

PUB. 195
SAILING DIRECTIONS
(ENROUTE)



GULF OF FINLAND
AND
GULF OF BOTHNIA



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Preface

Pub. 195, Sailing Directions (Enroute) Gulf of Finland and Gulf of Bothnia, Eleventh Edition, 2011, is issued for use in conjunction with Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean, Baltic Sea, North Sea, and the Mediterranean Sea. The companion volumes are Pubs. 191, 192, 193, and 194.

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

This publication has been corrected to 23 April 2011, including Notice to Mariners No. 17 of 2011. Subsequent Publication Data Updates (PDUs) have corrected this publication to 31 March 2012, including Notice to Mariners No. 13 of 2012.

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://dnc.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 meridional angle as the designated course. Vessels following the directives must allow for every influence tending to cause deviation from such track, and navigate so that the designated course is continuously being made good.

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

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 fa-

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.

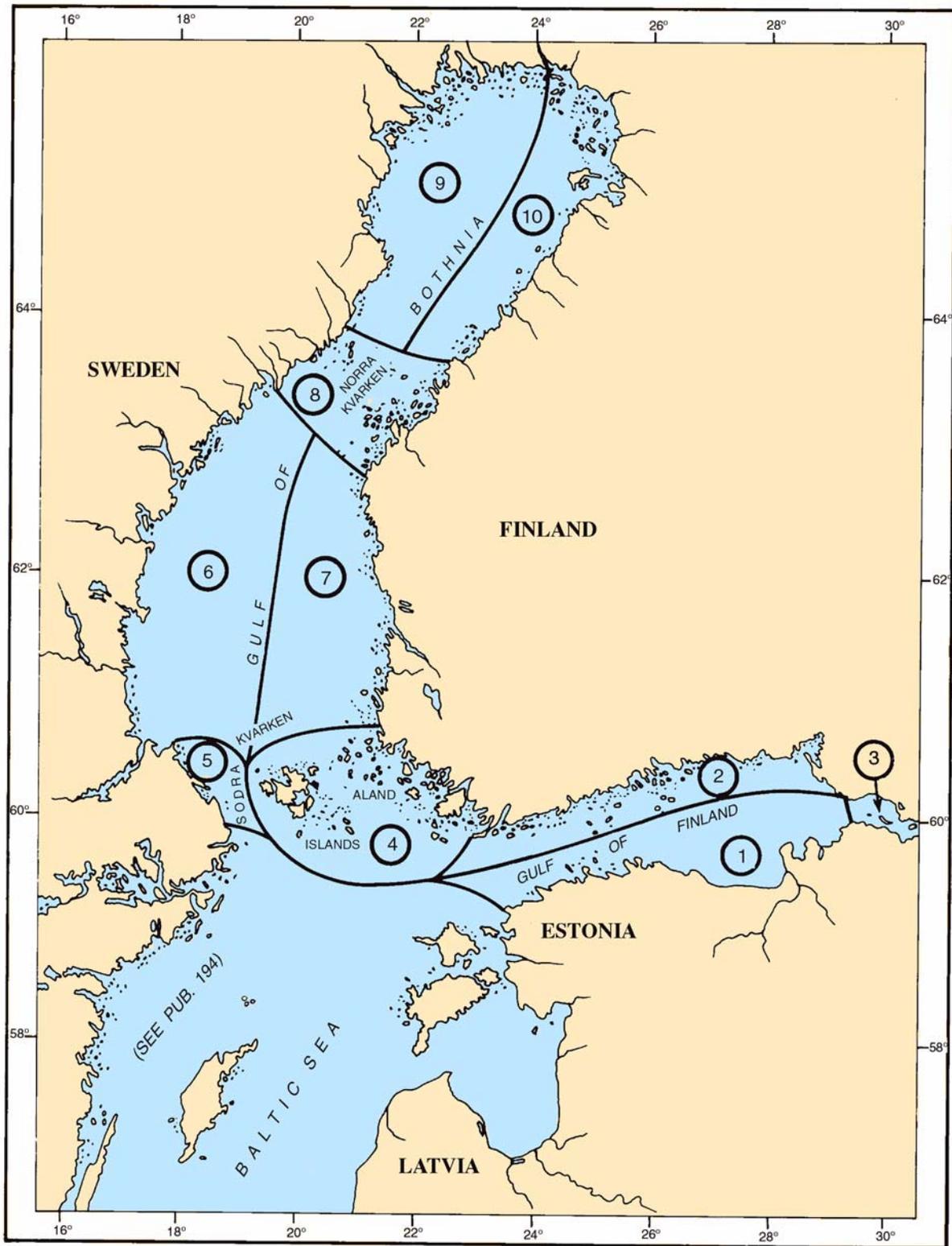
Japanese Sailing Directions.

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. 195

Conversion Tables

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

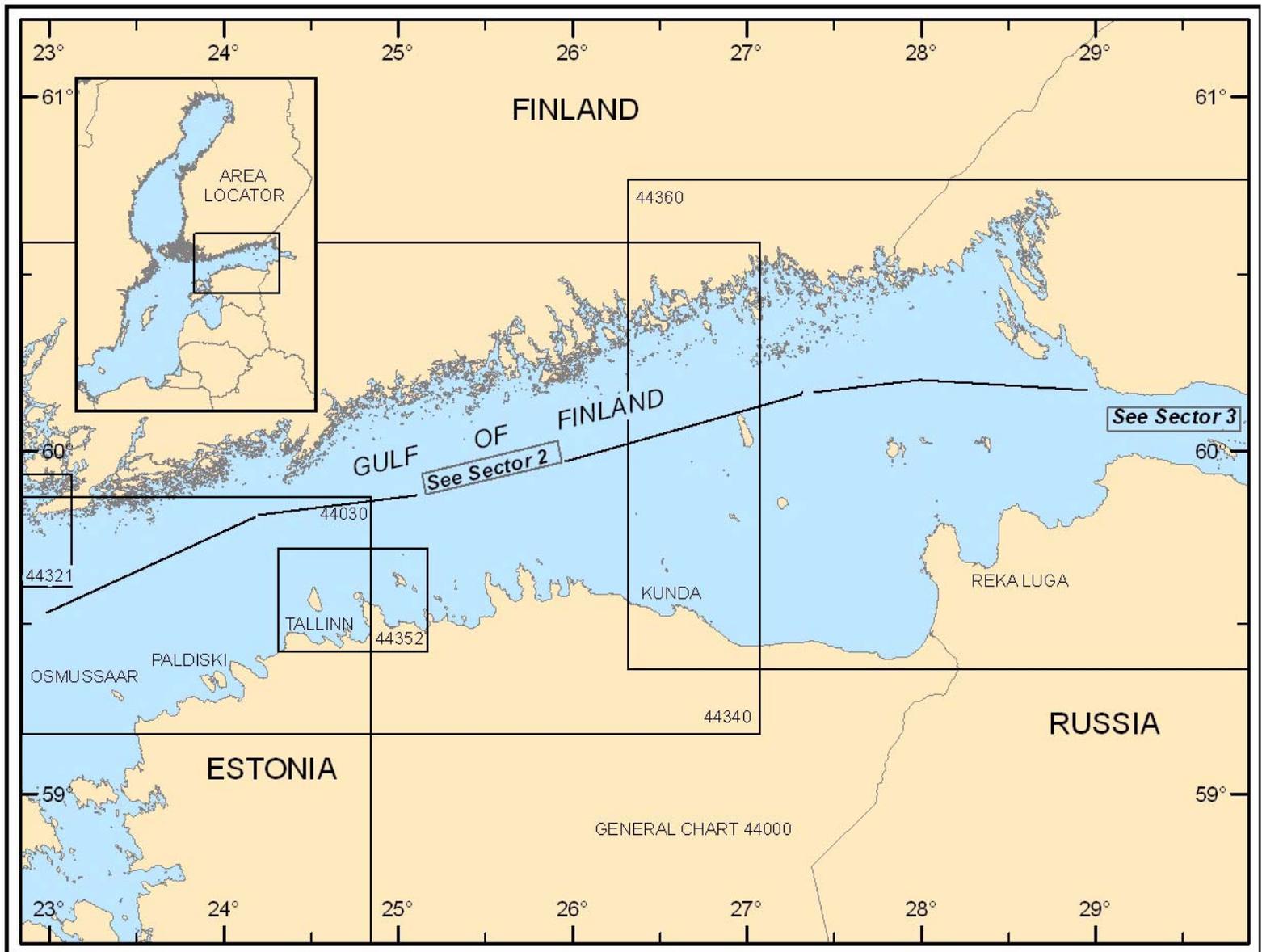
The following abbreviations may be used in the text:

IHO	International Hydrographic Organization
IMO	International Maritime Organization
loa	length overall

Pub.	Publication
SOLAS	International Convention for Safety of Life at Sea
St./Ste.	Saint/Sainte

Contents

Preface	II
Chartlet—Sector Limits	III
Conversion Tables	V
Abbreviations	VI
Sector 1	
The Gulf of Finland—Southern Shore—Osmussaar to St. Petersburg Guba	1
Sector 2	
The Gulf of Finland—Northern Shore—Hanko to St. Petersburg Guba	21
Sector 3	
Russia—St. Petersburg Guba and Nevskaya Guba	47
Sector 4	
The Aland Islands and the Adjacent Finnish Coast	59
Sector 5	
Sodra Kvarken and the Adjacent Swedish Coast	69
Sector 6	
Sweden—East Coast—Lovstabukten to Jarnasudde	77
Sector 7	
Finland—West Coast—Isokari to Strommingsbadan	103
Sector 8	
Norra Kvarken and the Adjacent Swedish and Finnish Coasts	117
Sector 9	
Sweden—East Coast—Ratan to the Finnish Border	131
Sector 10	
Finland—West Coast—Hallgrund to the Swedish Bordr	145
Glossaries	159
Index—Gazetteer	169



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

SECTOR 1 — CHART INFORMATION

SECTOR 1

THE GULF OF FINLAND—SOUTHERN SHORE—OSMUSSAAR TO ST. PETERSBURG GUBA

Plan.—This sector describes the S shore of the Gulf of Finland including the N shore of Estonia and the adjacent territory of Russia concluding at St. Petersburg Guba. The descriptive sequence is E from Osmussaar Island to Mys Shepelevskiy (59°59'N., 29°08'E.).

General Remarks

1.1 Ice.—Ice first appears in the Neva Estuary, between St. Petersburg and Kronshtadt, and in Vyborgskiy Zaliv (60°30'N., 28°30'E.) about the middle of November. The spread of ice is much more rapid along the N shore than along the S. Toward the end of December, it extends along most of the N shore, filling the inlets; on the S shore, it does not reach much W of Narva.

In the middle of January, ice fills the E end of the gulf to a position between Ostrov Moshchny (60°00'N., 27°50'E.) and Ostrov Gogland (60°05'N., 26°53'E.), while ice along the N shore has extended to form a wider coastal belt. On the S shore, the ice may have spread only slightly W of Narva, but in some years reaches longitude 26°E. By the middle of February, a rapid W extension has taken place, with ice covering the whole gulf E of Tallinn and reaching along the whole of the S shore, and farther W to enclose the island of Hilumaa. The only open part of the gulf at this time is therefore at the W end, away from the shores.

The ice attains its greatest extent about the first week of March, when the whole gulf is encumbered. Before the end of March, it is in retreat E. In the middle of April, the S shore is clear to about longitude 27°30'E; a little W of Narva, though ice still remains between Hiiumaa and the Estonian shore. Most of the gulf to the E of longitude 26°E is still ice encumbered, and ice persists in a wide belt along the N shore. The subsequent dispersal of the ice is rapid and at the beginning of May, ice is only found E of longitude 26°E, particularly between Ostrov Moshchny and Zaliv Primorsk (60°22'N., 28°38'E.). By the middle of May, all ice has disappeared.

The amount of ice in any particular part of the coast at a given time may depend very much on the direction of the wind. For example, in Tallinn Harbor, drift ice is mostly formed by N and NE winds; frequently this ice is driven out again by S winds and the roadstead becomes quite safe for shipping without the aid of an icebreaker.

For information pertaining to icebreaking services, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Tides—Currents.—The fundamental circulation of the currents in the Gulf of Finland is an inward flow of water E along the S shore, past Tallinn, and an outward flow W along the N shore, past Helsinki. This outward flow, turning NW at the mouth of the gulf, passes into the N current along the E coast of the Gulf of Bothnia.

The current in the gulf at any time depends largely on the wind. During W and SW winds, the current sets into the gulf

along both the N and S shores. With light winds, the excess of water driven into the gulf emerges in a W direction. With W gales, a strong current runs into St. Petersburg Guba, S of Kronshtadt; this current runs out on the N side, continuing along the shore of the gulf towards Mys Seyveste, with considerable force.

If there is any N direction to the wind, a set into the bights on the S shore of the gulf will generally be experienced.

After the break-up of the ice in the early spring, the outflow of water from the gulf is temporarily increased.

In the passage between Lavansaari and Kurgatski Rif, in calm weather, there is usually a weak SW current; at other times the direction and velocity depend on the wind.

While the tidal range in this area is negligible, considerable change in the water level may be caused by strong winds, variation in atmospheric pressure, and the seasonal amount of water released by the rivers.

Depths—Limitations.—All dangers along the immediate coast from the island of Osmussaar ENE to Tallinn, a distance of about 44 miles, are contained within the 40m curve, which has a greatest distance from the shore of about 8 miles.

From Tallinn to Letipea Neem, there are a number of rivers that discharge into the gulf. The coast in this area is marked with numerous off-lying islands, shoal banks, and shoal patches that extend up about 16 miles seaward.

Aspect.—The S coast of the Gulf of Finland consists of long stretches of limestone cliffs rising abruptly from the sea. This profile is prevalent in many of the coastal areas. The coastline is well-wooded and rises to heights of 80 to 92m in some localities.

The Estonian coast from Osmussaar Island to Tallinn (59°27'N., 24°46'E.) ranges from a low and sandy aspect with a border of woods to wooded hills.

The coast between Tallinn and Letipea (59°33'N., 26°35'E.) can be described as low, sandy, and bordered by woods, to steep cliffs and ridges with wooded hills inland.

Between Letipea and Mys Shepelevskiy, where this sector concludes, the coast is low, rocky, and wooded. It is also interspersed with meadows and marshy ground. The meadows contrast with the steep stone cliffs and partially-wooded hills, which rise to heights of 150m.

Pilotage.—The IMO recommends that vessels constrained by their draft or vessels not registered in one of the Baltic states, and infrequently sailing the area, embark a deep-sea pilot.

For information on deep-sea pilotage, See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Regulations.—Certain areas (restricted and semi-restricted) in Finnish waters have been declared restricted for reasons of navigational safety, inadequate charting, or for defense reasons. Foreign vessels, including small craft, may not enter these areas without permission, except to follow an officially recognized fairway for which permission is not required.

Anchoring within these areas is prohibited except in an emergency or when authorized to do so by the appropriate authority. However, a foreign vessel may anchor for not more than 48 hours within a restricted area in a recognized anchorage or mooring area indicated on the charts.

Permission to stay within a restricted area or to navigate outside the general fairways is granted on application to the Military Area Headquarters. Applications should be made on an official form not later than 14 days before planned entry into the area. Applications can be made after this time to the local Frontier Guard Authorities for a visit not exceeding 72 hours.

Vessels should consult the pilot for information on local rules, including regulations on the operation of navigation equipment and radios.

GOFREP, a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches. This system is operated by the VTS centers at Tallinn (VHF channel 61), Helsinki (VHF channel 60), and Saint Petersburg (VHF channel 74).

Vessels not equipped with an Automatic Identification System (AIS) and entering the area from the W are recommended to send a report to the relevant VTS traffic center at least 1 hour in advance.

The W limit of the reporting area is formed by a line joining the following points:

1. Bengtskar Light (59°43'N., 22°30'E.).
2. 59°33.3'N, 22°30.0'E.
3. 59°10.0'N, 21°30.0'E.
4. Ristna (Kopu Poolsar) (58°56'N., 22°03'E.).

For further information concerning GOFREP, see Finland in Pub. 140, *Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas*.

Vessel Traffic Service.—Vessel Traffic Services are in effect in Tallinn (paragraph 1.9), Muugla (paragraph 1.10), and Reka Luga (Ust Luga) (paragraph 1.21).

Vessels bound for Reka Luga (Ust Luga) also transit the coverage area of St. Petersburg Coastal VTS. (paragraph 3.1).

Directions.—Several IMO-adopted Traffic Separation Schemes (TSS) form the main route through the Gulf of Finland (see paragraph 2.1).

A Traffic Separation Scheme (TSS), established by the local authorities, exists in the approaches to the Port of Tallinn. The authorities advise that the principles of Rule 10 of the COLREGS applies to this TSS.

All of the above schemes may best be seen on the appropriate charts.

Caution.—It is reported that all navigational aids in the S part of the Gulf of Finland may be unreliable.

During the winter, many buoys are removed, while others may be damaged or break adrift.

In the coastal waters within this sector, numerous logs may be found adrift at all times of the year.

Several unexploded ordnance areas lie off the shores of the Gulf of Finland and may best be seen on the chart.

Areas dangerous due to mines laid during World War II exist within the Gulf of Finland. There is still a risk of danger in these areas when anchoring or carrying out any seabed activities.

It is reported that a submarine gas pipeline is being constructed between Russia and Germany. This pipeline will ex-

tend in a WSW direction through the Gulf of Finland from the vicinity of Bukhta Portovaya (60°31'N., 28°05'E.) and then lead in a SSW direction to pass E of Faro (57°57'N., 19°10'E.).

Off-lying Islands, Islets, and Dangers

1.2 Osmussaar Island (59°18'N., 23°22'E.) (World Port Index No. 28510) lies 4 miles NW of Poosaspea Neem (see paragraph 1.6). The center of the island, when viewed from a considerable distance, gives the impression that there are two islands. Overhanging limestone cliffs on the N side of the island rise to a height of 10m, the lower parts of which have been undermined by the action of the sea. The W and S sides have hills and ridges composed of gravel and sand.

A village is situated on a hill near the middle of the island; two windmills stand in this vicinity. A prominent white church, with a black spire, is situated 0.5 mile SE of the village.

Osmussaar Light is shown from a conspicuous tower, 35m high, standing on the NW extremity of the island. A beacon stands on the SE extremity of the island. A prominent tower is reported to stand about 0.8 mile SE of the light.



Osmussaar Light

Anchorage may be obtained off the S side of Osmussaar, about 1.5 miles S of the light, in a depth of 27m, mud and sand. Anchorage can also be obtained, in a depth of 13m, rock and sand, about 3.5 miles SE of the light.

Neugrund, an extensive shoal area, lies 5 miles ENE of Osmussaar and is marked by a lighted buoy on its N side.

Suur Pakri (59°20'N., 23°54'E.) is mostly bare and flat, with steep cliffs at the N end where it is joined by a causeway to Vaike Pakri. A light is shown from a structure, 10m high, standing at the N end of the island. Several villages are located on the S part of the island.

Krassigaar, an extensive shoal which dries in places, lies about 2.5 miles W of Suur Pakri. It is marked by buoys at the E and S sides, and by a lighted buoy at the N side.

Vaike Pakri lies close E of Suur Pakri and is connected to it by a causeway. The N end of this island is high and steep, but the S end is low and flat. The E side of the island is hilly and the center is wooded. There are two villages, one on the E side and the other on the W side. A light is shown from a framework structure, 16m high, standing on the NE end of the island.



Suur Pakri Light

Pakri Madal, a shoal, has a depth of 6.2m. It lies about 1.5 miles N of Pakri Neem (59°23'N., 24°02'E.) and is marked by a lighted buoy.

Caution.—A firing practice area lies centered 8 miles NE of Osmussaar Light.

A submarine cable, which may best be seen on the chart, extends between the SE end of Osmussaar and the mainland. Vessels are prohibited to anchor within 0.4 mile of this cable.

1.3 Tallinna Madal (59°42'N., 24°44'E.), with a least depth of 2.6m, lies in the N approaches to Tallinn and is the outermost danger in this vicinity. Tallinn Light is shown from a tower, 31m high, standing on this shoal. A racon is situated at the light.

The islands and dangers lying S and W of this shoal are described later in the text.



Tallinn Light on Tallinna Madal

Prangli Saar (59°38'N., 25°00'E.), a low and wooded island, lies on the E side of the approaches to Tallinn. This island is surrounded by foul ground and marked by lights on its NW, E, and S sides.

Keri Saar (59°42'N., 25°01'E.), a low and rocky islet, is located 3.5 miles N of Prangli Saar and surrounded by foul ground. A light is shown from a prominent tower, 31m high, standing at its SE end. A signal station is situated close to the light.

Kuradimuna, a shallow shoal, lies 3.5 miles W of Keri Saar. It is located on an area of foul ground and is marked by a lighted buoy.

Nygrund, with a least depth of 4.6m, lies about 2.5 miles SSW of Kuradimuna and is marked by a lighted buoy.



Prangli Saar NW Light



Keri Saar Light

Aksi Saar, a fairly high island, lies close E of Prangli Saar and is fronted by foul ground. A beacon (disused light tower), 15m high, stands on the SE part of this island.



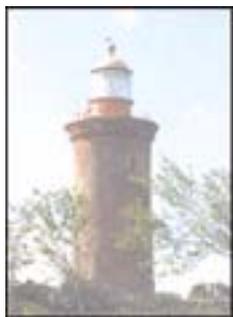
Aksi Saar Beacon (disused light tower)

Rammu Saar (59°35'N., 25°14'E.), a flat island, is located about 4 miles SE of Aksi Saar. Foul ground fronts the N end of this island and is marked by a lighted buoy.

Anchorage may be obtained, in a depth of 10m, S of Rammu Saar, about 0.5 mile offshore.

Mohni Saar (59°41'N., 25°48'E.), an island lying off Eru Laht, has a steep bank of shingle along its SW side. Its NW end is formed by a rocky hill and its NE side is fronted by foul ground and shoal water.

Mohni Light is shown from a tower, 27m high, standing on the NW extremity of the island. A signal station is situated in the vicinity of the light.



Mohni Light

Caution.—A submarine cable, which may best be seen on the chart, extends between Mohni Saar and the mainland.

1.4 Vaindlo (59°49'N., 26°22'E.) is a conspicuous rocky islet, 8m high, lying in the central portion of the Gulf of Finland. Foul ground and foul patches extend N, NE and S from the shores of this islet. Kakumadal, a shallow rock, lies at the extremity of a reef which extends up to 2 miles S from the S extremity of the islet. An isolated shoal, with a depth of 6.8m, lies about 3 miles SE of the islet.

Vaindlo Light is shown from a tower, 17m high, standing on the central portion of the islet. A signal station is situated at the light.



Vaindlo Light

Pohja Uhtja (59°41'N., 26°31'E.) is an extensive group of dangerous rocks, shoals, and islets lying 9 miles SSE of Vaindlo. This group extends for about 7 miles and is marked at its S end by a buoy. Uhtja Light is shown from a structure, 12m high, standing on the group, about 10 miles SSE of Vaindlo Light.

Ostrov Rodsher (59°58'N., 26°41'E.) is a rocky islet surrounded by a reef. A light is shown from a prominent tower, 19m high, standing on the N side of this islet. A racon is situated at the light.

Ostrova Virginny (59°57'N., 26°52'E.) consists of two rocky islets lying 1 mile apart. They are fringed by reefs, which are marked by buoys, and fronted by shoals. A light is shown from



Uhtja Light



Ostrov Rodsher Light

a tower, 14m high, standing on the northwesternmost islet.

Ostrov Malyy Tyuters, lying 17 miles E of Vaindlo, is a low sandy island with a pine forest at its center. The island is surrounded by foul ground, rocky reefs, and boulders rising from the water.

Ostrov Bolshoy Tyuters (59°51'N., 27°11'E.), lying 7 miles ENE of Ostrov Malyy Tyuters, is moderately high and densely wooded. A light is shown from a tower, 24m high, standing on the summit of this island.

A shoal bank, marked by a buoy, extends up to about 2.5 miles SSE of this island.

1.5 Ostrov Gogland (60°03'N., 26°59'E.) is 176m high and wooded. It has three peaks and is reported to be visible from a distance of 34 miles in clear weather. Gogland Light is shown from a framework tower, 23m high, standing on the heights at the N end of the island. Gogland S Light is shown from a tower, 26m high, standing on Mys Lounatrivi (60°01'N., 27°00'E.), the S extremity of the island. A radiobeacon is situated at this light.

During E winds, vessels may anchor, in depths of 36 to 54m, about 1 mile off the W side of Ostrov Gogland, but the holding ground is not good.

Small craft can anchor, in depths of 3 to 6m, within the small bay at Suurkyla, 1.5 miles SSE of the N extremity of the island, but it is exposed to E winds. The bay is sheltered by a breakwa-



Mys Lounatrivi (Gogland S Light)



Seskar Light



Poosaspea Light

ter and a village with a church stands at the head.

Vikalla, an extensive shallow reef, lies centered 7 miles S of the S extremity of Ostrov Gogland. The N and S extremities of the reef are marked by lighted buoys.

Ostrov Moshchnyy (60°00'N., 27°50'E.), located 24 miles E of Ostrov Gogland, is moderately high and wooded. Poluostrov Promezhutchnyy, the E part of the island is connected to the W and main part by a narrow isthmus, 5m high. Three small peninsulas extend N from the NW end of the island. Shoals extend up to about 6 miles S from the S end of the island and are marked by buoys. Bashnya Lavensari Light, equipped with a racon, is shown from a framework tower, 29m high, standing at the N end of the island.

Anchorage can be taken in Nore Kapel'lakht, about 0.7 mile N of the isthmus connecting the E and W parts of the island. The anchorage has depths of 8 to 14m, fine sand, but it is exposed to N winds.

Ostrov Malyy, lying 3 miles E of Ostrov Moschnyy, is low, wooded, and surrounded by reefs. The E and W sections of this island are joined by a sandy isthmus, 4m high. An islet, covered with grass, lies close W of the N extremity of the island, which is formed by a low spit. A lighted beacon, 27m high, stands on the W part of the island.

Anchorage, protected from S winds, can be obtained E of the N end of the island, in depths of 18 to 20m.

Shoals extend up to about 7 miles NNW and 5 miles S of Ostrov Malyy. They are marked by buoys and may best be seen on the chart.

Ostrov Seskar (60°02'N., 28°23'E.) is low, densely wooded, and surrounded by foul ground. Several villages stand on its W side. A light is shown from the SE extremity of the island. Seskar Light is shown from a prominent tower, 30m high, standing on the NW extremity of the island. Extensive shoals and reefs extend up to about 4 miles seaward from the W side of the island.

Caution.—Prohibited areas, the limits of which are shown on the chart, lie centered 4 miles NE of Ostrov Malyy, about 10 miles W of Ostrov Moshchnyy, and in the vicinity of Ostrova Seskar.

The Gulf of Finland

1.6 Poosaspea Neem (59°14'N., 23°31'E.) is a densely-wooded cape fronted by a rocky reef. Poosaspea Light is

shown from a prominent framework tower, 16m high, standing on the cape. On the E side of the cape there is a conspicuous ridge, on which stand several prominent windmills.

Dirhami, a small fishing harbor, is situated 1 mile S of Poosaspea Neem.

The entrance to the Gulf of Finland lies between Osmussaar Island, located 4 miles NW of Poosaspea Neem, and the island of Russaro (59°46'N., 22°57'E.), the largest of the islands located S of Hankoniemi.

Toomanina (59°15'N., 23°40'E.), a headland fronted by shoals, lies 4.8 miles ENE of Poosaspea Neem. The coast between is sandy with wooded hills in places. A conspicuous tower stands on this headland.

Keibu Laht, a bay, is entered between Toomanina and Ristinina, a precipitous point, 2.7 miles NE. This bay provides anchorage, in depths of 6 to 9m, mud and sand, sheltered from NE, through S, to W winds. Local knowledge is advised.

Pakri Neem (59°23'N., 24°02'E.) is a headland faced by high cliffs. Pakri Light is shown from a tower, 52m high, standing on this headland. A signal station stands near the light. The ruins of a disused tower are situated close W of the light.

Paldiski Laht (59°20'N., 24°00'E.), lying 13 miles E of Toomanina, extends SSE between Vaike Pakri and the mainland. It is the most sheltered bay in Estonia. The E shore is



Pakri Light



Paldiski—South Harbor

high and forms a plateau, while the S shore is low and marshy in some places.

Caution.—Numerous sunken mines are reported to lie in the entrance of Paldiski Laht.

1.7 Paldiski (59°21'N., 24°02'E.) (World Port Index No. 28505), a small commercial port and former Russian naval base, is situated within Paldiski Laht. The North Harbor consists of a small basin, protected by two moles, lying adjacent to the town. The South Harbor, situated about 1.2 miles SE, consists of a large basin protected by a pier.

This port is under the jurisdiction of Tallinn and is considered to be part of the Port of Tallinn.

Paldiski Home Page

<http://www.paldiski.ee>

Winds—Weather.—Winds from E cause the water in the basin to fall while W winds cause it to rise. The maximum difference between highest and lowest water amounts to about 0.9m.

Ice.—Paldiski Laht freezes later than other ports in the Gulf of Finland. The ice lasts, on an average, for 33 days, but in a mild winter there may be none. The bay is kept open by ice-breakers throughout the winter. The navigation season is normally the period from March 15 to February 1.

Depths—Limitations.—The entrance to North Harbor is 25m wide and has a depth of 7m. The basin is about 145m long and 37 to 73m wide. It provides 400m of quayage, with depths of 6 to 7m alongside.

South Harbor is protected by a pier, 400m long, which extends S and SSE. It provides about 1,200m of total berthage, with depths of 9 to 13m alongside.

The port has facilities for tanker, ro-ro, timber, bulk, general cargo, and passenger vessels. Vessels up to 230m in length, 35m beam, and 12.2m draft can be accommodated alongside.

Aspect.—Lighted ranges indicate the approach channel and the fairway leading to the pier.

Pilotage.—Pilotage is available through Tallinn. Vessels should send an ETA and request for pilotage 24 hours and 4 hours in advance. Pilots can be contacted by VHF channel 9 and board in position 59°23'N, 24°00'E.

Contact Information.—The port can be contacted by e-mail, as follows:

info@portpaldiski.ee

Anchorage.—Designated anchorage areas lie 1.2 miles W and 0.7 mile NW of the pier. These areas lie on both sides of the range line and have depths of 12 to 22m, mud and sand. Another designated area lies 1 mile NW of Pohjasadam (59°21'N., 24°03'E.) and has a depth of 35m, sand and clay.

Small vessels may anchor SE of Vaikke Pakri, in depths of 4 to 6m, mud and sand, sheltered from winds from all directions.

Caution.—A spit lies about 0.5 mile NW of the town of Paldiski. It is formed by the remains of an old stone mole and extends about 0.2 mile from the shore in front of an old fort.

A spoil ground area, which may best be seen on the chart, lies in the vicinity of the pilot boarding position.

An explosives dumping area, which may best be seen on the chart, lies close off the E side of Vaikke-Pakri.

1.8 Lahepere Laht (59°22'N., 24°12'E.), entered between Pakrineem and Lohusalunina, 4.8 miles E, is open NW and has a bottom of rock covered with sand. The shores of the bay are wooded. Leetse is an estate standing on the W side of the bay, the buildings of which are visible from seaward.

Lohusalu Laht, lying between Lohusalunina and Suurupi, 6.5 miles NE, is sheltered from offshore winds. It affords anchorage for small vessels, in a depth of 5m, but is fringed by shoals. A marina is situated at the W side of this bay. Turisalu, a resort, stands on high ground, faced with reddish cliffs, between two rivers in the S part of the bay.

Suurupi (59°28'N., 24°23'E.) is a broad hilly promontory, 43m high. Ninamaa, a wooded headland, forms the NW extremity of this promontory and is fronted by shoals. Suurupi Light is shown from a prominent round tower, 22m high, standing 0.8 mile SE of this headland.

Naissaar (59°34'N., 24°31'E.), lying in the middle of the entrance to Tallinna Laht, is densely wooded; the tops of the trees rise to a height of 30m in places. From seaward, this island shows up distinctly as a dark belt against the mainland. The E side is sandy and hilly, but the W side is more level. A settlement, with a red church, stands at the S end of the island.



Suurupi Light

Hulkari Ots Light is shown from a framework tower, 15m high, standing on the SE extremity of the island.

Naissaare Kari, a reef, extends about 1.5 miles SSE from the vicinity of Hulkari Ots Light. It has depths of 3 to 9m and may best be seen on the chart.

Pikasaare Ots Light (59°36'N., 24°31'E.), also known as Naissaar Light, is shown from a prominent tower, 45m high, standing on the N extremity of the island.



Pikasaare Ots Light

Uus Madal (59°40'N., 24°36'E.), a shoal with a least depth of 3.2m, lies in the approaches about 4.3 miles NE of Pikasaare Ots Light and is marked by buoys.

Niassaare Madal is an extensive rocky shoal lying parallel with and 2 miles E of the E side of the island. It is marked on the N, W, and S sides by buoys and may best be seen on the chart.

Kesk Madal, a shoal with a least depth of 7.4m, lies about 3.8 miles ESE of Pikasaare Ots Light and is marked on its E side by a lighted buoy.

Aegna Saar, densely wooded, lies 7 miles E of Naissaar and is fronted by shoals. A narrow sandy isthmus extends 0.5 mile seaward and forms the NE extremity of this island.

Aegna Light (59°36'N., 24°44'E.) is shown from a beacon structure, 21m high, standing on a rock about 1 mile NNW of the island.

Kopli Laht (59°27'N., 24°39'E.) is entered between Kaku-mae Neem and Kopli Nina, the NW extremity of a peninsula, 2.5 miles E. Two shipyards, the buildings of which are conspicuous from seaward, are situated on the SW side of this peninsula. A lighted range situated at the head of the bay indicates the

approach channel. See the Port of Tallinn (paragraph 1.9) for further details.

Tallinna Laht (59°36'N., 24°40'E.), entered between Naissaar and Aegna Island, extends SSE to the roadstead of Tallinna Reid. The port of Tallinn lies along the shore at the head of this roadstead.

Vahemadal (59°31'N., 24°40'E.), an extensive shoal, lies in the S part of Tallinna Reid, about 3.5 miles SE of the S extremity of Naissaar, and has a least depth of 3m. A light is shown from a prominent beacon tower, 14m high, standing near the S end of this shoal.



Vahemadal Light

Leoutjevimaldal (Kaguranna Madal) (59°30.8'N., 24°36.0'E.) lies about 2 miles W of Vahemadal. This isolated rocky shoal has a least depth of 11m and lies within the TSS traffic lane.

Caution.—Submarine cables are laid within about 0.2 mile of the entrance to the northwesternmost shipyard in Kopli Laht; the area is marked by buoys.

Submarine cables, which may best be seen on the chart, are laid between the S end of Naissaar and the mainland.

A firing practice area lies centered about 4 miles WNW of Pikasaare Ots Light.

A disused dumping ground area, the limits of which may best be seen on the chart, extends about 0.6 mile seaward from the N side of Aegna Saar.

Tallinn (59°27'N., 24°26'E.)

World Port Index No. 28480

1.9 Tallin, the capital of Estonia, is considered to be the most important port on the S side of the Gulf of Finland. The port is approached through Tallinn Laht and consists of several harbor basins.

The harbors at Mugga (paragraph 1.10) and Paldiski (paragraph 1.7) are considered to be part of the Port of Tallinn.

Tallinn Home Page

<http://www.loots.ee>

Winds—Weather.—In Tallinna Reid, the prevailing winds are W or SW, but NE winds are the strongest. With strong N winds, especially during the autumn, heavy seas and swell are

produced which may interfere with vessels attempting to maneuver in the port.

Ice.—Tallinna Laht may be frozen over in severe winters. From mid-January through March, the port is kept open by icebreakers, with sometimes only a single lane available to shipping. Ice has appeared in the inlet as early as November and has lasted until May.



Tallinn—Toompea Castle

Tides—Currents.—The tidal range in Tallinna Laht is very slight. The difference of the water level is due solely to the effects of the wind. A rise of water of about 0.4 to 0.5m from MLW is sometimes observed during NW and W winds. The reduced level of water is caused by SE and E winds.

Depths—Limitations.—The approaches to the port from N and W via the Traffic Separation Schemes (TSS) are deep and clear (see Directions).

Paljassaare Sadam, formerly known as Kopli Sadam, lies at the W side of the bay and is used by commercial vessels. There are four berths on the S side, with depth of 3.4 to 8.7m alongside, and seven berths on the N side, with depth of 4.1 to 9m alongside. The basin provides facilities for container, ro-ro, and tanker vessels. Cargo vessels up to 190m in length and 8.6m draft can be accommodated; tankers up to 120m in length and 6m draft can be accommodated.

Several basins lie close SE of this harbor and are mostly used by naval, port authority, icebreaker, and fishing vessels.

Vanasadam, formerly known as Kesklinna, lies in the S part of the bay and is the main commercial harbor for foreign ves-

sels. A detached breakwater is situated at the mouth and provides two entrances. The N entrance is 116m wide and has a depth of 11m. The S entrance is 90m wide and has a depth of 7.5m. The harbor has four basins which provide 23 berths, with depths of 4.7 to 10.7m alongside.

There are facilities for general cargo, bulk, ro-ro, container, and passenger vessels. Vessels up to 240m in length, 40m beam, and 10.7m draft can be accommodated.

Miiduranna Sadam lies on the NE side of the bay, 3.4 miles NNE of Vanasadam. This small harbor is protected by a breakwater and is divided into two basins. Vessels up to 120m in length, 17m beam, and 3.8m draft can be accommodated.

Pirita is located at the E side of the bay, 2 miles S of Miiduranna Sadam. This extensive yacht harbor is protected by two breakwaters.



Tallinn—Vanasadam (Old City Harbor)



Tallinn—Paljassaare Sadam

Vene-Balti Port, a shipbuilding and repair complex, lies at the NE side of Kopli Laht. It has two main basins and several floating docks. Vessels up to 200m in length and 6.5m draft can be handled. A basin area, used by patrol vessels, lies S of this shipbuilding complex.

Bekkeri and Meeruse are small harbors lying at the E side of Kopli Laht. They are used by commercial vessels and fishing craft. Vessels up to 140m in length, 22m beam, and 7.2m draft can be accommodated.



Tallinn

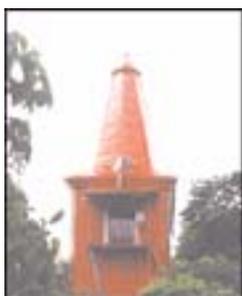
Aspect.—The lanes and separation zones of the main Traffic Separation Schemes (TSS) located in the approaches to the port are marked by lighted buoys and indicated by lighted ranges and sector lights, which may best be seen on the chart (see Directions).

Tallinna Laht Rear Range Light is shown from a prominent round tower, 40m high, standing 1.5 miles SE of the entrance to Vanasadam, the old harbor. Tallinna Laht Front Range Light is shown from a tower on a dwelling, 18m high, standing 0.6 mile NNW of the rear range light. This lighted range indicates the main fairway leading into Tallinna Laht.

For a description of the off-lying islands and islets in the approaches, see paragraph 1.3.



Tallinna Laht Rear Range Light



Tallinna Laht Front Range Light



Tallinn—Oleviste Church

The city extends on two levels along the steep rocky coast in the SE portion of the bay. Numerous high buildings, towers, chimneys, and masts stand in the vicinity of city. In good visibility, the spire of Oleviste Church can be recognized from a distance of 25 miles. It is 125m high and stands close SW of Vanasadam harbor basin. Toompea Citadel, surrounded by a high stone wall, is also conspicuous. It stands 0.5 mile SW of Oleviste Church and has a church with a dark green spire. The

high ruins of a prominent monastery stand on the E side of the bay, on the N bank of the Pirita River. A conspicuous obelisk is situated 1 mile SW of these ruins.

Pilotage.—Pilotage is compulsory for all vessels, except Estonian vessels of 300 grt and less, in Tallinn Bay, Kopli Bay, and Muuga Bay. Requests for pilotage must be sent through the agent 24 hours in advance to the Traffic Control Service (TCS).

Confirmation messages must be sent 6 hours and 2 hours prior to arrival at the pilot boarding place.

Vessels must also send a report through Tallinn Coast Radio Station or the agent 72 hours and 24 hours in advance of arrival. The ETA report must include the draft (fore and aft), and purpose for the port-of-call.

On approaching the port, vessels bound for Tallinn Bay and Kopli Bay must contact the Tallinn Traffic Control by VHF. Vessels bound for Muuga Bay must contact the Muuga Traffic Control on VHF. Permission must be received from the TCS before vessels can enter, leave, or shift berth in the port area.

Pilots should be contacted by VHF through the TCS (Tallinn on VHF channel 13 and Muuga on VHF channel 16 72). They board, as follows:

1. Tallinn Bay (call sign: Tallinn Pilot)—1.5 miles WNW of Tallinn No. 1 Lighted Buoy (59°36.5'N., 24°40.2'E.) or 0.5 mile S of Suurupi No. 3 Lighted Buoy (59°30.0'N., 24°32.6'E.).

2. Kopli Bay (call sign: Kopli Pilot)—0.5 mile S of Suurupi No. 3 Lighted Buoy (59°30.0'N., 24°32.6'E.).

3. Port of Muuga (call sign: Muuga Pilot)—Vessels from NW are boarded in position 59°39.0'N, 24°44.0'E. Vessels from N or NE are boarded in position 59°39.0'N, 25°05.4'E.

It is reported that during periods of inclement weather pilots may request vessels to proceed a distance within the TSS before boarding. Radar-assisted pilotage is available on request.

Regulations.—GOFREP, a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches. This system is operated by the VTS centers at Tallinn (VHF channel 61), Helsinki (VHF channel 60), and Saint Petersburg (VHF channel 74). For further information concerning GOFREP and other regulations pertaining to vessels approaching the ports along the S coast of the Gulf of Finland, see General Remarks in paragraph 1.1 and Finland in Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

The Traffic Separation Scheme (TSS) instituted by the local authorities in the S part of Tallinn Reid is not IMO-adopted. However, the authorities advise that the principles of Rule 10 of the COLREGS apply.

Vessels requiring icebreaker assistance should report, either directly to the harbormaster or through the agent, their ETA at the meridian of Ristna Light (58°56.3'N., 22°03.3'E.) 24 hours in advance. The harbormaster, through the TCS, maintains control over icebreaking operations. Information pertaining to the position of the ice edge and icebreaker pilotage will be supplied. Vessels bound for Tallinn, Kopli, or Muuga are usually requested to wait for icebreakers in position 59°10'N, 22°00'E.

Vessel Traffic Service.—A local Vessel Traffic Service (VTS) operates in the approaches to Tallinn Bay, Kopli Bay, and Muuga Bay. The VTS system area is bordered connecting the following points:

1. Ninamaa (59°28.4'N., 24°21.6'E.).
2. Position 59°29.5'N, 24°20.0'E.
3. Position 59°30.5'N, 24°20.0'E.
4. Position 59°40.0'N, 24°30.0'E.
5. Tallinn Light (59°42.7'N., 24°43.9'E.).
6. Keri Light (59°41.9'N., 25°01.4'E.).
7. Position 59°41.9'N, 25°12.3'E.

8. Rammu Saar (Loodo Ots) (59°34.7'N., 25°12.3'E.).

9. Ihasalu Nina (Uitru Spit) (59°32.5'N., 25°08.6'E.).

This system (Tallinn VTS) is mandatory for the following:

1. Vessels of 24m or more in length.
2. Vessels less than 24m in length when not under command, when restricted in ability to maneuver, or when having navigational equipment not in working order.
3. On request from Tallinn VTS.

All vessels within the VTS area must keep a continuous listening watch on VHF channel 13.

Vessels are required to report to Tallinn VTS when entering the area or leaving the port using the following format:

Designator	Information Required
ALFA	Name and call sign or IMO identification, or MMSI.
CHARLIE	Position (Lat/Long) in two 6-digit groups.
DELTA	Bearing from a clearly-identified landmark.
ECHO	True course in 3-digit group.
FOXTROT	Speed in knots in 2-digit group.
INDIA	Destination within the VTS area and ETA.
LIMA	Route information.
OSCAR	Draft in meters.
PAPA	Cargo and dangerous cargo by IMO class and total amount.
QUEBEC	Brief details of defects or restrictions of navigability.
ROMEO	Description of pollution or dangerous goods lost overboard.
UNIFORM	Vessel type and length.
WHISKEY	Total number of persons onboard.
X-RAY	Misc remarks: ice class, bunkers etc.

All vessels must then report to Tallinn VTS on VHF channel 13 when passing abeam of the following Reporting Points:

1. Tallinn No. 1 Lighted Buoy (59°36.5'N., 24°40.2'E.).
2. Suurupi No. 3 Lighted Buoy (59°30.0'N., 24°32.6'E.).

Vessels must also report immediately to Tallinn VTS in regard to the following:

1. Any incident, accident, danger, obstacle, or sea pollution.
2. Altering from their planned route.
3. When further information is requested by the VTS.

All vessels entering the area in order to anchor must advise Tallinn VTS of their intentions and report when anchoring or weighing anchor.

Contact Information.—The port of can be contacted by e-mail, as follows:

tallinn@loots.ee

Anchorage.—The bottom in the deeper parts of the roadstead is formed by soft mud. Close in, off the E shore, it is sand

and, in places, rocks. Off the W shore it is mostly mud, sand, and stones.

Three designated anchorage areas, with depths of 15 to 30m, are situated in the roadstead and may best be seen on the chart. Area A, Area B, and Area C (dangerous cargo) lie centered 2.5 miles N, 1.9 miles NW, and 3.5 miles NW, respectively, of Tallinn Front Range Light.

