	45 E	1.25
MYODO	34	53 N	127	45 E	1.25
MYONDO SUDO	34	58 N	126	06 E	3.10

N

NAB ROCK	30	00 N	122	04 E	6.27
NAENARO DO	34	30 N	127	28 E	1.18
NAGDONG PO	35	03 N	128	54 E	1.50
NAJIN	42	14 N	130	18 E	2.47
NAKP'OGAK	34	51 N	127	47 E	1.25
NAKSAN MAN	42	05 N	130	11 E	2.46
NAKTONG P'O	35	03 N	128	54 E	1.50
NAM PO	34	50 N	128	29 E	1.36
NAMHAE DO	34	48 N	128	00 E	1.23
NAMHYEONGJE DO	34	53 N	128	57 E	1.43
NAMHYONGJE DO	34	53 N	128	57 E	1.43
NAMP'O	38	43 N	125	24 E	3.31
NAMUSEOM	34	59 N	129	00 E	1.43
NAN DO	39	00 N	128	06 E	2.25
NAN DO	40	19 N	128	46 E	2.38
NAN DO	40	39 N	129	33 E	2.40
NAN K'OU	25	20 N	119	40 E	9.4
NAN SHA	24	06 N	118	06 E	9.20
NAN SHUIDAO	31	02 N	122	11 E	5.15
NAN YU	26	56 N	120	21 E	7.19
NAN'AO DAO	23	26 N	117	03 E	9.25
NANDING	25	08 N	119	23 E	9.9
NANDING DAO	24	08 N	118	02 E	9.20
NANG DO	34	36 N	127	33 E	1.20
NANHUI ZUI	30	53 N	121	53 E	6.2
NANJISHAN LIEDAO	27	27 N	121	04 E	7.17
NAN-LIAO	22	40 N	121	29 E	8.11
NANPENG LIEDAO	23	16 N	117	17 E	9.2
NANQUAN	26	37 N	120	20 E	7.22
NANRI SHUIDO	25	12 N	119	25 E	9.9
NANSHAN TOU	39	55 N	119	37 E	4.16
NAN-SHAN TSUI	38	52 N	121	41 E	4.9
NANSHAN ZUI	38	52 N	121	41 E	4.9
NAN-SHAN-CHIAO PI	24	16 N	121	44 E	8.8
NANZHI LANBY	30	58 N	122	11 E	5.15
NARO YEOLDO	34	30 N	127	30 E	1.18
NEI LANGJIANGSHA	26	07 N	119	41 E	7.31
NIANG JIAO	23	19 N	116	50 E	9.26
NI-LO CHIAO	29	08 N	122	03 E	7.6
NILUO YU	29	08 N	122	03 E	7.6

NINGBO	29	53 N	121	33 E	6.29
NIUBISHAN SHUIDAO	29	37 N	122	06 E	6.30
NIUSHAN DAO	25	26 N	119	56 E	9.3
NIU-SHAN TAO	25	26 N	119	56 E	9.3
NIUSHAN ZUI	29	01 N	121	43 E	7.7
NIU-T-OU	29	07 N	121	56 E	7.6
NIUTOU SHAN	29	07 N	121	56 E	7.6
NO MAL	34	55 N	128	05 E	1.31
NOMI GAK	37	00 N	126	47 E	3.21
NORTH MEROPE	24	11 N	118	05 E	9.20
NORTON ROCK	25	46 N	119	48 E	9.4

O

OCH'ONG DO	36	07 N	125	59 E	3.15
ODAEJIN	41	23 N	129	47 E	2.43
OEBUJI DO	34	42 N	128	24 E	1.34
OEPO RI	34	56 N	128	43 E	1.40
OEYONDO MYOJI	36	13 N	126	03 E	3.15
OG AM	42	18 N	130	30 E	2.48
OGOG DO	34	44 N	128	26 E	1.34
OGOK TO	34	44 N	128	26 E	1.34
OGPO MAN	34	53 N	128	43 E	1.39
OKGYE HANG	37	37 N	129	03 E	2.22
OKPO HANG	34	53 N	128	43 E	1.39
O-LUAN PI	21	54 N	120	51 E	8.10
ON SAN	35	27 N	129	22 E	2.7
ONG DO	36	39 N	126	01 E	3.17
ONSAN	35	27 N	129	22 E	2.7
ORANG DAN	41	23 N	129	48 E	2.43
OSIG DO	35	58 N	126	34 E	3.14
OU CHIANG	28	01 N	120	44 E	7.12

P

P'ALMIDO	37	21 N	126	31 E	3.23
P'ENG-BU TAO	23	34 N	119	37 E	8.29
P'ENG-CHIA YU	25	38 N	122	04 E	8.2
P'ENG-HU KANG	23	36 N	119	32 E	8.30
P'ING-HAI CHIAO	25	10 N	119	16 E	9.10
P'OHANG MAN	40	59 N	129	44 E	2.41
P'UNG DO	37	06 N	126	23 E	3.19
P'YONGT'AEK HANG	37	00 N	126	44 E	3.21
PA ZA ISLETS	29	30 N	121	36 E	6.32
PAEGIL HANG	34	18 N	126	34 E	1.10
PAEK SO	34	15 N	127	06 E	1.15
PAEK SO	34	38 N	128	00 E	1.24
PAEK-AM	35	02 N	128	38 E	1.44
PAEKSO	34	38 N	128	00 E	1.22
PAENGNYONG DO	37	57 N	124	40 E	3.28
PAI HO	38	59 N	117	43 E	4.21
PAI-CH'UAN LIEH-TAO	25	58 N	119	55 E	7.30
PAI-SHA CHIA	25	03 N	121	04 E	8.15
PAI-YA YANG	29	55 N	122	03 E	6.22
PALMI DO	37	21 N	126	31 E	3.23
PAN-CH'AO YEN	29	49 N	122	21 E	6.20
PANG SHAN	26	13 N	120	01 E	7.28
PANGCH'UK DO	35	51 N	126	23 E	3.13
PANSHI	27	59 N	120	50 E	7.16
PAN-YANG CHINO	30	01 N	121	58 E	6.23
PA-YAO WAN	22	08 N	120	53 E	8.10
PEDRO BLANCO	22	19 N	115	06 E	9.2
PEI CHIAO	24	36 N	121	53 E	8.6
PEI-CHING	39	56 N	116	24 E	4.21
PEI-CHUAN CHIAO	26	07 N	119	58 E	7.29
PEI-FANG WAN	24	36 N	121	53 E	8.7
PEI-KAN-T'ANG TAO	26	13 N	119	59 E	7.28
PEI-T'ING TAO	24	26 N	118	30 E	9.16
PEKING	39	56 N	116	24 E	4.21
PENG-HU CH'UN-TAO	23	23 N	119	30 E	8.28
PENGLAI	37	53 N	120	52 E	4.25
PESCADORES ISLANDS	23	23 N	119	30 E	8.28
PIGIN DO	34	43 N	128	28 E	1.35
PIJIN DO	34	43 N	128	28 E	1.34
PILOT ROCK	26	07 N	120	02 E	7.29
PINGHAI WAN	25	11 N	119	10 E	9.10
PINGJANG MAL	36	41 N	129	28 E	2.16
PINGYANG ZUI	27	28 N	120	40 E	7.18
PI-T'OU CHIAO	25	08 N	121	55 E	8.5
PIUNG DO	35	57 N	126	32 E	3.14
PIYANG DO	33	24 N	126	14 E	1.2
PIYANG DO	33	25 N	126	15 E	1.5
PO HAI HAI-HSIA	38	24 N	121	00 E	4.29
POGIL TO	34	09 N	126	32 E	1.9
POHANG HANG	36	03 N	129	23 E	2.13
POHANG NEW HARBOR	36	01 N	129	25 E	2.14
PONGSU PANDO	40	00 N	128	09 E	2.33
POSAN	38	53 N	125	34 E	3.32
PUDO SUDO	35	05 N	128	39 E	1.45
PUKCHANGJA SO	37	20 N	126	29 E	3.21
PUKP'YONG	37	29 N	129	09 E	2.20
PULGUN DO	34	09 N	126	45 E	1.11
PULMUGIDO	34	44 N	126	14 E	3.11
PUNCHARD ISLET	25	20 N	119	37 E	9.9
PUNG DO	37	06 N	126	23 E	3.19
PUSAN	35	06 N	129	02 E	1.52