Five designated anchorage areas lie in the outer approaches and may best be seen on the chart, as follows:

1. Area G lies centered 1 mile SW of Suurupi No. 3 Lighted Buoy (59°30.0'N., 24°32.6'E.) and has a depth of 30m, clay.
2. Area H lies centered 1.3 miles NW of Suurupi No. 3 Lighted Buoy and has depth of 34 to 37m.
3. Area F lies centered 1.3 miles NE of Hulkari Ots Light (59°32.5'N., 24°33.8'E.) and has depths of 17 to 33m, mud and sand.
4. Area E, for dangerous cargo, lies centered 1.8 miles ESE of Suurupi No. 3 Lighted Buoy and has depths of 31 to 37m, sand.
5. Area D, in Kopl Laht, lies centered 3.5 miles SE of Suurupi No. 3 Lighted Buoy and has depths of 19 to 26m, sand and mud.

Care is advised as obstructions have been reported to lie within the vicinity of these anchorage areas.

Directions.—Recommended routes and Traffic Separation Schemes (TSS), which may best be seen on the chart, lie in the N and W approaches to Tallinn Reid.

A Precautionary Area lies centered 4.5 miles SSW of Tallinn Light (59°43'N., 24°44'E.). A TSS, for vessels approaching from the E, extends about 1.2 miles E from the E side of the Precautionary Area. The inbound traffic lane is situated on the N side of the separation zone; the outbound traffic lane is situated on the S side of the separation zone.

Recommended Traffic Flow Routes, indicated by directional arrows, are situated adjacent to the NE, N, and W sides of the Precautionary Area; these routes are to be used by vessels approaching from the NE, N, and WNW, respectively.

The main TSS, which forms the approach route from N, is entered about 4.6 miles W of Pikasaare Ots Light (59°36'N., 24°31'E.). It extends SSE for about 7 miles from the S side of the Precautionary Area. The separation zone is marked by Tallinn No. 1 Lighted Buoy (59°36.5'N., 24°40.2'E.), moored at the N end, and by Tallinn No. 3 Lighted Buoy (59°29.8'N., 24°45.2'E.), moored at the S end. The inbound traffic lane is situated on the W side of the separation zone; the outbound traffic lane is situated on the E side of the separation zone. An Inshore Traffic Zone is located adjacent to the E side of the outbound lane.

The alignment of the Tallinn range lights indicates the direction of the separation zone in the TSS. It should be noted that vessels are prohibited from navigating on this alignment when proceeding between Tallinn No. 1 Lighted Buoy and Tallinn No. 3 Lighted Buoy.

Tallinn may also be approached from W. The TSS, forming the route from W, is entered about 2.5 miles NW of Suurupi Light (59°28'N., 24°23'E.). It extends E for about 7 miles, ENE for about 5 miles, and then joins the main TSS. The seaward entrance of the scheme is marked by Suurupi No. 1 Lighted Buoy (59°30'N., 24°20'E.). The separation zone junction is

marked by Suurupi No. 3 Lighted Buoy (59°30.0'N., 24°32.6'E.). The inbound traffic lane is situated on the S side of the separation zone and passes S of Vahemadal Shoal (59°31'N., 24°40'E.). The outbound lane passes N of Vahemadal Shoal and is situated on the N side of the separation zone.

It should be noted that vessels constrained by their draft may be required to deviate from the alignment of the lighted range indicating the outbound traffic lane in order to pass clear of Le-outjevimalad (Kaguranna Madal) (59°30.8'N., 24°36.0'E.) (see paragraph 1.8.).

It should be noted that the Traffic Separation Schemes (TSS) described above are not IMO-adopted but the Estonian authorities have advised mariners that the principles of Rule 10 of the COLREGS applies.

Caution.—A local magnetic anomaly has been reported to exist on the E side of Tallinn Reid.

Several obstructions lie in the S part of Tallinn Reid. They are marked by buoys and may best be seen on the chart.

Muuga (59°30'N., 24°56'E.)

World Port Index No. 28484

1.10 Muuga (Muuga Sadam), formerly known as Novotalinnsakiy, is a newly-developed complex lying within Muuga Laht. It specializes in bulk grain, reefer, chemical, timber, and vehicle cargo.

This port is under the jurisdiction of Tallinn and is considered to be part of the Port of Tallinn.

Winds—Weather.—The port and roadstead are unprotected from winds out of the NW, N, and NE. Even with only moderate winds from a N direction, dangerous surges may be experienced at the berths.

Ice.—See General Remarks in paragraph 1.1 and the port of Tallinn in paragraph 1.9.

Depths—Limitations.—The entrance channel is authorized for drafts up to 16.8m.

The harbor is divided into two basins by the grain pier. The basins provide 17 berths, 79 to 330m long, with depths of 7.2 to 14m alongside. There are facilities for bulk, container, ro-ro, reefer, ferry, and tanker vessels. The grain pier is 335m long and has depths of 17.4 to 18m alongside. It can accommodate vessels up to 150,000 dwt, 300m in length, 48m beam, and 16.5m draft.

An oil terminal is situated in the NW part of the W basin. It provides a jetty, 340m long, with a depth of 18m alongside.

It is reported that a new coal terminal is in operation. It provides three berths, with depths of 11 to 17.1m alongside.



Muuga (Port of Tallinn)



Muuga (Grain Silo)

Aspect.—Several shoals lie adjacent to the approach passages and are marked by lighted buoys.

Muuga Light (59°33'N., 24°58'E.) is shown from a prominent tower, 15m high, standing on the E part of Karbimadal.



Muuga Light

A lighted range, which may best be seen on the chart, indicates the entrance channel leading into the harbor. A conspicuous television tower and a prominent grain silo are situated 2 miles SW and 0.2 mile SE, respectively, of the front range light.

Several shoals lie adjacent to the approach and are marked by lighted buoys.

Pilotage.—See Pilotage for Tallinn (paragraph 1.9).

Regulations.—GOFREP, a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches. This system is operated by the VTS centers at Tallinn (VHF channel 61), Helsinki (VHF channel 60), and Saint Petersburg (VHF channel 74). For further information concerning GOFREP and other regulations pertaining to vessels approaching the ports along the S coast of the Gulf of Finland, see General Remarks in paragraph 1.1 and Finland in Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Speed in the approach channel is limited to 10 knots.

Vessels greater than 25,000 grt are usually not berthed with winds over 23 knots. With strong winds from NW, N, or NE,

vessels may be required to proceed from the berth to a safe anchorage. It is reported that large vessels are berthed at the grain complex only during daylight, with wind velocities of not more than 19 knots. At all times, vessels must have their main engines available for use on 1 hour's notice.

It is advised that at least one-third of the vessel's crew must be aboard at any time, as well as either the master or the chief officer.

The use of tugs is reported to be mandatory for vessels over 2,000 grt.

Vessel Traffic Service.—A mandatory Vessel Traffic Service (VTS) system operates in the approaches to Tallinn Bay, Kopli Bay, and Muuga Bay. For further information, see Regulations for Tallinn (paragraph 1.9).

Anchorage.—There are four designated anchorage areas. Anchorage Area A lies 2 miles SW of Ihasaluneem (59°32.5'N., 25°09.1'E.) and has depths of 19 to 38m, sand and clay. It provides shelter from winds from between ENE and S.

Anchorage Area B lies 1.5 miles SSW of Prangli Saar Light (59°36.9'N., 25°02.4'E.) and has depths of 20 to 60m, sand. It is for vessels carrying dangerous cargo.

Anchorage Area C and Anchorage Area D lie, respectively, 1.2 miles N and 1.5 miles NE of the grain pier. These areas have depths of 12 to 30m, sand and clay, and are situated on either side of the entrance range.

It is reported that several additional designated anchorage areas are located in the approaches to the port and may best be seen on the chart.

Directions.—Vessels from N may pass about 4 miles E of Keri Saar and then either E or W of Aksi Saar. An alternative route leads SE from the TSS lying in the approach to Tallinn. The harbor is then entered from the NE. A lighted range, which may best be seen on the chart, indicates the entrance channel leading to the harbor complex.

Karbimadal, an extensive rocky shoal, lies about 3.3 miles NNE of the front entrance range light and has a least depth of 1.8m. It is marked on the E side by Muuga Light and a lighted buoy. Vessels pass NE and SE of this shoal.

The VTS Ship Traffic Control Station may establish one-way traffic in the entrance channel with the passage of vessels of over 25,000 dwt, or in reduced visibility (see paragraph 1.9).

Caution.—It is reported that a container terminal is being constructed within the port.

Muuga to Mys Shepelevskiy

1.11 Ihasalu Nina (59°32'N., 25°09'E.), a headland, is located 7 miles ENE of Muuga and surmounted by a beacon and a tower.

Ihaslu Laht, a bay, is entered 2 miles SW of the headland, but is not suitable as an anchorage because it is deep and open to the NW. A below-water reef extends up to about 1.3 miles NW from the head of the bay.

Kaberneeme Laht (59°32'N., 25°14'E.) is entered between Ihasalu Nina and Rammu Saar, 2.8 miles NE. This bay is not suitable as an anchorage as it is also deep and open to the NW. A reef, with a least depth of 0.9m, extends about 1.7 miles NW from the head of the bay.

Rammu Saar is described with off-lying dangers in paragraph 1.3.

Koipsi Saar, lying 1 mile SE of Rammu Saar, is fairly high with a flat top. A settlement stands on its NE side. The island is separated from the mainland at Kaberneeme by a narrow channel.

Kolga Laht is entered between Rammu Saar and Juminda Nina, 9 miles ENE. Kuusalu church stands 2.8 miles S of the head of bay and is prominent. Valkla mill and several conspicuous buildings are situated on the high coast, about 3.8 miles NW of this church. Leesi church, also conspicuous over the tops of the trees, stands 2.5 miles S of Juminda Nina. A prominent beacon stands near a village at the head of the bay.

Juminda Nina, fronted by shoals, is a densely-wooded headland surmounted by several conspicuous gray structures and two framework towers. A light is shown from a round tower, 24m high, standing on this headland.



Juminda Nina Light

Pohjar Malusi, a low and rocky island, lies 6 miles WSW of the light near the middle of the entrance to the bay. An extensive area of islets, shoals, and rocks extends SE into the bay from this island and may best be seen on the chart. Pedasaar, a large islet, lies in the SW part of the bay and is connected to the head by a shallow sandy ridge. It is densely wooded and prominent from seaward. Vessels may anchor in the W part of the bay, but local knowledge is advised.

Hara Laht is entered between Juminda Nina and Purekkari Neem, about 5.5 miles E. This bay extends about 6 miles SSE between two peninsulas. Purekkara Neem is surmounted by a large rock and shoals, marked by a buoy at the seaward end, extend up to about 3 miles NNW of it.

The shores of this bay are mostly sandy and rocky, and the land is sparsely covered with pine woods. On the W side, a range of hills stretches the whole length of the peninsula and forms steep cliffs in places which are densely wooded. Several villages stand along the shores of the bay. At the head of the bay the land is low. Between Loksa, in the SE corner, and Odakivi, 3.5 miles N, the land is high, but it becomes low again further to the N. Hara Saar, lying close off the SW shore of this bay, is a densely wooded islet, 12m high, marked by a beacon.

Large vessels may anchor, in a depth of 40m, mud, about 0.7 miles NE of Hara Saar.

1.12 Loksa Sadam (59°35'N., 25°42'E.), a small harbor, is

situated at the head of Hara Laht. Pilots are available and may be contacted by VHF. They board in position 59°40'N, 25°35'E. Vessels should send a request for pilotage and an ETA through the harbormaster or the Estonian Maritime Board Coordination Center at least 24 hours in advance.

The harbor is protected by two breakwaters. There are two wharves, 120 and 140m long, with depths of 3.7m alongside.

It is reported that several prominent chimneys stand at a factory in the vicinity of the harbor.

Mohni Saar (59°41'N., 25°48'E.) is described with the off-lying dangers in paragraph 1.3.

Eru Laht is entered between Purekkari Neem, on the W side, and Mohni Saar. The W shore of the bay is wooded. The E shore of the bay is formed by the Kamu peninsula, which is sandy, moderately high, and covered with tall pine trees. A prominent tower is reported to stand on the NW extremity of this peninsula. Foul ground and rocks extend NNW between the N end of the peninsula and Mohni Saar. The S shore of the bay is low and partly wooded. The village of Eru stands at the head of the bay. A beacon stands at Turbu Neem, about 4.3 miles SSE of Purekkari Neem. A river flows into the SW corner of the bay and is fronted by foul ground.

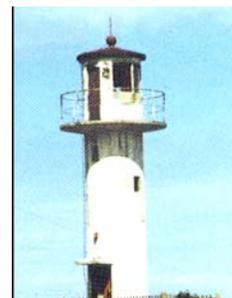
Anchorage may be obtained as convenient in the bay, but vessels usually anchor about 1.5 miles N of Eru at the head. Local knowledge is advised.

Kasmu Laht is entered between the NE extremity of the Kamu Peninsula and Lobineem, about 1.7 miles ENE. The shores of this bay are sandy, stony, and backed by trees. The S shore is low. The village of Ihumae, with a prominent white church, stands behind the trees on a steep hill, about 3 miles inland from the head of the bay.

Lobineem, surmounted by a tower, is rocky and, at some distance inland, covered with trees.

Anchorage may be obtained in any part of the bay in a convenient depth. Several dangerous wrecks are reported to lie in the vicinity of the entrance to this bay.

1.13 Vergi Sadam (59°36'N., 26°05'E.), a small fishing and pleasure craft harbor, lies about 5 miles SE of Lobineem. The coast between is fronted by foul ground. The N side of the harbor is protected by an islet connected to the mainland by a rocky reef. The E side is protected by a breakwater. A light is shown from a tower, 11m high, standing on the NE extremity of the islet.



Vergi Sadam Light

The harbor has a least depth of 4m and is open to E winds. A dredged channel, about 75m wide, leads into the harbor and is indicated by lighted range. Local knowledge is advised.

Kalkgrund (Soemadal), an extensive shoal area, lies about 6.5 miles N of Vergi Sadam. It has a least depth of 0.5m and is marked by a buoy.

Vainupea (59°35'N., 26°16'E.) is located 5.2 miles E of Vergi Sadam. A light is shown from a framework tower, 20m high, standing on this cape. A white church, with a prominent red roof, stands close S of the light.

Snegi Madal, an extensive shoal area, lies about 6 miles N of Vainupea. It has a least depth of 2.6m and is marked buoys.

Pohja Uhtja, lying 6 miles E of Snegi Madal, is described with off-lying dangers in paragraph 1.4.

Toolse Neem, surmounted by the conspicuous ruins of a castle, is located 6.8 miles ESE of Vainupea. The coast between is formed in places by several white sand hills.

1.14 Kunda Laht (59°32'N., 26°32'E.) (World Port Index No. 28440) is entered between Toolse Neem and Ulluneeme, 3.5 miles ENE. This bay is sheltered from S and E winds. The E and S shores are low and covered with trees, meadows, and swamps. A limestone ridge rises steeply about 1 mile S of the head of the bay. The Kunda Jogi flows toward the bay through this ridge. Several cement works, with tall chimneys, stand on an area of high ground near the river bank, about 1.5 miles inland. A prominent mill is situated about 1.5 miles SE of the head of the bay.

Extensive reefs front the shores and for the most part are covered at HW. In the E part of the bay, the depths are more uniform and small vessels are able to approach within 0.8 mile of the shore.

Kunda Sadam, a small harbor, lies at the head of the bay. It consists of two piers and is used for the export of cement. The entrance channel is 70m wide and has a depth of 10.4m. It is indicated by a lighted range and marked by buoys.

Pilots are available. Vessels should send a request for pilotage and an ETA by telephone or fax through the harbor master or the Estonian Maritime Board Coordination Center at least 24 hours in advance. They should then send a confirmation no later than 4 hours before arrival. Pilots can be contacted by VHF and board in position 59°38.0'N, 26°29.5'E, within Kunda Bay; and in positions 59°27.0'N, 27°55.0'E and 59°29.0'N, 27°42.0'E, within Narva Bay.

There are three berths, 32 to 176m long, with depths of 7.5 to 9m alongside. Vessels up to 8,000 dwt, 150m in length, and 8m draft can be accommodated.

Vessels may anchor in depths of 12 to 14m, sand, midway between the spar buoys marking the foul ground on either side of the entrance channel.

It is reported that a designated anchorage area lies about 4 miles N of the port, centered in position 59°34'N, 26°32'E.

Letipea Neem (59°33'N., 26°37'E.), fronted by foul ground, is located 1 mile NE of Ulluneeme, the E entrance point of Kunda Laht. Letipea Light is shown from a prominent tower, 14m high, standing on this cape.

Diomidi Madal, an extensive shoal area, lies centered 7.5 miles NE of Letipea Neem and has a least depth of 4.6m.

Neugrund, an extensive group of shallow rocks and shoals, lies 24 miles NE of Letipea Neem and is marked by buoys on the N, S, and W sides, and by a lighted buoy at the E side.

1.15 Narva Laht (59°33'N., 27°30'E.), also known as



Kunda Sadam Harbor

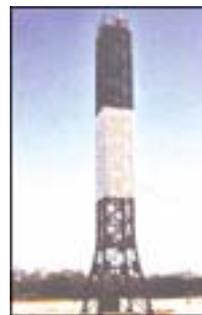


Letipea Light

Narvskiy Zaliv, lies between Letipea Neem and Mys Kurgal'skiy, about 47 miles ENE. The coast of this bay is mainly sandy and backed by cliffs, decreasing in height to the E; the plateau surmounting the cliffs is covered with pastureland and villages, with small woodlands in places. The shore is fronted by shoals and foul ground in many places.

A small craft harbor, protected by a breakwater, lies at Mahu, 4 miles ESE of Letipea Neem, and has a depth of 3m.

A cement factory, with several tall and conspicuous chimneys, is situated at Aseri, about 9.5 miles SE of Letipea Neem. A prominent church stands about 4 miles W of Aseri.



Moldova Light

Moldova (59°26'N., 27°03'E.) is situated 6 miles ESE of Aseri. A light is shown from a prominent framework tower, 28m high, standing near this town. Two prominent windmills are situated on a hill at Valaste, 15 miles E of Aseri.

A conspicuous windmill is situated at Toila, 20 miles E of Aseri. The cliffs in the vicinity of Toila are very steep in places.

Sillamae, a resort, stands on the high sandy coast, about 8 miles E of Toila. Merikula, another resort, is situated in a wooded area, 6.5 miles E of Sillamae. The Sinimaed Hills, partly wooded and 90m high, extend between these two resorts. They stand about 1.5 miles inland and are conspicuous from seaward.

Caution.—Several dangerous wrecks, which may best be seen on the chart, lie in the SE part of Narva Laht.

Extensive areas of foul ground and shoals, which may best be seen on the chart, extend up to 16 miles W and 15 miles N of the peninsula forming the E side of Narva Laht. Banka Namsi (59°46'N., 27°35'E.) is the outermost danger on the W side. This bank has a least depth of 1.4m and is marked by buoys on its N, S, and W sides, and by a lighted buoy on its E side. For additional dangers lying in the approach Narva Laht, see paragraph 1.4 and paragraph 1.14.

A precautionary area, with a radius of 3 miles, lies centered about 4.5 miles NE of Sillamae and may best be seen on the chart. This area has been established due to the presence of a sunken mine.



Silport (Sillamae)

1.16 Silport (59°24'N., 27°45'E.), the commercial port of Sillamae, has been established on the S coast of Narva Laht, about 1 mile NNW of the town. It is reported to be under continuing development.

Ice.—The port is generally free of ice all year round but ice-breaking assistance is available if required.

Depths—Limitations.—The harbor consists of an L-shaped jetty extending about 0.6 mile N from the shore. A finger pier extends 0.2 mile N from the knuckle of the jetty. Lights are shown from the heads of the jetty and the pier.

There is 1,180m of total quayage, which provides six main commercial berths. These berths are 31 to 319m long and have depths of 6.2 to 12.5m alongside. Facilities for general cargo, ro-ro, oil, LPG, and container vessels are under construction. Vessels up to 300m in length, 80m beam, and 11.9m draft can be accommodated.

Pilotage.—Pilotage is compulsory for all foreign commercial vessels. Vessels should send an ETA and a request for pilotage via their agent 24 hours in advance. The ETA should be confirmed 6 hours and 2 hours prior to arrival. Vessels should

then contact the port on VHF channel 68 in order to receive permission to enter the harbor. Pilots board 0.6 mile N the the outer fairway buoy, which is moored about 3.5 miles NW of the harbor.

Contact Information.—The port can be contacted by e-mail, as follows:

silport@silport.ee

Caution.—Extensive construction is being carried out in the vicinity of the harbor.

1.17 Narva Joesuu (59°28'N., 28°03'E.), a small commercial and fishing harbor, is situated on the SW side of the entrance of the Narva Jogi River, in the SE corner of Narva Laht. The river mouth is narrow and fronted by a bar. A dredged channel through the bar has a depth of 4.3m. The river becomes wider inside the mouth and is navigable as far as the town of Narva, 7.5 miles SE. Ocean-going vessels cannot ascend the river above the town because of a waterfall.

The harbor is well-sheltered from all winds, but access is impossible during gales. The old town, on the W bank of the river, is of medieval appearance and surrounded by fortified walls and towers. There is 260m of berthage, with depths of 3 to 9m alongside.



Narva Light

Narva Light is shown from a round tower, 30m high, standing on the S side of the entrance. From the vicinity of Fairway Buoy (59°28.7'N., 28°01.1'E.), the approach track leads 0.8 mile ESE toward the coast, about 0.3 mile NNW of the entrance. A range, formed by beacon marks, then leads in a SSE direction into the river entrance.

The approaches are usually free of ice from the middle of April until the beginning of November.

Pilotage is compulsory. The pilot station is situated close to the light tower. Pilots usually board vessels about 4 miles WSW of Narva Light.

Vessels may anchor, in depths of 18 to 20m, about 2.8 miles WNW of the light. The anchorage is open to N and W winds, which on occasion will raise a heavy sea; however, the holding ground is good. Small vessels may anchor, in a depth of 15m, about 1.5 miles NW of the light.

The boundary between Estonia and Russia is situated in the vicinity of the Narva Jogi River.

Caution.—A disused spoil area, the limits of which are shown on the chart, lies centered about 2.5 miles NNW of the mouth of the Narva Jogi River.

1.18 Mys Kurgal'skiy (59°47'N., 28°06'E.), the E entrance point of Narva Laht, forms the NW extremity of the Kurgal'skiy Peninsula.

A small craft harbor, with depths of 3 to 4m, is situated at Gakkovo, 11.3 miles N of Narva Joesuu. The approach channel is indicated by a lighted range. Ostrov Reymosaar lies about 1 mile off the coast near this harbor.

A light is shown from a framework tower, 37m high, standing at Kaybolova, 5 miles N of Gakkovo. A radiobeacon is situated at this light. The coast between is fronted by foul ground, rocks, and islets, which may best be seen on the chart.

Caution.—A restricted area, the limits of which are shown on the chart, extends up to 5.5 miles N from the N end of the Kurgal'skiy Peninsula.

Extensive areas of foul ground and shoals, which may best be seen on the chart, extend up to 16 miles W and 15 miles N of the Kurgal'skiy Peninsula.

1.19 Luzhskaya Guba (59°44'N., 28°19'E.), at the head of which is the mouth of Reka Luga, is entered between Mys Kurgal'skiy and Mys Kolgompya, 14 miles ENE. A lighted range, which may best be seen on the chart, is situated on Mys Kolgompya and indicates the approach from the N.

The W shore of this bay is densely wooded; along the whole length of the E shore are Soykina Gora, which from NW and NE appear as two separate ridges, the southernmost one being generally about 90m high.

A light is shown from a framework tower, 41m high, standing at an elevation of about 180m at Gorki, 3 miles SW of Mys Kolgompya. At the farm of Repino, about 2.5 miles SSW of Mys Kolgompya, there is a prominent stone windmill.

A harbor, known as Ruch'i, lies at the E side of the bay, about 2 miles SW of Gorki Light. There were extensive facilities for servicing naval vessels here, but it is reported that the harbor, for the most part, is in a state of disrepair and has been abandoned.

Reka Vyb'ya enters the SW corner of Luzhskaya Guba, and about 1.8 miles E is the mouth of Reka Luga. Sandhills rise between the mouths of these two rivers.

Vessels may anchor within Luzhskaya Guba, in depths of 7 to 18m. Winds from between N and W raise a heavy sea throughout the bay.

Caution.—The bay and its approaches are encumbered by extensive shallow shoals which may best be seen on the chart. These shoals extend up to about 6 miles seaward of the entrance to the bay and are marked by lighted buoys and beacons.

1.20 Reka Luga (Ust Luga) (59°40'N., 28°19'E.) (World Port Index No. 28410), at the mouth of a river, has a natural harbor available to small vessels.

Ice.—The harbor is usually frozen over until the middle of April.

Depths—Limitations.—The river mouth is fronted by a bar across which a channel, dredged to a depth of 4.7m, extends as

far as a sawmill about 2 miles inside the entrance. The channel, which is indicated by a lighted range and buoys, has a width of only 40m in places.

Vessels up to 82m in length and 4.5m draft can be handled. Vessels having the maximum draft must use tugs. The use of tugs for vessels with drafts of less than 4.4m is left to the discretion of the pilot.

A settlement is situated close E of the mouth of the river. There is a red church with a prominent green roof.

It is reported that a coal terminal, known as Ust Luga, has been constructed in the vicinity of the harbor and is capable of handling vessels up to 50,000 dwt. An entrance channel, 2.7 miles long, leads to the terminal. It is 150m wide and has a least dredged depth of 14m.

Pilotage.—Pilotage is compulsory for commercial vessels. Pilots can be contacted by VHF and board outside the bar.

Vessel Traffic Service.—Reka Luga (Ust Luga) Vessel Traffic Service (VTS) operates in an area within a circle with a radius of 12 miles centered on Gorki Light (59°48'02.4"N., 28°30'00.0"E.). The VTS can be contacted (call sign: Ust Luga Traffic) on VHF channel 14, 16, and 69.

Vessels bound for Reka Luga (Ust Luga) transit the coverage area of St. Petersburg Coastal VTS. For further information on the requirements of St. Petersburg Coastal VTS, see paragraph 3.1.

Anchorage.—Vessels may anchor in the approaches, in depths of 7 to 8m, sand, clear of the fairway.

Caution.—It is reported that several new cargo terminals are under construction in the vicinity of the harbor.

1.21 Mys Ustinskiy (59°55'N., 28°59'E.), fronted by foul ground and dangerous wrecks, is located 14 miles ENE of Mys Kolgompya. A light is shown from a framework tower, 29m high, standing on this point.

Koporskaya Guba lies between the two points and derives its name from Koporskiy Castle, now in ruins but still prominent, standing on a hill about 12 miles S of Mys Ustinskiy. A church, with a green dome and spires, is situated within the ruins of the castle; another church, with a green dome, stands close SE. The land to the N of the castle is wooded, while meadows extend to the S.

A tall white chimney stands at Sista Palkino, on the SE shore of the bay, 6.5 miles S of Mys Ustinskiy.



Shepelevskiy Light and Communications Tower

The former Dibicha Palace is situated about 4.8 miles SE of Mys Kolgompya. It is a prominent white stone building with a small tower.

Koporskaya Guba is open to N winds and, at times, SW winds raise a choppy sea. The shores of the bay are low, rocky, and covered with trees interspersed with meadows and marshy ground. There are no harbors in the bay but shelter is available.

During offshore winds, anchorage may be obtained, in depths of 11 to 18m, within the S part of the bay and in 23 to 31m, mud and sand, in the N part.

Caution.—Foul ground and shoal patches extend up to 2 miles from the shores of the bay and may best be seen on the chart.

The W limit of the Kronshtadt Fortified Zone lies at the E

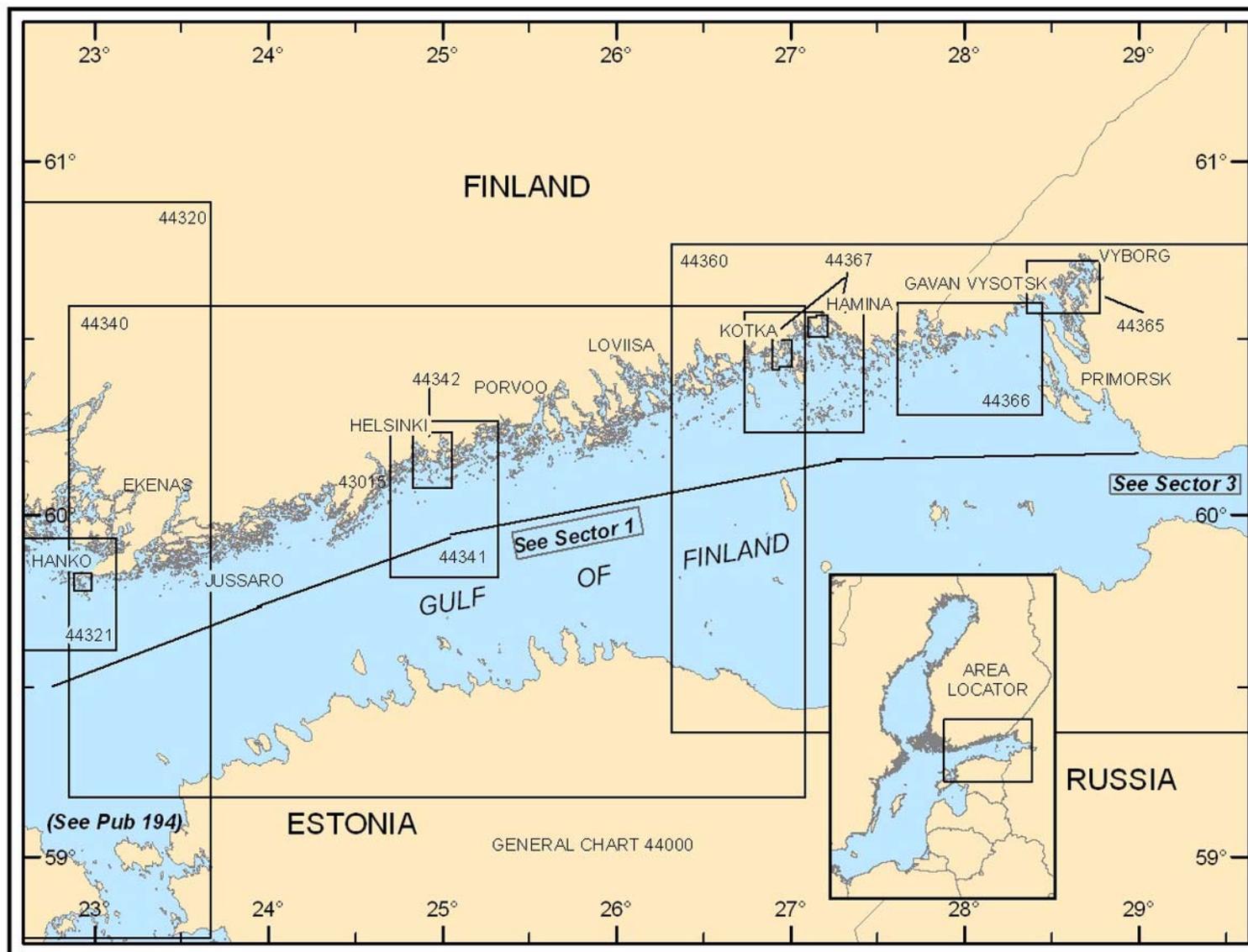
side of Koporskiy Guba and may best be seen on the chart.

1.22 Mys Shepelevskiy (59°59'N., 29°08'E.), fronted by foul ground and wrecks, is located 6 miles NE of Mys Ustin-skiy. Shepelevskiy Light is shown from a prominent stone tower, 36m high, standing on this point, at the N end of the Karavalday Peninsula. It is reported that a tall, conspicuous communications tower is situated close to the light.

Mys Osinovyy, surmounted by a beacon, is located 2.5 miles SW of the light.

Banka Demanstey, an extensive shoal, lies centered 11 miles W of the light. It has a least depth of 4m and is marked by buoys.

The waters lying E of Mys Shepelevskiy are described in Sector 3.



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

SECTOR 2 — CHART INFORMATION

SECTOR 2

THE GULF OF FINLAND—NORTHERN SHORE—HANKO TO ST. PETERSBURG GUBA

Plan.—This sector describes the N shore of the Gulf of Finland from the cape of Hanko to Mys Stirsudden, the N entrance point of St. Petersburg Guba. The descriptive sequence is W to E.

General Remarks

2.1 Winds—Weather.—Fog is frequent in the vicinity of Hanko, particularly during April. During the period of ice thaw, thick patches of fog have also been reported along the inner routes as far E as Orregrund.

Ice.—See General Remarks in paragraph 1.1.

For information pertaining to winter navigation, ice, and Finnish icebreaking services, including internet web sites, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Aspect.—Suomen Lahti is the Finnish name for the N shore of the Gulf of Finland. The Russians refer to it as Finskiy Zaliv. The coast is dominated by numerous inlets and fronted by islets, rocks, and shoals all of which extend many miles seaward in places. The coast is very rugged, but appears flat and monotonous. Elevation differences amount to no more than 10 to 20m. Dense forest characterizes the landscape. The E portion of the coast is not as extensively fronted with islets as the W part.

Natural landmarks hardly exist and are difficult to recognize from seaward. The coast and archipelago form poor radar images, but lights shown from many of the skerries along the sides of the approach passages make it possible to navigate safely. It is advisable to stay in the recommended passages and follow the designated Traffic Separation Schemes (TSS) and routes.

An inner passage (inshore route), authorized for drafts up to 5 or 6m, and a Winter Channel (coastal route), authorized for drafts up to 9m, lead through the off-lying dangers. Although both of these routes are well-defined by lighted ranges, local knowledge is advised.

Pilotage.—The IMO recommends that vessels constrained by their draft or vessels not registered in one of the Baltic states, and infrequently sailing the area, embark a deep-sea pilot. See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for information on deep-sea pilotage.

All ordering of local pilots throughout Finland is carried out by the Finnpilot Order Center, Helsinki. For more information, see Pilotage in paragraph 2.12.

Regulations.—The Finnish authorities have instituted a system of restricted areas and semi-restricted areas throughout the whole of Finland's coastal waters. The limits of these areas may best be seen on the chart. Vessels are permitted to transit these areas only through the approved channels and with a pilot aboard.

Vessels are permitted to anchor within a restricted area only at specially designated anchorages for a duration of 48 hours or less.

See Pub. 140, Sailing Directions (Planning Guide) North At-

lantic Ocean and Adjacent Seas for regulations pertaining to vessels within the waters of Finland and Russia. Vessels should also consult the pilot as well as the local authorities for details on local regulations.

Numerous nature reserve areas lie in the waters described within this sector and are affected by many prohibitions and rules. The majority of these areas are situated clear of the recommended routes.

GOFREP, a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches. This system is operated by the VTS centers at Tallinn (VHF channel 61), Helsinki (VHF channel 60), and Saint Petersburg (VHF channel 74).

Vessels not equipped with an Automatic Identification System (AIS) and entering the area from the W are recommended to send a report to the relevant VTS traffic center at least 1 hour in advance.

The W limit of the reporting area is formed by a line joining the following points:

1. Bengtskar Light (59°43'N., 22°30'E.).
2. 59°33.3'N, 22°30.0'E.
3. 59°10.0'N, 21°30.0'E.
4. Ristna (Kopu Poolsar) (58°56'N., 22°03'E.).

For further information concerning GOFREP, see Finland in Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Vessel Traffic Service.—Vessel Traffic Services are in effect in Helsinki (paragraph 2.12), Kotka (paragraph 2.19), Vyborg/Vostok (paragraph 2.27), and Primorsk (paragraph 2.30).

Vessels bound for Vyborg/Vostok and Primorsk also transit the coverage area of St. Petersburg Coastal VTS. (paragraph 3.1).

Directions.—Several IMO-adopted Traffic Separation Schemes (TSS) form the main route through the Gulf of Finland. These include a TSS lying centered 20 miles SW of Russaro Light (59°46'N., 22°57'E.), a TSS lying centered 7.5 miles SSE of Porkkala Light (59°52'N., 24°18'E.), a TSS lying centered 8 miles SSE of Helsinki Light (59°57'N., 24°56'E.), and a TSS lying centered 6 miles SSE of Kalbadagrund Light (59°59'N., 25°36'E.). In addition, a large Precautionary Area lies centered 12 miles SW of Helsinki Light. All of the above schemes and areas may best be seen on the appropriate charts.

For information concerning the Deep Water Route for loaded vessels outbound from Primorsk, see paragraph 2.30.

For information concerning the waters lying SW of the TSS centered 20 miles SW of Russaro Light (59°46'N., 22°57'E.) and the Deep Water Route leading through the E part of the Baltic Sea to the Gulf of Finland, see Sector 4 in Pub. 194, Sailing Directions (Enroute) Baltic Sea (Southern Part).

Caution.—Many sections of the inshore channels lying within the waters described in this sector are subject to speed restrictions.

During the winter, many buoys are removed while others may be damaged or break adrift.

Magnetic anomalies are reported to exist in several places within the Gulf of Finland and may best be seen on the chart.

In the coastal waters within this sector, numerous logs may be found adrift at all times of the year.

Areas dangerous due to mines laid during World War II exist within the Gulf of Finland. There is still a risk of danger in these areas when anchoring or carrying out seabed activities.

Due to various circumstances, including the discovery of obstructions, depths within the channels leading through the offshore dangers along this stretch of coast may change frequently. Therefore, vessels are advised to contact the local authorities in order to ascertain the latest information, including the maximum authorized drafts.

It is reported that a submarine gas pipeline is being constructed between Russia and Germany. This pipeline will extend in a WSW direction through the Gulf of Finland from the vicinity of Bukhta Portovaya (60°31'N., 28°05'E.) and then lead in a SSW direction to pass E of Faro (57°57'N., 19°10'E.).

Hanko to Helsinki

2.2 Hankoniemi (59°49'N., 22°54'E.), the peninsula extending SW from the mainland, is the N entrance point of the Gulf of Finland. It is bare, rocky, and rises to a height of 14m. The S side of this peninsula is fronted by numerous islands, rocks, and islets, between which lie deep passages.

The 40m curve lies up to 12 miles offshore in this vicinity. A rocky bank, with depths of less than 10m, extends up to about 8 miles S from the W extremity of the peninsula.

Russaro (59°46'N., 22°57'E.) is the largest of the islands lying S of Hankoniemi. It is formed of granite, partly covered by trees, and about 15m high. Foul ground fronts the island, except on its E side. Russaro Light is shown from a prominent tower, 21m high, standing at its S end of the island.



Russaro Light

Lilla Tarnskar (59°45'N., 22°58'E.) lies about 1 mile SSE of Russaro Light and is the outermost of the islets lying in the S approach to Hankoniemi. A light is shown from a structure, 3m high, standing on this islet. A racon is situated at the light.

Georgsbank, with a least depth of 10m, lies 3.8 miles S of Lilla Tarnskar Light. It is marked by a buoy and is the outer-

most shoal in this vicinity.

Caution.—Due to the large number of dangers lying S and W of Hankoniemi, only the most prominent and outermost are described. Vessels are advised to keep strictly to the charted routes in the approaches. Navigation outside the recommended approach passages should only be attempted with local knowledge.

2.3 Hanko (Hango)(59°49'N., 22°57'E.) (World Port Index No. 28140) is kept open throughout the winter by the use of icebreakers. It is an important railway terminus and a popular resort during the summer.

Hanko Home Page

<http://www.porthanko.fi>

Ice.—See General Remarks in paragraph 1.1.

Depths—Limitations.—Vessels are urged to contact the local authorities for the latest information on berths and depths at Hanko. The fairways leading to the port require local knowledge.

The main fairway channel, which is authorized for drafts up to 13m, approaches the port from the SE.

An inshore fairway, authorized for drafts up to 9m, leads from the pilot station at Uto (see paragraph 4.3). A route, authorized for drafts up to 7.3m, connects this 9m channel with Hanko Outer Harbour. An outer coastal passage, authorized for drafts up to 8.5m, and an inner coastal passage, authorized for drafts up to 5.5m, also lead from the E to the port.

Outer Harbour is situated close W of Tulliniemi, the SE extremity of the Hankoinemi peninsula. West Harbour is situated 2.5 miles E of Outer Harbour. Fishing Harbour lies close N of the entrance to West Harbour and its approach channel can be used by vessels up to 4.5m draft. East Harbour, consisting of an extensive yacht marina, is situated close E of West Harbour.

Outer Harbour provides 350m of quayage with a depth of 7.2m alongside. A jetty, with two ro-ro ferry berths, extends from the NW side of the harbor.

West Harbour has 1,570m of total quayage, including three ro-ro berths, with depths of 6.6 to 14.2m alongside. Great Mole Quay, 704m long, forms the S side of the harbor and can accommodate vessels up to 6.8m draft. Germany Quay, 150m long, is situated on the E side of the harbor and can accommodate vessels up to 5.8m draft. Notholmes Quay, 425m long, lies on the N side of the harbor and can accommodate vessels with drafts of 7.3 to 7.9m. Deep Quay extends NNE from the W end of Notholms Quay; it is 300m long and has a depth of 14.2m alongside.

Kune Oy Quay (Kuningattarenuori) is situated on the SW side of the coast between East Harbour and West Harbour. It is 135m long and can accommodate vessels up to 6.1m draft. The access channel leading to this quay is authorized for drafts up to 9.1m.

There are facilities for bulk, general cargo, container, ro-ro, and ferry vessels. Vessels up to 250m in length, 50m beam, and 13m draft can be accommodated within West Harbour.

Aspect.—The recommended routes and main channels leading to the port are indicated by lighted ranges and marked by buoys. Dangers lying adjacent to the fairways are marked by



Hanko—West Harbour

lights, beacons, or buoys.

Hanko 1 Lighted Beacon is situated 2.5 miles SE of Lilla Tarnskar Light and marks the outermost danger in the vicinity of the entrance to the main approach passage.

A water tower and a church, both conspicuous, stand in the S part of the town. On a N bearing, the church tower can not be identified due to the broad water tower situated directly behind it. A prominent multi-story white pilot station building stands on Tulliniemi, the SE extremity of the Hankoinemi peninsula.

Pilotage.—Hanko pilot station, situated on Tulliniemi, provides pilots for Koverhar, Tammisaari, and harbors in the Hanke-Turku region.

All ordering of local pilots throughout Finland is carried out by the Finn-pilot Order Center, Helsinki. For more information, see Pilotage in paragraph 2.12.

Pilotage is compulsory. Pilot can be contacted by VHF on channel 16 and boards about 1.5 miles ENE of Russaro or, if required, about 4 miles WSW of Ajax Light.

Contact Information.—The port can be contacted, as follows:

1. VHF: VHF channels 16 and 67
2. E-mail: port@hanko.fi

Anchorage.—It is reported that a designated outer anchorage area, with depths of 20 to 30m, lies centered 5 miles S of Lilla Tarnskar Light and may best be seen on the chart.

Vessels may anchor, in depths of 29 to 31m, mud, within the roadstead lying NW of Gustavsvärn, an island located about 1 mile S of Hanko. Anchorage may also be taken 0.4 mile WSW of the entrance to West Harbour, in a depth of 29m.

Directions.—From the Traffic Separation Scheme (TSS) in the entrance of the Gulf of Finland, vessels should steer NNE for about 13 miles. They should pass ESE of Georgsbank and then approach the outer entrance of the main approach passage.

2.4 Tvarminneo (59°51'N., 23°14'E.), a peninsula, is located about 9 miles E of the port of Hanko. The coast between is quite rocky, indented by numerous inlets, and backed by wooded hills of moderate height. Numerous dangers, with irregular depths between them, extend up to about 6.5 miles seaward of the shore.

Two inshore fairway channels lead between these offshore dangers, about 1.5 miles off the coast. The outer fairway is authorized for drafts up to 9m and the inner fairway is authorized for drafts up to 5m. These channels are marked by lights, ranges, beacons, and buoys, but should not be used without local knowledge. Pilots for either of these channels may be obtained

at Hanko.

Ajax Shoal (59°44'N., 23°13'E.), marked by a lighted beacon, is located on the NW side of the approaches to Tammisaari and is the outermost danger.

Segelskar (59°46'N., 23°23'E.), a rocky islet, lies in the outer approach, E of the main fairway. A conspicuous tower, 13m high, stands on this islet.

Langden (59°47'N., 23°15'E.), a small islet, lies on the NW side of the main fairway. Langden Light is shown from a tower standing on this islet. A racon is situated at the light.



Langden Light

2.5 Pohjanlahti (59°59'N., 23°27'E.), an inlet, extends NNE for about 8 miles from the vicinity of Tammisaari. A railroad swing bridge and a road lift bridge span the inlet at the N end of Tammisaari. The fjord forming the approach to this inlet is encumbered by numerous islands, islets, rocks, and shoals.

A main outer approach passage, about 9 miles in length, leads NNE from the Gulf of Finland to the entrance of this inlet. The fairway passes ESE of Ajax Shoal and Langden. It is authorized for drafts up to 12m as far as Syndalsholm (59°52'N., 23°15'E) and is indicated by lighted ranges. Local knowledge is required.

Lappohja (59°54'N., 23°16'E.), Koverhar (59°55'N., 23°19'E.), and Skogby (59°55'N., 23°19'E.), three small loading places, are situated within the approaches to Tammisaari.

The channel leading from Syndalsholm to Koverhar is authorized for drafts up to 9m. There are two quays at Koverhar. The old quay is 250m long and the new quay is 120m long. Vessels up to 190m in length, 23m beam, and 9m draft can be handled. Two conspicuous chimneys and a tower stand in the vicinity of the harbor.

The channel leading from Syndalsholm to Lappohja is authorized for drafts up to 9.4m. The harbor provides several privately-owned piers.

Skogby provides a jetty, with a depth of 7m alongside, which can handle vessels up to 18,000 dwt and 165m in length.

It is reported that a new quay was under construction, but the harbor remains closed to commercial shipping.