Q

QBK OIL FIELD	24	48 N	120	40 E	8.16
QI SHAN	26	00 N	119	41 E	9.3
QIAN SHAN	28	03 N	121	24 E	7.12
QING ZHOU	22	24 N	114	40 E	9.37
QINGBIN DAO	30	12 N	122	42 E	6.13
QINGDAO GANG	36	02 N	120	16 E	5.10
QINGLANSHAN	25	03 N	119	01 E	9.10
QINGSHAN DAO	26	37 N	119	47 E	7.24
QINGSHAN DAO	27	55 N	121	07 E	7.15
QINHUANGDAO	39	56 N	119	37 E	4.16
QINSHAN DAO	34	52 N	119	17 E	5.12
QIQU QUNDAO	30	36 N	122	05 E	6.9
QIXING DAO	27	03 N	120	51 E	7.18
QIXING JIAO	26	05 N	119	50 E	7.31
QUANZHOU	24	54 N	118	35 E	9.12
QUANZHOU WAN	24	50 N	118	43 E	9.11
QUEMOY	24	27 N	118	23 E	9.16

R

RAMBLER CHANNEL	29	51 N	122	17 E	6.20
REFINE PRODUCT WHARF	34	52 N	127	44 E	1.26
REN YU	25	20 N	119	36 E	9.9
REOEO MAL	35	35 N	129	28 E	2.11
RI DAO	37	29 N	122	12 E	4.33
RIDGE POINT	26	35 N	119	51 E	7.25
RIYUE YU	27	02 N	120	25 E	7.19
RIZHAO LIGHT	35	23 N	119	33 E	5.12
ROCK POINT	27	56 N	121	05 E	7.14
ROKKO	24	03 N	120	25 E	8.13
RONGCHENG WAN	37	21 N	122	38 E	5.4
ROUNDABOUT ISLAND	29	54 N	122	09 E	6.23

S

SA-A TAO	29	59 N	122	06 E	6.27
SAEGEUN SEO	35	02 N	128	44 E	1.43
SAENGIL TO	34	19 N	127	00 E	1.16
SAIL DAN	37	18 N	129	18 E	2.18
SAIL ROCK	29	42 N	121	52 E	6.32
SAIL TAN	37	18 N	129	18 E	2.18
SAKUNSO SEO	35	02 N	128	44 E	1.43
SAM GI	34	48 N	127	49 E	1.23
SAMCH'OK	37	26 N	129	12 E	2.19
SAMCH'ONP'O	34	55 N	128	04 E	1.31
SAMCH'ONP'O HANG	34	55 N	128	05 E	1.31
SAMCHEOG	37	26 N	129	12 E	2.19
SAMCHEONPO	34	55 N	128	04 E	1.31
SAMGI	34	48 N	127	49 E	1.23
SAMT'AE DO	34	25 N	125	17 E	3.2
SANDU	26	38 N	119	40 E	7.25
SANDU AO	26	35 N	119	50 E	7.24
SANDU DAO	26	39 N	119	41 E	7.25
SANGBAEG DO	34	02 N	127	37 E	1.13
SANGBAEK TO	34	02 N	127	37 E	1.13
SANGGOU WAN	37	06 N	122	31 E	5.6
SANGI MAL	35	03 N	129	06 E	1.52
SANGWANGDUNG DO	35	39 N	126	07 E	3.13
SAN-HSIEN-T'AI	23	08 N	121	24 E	8.10
SAN-HSIEN-T'AI	24	36 N	121	54 E	8.7