2.6 Tammisaari (59°59'N., 23°26'E.) (World Port Index No. 28170), formerly known as Ekenas, is a small commercial

and fishing port allowing 4.6m fresh water draft at two letties. The main channel leading from Syndalsholm (59°52'N., 23°15'E) is authorized for drafts up to 4.9m. An overhead cable, with a vertical clearance of 35m, spans the fjord about 0.4 mile SW of Odenso (59°56'N., 23°22'E). The harbor has two quays, 49m and 152m long, and a small craft basin. Vessels up to 4.6m draft can be accommodated. An anchorage, with a depth of 5.5m, lies about 3.5 miles SW of the harbor.

Navigatin is generally possible between the end of April and the end of December. A waiting anchorage is established centered in position 59°40.5'N, 23°18.5'E, in depths of 35 to 45m, for vessels approaching Tammisaari and Lappohja.

The Tammisaari Archipelago fronts the mainland and extends up to about 6 miles offshore between the approach to Pohjanlahti and Hoggrund (59°55'N., 24°02'E.), which lies at the W entrance of Porkkalanselka.

The 40m curve lies 5 to 7 miles S of this archipelago; all dangers lie within this curve.

A fairway extends between Tammisaari and Porkkalanselka, leading S of the islands, and is authorized for drafts up to 5m. This fairway is intricate and, although well-marked with navigational aids, should not be attempted without local knowledge.

2.7 Jussaro (59°50'N., 23°34'E.) (World Port Index No. 28180), a rocky island, is covered with pine trees and is swampy in places. Its S extremity is marked by a cairn. A prominent disused light tower, 21m high, stands on the SE side of the island.

Lill Jussaro, a small island, lies close N of Jussaro and a sheltered harbor is formed between them. Range beacons indicate the entrance channel. Small vessels can anchor in the harbor, in a depths of 9m and in 5.8 tp 12m. A jetty is situated at the W end of the harbor. An intricate passage, authorized for drafts up to 5m, leads from seaward to this harbor. Local knowledge is advised.

Sundharu (59°47'N., 23°33'E.), an islet, lies about 2 miles S of Jussaro. Jussaro Light is shown from a square tower, 24m high, standing on this islet.



Jussaro Light

Stengrund lies about 1.7 miles NE of the light. A fishing light is occasionally shown from a structure standing on this rock.

Vasterbadan (59°50'N., 23°47'E.) is a shoal with a depth of 3.7m. An above-water rock with the same name lies about 2.7 miles WNW of this shoal and is marked by a beacon. A rock, awash, lies about 0.8 mile ENE of the beacon.

2.8 Porkkalanselka (60°00'N., 24°10'E.), formerly known as Baro Sound, is an extensive bay encumbered with numerous islets and dangers. The entrance, about 10 miles wide, extends between Hoggrund (59°55'N., 24°02'E.) and the island of Makiluoto (59°55'N., 24°20'E.). The N shore of the bay is indented by many small inlets. The W side is formed by the Tammisaari Archipelago, which extends up to 6 miles S from the coast. The E side is formed by a peninsula extending about 7 miles SSW from the coast and terminating in Porkkalanniemi.

The islets in the bay are mostly bare and rocky. The coast is low and wooded.

The port of Inkoo is situated in the NW part of the bay; Kantvik (Porkkala) lies in the NE part.

Porkkala Kallbadan Reef (59°52'N., 24°18'E.), an extensive rocky shoal area, lies 3.3 miles SSW of Makiluoto. Porkkala Light is shown from a prominent tower on a dwelling, 20m high, standing on the NW side of this reef.



Porkkala Light

Haststen, a rock, lies about 3.7 miles W of the light and is marked by a beacon. A racon is situated at this beacon.

A main passage, authorized for drafts up to 13m, leads NNE from seaward, at the E side of the bay, to the pilot boarding place. It passes NW of Haststen and is indicated by a lighted range which may best be seen on the chart. A racon is situated at the front range light.

Another passage, authorized for drafts up to 7.9m, leads NNE from seaward and passes W of Porkkala Kallbadan Reef. It is indicated by a lighted range situated on islets lying close to Makiluoto.

There is also an inshore route, authorized for drafts up to 5m, for small vessels with local knowledge.

2.9 Inkoo (60°01'N., 23°58'E.) is the collective name given to the berthing areas situated around Fagervik, the north-westernmost inlet of the bay. The town of Inkoo, fronted by a marina, stands about 2.6 miles NE of these berths.

Depths—Limitations.—The main approach channel is au-

thorized for drafts up to 13m. The access fairway leading to the oil terminal is authorized for drafts up to 10m.

The IVO Quay, also known as the Power Plant Quay, has 240m of berthage, with a depth of 13m alongside, and 170m of berthage, with a depth 10m alongside.

Coal Harbour Basin provides two quays, with a depth of 7.8m alongside. Coal Quay is 180m long and Paper Quay is 145m long. The oil terminal consists of a T-shaped jetty.

Vessels up to 80,000 dwt and 13m draft can be accommodated.

Aspect.—The intricate approach fairway is indicated by lighted ranges and marked by beacons. A conspicuous chimney, 152m high, stands at the power station.

Pilotage.—See Pilotage in paragraph 2.12.

2.10 Kantvik (Porkkala) (60°05'N., 24°23'E.) (World Port Index No. 28185), situated at the NE end of the bay, is the site of a sugar refinery.

Depths—Limitations.—The main approach channel is authorized for drafts up to 10m as far as Svino (60°04'N., 24°21'E.). The fairway leading to the berths is then authorized for drafts up to 9.2m.

Outer Quay is 110m long and can handle vessels with drafts up to 9.2m alongside; Inner Quay is 50m long and can handle vessels with drafts up to 5.3m alongside; and South Quay is 60m long and can handle vessels with drafts up to 9.2m alongside. Vessels up to 200m in length and 9.2m draft can be accommodated in the harbor.

Pilotage.—See Pilotage in paragraph 2.12.

Caution.—The main channel is subject to silting and the local authorities should be contacted for the latest information concerning minimum depths.

Several submarine cables and pipelines extend across the fairways in the approaches to the harbor.

2.11 Between the island of Makiluoto, at the E side of Porkkalanselka, and Helsinki, about 24 miles E, the coast is fronted by numerous islets and patches of foul ground. Coastal fairways, used by small craft with local knowledge, lie about 1.5 miles offshore and lead between these dangers.

Espoonlahti (60°05'N., 24°40'E.), an inlet, indents the coast about 8 miles W of Helsinki and trends in a NW direction for almost 6 miles.

A conspicuous television mast stands at an elevation of about 300m at Esbo (60°11'N., 24°39'E.), on the N side of Espoolahti.

Helsinki Light (59°57'N., 24°56'E.), equipped with a racon, is shown from a prominent concrete tower, 25m high with a helicopter platform, standing about 14 miles S of the port area. It is situated at the E end of Helsingin Matala, a shoal area with a least depth of 10.5m.

A shoal patch, with a depth of 4m, lies about 3.7 miles NNW of the light and is marked by a lighted beacon. Another shoal patch, with a depth of 2.7m, lies about 1.4 miles WSW of the lighted beacon.

Isolated depths of less than 20m lie up to about 6 miles W and SW of Helsinki Light.

A shoal patch, with a depth of 9.7m, lies about 4.7 miles SW of Helsinki Light. This shoal is the outermost danger in this vi-



Helsinki Light

cinity and is marked by a buoy.

Graskarsbadan Light (60°02'N., 24°54'E.) is shown from a column standing on the northeasternmost of an extensive group of rocks and shallow shoals lying about 5.4 miles NNW of Helsinki Light.

Helsinki (60°10'N., 24°58'E.)

World Port Index No. 28190

2.12 The port of Helsinki, which is the capital of Finland, is of considerable commercial importance. It consists of several natural harbors lying on either side of a peninsula on which the city stands.

Helsinki Home Page

<http://www.portofhelsinki.fi>

The port can be divided into five separate harbor areas, as follows:

1. West Harbour (Lansistama), consisting of the basins and berths in the W part of the port.
2. South Harbour (Etelasatama), lying on the SW side of Katajanokka, a peninsula, which projects E from the NE part of the city.
3. North Harbour (Sornainen Satama), fronting the NE part of the city and situated at both sides of a peninsula, about 1 mile N of South Harbour.
4. Herttoniemen Satama is situated 1.5 miles E of North Harbour. This area is reported to be closed to commercial shipping and is used only by pleasure craft.
5. Laajasalo, the oil terminal, which is situated about 1.2 miles E of North Harbour.

It is reported that a new harbor, with extensive facilities, has been constructed at Vuosaari (60°13'N., 25°11'E.), a suburb of Helsinki, which is situated about 7 miles NE of Harmaja Rear Range Light (church).

Ice

Icebreakers keep the port open all year round. Government icebreakers assist vessels from the open sea to the harbor when necessary.

Depths—Limitations

There are facilities for general cargo, ro-ro, container, bulk, tanker, passenger, ferry, fishing, and cruise vessels. An extensive marina is situated near the entrance to South Harbour. Tankers up to 200m in length and 9.6m draft can be accommodated at the oil terminals in Laajasalo. The port can accommodate vessels up to 11m draft (see Directions).

There are also several repair and building docks in the port. The largest repair drydock, which is 222m long and 56m wide, has a depth of 9.6m on the sill.

Numerous islands and islets front the city and lie in the approaches to the port areas. They extend up to about 5.5 miles S of the city and may best be seen on the chart.

The main port facilities, with alongside depths, are listed below:

a. West Harbor:

1. Tammasaari Quay—135m long with a depth of 7.5m.
2. Energy Board Fuel Quay—137m long with a depth of 9.8m. It is used for supplying Salmisaari power station.
3. Saukonpaasi Quay (private)—20m long with a depth of 4.5m.
4. Saukko Quay—430m long, with depths of 9.2 to 10.1m, and a ro-ro ramp. It is used by container vessels.
5. Jatkasaari Quay—1,285m long, with depths of 6 to 9.5m, and a ro-ro ramp. It is used by passenger vessels.
6. Sampo Quay—187m long with a depth of 5.5m.
7. Valtameri Quay—210m long with a depth of 11m.
8. Melkki Quay—400m long with depths of 12.1 to 12.2m. It is used by container vessels.
9. Silli Quay—275m long with depths of 4 to 6m.
10. Munkkisaari Quay—618m long with depths of 7.4 to 9m. It is used by cruise ships.
11. Hietalahti Quay—170m long with a depth of 6.5m.

b. South Harbor:

1. Olympia Quay—370m long, with depths of 7.5 to 8.8m, and several ro-ro ramps. It is used by ro-ro ferries.
2. Makasiini Quay—270m long, with depths of 7.2 to 7.5m, and several ro-ro ramps. It is used by ro-ro ferries.
3. Pakkahuone Quay—135m long with a depth of 6m.
4. Lubeck Quay—95m long with a depth of 3.8m.
5. Keisariluoto Quay—80m long with a depth of 3m.
6. Linna Quay—96m long with a depth of 3.5 to 4.5m.
7. Katajanokka Quay—810m long, with depths of 5.5 to 8.9m, and several ro-ro ramps. It is used by ro-ro ferries.
8. Passenger Cruise Terminal—280m long with depth of 10m.

c. North Harbor:

1. Oy partek Ab Quay—100m long with a depth of 6m.

2. Hanasaari Quay—430m long with a depths of 8.9 to 9.6m. It is used by bulk coal vessels.

3. Sompassaari Quay—1,080m long with depths of 7 to 9m. It is used by container and general cargo vessels.

4. Sornainen Quay—399m long, with a depth of 5.5m, and a ro-ro ramp.

5. Fishing Quay—210m long with a depth of 5m.

d. Laajasalo (oil terminal):

1. Shell Pier—32m long with a depth of 10m.

2. Esso Pier—30m long with a depth of 10.6m.

3. Neste Pier—58m long with a depth of 10.2m.

Vuosaari (60°13'N., 25°11'E.), a suburb of Helsinki, is situated about 7 miles NE of Harmaja Rear Range Light (church) and is fronted on its E side by a new harbor. It is reported that the marine facilities will be operational in. Vessels up to 230m in length, 33m beam, and 11m draft will be handled. Entry to the harbor may be made from the Winter Channel (coastal route) or from seaward. For further information, see Directions.

Aspect

Lauttasaarenselka, the W roadstead, lies between West Harbour and Lauttasaari, an island joined to the mainland by a causeway and several bridges.

Kruunuvuorenselka, the E roadstead, lies between North Harbour and Laajasalo oil terminal. It is enclosed by numerous small islands and shoal patches.

Several inlets lie at either side of the peninsula on which the city stands and may best be seen on the chart. These inlets are encumbered by numerous islands which are connected by bridges.

Harmaja lies 4.8 miles NE of Graskarsbadan Light (60°02'N., 24°54'E.). Harmaja Light is shown from a tower, 17m high, standing on the E part of the island. It forms the front light of the outer approach range. The rear range light is shown from Suomenlinna Church, a conspicuous church with a dome, situated on the N part of an island lying 2.5 miles N. Racons are situated at both of these range lights. This range indicates the main approach to the port from seaward. A prominent radio mast, 30m high, stands about 1.4 miles E of the church.

The Lutheran Cathedral, a white building, stands close inland near the head of South Harbor; its green dome is conspicuous from seaward.

The Orthodox Uspenski Cathedral, a brick building, stands near the N side of the head of South Harbor and its green spire is conspicuous.

Lauttasaari water tower (60°10'N., 24°53'E.) stands 7.5 miles N of Graskarsbadan Light and is very conspicuous from seaward.

Pilotage

All ordering of local pilots throughout Finland is carried out by the Finn-pilot Order Center, Helsinki. Pilots may be ordered by Internet Service, e-mail, facsimile, or telephone. Vessels are no longer able to order pilotage by VHF.

Inbound vessels must provide 24-hour and 6-hour advance warning of their ETA at the pilot boarding position. Vessels must then place a binding pilotage order 3 hours prior to arriv-



Helsinki Harbor



Helsinki—Lutheran Cathedral

al. Pilots will contact inbound vessels on VHF when they are less than 1 hour from the boarding position.

Departing vessels must provide 24-hour and 6-hour advance warning through their agent. Vessels must then place a binding pilotage order 2 hours prior to departure.

Vessels shifting berth must provide 6 hours advance notice to the Pilot Order Center with 2 hours confirmation.

During winter months, pilot boarding positions may be subject to alteration according to the prevailing weather conditions.

The Finnpilot Order Center will confirm receipt of the order using the same method as used to make the order. Orders using the form on the Internet Service can also be confirmed by e-mail if requested, providing an address is included. Orders placed by telephone are not confirmed separately after the call.

Finland is divided into three Pilotage Zones, as follows:

1. Southern Pilotage Zone—includes the pilotage areas of Helsinki, Porkkala, Emasalo, and Hanko and can be contacted, as follows:

- a. Telephone: 358-20754-6151
- b. Facsimile: 358-20754-6161
- c. E-mail: pilotorder.south@finnpilot.fi

2. Eastern Pilotage Zone—includes the pilotage areas of Kotka (Orregrund, Haapasaari, and Santio) and the Saimaa Canal (Lake Saimaa). and can be contacted, as follows:

- a. Telephone: 358-20754-6152
- b. Facsimile: 358-20754-6162
- c. E-mail: pilotorder.east@finnpilot.fi

3. Western Pilotage Zone—includes the pilotage areas of the Archipelago (Uto, Isokari, and Mariehamn), Raumi (Pori), Vaasa (Kristiinankaupunki and Kaskinen), Kokkola



Helsinki waterfront in summer



Helsinki—North Harbor



Helsinki—West Harbor



Helsinki—South Harbor

(Pietarsaari and vessels coming and going S from Rahja), and the Bay of Bothnia (Tornio, Oulu, Raahe, and vessels



Helsinki—Lauttasaari water tower

coming and going N from Rahja) and can be contacted, as follows:

- a. Telephone: 358-20754-6153
- b. Facsimile: 358-20754-6163
- c. E-mail: pilotorder.west@finnpilot.fi

To provide preliminary information and to place an order for



Harmaja Light (front range)



Suomenlinna Light (rear range)



Helsinki—Orthodox Cathedral

pilotage, vessels may use the following Internet Service:

Pilot Ordering Home Page

<http://www.pilotorder.fi>

Helsinki also provides pilotage for the Hanko, Emasalo, and Porkkala regions. Pilotage is compulsory for vessels over 60m in length, vessels over 10m beam, or vessels with a summer

load salt water draft exceeding 4.5m.

Pilotage is also compulsory for vessels transporting bulk hazardous cargo and vessels belonging to a foreign government that are not being used in commercial operations.

Pilots board vessels, as follows:

1. For Helsinki, Kalkkiranta, and the rest of the Harmaja region—about 2 miles S or 6 miles SSW of Harmaja Light,.
2. For Inkoo, Kantvik, and the Porkkala region—in an area lying 2.5 miles SW of Sommaro.
3. For Vuosaari—in position 60°04.9'N., 25°09.8'E.
4. For Porvoo, Tolkinen, Kalkkiranta, and the Emasalo region—about 2 miles WNW of Kalbadagrund Light at Emasalo S (60°00'N., 25°32.6'E.) or Emasalo N (60°02.6'N., 25°33.8'E.).
5. For Hanko—about 1.5 miles ENE of Russaro (59°46'N., 22°57'E.) or 4 miles WSW of Ajax Light (59°44'N., 23°13'E.). During bad weather the pilot will board in Hanko roads.

Vessels having a draft of more than 9m, a length of more than 160m, or a registered tonnage exceeding 18,000 tons can be piloted through Kustaanmiekka (60°08.3'N., 24°59.7'E.), the narrow fairway leading between the islands in the E part of the port, only during daylight hours. The master or pilot may also consider it necessary to request the assistance of a strong tug. Vessels having a length of more than 201m or a registered tonnage of more than 25,000 tons cannot be piloted through Kustaanmiekka, even though their draft is less than 9.6m. Such vessels will be instructed to anchor off the port.

Regulations

The Gulf of Finland Reporting System (GOFREP), a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches. This system is operated by the VTS centers at Tallinn (VHF channel 61), Helsinki (VHF channel 60), and Saint Petersburg (VHF channel 74). For further information concerning GOFREP, see Finland in Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Vessel Traffic Service

A Vessel Traffic Service (VTS) operates in the approaches to the coast and can be contacted by e-mail, as follows:

helsinki.vts@fta.fi

The VHF channels cover the main navigation routes in the Helsinki, Emasalo, and Porkkala regions. This VTS system consists of the following three sectors:

1. Helsinki VTS Sector 1—The approaches to the port of Helsinki in the area between Kyto Light House, Helsinki caisson and in the E, the area between Kaunissaari and Kalkkiranta. The sector also include the administrative area of the port of Helsinki. The area is bounded by lines joining the following positions:
 - a. 60°08.7'N, 24°43.5'E.
 - b. 59°55.5'N, 24°43.5'E

- c. 59°58.2'N, 25°20.0'E.
- d. 60°10.3'N, 25°20.0'E
- e. 60°15.5'N, 25°25.0'E.

2. Helsinki VTS Sector 2 (Western)—Fairways in the Inkoo area excluded. The area is bounded by lines joining the following positions:

- a. 59°52.1'N, 23°33.0'E.
- b. 59°42.0'N, 23°33.0'E
- c. 59°55.5'N, 24°43.5'E.
- d. 60°08.7'N, 24°43.5'E

3. Helsinki VTS Sector 2 (Eastern)—Fairways in the Emasalo area, harbor area excluded. The area is bound by lines joining the following positions:

- a. 59°58.2'N, 25°20.0'E.
- b. 60°10.3'N, 25°20.0'E
- c. 60°15.5'N, 25°25.0'E.
- d. 59°59.5'N, 25°44.5'E
- e. 60°12.5'N, 25°41.2'E.

All vessels more than 12m in length should maintain a continuous listening watch on VHF channel 71, 9, or 67 when within the respective sectors of the system.

All vessels more than 20m in length should report on VHF channel 71 (Sector 1), VHF channel 9 (Sector 2), or VHF channel 67 (Sector 3) when initially entering the VTS area. Vessels must state their name, location, planned route, and destination. The VTS Center will confirm receipt of message and will provide instructions.

All vessels must report 15 minutes before arriving at the Strait of Sarkkna (60°09'N., 24°58'E.) or the Strait of Kustaanmiekka (60°08'N., 25°00'E.).

Vessels must report after berthing or anchoring. If necessary, the VTS Center will allocate an anchorage.

The following are the mandatory reporting points for Sector 1:

- 1. Helsinki Light (9.6m depth)—59°56'N, 24°45'E.
- 2. Helsinki Light (channel depth 11m)—59°57'N, 24°57'E.
- 3. Kyto Light.
- 4. Kuiva Havonen Light.

The following are the mandatory reporting points for Sector 2:

- 1. Inkoo 2 Light.
- 2. Kalbadagrund (channel depth 9m)—60°01.6'N, 25°37.8'E.
- 3. Kalbadagrund (channel depth 5.3m)—59°59.1'N, 25°32.3'E.
- 4. Vaarlahti, Emasalo—60°11.7'N, 25°40.0'E.
- 5. Merholm Light.

The following are the mandatory reporting points for Sector 3:

- 1. Hanko—59°39'N, 23°11'E.
- 2. Flackgrund—59°52.1'N, 22°49.7'E.

Vessels proceeding E via Flackgrund should report to Helsinki VTS, on VHF channel 67, 20 minutes before passing Flackgrund (59°52.4'N., 22°50.4'E.).

Vessels proceeding W for the open sea are not required to report when passing Hanko.

Anchorage

A designated outer anchorage area, with depths of 22 to 45m, is centered about 1.4 miles NNW of Helsinki Light (59°57'N., 24°56'E.) and may best be seen on the chart.

Anchorage can be taken, in a depth of 22m, mud and stones, off the W side of Susisaari, about 0.6 mile SW of Harmaja Rear Range Light (Suomenlinna Church). This is a good temporary anchorage but is open to onshore winds.

Kruunuvuorenselka, the E roadstead, affords the best anchorage, in depths of 12 to 16.5m, mud. This anchorage is well-protected from all winds.

Directions

The main approach to the port leads in a N direction from the Traffic Separation Scheme (TSS) in the Gulf of Finland. This route, which is authorized for drafts up to 11m, passes close E of Helsinki Light (59°57'N., 24°56'E.) and is indicated by a lighted range (see Aspect). It then branches NW and N, at a junction about 3.8 miles N of the light, to approach the W and E areas of the port.

From the junction, the main channel, authorized for drafts up to 11m, leads NW and passes close NE of Graskarsbadarne Light (60°02'N., 24°54'E.). It then turns in a N direction and leads into West Harbour (Lansistama).

From the junction, the alternate channel, authorized for drafts up to 9.6m, leads NNE. It passes close E of Harmaja Front Range Light, through narrow passages between the islands, and into the harbors in the E part of the port.

The port may also be approached from W or E by using the Winter Channel. This coastal fairway is authorized for drafts up to 9m. The routes from the E and W lead in a W direction and in a NE direction, respectively, and meet the main alternate channel, authorized for drafts up to 9.6m, about 0.9 mile NNE of Harmaja Front Range Light.

A secondary channel, authorized for drafts up to 9m, also leads NNW from the alternate channel at a position about 1.5 miles S of Harmaja Front Range Light. It extends for 2 miles and joins the Winter Channel (coastal fairway) about 0.7 mile WNW of Harmaja Front Range Light.

Another approach route, authorized for drafts up to 7.5m, leads NE from seaward. It passes about 2.5 miles NW of Helsinki Light and meets the main approach channel 3.5 miles N of the light. This route is used by passenger ferries.

The fairway channels and routes, which may best be seen on the chart, are indicated by lighted ranges and marked by lighted beacons and buoys.

The seaward approach route to Vuosaari leads NE for 3 miles and N for 4 miles to the vicinity of Ytter Tjarhall Light (60°08'N., 25°19'E.), which is equipped with a racon. The inner part of the route, which is authorized for drafts up to 7.5m, passes close SW of the light and continues in a NW direction for about 4.5 miles through the off-lying dangers. It then leads in a NNE direction for about 1.5 miles to the harbor.

It is reported that a new primary seaward approach route to Vuosaari has been established. It has a minimum width of 200m, a dredged depth of 12.5m, and is authorized for drafts up to 11m. The route extends in a NNE direction from a position located about 3.5 miles E of Helsinki Light (59°57'N., 24°56'E.). It passes about 1.2 miles SSE of Lansitoukki (Vastertokan) (60°05.5'N., 25°08.0'E.) and close NNW of Itatoukki (Oster Tokan) (60°06.0'N., 25°11.8'E.), an islet marked with a racon. From close N of this islet the track continues in a N direction for about 5.5 miles through the off-lying dangers. It passes about 0.6 mile W of Estlotan (Estiluoto) (60°07.5'N., 25°13.5'E.), an islet marked by a prominent tower; close W of Kulva Hevonen (Torra Hasten) (60°10.5'N., 25°13.3'E.); and close W of Krokholmen (60°11.6'N., 25°13.9'E.). From close E of the E end of Lilla Baston (60°12.2'N., 25°12.7'E.) the route then extends for about 1 mile in a NW direction to the harbor entrance. Pilots for this route will board vessels about 2 miles SSW of Itatoukki (Oster Tokan). An anchorage area has been established along this route. It lies adjacent to the W side of the fairway, between Kulva Hevonen (Torra Hasten) and Krokholmen.

Caution

Numerous submarine cables and pipelines, which may best be seen on the chart, extend between the many islands in the harbor and the approaches

Due to silting, the authorized drafts in the approach routes may, on occasion, be reduced. Vessels are advised to contact the authorities in advance for the latest information concerning depths in the approach passages.

Helsinki to Kotka

2.13 Loviisa (60°27'N., 26°14'E.), a port, lies about 40 miles ENE of Helsinki. The coast between is hilly, wooded, and fronted by numerous islands, islets, rocks, and shoals. These dangers lie up to 13 miles seaward of the coast and several inshore passages lead between them. Vessels should not attempt to enter the inshore channels without local knowledge.

The 40m curve lies up to 16 miles offshore in this vicinity. Within this curve, the depths are very irregular.

Porvoo and Loviisa are the only ports of any importance along this stretch of coast.

Kalbadagrund (59°59'N., 25°36'E.), an extensive reef, lies about 20 miles E of Helsinki Light and has a least depth of 2m. Kalbadagrund Light is shown from a prominent tower, 25m high with a helicopter platform, standing on the S part of this reef. A racon is situated at the light.

Shoals, with depths of 3.1m and 9.7m, lie about 4 miles E of the light and form the outermost dangers in this vicinity.

Porvoo Light (60°06'N., 25°36'E.) is shown from a prominent tower, 10m high, standing 6.5 miles N of Kalbadagrund Light. A racon is situated at the light.

Soderskar Beacon (60°07'N., 25°25'E.), a disused light tower, stands on an islet about 5.5 miles WNW of Porvoo Light. It is 30m high and prominent.

Tiiskeri (Digskar) (60°10'N., 26°16'E.), the largest islet of a group surrounded by foul ground, lies about 23 miles NE of



Kalbadagrund Light



Porvoo Light



Tiiskeri Light

Kalbadagrund. A light is shown from a tower, with a wind generator, standing on this islet. A racon is situated at the light.

Shoals, with depths of 7.2m to 10m, lie within about 3.5



Soderskar Beacon (disused lighttower)

miles SW of this light and form the outermost dangers in this vicinity.

Skarvgaddarna Light (60°11'N., 26°08'E.) is shown from a tower standing 4.2 miles WNW of Tiiskeri. A racon is situated at this light.

Gasskvattan Beacon (60°11'N., 26°03'E.), standing on an above-water rock, lies 2.3 miles W of Skarvgaddarna Light. A racon is situated at this beacon.

Emsalo (60°15'N., 25°37'E.) and **Vessolandet** (60°17'N., 25°43'E.) are two large islands occupying the greater portion of the indentation of the coast close S of Porvoo. Numerous islands and foul ground lie between the N ends of these islands.

2.14 Porvoo (60°23'N., 25°40'E.) (World Port Index No. 28210), also known as Skoldvik, is situated 27 miles E of Helsinki. The channel leading to this oil port is kept open by ice-breakers, but is affected by ice from about the middle of December until April. For Traffic Service, see details on Helsinki VTS.

Depths—Limitations.—The main approach channel leading to the port is 270m wide and authorized for drafts up to 15.3m.

There are six berths for oil products and one for petrochemicals. There are LPG facilities at Berth No. 1 and Berth No. 5. The berths have depths of 7.3 to 17.6m alongside. Vessels up to 262,200 dwt, 340m in length, and 15.3m draft can be accommodated.

During the ice-free period, all berths are surrounded by oil booms. In winter, vessels are limited to a maximum beam of 21.3m.

Aspect.—Beacons and buoys mark the dangers in the approaches to the port. Porvoo Light along with Larsskar Light, 3.2 miles N, forms a range, which indicates the main approach from seaward. The route leads NNE and passes about 1.8 miles W of Kalbadagrund Light.

Pilotage.—Pilotage is provided by Helsinki (see paragraph 2.12). The pilot boards in Emasalo S (60°00.1'N., 25°32.6'E.) or in Emasalo N (60°02.6'N., 25°33.8'E.), about 2 miles WNW of Kalbadagrund Light.

Regulations.—Vessels should send the following information to the port (Fortum Harbour) 72 hours prior to arrival:

1. Vessel's name and nationality.
2. Master's name.
3. Owner or operator of vessel.
4. Telex, facsimile, and telephone numbers of vessel.
5. Draft fore and aft.
6. Port of departure.
7. Confirmed ETA.
8. Quantity, type, IMO class, and UN number of cargo.
9. Quantity, type, and IMO class of cargo to be loaded.
10. Three previous cargoes.
11. If cargo tanks are inerted and confirmation that oxygen content is below 8 per cent.
12. Thrusters, bow or stern (number and effect).
13. All equipment functioning well.
14. Quality and quantity of contained ballast water or mixtures containing oil or chemicals to be discharged.
15. Quality and quantity of waste to be discharged.
16. Quality and quantity of bunkers to be loaded.
17. Any measures subject to permission.
18. List of equipment relating to navigation, safety, or cargo handling not in working order.
19. If vessel is ready to load or discharge upon arrival.

Vessels should confirm the ETA 24 hours in advance and state the vessel's name and nationality, nrt, draft fore and aft, ETA at pilot boarding position, and date and time of the notice.

Any change to the ETA must be forwarded immediately.

Contact Information.—The port can be contacted by e-mail, as follows:

skoldvik.harbour@nesteoil.com

Anchorage.—Anchorage can be taken, in a depth of 22m, good holding ground, close E of the oil harbor.

A designated anchorage area, with depths of 19 to 30m, lies centered about 3 miles NW of Kalbadagrund Light, W of the main entrance fairway. Generally, anchorage in the outer approaches is not safe except during calm weather.

2.15 Pelling (Suur Pellinki) (60°13'N., 25°50'E.) is the largest island of a group which fronts the mainland and extends E for almost 7 miles. Numerous rocks and shoal patches extend

up to about 13.5 miles S from this island, terminating in the vicinity of Kalbadagrund Light.

Fairways, with draft limitations of 7m and 7.3m, lead E and S of the group. They then branch to lead in a N direction through the E part of the islands and NE of Vatskar (60°18'N., 26°07'E.), where they rejoin and lead ENE to Boiso (60°20'N., 26°30'E.). A fairway, with a least charted depth of 2m, leads through the N part of the islands. These fairways, although well-marked by buoys, beacons, and lighted ranges, should not be used without local knowledge.

Kejvsalo Fjarden (60°22'N., 26°08'E.), entered about 3 miles N of Vatskar, extends about 11 miles NW. This inlet is encumbered by numerous islets and shoals, but a fairway, authorized for drafts up to 6.1m and marked by buoys, leads along the NE part to Pernaja (60°26'N., 26°03'E.), an anchorage loading place for Loviisa, located about 6 miles from the entrance. A fairway, authorized for drafts up to 4.3m, branches W about 2.3 miles SE of Pernaja and leads to a loading place in Isnasvik, 3 miles SW of Pernaja. There is a jetty, with a depth of 4.2m alongside, at Isnasvik.

Hamnskar (60°13'N., 26°18'E.), fronted by foul ground, is a low, bare islet with a monument situated at its W side. A light, used by fishing vessels, is shown from a structure standing on the E side of the islet.

Tainio Light (60°13'N., 26°25'E.) is shown from a tower, 14m high, standing on a shoal at the E side of the fairway leading to Loviisa. A racon is situated at the light.

Skarven Light (60°18'N., 26°21'E.) is shown from a tower standing on the N end of a group of reefs on which lie several islets. A racon is situated at this light.

Orregrund (60°16'N., 26°27'E.) is a low sparsely-wooded island. It is steep-to on the W side, but foul ground extends up to about 0.5 mile SE from the S part of the island. The island of Baksor lies on this foul ground. A light is shown from a flood-lit tower standing on the W side of the island. A prominent tower, 23m high, is situated close NE of the light. A lighted range is shown from the E part of the island; a racon is situated at the front light.

Vastra Baken Light is shown from a structure standing about 0.5 mile W of the W end of Orregrund.

Lalatta Light (60°17'N., 26°33'E.) is shown from an islet surrounded by foul ground. A racon is situated at this light.

Range lights are also shown from Ostergrund, an islet about 1 mile NE of Orregrund.

Stor Taktaren (60°20'N., 26°22'E.), with Yttre Taktaren located close S of it, lies on the SW side of the fairway leading to Loviisa. Foul ground extends up to 1.7 miles SE of these islets and is marked by spar buoys. Patches of foul ground also lie up to 1 mile E and between Stor Taktaren and Stora Rovaren, about 0.5 mile N. Range beacons are situated at various places on these islets.

Caution.—It is reported that overhead lines, with a minimum vertical clearance of 10.8m, extend across the channel leading to Pernaja (60°26'N., 26°03'E.).

2.16 Loviisa (Lovisa) (60°27'N., 26°14'E.) (World Port Index No. 28220), a small port, lies at the head of Loviisanlahti (Lovisaviken) and includes the facilities at Valkom, which is situated on the W shore of the inlet, 2 miles S. The facilities at Loviisa are used mostly by local coasters.

Ice.—The main navigation season lasts from the end of April to the beginning of December. Generally, icebreakers keep the port open all year.

Depths—Limitations.—The main approach channel leading from seaward to the berthing facilities at Valkom is authorized for drafts up to 8.5m. The fairway continuing to Loviisa is authorized for drafts up to 4m.

North Quay is 142m long and has a depth of 8.5m alongside; Middle Quay is 280m long and has a depth of 7.3m alongside; Connection Quay is 115m long and has a depth of 7.3m alongside; and South Pier is 135m long and has a depth of 8.5m alongside. There are facilities for container, ro-ro, tanker, bulk, and general cargo vessels.

The Sawmill Wharf at Loviisa is 60m long, with a depth of 4m alongside. There is also a basin for small craft and yachts.

Pilotage.—Pilotage is compulsory. Pilots may be contacted by VHF and generally board about 1.5 miles SSW of Orregrund. Pilots must be requested through the Finnpilot Order Center, Helsinki (see paragraph 2.12).

Anchorage.—Anchorage can be taken, in a depth of 17m, mud, about 0.5 mile SW of Svartholm (60°23'N., 26°18'E.) and, in a depth of 9m, mud, about 0.5 mile NNE of Valkom.

Directions.—From E of Tiiskeri Light (60°10'N., 26°16'E.), an outer approach route, indicated by a lighted range, leads about 5.5 miles NNE to the vicinity of Orregrund and the pilot boarding place. It passes SE of Hamnskar and NW of Tainio Light. An intricate fairway then leads in a NNW direction to the berths. It is indicated by ranges, sector lights, and beacons.

2.17 The coast between Loviisa and Hamina (60°34'N., 27°12'E.), 29 miles ENE, is densely wooded, as are several of the islands fronting it. The shore is indented by a number of inlets. The ports are Kotka and Hamina are situated along this stretch.

The 40m curve lies about 13 miles offshore to the W of Ostrov Gogland, which was described in paragraph 1.5. The depths are irregular and the dangers in this vicinity extend S to within 2 miles NW of Ostrov Gogland.

Between Munapirtti (60°25'N., 26°30'E.) and Kotko, 8 miles ENE, the islands, islets, and areas of foul ground extend up to 3.5 miles seaward. The outer dangers are marked by buoys, beacons, and lights.

Mustaviiri, an island, lies 1.8 miles SE of Lalatta Light and a conspicuous tower stands near its center. A shoal extends up to about 2.5 miles SSW from the SW part of this island.

Kotkan Majakka Light (60°10'N., 26°39'E.) is shown from a column, with a helicopter platform, standing on a shallow shoal. A racon is situated at the light.

A shoal area, with depths less than 10m, extends up to about 5.5 miles SSE from the light. Banka Margasova, marked by a lighted buoy, lies 1 mile NW of the light.

Haapasaari (60°17'N., 27°12'E.) is one of an extensive group of islands which, lying close to one another, appear as one island when seen from a distance. The larger islands are partly wooded and moderately high, while the smaller are low and bare.

Haapasaari is divided into E and W parts which are connected by a narrow isthmus. A prominent church, with a gray roof, stands on the E part and a radio tower is situated on the SW part. A prominent square tower, with a pointed roof, stands on

the NW side of the island. A light is shown from the NE extremity of the island; another light is shown from Kivikare, a rock lying close NE of the island.

Good anchorage can be obtained off the S side of Haapasaari, in depths of 9 to 11m, clay, but local knowledge is advised. Anchorage can be obtained about 0.4 mile N of the N side of the island, in depths of 22 to 29m, mud. Anchorage may also be taken about 0.4 mile E of the island, in depths of 18 to 20m, sand and stone, but this anchorage is exposed to SW winds.

Veitkara (60°16'N., 27°15'E.), a small island, lies on a shoal at the SE end of the group. A light is shown from its N part. A racon is situated at the light.

2.18 Luppi (60°14'N., 27°02'E.), marked by a light, is the outermost of the islands and shoals which extend up to about 6 miles SW from Haapasaari.

Reippo, a shoal with above and below-water rocks, lies 1.5 miles W of Luppi. Numerous dangers, including rocks awash, extend up to about 6 miles SW from this shoal.

Tuomalamatala, a shoal with a depth of 7.9m, lies about 2.2 miles SSW of Veitkara. It is marked by a buoy and is the outermost danger in the approach to Haapasaari.

Merikari (60°21'N., 27°06'E.), an islet, lies 5 miles NW of Haapasaari and is marked by a light. Shoals, marked by buoys, front this islet on its S and W sides.

Rankki (60°22'N., 26°58'E.), an island, lies near the S end of an extensive shoal area. A light is shown from a tower, 6m high, standing on an islet located close S of the S extremity of the island.

Retonpaasi (60°22'N., 27°01'E.), a rock awash, lies about 1.5 miles E of the S end of Rankki and is marked by a lighted beacon.

Rankin Kivikari (60°21'N., 26°57'E.), a shoal with above-water rocks, lies about 0.8 mile SW of the S end of Rankki and is marked by a light at the N end. A racon is situated at the light.

Lellerinsaaret (60°24'N., 26°58'E.), a group of three islets and foul ground patches, lies about 1.5 miles NNE of Rankki. A light is shown from the easternmost islet of this group.

Hietakari (60°24'N., 27°00'E.) lies about 1 mile E of Lellerinsaaret on an area of foul ground about 0.5 mile off the W side of Kirkkomaansaari. A light is shown from this islet.

Kiviletto (60°18'N., 26°57'E.), a shoal with above-water rocks, lies about 4 miles NW of Luppi Light and is marked by a light.

Ristisaari, an islet, lies 4.2 miles WNW of Kiviletto near the S end of an area of foul ground. This foul area extends up to about 5 miles NNW and Kaunissaari, an island, is located in its N part. A light is shown from the N extremity of Kaunissaari and a beacon stands on a shoal about 0.3 mile S of the S extremity of Ristisaari.

Kotka (60°28'N., 26°58'E.)

World Port Index No. 28230

2.19 Kotka, the second largest port of Finland, is situated at the mouth of the Kymijoki River and in a bay which is protected by numerous islands and islets. The city stands on the island

of Kotka. The area is typically industrial with sawmills, sugarmills, pulp, cellulose, fertilizer, and chemical plants.

Ice.—The main navigation season lasts from the middle of April to the beginning of January, but the harbor is usually kept open all year by icebreakers. The quays are kept ice free by an underwater compressed air system which prevents ice formation.

Tides—Currents.—The water level is affected greatly by the winds. Gales from S to SW increase the water level of the harbor up to 0.9m above normal. Gales from N decrease the level about 0.3m. The currents are inappreciable, but since the Kymijoki, one of the largest rivers flowing into the Gulf of Finland from the numerous inner lakes, empties into the harbor, the set is nearly always S.

Depths—Limitations.—The main route leading from seaward to the harbor is authorized for drafts up to 15.3m.

The port has facilities for ro-ro, bulk, tanker, general cargo, timber, container, and passenger vessels. In addition to the main facilities described below, several private quays and piers are situated within the port.

The City Terminal (Kantasatama) is situated along the NE and NW sides of Kotka. The main quays include Italaituri, 442m long, with depths of 9 to 10m alongside; Valilaituri, 420m long, with depths of 7.7 to 9m alongside; Pohjoislaituri, 200m long, with depths of 6.3 to 6.7m alongside; and Harniemlaituri, 975m long, with depths of 6.4 to 10m alongside.



Kotka—City Terminal

Poland Quay, a bulk terminal, is situated close W of the City Terminal. The quay, also known as Vasikkasaaten, is 360 long and can handle vessels up to 8.5m draft.

Hietanen, situated 1 mile N of the City Terminal, is a ro-ro terminal. The quay is about 1,000m long and provides six berths. Vessels up to 10m draft can be accommodated alongside.

Sunila Quay, a dry bulk terminal, is situated on the W side of the island of Pyotinen, close E of Hietanen. The quay is 400m long and provides three berths. Vessels up to 7.9m draft can be handled alongside.

Mussalo (60°27'N., 26°53'E.) is situated in the SW part of the port and includes terminals for container, dry bulk, and liquid bulk vessels.

The container terminal basin has 1,436m of total quayage and provides eight berths. Vessels up to 10m draft can be handled at six of the berths and vessels up to 12m draft can be handled at the other two.



Kotka—Hietanen (ro-ro terminal)

The dry bulk terminal quay is 600m long and provides four berths. Vessels up to 15.3m draft can be handled.

The liquid bulk (oil tanker) terminal consists of a pier which provides two berths. Tankers up to 13.5m draft can be handled.

Vessels up to 120,000 dwt, 300m in length, and 15.3m draft can be accommodated in the port.

The port has three floating repair drydocks. The largest can handle vessels up to 165m in length, 28m beam, and 7.8m draft.



Kotka—Mussalo (oil terminal)

A prominent tower, with a chimney situated close NW, stands in the E part of Kotka. Another prominent chimney stands about 1 mile NNE of the tower. A conspicuous monument stands on the E part of Varissaari, an islet lying about 1.2 miles S of the tower. A prominent water tower is situated in the W part of the city. Kotka Church stands in the NE part of the city and is conspicuous.



Kotka—Mussalo (container terminal)



Kotka—Mussalo (dry bulk terminal)

Aspect.—The harbor lies at the seaward end of a heavily wooded valley formed by the Kymijoki River. From seaward, the islands and the coast blend together.



Kotka Church

The approach routes and entrance channels are indicated by lighted ranges which may best be seen on the chart. Adjacent dangers are marked by lights, beacons, and buoys.

Pilotage.—Pilotage is compulsory for the following:

1. A vessel or vessel combination with a maximum length of over 60m or a maximum beam of over 10m or whose greatest summer load draft in salt water is over 4.5m. (Does not apply to vessels with an Exemption Certificate granted by the Finnish Marine Administration.)

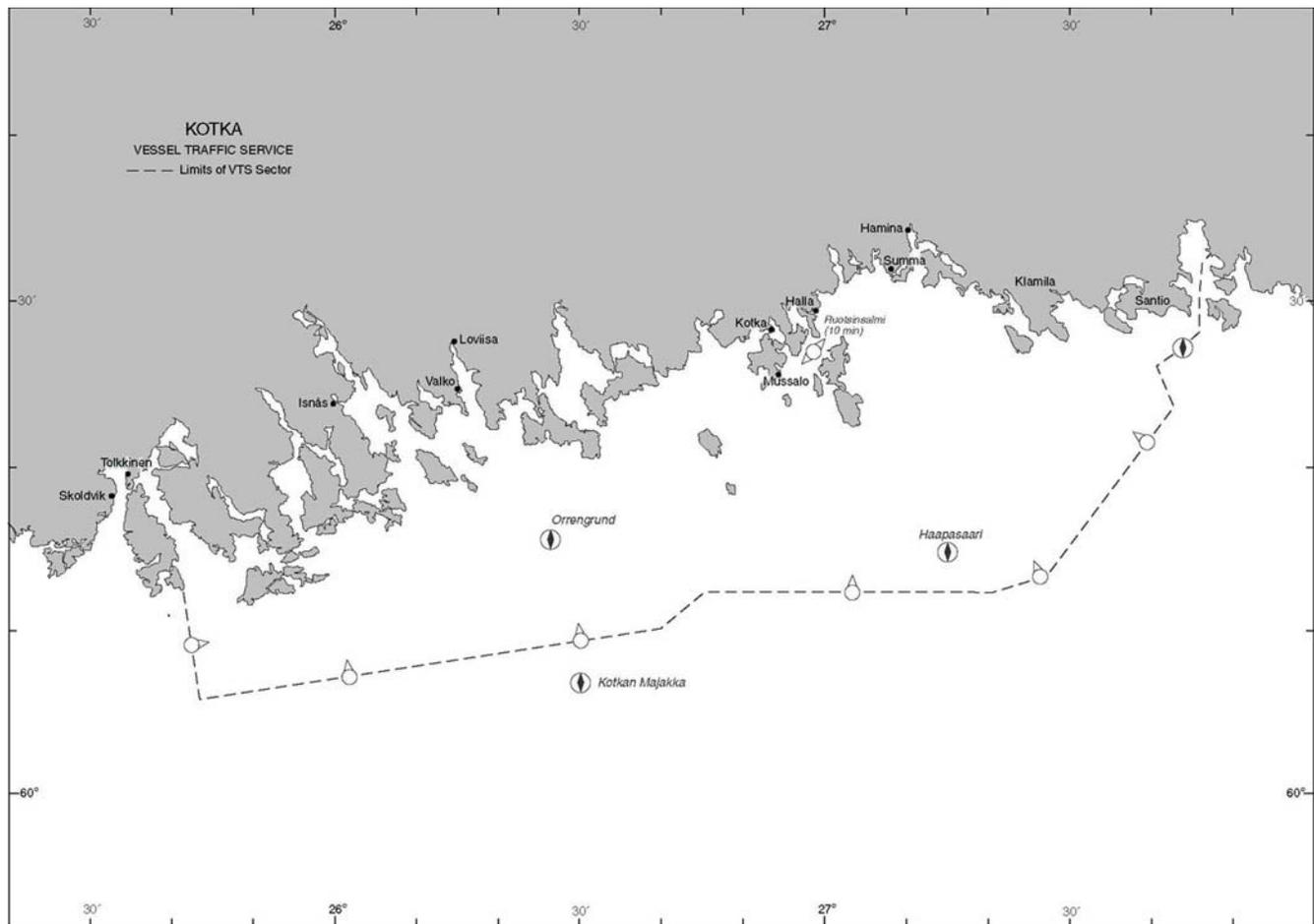
2. A vessel carrying bulk cargo of hazardous substances or substances that can pollute the sea.

3. A vessel belonging to a foreign government, which is not used in commercial operations.

All ordering of local pilots throughout Finland is carried out by the Finnpilot Order Center, Helsinki. For more information, see Pilotage in paragraph 2.12.

Pilots can be contacted on VHF channel 16 or 13 and board, as follows:

1. Vessels with a maximum draft of 10m are advised to use the Orregrund 10m fairway and the Orregrund pilot boarding position (60°15'N., 26°26'E.).



Kotka VTS

2. Vessels with a maximum draft of 15.3m using the Mussala fairway—Kotkan Majakka pilot boarding position (60°07'N., 26°30'E.).

3. Vessels with a maximum draft of 7.3m from or to the E—Haapasaari pilot boarding position (60°15'N., 27°16'E.) (closed during winter).

4. Vessels approaching from the E may embark a pilot at Santio (60°27'N., 27°42'E.).

Regulations.—GOFREP, a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches (see paragraph 2.1).

Vessel Traffic Service.—A local Vessel Traffic Service (VTS) system operates within the approach fairways of the port pilotage area. Kotka VTS can be contacted on VHF channel 67. Radio communications are in English, Finnish, and Swedish.

The Kotka VTS can be contacted by e-mail, as follows:

supervisors.hki@liikennevirasto.fi

All vessels operating in the VTS area shall maintain a continuous VHF watch on channel 67.

All vessels with an loa of 24m and above are required to par-

ticipate in the Kotka VTS.

Vessels must report to Kotka VTS on VHF channel 16, as follows:

1. When entering the VTS area.
2. 10 minutes prior to entering Ruotsinsalmi.
3. On anchoring or berthing.
4. Prior to departure from a port or anchorage.

Reports shall contain the following information:

1. Vessel's name
2. Position.
3. Destination.
4. Intended route. If an alternative route is selected, this must be reported.

Vessels are required to notify Kotka of the following:

1. Any incident or accident affecting the vessel's safety.
2. Any incident endangering the safety of navigation.
3. Any circumstance that may cause pollution of waters of the coast.
4. Any pollutant spills and containers of packages drifting in the sea.

If a vessel anchors or stops for any reason on its way through the VTS area, a report must be made stating the reason. A report must be made when it gets underway again.

The VTS Center may give instructions on the speed of vessels and, when necessary, prohibit overtaking in the area or specify the right-of-way in narrow channels.

The VTS Center can provide positioning assistance on request in the case of equipment malfunction.

The Kotka VTS includes the approaches to the Ports of Kotka, Hamina and Lovisa and the coastal fairway and is bounded by lines joining the following approximate positions:

- 60°12.5'N, 25°41.2'E.
- 60°05.6'N, 25°43.0'E.
- 60°10.3'N, 26°39.0'E.
- 60°12.1'N, 26°45.9'E.
- 60°12.0'N, 27°17.6'E.
- The maritime boundary between Finland and Russia.

Vessels entering the VTS area from Russian territorial waters should make the initial traffic report when crossing a line extending along the seaward limit of the Finnish territorial sea and joining the following points:

- 60°33'N, 27°48'E. (shore).
- 60°12'N, 27°18'E.
- 60°05'N, 26°33'E. (near NE limit of GOFREP area).

Anchorage.—Anchorage can be taken by vessels with local knowledge E of the N end of Kotka Island, in depths of 11 to 16m, clay and mud. Anchorage may also be taken, in depths of 6 to 11m, clay and sand, sheltered from all winds, off the N end of the island.

It is reported that designated outer anchorage areas are centered about 2 miles and 6 miles E of Tiiskeri Light (60°10'N., 26°16'E.).

Directions.—The main route, authorized for drafts up to 15.3m, leads from the SW to the harbor. From SE of Tiiskeri Light the channel leads in a NE direction, passing SE of Tainio Light, NW of Kotkan Majakka Light, and SE of Banka Margasova. Off the SW side of Kiviletto, the channel turns N. It then leads N and NNE into the harbor, passing W of Rankin Kivikari Light.

Another route, authorized for drafts up to 10m, leads from the W into the harbor. This route leads from E of Tiskeri Light and joins the Winter Channel coastal fairway, passing SE of Orregrund and NNW of Lalatta Light. It continues in a NE direction and passes N of Kaunissaari Light. The channel then turns NNE and joins the main route leading into the harbor.

Two alternate fairways, authorized for drafts up to 7.3m, lead from the S and pass through the Haapasaari group. At the N side of the group they meet and form a single channel. This channel then leads NW and NNW into the harbor, passing E and N of Vahakari Light and ENE of Rankin Kivikari Light.

Caution.—An overhead cable, with a vertical clearance of 33m, spans the channel in the N part of the harbor.

Several submarine cables lie in the approaches to the harbor and may best be seen on the chart.

A submarine pipeline, which may best be seen on the chart, leads S and SE from the harbor area to the Haapasaari group.

Hamina (60°34'N., 27°12'E.)

World Port Index No. 28240

2.20 The port of Hamina, formerly known as Frederik-

shamn, lies at the head and along the W side of an inlet that indents the coast about 9 miles NE of Kotka. The shores of the inlet are steep-to for about 1 mile within the entrance. Numerous patches of foul ground and many islets, which may best be seen on the chart, extend across the inlet, providing shelter to the outer part of the harbor. Most of the islets are heavily wooded.

Hamina Home Page

<http://www.portofhamina.fi>

Ice.—The main navigation season lasts from the end of April to the end of December. Generally, the port is kept open all year by icebreakers.



Hamina

Depths—Limitations.—The deepest passage leading to the port is authorized for drafts up to 10m.

The Oil Terminal is situated in the S part of the port. There is an LPG pier, 170m long, which can handle vessels up to 9m draft. There are also three oil berths, the largest of which can accommodate tankers up to 250m in length and 10m draft.

Palokangas Basin, lying close NNE of the Oil Terminal, has six berths, 150 to 234m long, which can accommodate vessels up to 10m draft.

Hiirenkari Quay, close ENE of Palokangas Basin, has five berths, 158 to 210m long, which can accommodate vessels up to 210m in length, with drafts of 7.9 to 8.6m.

Lakulahti Basin, close N of Hiirenkari Quay, has about 800m of total quayage. There are eight berths which can accommodate vessels of 7.9 to 8.6m draft.

Hillo Quay, close NNE of Lakulahti, has 345m of berthage and can accommodate vessels up to 6.9m draft.

The port has extensive facilities for LPG, oil, general cargo, ro-ro, container, bulk, and timber vessels. Vessels up to 72,000 dwt and 10m draft can be accommodated in the harbor.

Aspect.—**Einonkarinmatala** (60°26'N., 27°08'E.) is an isolated shoal marked by a light.

Hamina is a small commercial town with several prominent factories and sawmills. Tank farms situated in the port area are prominent from seaward.

The approach routes and entrance channels are indicated by lighted ranges which may best be seen on the chart. Adjacent

dangers are marked by lights, beacons, and buoys.

Pilotage.—Pilotage is compulsory. Pilots may be obtained from Kotka (see paragraph 2.19).

All ordering of local pilots throughout Finland is carried out by the Finn-pilot Order Center, Helsinki. For more information, see Pilotage in paragraph 2.12.

The agent should advise the port authority of the vessel's ETA no later than on the Friday preceding the week of arrival. An ETA must be given 24 hours in advance for vessels carrying IMO cargo, or by 1600 if on a day before a holiday.

Contact Information.—The port can be contacted, as follows:

1. VHF: VHF channels 12, 13, and 16
2. E-mail: office@portofhamina.fi

Anchorage.—Anchorage can be obtained, in a depth of 14m, mud, outside the entrance of the inlet.

Within the harbor, anchorage may be taken 1.3 miles N of the entrance, in depths of 7 to 10m, and W of the fairway in the inner roadstead.

Directions.—The main and deepest passage leading to the port is the continuation of the Winter Channel (coastal route). This channel, which is authorized for drafts up to 10m, leads in an E direction from Kaunissaari, passing S of Merikari Light. It then turns NNE and passes SE and E of Aarholma (60°25'N., 27°18'E.). About 1.5 miles NE of Aarholma, the channel turns and approaches the harbor from the SE.

The most direct passage from seaward, which is authorized for drafts up to 7.3m, leads from S, passing through the Haapasaari group and approaching the port from the SW. Vessels with drafts up to 8.6m may enter the port by using the route leading in an E direction from Kaunissaari and then joining the S approach channel, about 3.5 miles N of the Haapasaari group.

Caution.—Submarine cables and pipelines, which may best be seen on the chart, extend across the harbor area.

Several mooring buoys are laid in the roads and in the vicinity of the berths.

Hamina to Vyborg

2.21 Between the entrances of the ports of Hamina and Vyborg (60°43'N., 28°45'E.), the coast is rocky, hilly, and predominately wooded. It is indented by several bays, inlets, and fjords. Virolahti (60°33'N., 27°45'E.), the largest of these inlets, is entered midway along this stretch of the coast.

The boundary between Finland and Russia runs through Virolahti.

Between Hamina and Virolahti, the coast is fronted by numerous islets and dangers, but E of Virolahti the off-lying features are not as numerous. There are several loading places and anchorages along this stretch of the coast, but none of commercial importance.

The inshore coastal channel, leading E from S of Kuorsalo (60°28'N., 27°23'E.) is authorized for vessels with drafts up to 7.3m, but is only available to vessels with local knowledge. Pilots for the passage may be obtained from Hamina.

Tammio (60°25'N., 27°25'E.) is the largest of an extensive group of barren islets and rocks. Foul ground surrounds this group and also lies in patches within 1.3 miles N and 1.5 miles NW and W of it. A lighted range is shown from structures

standing on the W part of Tammio and the S end of an islet lying close W of it.

The Vasikkasaari group lies about 1 mile NE of Tammio. A light is shown from Lotouri, a rock, lying midway on an area of foul ground extending NW from the group.

The route, authorized for drafts up to 7.3m, passes close N of this light and between the buoys marking the dangers extending S from Kuorsalo and N from Tammio and the Vasikkasaari group.

Mustamaa, an island, lies 2 miles E of the Vasikkasaari group. It is steep-to on the W side. An above-water rock, marked by a buoy moored close N, lies about 0.2 mile W of the NW extremity of the island. A cairn stands on the NW extremity and a pair of range beacons stands close NE. This range marks the fairway, authorized for drafts up to 4.6m, which leads through the foul ground lying between Mustamaa and Ruissaari, an island located 0.5 mile NNW. A light is shown from the SW extremity of Mustamaa.

The route leading between the off-lying islands to the E of Mustamaa is authorized for drafts up to 7.3m.

A large bay, indenting the coast in a NW direction, lies about 1 mile N of Mustamaa. It is formed by the mainland on the W and N sides and Siikasaari, an island connected to the mainland by an isthmus, on the E side. The bay has general depths of 11 to 18m, but is encumbered by several shoals and rocks. Fairways, authorized for drafts up to 7.3m and drafts up to 5.5m, lead to several loading anchorages situated within the bay. Local knowledge is required and pilots are available from Hamina.

Maringinlahti, a bay, lies on the NE side of the peninsula of Siikasaari (60°29' 27°36'E) and is entered close E of the SE extremity of the island. It has general depths of 4 to 11m. The fairway leading into the bay is authorized for drafts up to 3m. Anchorage can be taken in the N part of the bay, in a depth of 7.3m, stone and sand. Local knowledge is required.

Between the Haapasaari group and Virolahti, the offshore area offers no recognized access to the inshore channel.

Kilpisaari (60°17'N., 27°18'E.), moderately high, is one of the outermost islands in this vicinity and is covered with pine trees. Itakarit and Koivuluotok are islets marked by beacons lying 1 mile E and 3 miles NE, respectively, of Kilpisaari.

Majakartti (60°19'N., 27°35'E.), an islet, lies about 4.2 miles SE of Tammio. It is surrounded by shoals and marked by a beacon, 24m high. Isolated shoal patches and rocks extend up to about 6 miles ESE of this beacon. Banka Pitkyaenen, the outermost danger, is marked by a buoy.

2.22 Ostrov Sommers (60°12'N., 27°39'E.), an islet, lies 6.5 miles SSE of Majakartti and is 15m high. A light is shown from a framework tower, 37m high, standing on the W part of this islet.

Ostrov Malyy Sommers, a rock, lies about 0.8 mile E of the light and is 1m high. A stranded wreck lies on a reef in the vicinity of this rock.

Ostrov Nerva (60°15'N., 27°57'E.), an above-water rock, lies 10 miles ENE of Ostrov Sommers. A light is shown from a framework tower, 37m high, standing on this rock. Banka Narvinmatala, an isolated shoal with a depth of 7m, lies about 3 miles NE of this light.

Parrio (60°28'N., 27°42'E.), an island, lies about 5 miles

ENE of Mustamaa. A beacon stands on the E side of the island and a light is shown from the SW side. Santio lies close E of Parrio. Both these islands are steep-to on their N and W sides, but are fringed by dangers elsewhere. A buoy marks the S extremity a shoal which extends up to about 1 mile SSE from the S side of Santio.

2.23 Ostrov Kopytin (60°26'N., 27°42'E.), an island, lies near the center of an extensive bank of foul ground, 1.5 miles S of Parrio. Islets and rocks extend up to about 1 mile NW and SE from this island. Detached shoal patches, with depths of 4.5 to 7m, lie up to about 0.7 mile farther NW and 1.2 miles SE. Lighted ranges are shown from structures standing on the island and on the islets in this vicinity.

Huovari, an islet, is located about 2 miles S of Ostrov Kopytin. It is marked by a light and lies on the S part of a shoal patch. Isolated shallow rocks lie up to about 1 mile W and 0.6 mile E of this shoal patch. Banka Okhtamatala, with depths of less than 20m, lies about 4 miles E of Huovari and is marked by a lighted buoy.

Ostrov Kozlinyy (60°27'N., 27°47'E.), an island 24m high, lies at the S end of an area of foul ground extending about 3 miles SE from the W entrance point of Virolahti. It forms the SW side of Kavonselka (Reyd Shtandart). A light is shown from the S extremity of the island.

Isolated shoals, marked by buoys, lie up to about 1.5 miles SE and 1.2 miles SW of the light. The W side of the island is fronted by foul ground and rocks.

Khemminginletto (60°27'N., 27°50'E.), a rock, lies 1.5 miles E of the part of Ostrov Kozlinyy and forms the E entrance point of Kavonselka (Reyd Shtandart). A light is shown from a framework tower, 6m high, standing on this rock.

Kavonselka (Reyd Shtandart) (60°28'N., 27°48'E.) is entered between Khemminginletto and Ostrov Kozlinyy. It extends about 2.5 miles NNW and has general depths of 7 to 27m. It was reported that this inlet is closed to navigation.

Caution.—An explosives dumping ground area, the limits of which may best be seen on the chart, lies centered 2.3 miles N of Ostrov Nerva.

2.24 Virolahti (60°32'N., 27°45'E.) may be entered through a narrow channel NE of Santio. This inlet extends about 5.5 miles from its entrance. The SE part of the inlet is formed by three large islands, of which Ostrov Bolshoy Pogranichnyy is the southernmost. There are general depths of 4 to 9m within the inlet, which gradually shoals near its head.

Pitkyapasskiy Reyd (60°29'N., 27°56'E.) is sheltered by Ostrov Bolshoy Pogranichnyy on the W side and by an archipelago of islands on the S side. This inlet affords safe anchorage, in depths of 11 to 13m, mud and sand. A fairway channel, having a least depth of 6.1m, enters the inlet at the E side of the anchorage. Local knowledge is required.

Ostrov Dolgiy Kamen (60°28'N., 27°52'E.), the main island in the archipelago lying S of Pitkyapasskiy Reyd, is 25m high and located 1.2 miles NNE of Khemminginletto Light.

Arhipelag Bol'shoy Fiskar (60°29'N., 27°56'E.), a prominent group of comparatively high islets, lies centered 3.8 miles SE of Khemminginletto Light. The islets have a reddish appearance and are covered with low bushes. A light is shown from a tower, 10m high, standing on Ostrov Kinima, the central

islet. Shoal patches and rocks extend up to about 2 miles N,S, and E, and 1.5 miles W of this light.

Mys Krestovyy (60°31'N., 28°14'E.) is located 12 miles ENE of the entrance to Pitkyapasskiy Reyd. Three small peninsulas project about 1.5 miles SSE from the intervening coast and are located equidistant from each other. Foul ground, shoal patches, and isolated rocks front the shore and extend up to about 4.5 miles seaward in places. The dangers lying adjacent to the recommended routes are marked by lights, buoys, and beacons.

The three bays formed between the three peninsulas and Mys Krestovyy have general depths of 7 to 18m and afford safe anchorage to vessels with local knowledge.

Mys Krestovyy, the W entrance point of Vyborgskiy Zaliv, is low, covered with trees, and surmounted by a conspicuous building. Its sandy extremity is barren and covered with rocks. A shoal bank extends about 1 mile SE from this headland and is marked by a lighted buoy.

A light is shown from a tower, 15m high, standing on a rocky mass about 1.4 miles SE of the headland. Shoal patches and rocks extend up to about 2 miles SE and SSE of the light.

Ostrov Malyy Fiskar, an islet fringed by foul ground, lies about 1.5 miles offshore, 5 miles W of Mys Krestovyy Light. A light is shown from a framework tower, 14m high, standing on this islet.

Banka Posluoto, with a least depth of 1.6m, lies about 1.8 miles ESE of Ostrov Malyy Fiskar and is marked by a buoy. Isolated shallow shoal patches extend up to about 3.8 miles SE of this rocky bank.

Ostrov Rondo (60°27'N., 28°22'E.), an island fronted by foul ground, lies 4 miles SE of Mys Krestovyy Light and is 11m high. A light (front range) is shown from a framework tower, 10m high, standing on the N part of this island.

Banka Ruoninmatala, with a least depth of 5.4m, lies about 2 miles W of Ostrov Rondo and is marked by a lighted buoy.

Skala Khalli (60°24'N., 28°08'E.), a rock fringed by foul ground, lies about 7 miles WSW of Ostrov Rondo. A light is shown from a framework tower, 12m high, standing on this rock.

Banka Ruismatala (60°25'N., 28°13'E.), with a depth of less than 2m, lies about 2 miles E of Skala Khalli Light and is marked by a buoy.

2.25 Vyborgskiy Zaliv (60°30'N., 28°22'E.) is entered E of Mys Krestovyy and extends about 19 miles NE to the port of Vyborg at its head. The shores of the gulf and the islands lying within it are rocky and covered with pine forests. The gulf is subdivided into several parts by inlets, peninsulas, and islands.

Numerous shoal patches and dangers lie within the gulf and the approaches. The principal dangers are marked by lights, buoys, and beacons.

Vyborgskiy (60°32'N., 28°23'E.), a bank with drying rocks, lies 4.4 miles N of Ostrov Rondo and is marked by a lighted buoy, moored at its S extremity. A light is shown from a prominent tower, 10m high, standing in the N part of the bank.

Ostrov Vikhrevoy (60°34'N., 28°26'E.), 23m high, lies about 3 miles NE of Vyborgskiy Light. This island is fronted by shoals. A beacon stands in its NW part and a light is shown from its E part.

Ostrov Mayachnyy (60°34.3'N., 28°25.5'E.) lies close N of



Vyborgskiy Light

the NW side of Ostrov Vikhreyov. Povorotnyy Light is shown from a tower, 13m high, standing on this rocky islet.

Banka Tarantsova lies about 1 mile NW of the light. This isolated shoal has a least depth of 6.8m and is marked by a buoy.



Povorotnyy Light (Ostrov Mayachnyy)

Ostrov Igrivvy (60°36'N., 28°28'E.) is low and covered with thick woods. Foul ground extends up to 0.2 mile SE from Mys Teykarniyemi, the SE extremity of the island, and is marked by a lighted buoy.

2.26 Ostrov Krepysh (60°38'N., 28°32'E.), a comparatively large island, lies on the W side of the Vysotsk harbor area. A light (rear range) is shown from a tower, 16m high, standing on Mys Ostryy, the SW extremity of the island.

Banka Hallikivi (Khallikivi), with a least depth of 2.5m, lies centered about 0.5 mile SW of Mys Ostryy. A light (front range) is shown from a tower, 4m high, standing on the N part of this shoal and a lighted buoy marks the S part.

Banka Yalkamatala extends NW from the W side of Ostrov Vysotskiy, an island forming the S side of the Vysotsk harbor area. The N extremity of this shallow shoal lies about 0.6 mile SSW of Mys Ostryy and is marked by lighted buoys.

A breakwater extends SSE from the SE extremity of Ostrov Krepysh. A lighted buoy is moored off the seaward end of this

breakwater and marks an obstruction formed by the ruins of a light tower. A detached breakwater lies with its N end located about 100m SSE of the obstruction. A light (front range) is shown from a column, 5m high, standing on the N end of this breakwater.

Gavan Vysotsk (60°37'N., 28°34'E.) (World Port Index No. 28310) is situated in the S and central parts of Vyborgskiy Zaliv, an extensive inlet. This harbor area is being developed as an outer loading port for Vyborg to relieve traffic congestion (see paragraph 2.27).

Vyborg (60°43'N., 28°45'E.)

World Port Index No. 28300

2.27 Vyborg, known in Finnish as Viipuri, lies at the head of Vyborgskiy Zaliv, about 19 miles from the entrance. There are two harbor areas in the port. Yuzhnaya, the SW harbor, is the primary commercial area and is situated on the W side of the Krepostnoy Bridge (Castle Bridge). Severnaya, the NE harbor, is situated at the E side of the bridge and is only used by small vessels.

New port facilities have been constructed at Vysotsk, in the S part of Vyborgskiy Zaliv to relieve congestion at Vyborg.

Winds—Weather.—Although the tidal range is small, considerable changes in the water level may be caused by strong winds, variation in atmospheric pressure, and the seasonal increase of water during the ice melt. The greatest change due to weather conditions is 1.6m.



City of Vyborg

Ice.—Generally, ice appears about the middle of November and lasts until April. The port is kept open year round with the assistance of icebreakers.

Tides—Currents.—In the N and S entrances to Gavan Vysotsk, a strong wind-induced current may be encountered occasionally.

Signals indicating a rising or falling water level and the velocity of the current are displayed from masts on either side of the harbor, day and night.

Depths—Limitations.—Vyborgskiy Zaliv is divided into several port areas by projecting points and islands, which the main fairway passes around or between. From seaward to Gavan Vysotsk, the fairway is authorized for a maximum draft of 7.3m. The entrance fairway leading NE and passing S of the SE extremity of Ostrov Krepysh is reported to be swept of a depth of 8m.

Gavan Vysotsk is situated on the E side of a narrow passage leading between Polustrov Vysotskiy, a point extending from the SE side of the bay, and several islands located in the bay's center. This passage also carries the main channel to Vyborg.

Vessels berth head and stern-to to mooring posts, the ship's anchors used as necessary.

Generally, vessels up to 150m in length and 7.5m draft can enter the port area at Vysotsk during daylight. Vessels up to 135m in length and 7m draft can enter at night. It is reported that several quays, with depths of 8m alongside, are in operation. It is reported that vessels with drafts up to 8.5m can enter with special permission.

The S harbor at Vyborg provides 2,020m of quayage. The are 13 berths, with depths of 4.2 to 8m alongside. The N harbor is restricted by a bridge to small vessels with a maximum beam of 7.3m. It provides 2,340m of quayage, with a depth of 3m alongside.

Vessels up to 135m in length and 6.5m draft can enter the port area at Vyborg during daylight. Vessels up to 125m in length with drafts up to 6m or 105m in length with drafts up to 6.2m can enter at night.

Vessels exceeding the above dimensions must receive special permission prior to entering the port areas. It is reported that vessels up to 15,900 dwt and 173m in length have entered the port areas. There are facilities for timber, bulk, general cargo, and passenger vessels.

Aspect.—The approach routes, entrance channels, and inner fairways are indicated by lighted ranges. The dangers lying adjacent to the fairways are marked by lights, beacons, and buoys.

The most prominent feature in the city of Vyborg is the castle standing on the small island which is connected to the NE side of the Krepostnoy Bridge. Its conspicuous tower, 74m high, dominates the surrounding area.



Vyborg Castle and Tower

Pilotage.—Pilotage is compulsory. The pilot station is situated at the NW end of Ostrov Vikhreyov. Vessels should send a request for pilotage and an ETA 24 hours in advance. Pilots may be contacted by VHF on channel 10.

Vessels bound for the Lukoil II Terminal, Vysotsk, board the pilot, as follows:

1. In the vicinity of Khalli Lighted Buoy (60°24.5'N., 28°05.0'E.) at the N end of the TSS.
2. In the vicinity of the Fairway Lighted Buoy (60°26'N., 27°43'E.).

Vessels bound for the ports of Vyborg or Vysotsk board the pilot boards about 0.6 mile W of the N end of Ostrov Mayachnyy (60°34'N., 28°25'E.).

During inclement weather, the pilot boat will lead vessels into more sheltered waters within Bol'shoy Tranzundskiy Reid (60°35.5'N., 28°30.0'E.) before boarding.

Regulations.—Between the inner pilot boarding place and Banka Hallikivi, a speed restriction of 8 knots is in effect; then through the port entrance, a speed restriction of 6 knots is in effect. Within the intricate channel leading to the entrance of Vyborg at the N end of Vyborgskiy Zaliv, overtaking is prohibited and a speed restriction of 6.5 knots is in effect.

Entry into the port areas of Vysotsk and Vyborg may only be carried out with special permission from the authorities when the visibility is less than 1 mile and/or the wind is greater than force 6.

All inbound vessels should send a message to the Port Authority at least 48 hours in advance. In the case of their voyage being less than 48 hours, vessels should send a message not later than 1 hour after leaving their last port of call. The message should include the ETA at the pilot boarding place, last port of call, volume and nature of cargo to be discharged or loaded, details of any dangerous cargo, details of any heavy lifts, name of charterer, length, draft, number of passengers, and details of any services required.

Vessels entering the port areas with maximum allowable drafts are considered to be constrained by their drafts. Such vessels must display one black ball by day and one all-round red light at night above the forward steaming light.

The use of tugs is compulsory for vessels over 100m in length without a bow thruster arriving at Vyborg. Tugs are also compulsory for vessels over 80m in length and 5m draft leaving Vyborg.

Vessel Traffic Service.—Vyborg and Vystok Vessel Traffic Service (VTS) operates in the following area:

1. Fairway No. 4 E of Lighted Buoy No. 3.
2. Vyborgskiy Zaliv Traffic Separation Scheme E of Khalli Lighted Buoy.
3. North of Veprevskiy Light.
4. The water area of Vyborg and Vysotsk, including Lukoil II Terminal

Vessels bound for Vyborg, Vysotsk, or the Saymenskiy Canal, must establish contact with the VTS (call sign: Vyborg Radio 5) on VHF channel 12 or 16 when approaching the S entrance to the Vysotsky Roads and follow instructions.

Vessels bound for Vyborg, Vysotsk, or the Saymenskiy Canal transit the coverage area of St. Petersburg Coastal VTS. For further information on the requirements of St. Petersburg Coastal VTS, see paragraph 3.1.

Contact Information.—The ports of Vyborg and Vysotsk can be contacted by e-mail, as follows:

ivs@vbgport.ru

Anchorage.—Three designated anchorage areas, the limits of which are shown on the chart, lie within Tranzundskiy Reid, the outer roadstead located between Ostrov Igrivvy and the entrance to the port areas. They have general depths of 14 to 18m, mud and sand.

Two designated anchorage areas, the limits of which are shown on the chart, lie between Gavan Vystock and Vyborg. They have depths of 11 to 17m, sand and mud, but require local

knowledge.

An anchorage area, with depths of 11 to 14m, lies adjacent to the N side of the deep-water route (see Directions) and may best be seen on the chart.

Directions.—The main approach from seaward is via the Traffic Separation Scheme (TSS) which leads NE from E of Ostrov Sommers to a position located about 2 miles W of Skala Khalli Light (60°24'N., 28°08'E.). A divided Safety Fairway, which may best be seen on the chart, then leads to the port entrance. This route leads ENE from the N end of the TSS toward Ostrov Rondo. The inbound track is situated on the S side of the fairway and passes S of Banka Ruismatala (see paragraph 2.24). The outbound track is situated on the N side of the fairway and passes N of Banka Ruismatala. From the vicinity of Ostrov Rondo, the route turns NE and N and passes about 0.7 mile W of Vyborgskiy Bank. About 1.5 miles NNW of Vyborgskiy Bank, the route turns NE and leads to the inner pilot boarding place located W of Ostrov Mayachnyy. It then continues ENE, NE, and ENE to join the entrance fairway, passing S of Mys Teykarniyemi and between Banka Hallikivi and Banka Yalkamatala. The entrance fairway leads ENE between the ruins of the light tower, on the N side, and the N end of the detached breakwater, on the S side.

The inshore channel leads 6.4 miles in a NE direction from S of Mys Krestovyy to the inner pilot boarding place in the vicinity of Ostrov Mayachnyy.

A deep-water route also leads into the port. This channel, which is swept to a depth of 10.7m, is marked by buoys. It branches NNE for about 0.7 mile from the NW side of the Safety Fairway at a position located about 1 mile SW of Banka Hallikivi. The channel then leads ENE for about 0.6 mile and SE for 0.3 mile, passing N of Banka Hallikivi and SW of Mys Ostryy. It continues E for about 0.2 mile and joins the main fairway close outside the port entrance.

Caution.—Care should be exercised when within the harbor areas of Gavan Vystock as numerous piles, many in a dilapidated condition, are present.

Several isolated patches, with depths of less than 10m, lie within Tranzundskiy Reid, the outer roadstead, and adjacent to the designated anchorage areas.

Care should be taken when navigating in the vicinity of Vyborgskiy Bank as vessels have frequently wrecked on this shoal area.

A recommended route, which may best be seen on the chart, extends in a N direction from the vicinity of Veprevskiy Light (60°28'N., 28°26'E.) to the inner pilot boarding place located W of Ostrov Mayachnyy. It is reported that navigation along this route is prohibited for foreign vessels.

It is reported that extensive dredging has been carried out in the TSS leading NE from the vicinity of Ostrov Sommers and, in parts, has a minimum depth of 14.5m. This is to enable deep-draft vessels to reach the new facilities at Vystock.

Vyborg to St. Petersburg Guba

2.28 The **Saimaa Canal** (60°43'N., 28°45'E.) connects the Gulf of Finland with lakes and inland waterways extending for over 200 miles N of Lake Saimaa. It was originally opened in 1856 and extensively modified in 1968.

The canal, which is known in Russian as the Saymenskiy

Canal, is open to international shipping. It is reached by a channel, 8 miles long, which is entered from the fairway leading between Gavan Vysotsk and Vyborg.

The canal, which has a total length of 23 miles, passes through both Finnish and Russian territory. It has five locks in the Russian area and three in the Finnish area, rising a total of 75m. Thirteen bridges cross the canal; seven of these are bascule bridges or swing bridges, with the remainder being fixed bridges with a least vertical clearance of 25m.

It was reported that the canal had been swept to a depth of 5.1m. Generally, navigation is limited to vessels with a maximum draft of 4.3m, a length of 82m, a beam of 12.2m, and a masthead height of 24.5m. Larger vessels may be allowed to transit the canal at times but special permission from the canal administration must be received in advance.

The canal has floodlights so that it can accommodate traffic at night as well as in limited visibility. Transit of the canal takes between 6 and 8 hours, depending on traffic. Speed is limited to 6 knots in the canal and 8 knots in the lakes. With the use of icebreakers, the season usually starts in early April and extends into January.

Pilotage is compulsory. Transit of the canal as far as Brunitchnoe (60°48.6'N., 28°44.4'E.) is taken by Russian pilots. Finnish pilots then take vessels to Malkia Lock, at the N end of the canal. The canal is managed by the Regional Waterways Division, Itainen Kanavatie 2, 53420 Lappeenranta, Finland, which is part of the Finnish National Board of Navigation.

The following is a list of important ports in Saimaa Lakes district:

1. Imatra (61°10'N., 28°50'E.).
2. Joensuu (62°35'N., 29°45'E.).
3. Joutseno (61°08'N., 28°29'E.).
4. Kuopio (62°51'N., 27°30'E.).
5. Lappeenranta (61°04'N., 28°15'E.).
6. Puhos (62°06'N., 28°45'E.).
7. Varkaus (62°20'N., 27°50'E.).

The area is covered by the Finnish publication "Atlas of Saimaa Canal" and a large scale Finnish Chart. Vessels may be allowed to transit the canal, subject to permission of the Authority.

2.29 Between the main entrance to Vyborgskiy Zaliv and Mys Stirsudden, about 29 miles SE, the coast is indented by several bays. The shore is fronted by irregular depths and numerous detached dangers.

Proliv Byerkezund (Koiviston Salmi) (60°28'N., 28°30'E.), a sound, connects Vyborgskiy Zaliv with the E part of the Gulf of Finland and provides a direct route between Vyborg and St. Petersburg.

The mainland coast on the NE side of the sound rises gradually to a chain of hills, 55 to 85m high. Numerous houses and villages are situated on the slopes of these hills. The three Berzovyy islands, which are comparatively high and wooded, form the SW side of this sound. A remarkable hill rises to a height of 115m on Ostrov Zapadnyy Berzovyy, the outermost island.

The sound has general depths of 14 to 33m. The fairway channel leading through the dangers in the sound is well-marked and available for vessels with drafts up to 9.1m.

Sheltered anchorage can be found within the sound, but S

winds cause a heavy swell in its S part and local knowledge is required.

Caution.—It is reported that passage through the N part of Proliv Byerkezund is restricted to local fishing vessels and Russian naval vessels.

2.30 Primorsk (60°22'N., 28°38'E.) (World Port Index No. 28360), a small port and oil terminal, is situated along the shores of an enclosed bay at the E side of Proliv Byerkezund.

Ice.—In severe conditions, icebreaker assistance is provided. Generally, the ice season lasts from the beginning of December to the end of April. The maximum ice coverage occurs in March.

The Captain of the Port of St. Petersburg directs all icebreaker operations. Vessels requiring assistance should send a request via their agent 24 hours in advance.

During the period of ice navigation, vessels proceeding to the port are advised to send their ETA at the designated convoy position to the Port Captain at Primorsk 48 hours, 24 hours, and 12 hours in advance. On approaching the convoy position, vessels should establish VHF contact with the nearest icebreaker and follow instructions. Vessels should advise Primorsk VTS (SUDS) the times of commencement and completion of icebreaker pilotage.



Primorsk Oil Terminal (under construction)

Depths—Limitations.—The harbor is protected by breakwaters and has depths of 5.5 to 9m, decreasing gradually toward the shore. There are two piers with depths of 8.5 and 9.4m alongside their heads.

The oil terminal consists of a T-shaped jetty, which extends about 0.2 mile SW from the shore, and several mooring buoys. The head of the jetty has depths of 17.7 to 18m alongside. The root of the jetty has a depth of 7.4m alongside. Tankers up to about 150,000 dwt, 307m in length, 50m beam, and 15m loaded draft can be handled.

Aspect.—A church with a prominent spire stands on the N side of the harbor entrance.

It is reported that the Safety Fairway is marked by lighted buoys and is indicated by a lighted range.

Pilotage.—Waiting Area No. 6, which may best be seen on the chart, is situated 3 miles W of Ostrov Rodsher (59°58'N., 26°41'E.). Pilotage is compulsory for vessels of 50,000 dwt and over between this waiting area, or the entrance of the TSS located about 9 miles E of Ostrov Rodsher, and the port.

Waiting Area No. 7, which may best be seen on the chart, is situated about 11 miles NE of Ostrov Seskar (60°02'N., 28°23'E.), on the NW side of the Safety Fairway. Pilotage is compulsory for vessels of less than 50,000 dwt between this

waiting area, or the beginning of the second reach of the Safety Fairway, and the port.

Tug service is compulsory between Waiting Area No. 7 and the port for vessels in ballast, and between Ostrov Seskar and the port for loaded vessels.

Pilots can be contacted on VHF channels 9 and 67 and board, as follows:

1. Vessels of 50,000 dwt and over—in position 59°59.8'N, 26°40.0'E (about 3 miles S of the S extremity of Ostrov Gogland).
2. Vessels of less than 50,000 dwt—close SSE of Waiting Area No. 7 (60°10'N., 28°37'E.).
3. In position 60°08.0'N, 28°10.0'E (between No. 5 Lighted Buoy and No. 6 Lighted Buoy).
4. Vessels proceeding SE through Proliv Byerkezund—in position 60°22.0'N, 28°34.5'E.
5. Vessels proceeding NW through Proliv Byerkezund—in position 60°14.7'N, 28°50.8'E.

Vessels should send an ETA at Waiting Area No. 7, via the agent, to the Port Captain 48 hours and 24 hours in advance. This ETA should be confirmed by VHF 4 hours prior to arrival.

Vessels should send a request for pilotage to the Port Captain 24 hours before arriving at the appropriate boarding position. This request should be confirmed by VHF 2 hours in advance.

Any changes should be sent via the agent not less than 1 hour 30 minutes in advance.

Vessels transiting the port area should contact the Port Captain by VHF 2 hours prior to arriving at the appropriate boarding position in Proliv Byerkezund.

Departing vessels should request pilotage in writing or by telephone not less than 2 hours before sailing.

Regulations.—Tankers bound for the port in winter are required to be double-hulled.

In addition to regular navigation equipment, tankers are required to be fitted with an Electronic Chart Display and Information System (ECDIS) and a Satellite System (GPS/GLONASS). If these systems are not available, they may be provided by the pilot service.

Vessel Traffic Service.—Primorsk Vessel Traffic Service (VTS) operates in the port area and includes Proliv Byorkyozund S of 60°25'N, including Fairway No. 5 south to its intersection with Fairway No. 5A southwest to the intersection with the Ostrov Seskar TSS (the line between Lighted Buoy No. 1 and Lighted Buoy No. 2 of Primorskiy Fairway); the inner roadstead, including anchorage Area No. 6 and anchorage Area No. 6A; and the turning circle for swinging large tankers.

Vessels must contact the Traffic Control Center of the Primorsk VTS (call sign: Primorsk Traffic) on VHF channel 68 (reserve channel—VHF channel 13) 1 hour before entering the VTS area.

Vessels must, on request, advise the Traffic Control Center of their bearing and distance from Seskar Light (60°02'N., 28°22'E.).

Vessels should maintain a continuous listening watch on VHF channel 68.

Vessels proceeding to Proliv Byerkezund should establish VHF contact with Primorsk VTS when 30 miles from the port to request permission to enter the area.

Vessels bound for Primorsk transit the coverage area of St.

Petersburg Coastal VTS. For further information on the requirements of St. Petersburg Coastal VTS, see paragraph 3.1.

Directions.—The main approach from seaward is via the Traffic Separation Scheme (TSS), which leads N of Ostrov Rodsher (59°58'N., 26°41'E.) and S of Ostrov Gogland (60°03'N., 26°59'E.). This scheme continues in a NE direction to the junction centered about 4 miles ESE of Ostrov Sommers (60°12'N., 27°39'E.) and then ESE and SE to a position N of Ostrov Seskar (60°02'N., 28°23'E.).



Stirsudden Light

A Deep-Water Route has been established between the S end of Ostrov Gogland and a position about 7 miles NW of Ostrov Rodsher. This route, which has a least depth of 15m, passes N of the TSS traffic lanes and is for the use of outbound loaded vessels from Primorsk. It is 1,000m wide and may best be seen on the chart.

A Precautionary Area has been established about 3 miles N of Ostrov Seskar. The TSS traffic lanes and a Safety Fairway,

which leads to St. Petersburg, extend E from the E side of this area and may best be seen on the chart (see paragraph 3.1).

Primorsk Safety Fairway, which extends about 14 miles in a NE direction and then about 4 miles in a NW direction, leads from the NE side of the Precautionary Area to the oil terminal.

2.31 Ostrov Syarkkyaluoto (60°18'N., 28°48'E.), an islet, lies near the outer end of an area of foul ground on the SE side of Proliv Byerkezund. A light is shown from a framework tower, 12m high, standing on this islet.

Mys Kyurenniyemi (60°16'N., 28°55'E.) is located 4 miles SE of Ostrov Syarkkyaluoto. A light is shown from a framework tower, 12m high, standing on this headland. Shoals extend up to about 2 miles S and SW of this light.

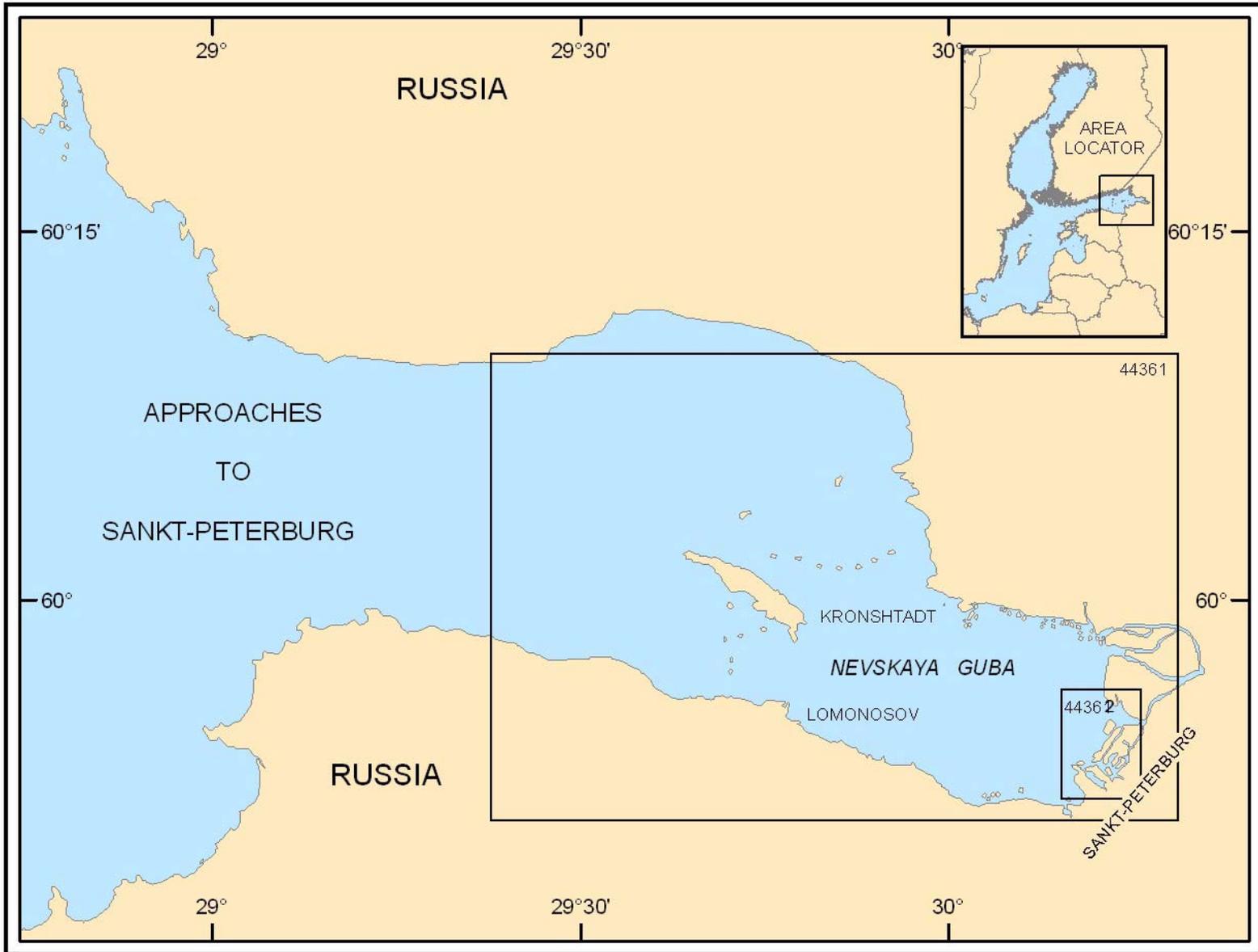
The 20m curve lies between less than 1 mile and about 2 miles off the W sides of the Berezovyy islands, but numerous detached shoal patches, with depths less than 10m, lie within about 8 miles W and SW of these islands.

Banka Shrednyaya (60°11'N., 28°20'E.), with a least depth of 6.4m, lies about 17.5 miles WSW of Mys Kyurenniyemi and is marked by a lighted buoy. Banka Agamemnon, with a least depth of 8.2m, lies about 6 miles E of this isolated shoal bank and is marked by a buoy.

Mys Stirsudden (60°11'N., 29°01'E.), the N entrance point of St. Petersburg Guba, is a low and rocky headland located 6 miles SE of Mys Kyurenniyemi. Gora Torkalla, a prominent hill, is 100m high and rises 5.8 miles NNE of this headland.