SANJI LIGHT	33	31 N	126	33 E	1.6
SAN-LIEN YU	26	14 N	120	03 E	7.28
SANMEN DAO	22	28 N	114	38 E	9.36
SANMEN WAN	29	00 N	121	45 E	7.7
SANSHA	26	55 N	120	13 E	7.21
SANSHA WAN	26	25 N	120	00 E	7.23
SANSHAN SHUIDAO	38	54 N	121	50 E	4.6
SAN-TIAO CHIAO	25	01 N	122	00 E	8.6
SAN-TIAO CHIAO	25	07 N	122	02 E	8.6
SAN-TU AO	26	35 N	119	50 E	7.24
SANXING LIEDAO	30	26 N	122	31 E	6.11
SARYANG DO	34	49 N	128	14 E	1.32
SASUDO	33	55 N	126	39 E	1.7
SECOND ENTRANCE	22	33 N	120	18 E	8.23
SEJON DO	34	30 N	128	05 E	1.21
SENBONG	42	20 N	130	24 E	2.49
SEO DO	35	01 N	128	59 E	1.49
SEOGWIP'O HANG	33	14 N	126	34 E	1.3
SEOI MAL	34	47 N	128	44 E	1.37
SEONGSAN BANDO	33	28 N	126	56 E	1.4
SEOUL	37	35 N	127	00 E	3.23
SEUL DO	35	29 N	129	26 E	2.9
SHA LUNG OIL TERMINAL	25	09 N	121	11 E	8.15
SHACHENG GANG	27	10 N	120	24 E	7.20
SHAFENG JIAO	26	01 N	119	42 E	9.3
SHANGDACHEN SHAN	28	30 N	121	53 E	7.4
SHANGHAI	31	13 N	121	30 E	5.16
SHAN-HSI T'OU	38	59 N	121	49 E	4.5
SHANTOU	23	22 N	116	41 E	9.26
SHANXI TOU	38	59 N	121	49 E	4.5
SHATOU SHUIDAO	28	01 N	121	02 E	7.14
SHEN-AO WAN	25	08 N	121	49 E	8.5
SHENGSI LIEDAO	30	42 N	122	30 E	6.7
SHENG-T'U-LI TAO	25	15 N	119	45 E	9.8
SHENG-T’U-LI TAO	25	15 N	119	45 E	9.8
SHENHU WAN	24	39 N	118	40 E	9.13
SHENQUAN	22	58 N	116	09 E	9.27
SHENQUAN GANG	22	57 N	116	18 E	9.27
SHESHAN DAO	28	33 N	121	55 E	7.4
SHI JIAO	26	39 N	120	07 E	7.22
SHI YU	23	35 N	117	27 E	9.23
SHIBEISHAN JIAO	22	56 N	116	29 E	9.27
SHIDAO GANG	36	54 N	122	28 E	5.6
SHIH-P'U	29	13 N	121	57 E	7.6
SHIH-PENG CHIANG	29	46 N	122	15 E	6.21
SHIH-TZU-T'OU PI	25	14 N	121	39 E	8.3
SHIJIU LIGHT	35	23 N	119	34 E	5.12
SHIJIU ZUI	35	23 N	119	34 E	5.12
SHIJIUSUO	35	23 N	119	34 E	5.12
SHIMAI TO	38	41 N	124	59 E	3.30
SHINSU HANG	34	54 N	128	04 E	1.32
SHITANG YAN	25	15 N	119	45 E	9.8
SHOU SHAN	22	39 N	120	15 E	8.23
SHUANG SHAN	29	27 N	122	12 E	6.30
SHUANG-JIH TAO	25	16 N	119	40 E	9.7
SIA HAE	34	40 N	126	14 E	3.9
SIBIDONGP'A DO	35	59 N	126	13 E	3.13
SIERGOU QU	38	55 N	121	41 E	4.7
SIGNAL HILL	36	04 N	120	20 E	5.10
SIJIAO SHAN	30	42 N	122	30 E	6.7
SIKI	22	42 N	115	47 E	9.29
SIN PO	35	28 N	129	23 E	2.8
SINCH'ANG HANG	40	07 N	128	29 E	2.35
SINGLE ISLET	22	24 N	114	40 E	9.37
SINP’O	40	02 N	128	12 E	2.34
SINSU DO	34	54 N	128	05 E	1.32
SISHUANG LIEDAO	26	40 N	120	21 E	7.22
SIZIMEI DAO	30	10 N	122	52 E	6.13
SO DO	38	33 N	124	46 E	3.29
SO YONG DAN	34	24 N	127	48 E	1.19
SOAN KUNDO	34	10 N	126	27 E	1.9
SOCH'ONG DO	37	46 N	124	45 E	3.28
SOCOTRA ROCK	32	07 N	125	11 E	5.2
SODEIN	36	38 N	125	43 E	3.17
SODO	35	01 N	128	59 E	1.49
SODUNG DO	36	38 N	125	43 E	3.17
SOHUKSAN DO	34	04 N	125	07 E	3.2
SOI MAL	34	47 N	128	44 E	1.37
SOJUNGGWAN KUNDO	34	12 N	125	30 E	3.2
SOK TO	38	39 N	125	00 E	3.29
SOKCH'O HANG	38	12 N	128	36 E	2.23
SOKU TO	38	39 N	125	00 E	3.29
SOLITARY ROCK	27	02 N	120	25 E	7.19
SOMA DO	34	14 N	126	47 E	1.11
SOMO DO	34	14 N	126	47 E	1.11
SONG DO	42	15 N	130	23 E	2.48
SONGDAE MAL	35	48 N	129	31 E	2.11
SONGDO	35	04 N	129	01 E	1.52
SONGDO GAP	40	02 N	128	20 E	2.35
SONGJON MAN	39	20 N	127	30 E	2.30
SONGJONG DAN	42	11 N	130	19 E	2.47
SONGMUN AM	38	31 N	124	55 E	3.29
SONGNYONG MAN	40	02 N	128	00 E	2.32
SONJUG YEOLDO	34	17 N	127	23 E	1.15
SORREL ROCK	25	02 N	119	11 E	9.11
SOSUAP TO	37	50 N	125	45 E	3.25
SOSURAJI	42	16 N	130	36 E	2.48
SOUTH MEROPE	24	06 N	118	06 E	9.20
SOYA DO	37	12 N	126	11 E	3.22
SOYO AM	36	19 N	126	29 E	3.16
SSANGP'O MAN	41	57 N	129	59 E	2.45
STRAWSTACK ISLAND	26	56 N	120	21 E	7.19
SU-AO KANG	24	36 N	121	52 E	8.7
SUJEON MAL	37	00 N	129	25 E	2.17
SUNWIDO MYOJI	37	45 N	125	20 E	3.27
SUNYEOM MAL	35	40 N	129	28 E	2.11
SUSAN DAN	38	05 N	128	41 E	2.23
SUSHAN DAO	36	45 N	122	15 E	5.7
SUU DO	34	50 N	128	08 E	1.32
SUUDO	34	50 N	128	08 E	1.32
SUUN DO	39	41 N	124	25 E	3.35
SUWON DAN	38	41 N	128	22 E	2.26
SUYEONG MAN	35	08 N	129	09 E	2.3
SUYONG MAN	35	08 N	129	09 E	2.3