Stirsudden Light is shown from a prominent tower, 28m high, standing 0.6 mile ENE of the headland. Shoals front the shore in the vicinity of this headland and Banka Diomid, with depths of less than 10m, extends up to about 4.5 miles S of it.

The waters lying E of Mys Stirsudden are described in Sector 3.



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

SECTOR 3 — CHART INFORMATION

SECTOR 3

RUSSIA—ST. PETERSBURG GUBA AND NEVSKAYA GUBA

Plan.—This sector describes the S and N coasts of St. Petersburg Guba and the approach from seaward to Kronshtadt that forms part of the main shipping channel to St. Petersburg. In addition, Kronshtadt, the S and N coasts of Nevskaya Guba, and the port of St. Petersburg are also detailed. The descriptive sequence is from W to E.

General Remarks

3.1 Tides—Currents.—At Kronshtadt, regular observations of the effects of wind on the water level have been made over a period of decades. These observations indicate that there are periodic changes in the water level due mainly to the flow of river water into the Baltic Sea and then into the North Sea, and due partly to meteorological conditions. The periodic changes are relatively small and follow a definite routine, showing two maximum and two minimum effects in each year. The former changes occur in August, December, and January and the latter in April, May, and October. The extreme difference in level between the maximum rise and the minimum fall of these seasonal changes may reach 0.9m.

The effect of the tide is small; the range at Kronshtadt due to this cause is not more than about 0.1m. The changes due to meteorological conditions are more pronounced at times, especially in the mouth of the Neva, where they cause heavy floods and serious damage.

At Kronshtadt, the water has been known to rise about 1.4m in 6 hours due to the meteorological changes. These conditions are more noticeable in their effect during the autumn and winter than during spring and summer. In general, E winds lower the water level and the W winds raise it. The force of the wind is of greater consequence than its direction.

The water level begins to rise somewhat earlier than the freshening or shifting of the wind, and it attains its maximum height before the wind reaches its greatest force. Any appreciable rise of the water level is a certain indication of W winds. When certain conditions of wind and barometric pressure occur at the same time, the rise of the water level may be considerable.

At Kronshtadt, an increase of more than 3m above normal has been recorded, and at St. Petersburg, a rise of more than 3.5m above normal has been recorded. These extreme rises, which cause floods, are not frequent in October and November; the maximum rise at St. Petersburg during the months of February, March, April, and June has not exceeded 1.8m. The maximum difference between the high and low level at Kronshtadt in the last 100 years is 4.6m.

With winds from NNE through N to SSE, the water rises at Kronshtadt and falls with those from other directions.

The current in Nevskaya Guba sets W in mid-channel between Ostrov Kotlis and Mys Lisiy Nos at a velocity of about 0.25 knot, but in the S area of the estuary it is weaker. During light E winds, there is a W set with a velocity of about 0.5 knot and with strong winds from that direction, the set attains a ve-

locity, at times, of about 1.5 knots. No current is perceptible along the shores of the estuary.

Depths—Limitations.—The Safety Fairway, which extends between the TSS traffic lanes located off Ostrov Seskar (60°02'N., 28°23'E.) and St. Petersburg Lighted Buoy (60°02'N., 29°26'E.), has general depths of 20 to 31m; however, several shoal patches, wrecks, and obstructions exist within and adjacent to the fairway. All these dangers may best be seen on the chart. This fairway also passes through a former Mine Danger Area, as well as the Kronshtadt Fortified Zone.

Vessels up to 260m in length, 40m beam, and 11m fresh water draft are able to proceed to St. Petersburg.

Vessels exceeding 170m in length or with drafts of 8.5m and over are considered to be constrained by their draft. Such vessels must display the appropriate signals. Vessels displaying these signals are given the right-of-way. Vessels constrained by draft must employ tugs in the narrows between Lesnoy Mol (59°53'N., 30°12'E.) and Bolshaya Neva (59°55'N., 30°15'E.).

Pilotage.—Pilotage is compulsory for all vessel and is available 24 hours.

Requests for pilotage must be sent 24 hours in advance and confirmed 1 hour before the approach to the boundary of the appropriate port VTS or pilot boarding position.

Vessels intending to arrive at or depart from the freight operations areas of Gorskaya, Litke (Ostrov Kotlin), and the Port of Lomonovskaya Gavan must request pilotage at least 3 hours in advance.

Vessels intending to arrive or depart the Port of Saint Petersburg must request pilots at least 2 hours in advance.

Pilots board in the vicinity of St. Petersburg Lighted Buoy (60°01.6'N., 29°25.9'E.). In bad weather, vessels may be required to follow the pilot vessel to a sheltered area for boarding.

The pilots can be contacted (call sign: Saint Petersburg Pilot) on VHF channel 9, 16, or 70.

The Pilot Service Controller as be contacted, as follows:

1. Call sign: Petersburg Radio 21
2. VHF: VHF channel 9 or 67
3. Telephone: 78-812-7149595
78-812-3807064
4. E-mail: govva@mail.pasp.ru

Regulations.—GOFREP, a mandatory ship reporting system under SOLAS, has been established in the Gulf of Finland and its approaches. This system is operated by the VTS centers at Tallinn (VHF channel 61), Helsinki (VHF channel 60), and Saint Petersburg (VHF channel 74). For further information concerning GOFREP, see Finland in Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Vessels bound for ports in Russia should send an ETA to the agents 12 days, 96 hours, and 12 hours in advance. All oil, gas, and chemical tankers should send an ETA 14 days, 72 hours, and 12 hours in advance.

In Kronshtadtskiy Korabelnyy Farvater and St. Petersburg

Morskoy Kanal W of the sea walls, speed is restricted to 10 knots. Within the moles and in the harbor area, speed must not exceed 6 knots; the speed limit is 3 knots when passing vessels secured alongside and engaged in diving operations, etc. If steerageway can not be maintained at these speeds, tugs must be employed.

Overtaking in the main fairway is permitted only along the port side of the vessels being passed. Elsewhere in the port, overtaking is permitted on either side.

Vessels carrying explosives, inflammables, or poisonous materials are to await instructions at the St. Petersburg Lighted Buoy.

Vessels are urged to contact the local authorities and the pilot for information on local navigation regulations. The use of the vessel's bridge equipment may be restricted.

See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for regulations pertaining to vessels in Russian waters.

Vessels must send their ETA at Saint Petersburg Lighted Bouy or in ice conditions (at the beginning edge of the ice) 48 hours, 24 hours, and 4 hours in advance through their agent.

With a visibility of less than 2 miles, vessels navigating between Uuzhnaya Damba (the NE entrance breakwater of St. Petersburg) and St. Petersburg Lighted Buoy are required to maintain a listening watch on VHF channel 12.

Anchored vessels or vessels berthed alongside are requested not to use VHF channel 6, 8, 9, 11, 12, 13, 14, or 26 for intership communications.

Vessel Traffic Service.—The Saint Petersburg Coastal Vessel Traffic Service (VTS) is in effect for the fairways and harbors in the E part of the Gulf of Finland from the E boundry of the Gulf of Finland Ship Reporting System (GOFREP) withing the Russian territorial limits, excluding the areas covered by individual port VTS centers. In addition to inbound and outbound vessels, the VTS controls traffic (Saint Petersburg Port VTS) from Lighted Bouy No. 14 (60°01.7'N., 28°20.1'E.) to Zolotyie Vorota. Within the port of Saint Petersburg the VTS center controls the traffic from Zolotyie Vorota to the Leytenanta Shmidta Bridge.

Participation in the Vessel Traffic Services (Saint Petersburg Coastal VTS, Saint Petersburg Port VTS, Primorsk Port VTS, Vyborg and VystokVTS, and Ust Luga Port VTS) is amdatory for the following vessels:

1. All vessels of 300 gross tons and over.
2. Vessels of less than 300 gross tons, as follows:
 - a. If there is a loss of control or if it is necessary to anchor in a TSS, a fairway of a channel.
 - b. When restricted in maneuverability.
 - c. When the vessel's navigational equipment is malfunctioning.

The two types of required reports are known as a Full Report and a Short Report.

Vessels must submit a Full Report, as follows:

1. On departure from the GOFREP area and heading in to the Saint Petersburg Coastal VTS.—Sent to Saint Petersburg Coastal VTS on VHF channel 74 or via AIS.
2. On departure from a Russian port towards the W and navigating the GOFREP.—Sent to Saint Petersburg Coastal VTS by facsimile (7-8-812-3807020) or e-mail ([gof-](mailto:gof-rep@rsbm.ru)

rep@rsbm.ru).

Contents of Full Report	
ID	Information Required
A	Vessel name, type of vessel, IMO number, country of ownership, and flag.
F	Speed in knots, including maximum and minimum speed.
G	Port of departure.
H	Time and place of entry into VTS.
I	Destination port and ETA.
K	Date, time, and place of departure from VTS or the arrival at destination port.
O	Actual draft (forward and aft).
P	Type and amount of cargo.
Q	Condition of radars and any restrictions in the control of vessel.
U	Net registered tons and vessel dimensions.
X	Engine power, ice strengthening class, or other information.

Vessels must submit a Short Report, as follows:

1. When navigating the area covered by the Saint Petersburg Coastal VTS along the shipping routes within the Bol'shoy Korabel'nyy Fairway.—Sent to Saint Petersburg Coastal VTS on VHF channel 74.
2. Before crossing from the VTS area covered by Saint Petersburg Coastal VTS to the area covered by a port VTS—Sent to the port's VTS on the appropriate VHF channel.
3. Before crossing from Saint Petersburg Coastal VTS area to the GOFREP area.—Send to Saint Petersburg Coastal VTS on VHF channel 74 and to Helsinki Traffic on VHF channel 60.
4. Before crossing in either direction from Saint Petersburg Coastal VTS to Kotka VTS (Finland) along Kotka Fairway No 4 and vice-versa.—Send to Saint Petersburg Coastal VTS on VHF channel 74 and Kotka Traffic on VHF channel 67.
5. Upon arrival at the port of destination.—Send to the relevant port VTS on the appropriate VHF channel..
6. When crossing into Russian Territorial Waters at an unspecified point.—Send to the nearest port VTS on VHF.

Contents of Short Report	
ID	Information Required
A	Vessel name, type of vessel, IMO number, country of ownership, and flag.
C	Position of vessel (latitude/longitude).
D	Position of vessel (bearing and distance from landmark).
E	Course

Contents of Short Report	
ID	Information Required
F	Speed in knots, including maximum and minimum speed.
X	Engine power, ice strengthening class, or other information.

On arrival at the port of destination, items A and X need to be reported, along with anchor details and coordinates.

Vessels proceeding to Russian ports must provide the following additional information 1 hour prior to arrival in the area covered by the port VTS:

1. Vessels bound for Saint Petersburg.—Advise the pilot

vessel of the time of approach at Sanki Peterburgskiy Lighted Bouy (60°01.6'N., 29°25.9'E.).

2. Vessels bound for the Port of Vyborg/Vysotsk, Primorsk or Wst-Luga.—Stop and establish radio contact with the appropriate VTS center.

3. When crossing into areas covered by a port VTS.—vessels must comply with the requests for the port VTS and the local navigation rules for that port.

Vessels in transit from Reka Neva to the port of Saint Petersburg, or in transit to the W, must send a report to Saint Petersburg Port VTS on VHF channel 9, 1 hour before approaching the Leytenanta Shimidta Bridge or the Tuchkov Bridge.

In addition to the above, any incidents of pollution or sightings of marine environmental pollution should also be reported.

Inbound Reporting Points		
Reporting Point	VTS	VHF channel
Departing GOFREP area/entering the Saint Petersburg Coastal VTS area	Saint Petersburg Traffic (Full Report required)	74
Entering Russian territorial waters from the Kotka VTS area	Tallin Traffic (Full Report required)	61
Passing Lighted Bouy No. 1 (59°58.5'N., 27°03'E.)	Saint Petersburg Traffic (Short Report required)	74
Passing Lighted Bouy No. 4 (60°11.6'N., 27°46.2'E.)		
Vessels bound for Vyborg and Vysotsk		
On entering the VTS port area and on arrival	Vysotsk Traffic (Short Report required)	69
Vessels bound for Vyborg		
Between the breakwaters at Vysotsk (60°36.6'N., 28°33.0'E.) and on arrival	Vyborg Radio 5	12
Vessels bound for Ust'Luga		
Upon entering the VTS port area and on arrival	Ust'Luga Traffic (Short Report Required)	69
Vessels bound for Primorsk		
When entering the VTS port area and upon arrival	Primorsk Traffic (Short Report Required)	68
Vessels bound for Saint Petersburg		
Upon passing Buoy No. 8 (60°02.8'N., 28°31.9'E.)	Saint Petersburg Traffic (Short Report Required)	74
One (1) hour before entering the VTS port area	Petersburg Lotsman/Saint Petersburg Pilot to confirm pilot request (Short Report Request)	9
Passing Lighted Bouy No. 14 (60°01.7'N., 29°20.0'E.)	Petersburg Radio 9 (Short Report required)	12
	Saint Petersburg Traffic (Short Report required)	74
Passing Saint Petersburg Lighted Bouy (60°02.0'N., 29°25.9'E.)	Petersburg Radio 17	09
Passing the protective dam (59°59.2'N., 29°41.5'E.)		
Passing Lighted Bouys No. 23/24 (59°57.8'N., 29°48'E.)		
Passing Lighted Bouys No. 29/30 (59°56.2'N., 29°55.8'E.)		
Upon entering Saint Petersburg Morskoy Canal (59°54.2'N., 30°05.8'E.) and on arrival		

Outbound Reporting Points		
Reporting Point	VTS	VHF Channel
Vessels departing Saint Petersburg		
Departing Saint Petersburg Morskoy Canal (59°54.2'N., 30°05.8'E.)	Peterburg Radio 17	9
Passing Lighted Bouys No. 29/30 (59°59.2'N., 29°55.8'E.)		
Passing Lighted Bouys No. 23/24 (59°57.8'N., 29°48.0'E.)		
Passing the protective dam (59°59.2'N., 29°41.5'E.)		
Passing Saint Petersburg Lighted Bouy (60°01.6'N., 29°25.9'E.)		
Passing Lighted Bouy No. 14 (60°01.7'N., 29°20.90'E.)	Petersburg Radio 9 (Short Report Required)	12
	Saint Petersburg Traffic (Short Report Required)	74
Passing Lighted Bouy No. 8 (60°02.8'N., 28°31.9E.)	Saint Petersburg Traffic (Short Report Required)	74
Vessels departing from Ust'Luga		
Upon departure from the port VTS area	Ust'Luga Traffic (Short Report Required)	74
Vessels departing from Primorsk		
Upon departure from the port VTS area	Primorsk Traffic (Short Report Required)	74
Vessels departing from Vyborg and Vysotsk		
Upon departure from the port VTS area	Saint Petersburg Pilot Traffic (Short Report Required)	74
Vessels transiting Saint Petersburg Coastal VTS area		
Passing Lighted Bouy No. 4 (60°11.6'N., 27°48.2'E.)	Saint Petersburg Pilot Traffic (Short Report Request)	74
Passing Lighted Bouy No. 14 (60°01.7'N., 29°20.0'E.)		
Departing Russian Territorial Waters and entering Kotka VTS area	Kotka VTS (Short Report Required)	67
	Saint Petersburg Traffic (Short Report Required)	74
Departing Saint Petersburg Coastal VTS area/entering GOFREP area	Helsinki Traffic (Short Report Required)	60
	Saint Petersburg Traffic (Short Report Required)	74

Vessels intending to operate in the main ship channel between the harbor entrance and the harbor area NE of Lesnoy Mol, should request permission to proceed before passing the harbor entrance if inbound, and before departing berth, if outbound.

Vessels intending to navigate between the area NE of Lesnoy Mol and the NE end of the harbor should contact the Nevskiye Vorota signal station before reaching the SE end of Berth 31 if northeastbound, or before passing Nevskiye Vorota if southeastbound. In winter, permission should be obtained from the Ship Control Center.

The radar station is available for assistance in poor visibility.

Storm warnings or a water rise of 1.5m above normal will be broadcast to vessels in St. Petersburg harbor or anchorages.

Anchorage.—Waiting Anchorage Area No. 4, which may best be seen on the chart, lies centered about 1 mile NW of St. Petersburg Lighted Buoy (60°02'N, 29°26'E.). It has depths of 20 to 25m, mud and sand, with good holding ground.

It is reported that Anchorage Area No. 5 and Anchorage Area No. 5A have been established about 5 miles NNW of St. Pe-

tersburg Fairway Lighted Buoy.

Directions.—Vessels approaching St. Petersburg Guba should make use of the several Traffic Separation Schemes (TSS) in the Gulf of Finland, which are best seen on the chart.

A buoyed Safety Fairway leads from the TSS traffic lanes located at the E side of the Precautionary Area off Ostrov Seskar (60°02'N., 28°23'E.), through the Kronshtadt Fortified Zone, to the pilot boarding place and waiting anchorage. This channel has a bottom width of 80m and is marked by buoys. The Russian authorities recommend adhering to this fairway, particularly within the Kronshtadt Fortified Zone.

Caution.—Deep-draft vessels sometimes conduct cargo lightening operations in the vicinity of the outer anchorage prior to entering the ports.

It is reported that the buoys, lights, and beacons of the TSS lying in the outer approach to St. Petersburg may be missing or unlit.

There is periodic dredging of the main channel fairways in both the approaches and the ports during the summer navigation season.

Uncharted floating aids may be established in the vicinity of dredging operations and charted floating aids may be out of position. Care must be exercised when navigating in the work areas.

A number of designated spoil (dumping) ground areas lie in the outer approaches and may best be seen on the chart.

Several restricted areas, including unexploded ordnance areas and mine sweeping exercise areas, lie in the outer approaches and may best be seen on the chart.

Kronshtadt Fortified Zone is entered on passing longitude 29°00'E. Practically the whole of St. Petersburg Guba lies in a Fortified Zone, which may best be seen on the chart. See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for regulations pertaining to Fortified Zones.

Extensive areas are prohibited to navigation, the limits of which are subject to change without notice. Permission to enter the Fortified Zone must be secured from the military authorities in advance, as well as permission to enter Kronshtadt or St. Petersburg.

Vessels must not deviate from the charted courses. A vessel entering a prohibited area will be warned by the firing of a gun or rocket, and such vessel must stop and await orders. Vessels failing to heave-to may be detained.

St. Petersburg Guba

3.2 St. Petersburg Guba, including Nevskaya Guba, extends in an ESE direction for 35 miles from its entrance between Mys Shepelevskiy and Mys Stirsudden, 12 miles NNW.

Kronshtadtskiy Korabelnyy Farvater, about 12 miles long, leads from the E end of the buoyed channel (Safety Fairway) to the vicinity of Kronshtadt. The St. Petersburg Morskoy Kanal then leads to St. Petersburg. Secondary channels, for small craft, lie on either side of this canal.

North shore.—Mys Flotskiy, a low point, is located 4 miles ESE Mys Stirsudden (see paragraph 2.31). A light is shown from a framework tower, 20m high, standing on this point.

Mys Pesochnyy is located 9 miles E of Mys Flotskiy and the coast is moderately high and predominantly wooded.

Gora Torkalla, 100m high, stands about 6 miles NNE of Mys Stirsudden and is conspicuous, as it is the highest hill on this part of the coast.

A conspicuous church is situated at Gorod Zelenogorsk (60°12'N., 29°42'E.).

Between Mys Pesochnyy and Mys Dubovskiy, about 15 miles ESE, the shore is mostly sandy, with some marshy areas, and fringed with boulders. Numerous dangers lie between Mys Dubovskiy and Ostrov Kotlin.

A conspicuous tower stands on Mys Lisiy Nos, 4.5 miles S of Mys Dubovskiy. The coast between is low, sandy, and wooded. Numerous holiday resorts stand along this stretch, some close to the shore.

South shore.—The coast is low between Mys Shepelevskiy (see paragraph 1.22) and Mys Seraya Loshad, about 2.5 miles ENE. At Mys Shepelevskiy, a range of low hills rises, increasing in height as they trend E, until at Mys Krasnaya Gorka, 4 miles farther E, they form a red sandy cliff. This cliff is conspicuous from seaward, but invisible from W. Between Mys Krasnaya Gorka and Bronnaya Gora, 9.5 miles E, the coast is

bordered by low, sandy hills.

Conspicuous churches are situated at Gory Valday (59°58'N., 29°12'E.) and Bol'shaya Izhora (59°56'N., 29°34'E.).

3.3 Ostrov Kotlin (60°00'N., 29°46'E.) is located at the seaward entrance to Nevskaya Guba. The island is low and its center and W parts are covered with vegetation. The W end of the island consists of a low, rocky cape. The port of Kronshtadt lies at the SE side of the island.

A causeway, with a road, extends in an E direction and connects the N part of the island to Mys Lisiy Nos, on the N shore.

An area of reclaimed land, about 0.4 mile wide, extends SSW from the S shore of the island to the N edge of the fairway channel. Opposite this reclaimed area, a dam extends for about 3 miles from the S shore to the S edge of the fairway channel.

Tolbukhin Light (60°03'N., 29°33'E.) is shown from a conspicuous tower with a dwelling, 30m high, standing on a rocky islet, 3 miles WNW of the W end of Ostrov Kotlin.



Tolbukhin Light

The island is fringed by a rocky shoal which extends W from its W side to the vicinity of the light.

Londonskaya Otmel (59°59'N., 29°30'E.), an extensive rocky shoal, extends up to about 2.5 miles from the S shore, S of Tolbukhin Light. Several dangers lie on this shallow shoal and may best be seen on the chart.

3.4 Kronshtadt (59°59'N., 29°47'E.) (World Port Index No. 28400) is situated at the E end of Ostrov Kotlin and is the largest Russian military harbor on the Baltic. The port consists of a town fronted by five artificial harbors. Foreign commercial vessels may enter the harbor only with special permission.

Tides—Currents.—The current in the roadstead runs to the E with winds from the W, at a velocity of 0.5 to 1.5 knots; after sustained W winds bank up the water, the velocity may even reach 3 knots.

Depths—Limitations.—Kobotazhnaya Gavan, the coaster harbor, has depths of 1.5 to 7m, with the greatest depths being in the S part.

Kupecheskaya Gavan, the commercial harbor, has depths of 7.3 to 9.4m in the S part and 1.8 to 5.2m in the N part.

Srednyaya Gavan, used by naval vessels, has depths of 8.5 to

10.7m in the S and E parts, but the N part is shallow.

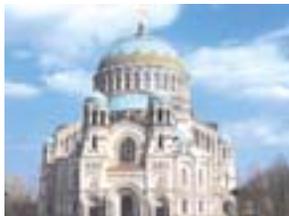
Voyennaya Gavan, also used by naval vessels, is connected to Srednyaya Gavan.

Zavodskaya Gavan fronts the E side of the island and is used by power boats.

Vessels up to 200m in length and 8m draft can enter the port.

Aspect.—The approach channels are indicated by lighted ranges and marked by buoys, which may best be seen on the chart.

A foundry chimney and the dome of the Naval Cathedral, both prominent, are situated in the town.



Kronshtadt—Dome of the Naval Cathedral

Ostrov Kronshlot, a fortified island, lies close S of the fairway, in the vicinity of the port, and is marked by lights.

For determining the error of the compass during the transit of the roadstead, marks are placed on the outer walls of the harbor basins indicating the true bearing of the foundry chimney. These marks are visible from a distance of 5 miles.

Each complete 10° is shown by two white figures on a background of black and red diagonal stripes. The intervening degrees are shown only by the last number, with even numbers on a black background and odd numbers on a red background. Half degrees are marked by a small white circular disc with a black border.

In Bol'shoy Reyd, the bearings shown are from 079° through E to 101°; in Malyy Reyd, from 078° through N to 355°; and in Vostochny Reyd, from 337° to 254° through W. Separate marks for 271° and 278° are shown on two of the piers.

Regulations.—When approaching the harbor entrances, proceeding through narrow passages, and generally whenever a close-quarters situation is possible, vessels shall proceed at slow speed and sound a prolonged blast of the whistle.

Vessels intending to enter or leave a harbor shall, at a distance of about 100m from the entrance, sound several prolonged blasts of the whistle to warn vessels on the other side of the harbor wall. The entrance shall not be approached by vessels intending to pass through until the passage is clear; this is shown by a signal hoisted at the signal mast at the entrance.

Anchoring in the roadstead of Kronshtadt is strictly prohibited.

Directions.—Kronshtadtskiy Korabel'nyy Farvater leads from the pilot boarding place, in the vicinity of St. Petersburg Lighted Buoy, to the roadstead of Kronshtadt.

Caution.—During the day, some ranges in the vicinity of the roadstead are difficult to identify against the buildings in the background.

A submarine cable extends SW and W into the fairway from the port and may best be seen on the chart.

The thickness of the ice averages 0.7m and is never more than

Nevskaya Guba

3.5 Nevskaya Guba lies between Ostrov Kotlin and the mouth of the Reka Neva. The S shore, on which there are many villages, descends to the sea in terraces. Both the N and S shores are densely wooded.

Between Mys Lisiy Nos and Lakhta, 6 miles ESE, the N shore of Nevskaya Guba is low, sandy, and wooded. Off the villages of Dubi and Verperow, about 1.2 and 1.8 miles SE of Mys Lisiy Nos, respectively, are two low-lying rocky islets, the easternmost of which is Ostrovki Verperluda. The white tower of the biological institute, standing 5.2 miles E of Mys Lisiy Nos, and Lakhtinskiy Rescue Station, now disused, situated 1.5 miles farther E, are good landmarks. Numerous holiday resorts, some close to the shore, are situated between Mys Lisiy Nos and Lakhta.

On the S shore, a prominent palace stands on a hill near the town of Lomonosov, S of the E end of Ostrov Kotlin. Martyshkina Church, also prominent, is situated 1.8 miles ESE of the palace.

At Petrodvorets, 5 miles ESE, the former palace, with its golden emblem, and the cathedral are conspicuous.

The St. Petersburg Morskoy Kanal connects the E end of Kronshtadtskiy Korabel'nyy Farvater with the harbor of St. Petersburg. This canal is about 15 miles long. It is marked by buoys and indicated by lighted ranges which may best be seen on the chart.

Vessels entering the canal are usually limited to a maximum length of 260m, a maximum beam of 40m, and a maximum fresh water draft of 11m.

Other minor channels, used by local craft, connect several small harbors within Nevskaya Guba and may best be seen on the chart.

Lomonosov (59°55'N., 29°46'E.) (World Port Index No. 28390) is a small naval harbor protected by two breakwaters. A channel leads S from the main fairway at the E end of Ostrov Kotlin to this harbor. There are depths of 3.6 to 7.2m alongside the principal quays.

Caution.—An obstruction lies 0.4 mile N from the head of E mole; another obstruction lies with a depth of 5.7m at the edge of the channel from the same mole.

St. Petersburg (59°56'N., 30°18'E.)

World Port Index No. 28370

3.6 The port of St. Petersburg (Sankt Peterburg) is situated on the banks of the Reka Neva and the islands forming its delta. The city, which was once the capital of Russia, was previously known as Leningrad and Petrograd. The port, used by both naval and commercial vessels, is connected by an interior waterway canal system with the White Sea, the Caspian Sea, and the Black Sea.

Ice

Navigation is possible all year round with icebreaker assistance from the end of November until about the last week of April. Ice first begins to form in the middle of November. 1m.



St. Petersburg

Winds—Weather

Within Nevskaya Guba, SW and W winds prevail in winter and represent 70 to 75 per cent of recordings. In summer, W and NW winds prevail and represent 21 per cent and 18 per cent of recordings, respectively. In spring, the most frequent winds are W and represent 16 to 27 per cent of recordings. In the fall, SW winds prevail and represent 17 to 24 per cent of recordings. Wind force decreases in spring and summer, but increases in the fall and winter.

Calms are most frequent in spring and summer and represent 30 per cent of recordings. Storms are mainly recorded during fall and winter; their occurrence fluctuates around 10 per cent of recordings.

Storms are most frequently related to S and SW winds, though they also occur during NW, NE, and E winds. The duration of these storms seldom exceeds 24 hours.

The number of days with fog in Nevskaya Guba averages 57 per year. The largest number of days with fog is recorded during the September to April period, and varies from 5 to 8 days per month. During this period, fogs are thicker and last longer. In winter, fogs occur most frequently during E and NE winds and more rarely during NW and N winds. In spring, fogs are formed during SW and W winds.

Tides—Currents

Basic level fluctuations are caused by the cumulative effect of rollers and by the seiche phenomena. The cumulative fluctuations usually occur suddenly, last a short period of time, and are intensive. Level increases are usually brought on by winds



St. Petersburg Harbor



St. Petersburg—Passenger Terminal Berths



St. Petersburg—Marine Terminal Pier



St. Petersburg—General Cargo Berths



St. Petersburg—Container Terminal Berths



St. Petersburg—Bulk Berths



St. Petersburg—Container Terminal

of W directions and decreases by winds of E directions. The value of these fluctuations of level seldom exceeds 0.5m in the spring and summer, but in the fall and winter it reaches 1.2m.

Particularly high rises of water are observed in Nevskaya

Guba, which in some years has recorded 2.5 to 3.5m, although it was reported that the rise has been as high as 3.9m. In the Reka Neva estuary, the strongest water level fluctuations occur during SW fall storms.

Seiche level fluctuations usually do not exceed 0.2 to 0.3m, and only in isolated cases do they reach 1m.

The current velocity of the Reka Neva averages about 2 knots, increasing to 3 knots with N winds, and becoming weaker during W winds.

Depths—Limitations

Vessels entering the port of St. Petersburg are restricted to a maximum draft of 11m, a length of 260m, and a beam of 40m. Ocean-going vessels enter via the St. Petersburg Morskoy Kanal. Four other minor channels lead to the port and are used by local small craft.

The port is separated from Nevskaya Guba by Kanonerskaya Otmel. The canal, the main entrance channel, enters the S part of the port. A fairway, swept to a depth of 9.8m, then leads NE to the N part. The main harbor basins lie E of this fairway.

Between the entrance sea walls, the channel is reported to be dredged to a depth of 11.3m.

Ugolnaya Gavan, at the S end of the harbor complex, is bound on its SW side by Ugolnyy Mol and on its NE side by Lesnoy Mol. This basin has an entrance, 140m wide, and



St Petersburg—Peter and Paul Fortress Cathedral

depths up to 11m alongside the quays.

An oil berth, with a depth of 10.8m alongside, is situated in the NW part.

Reyd Lesnoyo Mola, the basin lying N of Lesnoy Mol, has depths of 5 to 11.5m alongside the quay on the SW side.



St Petersburg—Spire of the Admiralty

Barochnyy Basseyn lies close NE of Reyd Lesnoyo Mola. This basin has an entrance, 220m wide, and depths up to 11.5m alongside the quays.

Vostochnyy Basseyn is approached via a channel, with a dredged depth of 8.5m, which leads from the SE side of Barochnyy Basseyn and along the N side of Krivaya Damba, a



St Petersburg—Dome of Issacs Cathedral



St Petersburg—Spire of Peter and Paul Fortress Cathedral

de-tached breakwater. This basin has depths of 6 to 8m alongside the quays.

Morskoy Kanal, leading to the N part of the port, has berths situated along its E side with depths up to 11.5m alongside.

Gutuyevskiy Kovsh is a small basin which extends E from the N end of the canal. This basin has depths of 4 to 7.6m alongside the quays.

Novaya Kanonerskiy Gavan, a ship repair harbor, has depths of 6.5 to 8m in the approach channel and 4 to 8m in the basin. This harbor area lies between Ostrov Kanonerskiy and Ostrov Belyy. The approach channel leads W between Bolshaya Neva and Neviskiye Vorota, the N entrance to the port.

An international passenger terminal is situated on the N shore of Bolshaya Neva. The berths and approach channel have depths of 9.5m.

There is a total of 1,200m of berthage alongside the N and W banks of the river, with depths of 4.2 to 6.1m alongside.

The port has facilities for tanker, bulk, general cargo, container, ro-ro, timber, reefer, cruise, and passenger vessels. There are also facilities for pleasure craft and yachts.

Aspect

The entire St. Petersburg area is comparatively low, varying from 5m high in the S and E parts, to 10m high in the N part. The region is dominated by the delta of the river.

When approaching the port, the Admiralty, is conspicuous. This large building is 74m high with a gilded tower and spire. It is situated on the S bank of the Reka Neva, nearly 0.5 mile above the Lieutenant Shmidt Bridge.

Dvoryetz Iskussrv, or Palace of Arts, formerly the Winter Palace, stands close NE of the Admiralty.

The gilded dome of Issacs Cathedral, standing close S of the Admiralty, is very conspicuous. Also conspicuous is the gilded and lofty spire of the cathedral rising from the Peter and Paul Fortress. It is situated on the opposite shore of the Reka Neva, NE of the Admiralty.

Pilotage

See Pilotage under General Remarks in paragraph 3.1. Departing vessels should order a pilot at least 2 hours prior to departure. Deep-sea pilots are available upon request.

Regulations

See Regulations under General Remarks in paragraph 3.1.

Vessels exceeding 170m in length or with drafts of 8.5m and over are considered to be constrained by their draft and must display the appropriate signals. Such vessels have the right of way and must employ tugs in the narrows within the St. Petersburg Morskoy Kanal.

Vessel Traffic Service

In addition to participating in the Saint Petersburg Port Vessel Traffic Service, vessels bound for Saint Petersburg transit

the coverage area of St. Petersburg Coastal VTS. See paragraph 3.1 for further information.

Signals

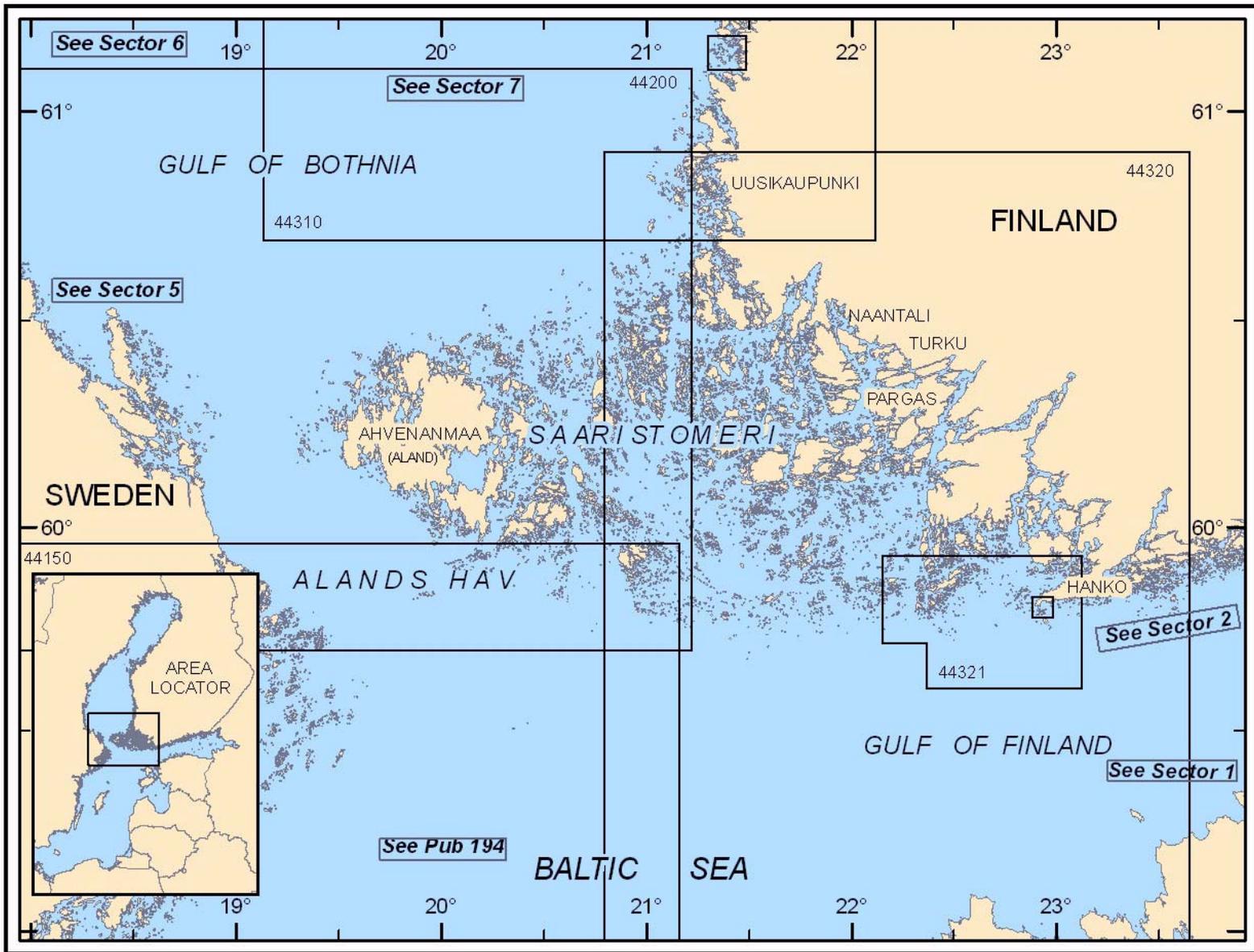
Storm signals are shown, by day, from the meteorological station at Lebyazh'ya (59°58'N., 29°26'E.) and from the lower yardarm of a mast at Lomonosov.

Anchorage

Several anchorage (waiting) areas are situated adjacent to the sides of the St. Petersburg Morskoy Kanal and may best be seen on the chart.

Caution

Care is advised as the entrance channel narrows to a width of about 70m between the sea walls, which were reported to be in a poor state of repair.



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

SECTOR 4 — CHART INFORMATION

SECTOR 4

THE ALAND ISLANDS AND THE ADJACENT FINNISH COAST

Plan.—This sector describes the Aland Islands and those dangers lying along the seaward edges of the archipelago extending from the Finnish coast. The descriptive sequence is W from the cape of Hanko (Hangoudd) (59°49'N., 22°54'E.) to Sodra Kvarken (60°15'N., 19°00'E.) and then E to Isokari (60°43'N., 21°01'E.). The ports of Turku and Naantali, situated at the SW corner of Finland, are described at the end of this sector.

General Remarks

4.1 Winds—Weather.—Among the islands, SW winds prevail. Winds from SE are usually accompanied by rain and N winds are accompanied by squalls.

Fog occurs in the spring and autumn. The fog is usually thick and dry in the spring, and damp with fine rain in the autumn.

Ice.—During an average winter ice forms within the inlets of the Ahvenanmaa Islands in the middle of January, and quickly extends around these islands and over the sea to the E of them. By the beginning of February the whole sea area between the Ahvenanmaa Islands and the Finnish coast is ice-encumbered. In the middle of February, the N part of the Aland Sea and Sodra Kvarken are ice-covered. After the middle of March the ice begins to decrease, and by the beginning of April, the Aland Sea and Sodra Kvarken are open. At the end of April the sea between the Ahvenanmaa Islands and the Finnish coast is clear.

A passage is usually kept open all winter through Rodhamnsfjarden and Foglofjard as far as Turku. If the winter anticyclone to the SE extends W and N, giving a period of E winds and cold weather over the Baltic, a great deal of ice is heaped up on the S coast off the Ahvenanmaa Islands. On the S side of the Aland Sea, traffic is unhindered in very mild winters.

The earliest reports of ice in the N part of the Gulf of Bothnia occur usually in November. Ice first forms within inlets and in shallow water along the coasts. It is slow to extend seaward but extends quite rapidly along the coasts. By the middle of January a continuous belt of ice surrounds most of the coasts and much of the sea area in the gulf N of latitude 63° is frozen. Ice conditions are usually at their peak by the end of February. Normally, ice conditions improve from early March onward. Ice recedes N and has usually left Turku (60°27'N., 22°15'E.) and Gavle (60°41'N., 17°10'E.) by 14 April. The N part of the gulf is normally ice-free by the middle of May.

For information pertaining to winter navigation, ice, and Finnish icebreaking services, including internet web sites, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Tides—Currents.—Currents are generally dependent on the direction of the wind, but strongly divided by the islands and shoals. The water level is a good indication of expected winds. A rise precedes winds from the SE or SW, and a fall precedes those from the N.

Aspect.—The peninsula of Hanko and the dangers adjacent to it are described in paragraph 2.2.

The Aland Islands, located in the entrance of the Gulf of Bothnia, are separated from the coast of Sweden by the Aland Sea and Sodra Kvarken.

Saaristomeri, the waters lying between the Aland Islands and the mainland of Finland, are encumbered by islands, islets, and innumerable rocks and shoals.

Aland Island (Ahvenanmaa), the largest of the group, is partially wooded and intersected by numerous inlets. It is reported that about two-thirds of the inhabitants of the group reside on this island and are of Swedish extraction.

Pilotage.—Pilotage is compulsory within the archipelago area for all merchant vessels and foreign warships; all tankers over 15,000 dwt when loaded must carry two pilots.

The IMO recommends that vessels constrained by their draft or vessels not registered in one of the Baltic states, and infrequently sailing the area, embark a deep-sea pilot. Vessels requiring deep-sea pilotage should send their request to any coastal pilot station in Finland, at least 24 hours in advance.

All ordering of local pilots throughout Finland is carried out by the Finn-pilot Order Center, Helsinki. For more information, see Pilotage in paragraph 2.12.

Pilots for the archipelago area board vessels in the following positions:

1. For vessels approaching from S—about 3 miles SSW of Uto.
2. For vessels approaching from W bound for Farjsundet, Degerby, and all other destinations in the E part of the archipelago—in position 59°56.6'N, 19°57.6'E. This boarding position is also used by vessels transiting the Archipelago Sea bound for Hanko during ice conditions.
3. For vessels approaching from N—in position 60°44.47'N, 20°55.03'E (Isokari).
4. For vessels approaching from SE—about 1.5 miles ENE of Russaro.
5. For the port of Mariehamn (Maarianhamina)—in position 60°01.3'N, 19°50.3'E.

Regulations—General.—The Finnish authorities have instituted a system of restricted areas and semi-restricted areas throughout the whole of Finland's coastal waters. The limits of the areas lying within the waters described in this sector may best be seen on the chart.

Vessels are permitted to transit these restricted areas only through an approved channel, with a pilot aboard.

Vessels are permitted to anchor within a restricted area only at specially designated anchorages, for a duration of 48 hours or less.

Areas dangerous due to mines laid during World War II exist within the waters described in this sector. There is still a risk of danger in these areas and anchoring or carrying out any seabed activities are prohibited without special permission.

See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for regulations pertaining to vessels within the waters of Finland. Vessels should also consult the pilot as well as the local authorities for details on local

regulations.

Vessel Traffic Service.—An Archipelago Vessel Traffic Service (VTS) operates in the Saaristomeri area. This VTS is mandatory and authorized to issue instructions when necessary for the safe navigation of vessels within the area. The seaward limits of the VTS area are Uto Island (59°47'N., 21°22'E.) and Isokari Island (60°43'N., 21°01'E.).

All vessels within the VTS area and those operating nearby must maintain a continuous listening watch on VHF channel 71. The VTS Marine Traffic Center is situated at Parnaisten (60°10'N., 21°42'E.).

The VTS area consists of two sectors. Sector 1 extends from the limit at Uto Island to Turku (60°27'N., 22°15'E.) and Naantali (60°28'N., 22°01'E.) along the 10m and 13m fairways. Sector 2 extends from the limit at the island of to the intersection point at Lovskar (60°13.2'N., 21°43.6'E.) along the 9m and 10m fairways; and from Isokari to Uusikaupunki (60°13.2'N., 21°43.6'E.) along the 4.5m, 7m, 9m, and 10m fairways.

All vessels must provide an Advance Report at least 2 hours before entering the VTS area by fax, telephone, or VHF. This report must include the following designators and details:

Designator	Details
A	Name, call sign, and nationality (flag).
B	Date and time (6 digits GMT/UT).
C	Position (4 digits Lat and 5 digits Long).
D	Position. True bearing and distance from a clearly identified landmark.
E	True course (3 digits).
F	Speed in knots and tenths (3 digits).
G	Name of last port of call.
I	Destination (port) and ETA.
L	Route information (intended track).
O	Draft (4 digits meters and centimeters).
P	Cargo (brief details of any dangerous cargo).
Q	Brief details of defects or limitations.
U	Vessel size and type.

All vessels must then provide an Entry Report, on VHF channel 71, when crossing the VTS area limit. This report must include the information under designators A, D, E, and F (see table above).

When within the VTS area, vessels should consult the pilot for details of movement reports and reporting points along the various fairways. Navigation assistance is available from the VTS center and is recommended during inclement weather conditions.

Directions.—The main offshore shipping routes leading to ports in the Gulf of Bothnia pass W of the Aland Islands and through Sodra Kvarken (see paragraph 4.6 and paragraph 5.8).

Channels, requiring extensive local knowledge, lead between the islands and dangers, and connect the Aland Islands with the mainland. The main approaches to these channels from sea-

ward are, as follows:

1. From the SW—through Rodhamnsfjarden (via Nyhamn).
2. From the S—by a channel passing W of Uto (59°47'N., 21°22'E.).
3. From the E—using the NW approaches to Hanko.
4. From the N—via Isokari.

Caution.—Strong S to SW winds cause treacherous seas among the islands off the S and SW coasts of Finland, between Uto (59°47'N., 21°22'E.) and Bengtskar (59°43'N., 22°30'E.). Wave heights can increase suddenly from 4 to 6m in this area.

Local magnetic anomalies are reported to exist within several areas covered by this sector, including areas between the SW side of the Aland Islands and the Swedish coast, as well as about 10 miles SW and SE of Uto.

During the summer, heavy traffic, including numerous small craft and ferries, may be encountered in the waters lying between the Swedish coast and the E side of the Aland Islands.

Hanko to Uto

4.2 The Skerries between Hanko and Uto, about 46 miles W, form an extension of the S coast of Finland and bound the Gulf of Finland on the NW side. They form a chain of predominantly barren islets, rocks, and shoals lying in close proximity to one another. Channels lead to the larger islands and to the mainland.

The bottom consists of coarse and fine sand in places, more frequently of mud, and yet more often of stones.

A number of dangerous shoals and areas with irregular depths lie seaward of the Skerries and extend S as far as the parallel of 59°35'N. Therefore, vessels entering the Gulf of Finland on the N side are advised to remain S of the above parallel and to pass the outer skerries at a distance of 8 to 10 miles.

Entry between the cape of Hanko and Uto should not be attempted without local knowledge. Therefore only the most conspicuous islands and off-lying dangers will be described.

Morgonlandet (59°46'N., 22°42'E.) is 6m high; its summit is barren. The E part of this island is lower than the W. The island is readily identified from seaward by its isolated position.

Dommaskar (59°45'N., 22°30'E.) is a barren islet about 6m high. It may easily be identified from seaward by its dark color.

Bengtskar (59°43'N., 22°30'E.) is one of the southernmost islets in the approaches to the Gulf of Finland. Bengtskar Light is shown from a conspicuous tower with a building and wind generator, 46m high, standing on this islet.

Oro (59°49'N., 22°20'E.) is partially wooded and although lying some distance N of the outer dangers, it may easily be identified from seaward.

Vano Kalkskar (59°47'N., 22°05'E.) is a barren, rocky islet about 15m high.

Oleg (59°35'N., 21°58'E.), a shoal on which a wreck with a depth of 12.7m lies, is the southernmost danger located between Hanko and Uto.

Jurmo (59°50'N., 21°36'E.) rises to a height of 22m on the N side. A red wooden church, with a weather vane on the E angle of the roof, stands on the N side of this island and is visible from the channel leading between Uto and Lom (Lohm), 21 miles NNE.



Bengtskar



Bengtskar Light

4.3 Uto (59°47'N., 21°22'E.) is a barren, hilly island lying on the SW side of a group. It is located at the entrance of the channel which leads through Vidskars Fjord to Turku, 48 miles NE. Uto Light is shown from a tower, 24m high, standing on the summit of the island.

Range lights are shown from structures situated at the W side of the island and indicate the main entrance route leading in a NNE direction from seaward. Another lighted range, situated about 4 miles NNW of Uto, indicates the main fairway leading past this island.

Uto Harbor lies between the N side of the island and Enskar, the N peninsula. The N side of the harbor is protected by Ormskar, a bare and hilly island lying close NE of Enskar. The harbor has depths of 3 to 9m, but can only accommodate small vessels with drafts up to 3m. A channel, authorized for drafts up to 4m and marked by a lighted range, leads to the anchorage of the harbor. Local knowledge is required.

Lillharun (59°44'N., 21°24'E.), an islet, 7m high, is fronted by foul ground. It lies at the E side of the main channel and about 3.2 miles SSE of Uto. A light is shown from a tower, surmounted by a wind generator, standing on this islet. A racon is



Uto Light

situated at the light.

Grimsorar, marked by a beacon, is a group of rocks, 4 to 7m high, lying centered 4.2 miles SSE of Lillharun.

Uto Langan (59°41'N., 21°30'E.), an islet, 3.4m high, lies about 1 mile N of Grimsorar beacon.

A shoal, with a least depth of 6.7m, lies about 2.3 miles S of Grimsorar beacon and is marked by a buoy.

Formansbadan, with a least depth of 0.9m, lies on the W side of the main channel, about 3.2 miles WNW of Lillharun.

Bokullankivi Light (59°51'N., 21°25'E.) is shown from a tower, surmounted by a wind generator, standing on an islet, 4 miles NNE of Uto. A racon is situated at the light.

Caution.—Local magnetic anomalies are reported to exist in the area surrounding Lillharun and in another area centered about 7 miles ESE. Other anomalies are also reported to exist in areas lying about 10 miles SSE and WSW of Lillharun.

Uto to Mariehamn

4.4 Many islands and rocks, along with numerous shoals, extend up to about 13 miles W from Uto. They are separated from another group of dangers lying farther W by Kokarsfjarden (Kokarin Selka).

Vastra Morskas (59°47'N., 21°09'E.) is the largest of the numerous islands lying up to 13 miles W of Uto. The surrounding area is encumbered with rocks and shoals. The island is 17m high in the S part, about 13m high in the NE part, and is covered with bushes.

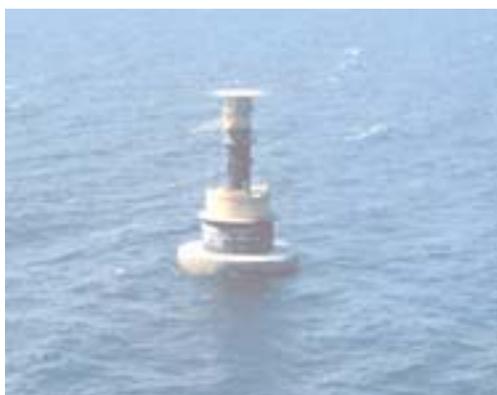
Bogskar (59°30'N., 20°21'E.), a group of rocks fronted by shoals, is the southernmost danger in the Aland archipelago. Bogskar Light is shown from a tower with a building and wind generator, 46m high, standing on the westernmost rock. A racon is situated at the light. On the easternmost and highest rock, lying about 2.5 miles ENE of the light, there is a beacon.

Suomen Leijona (59°28'N., 20°49'E.), a shoal, has a least depth of 10.4m and lies about 14.5 miles ESE of Bogskar. Suomen Leijona Light is shown from a tower, 14m high, standing on the S part of this shoal. A racon is situated at the light.

Svenska Bjorn Light (59°33'N., 20°01'E.) is shown from a tower, with a helicopter platform, 32m high, standing on Sodra

**Bogskar Light**

Klatten, a shoal. A racon is situated at the light. Sodra Klatten, along with Norra Klatten, another shoal lying 1 mile NW, has a least depth of 10m. These shoals lie at the E edge of the dangers extending up to over 30 miles from the Swedish mainland.

**Svenska Bjorn Light**

Armbagen (59°38'N., 19°58'E.), a shoal, has a least depth of 6.7m and lies about 5 miles NNW of Svenska Bjorn Light. A light is shown from a mast with a helicopter platform, 20m high, standing on this shoal. A racon is situated at the light.

Caution.—It is reported that a large ODAS buoy is moored about 17 miles SSE of Suomen Leijona Light.

4.5 Troskeln (59°39'N., 19°50'E.), an extensive shoal, lies about 9 miles NNW of Svenska Bjorn Light and has a least depth of 7.6m.

Troskeln Vastra Light (59°40'N., 19°52'E.) is shown from a mast with a helicopter platform, 20m high, standing about 1.2 miles E of the shallowest part of the shoal, 4.6 miles NW of Armbagen. It is reported that this light structure has been destroyed and a lighted buoy is moored close E of the ruins.

Troskeln Ostra Lighted Beacon stands on a shoal on the NE side of the fairway.

Flotjan (59°49'N., 19°47'E.), a large rocky shoal, lies about 9 miles NW of Troskeln Ostra Light and is the outermost danger in the SW approach to Foglofjard. Flotjan Light is shown from a tower standing on the S part of the shoal. A racon is situated at the light.

Lagskar (59°50'N., 19°55'E.), an islet fronted by an extensive area of foul ground and rocks, lies 4.5 miles ENE of Flot-

**Flotjan Light**

jan. A light is shown from a tower, 33m high, standing on the N side of this islet.

**Lagskar Light****Nyhamn Light**

Nyhamn Light (59°58'N., 19°57'E.) is shown from a tower, 34m high with a wide top, standing on the S side of Lilla Batskar, a small island lying 7.3 miles N of Lagskar. A small harbor, used by pilot vessels, is situated at the NE side of this island. It is reported that this light is no longer operational.

Pilotage.—Pilots board in the following positions:

1. Uto (59°44.6'N., 21°20.5'E.).
2. Nyhamn (59°57.0'N., 19°58.8'E.).
3. Isokari NW (60°44.5'N., 20°54.5'E.).
4. Isokari SE (60°42.1'N., 20°59.9'E.).
5. Hanko N (59°46.9'N., 23°00.3'E.).
6. Hanko S (59°42.2'N., 23°04.9'E.).
7. Lillmalo (60°13.8'N., 22°06.6'E.).
8. Flackgrund (59°52.9'N., 22°48.5'E.).

Rodhamnsfjarden (59°56'N., 19°58'E.) is entered between Lilla Batskar and Oxbadar, a group of dangerous rocks lying 3.2 miles SSE. A main route, authorized for drafts up to 9m, leads from seaward through this passage. The fairway is indicated by a lighted range, but is reported to be dangerously nar-

row in places for large vessels.

4.6 Offshore route.—The offshore route leading from the S to the Gulf of Bothnia passes through the Ahvenanmeren Deep-Draft Channel and the Aland Sea. The channel is swept to a depth of 18.2m and is authorized for drafts up to 15.3m. It can be used by all vessels.

The channel can be entered W of Bogskar Light (59°30'N., 20°21'E.) and E of Svenska Bjorn Light (59°33'N., 20°01'E.). It then leads 4 miles N and turns NW, passing, with a minimum width of 1 mile, N of Armbagen Light (59°38'N., 19°58'E.), N of Troskeln Vastra Light (59°40'N., 19°52'E.), and S of Troskeln Ostra Light (59°40'N., 19°55'E.). The route then continues in a NW direction, passing SW of Flotjan Light (59°49'N., 19°47'E.).

Vessels proceeding W out of the Gulf of Finland into the Aland Sea can pass N of Suomen Leijona Light (59°28'N., 20°49'E.) and join the main route in the vicinity of Bogskar Light.

For the route and dangers lying S of Bogskar Light, see Pub. 194, Sailing Directions (Enroute) Baltic Sea (Southern Part).

4.7 Between Nyhamn Light (59°58'N., 19°57'E.) and Hammarudda, the SW extremity of Aland Island, 10 miles NW, there are many off-lying dangers. The entrance fairways leading to Mariehamn lie between these dangers and require local knowledge.

Marhallan (60°02'N., 19°52'E.), a rock, lies about 3.5 miles SW of the harbor entrance and 5 miles NNW of Nyhamn Light. A light is shown from a floodlit tower standing on this rock.

Kobbaklinter, a group of islets lying on an area of foul ground, is located about 0.3 mile E of Marhallan.

Korso is the westernmost islet of this group. Two sets of lighted ranges are shown from structures standing in this vicinity and indicate channels leading N and S of Marhallan. A racon is situated at the front range light.

A light is shown from Tvibenan Islet, which lies on the W side of the main channel, 0.5 mile W of Korso. Hetronklubb Islet lies on the E side of the channel and is marked by a beacon. The islet of Skogo, 0.7 mile of Korso, has foul ground extending up to about 0.3 mile NE and SE from it.

A shoal, with a depth of 4.9m, lies between Skogo and Vitfagelskar, another islet located 0.7 mile NE. Vitfagelskar is marked by a cairn beacon. Another beacon, fitted with a radar reflector, stand on the W side of the channel, about 0.3 mile E of Skogo.

Druvan Beacon stands on the N extremity of an islet of the same name, about 0.3 mile N of Skogo.

Grano, with its adjacent dangers, fronts the entrance of the harbor and lies about 0.8 mile NE of Korso. Granoklubb and Granskar, fronted by foul ground, lie close NW and 0.3 mile W of Grano, respectively. A beacon stands on the N end of Granoklubb.

Foul ground extends about 0.3 mile S of Grano; a 5.8m shoal lies 0.3 mile N of Grano. A 5.5m shoal lies in the fairway close W of Granskar. A light is shown from the NE extremity of Grano; buoys mark the surrounding dangers.

Mariehamn (Maarianhamina) (60°06'N., 19°55'E.)

World Port Index No. 27920

4.8 The port of Mariehamn, a major ferry terminal, is situated on the S side of Aland Island, about 89 miles WNW of the cape of Hanko. The town is the largest in this island group. The small natural E and W harbors are well sheltered, but the E harbor is now used only for small craft. An airport is situated close N of the town.

Winds—Weather.—See the General Remarks in paragraph 4.1.

Ice.—The port is free of ice, except when the harbor is affected by the coldest winters, and then the harbor is kept open by icebreaker assistance.

Depths—Limitations.—The E harbor has depths of 1 to 4.5m and is used only by small craft.

The W harbor provides a total of 795m of quayage, with depths of 5 to 7.8m alongside the berths. The oil berth at the power station has a depth of 5m alongside; the Oil Harbor Terminal berth has a depth of 6m alongside. There are facilities for ro-ro, timber, general cargo, passenger, automobile ferry, and tanker vessels.

Vessels up to 160m in length and 7m draft can be accommodated, but require twin screw propellers and a bow thruster for safe maneuvering. Tankers up to 44,700 dwt and 6m draft have been handled.

Aspect.—Mariehamn is difficult to view from seaward due to the heavily-wooded hills in the vicinity.

An aeronautical light is shown from a tower standing at an elevation of 81m in the vicinity of the airport, 2 miles N of the town. A prominent television tower, 196m high, stands about 9 miles NE of the town and is visible from all directions from seaward. A conspicuous water tower is situated in the town.

The fairway channels leading to the port are indicated by lighted ranges. Dangers lying adjacent to the fairways are marked by lights, beacons, and buoys.

Pilotage.—Pilotage is compulsory for foreign vessels. See paragraph 4.1 for further details. The pilot boards in position 60°01.0'N, 19°50.5'E.

Anchorage.—Anchorage is available about 0.5 mile NE of Skogo, in depths of 17 to 29m, mud and stones. The port provides well-sheltered anchorage because of the numerous off-lying islands.

Directions.—Vessels can reach the port by using a main channel authorized for drafts up to 8.2m. This channel can be entered from seaward by steering in a NE direction, on a lighted range, and passing close SE of Marhallan Light. It can also be approached from S by steering in a NNE direction for 1.5 miles and passing between Masskar and Kvasten, 0.5 mile W. This fairway then leads about 0.7 mile NNW to join the main channel, passing between Kobbaklinter and Artskar.

A channel, authorized for drafts up to 7.3m, leads from the W between Stora Skovgrund and Osengrund. Another channel, also authorized for drafts up to 7.3m, leads from the SE.

A channel from Ledskar, authorized for drafts up to 3.3m, leads close NE of Lango and then NNW to Slemmern, lying on the E side of Mariehamn.

Caution.—Two submarine cables extend in a SW direction from Mockelo to the W side of the port.

The Aland Islands

4.9 Between **Hammarudda** (60°05'N., 19°46'E.), the SW extremity of Aland Island, and the islet of Sodra Salskar (Salskar) (60°25'N., 19°36'E.), 20 miles NNW, the Aland Islands extend W about 12 miles to **Yttre Borgen** (Ytre Borgen) (60°16'N., 19°16'E.), their outermost rock.

Eckero, the largest island of the group, is separated from Aland Island by Marsund, a narrow strait, authorized for drafts up to 2.1m. Numerous islets, rocks, and reefs lie within this area and many navigable channels lead between them.

The dangers situated at the E side of Sodra Kvarken are described beginning in paragraph 5.8.

A channel, with a least depth of 6.1m, leads between the islets and reefs fringing the W and N side of Eckero and into the Gulf of Bothnia. It is marked by beacons and buoys, but local knowledge is necessary.

Eckero Fjord, indenting the S side of Eckero, affords anchorage for vessels with local knowledge, in depths of 12 to 14m. The anchorage lies about 0.5 mile N of the N extremity of the island of **Torpo** (60°10'N., 19°37'E.), which is located on the W side of the entrance to the fjord.

The fairway leading to this anchorage runs ENE between Rodskar and Vittingen and then leads E of Torpo in a NNW direction.

The bay lying between Hammarudda and the S extremity of Eckero, about 6 miles NW, is encumbered with a number of dangerous shoals.

Utbadan, an above-water rock fronted by dangers, lies about 1.5 miles WSW of Hammarudda. A lighted beacon, 6m high, stands on this rock.

Caution.—Numerous submarine cables have been laid across Alands Hav, between the large island of Aland and the Swedish coast. These cables may best be seen on the chart.

4.10 Off-lying islands and dangers.—The southwesternmost danger is **Gisslan** (60°10'N., 19°18'E.), an islet lying about 14 miles WNW of Hammarudda. This islet, which is marked by a light, is fronted by foul ground extending up to about 0.4 mile seaward.

Signilskar (60°12'N., 19°20'E.) (World Port Index No. 27870), a large island, lies about 2.5 miles NE of Gisslan. It is separated from Eckero by a channel 4.5 miles wide, in which lie several islets and numerous dangers. Close to the NNW side of Signilskar, the island of Enskar provides anchorage for vessels with local knowledge within the entrance of a bay indenting its S side.

Glasskar and Tollingarna lie 1.5 miles ESE and 2.5 miles E, respectively, of the S extremity of Signilskar, with Tollingbadarna, marked by a light, located 0.5 mile farther E.

Batgrund, with a depth of 5.2m and marked by a buoy on its W side, lies midway between Tollingarna and the W side of Eckero.

Yttre Borgen (60°16'N., 19°16'E.), the westernmost danger in this area, is located 6.5 miles NNW of Gisslan. This rock is closely surrounded by shallow water. Lagbadan, Masskar, and Flyttorna lie between Enskar and this rock. Sydbrotten, with a

depth of 0.6m, lies about 6 miles NNE of Yttre Borgen.

Markallarna, formed by two rocks, lies 4.7 miles NNE of Sydbrotten. Sydbrotten and Markallarna form the outermost dangers on the NW side of the Aland Islands.

Caution.—Submarine cables, which may best be seen on the chart, extend between Enskar and Signilskar. They also extend ESE and then ENE to the W side of Eckero.

4.11 The N side of the Aland Islands is moderately high and the elevated land standing on the E side of Eckero can be seen from a considerable distance seaward. A radio mast, 40m high, stands at an elevation of 138m on **Getaberget** (60°23'N., 19°51'E.) and is a prominent landmark.

The area SE of a line drawn between Sodra Salskar and **Isokari** (60°43'N., 21°01'E.), about 46 miles ENE, is encumbered by a myriad of islets, rocks, and reefs between which are several hazardous, but navigable channels. In this area several isolated dangers lie almost 5 miles NW of a line of bearing previously mentioned, but since their positions have not been determined accurately, mariners are cautioned to stay clear of these dangers.

Isokari, situated 10 miles off the mainland coast of Finland, is profusely indented and fronted by hundreds of islets, rocks, and reefs.

4.12 Off-lying islands and dangers.—Hogsten (60°21'N., 19°27'E.), an islet, lies about 10 miles ENE of Market Light (60°18'N., 19°08'E.) (see paragraph 5.9) and is marked by a beacon, 16m high. The islet of Rodakon lies on foul ground, about 2.5 miles SSE of Hogsten. Several above-water rocks and shallow shoals lie up to 7 miles from Hogsten at the seaward side.

Sodra Salskar (60°25'N., 19°36'E.), a large rocky islet, lies 5.5 miles NE of Hogsten. A light is shown from a tower, 32m high, standing on this islet.

Tartarusa, a rocky shoal with a depth of 4m, lies about 4.2 miles NNW of Salskar Light.



Sodra Salskar Light

Ostra Malen and Vastra Malen, above-water rocks, lie about 4.5 miles W of Salskar Light and a group of shoals, with a least depth of 1.2m, lies about 3.2 miles farther W.

Below-water rocks and shoals compound the dangers lying

within 3 miles NW and SW of Vastra Malen.

Dano Gamlan, an island, lies 4.7 miles E of Sodra Salskar Light. A beacon stands on the W side of Mellanskar and another on Halvman, two islets, located about 0.5 mile N and 0.5 mile NNW, respectively, of the NW extremity of Dano Gamlan.

Iarnbodan is the southernmost of two above-water rocks lying about 3.7 miles NNW of Halvman Beacon. Yttre Margrund and Inre Margrund, each with a depth of 0.6m, lie about 1.2 miles ESE and 1.7 miles SE, respectively, of Iarnbodan.

Brunkan, an above-water rock, lies on the N side of the coastal track about 0.5 mile NE of Mellanskar; shoals, with depths of 0.6 to 6.1m, lie within 1 mile NE and NW of this rock. Shoal water fringes the S side of Brunkan and is marked by a buoy.

Kallan (60°27'N., 19°45'E.), an islet from which a light is shown, lies 1 mile WNW of Brunkan.

Jarngrynnorna (60°34'N., 19°53'E.), a shoal, lies about 8 miles NNE of Mellanskar Beacon. It has a depth of 2.7m and is marked by buoys. Isolated shoal patches, with depths of less than 10m, lie up to about 5 miles N of this shoal.

4.13 Koxnan (Koksnan) (60°28'N., 19°57'E.), from which a light is shown, lies about 5.5 miles ENE of Mellanskar Beacon. Shoal water extending about 0.5 mile S from Koxnan is marked by a buoy.

Ranno (60°32'N., 20°12'E.), with Norrskar close N, is one of the outermost islets in this vicinity. A light is shown from a building standing on this islet. A racon is situated at the light.

Ytterstberg (60°34'N., 20°32'E.), an above-water rock, lies about 16 miles SW of Isokari Light; it is fringed by shoals which extend up to about 1 mile S. A rocky shoal, with a depth of 2.4m, and another shoal, with a depth of 4m, lie about 1.5 miles SW and 1.2 miles WNW, respectively, of Ytterstberg.

Lights are occasionally shown from Inre Bredan, an islet lying 5.8 miles E of Ytterstberg, and from Langor, another islet lying 4.5 miles SSE of Inre Bredan.

Ytterstbergsbrott (60°37'N., 20°33'E.) lies about 2.2 miles N of Ytterstberg and has a depth of 0.9m. It is one of the outermost dangers lying NW of Saaristomeri. Numerous rocks, shoals, and islets encumber the seaward approaches to this area and to the SSW.

Petterssonsgrund (60°41'N., 20°44'E.), an isolated shoal patch, has a least depth of 8.1m, and lies about 8.5 miles WSW of Isokari Light (60°43'N., 21°01'E.). A shoal, with a depth of 1.8m, lies about 1.2 miles SE of this patch at the NE edge of an area of foul ground.

An extensive area encumbered with numerous islets, rocks, and shoals lies E and SE of Petterssonsgrund.

Matinmatala, a shoal with a least depth of 2.7m, lies 2 miles S of Isokari and is marked by a buoy.

The main approach channel from seaward in this vicinity, which is authorized for drafts up to 10m, leads SE and passes SW of Isokari.

Fairways from Seaward to Turku and Naantali

4.14 The following are the five main fairways leading to the ports of Turku and Naantali, as follows:

1. From the Baltic Sea by way of Uto—a 61-mile long

fairway authorized for drafts up to 13m.

2. From the Baltic Sea by way of Uto—a 53-mile long fairway authorized for drafts up to 10m.

3. From the Aland Sea via Nyhamn—an 83-mile long fairway authorized for drafts up to 9m

4. From the Gulf of Bothnia via Isokari—a 58-mile long fairway authorized for drafts up to 10m.

5. From the Gulf of Finland via Hanko—a 61-mile long fairway authorized for drafts up to 7.5m.

The authorized drafts for the above routes are sometimes slightly reduced for temporary periods and the authorities should be contacted for the latest information.

See paragraph 4.1 for details concerning pilotage. The harbors are kept open all year with icebreaker assistance. Although the fairways are well marked, they are extremely long, narrow, and intricate. Local knowledge is necessary. Pilots should be consulted for information concerning anchorages along the fairways.

Turku (60°27'N., 22°15'E.)

World Port Index No. 27820

4.15 The port of Turku, formerly known as Abo, is situated at the mouth of the Aurajoki River. The port is a major automobile ferry terminal and is connected by railways and roadways to towns in Finland, Sweden, Germany, and Russia. There are also facilities for shipbuilding and repairs.

Turku Home Page

<http://www.portofurku.fi>

Tides—Currents.—The harbor has virtually no tide and the current is negligible.

Depths—Limitations.—The main berthing facilities are spread along the mainland, which is fronted by several islands. The largest of these islands are Hirvensalo (60°25'N., 22°10'E.), Ruissalo (60°26'N., 22°10'E.), and Luonnonmaa (60°28'N., 22°00'E.). The channels leading to the main port complexes lead between these islands. The facilities lie at the mouth of the Aurajoki River, along the river channel, and along the fairway lying between the mainland and the fronting islands on either side of the river mouth.



Turku

The entrance channel leading to the main harbor is authorized for drafts up to 10m. The entrance channel leading to the oil terminal is authorized for drafts up to 9m.

The main harbor has a total of 5,090m of quayage and provides 39 berths, with depths of 6 to 11m alongside. There are facilities for passenger, cruise, bulk, general cargo, container, ro-ro, timber, ferry, oil, and LPG vessels. Generally, vessels up to 250m in length and 10m draft can be accommodated in the main harbor. Tankers up to 170m in length and 9m draft can be handled at the oil terminal.

The largest drydock, generally used for building, is 365m long and 80m wide. The largest repair drydock is 183m long and 25.6m wide, with a depth of 8.2m on the sill.

Pilotage.—Pilotage from seaward is compulsory, although, harbor pilotage is not. See paragraph 4.1 for further details. The sea pilot will be able to advise vessels on pilot exchange points and recommendations with regard to harbor pilotage.

Harbor pilots generally board regular vessels in the vicinity of Kalkkiniemi Lighted Buoy T12 (60°25'.3N., 22°10.6'E.) and deep-draft vessels in the vicinity of Kuuva Light (60°24.5'N., 22°07.5'E.).

Regulations.—See paragraph 4.1 for details concerning the Archipelago Vessel Traffic Service (VTS).

When passing Rajakari Light (60°22.7'N., 22°06.0'E.), all vessels bound for the port must report to Turku Port Control on VHF channel 12.

Tankers are prohibited from passing in Pansio Channel and must report to Turku Port Control.

Generally, vessels are prohibited from passing in Rajakari-Port of Turku Channel (10m) between Kuuva Light (60°24.5'N., 22°07.5'E.) and the port. However, minor vessels may pass each other between Kuuva Light and Janissaari Light (60°25.3'N., 22°10.9'E.).

Between Janissaari Light and the port, minor vessels and cargo vessels of such size that they can pass each other safely may do so. It is assumed that both vessels have agreed between themselves on this matter in advance and both vessels accept such an encounter. In addition, Turku Port Control must be informed of this situation.

All vessels must report to Archipelago VTS Center when entering and exiting the Turku Port Control area.

Contact Information.—The port can be contacted by e-mail, as follows:

portcontrol@turku.fi

Caution.—Several submarine cables and pipelines cross the approach channels at numerous points along the route.

Naantali (60°28'N., 22°02'E.)

World Port Index No. 27805

4.16 Naantali, a ferry terminal and commercial bulk port, is situated close W of Turku. There are also facilities for ship-

building and repairs.

Naantali Home Page

<http://www.naantali.fi/satama>

Tides—Currents.—The harbor has virtually no tide and the current is negligible.

Depths—Limitations.—The main entrance channel is authorized for drafts up to 13m.

The oil terminal (Tupavuori) has three berths. No. 1 Berth is 50m long and has a depth of 7m alongside; No. 2 Berth is 80m long and has a depth of 10m alongside; and No. 3 Berth is 70m long and has a depth of 13m alongside.

Bulk Cargo Quay is 370m long and has a depth of 13m alongside. Timber Quay is 110m long and has a depth of 8m alongside. Sugar Quay is 32m long and has a depth of 4.5m alongside.

There are three ro-ro ferry berths, up to 165m long, with depths of 6.9m alongside.

The port provides facilities for ro-ro ferry, bulk, general cargo, timber, and tanker vessels. Vessels up to 70,000 dwt, 250m in length, and 13m draft can be accommodated.

A fairway, authorized for drafts up to 7.7m, leads to the shipyard. The drydock, generally used for building, is 255m long and 70m wide, with a depth of 8.2m on the sill.

Aspect.—Several conspicuous silos stand in the vicinity of the harbor berths.



Naantali

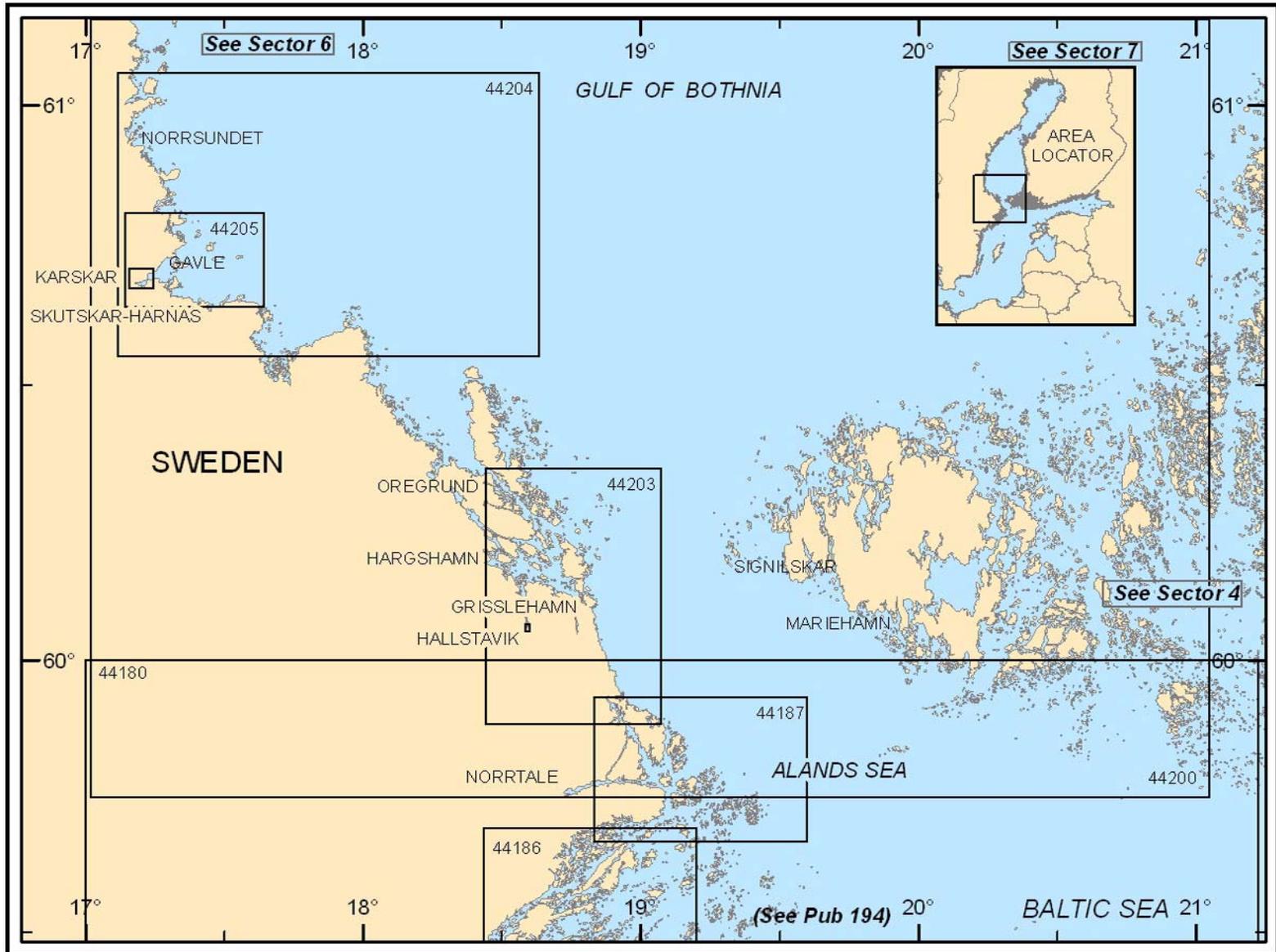
Pilotage.—Pilotage is compulsory. See paragraph 4.1 for further details. The sea pilot will be able to advise vessels on pilot exchange points. Harbor pilots are stationed in the vicinity of Tupalahti Light (60°27'.4N., 22°03.6'E.).

Regulations.—See paragraph 4.1 for details concerning the Vessel Traffic Service (VTS). In addition, see Regulations under Turku in paragraph 4.15.

Contact Information.—The port can be contacted by e-mail, as follows:

portcontrol@naantali.fi

Caution.—Several submarine cables and pipelines cross the approach channels at numerous points along the route.



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

SECTOR 5 — CHART INFORMATION

SECTOR 5

SODRA KVARKEN AND THE ADJACENT SWEDISH COAST

Plan.—This sector describes a portion of the E coast of Sweden between Arholma and Lovstabusken, with its limits on the Aland Sea; and Sodra Kvarken, the main passage leading N from the Aland Sea into the Gulf of Bothnia. The descriptive sequence is N and NW from Arholma.

General Remarks

5.1 Tides—Currents.—Discharge from the rivers and the general counterclockwise water circulation in the Baltic Sea cause what the Swedes refer to as the “net current” through the Stockholm archipelago. The “net current” is very weak, about 0.2 knot, and is easily allowed for. However, currents caused by weather and winds, particularly in narrow passages such as Sodra Kvarken, may reach a velocity of several knots.

Ice.—The Swedish Maritime Administration Icebreaking Division, in Gothenburg, operates ten icebreakers around the Swedish coast and maintains 24-hour operations at the Ice Center.

The Icebreaking Division provides a brief account of the ice situation for each day from the areas where icebreakers are operationing, together with instructions on safe ship routings and an updated “Ice Chart” for winter navigation. The “Ice Chart” can be accessed at the Swedish Maritime Administration home page.

Swedish Maritime Administration Home Page

<http://www.sjofartsverket.se/en/>

The Ice Center can be contacted, as follows:

1. Telephone: 46-31-647780
2. Facsimile: 46-31-647789
3. E-mail: opc@sjofartsverket.se

The main function of the Division is ice-breaking, that is to break ice between open waters and the waters protected from sea ice, pack ice, and other obstacles.

The purpose of icebreaking is to procure the efficiency of Swedish commercial shipping by minimizing cost and maximizing standards of service in winter months. The services also provide an appropriate traffic restriction policy to accomplish safe and efficient transits to and from Swedish ports.

Restrictions are imposed to improve on safety and efficiency of vessels traffic. Icebreaker assistance is given only to vessels those meet with the appropriate classification society requirements on hull integrity.

Information on ice report, restraining conditions, existing restrictions, traffic directions, cargo limitations and restrictions, port infrastructure, and winter navigation guidance can be obtained from the website.

For further details, see Pub. 140, Sailing Directions (Planning Guide) for the North Atlantic Ocean and Adjacent Seas.

Pilotage.—Pilotage is compulsory in Swedish coastal waters and along certain fairways connecting ports along the coast.

The vessels subject to compulsory pilotage vary in type and size according to location; these vessels are divided into the following categories:

1. Category 1—Vessels carrying or with uncleaned tanks which last carried:

- (i) liquefied gas.

- (ii) liquid chemicals defined in MARPOL '73 Supplement 2, Annex 2 as category A, B, or (if vessel does not have a double-skin hull under all cargo tanks) C.

- (iii) liquid chemicals which, according to the IMO bulk chemical code, should be carried in Type 1 or 2 vessels.

2. Category 2—All other chemical tankers which are laden or have uncleaned tanks and all laden oil tankers.

3. Category 3—All other vessels.

Generally, pilots must be requested at least 5 hours in advance stating when and the area where pilotage is required. Any amendments should be sent at least 3 hours before the requested time. If continuous pilotage is required on voyages exceeding 12 hours, this must be reported when ordering.

Deep-sea pilots and pilotage service required outside of normal operating hours should be ordered at least 24 hours in advance. Vessels should establish VHF radio contact with the pilot station before arrival.

Application for pilotage exemption certificates for certain fairways may be made to the pilotage authority in the area concerned. Exemption certificates may be held for a period of two years for certain pilotage areas and channels.

The main pilot station along this part of the coast is situated at Svartklubben. Pilots can be contacted by VHF and board vessels about 2 miles SE of Svartklubben Light (60°11'N., 18°50'E.).

The Svartklubben pilotage area lies between a line extending E from Rodhall (60°36.0'N., 17°59.5'E.) and latitude 59°50'N.

Pilotage is compulsory for vessels, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of over 80m length or 15m beam.
3. Category 3 vessels of over 90m length or 16m beam.

In certain pilot channels between Svartklubben and Hallstavik, pilotage is compulsory, as follows:

1. All Category 1 vessels.
2. Category 2 and 3 vessels of over 80m length, 15m beam, and 5m draft.

In certain pilot channels between Svartklubben and Forsmark, pilotage is compulsory, as follows:

1. All Category 1 vessels.
2. Category 2 and 3 vessels of over 80m length, 15m beam, and 4.5m draft.

All ordering of pilots from the station at Svartklubben must be carried out through VTS Stockholm.

See Pub. 194, Sailing Directions (Enroute) Baltic Sea (Southern Part) for information concerning VTS Stockholm.

For information pertaining to icebreaking vessels, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

It should be noted that ordering of pilots in the Swedish waters described within this sector is presently carried out through the main VTS systems. However, it is reported that procedures for the initial ordering of pilots via the internet will be introduced in the near future. For additional information concerning these procedures, see the following Swedish Maritime Administration website:

Swedish Maritime Administration Home Page

<http://www.sjofartsverket.se/en/>

Regulations.—Channels leading through and into the Stockholm archipelago (Stockholms Skargard) are subject to a mandatory Vessel Traffic Service (VTS) system. The information centers will pass navigational and traffic details as required. Reporting is mandatory for vessels over 300 grt or over 50m in length, as well as vessels under tow that have a combined length of over 50m.

See Pub. 194, Sailing Directions (Enroute) Baltic Sea (Southern Part) for information concerning VTS Stockholm.

The Swedish authorities have instituted a system of restricted areas and semi-restricted areas throughout the coastal waters. The limits of these areas may best be seen on the chart. Vessels are generally permitted to transit these areas only through the approved channels, and with a pilot aboard. For further details, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Directions.—From the vicinity of Flotjan Light (59°49'N., 19°47'E.) (see paragraph 4.5 and paragraph 4.6), the main off-shore route continues in a NW direction through the center of the Aland Sea. It then turns N and passes through Sodra Kvarken.

Caution.—When proceeding through the Aland Sea and Sodra Kvarken, the Swedish coast and its fringing islands will be observed to be comparatively high, in contrast to the low Finnish coast. With the Swedish side being steep-to, it may tend to appear closer than the low Finnish side. Vessels should take care in ascertaining their position before altering course toward the Finnish side of the gulf. The Stockholm archipelago area has few distinguishing landmarks.

Special marks and buoys are occasionally placed temporarily on and off the Swedish coast, during the summer season, for the purpose of making surveys. Vessels are warned not to mistake these special marks for the navigational aids.

Fishing for herring during the autumn months is carried out around the shoals lying N of Orskar, in the approaches to Gavlebukten, and on Finnegrunden. Vessels may encounter heavy concentrations of fishing gear in these areas.

Several submarine cables extend across the Alands Sea and may best be seen on the chart.

During the winter, many buoys in these waters are removed while others may be damaged or break adrift.

In the coastal waters within this sector, numerous logs may be found adrift at all times of the year.

Areas dangerous due to mines laid during World War II exist within the waters described in this sector. There is still a risk of danger in these areas when anchoring or carrying out any seabed activities.

Arholma to Sodra Kvarken

5.2 Arholma (59°50'N., 19°07'E.), an island, lies off the E coast of Sweden, about 20 miles W of Flotjan Light (59°49'N., 19°47'E.). The coast between this island and Grisslehamn, 17 miles NNW, is heavily wooded and fronted by Bjorko and Vaddo. A prominent beacon tower, 16m high, stands on the W and tallest part of Arholma.

Stockholms Skargard is an area consisting of numerous islands, islets, rocks, and shoals lying S of Arholma. It extends, in places, up to 30 miles seaward of the mainland coast.

The Arholma entrance to Stockholm Skargard is authorized for vessels with drafts up to 7m. The main channel from seaward leads SSE and passes close W of Simpnasklubb Light.

Stockholms Skargard and the channels passing through it are described in Pub. 194, Sailing Directions (Enroute) Baltic Sea (Southern Part).

Simpnasklubb Light (59°54'N., 19°05'E.), equipped with a racon, is shown from a prominent floodlit tower, 16m high, standing on a rock 2.4 miles NW of the N extremity of Arholma.



Simpnasklubb Light

Norrbadan, a rock awash, lies about 0.4 mile ENE of the light. This rock forms the outermost danger in this vicinity and is marked by a buoy.

Vaddo Kasberg, located on the S part of Vaddo, is 50m high and bare on the S side of its summit. This hill is therefore conspicuous along the otherwise wooded section of coastline. A conspicuous television tower, with aeronautical lights, stands close N of the summit, 8.5 miles NW of Simpnasklubb Light.

In contrast to this part of the coast, Vaddo is quite rocky, except for a moderately steep-to 3.5 mile stretch extending S of Grisslehamn. In the vicinity of Grisslehamn, a number of houses and other buildings are clearly visible from seaward on the E and SE side of the town.

The Vaddo Kanal, 12 miles long, connects Stockholm Skargard to Oregrunds Skargard. It leads along the W side of Vaddo Island and has a least depth of 2m. Several overhead cables and bridges span the fairway of this canal.

Caution.—A defensive minefield area, through which surface navigation is permitted, lies between Arholma and Bjorko. Anchoring and fishing are prohibited in the fairway within this area. Vessels should avoid transiting the area during thunder-

storm activity.

An area in which anchoring, diving, and fishing are prohibited lies centered 13.5 miles ESE of Simpnasklubb Light and may best be seen on the chart. A wreck with unexploded ammunition lies in this area.

Several submarine cables, which may best be seen on the chart, extend seaward from the E sides of Bjorko and Vaddo.

5.3 Grisslehamn (60°06'N., 18°49'E.) (World Port Index No. 25440) is situated on the narrow isthmus connecting the N end of Vaddo with the peninsula of Byholma. This small port consists of two natural harbors, one on each side of the isthmus. The harbor on the W side is only used by small craft. The harbor on the E side is used by automobile ferries and fishing vessels.

Winds—Weather.—The easternmost harbor is open to winds between the E and W.

Ice.—The port is normally closed by ice from early January to early March.

Depths—Limitations.—The easternmost harbor is entered through a channel, which is authorized for vessels with drafts up to 6m. Local knowledge is advised.

An automobile ferry berth, 98m long, is situated at the N side of the harbor and has a depth of 5.5m alongside. A lay-by quay, 160m long, is situated next to the ferry berth and has a depth of 6m alongside. The inner part of the harbor has depths of 2 to 4.5m alongside and provides piers for small craft and fishing vessels.

Aspect.—Loskaret, a barren and rocky islet, lies off the N entrance point of the easternmost harbor and is prominent.

A conspicuous radio mast stands, at an elevation of 140m, about 0.5 mile S of the easternmost harbor.

A lighted range indicates the approach channel, but the posts are unmarked and are reported to be difficult to make out by day.

Regulations.—A maximum speed of 5 knots is enforced in the vicinity of the harbor.

Anchorage.—Vessels with local knowledge can anchor, in depths of 8 to 9m, sand and clay, W of Loskaret, but vessels must be ready to put to sea if the wind shifts to between E and S.

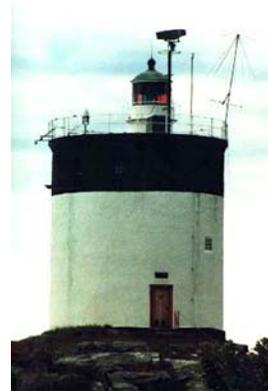
5.4 A chain of islands, of which the largest are Singo (60°11'N., 18°46'E.) and Graso (60°24'N., 18°27'E.), extends 28 miles in a NNW direction from the N end of Vaddo. Oregrunds Skargard and Oregrundsgrepen lie between these islands and the mainland to the W. Several small harbors are situated along the shores of these two areas of water.

Svartklubben Light (60°11'N., 18°50'E.), equipped with a racon, is shown from a prominent floodlit tower, 12m high, standing on a skerry, 7m high, lying close off the wooded island of Singo.

Stora Laget, a group of small islets, lies 2 miles N of Svartklubben Light. A racon is situated at this group.

From seaward of Svartklubben Light, an aeronautical light shown at an elevation of 375m at Palsmoraasen (60°16'N., 18°05'E.) may be seen.

Oregrunds Skargard (60°16'N., 18°36'E.), consisting of the waters lying SE of Oregrund (60°20'N., 18°27'E.), is enclosed on the E side by Singo and other off-lying islands and on the W side by the mainland. The waters lying NW of Oregr-



Svartklubben Light

und are known as Oregrundsgrepen

The main entrance leading from seaward into Oregrunds Skargard is through Jossans Inlopp, situated about 2 miles NE of Svartklubben Light. This channel is authorized for drafts up to 10.4m as far as Vassaro (60°15'N., 18°42'E.). The fairway then continues NW to Oregrund and is authorized for drafts up to 6.5m.

The secondary entrance channel leads NW and passes close NE of Svartklubben Light. This channel, which is authorized for drafts up to 7m, continues NW for about 6 miles and then joins the main fairway, close SW of Vassaro.

These entrance routes are well-marked and may best be seen on the chart.

The channels leading through Oregrunds Skargard and Oregrundsgrepen can be used to good advantage, particularly at night and in bad weather, as an alternative to passing through Sodra Kvarken. Good anchorage may be obtained in several places along this route; however, local knowledge or the services of a pilot is necessary (see paragraph 5.1).

Singofjarden is the expanse of water lying W of Singo and Fogdo; extending from it are Raggarfjarden, Galtfjarden, and Herrang. A route, authorized for drafts up to 8.5m, leads in a S direction from SW of Vassaro into Singofjarden.

Caution.—An area, which has not been fully surveyed, extends up to 7 miles E of Graso (60°24'N., 18°27'E.) and may best be seen on the chart.

It is reported that less depths than charted exist within the main entrance channel leading from seaward into Oregrunds Skargard through Jossans Inlopp. The local authorities should be contacted for the latest information concerning maximum authorized drafts.