T

T'AI-CHOU WAN	28	40 N	121	37 E	7.8
T'AI-TUNG KANG	22	45 N	121	09 E	8.10
T'IAO-CHOU MEN	29	43 N	122	16 E	6.21
T'O-CHI TAO	38	10 N	120	45 E	4.30
T'OEJO MAN	39	53 N	127	47 E	2.32
T'ONGYONG HAEMAN	34	47 N	128	27 E	1.34
T'OU-CH'ENG CH'UAN	24	51 N	121	49 E	8.6
T'SE-TZU SHU-TAO	30	00 N	121	57 E	6.23
T'UNG-SHAN CHIANG	23	46 N	117	32 E	9.22
T'UNG-T'OU SHAN	29	14 N	122	00 E	7.6
T’AIPEI KANG	25	09 N	121	23 E	8.14
T’AIPEI	25	09 N	121	23 E	8.14
TA-CH'EN TAO	28	30 N	121	53 E	7.3
TA-CH'I SHAN	30	49 N	122	10 E	6.2
TAE AM	34	17 N	127	26 E	1.15
TAE DAN	42	18 N	130	27 E	2.48
TAEBANG SUDO	34	56 N	128	02 E	1.32
TAEBANGSAN	34	51 N	127	59 E	1.32
TAEBYON	35	13 N	129	14 E	2.5
TAEHUKSAN GUNDO	34	42 N	125	26 E	3.3
TAEJIN NI	38	30 N	128	26 E	2.24
TAEJUK TO	35	08 N	128	41 E	1.47
TAEO DO	39	13 N	127	38 E	2.28
TAERYANGHWA MAN	41	13 N	129	44 E	2.42
TAESAN HANG	37	01 N	126	25 E	3.19
TAI PANG WAN	22	35 N	114	30 E	9.35
TAI SHIH	26	08 N	119	58 E	7.29
TAI TAN	34	39 N	127	49 E	1.22
TAI-CHUNG	24	17 N	120	30 E	8.17
TAIPING SHAN	36	04 N	120	21 E	5.10
TAISHAN LIEDAO	27	00 N	120	42 E	7.19
TAIWAN BANKS	23	00 N	118	35 E	8.27
TAIWAN STRAIT	24	00 N	119	00 E	8.27
TAIZHOU LIEDAO	28	30 N	121	53 E	7.3
TAJIN MAN	41	16 N	129	45 E	2.42
TAKE SHIMA	37	15 N	131	52 E	2.2
TA-KUNG TAO	35	58 N	120	29 E	5.9
TA-LIN-PU	22	32 N	120	20 E	8.24
TA-LIN-PU OFFSHORE OIL TERM	22	30 N	120	17 E	8.24
TA-LIU-CHIA TAO	22	35 N	114	39 E	9.34
TALLI DO	34	46 N	126	19 E	3.11
TALMAN GAP	36	06 N	129	26 E	2.12
TA-LU TAO	39	45 N	123	44 E	4.3
TANGGANG MAL	35	03 N	129	01 E	1.51
TANGGEON YEO	34	22 N	127	31 E	1.18
TANGJIN HWARYOK	37	03 N	126	30 E	3.20