5.5 Hallstavik (60°03'N., 18°35'E.) (World Port Index No. 25460) is situated at the head of the Edeboviken, a narrow inlet leading S from Singofjarden. This small port, which is privately owned, exports paper and timber products.

Ice.—The harbor is normally obstructed by ice from early January to the end of March, but is kept open by an icebreaker.

Depths—Limitations.—The main entrance channel is authorized for drafts up to 7m. Overhead cables, with a vertical clearance of 40m, span the entrance channel and the S part of the harbor.



Hallstavig

The paper factory quay, at the E side of the harbor, is 310m long and has depths of 7 to 7.5m alongside. Oil can be discharged at this quay. It is reported that pontoons are situated between the side of the vessel and the quay for mooring purposes.

The paper warehouse quay, at the SW side of the harbor, forms a berth, 160m long, with two breasting dolphins, and has a depth of 7m alongside. A ro-ro ramp, with a depth of 7.5m alongside, is located inside the dolphins.

Clay Pier, 72m long, projects into the harbor and provides a ro-ro berth with a depth of 7m alongside.

Vessels up to 185m in length, 28m beam, and 7m draft can be accommodated in the harbor.

Regulations.—Tankers may enter and leave only during daylight. Vessels over 150m in length and 20m beam may only enter by daylight.

Speed restrictions are in force within the entrance channel.



Hargshamn

Caution.—Numerous log rafts may be secured along the sides of the approach channel.

5.6 Hargshamn (60°11'N., 18°27'E.) (World Port Index No. 25480), a small harbor, lies at the W side of Galtfjarden and exports ore products and timber.

Ice.—The harbor is normally obstructed by ice from early January to the end of March, but is kept open by an icebreaker.

Depths—Limitations.—The main entrance channel is authorized for drafts up to 8.5m. The harbor consists of a series of berths situated along the SW shore of the mainland opposite the island of Glotan.

Ore Quay is 95m long and has depths of 11.9 to 12.5m alongside. A ro-ro berth is situated close E of the root of the this quay and has a depth of 7.1m alongside. The loading con-

veyor travels along most of the length of the ore quay and only the largest vessels have to shift during loading.

New Quay, 40m long, is located close WNW of Ore Quay and has a depth of 8m alongside. A ro-ro jetty, 45m long, is located at the E end of New Quay and has a depth of 9.4m alongside.

Vessels up to 185m in length, 26m beam, and 8.5m draft can be accommodated in the harbor.

Pilotage.—Pilots board off Svartklubben Light, off Oregrund, off Engelska Light (60°22.2'N., 18°20'E.) and off Djursten Light (60°22.2'N., 18°24.3'E.) on a request basis.

Pilots can be contacted, as follows:

1. VHF: VHF channel 13
2. Telephone: 46-173-20155
3. E-mail: eastcoastpilot@sjofartsverket.se

Anchorage.—Vessels may anchor, in depths of 6.5 to 12m, loose mud, within the basin lying SW of Glotan.

5.7 Oregrund (60°20'N., 18°27'E.) (World Port Index No. 25510), a small harbor, is situated at the head of Oregrundsgrepen and protected by a breakwater, 150m long. It is usually closed by ice from January until the beginning of April.

The belfry of the church in the town is prominent and an old lightship stands as a monument on the E side of the entrance.

The harbor is used by fishing vessels, small craft, yachts, and an automobile ferry. The main quay, 100m long, is situated at the W side of the harbor basin and has depths of 2.5 to 4m alongside. The roadstead has depths of 14 to 20m, stiff mud, but is seldom used by vessels because the anchorage is exposed to N winds.

Kallero (60°21'N., 18°16'E.), a small harbor, is situated about 2.5 miles inside Kallrigafjarden, which is entered 4.5 miles WNW of Oregrund. The entrance channel is authorized for drafts up to 4.3m. The main quay is 110m long and has depths of 3.5 to 5m alongside. Vessels with local knowledge can anchor, in a depth of 5m, clay and mud, off the harbor.

Fosmark (60°24'N., 18°13'E.), a small private harbor, is situated 8 miles NW of Oregrund and serves a power station. It is formed by a breakwater and a pier. The entrance channel is authorized for drafts up to 5.5m. There is a quay, 95m long, and a ro-ro ramp, with three breasting dolphins. Both berths have depths of 6m alongside.

Caution.—It is reported that less depths than charted exist within the entrance channel leading to Kallero and the local authorities should be contacted for the latest information concerning maximum authorized drafts.

A restricted area extends SE from the harbor at Fosmark toward the entrance fairway. Entry into this area is prohibited without permission from the authorities.

Sodra Kvarken

5.8 Sodra Kvarken (60°18'N., 19°00'E.), the main offshore passage, lies between the E edge of the dangers extending N for 20 miles from Svartklubben Light and those dangers extending W from the Aland Islands (Ahvenanmaa).

The main channel, through which the route passes, is swept to a least depth of 18.2m. The approaches on the N and S sides of this channel have depths of over 100m.

Aside from occasional drift ice, the passage is normally free from ice until the late winter freeze in March.

5.9 East side.—Solovjeva (60°11'N., 19°11'E.), marked by a lighted beacon, lies 3 miles WNW of Gisslan Light (60°10'N., 19°18'E.) (see paragraph 4.10) It is the southernmost danger of a line of detached rocks that extends about 7 miles SSE from Market, on the E side of the passage.

Brentonsgrund, with a depth of 4.9m; Sodra Sankan, with a depth of 0.6m; Stor Sankan, awash; and Norra Sankan, with a depth of 1.2m, lie, respectively, 2.3, 3.5, 5.2, and 6.7 miles N of Solojeva.

Market (60°18'N., 19°08'E.), an islet through which the border between Sweden and Finland runs, lies about 7 miles N of Solojeva. A light is shown from a tower, 14m high, at the corner of a prominent white house standing on this islet.



Market Light

Marketshaller, an above-water rock, lies about 0.7 mile NW of Market Light.

Marketskallen Light (60°19'N., 19°02'E.) is shown from a tower, 17m high with a helicopter platform, situated 3 miles W of Market. A racon is situated at this light.

Sodra Kvarken Light (60°26'N., 19°05'E.) is shown from a prominent structure, 17m high, standing on a shoal about 8 miles N of Market. A racon is situated at this light.

Caution.—Vessels are advised against passing E of Market as the area is not well-marked nor adequately surveyed.

An area dangerous to fishing and anchoring due to bottom mines is formed between Understen and Market; the limits of the area are best seen on the chart.

5.10 West side—Halsaren (60°13.2'N., 18°54.8'E.) is a small pinnacle rock, 6m high, lying 4.8 miles NE of Svartklubben Light. It is dark in color and can be distinguished from a considerable distance, particularly from the N. An isolated shoal patch, with a depth of 9.7m, lies about 0.5 mile NE of this rock.

Travarn, a small rocky shoal, lies about 1 mile N of Halsaren. When there is any sea, the breakers in the vicinity of this shoal are visible from a considerable distance.

Understen Light (60°17'N., 18°55'E.) is situated on a rocky ledge 3.2 miles N of Halsaren. It is shown from a prominent tower, 39m high. A dark round tower stands close W of the



Understen Light



Grundkallen Light

light and is conspicuous in contrast to the other buildings on the rock.

Nyberget and Oldbergsgrund, marked by buoys, lie about 1.5 and 2.2 miles NNE of Understen Light.

Oldbergsgrund Lighted Buoy (60°19'N., 18°59'E.) marks the E side of a shoal area extending NE from Nyberget.

Hoppetsgrund (60°22'N., 18°53'E.), with a depth of 2.3m, is marked on its E side by a buoy. This shoal lies about 5 miles NNW of Understen Light. Baldersgrund, a rock awash, lies 1 mile NNW of Hoppetsgrund.

Grundkallen Light (60°30'N., 18°51'E.) is shown from a prominent tower, 34m high with a helicopter platform, standing 8 miles NW of Sodra Kvarken. A racon is situated at this light.

Grundkallegrund, an extensive bank, extends up to about 5.5 miles S and 3 miles SE of the light. This bank is composed of numerous steep-to and shallow shoals, some awash. It is marked on the E side by buoys. A conspicuous disused light structure is reported to stand near the S end of the bank, about 4 miles SSW of Grundkallen Light.

Giffardsgrund, a group of shoals with a least depth of 1.4m, lies about 4 miles NW of Grundkallen Light and is marked by a buoy.

Directions.—The main offshore route continues in a NW di-



Orskar Light



Bjorn Light

rection up the middle of the Aland Sea, passing NE of Simp-nasklubb Light and W of Solovjeva. It then turns N and passes E of Understen Light and between Marketskallen Light and Oldberggrund Lighted Buoy, about 1.2 miles WNW. The route then leads W of Sodra Kvarken Light and NE of Grundkallen Light.

Caution.—An area, which is incompletely surveyed, lies W of Understen Light and extends up to 7 miles from the E coast of Graso.

Generally, the soundings give very little warning of the close approach to the off-lying shoals which are mostly steep-to.

5.11 Argos Grund Light (60°38'N., 18°22'E.) is shown from a prominent structure, 18m high, standing on the N part of a shoal about 16.5 miles NW of Grundkallen Light. A racon is situated at this light.

Orskar Light (60°32'N., 18°23'E.) is shown from a prominent tower, 33m high, standing on the N part of Orskar.

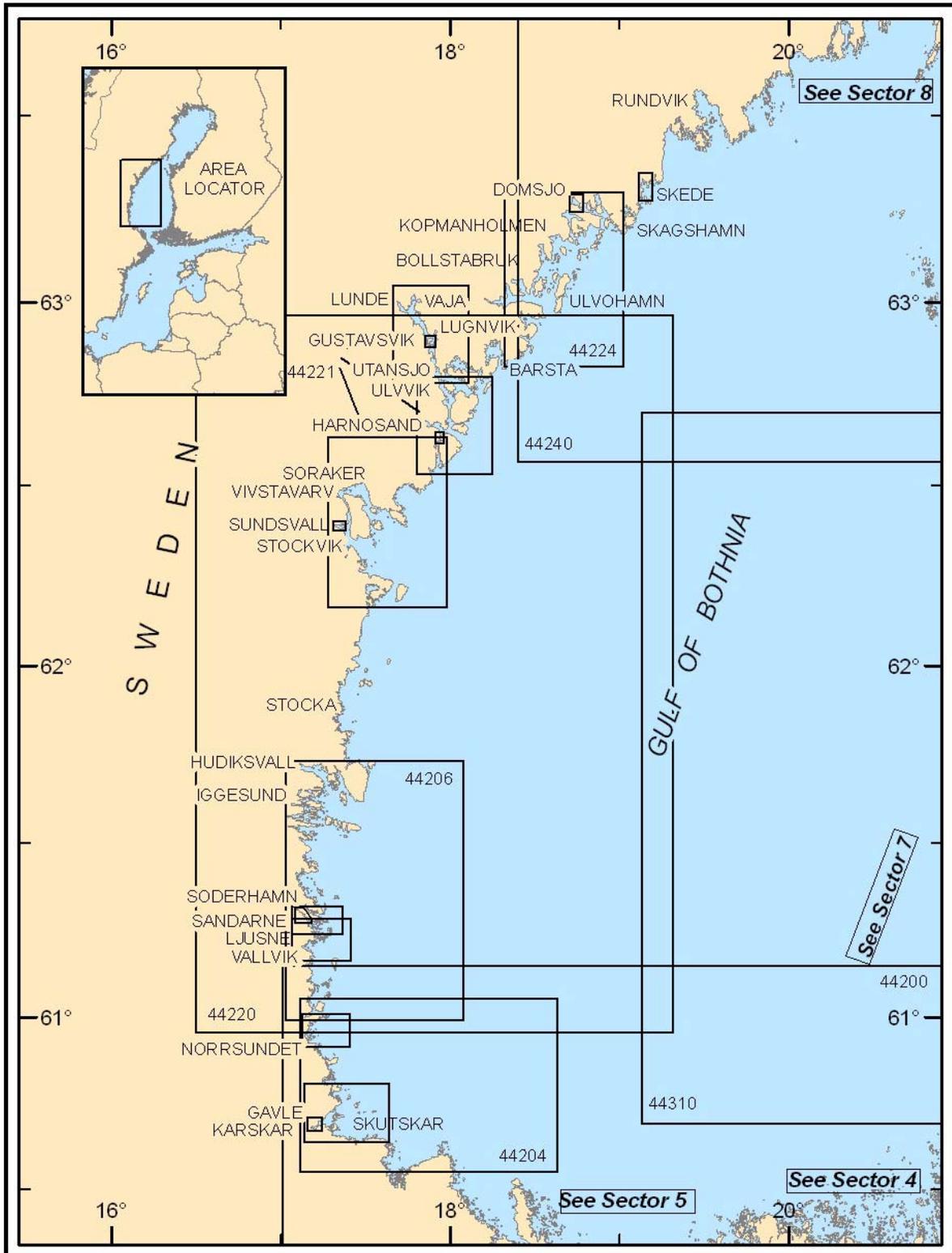
Two prominent radio masts stand at an elevation of 120m about 2 miles SSE of the light, on the island of Graso.

A prominent lookout tower, 15m high, is situated at the village of Norrboda, close SSW of the radio masts.

Bjorn Light (60°38'N., 17°59'E.) is shown from a tower, 25m high, standing on an islet lying 2.3 miles N of the mainland. This islet lies 11 miles W of Argos Grund Light at the outer edge of the numerous rocks and shoals fronting the mainland in this vicinity. A number of conspicuous buildings are situated on the islet.

The main approach into Oregrundsgrepen, which is encumbered by numerous shoals on both sides of the passage, lies between Bjorn Light and Argos Light. The fairway channel continues SE to Oregrund and is authorized for drafts up to 6.5m.

For details of the waters lying W and N of Bjorn Light, see paragraph 6.2.



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

SECTOR 6 — CHART INFORMATION

SECTOR 6

SWEDEN—EAST COAST—LOVSTABUKTEN TO JARNASUDDE

Plan.—This sector describes the greater part of the Swedish coast bordering the S portion of the Gulf of Bothnia, between Lovstabukten and Jarnasudde (63°26'N., 19°39'E.). The descriptive sequence is S to N.

General Remarks

6.1 Tides—Currents.—Along the Swedish shore of the Gulf of Bothnia, the general set of the current is S in calm weather, with a tendency to set toward the land. The currents are affected by the wind. A change in the current often precedes a storm by an interval of several hours to a day.

The current in the Angermanalven river sets generally S through the estuary and is usually weak. However, during spring freshets the current may sometimes attain a considerable velocity at Nyland (63°00'N., 17°46'E.) and in the narrow passages.

Near Ostra and Vastra Finngrunden (60°59'N., 18°36'E.) the current usually sets SE or ESE, and frequently attains a rate of 1 knot. The direction varies with sudden changes of wind and weather. In the approaches to Gavle (60°41'N., 17°10'E.), the current is weak and its direction variable.

Ice.—See general Remarks in paragraph 5.1.

Pilotage.—See paragraph 5.1 and Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for information pertaining to vessels in Swedish waters.

The main pilot stations along this part of the coast are situated at Gavle, Sundsvall, and Ornskoldsvik.

The station at Gavle provides pilotage for the area lying between a line bearing 090° from Rodhall (60°36'N., 17°59'E.) and latitude 62°08'N (see paragraph 6.7).

The station at Sundsvall provides pilotage for the area lying between latitude 62°08'N and latitude 62°50'N, including Gavgfjorden and Angermanalven (see paragraph 6.43). Requests for pilotage in this area must be made through the VTS station at Gavle (see paragraph 6.7).

The station at Ornskoldsvik provides pilotage for the area between a line bearing 140° through Norrbyskar (63°33'N., 19°52'E.) and latitude 62°50'N (see paragraph 6.52). Requests for pilotage in this area must be made through the VTS station at Lulea (see paragraph 9.19).

It should be noted that ordering of pilots in the Swedish waters described within this sector is presently carried out through the main VTS systems. However, it is reported that procedures for the initial ordering of pilots via the internet will be introduced in the near future. For additional information concerning these procedures, see the following web site:

Swedish Maritime Administration Home Page

<http://www.sjofartsverket.se/en/>

Regulations.—Channels leading through and into the Stockholm archipelago are subject to a mandatory Vessel Traffic Ser-

vice (VTS) system. The information centers will pass navigational and traffic details as required. Reporting is mandatory for vessels over 300 grt or over 50m in length, as well as for vessels under tow that have a combined length of over 50m.

The Swedish authorities have instituted a system of restricted areas and semi-restricted areas throughout the coastal waters. The limits of these areas may best be seen on the chart. Vessels are generally permitted to transit these areas only through the approved channels, and with a pilot aboard. For further details, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Caution.—During the winter, many buoys in these waters are removed while others may be damaged or break adrift.

In the coastal waters within this sector, numerous logs may be found adrift at all times of the year.

Areas dangerous due to mines laid during World War II exist within the waters described in this sector. There is still a risk of danger in these areas when anchoring or carrying out any seabed activities.

Due to various circumstances, including the discovery of obstructions, depths within the channels leading through the offshore dangers along this stretch of coast may change frequently. Therefore, vessels are advised to contact the local authorities in order to ascertain the latest information, including the maximum authorized drafts.

Lovstabukten to Gavle

6.2 Lovstabukten (60°38'N., 17°45'E.), a large bay, is entered between Bjorn and a point on the mainland about 10.5 miles W. It is encumbered with numerous islets and dangers, and should not be entered without local knowledge. The shores of the bay are low and wooded.

Several small harbors, mostly used by fishing vessels and small craft, are situated within this bay. Timber rafts are assembled off some of these harbors.

Bjorn Light (60°38'N., 17°59'E.), described in paragraph 5.11, is shown from the northernmost islet of a group of dangers extending up to about 2.5 miles N from the mainland coast, on the E side of Lovstabukten.

Boliviagrundet, a rocky shoal with a depth of 6.9m, lies about 2.4 miles E of Bjorn Light and is the outermost danger in this vicinity.

Campsgrund (60°42'N., 17°51'E.) lies about 5 miles NW of Bjorn Light in the approach to Lovstabukten. This shoal has a least depth of 8m and is marked by a lighted buoy.

Caution.—A firing and bombing practice exercise area, which extends 1.5 miles N from the shore, is situated off Norrskaten, in the NE part of Lovstabukten, about 3.5 miles SW of Bjorn Light.

6.3 Finngrunden (60°58'N., 18°03'E.) lies about 40 miles offshore and fronts the approach to Gavlebukten. It consists of two extensive banks of sand and gravel, which may best

be seen on the chart.

Ostra Banken, the outer bank, lies with its S extremity located about 21 miles NE of Bjorn Light. A shoal patch, with a least depth of 1.5m, lies near the S end of the bank and other patches, with depths of 3.2 to 3.5m, are located in the N part. The S end and E sides of this bank are marked by buoys.

The position of this bank can be easily distinguished during daylight as the color of the water, being dark at a greater depth, suddenly changes and becomes very light at the edges.

Finngundet Light (60°59'N., 18°36'E.), equipped with a racon, is shown from a prominent tower, 25m high, standing 27 miles NE of Bjorn and 4 miles E of Ostra Banken.

An isolated shoal patch, with a least depth of 6.6m, lies 13 miles WNW of Finngundet Light and is marked by a buoy.

Vastra Banken, the inner bank, lies about 6 miles W of Ostra Finngunden and consists of several shoal patches. The north-easternmost patch has a least depth of 0.6m and is marked by a lighted buoy moored on its E side.

Vastra Banken Light (60°53'N., 17°55'E.), equipped with a racon, is shown from a prominent tower, 27m high, standing on the S part of Vastra Banken, about 21 miles WSW of Finngundet Light. A patch lying about 2 miles NNE of this light has a least depth of 3.2m and is marked by a buoy.



Vastra Banken Light

Utknallen, a shoal with a depth of 6.8m, lies about 4 miles WNW of Vastra Banken Light and is marked by a buoy.

Blockbanken, with a depth of 5.8m, lies about 5.5 miles SSW of Utknallen and consists of large boulders.

Sylen (61°15'N., 18°27'E.), an isolated shoal patch, lies about 16.5 miles NNW of Finngunden Light. It has a least depth of 9.4m and is marked by a lighted buoy.

Directions.—The coastal route leads NW from NNE of Bjorn Light. Vessels may pass NE of Campsgrund, SW of Vastra Banken Light, NE of Blockbanken, and WSW of Utknallen. They may then continue NNW to a position located E of Gashallan Light (61°01'N., 17°17'E.).

The depths along this route are irregular, especially between Blockbanken and Utknallen, where there are isolated shoal depths of less than 15m.

Approaches to Gavle

6.4 Gavlebukten is a bight lying between Bjorn and Gashallan, about 30 miles NW. The coast in this vicinity is generally low and wooded. The shores of the bight are fronted

by numerous islands, islets, and shoals, which may best be seen on the chart.

The SW part of the bight fronts the port of Gavle and is encumbered with numerous dangers, which lie up to about 8 miles offshore in places.

Iggon Light (60°52'N., 17°18'E.) is shown occasionally from a structure standing on the E side of an island lying close offshore, 8 miles S of Gashallan. The island is covered by dark, dense woods and is prominent from seaward.

Vicksellsgrundet, a large bank formed by several shoals, lies centered 3 miles NNE of Iggon Light and is the outermost danger in this vicinity. It has a least depth of 2m and is marked by buoys.

Eggegrund Light (60°44'N., 17°34'E.) is shown from a prominent tower, 26m high, standing on the SE end of an islet of the same name, lying about 13.5 miles WNW of Bjorn Light. Some houses are situated near the light tower. The islet is sandy, 5m high, partly wooded, and fringed by a narrow reef.



Eggegrund Light

Purrutsgrund Light (60°47'N., 17°27'E.), equipped with a racon, is shown from a metal tower, 5m high, standing on a shoal lying 4.3 miles NW of Eggegrund Light. This light marks the SE extremity of the coastal bank, which extends up to about 4.5 miles seaward on the N side of the approach to the port of Gavle.

Trodjehallan Light (60°48'N., 17°21'E.) is shown from a tower, 10m high, standing on a barren rock, 4m high, lying about 0.7 mile offshore, 3.2 miles WNW of Purrutsgrund Light.

Lovgrunds Rabbar is a large shoal area, with several rocks awash, lying between 1 mile and 4 miles NE of Purrutsgrund Light. This shoal area is steep-to on its NW side and is marked by buoys.

Petres Bank, a detached gravel shoal, lies S of the SE end of Lovgrunds Rabbar, 2.8 miles NNE of Eggegrund Light. It has a least depth of 2.4m and is marked by a buoy.

Hansbadan, a shoal with a least depth of 5.9m, lies centered 1 mile ENE of Eggegrund Light and is marked at the N end by a buoy.

Grussankan, a narrow shoal, extends about 0.5 mile SSE from the S end of Hansbadan. It has a least depth of 10.4m and is marked at its S end by a buoy.

Vaktaren lies about 1.2 miles S of the S end of Grussankan and 2 miles SE of Eggegrund Light. This shoal has a least depth of 8m and is marked on its N side by a lighted buoy. It is located at the N end of an area of foul ground and dangerous rocks, which extends about 4 miles NNE from the mainland on the S side of the approach to the port of Gavle.

6.5 Skraddarhallan Light (60°46'N., 17°22'E.) is shown from a structure standing on an islet about 0.3 mile offshore, 3 miles WSW of Purrutsgrund Light.

Vitgrund and Norrskar are two low islets, fringed by shoals, lying 1 mile E and 1.3 miles ENE, respectively, of Skraddarhallan Light.

Limo Light (60°43'N., 17°22'E.) is shown from a framework tower, 21m high, standing on an island of the same name. The island is wooded, 15m high, and lies in the middle of the approach, 6 miles W of Eggegrund Light.



Limo Light

Ytteriskan Light (60°44'N., 17°20'E.) is shown from a metal floodlit tower, 5m high, standing on a rock lying about 1.3 miles NNW of Limo Light.

Bonan Light (60°44'N., 17°19'E.) is shown from a tower, 10m high, standing on the mainland, 0.6 mile NW of Ytteriskan Light. A prominent disused light tower with a dwelling is located near the light.



Bonan Light

Lovgrund, 10m high and partly wooded, lies 3.5 miles

WNW of Eggegrund Light. A chapel and some cottages stand on the NE part of this island.

Sjalstenarna lies 2 miles W of Eggegrund Light and consists of two bare islets fringed by partly awash rocks.

Grasjalsbadan, a wooded islet, lies 0.8 mile W of Sjalstenarna and is also fringed by rocks. Sjalstensgrund, a shoal with a least depth of 1.4m, lies about midway between Sjalstenarna and Grasjalsbadan.

Numerous other shoals and dangers, with depths of less 10m, lie in the approaches and may best be seen on the chart.

Limo Island lies in the NE part of an extensive area of rocks and shoals which fronts the port. Orarnas, a low and wooded island, lies 1 mile SSW of Limo, in the S part of this area.

Holmuddsrannan (60°44'N., 17°20'E.), entered close SW of Ytteriskan Light, is the main channel leading to the port. This channel, which is about 1 mile long and 60m wide, extends SW through the N part of the above area of rocks and shoals.

Caution.—Several submarine cables lie in the approaches to the W of Eggegrund Island and may best be seen on the chart.

6.6 Directions—Approach Routes.—There are three main approach routes and one inshore channel leading to the port entrance.

The **East Deep-Water Route**, which is authorized for drafts up to 10.2m, leads W for about 18 miles from a position located NE of Bjorn Light. It passes N of Campsgrund, between Vakaren and Grussankan, and S of Eggegrund Light to a position located 0.7 mile S of Grasjalsbadan. The route continues WNW for about 4 miles using the white sector of Bonan Light. It then passes close N of Ytteriskan Light and leads SW to the outer entrance of Holmuddsrannan.

Vessels requiring more maneuvering room may head NW, using the white sector of Skraddarhallan Light, from the position located S of Grasjalsbadan before changing course to SW.

The **East Alternative Route**, which is authorized for drafts up to 9.5m, leads WNW for about 17 miles from a position located NE of Bjorn Light. It passes NNE of Campsgrund, between Hansbadan and Petres Bank, and NNE of Eggegrund Light to a position located 0.7 mile S of Purrutsgrund Light. The route then continues SW for 1.5 miles and WSW for 2.5 miles to the outer entrance of Holmuddsrannan. It passes between Vitgrund and Lovgrund, and close N of Ytteriskan Light.

At night, vessels may pass between Hansbadan and Petres Bank by using the white sector of Trodjehallan Light. When about 0.4 mile E of Purrutsgrund Light, they should change course to the SW and follow the route leading between Vitgrund and Lovgrund. Vessels may then use the white sector of Bonan Light to approach the outer entrance of Holmuddsrannan. This route may be used in the winter.

The **North Route** leads SE for about 5 miles from a position located off Iggon Light. It passes between Purrutsgrund Light and the SW end of Lovgrunds Rabbar. The route then leads SW and joins the East Alternative Route. At night, the route initially leads SE using the white sector of Eggegrund Light. This route has a least depth of 12.9m up to the vicinity of Purrutsgrund Light, but, after joining the East Alternative Route it is only authorized for drafts up to 9.5m.

The **Inshore Channel**, which is authorized for drafts up to

3.7m, leads S and SSE for 5 miles from a position SSE of Igon Light. It passes close E of Trodjehallan Light and Skraddarhallan Light. Vessels should then steer SW to the outer entrance of Holmuddsrannan. The channel is very narrow in places and should be used only by small vessels. Local knowledge is advised.

Anchorage.—Anchorage may be obtained, in depths of 15 to 21m, within an area, designated A, centered 0.6 mile ENE of Bonan Light (60°44'N., 17°19'E.). The bottom is formed of sand and clay, with good holding ground, but this roadstead is exposed to E winds.

Anchorage may be obtained, in depths of 13 to 23m, sand, within an area, designated B, centered 2 miles ESE of Limo Light (60°43'N., 17°22'E.). Vessels must remain clear of the white sector of this light. During E winds, pilots are often unable to embark in this roadstead and the anchorage, designated A, located ENE of Bonan Light is preferable.

It is reported that anchorage may be obtained, in depths of 18 to 25m, sand and clay, within an area, designated G, centered close SW of Lovgrund, 2.3 miles NE of Limo Light (60°43'N., 17°22'E.).

Anchorage may also be obtained off Skutskar-Harnas (see paragraph 6.8).

Caution.—A mined area, through which surface navigation is permitted, lies across Holmuddsrannan and the NE end of Yttrefjarden. Vessels transiting the area during a thunderstorm do so at their own risk.

The maximum authorized drafts stated for the approach routes may vary due to silting and the local authorities should be contacted prior to entry.

Gavle (60°41'N., 17°10'E.)

World Port Index No. 25590

6.7 Gavle (Gefle), one of the oldest towns in Sweden, is situated at the mouth of the Gavle River. The port consists of Yttrefjarden, the outer harbor and roadstead, and Inre Fjarden, the small natural inner harbor.

Tides—Currents.—Normal HW is approximately 0.3m above mean sea level; normal LW is approximately 0.2m below. Gales from the NE cause an exceptionally high HW level, which is usually followed by an exceptionally low LW level; the former is as much as 1.2m above mean sea level while the latter is much as 0.9m below mean sea level.

The current in the approaches is weak and variable in direction. Within Yttrefjarden, there is a slight current generally setting E.

Ice.—Ice obstructs navigation from the end of January to the end of March, but the harbor is kept open by ice breakers.

Depths—Limitations.—Yttrefjarden, the outer harbor and roadstead of the port, can be entered via two channels. Bakhsarrannan, the S channel, leads between the islands of Limo and Orarna. It is available only for small craft, with drafts up to 2.7m, during daylight hours.

Holmuddsrannan, the N and main channel, has a dredged depth of 10.9m and is authorized for vessels with drafts up to 10.4m. Vessels up to 220m in length may transit during daylight.

For routes and draft limitations in the approaches, see para-

graph 6.6.

Inre Fjarden, the inner harbor, fronts the town and is closed to commercial shipping. The entrance channel is no longer dredged and is only used by pleasure craft.

The main facilities are situated in the vicinity of Frederiksskans, at the W end of Yttrefjarden.

New Oil Quay, at the outer end on the N side, is 70m long and has a depth of 10.8m alongside.

East Basin has a quay, 575m long, at its W side, with a depth of 9.3m alongside. Vessels, with drafts up to 8.9m, can be handled here. A floating quay installation, 90m long, is situated at the E side of the basin and has a depth of 6m alongside. A quay, 75m long, is situated at the N end of this basin and has a depth of 8.3m alongside.

South Quay and Southwest Quay provide 570m of total berthage, with a depth of 7.7m alongside. Vessels, with drafts up to 7.4m, can be accommodated here. A ro-ro berth is situated at the W end of Southwest Quay.

Old Oil Quay is 85m long and has a depth of 7.7m alongside. Coastal Tanker Quay, consisting of a wharf with a breasting dolphin, provides 75m of berthage with a depth of 5.4m alongside.

Granudden Terminal, on the S side, has two timber product berths. The E berth is 200m long, with a depth of 10.9m alongside; the W berth is 150m long with depth of 9.4m alongside.

There are facilities for general cargo, bulk, tanker, ro-ro, and timber product vessels. The port can accommodate vessels up to 220m in length, 28m beam, and 10.2m draft.

For additional outport facilities, see paragraph 6.9.

Aspect.—The approach routes are indicated by lighted ranges and directional sector lights. Holmuddsrannan, the main entrance channel, is marked by lighted buoys and lighted floodlit beacons.

Herosgrund Light is shown from a floodlit tower standing in the vicinity of a group of shoals lying within Yttrefjarden, about 1 mile SW of the inner entrance of Holmuddsrannan.

A prominent wind generator, 54m high, stands close N of the New Oil Quay. A conspicuous tank farm is situated in the vicinity of the harbor.



Gavle

Pilotage.—The pilotage area for Gavle lies between a line bearing 090° from Rodhall (60°36'N., 17°59'E.) and latitude 62°08'N.

Pilotage is compulsory for vessels, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 80m in length or 15m beam and over.

3. Category 3 vessels of 90m in length or 16m beam and over.

Vessels should send an ETA and request for pilotage 5 hours in advance. All requests for pilotage in the area (including Sundsvall, Hudiksvall, and Soderhamn) must be made through the Gavle VTS station.

Pilots board vessels, as follows:

1. For Soderhamn and Ljusnefjarden—in position 61°12.9'N, 17°20.9'E.
2. For Gavle—close S of Grasjalsbadan (60°43.5'N., 17°27.5'E.).
3. For Hudiksvall—in position 61°15.9'N, 17°24.0'E or, by special arrangement, about 1.5 miles S of Hurnsudde in position 61°35.7'N, 17°29.0'E.

Regulations.—A Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea.

The system is mandatory for vessels over 300 grt, and vessels, including tows, over 45m in length.

Approaching vessels must send a report to VTS Gavle 30 minutes before passing the first Reporting Point (see below). Vessels with an Automated Identification System (AIS) are not obliged to send this report.

Participating vessels must report to VTS Gavle on passing the following Reporting Points (RP):

1. RP No. 11 Vaktaren (60°42.7'N., 17°36.2'E.).
2. RP No. 12 Purrutsgrund (60°46.7'N., 17°27.5'E.).
3. RP No. 13 Valkommen (60°57.8'N., 17°15.0'E.).
4. RP No. 21 Storjungfrun S (61°06.9'N., 17°21.3'E.).
5. RP No. 22 Blomman (61°11.5'N., 17°17.5'E.).
6. RP No. 23 Hallgrund (61°15.8'N., 17°22.0'E.).
7. RP No. 31 Tihallsten (61°31.5'N., 17°19.0'E.).
8. RP No. 32 Hudiksgrund (61°35.0'N., 17°24.0'E.).
9. RP No. 41 Britas Klack (61°53.1'N., 17°27.7'E.).
10. RP No. 52 Bramon N (62°17.4'N., 17°40.4'E.).
11. RP No. 53 Astholmsudde (62°22.8'N., 17°43.8'E.).
12. RP No. 61 Hamo (62°36.6'N., 18°05.8'E.).
13. RP No. 62 Storon S (62°43.4'N., 18°12.8'E.).
14. RP No. 63 Storon N (62°47.6'N., 18°17.0'E.).
15. RP No. 64 Ramon (62°50.0'N., 17°54.0'E.).
16. RP No. 65 Brunne (62°56.0'N., 17°50.0'E.) (Out-bound).

Reports must include the vessel's name, call sign, position, and destination.

Vessels must report their name, position, and destination when arriving at or leaving a berth (including an anchorage), when changing route, when being involved in an accident (including groundings and collisions), and on the occurrence of any defect affecting the safety of navigation. The report should be sent 10 minutes prior to leaving a berth or an anchorage.

Participating vessels must maintain a continuous listening watch on VHF channel 13 after the first report.

Gavle VTS may be contacted on VHF channels 13 and 16 or by e-mail, as follows:

vtsgavle@sjofartsverket.se

All vessels must proceed through Holmuddsranna, the main entrance channel, at a slow speed.

Vessels entering Yttrefjarden have priority in the channel over those leaving. However, towed vessels have priority over all other vessels.

Vessels over 172m in length or 7.35m draft are prohibited from passing through Holmuddsrannan during darkness.

Vessels with drafts over 9m must use tugs when passing through Holmuddsrannan.

Berthing at the New Oil Quay at night is restricted to tankers of 172m in length, 25m beam, and 7.5m draft.

Anchorage.—Three inner anchorage areas, designated D, E, and F, are situated in the S part of Yttrefjarden. They have depths of 11 to 15m, mud and clay, and may best be seen on the chart. For information concerning anchorages in the outer approaches, see paragraph 6.6.

Caution.—Prohibited anchorage areas, the limits of which may best be seen on the chart, are situated in the SW part of Yttrefjarden, close N of Herosgrund Light, and in the vicinity of Holmuddsrannan, the main entrance channel.

6.8 Skutskar-Harnas (60°39'N., 17°24'E.) (World Port Index No. 25550), a small harbor, is situated 18 miles W of Bjorn, in the S approach to Gavle. It is well-protected by two breakwaters. This harbor serves the towns of Skutskar and Harnas, which stand, respectively, on its SE and W sides.

Ice.—The harbor is normally closed because of ice from early January to early April.

Depths—Limitations.—The harbor is approached by using the East Deep-Water Route for Gavle (see paragraph 6.6) and then proceeding SW toward the port entrance. An entrance channel, which leads S between the breakwaters, has a least depth of 9.1m and is authorized for vessels with drafts up to 7.2m.

Several shallow areas lie within the harbor and dredged fairways lead through them to the berths. The fairway leading to Skutskar, situated at the E side of the harbor, has a least depth of 8.1m. The fairway leading to Harnash, situated at the SW side of the harbor, has a least depth of 7.1m.

Massakajen is the main wood pulp pier at Harnash. The berth on the W side is 245m long and has depths of 6.2 to 6.8m alongside. The berth on the E side is 95m long and has a depth of 5.8m alongside.

Two berths at Skutskar provide 260m of total quayage and have a depth of 8.1m alongside.

It is reported that the harbor is used only for the import of pulpwood.

Aspect.—The entrance channel is indicated by a lighted range and is marked by buoys. A light is shown from a mast standing at the head of the W breakwater.

A church, with a prominent black pointed spire, stands in the town of Skutskar. The tower and chimneys of the woodpulp factory, standing at the SW side of the harbor, are clearly visible from seaward. A prominent water tower is situated at the SE side of the harbor.

Pilotage.—Pilots are provided by the Gavle pilot station.

Anchorage.—Vessels can anchor, in depths of 15 to 17m, clay, within an area, designated C, centered about 1.5 miles NE of the head of the W breakwater.

Caution.—Local knowledge is required and large vessels should not enter the harbor during darkness.

6.9 Karskar (60°41'N., 17°16'E.) (World Port Index No. 25570), an outport of Gavle, is situated in the S part of Yttrefjorden. It is approached through a channel authorized for drafts up to 7.8m.

There is an oil pier, 195m long, with berths for tankers on each side. The maximum permitted drafts are 6.5m on the W side and 7.8m on the E side.

There are also two quays. One is 90m long, with a depth of 4.8m alongside; the other is 110m long, with depths of 4.8 to 6.3m alongside.

The pier at Kastet, 0.5 mile NW of Kaskar, is reported to be disused.

Langharen (60°41'N., 17°17'E.), another outport of Gavle, is situated in the S part of Yttrefjorden, close E of Karskar. It consists of a tanker terminal. The berth is 60m long and has a depth of 10.9m alongside. Tankers up to 220m in length and 10.4m draft can be accommodated. Berthing is carried out during daylight only and vessels enter stern first.

Gavle to Ljusnefjorden

6.10 Gashallan (61°01'N., 17°17'E.), a barren islet, lies about 0.5 mile offshore and is 6m high. A light is shown from a prominent tower, 8m high, standing on this islet.

Knaggen, a group of shoals, extends up to about 0.8 mile E and SE of the light. This group has a least depth of 3.4m and is marked by a buoy.

The approaches to Norrsundet include the area lying between Iggon Light (60°52'N., 17°18'E.) and Gashallan, about 8 miles N.

The mainland and larger islands bordering this area are covered with forest. The shore is fronted by numerous islands, islets, rocks, and shoals, which may best be seen on the chart.

Several anchorages and small harbors of refuge lie along this part of the coast, but local knowledge is required for entry.

Vicksellsgrundet, a large shoal bank, lies on the S side of the approach and has been previously described in paragraph 6.4.

A group of small islands, islets, and shoals, which may be best seen on the chart, fronts Norrsundet and extends about 3 miles NE from the coast.

6.11 Bjorn Beacon (60°57.0'N., 17°13.3'E.), a framework mast, 11m high, stands on a barren islet lying on the outer part of this group.

Forstugund, a shoal patch, lies about 1.7 miles ESE of Bjorn Beacon. It has a least depth of 3.4m and is marked by a buoy. Valkommen, a shoal patch, lies about 1 mile ENE of Bjorn Beacon. It has a least depth of 7m and is marked by a buoy. These two shoal patches form the outermost dangers in the approach to Norrsundet.

Saltarsfjorden (60°56'N., 17°11'E.), a bay lying close S of Norrsundet, provides anchorage, exposed to E winds, in a depth of 18m, sand. The entrance lies about 1.3 miles SW of Bjorn Beacon and is encumbered by a group of dangerous shoals, known as Saltarsgrundet, on the N side.

This anchorage is usually icebound from the end of January to the beginning of April. The approach is indicated by range beacons. Vessels should head in a SW direction and pass between Forstugund and Valkommen shoals. When within about 0.4 mile of the shore, vessels should change course and head W

into the bay. Local knowledge is advised.

6.12 Norrsundet (60°56'N., 17°10'E.) (World Port Index No. 25610), a small and well-sheltered harbor, is situated 5 miles SW of Gashallan Light. It handles timber products.

Ice.—Ice usually obstructs the harbor from the end of January to the beginning of April.

Depths—Limitations.—From a position located about 2 miles SSE of Gashallan Light, the main approach route leads WSW for 5 miles between the dangers fronting the port. It passes about 0.4 mile NNW of Valkommen shoal and Bjorn Beacon. A dredged entrance channel, which is authorized for drafts up to 6.4m, then continues SW and leads into the harbor.

A secondary approach route, authorized for drafts up to 5.4m, leads from S. From a position NE of Iggon Light, the route leads in a NW direction for about 6 miles and joins the main route, 1.3 miles NE of Bjorn Beacon. It passes close SW of the SW side of Vicksellsgrundet, close NE of Forstugund, and close ENE of Valkommen.

The commercial facilities are situated on the SW side of the harbor. Trautlastingskajen, a timber-loading quay, is 91m long and has depths of 3.5 to 4.3m alongside; and Massakajen, a pulp quay, is 172m long and has a depth of 6.8m alongside.

Vessels up to 135m in length and 6.4m draft can be accommodated. Vessels entering at night are limited to a length of 100m.

Aspect.—The harbor lies within an inlet, which is formed by the island of Granskar, on the N side, and the peninsula of Farholmen, on the S side. The island of Granskar is connected to the mainland by causeways.

The approach route is indicated by a sector light. The entrance channel is indicated by a lighted range and is marked by buoys.

A prominent chimney stands in the vicinity of the pulp mill and is illuminated at night.

Pilotage.—Pilots may be obtained from the Gavle pilot station (see paragraph 6.7).

Anchorage.—Anchorage is available close N of the island of Dodmanskar (60°57'N., 17°12'E.), about 0.7 mile W of Bjorn Beacon. This inner roadstead has depths of 15 to 17m, sand, gravel, and clay.

An outer anchorage area, designated N, lies centered about 2 miles SSW of Gashallan Light (60°01'N., 17°17'E.), on the N side of the approach track. It has depths of 16 to 20m and may best be seen on the chart.

Caution.—It is reported that severe magnetic disturbances have been experienced in the approach to the port.

6.13 Kuson (61°02'N., 17°14'E.), a wooded island, lies 2 miles NW of Gashallan Light. This island is 33m high and is fringed by shoals extending up to 1.2 miles E of it.

A prominent radio mast stands 8 miles WNW of Kuson.

Sundsmars Redd (61°01'N., 17°13'E.), a sheltered roadstead, lies 2.3 miles WNW of Gasholmen Light. It is located between the peninsula of Sundsmarnaset, 41m high, and the SW part of Kuson. This roadstead is considered to be one of the best refuge anchorages along this part of the coast. It is usually icebound from the middle of December to the end of April.

The anchorage has depths of 10 to 13m, stones, sand, and clay. It may be entered from the N via a channel leading S and

passing close W of the Kuson or from the E via a channel, available for drafts up to 5m, leading W and passing S of Kuson. Both channels are buoyed. A reef extends from the S side of Kuson and constricts the fairway to a width of about 180m. Local knowledge is advised.

6.14 Between Kuson and Ljusnefjarden, about 9 miles N, the coast is generally low and wooded. The shore is fronted by a number of islands, islets, and shoals, which may best be seen on the chart. Only the outer dangers are described below.

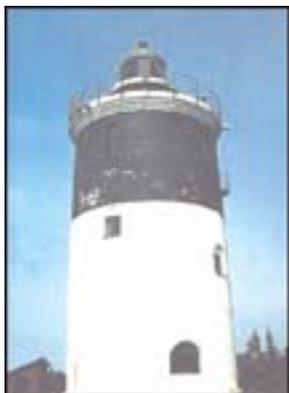
An extensive area of islets, rocks, and shoals fronts the mainland shore to the N of Kuson and extends up to about 5 miles NNE of this island.

Tupparna (61°10'N., 17°20'E.), a low and partly wooded islet, lies about 4 miles offshore, at the NE end of this area. Tuppstorggrund, a shoal with a least depth of 2.4m, lies about 0.4 mile E of this islet, near the edge of the area.

Reveljen (61°07'N., 17°21'E.), a detached shoal, lies about 1.3 miles E of Tupparna. It has a least depth of 5.7m and is marked by a buoy.

Storjungfrun (61°10'N., 17°20'E.), a densely-wooded island, lies about 4 miles offshore and is 22m high. The W side of the island is clear of dangers. However, the E side and S end of the island are fronted by dangers and should not be approached within 1 mile.

A light is shown from a prominent tower, 21m high, standing on the NE end of the island. A number of cottages and a chapel are situated in the vicinity of the light.



Storjungfrun Light

Anchorage may be obtained by vessels with local knowledge close to the W side of this island, about 1 mile SSW of Kalkudden, the W extremity, in depths of 9 to 18m, but the bottom shelves steeply. Anchorage may also be obtained within an area centered 1 mile NW of Kalkudden.

Storgrundet (61°09'N., 17°27'E.), an extensive shoal, lies centered 3 miles E of Storjungfrun and consists of gravel, sand, and shingle. It has a least depth of 0.5m and is marked on the E and W sides by buoys.

Enskar (61°14'N., 17°17'E.), an indented island, lies 2 miles offshore, about 4.5 miles NNW of Storjungfrun Light. It is located on the outer part of an extensive area of dangers fronting the coast. Klumpudden Light is shown from a structure stand-

ing on the N part of this island.