TANGNAO SHAN	30	36 N	121	58 E	6.11
TAN-SHUI KANG	25	11 N	121	24 E	8.14
TANTOU SHAN	29	10 N	122	02 E	7.6
TA-P'ENG AO	22	35 N	114	30 E	9.35
TA-PAN-LIEH MAO-TI	21	57 N	120	45 E	8.26
TA-PENG CHIAO	29	50 N	122	25 E	6.12
TA-TE HSU	25	05 N	119	02 E	9.11
TAU-TSUI HEAD	36	44 N	121	38 E	5.7
TA-YA CHIAO	22	35 N	114	45 E	9.33
TA-YA WAN	22	37 N	114	40 E	9.32
TA-YUAN SHAN	30	14 N	122	16 E	6.14
TENG-CHOU T'OU	37	50 N	120	44 E	4.25
TENG-HUO-PAI	22	31 N	114	41 E	9.35
TERMINAL HEAD	39	09 N	122	09 E	4.3
TIANJIN XIN GANG	39	00 N	117	42 E	4.19
TIANWEI JIAO	22	45 N	115	49 E	9.29
TIEN-WEI CHIAO	22	45 N	115	49 E	9.29
TING-HAI	30	00 N	122	06 E	6.27
TOGU DO	34	15 N	127	01 E	1.14
TOJANG P'O	34	46 N	128	41 E	1.37
TOK TO	38	45 N	124	58 E	3.31
TOK TO	38	45 N	125	26 E	3.31
TOKCHOK TO	37	14 N	126	07 E	3.23
TOKP'O DAN	38	22 N	128	31 E	2.24
TOKU SOMU	38	45 N	124	58 E	3.31
TOLSAN DO	34	38 N	127	48 E	1.22
TOLSANDO	34	38 N	127	48 E	1.21
TONG SUDO	37	06 N	126	20 E	3.18
TONGDUMAL	34	59 N	128	50 E	1.41
TONGHAE HANG	37	29 N	129	09 E	2.20
TONGJOSON MAN	39	30 N	128	00 E	2.25
TONGYEONG HAEMAN	34	47 N	128	27 E	1.34
TONGYONG	34	50 N	128	25 E	1.35
TORI DO	37	07 N	126	37 E	3.20
TOUMEN SHAN	28	41 N	121	47 E	7.8
TOWN POINT	26	33 N	119	48 E	7.24
TS'AO-HSIEH-PA YU	29	00 N	121	54 E	7.7
TSO-YING KANG	22	42 N	120	15 E	8.22
TU-LAN WAN	22	50 N	121	12 E	8.10
TULSAN DO LIGHT	34	42 N	127	48 E	1.19
TUMEN RIVER	42	17 N	130	41 E	2.50
TUNG TAO	30	44 N	123	09 E	6.4
TUNG-CHU TAO	25	58 N	119	58 E	7.30
TUNG-HSU SHAN	29	37 N	122	02 E	6.30
TUNG-KANG PO-TI	22	27 N	120	26 E	8.25
TUNGKI ROCKS	22	46 N	115	50 E	9.30
TUNG-SHA TAO	26	10 N	120	24 E	7.5
TUNG-SHAN TAO	23	40 N	117	25 E	9.23
TUNG-YIN TAO	26	23 N	120	30 E	7.5
TUNG-YUEH YU	25	16 N	119	40 E	9.7
TUOJI DAO	38	10 N	120	45 E	4.30
TUONING LIENDAO	22	27 N	114	38 E	9.36

U

U AM	34	43 N	127	48 E	1.23
U DO	33	30 N	126	58 E	1.7
UGA MAL	35	36 N	129	28 E	2.11
UGI MAL	35	36 N	129	28 E	2.11
UL GI	35	29 N	129	27 E	2.9
ULGI	35	29 N	129	27 E	2.9
ULLEUNG DO	37	30 N	130	50 E	2.2
ULLUNG DO	37	30 N	130	50 E	2.2
ULSAN HANG	35	30 N	129	23 E	2.8
ULSAN MAN	35	27 N	129	24 E	2.8
UNG DO	35	04 N	128	43 E	1.45

V

VERNON CHANNEL	29	46 N	122	15 E	6.21

W

WA AM	40	01 N	128	02 E	2.32
WAI LANGJIANGSHA	26	07 N	119	46 E	7.31
WAI-CH'ANG-SHAN SHUIDAO	39	03 N	122	47 E	4.4
WAI-HUO HSU	30	04 N	122	27 E	6.18
WAILONGYAN	28	13 N	121	33 E	7.11
WAI-SAN-TING CHOU	23	31 N	120	02 E	8.13
WAI-SHENG CHIAO	23	42 N	120	10 E	8.19
WAIYANG'AN DAO	29	52 N	122	35 E	6.17
WAI-YU SHAN	29	59 N	121	45 E	6.28
WAIZHE DAO	37	15 N	122	35 E	5.5
WANG DO	34	16 N	127	32 E	1.15
WAN-JEN-TUI PI	25	10 N	121	44 E	8.4
WAN-SHOU SHAN	22	39 N	120	15 E	8.23
WATERWITCH CHANNEL	26	36 N	119	46 E	7.24
WEIFANG GANG	37	15 N	119	11 E	4.23
WEIHAI	37	30 N	122	06 E	4.32
WEI-T'OU AO	24	33 N	118	30 E	9.15
WEI-T'OU CHIAO	24	31 N	118	34 E	9.14
WEITOU JIAO	24	31 N	118	34 E	9.14
WEI-TOU SHUI-TAO	25	31 N	119	38 E	7.31
WEITOU WAN	24	33 N	118	30 E	9.15
WEN-CH'UNG SHAM	30	12 N	122	15 E	6.14
WENCHONG SHAN	29	24 N	122	10 E	6.30
WENZHOU	28	01 N	120	39 E	7.16
WENZHOU QIANTAN	27	56 N	120	57 E	7.14
WENZHOU WAN	27	55 N	121	15 E	7.13
WI DO	35	35 N	126	17 E	3.12
WOLMI DO	37	28 N	126	36 E	3.23
WONSAN	39	10 N	127	27 E	2.29
WU CHIAO	30	22 N	122	41 E	6.11
WUAB SHUIDO	24	20 N	118	08 E	9.17
WU-CH'IU HSU	25	00 N	119	27 E	9.2
WU-CHU CHIANG	26	10 N	119	36 E	7.31
WUQIU YU	25	00 N	119	27 E	9.2
WU-SHA MEN	29	49 N	122	22 E	6.20
WUSONG KOU	31	23 N	121	31 E	5.16
WU-TAN	24	22 N	118	08 E	9.17

X

XIACUO	25	10 N	118	59 E	9.10
XIADANCHEN SHAN	28	26 N	121	53 E	7.3
XIALANGTAN	28	04 N	121	31 E	7.12
XIAMEN DAO	40	13 N	121	57 E	4.13
XIAMEN	24	27 N	118	04 E	9.17
XIANGSHAN GANG	29	38 N	121	48 E	6.32
XIAOBAN MEN	30	12 N	122	36 E	6.13
XIAOGAN SHAN	29	57 N	122	14 E	6.20
XIAOGONG DAO	36	00 N	120	35 E	5.9
XIAOJIAOTOU	28	28 N	121	55 E	7.4
XIAOLONGSHAN DAO LIGHT	38	58 N	120	59 E	4.10
XIAOSANSHAN SHUIDAO	38	56 N	121	50 E	4.6
XIAOZHUI DAO	24	49 N	118	46 E	9.11
XIJIE JIAO	22	42 N	115	47 E	9.29
XINGDAO DAO	26	59 N	120	28 E	7.19
XINGHUA SHUIDAO	25	18 N	119	39 E	9.8
XINGHUA WAN	25	20 N	119	20 E	9.5
XIONGDI YU	23	33 N	117	40 E	9.2
XIPI SHI	26	04 N	119	57 E	7.29
XIQUAN DAO	25	59 N	119	56 E	7.30
XIU SHAN	30	10 N	122	10 E	6.16
XIUYU	25	13 N	118	59 E	9.10
XIYANG DAO	26	30 N	120	03 E	7.23

Y

YA-LU CHIANG	39	55 N	124	20 E	4.3
YALU RIVER	39	40 N	124	15 E	3.34
YALU RIVER	39	55 N	124	20 E	4.3
YANG AM	34	44 N	127	47 E	1.23
YANG PO HANG	35	52 N	129	32 E	2.12
YANGDEOG DO	34	30 N	126	07 E	3.8
YANGMA DAO	37	28 N	121	37 E	4.31
YANGPO HANG	35	52 N	129	32 E	2.12
YANGTZE RIVER	31	48 N	121	10 E	5.17
YANTAI	37	33 N	121	27 E	4.31
YANTAI SHAN	37	33 N	121	24 E	4.31
YA-TAO CHIA	36	08 N	120	43 E	5.9
YEH-LIU PAN-TAO	25	13 N	121	42 E	8.4
YEMAODONG	30	48 N	122	47 E	6.6
YEN TAO	26	37 N	119	47 E	7.24
YEN-SHUI KANG	24	45 N	120	54 E	8.15
YEN-T'AI	37	33 N	121	27 E	4.31
YEOGMAN DO	34	10 N	127	21 E	1.15
YEOJA MAN	34	40 N	127	30 E	1.20
YEONGIL MAN	36	04 N	129	28 E	2.12

YEONJA DO	35	25 N	129	22 E	2.6
YEONPYEONG	37	40 N	125	42 E	3.24
YEOSEO DO	33	59 N	126	56 E	1.7
YEOSU	34	44 N	127	45 E	1.24
YINGKOU	40	41 N	122	14 E	4.12
YINGKOU LIGHT VESSEL	40	31 N	121	59 E	4.12
YIN-SHUI CHIAO	26	07 N	120	02 E	7.29
YISUAN SHAN	28	13 N	121	40 E	7.10
YOGCHI DO	34	38 N	128	15 E	1.30
YOGJI DO	34	38 N	128	15 E	1.30
YON DO	36	05 N	126	26 E	3.17
YONDAE DO	34	44 N	128	24 E	1.34
YONGAMP'O	39	56 N	124	22 E	3.36
YONGCHU GAP	37	03 N	129	26 E	2.18
YONGDAE GAP	40	28 N	129	04 E	2.38
YONGDANGP'O	38	00 N	125	42 E	3.26
YONGHUNG MAN	39	15 N	127	30 E	2.28
YONGIL MAN	36	04 N	129	28 E	2.12
YONGMAN DO	34	10 N	127	21 E	1.15
YONGWI DO	37	47 N	125	20 E	3.27
YONJA DO	35	25 N	129	22 E	2.6
YONP'YONG YOLTO	37	40 N	125	42 E	3.24
YOSO ENERGY BERTH	34	52 N	127	46 E	1.28
YOSU	34	44 N	127	45 E	1.24
YOSU BANDO	34	44 N	127	45 E	1.23
YOSU ENERGY BERTH	34	52 N	127	46 E	1.28
YOSU HAEMAN	34	40 N	127	51 E	1.21
YU YAN	38	34 N	121	38 E	4.29
YU YAN	38	35 N	121	36 E	4.9
YUAN DAO	38	40 N	122	10 E	4.6
YUANYAO ZUI	37	34 N	122	04 E	4.31
YUANZHUI JIAO	23	40 N	117	29 E	9.23
YUDAL SAN	34	47 N	126	22 E	3.11
YUHUAN DAO	28	08 N	121	12 E	7.12
YULPO MAL	34	53 N	128	08 E	1.32
YUN-AN LNG TERMINAL	22	49 N	120	11 E	8.21
YUSHAN LIEDAO	28	52 N	122	15 E	7.2
YU-SHAN LIEH-TAO	28	52 N	122	15 E	7.2
YUXINGNAO	30	21 N	121	52 E	6.16

Z

ZHAITOU JIAO	28	08 N	121	21 E	7.12
ZHAO'AN WAN	23	37 N	117	17 E	9.24
ZHAOBEI ZUI	37	28 N	122	14 E	4.32
ZHAOBEI ZUI	37	28 N	122	14 E	4.33
ZHELANG JIAO	22	39 N	115	34 E	9.30
ZHELIN WAN	23	36 N	117	03 E	9.24
ZHENHAI	29	57 N	121	42 E	6.28
ZHENHAI	29	57 N	121	43 E	6.1
ZHENHAIO JIAO	24	16 N	118	08 E	9.19
ZHENYAN TOU	22	19 N	115	06 E	9.2
ZHIFUDONG JIAO	37	36 N	121	20 E	4.31
ZHISONG YAN	23	26 N	117	18 E	9.25
ZHONGJIESHAN QUNDAO	30	11 N	122	40 E	6.12
ZHOUSHAN DAO	30	05 N	122	06 E	6.17
ZHU HANGDAO	24	26 N	118	04 E	9.17
ZHUANGHE	39	37 N	122	57 E	4.4
ZHUCHA DAO	35	57 N	120	19 E	5.11
ZHUJIAJIAN	29	56 N	122	23 E	6.17
ZIGAN	24	24 N	118	25 E	9.16