Ellegrund, a shoal with a depth of 1.1m, lies about 0.5 mile E of the SE end of Enskar. A detached shoal patch, with a least depth of 8.4m, lies 0.7 mile ENE of Ellegrund and is the outermost danger in this vicinity.

Caution.—Permanent fishing equipment may be found around Storjungfrun.

A submarine pipeline, which may best be seen on the chart, extends between the W side of Storjungfrun and the mainland.

Ljusnefjarden

6.15 Ljusnefjarden (61°13'N., 17°12'E.) is entered about 4 miles WNW of the N end of Storjungfrun. The approach to the inlet lies between Storjungfrun and Enskar, 4.5 miles NNW. The S side of the approach is comparatively free from dangers, but on the N side, shoals extend up to about 3.5 miles from the mainland.

The harbors of Vallvik, Ljusne, Orrskarshammen, and Ala are situated within this large inlet.

Blomman (61°12'N., 17°16'E.), a shoal with a least depth of 7m, lies about 2 miles S of the SW end of Enskar and is marked by a lighted buoy. It is the outermost shoal on the SE side of the dangers bordering the N approach to Ljusnefjarden.

Fabodvallshararna (61°11.5'N., 17°10.7'E.), a group of wooded islets, lies near the shore, close within the S entrance point of Ljusnefjarden.

Vallvik Light (61°11.5'N., 17°10.8'E.) is shown from a tower standing on the S end of the southernmost islet of Fabodvallshararna.

Saggrund (61°12'N., 17°12'E.), a shoal with a least depth of 1.3m, lies about 0.5 mile NE of Fabodvallshararna and is marked by a buoy. It is the outermost shoal on the SW side of the dangers bordering the N approach to Ljusnefjard.

Storgrytan, a sparsely wooded islet, lies about 0.5 mile NW of the NW end of Fabodvallshararna and steep, rugged reddish rocks fringe its NE side. A light is shown from a structure standing at the N extremity of this islet.

Lekskaraen, a shoal with rocks awash, lies about 0.3 mile NNE of Storgrytan Light. It is marked by a beacon and two buoys.

Nestorsgrund, a shoal with a least depth of 3.3m, lies about 0.4 mile ENE of WSW Storgrytan Light and is marked by a lighted buoy.

Abrahamsharen, an islet, lies about 1 mile ENE of Storgrytan Light, near the S end of the dangers extending S from the mainland.

Ice.—The harbors within the inlet are usually icebound between February and April.

Aspect.—The main approach route leading into the inlet is indicated by a lighted range and a directional sector light.

Vardberget, a rounded hill, stands on the NW side of the inlet, 1.8 miles NW of Vallvik Light. It is 50m high and prominent from seaward.

A number of conspicuous chimneys, 65m high, stand in the vicinity of the woodpulp factory, 0.2 mile S of Vallvik Light. A tower is situated close S of the factory.

Pilotage.—Pilots for the harbors in Ljusnefjarden are provided by the Gavle pilot station (see paragraph 6.7). Pilotage should be requested 24 hours in advance. It is reported that ves-

sels must contact VTS Gavle on VHF channel 13 prior to entering the harbor area. Pilots board about 2.8 miles N of Storjungfrun Light.

Directions.—The main approach route, which is authorized for drafts up to 11.1m, leads NNW for about 10 miles from a position located E of Gashallan Light. It passes between the island of Storjungfrun and Storgrundet shoal. The route then continues W for about 4.5 miles and leads into the S part of the inlet. This section of the route passes S of Blomman and is indicated by the white sector of Vallvik Light.

From the N, a route, which passes 1.6 miles ESE of the SE end of Enskar, leads SSW and joins the main approach route about 1.7 miles NW of Storjungfrun Light.

An alternate route, which is authorized for drafts up to 7.5m, leads in a NW direction for about 7 miles to a position located 0.6 mile E of Vallvik Light, at the inlet entrance. It passes between Reveljen and the dangers fronting the S end of Storjungfrun. The route then continues NW between the mainland and the W side of Storjungfrun.

An inshore route, which is authorized for drafts up to 5.1m, leads inside the dangers fronting the coast between Gashallan Light and Storjungfrun. The channel is narrow in places and local knowledge is required. This route is usually blocked by ice between December and April.

6.16 Vallvik (61°11'N., 17°10'E.) (World Port Index No. 25640), a small industrial harbor, is situated near the S entrance point of Ljusnefjarden.

Depths—Limitations.—The harbor can be entered through two channels, which are both authorized for drafts up to 7.5m.

The shorter channel leads WNW for 0.7 mile from a position located 0.6 mile E of Vallvik Light. It then continues SW between Fabodvallshararna and Storgrytan. This part of the channel is marked by buoys and is very narrow in places.

The longer channel leads NW for 1.3 miles from a position located 0.6 mile E of Vallvik Light. It passes SW of Saggrundand and Nestorsgrund. The channel then continues SW, rounds the N end of Storgrytan, and leads SE for 0.7 mile to the harbor.

The main pier extends NW into the harbor and is 200m long. It has depths of 5 to 8.1m alongside the NE side. The berth at the SE side is 70m long and has depths of 5.3 to 7.4m alongside.

A quay extends about 190m ESE from the root of the pier on the NE side. It has depths of 2.4 to 5m alongside, but is no longer used by commercial vessels.

Aspect.—The inner part of the entrance channel is indicated by a lighted range and is marked by buoys.

Anchorage.—Vessels can anchor, in depths of 12 to 15m, clay, N or S of Nestorsgrund, staying clear of the harbor entrance channels.

Well-sheltered anchorage may also be obtained, in a depth of 10m, clay, about 0.3 mile WSW of Lekskaraen.

Caution.—Vessels over 5,000 dwt are advised to enter or leave the harbor during daylight hours only.

6.17 Ljusne (61°12'N., 17°08'E.) (World Port Index No. 25650), a small commercial and fishing harbor, is situated at the W side of Ljusnefjarden, at the mouth of a river.

Depths—Limitations.—The harbor is initially approached

by using the longer channel to Vallvik. From a position located N of Storgrytan, a buoyed fairway, which is authorized for drafts up to 3.6m, leads W to the entrance.

The commercial quay, on the N side of the harbor, is 100m long and has a depth of 4.5m alongside. The fishing quay, on the S side of the harbor, is 80m long and has a depth of 4m alongside.

A quay extends about 190m ESE from the root of the pier on the NE side. It has depth of 2.4 to 5m alongside, but is no longer used by commercial vessels.

Aspect.—The inner part of the entrance channel is indicated by lighted ranges and is marked by buoys.

Anchorage.—Vessels may find well-sheltered anchorage, in a depth of 10m, clay, W of Storgrytan.

6.18 Orrskarshammen (61°13'N., 17°10'E.), a small commercial harbor, is situated at the NW side of Ljusnefjarden.

Depths—Limitations.—From a position located 0.6 mile E of Vallvik Light, a buoyed channel, 110m wide, leads in a NW direction for about 1.5 miles to the harbor. It passes SW of Saggrund and NE of Nestorsgrund. This channel is authorized for drafts up to 11.1m.

A concrete pier, equipped with a conveyor system for loading wood chips, is situated in the S part of the harbor. The berth on the E side of the pier is 100m long and has a depth of 11.8m alongside. The berth on the W side is 90m long and has a depth of 10.8m alongside.

A quay, situated close NW of the pier, has a berth, 100m long, with a depth of 10.4m alongside.

Aspect.—The inner part of the entrance channel is indicated by a lighted range.

6.19 Ala (61°13'N., 17°10'E.), a small commercial harbor, is situated at the N side of Ljusnefjarden.

Depths—Limitations.—From a position located 0.6 mile E of Vallvik Light, the channel leads in a NNW direction for about 1.7 miles to the harbor. It passes close WSW of Saggrund and between Nestorsgrund shoal and the islet of Abrahamsharen. This channel is authorized for drafts up to 7.4m.

A concrete pier, 160m long, extends ESE into the harbor and is used for exporting timber products. The berth on the S side of this pier is 120m long and has depths of 7.7 to 8m alongside. The berth on the N side is 130m long and has depths of 5.8 to 5.9m alongside.

Aspect.—The inner part of the entrance channel is indicated by a lighted range and is marked by buoys.

Caution.—Vessels with drafts over 5.5m must enter during daylight.

Ljusnefjarden to Hudiksvall

6.20 Hallgrund Light (61°17'N., 17°24'E.), equipped with a racon, is shown from a prominent floodlit tower, 23m high, standing on a rock, awash, 4 miles NE of Enskar. Shoals, with depth of less than 10m, extend up to about 0.8 mile NE and 0.4 mile SW of the light.

Soderhamnsfjarden (61°17'N., 17°10'E.), entered 3.5 miles W of Hallgrund Light, extends about 5.5 miles NW. The entrance to this inlet lies between the N side of Enskar and the E end of the Skaton Peninsula, 2.1 miles N.



Hallgrund Light

The approaches and entrance to Soderhamnsfjarden are encumbered by numerous small islands, islets, rocks, and shoals, which may best be seen on the chart.

Norrutharet Light (61°16'N., 17°18'E.) is shown from a prominent tower, 10m high, standing on the N end of a small island, 3.2 miles WSW of Hallgrund Light.



Norrutharet Light

Storgrund, a shoal area with a least depth of 0.6m, lies centered 1 mile ESE of Norrutharet Light. It is marked by buoys and is the outermost danger on the S side of the approach to the inlet.

Otterhallan Light (61°16'N., 17°18'E.), equipped with a racon, is shown from a framework tower standing on a red rock lying 1.5 miles WNW of Norrutharet Light.

Caution.—A submarine cable, which may best be seen on the chart, extends between Hallgrund Light and the Skaton Peninsula.

6.21 Soderhamn (61°18'N., 17°05'E.) (World Port Index No. 25720) is situated at the head of Soderhamnsfjarden. The port includes the facilities at Stugsund, in the NW part of the inlet; at Sandarne, in the SW part; and at Langror, close N of Sandarne.

Tides—Currents.—The water level normally varies from 0.6m above to 0.4 below mean level. A higher level occurs with S and W winds, a lower level with N winds.

Currents in the approach to the inlet are negligible.

Ice.—In the Soderhamn archipelago, ice usually occurs from early January to early April. Shipping channels are kept open

with the aid of icebreakers.

Depths—Limitations.—The main approach route leads W for about 5 miles from a position located 0.8 mile S of Hallgrund Light. It passes N of Storgrund, N of Norrutharet Light, and S of the dangers fronting the S side of the Skaton Peninsula. A dredged entrance channel, which is authorized for drafts up to 7.9m, then leads W and passes S of Otterhallan Light. It is 1 mile long and 60m wide.

The branch channel leading WSW to Sandarne is authorized for drafts up to 6.3m.

The branch channel leading NW and WSW to Langror is authorized for drafts up to 7.9m.

The branch channel leading NW to Stugsund is authorized for drafts up to 5.7m. The continuing channel leading NW to Soderhamn is authorized for drafts up to 2.5m.

Soderhamn has 1,600m of berthage, with a depth of 2m alongside. It is used only by recreational craft.

Stugsund has 900m of berthage, with depths of 5.2 to 5.9m alongside. It has facilities for handling bulk cargoes.

Langror has a quay, 80 long, with a depth of 8.3m alongside. It has facilities for handling oil and general cargoes. Vessels up to 180m in length and 7.9m draft can be accommodated.

Sandarne has a quay, 438m long, with a depth of 7.1m alongside. It has facilities for handling liquid resin.

Aspect.—The entrance channels are indicated by lighted ranges and are marked by buoys.

A prominent chimney, 75m high, stands at Sandarne; and a number of conspicuous silos are situated at Stugsund.

Skeppskolsberget, 322m high, stands about 13.5 miles WSW of Soderhamn. This prominent hill resembles the keel of a ship turned bottom up.

An aeronautical light is shown from a structure, 56m high, standing in the vicinity of the airport, about 2 miles W of Sandarne.

Pilotage.—Pilotage is compulsory. Pilots must be requested through Gavle VTS (see paragraph 6.7). Pilots may be contacted by VHF and board about 1.5 miles S of Hallgrund Light.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Gavle (paragraph 6.7).

Speed restrictions apply within the entrance channels.

From the vicinity of Otterhallan Light, vessels proceeding to Langror must be accompanied by tugs. Vessels can berth at Langror only during daylight.

Anchorage.—Lilljungfruns Redd, located 1 mile SW of Norrutharet Light and 0.4 mile N of Enskar, provides anchorage, in depths of 11 to 20m, mud and rock. Vessels can enter this roadstead through a branch channel, which is authorized for drafts up to 8.9m, to complete loading if necessary.

Branthalls Redd lies W of the island of Branthall, 1.1 miles WSW of Otterhallan Light. This roadstead provides anchorage, in depths of 7 to 13m, mud.

Prastholms Redd lies close NE of Langror. This roadstead provides anchorage, in a depth of 7m, mud.

Caution.—During winter, an ice bridge is laid out between Stugsund and the N side of the inlet, 100m NE. Traffic signals are exhibited. A white light indicates that the bridge is open for the passage of vessels. A red light indicates that the bridge is closed and the passage of vessels is prohibited.

6.22 The coast between Hallgrund Light and the island of Agon, 16 miles N, is greatly indented. The shore is fronted by numerous small islands, islets, rocks, and shoals, which extend up to 4.5 miles seaward in places and may best be seen on the chart. Only the outermost of these dangers are described below.

Several local fishing and small craft harbors are located along this stretch of coast but there are no commercial ports.

Yttergrund (61°18'N., 17°21'E.), a large shoal bank, lies centered 1.8 miles WNW of Hallgrund Light. It has a least depth of 3m and is marked by buoys. Several detached shoal patches, with depth of less than 8m, lie between this bank and the light.

Skroveln, a shoal with a least depth of 0.8m, lies 2.3 miles W of Hallgrund Light and is marked by a buoy. This shoal is located at the S end of an extensive area of foul ground, which fronts the mainland peninsula of Stalnaset (61°19'N., 17°14'E.) and extends up to about 2 miles seaward.

Prastgrundet (61°21'N., 17°20'E.), 10m high, lies 4.5 miles NNW of Hallgrund Light. The greater part of this island is wooded, but the S end is barren except for some large boulders. A light is shown from a tower, 6m high, standing on the SW side of the island.

Foul ground and shallow shoals extend up to about 1 mile NE and 0.8 mile SW of Prastgrundet.



Prastgrundet Light

Vitgrund Light (61°23'N., 17°12'E.) is shown from a framework tower, 5m high, standing on the N part of an islet lying 4.7 miles NW of Prastgrundet Light. This islet lies 2.1 miles offshore, on an extensive chain of dangers fronting the coast.

Tattingen (61°26'N., 17°17'E.), with a least depth of 5.9m, is a large shoal bank lying 3.8 miles NE of Vitgrund Light. This bank is located 2.3 miles offshore and is the outermost danger in this vicinity.

Storgrund, with above-water rocks, is a shoal lying centered about 0.7 mile SW of Tattingen.

Fiske (61°31'N., 17°13'E.), marked by a light, is an islet lying about 5 miles NNW of Tattingen, in the outer approach to Enhammarsfjarden. Shoal patches, with depths of less than 10m, lie up to about 1.5 miles SE of Fiske Light.

Idensgrund, a detached shoal with a least depth of 3.6m, lies about 1.3 miles NE of Fiske Light.

6.23 Agon (61°33'N., 17°27'E.), a wooded island, lies at the outer end of a chain of islands, which extends E for about 7



Vitgrund Light

miles from Vatnasudde, on the mainland.

Ago Light (61°32.5'N., 17°28.0'E.) is shown from a prominent round tower, 15m high, standing at the E extremity of Agon. A disused light tower, with a dwelling, is located near the light.



Ago Light

Small vessels, with local knowledge, may obtain sheltered anchorage, in depths of 7 to 25m, gravel and mud, within a narrow inlet indenting the SW side of the island. A channel, authorized for drafts up to 5.8m, leads to this anchorage.

Tihalan, an islet, lies 1 mile S of Agon and is located near the center of a group of dangers, about 3 miles long, which front the S side of the island.

Gretasklackar (61°31'N., 17°47'E.), a group of three shoals with a least depth of 10.3m, lies 9 miles ESE of Ago Light.

Caution.—Due to the numerous shoals lying between Prastgrundet and the mainland, vessels passing W of this island require local knowledge.

Approaches to Hudiksvall

6.24 Hudiksvall (61°35'N., 17°28'E.), an extensive inlet, is encumbered by numerous small islands, rocks, and shoals, which may best be seen on the chart. The shores are wooded and hilly.

Iggesund and Hudiksvall are the main commercial ports situated within this inlet. Krakon (61°34'N., 17°20'E.), Njutanger

(61°36'N., 17°04'E.), Holick (61°38'N., 17°26'E.), Karingon (61°39'N., 17°14'E.), Saltvik (61°41'N., 17°15'E.), and Lingaro (61°43'N., 17°15'E.) are harbors used only by small craft and pleasure boats. There are also several marinas.

The approach to Hudiksvall is bordered, on the S side, by a chain of islands extending 7 miles E from the mainland. Agon is the outermost island of this chain (see paragraph 6.23). The approach, on the N side, is bordered by the S side of the peninsula of Hornslandet, located 4.8 miles N.

The peninsula of Hornslandet is 115m high and partly wooded. At a distance, from the NE, it appears to be separated from the mainland. The E side of this peninsula is light colored and moderately steep.

Krakskar Light (61°34'N., 17°20'E.) is shown from a prominent tower, 6m high, standing on the N extremity of Krakon, 4.3 miles WNW of Ago Light.

Holickskar Light (61°37'N., 17°27'E.) is shown from a tower, 6m high, standing on the SW extremity of the Hornslandet Peninsula, 4.5 miles NE of Krakskar Light.

Myran (61°36'N., 17°28'E.), a group of shoals with a least depth of 2.9m, lies about 1 mile SE of Holickskar Light and fronts the S side of the Hornslandet Peninsula.

Olofsgrund (61°34'N., 17°28'E.), a detached shoal bank, lies 1.4 miles N of Ago Light. It has a least depth of 5.1m and is marked by buoys.

Hudiksgrund (61°36'N., 17°25'E.), a detached shoal bank, lies about 1.5 miles SSW of Holickskar Light. It has a least depth of 4.6m and is marked by a buoy.

An isolated shoal, with a depth of 9.6m, lies about 1 mile S of Hudiksgrund, 2.8 miles NW of Ago Light, and is marked by a buoy.

Pilotage.—Pilotage within Hudiksvall is compulsory. Pilots must be requested through Gavle VTS (see paragraph 6.7). Pilots may be contacted by VHF and board in the vicinity of Hallgrund Light (61°17'N., 17°24'E.) or, by special arrangement, about 3 miles N of Ago Light.

Directions.—Two main approach routes lead from seaward and are both authorized for drafts up to 9.9m.

Vessels may head WSW and pass between Myran shoal and Olofsgrund shoal or they may head W and pass between the N side of Agon Island and Olofsgrund shoal.

Vessels may then pass S and W or N of the isolated 9.6m shoal lying 1 mile S of Hudiksgrund. Deep-draft vessels are advised to pass S and W of the latter shoal.

Hudiksvall (61°44'N., 17°07'E.)

World Port Index No. 25780

6.25 The port, which mainly handles timber products, is situated at the head of Hudiksvallsfjarden, about 14 miles NW of the entrance to the inlet.

Ice.—Hudiksvallsfjarden is usually ice-covered from the middle of December to the end of April. The channel is kept open by icebreakers but berthing delays may occur.

Tides—Currents.—The water level within the inlet is lowered by N winds and raised by S winds. Currents in the approaches are negligible.

Depths—Limitations.—The route leading NW from S of Hudiksgrund has a least depth of 11m and is authorized for

drafts up to 9.9m.

The main channel leading into Hudiksvallsfjarden passes through Saltvikssundet, a narrow passage 1.5 miles long, located 5 miles SE of the port. Kastellholm, a small islet, lies in the approach to the berths and buoyed channels pass each side of it.

Oljekajen, a T-shaped oil jetty, is 69m long and has a depth of 10.9m alongside. Tankers up to 60,000 dwt, 230m in length, 32m beam, and 9.9m draft can be accommodated.

Stenkajen, the main quay, is 400m long and has depths of 4.8 to 7.3m alongside. Kattvikskajen, with a ro-ro ramp at the S end, is 365m long and has depths of 5.3 to 9.3m alongside. Cargo vessels up to 30,000 dwt, 165m length, 32m beam, and 8.6m draft can be accommodated.

Aspect.—The entrance channel is indicated by lighted rangeways and marked by buoys and beacons.

Blaxasberget, 460m high, stands 11 miles WSW of Hudiksvall. This hill is precipitous on its E and S sides and is especially conspicuous from SE.

Storberget, a prominent hill, rises 8 miles W of Hudiksvall. An aeronautical light is shown from a mast, with an elevation of 335m, standing on the N side of this hill.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Gavle (paragraph 6.7).

At night, berthing at Oljekajen, the oil jetty, is restricted to tankers of not more than 100m in length.

Speed restrictions apply within the port.

Tugs are compulsory for cargo vessels over 8,000 tons and tankers over 6,000 tons.

Anchorage.—Vessels may anchor, in depths of 8 to 23m, mud and sludge, close SE of Kastellholm islet.

Caution.—A submarine cable and a submarine pipeline, which may best be seen on the chart, extend across the harbor close W of the oil jetty.

Hudiksvall to Sundsvallsbukten

6.26 Iggesund (61°38'N., 17°07'E.) (World Port Index No. 25760) is situated at the head of a narrow inlet, 5 miles S of Hudiksvall.

Ice.—The channel leading to Iggesund is normally obstructed by ice from January to April.

Depths—Limitations.—The routes leading from seaward into Hudiksvall are authorized for drafts up to 9.9m.

The entrance channel leading to the harbor is authorized for drafts up to 8m as far W as Skarnas Terminal, the commercial facility.

Skarnas Terminal consists of a concrete pier and a quay. The pier, at the E side of the terminal, is 152m long and has a berth on each side. The berth on the N side is 150m long and has a depth of 7.9m alongside. The berth on the S side is 140m long and has a depth of 7.9m alongside.

The quay, located W of the pier, is 240m long and has a depth of 7.8m alongside.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Gavle (paragraph 6.7).

Vessels bound to or from Skarnas Terminal should make a general call on VHF channel 16 prior to proceeding through Dukarsund, the narrow entrance channel. Inbound vessels should call when passing Bondgrund shoal (61°37'N., 17°16'E.); outbound vessels should call before leaving the berth.

Aspect.—The entrance channel is indicated by a lighted range and marked by buoys.

The buildings and chimneys, up to 125m high, of the textile factory at Iggesund are conspicuous.

Anchorage.—Anchorage can be obtained, in depths of 10 to 12m, mud, SW of Skarnas Terminal.

Caution.—It is reported that less depths than charted exist within the entrance channel leading to Skarnas Terminal and the local authorities should be contacted for the latest information concerning maximum authorized drafts.

6.27 The coast between the peninsula of Hornslandet and the S entrance of Sundsvallsbukten, 32 miles N, is mostly high and wooded. The shore is fronted by numerous islands, rocks, and shoals, which may best be seen on the chart. Only the outer dangers are described below. Several small fishing boat harbors are situated along this stretch of the coast.

Balson (61°43'N., 17°32'E.), a wooded island, lies close off the NE side of the peninsula of Hornslandet and is fringed by shoals. Its N and S sides should not be approached within 1 mile and its E side should not be approached within 0.5 mile.

Balson Light is shown from a prominent tower, 6m high, standing on a rock lying close off the E side of the island.

Balsosund, a narrow passage encumbered by rocks and shoals, separates Balson from the NE side of Hornslandet. A buoyed channel, which is authorized for drafts up to 3.9m, leads through this passage and may be used by small vessels with local knowledge.

Kuggorarna, a bare islet, lies at the SW end of Balsosund. A prominent chapel, with a belfry, stands on this islet.

Anchorage may be obtained by small vessels, with local knowledge, in a depth of 13m, sand and stones, between the N end of Kuggorarna and the E side of the mainland peninsula.

Arnoviken (61°43'N., 17°24'E.) lies at the NW side of Hornslandet, 3.5 miles W of Balson. This inlet provides sheltered anchorage and is accessible to vessels of medium draft. Halvarskar, a wooded islet, lies on the W side of the entrance and Hastholmen, another islet, lies close off the N extremity of Hornslandet. The best anchorage is in depths of 20 to 25m, mud and sand, at the head of the inlet. The entrance channel is available to vessels with drafts up to 4.9m. Local knowledge is advised. Ice usually obstructs this inlet from November to May.

6.28 Bergo Light (61°49'N., 17°25'E.) is shown occasionally from a structure standing on the mainland, 7 miles NW of Balso Light. Rocks and shoals extend up to about 1 mile seaward from the shore in the vicinity of this light.

Remmarharet (61°51'N., 17°26'E.), an above-water rock, lies on a large shoal bank centered 2 miles NNE of Bergo Light. A prominent beacon, 4m high, stands on this rock.

Britas Klack (61°53'N., 17°28'E.), with a least depth of 2.3m, lies 3 miles offshore, about 5 miles NNE of Bergo Light. This shoal is marked at its S and W sides by buoys.

A detached shoal bank, with above-water rocks, lies centered 1.7 miles NNE of Britas Klack.

Glavsberget, rising 9.5 miles WNW of Bergo Light, is 187m high and consists of several large rocky hummocks, which are clearly visible from SE. From the E, this hill appears more compact.

Bolleberget, rising about 14 miles NW of Bergo Light, is 294m high. This hill can be easily distinguished from the others in the vicinity and is conspicuous from seaward.

Caution.—**Eystrasaltbanken** (61°46'N., 18°52'E.), a shoal bank with a least depth of 12m, lies about 38 miles E of the NE extremity of the island of Balson.

6.29 Stocka (61°54'N., 17°21'E.) (World Port Index No. 25800), a former commercial harbor, is situated on the S side of a small inlet, 12 miles NNW of Balso Light.

The inlet is sheltered by several shoals and the islets of Ingaskar and Ronnskar, which lie in the entrance. A breakwater extends NE from the S shore of the inlet toward Ingaskar. There are depths of 5.5 to 6.4m, clay, gravel and stones in the inlet, which narrows toward its head. The entrance channel, which leads close S of Britas Klack shoal, is authorized for drafts up to 5.4m. Ice usually obstructs the harbor from January to March. Local knowledge is required.

A pier, used for laying up, is situated in the SW part of the harbor. The outer part of the N side of the pier provides a berth, 110m long, with a depth of 5.1m alongside. The inner part provides a berth, 50m long, with depths of 1.9 to 3.9m. The S side of the pier provides a berth, 65m long, with a depth of 3.8m alongside.

Anchorage may be taken, in depths of 4 to 6.5m, stone, clay, and sand, close W of Ingaskar.

Four prominent wind generators stand near the coast about 1 mile SSE of Stocka.

A conspicuous chimney is situated at Stromsbuck, about 1.5 miles S of Stocka. A tower stands close N of this chimney but is prominent only when viewed from the S and SE.

Jattholmarna (61°57'N., 17°31'E.), lying about 3 miles offshore, consists of two moderately-high wooded islands, which are separated from each other by a narrow channel. This channel may only be seen from N or S. The islands are fringed by rocks and shoals.

Vitorarna, consisting of two islets, lies on a shoal bank 1.2 miles N of Jattholmarna. The N and larger islet is mostly wooded; a beacon stands on the S islet.

Hartefjarden, an inlet, indents the mainland, 2.5 miles W of Vitorarna. Harteskar, a small islet, lies in the middle of the entrance. Anchorage may be obtained, in a depth of 10m, sand, within this inlet but it is open to winds from between E and S. The entrance channel leads SW of Harteskar and is authorized for small vessels with drafts up to 7m. Local knowledge is advised.

Gran (62°01'N., 17°38'E.), a moderately-high wooded island, lies about 5 miles offshore, 4.5 miles NE of Jattholmarna. A small fishing harbor, protected by a breakwater, is situated at the E side of this island.

A light is shown from a prominent framework tower surmounting a dwelling near the center of the island.

6.30 Lillgrund (62°03'N., 17°40'E.), a shoal bank with

rocks, awash, lies centered 2 miles NNE of Gran and is marked by buoys.

Norra Myran, a shoal bank with a least depth of 3.2m, lies centered 2.3 miles WNW of Gran and is marked by a buoy.

Hundgrund (62°07'N., 17°48'E.), with a least depth of 6m, lies 7.5 miles NE of Gran. This shoal is the outermost danger in this vicinity and is marked by a buoy.

Orraklinten, 242m high, rises 12.3 miles NW of Gran. This prominent hill is very steep on its N side, but appears to have three summits of equal elevation when viewed from the S.

Bramon (62°13'N., 17°43'E.), 73m high and densely wooded, lies 1.5 miles off the Bjorko Peninsula, 12 miles NNE of Gran. A light is shown from a prominent tower, 16m high, standing on the NE side of this island.



Bramon Light

Revhallan, a shoal with a least depth of 0.8m, lies about 0.4 mile NE of the light and is marked by a buoy.

Bramo Kalv, a wooded islet, lies close off the SW end of Bramon. A light is shown from a prominent tower, 9m high, standing on the SW side of this islet.

Bramosund lies between the mainland and the W side of Bramon. This sound is generally clear of dangers but foul ground fringes the mainland shore. The passage is available to vessels with drafts up to 10m. Local knowledge is advised.

Anchorage may be obtained, in depths of 14 to 25m, sand and mud over clay, close off Sanna, a village standing on the W side of Bramon 1.2 miles N of Bramo Kalv Light.

The current sets moderately through the sound and is frequently strong. The most troublesome sea is raised by SW winds.

Lorudden (62°14'N., 17°39'E.), a high point, is situated on the mainland at the NW end of Bramosund and is marked by a light.

Caution.—Several nature reserves, including the waters surrounding the island of Gran and the islets of Vitorarna, are situated along the coast between Hornslandet and the S entrance of Sundsvallsbukten. Entry into these reserves is affected by numerous restrictions.

Submarine cables, which may best be seen on the chart, extend across Bramosund, about 1.3 miles S of Lorudden Light.

Sundsvallsbukten

6.31 Sundsvallsbuken (62°20'N., 17°35'E.), a large bay, is entered between the island of Bramon and the island of Aston, 9.5 miles N. Sundsvall, with its associated harbors, is the principal port lying within this bay. A number of former timber-loading berths are situated throughout the bay but most of these are no longer open to commercial shipping.

Astholmsudde (62°23'N., 17°44'E.) is the SE point of Aston and the highest part of the island. A light is shown from a structure standing on this point. A beacon, 5m high, is situated close N of the light.

The bay is encumbered by many islands, rocks, and shoals, which may best be seen on the chart. Only the outermost dangers are described below.

Kattgrundet (62°16'N., 17°45'E.), with a least depth of 9.9m, lies about 3.2 miles N of Bramon Light. This shoal is the outermost danger on the S side of the approach.

Sjogrund, a shoal patch with a least depth of 8.5, lies about 3.8 miles NW of Lorudden Light. Storgunden, a shoal bank with a rock, awash, lies centered about 1 mile WNW of Sjogrund. Knuten, a shoal with a least depth of 2.8m, lies near the NW side of Storgunden, about 1.4 miles NW of Sjogrund. These three shoals form the outermost dangers on the S side of the entrance.

Alnon (62°23'N., 17°28'E.), a large island, encumbers the inner part of the bay and rises to a height of 120m in its SW part.

Gubben Light (62°21'N., 17°35'E.) is shown from a prominent floodlit tower, 10m high, standing on an islet lying 1.5 miles ESE of the SE extremity of Alnon.

Draget, lying 1.3 miles SSW of Gubben light, is the southernmost islet of a chain of islands and islets extending up to 1.8 miles S from the SE extremity of Alnon.

A shoal, with a depth of 6.3m, lies about 0.3 mile SSW of Draget. Vastra Asen, a detached shoal with a depth of 2.7m lies about 0.3 mile WSW of Draget and is marked by buoy. These two shoals form the outermost dangers in this vicinity.

Rodon, 92m high and hilly, is located 2.5 miles N of Gubben Light and is the largest of several islands lying close off the E side of Alnon. Its shoreline is reddish in color.

Rodogubben Light (62°23'N., 17°36'E.) is shown from a prominent tower, 12m high, standing on a small islet lying close off the SE side of Rodon.

Granon, an island marked by a light on its NW side, lies 3.5 miles NNW of Rodogubben Light.

6.32 Draghallan Light (62°20'N., 17°26'E.) is shown from a prominent tower, 14m high, standing on a rocky shoal lying about 0.8 mile S of the SW extremity of Alnon. The N side of this rocky shoal is marked by a lighted buoy.

A shoal, with a least depth of 2.7m, lies close SE of the light and is marked by a buoy. A detached shoal patch, with a depth of 8.2m, lies 0.4 mile N of the light and is marked by a lighted buoy.

Alnosundet (62°26'N., 17°24'E.) is the passage lying between the mainland and the W side of Alnon. The Alnobron Bridge spans this passage about 5.7 miles NNW of Draghallan Light and is marked by a racon.



Draghallan Light



Draghallan Light from SW

The navigable channel leading under the bridge is 70m wide and has a vertical clearance of 39m.

Klingerfjarden (62°29'N., 17°28'E.) is an inlet lying between the N end of Alnon and the head of the bay.

Anchorage.—Designated anchorage areas lie in the outer part of the bay and may best be seen on the chart. Area A and Area B are centered about 5 miles S and 1 mile ENE, respectively, of Gubben Light (62°13'N., 17°43'E.). Area C is centered 2 miles N of Rodogubben Light (62°23'N., 17°36'E.).

Directions.—Two approach routes, which may best be seen on the chart, lead into the bay and converge in the vicinity of Draghallan Light.

The main route, which is authorized for drafts up to 13m, leads W for about 2 miles from a position located 0.6 mile SE of Astholmsudde Light. It continues WSW for about 5 miles and passes midway between Rodogubben Light and Gubben Light and close SSE of the SE extremity of Alnon island. This main route then leads SW and rounds Draghallan Light on the S side.

Vessels, with drafts up to 8m, may use the channel leading between the N side of Draghallan Light and the detached 8.2m shoal patch lying 0.4 mile N.

The secondary approach route, which is authorized for drafts up to 10m, leads NW for about 5 miles from a position located 1.2 miles E of Bramon Light (62°13'N., 17°43'E.). It passes between the N side of Bramon island and Kattgrundet shoal. The route then continues WNW for about 7 miles and rounds Draghallan Light, on the S side. It passes about 0.9 mile NNE of Knuten shoal and 0.6 mile SSW of Vastra Asen shoal.

The alternate route through Bramosund, which is authorized for drafts up to 10m, joins this secondary route at a position located about 4.5 miles SE of Gubben Light (see paragraph 6.31).

Caution.—Floating logs may be encountered in the ap-

proaches to Sundsvallsbukten.

A military exercise area lies in the approaches to Sundsvallsbukten. It is situated between Bramon (62°13'N., 17°43'E.) and Skarpudden (62°29'N., 17°49'E.) and extends up to 10 miles seaward.

Several submarine cables, which may best be seen on the chart, extend across the routes within Sundsvallsbukten.

Sundsvall (62°23'N., 17°21'E.)

World Port Index No. 25910

6.33 Sundsvall is situated at the head of Sundsvallsfjarden, an inlet located at the W side of Sundsvallsbukten. The port also includes the facilities at Vindskarvarv, Ortvikén, Kubikenborg, Skonsberg, and Cementsilokajén, which are situated within Sundsvallsfjarden; and the harbors of Tunadalshammen, Johannedal, and Ostrand, which are situated in Alnosundet.

The port exports various wood products and aluminum, and imports bauxite, oil, and fertilizers.

Ice.—The port is usually operated all year round. However, ships may be delayed by ice from December to April.

Tides—Currents.—The greatest extremes of water level observed in Sundsvallsbukten are about 0.8m above and 1.1m below mean sea level. Higher water levels occur with E and SE winds, and low water levels with N and prolonged NNE winds. The timing of high or low water is unpredictable and depends entirely on the wind direction and velocity.

Aspect.—The approach routes and entrance channels are indicated by directional sector lights and lighted ranges. The fairways are marked by buoys.

Tjuvholmen, an islet 35m high, lies in the entrance to Sundsvallsfjarden and is marked by a light on its W side.

Five prominent chimneys, at an aluminum works, and a conspicuous silo stand on the S side of Sundsvallsfjarden, about 0.4 mile SSW of Tjuvholmen Light.

A conspicuous radio mast stands on a hill about 3 miles SSW of Draghallan Light.

An aeronautical light is shown from a conspicuous framework tower standing on the N slope of Sodra Stadsberget, 3.8 miles WNW of Draghallan Light.

A conspicuous floodlit pilot lookout tower stands on Skorven, an islet lying close off the SE extremity of Alnon.

A conspicuous church, with a square tower and a spire, stands in the S part of Njurunda, 5.3 miles SSW of Draghallan Light.

Depths—Limitations.—From close W of Draghallan Light, the main route, which is authorized for drafts up to 13m, leads 2.5 miles NW to the entrance of Sundsvallsfjarden. The channel passing N of Tjuvholmen is authorized for drafts up to 12m and the channel passing S of this islet is authorized for drafts up to 11.3m. The channel leading to the inner part of Sundsvallsfjarden is authorized for drafts up to 7.8m.

The channel leading into Alnosundet from the vicinity of Tjuvholmen is authorized for drafts up to 12m as far as Tunadalshammen, 1 mile S of the bridge. The channel continuing to the anchorage off Ostrand, at the NW end of Alnosundet, is authorized for drafts up to 9m. The channel leading from Ostrand anchorage to the berths is authorized for drafts up to 7m.

Vindskarvarv, an oil terminal, is situated on the SE side of

the inlet. It has a berth, 100m long, with a depth of 12m alongside.

Ortviken, a harbor situated on the NE side of the inlet, has three quays. They are 157m, 90m, and 160m long, with depth of 6.9m, 6.5m, and 11.3m alongside, respectively.

Kubikensborg, a harbor situated on the SE side of the inlet, has a quay, 153m long, with a depth of 10.1m alongside. At a distance of 3m off the quay the depth is 11m.

Skonsberg, a harbor on the N side of the inlet, has a quay, 50m long, with a depth of 6.7m alongside.

Cementsilokajen, a harbor on the S side of the inlet, has a quay, 15m long with two breasting dolphins, with a depth of 6.9m alongside.

Sundvall Harbor, also known as Stadshamnen, has 740m of quayside, with depths of 5.3 to 8.1m alongside. There is also a reserve berth, 325m long, with a depth of 3.9m alongside.

A new ferry berth, 130m long with a ro-ro ramp, has been constructed at the Town Quay. It has a depth of 8.1m alongside and can handle vessels with drafts up to 7.8m.

Tunadalshamnen Harbor is situated at the SW side of Alnosundet and provides three quays. Timber Quay is 195m long and has depths of 4.5 to 7.3m alongside; Sundvall Terminal Quay is 660m long and has depths of 9.1 to 12.3m alongside; and Gas Oil Quay is 62m long and has a depth of 11.8m alongside.

Johannedal Harbor is situated on the W side of Alnosundet, close N of the bridge. It has a timber quay, 120m long, with depths of 2.5 to 5.5m alongside.

Ostrand Harbor, at the NW end of Alnosundet, has a quay, 52m long, with a depth of 5.8m alongside. Vessels up to 130m in length can also berth alongside a lighter.

The port has facilities for tanker, ro-ro, container, timber, bulk, general cargo, LPG, cruise, and ferry vessels. Tankers up to 60,000 dwt, 250m in length, and 11.4m draft can be handled. LPG vessels up to 200m in length and 10.4m draft can be handled.

Pilotage.—The pilotage area for Sundsvall lies between latitude 62°08'N and latitude 62°50'N (including Gaviksfjorden and Angermanalven). All requests for pilotage must be made through the VTS station at Gavle (see paragraph 6.7).

Pilotage is compulsory for vessels, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 90m in length or 16m beam and over.
3. Category 3 vessels of 100m in length or 17m beam and over.

In certain channels within Angermanalven, pilotage is compulsory, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 80m in length, 15m beam, and 5m draft and over.
3. Category 3 vessels of 90m in length, 16m beam, and 5.5m draft and over.

Pilots can be contacted by VHF and board in Sundsvallsbukten, about 2.5 miles E of Gubben Light.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Gavle (paragraph 6.7).

Anchorage.—Anchorage may be obtained, in depths of 29

to 32m, mud, E of Tjuvholmen islet or, in depths of 10 to 20m, clay and mud, within Sundsvallsfjorden.

Anchorage may be obtained by vessels with drafts up to 9m close off the quays at Ostrand.

Caution.—Submarine pipelines, which may best be seen on the chart, extend 0.8 mile ENE from a point located on the N side of Sundsvallsfjorden, 0.5 mile NNW of Tjuvholmen Light; and extend 1.2 miles ENE from the vicinity of Ostrand.

Several submarine cables and a pipeline, which may best be seen on the chart, extend across Alnosundet.

6.34 Stockvik (62°20'N., 17°23'E.) (World Port Index No. 25900) is situated on the NW side of Ljungan Inlet, about 2 miles W of Draghallan Light. Limestone, coke, methanol, and oil are imported here; and ammonium nitrate and carbide are exported.

The channel leading to the anchorage from the vicinity of Draghallan Light is authorized for drafts up to 13m. The channel leading to the berth is authorized for drafts up to 6.3m.

The harbor is protected by a detached breakwater, 200m long. Stora Kajen, the N and main berth, is 195m long and has depths of 6 to 6.5m alongside. A T-headed jetty, 20m long, is situated close S of the main berth and has a depth of 4.6m alongside. Vessels up to 190m in length and 6.3m draft can be handled at the port. Silting occasionally occurs at the N end of Stora Kajen.

Vessels can anchor, in a depth of 29m, clay, close off the harbor.

6.35 Klingerfjorden (62°29'N., 17°28'E.), lying between the N end of Alnon and the head of Sundsvallsbukten, can be entered from seaward and via the N end of Alnosundet. Both routes are authorized for drafts up to 9m.

The ports of Vivstavarv and Soraker are situated in Klingerfjorden along with several small craft harbors.

The main route from seaward leads between the E side of Alnon and the mainland to the NE. An alternative channel, which joins the main route, passes between the E side of Alnon and the W side Rodon islet.

Regulations.—Designated safety areas, which may best be seen on the chart, lie S of Sundsvall Airport (62°32'N., 17°27'E.), in the NE part of Klingerfjorden. Vessels with an air draft height over 20m must contact VTS Gavle on VHF channel 13 or by telephone at least 2 hours prior to entering Area A, which extends about 0.7 mile SSE from the N shore. Vessels with an air draft over 40m must contact VTS Gavle at least 2 hours prior to entering Area B, which extends between about 0.7 mile and 1.2 miles SSE from the N shore.

6.36 Vivstavarv (62°29'N., 17°22'E.) (World Port Index No. 26140) lies on the NW side of Klingerfjorden. Liquid resin and paper products are exported; and fuel oil and caustic soda are imported.

The channel leading to the anchorage is authorized for drafts up to 9m; the channel leading to the berths is authorized for drafts up to 7.3m.

Papperskajen, the paper quay, is 145m long and has depths of 7.8 to 10.6m alongside. Pulp Quay is 90m long and has depths of 4.7 to 6m alongside. Vessels up to 130m in length can be handled with the maximum draft depending on their

length. Vessels with drafts up to 9m can anchor off the harbor and secure to stern moorings.

Soraker (62°30'N., 17°30'E.) (World Port Index No. 26180) lies on the E side of Klingerfjorden. Salt, fertilizer, steel, and limestone are imported; and machine goods are exported.

The approach channel is authorized for drafts up to 5.8m. The harbor consists of a dredged basin, 190m long and 30m wide. The quay, situated in the inner part of the basin, is 180m long and has a depth of 6.1m alongside.

Vessels up to 90m in length and 5.8m draft can be accommodated. Vessels with drafts of 4m and over must be assisted by a tug.

Caution.—Several log pond areas are situated adjacent to the shore in the vicinity of Vivstavarv.

Sundsvallsbukten to Harnosand

6.37 Skarpudden (62°29'N., 17°49'E.), marked by a light, is located 6 miles NE of Astholmsudde Light.

Nygrund, a detached shoal with a depth of 4.8m, lies about 0.8 mile SW of Skarpudden and is marked by a buoy; Isaksgrundet, a rock awash, lies about 0.5 mile ESE of Skarpudden and is marked by a buoy; and Glogrund, a detached shoal with a depth of 10m, lies about 0.5 mile offshore, 1.5 miles NE of Skarpudden.

Avikebukten (62°28'N., 17°44'E.), a large bay, is entered S of Skarpudden. Fjardgrunden, a shoal with a least depth of 3.8m, lies in the S part of this bay, about 3 miles SW of Skarpudden Light.

Anchorage can be obtained, by vessels with local knowledge, in various locations within Avikebukten, in depths of 5 to 25m, sand.

Byviken (62°33'N., 17°53'E.), entered about 4 miles NNE of Skarpudden Light, is clear of dangers to within 0.4 mile of its head. This inlet affords anchorage to vessels, with local knowledge, in depths of 10 to 13m, sand and stone, but it is exposed to winds from the SE. Norra Baden and Sodra Baden are two islets lying close off the N entrance point.

An aeronautical light is shown, at an elevation of 270m, from a prominent framework mast standing at Ljustorp, 15 miles WNW of Skarpudden Light.

Caution.—**Vanta Litets Grund** (62°30'N., 18°16'E.), lying 12.5 miles E of Skarpudden Light, consists of two steep-to shoals, which are composed of stones and pointed rocks. The northeasternmost shoal has a least depth of 6.3m; the southwesternmost shoal has a least depth of 4.1m. A light is shown from a prominent tower, 20m high, standing on the NE shoal and a buoy marks the SW shoal.

The depths in the vicinity of Vanta Litets Grund are very irregular and the area should be given a wide berth.

Approaches to Harnosand and Angermanalven

6.38 The approaches to Harnosand and Angermanalven lie between the N entrance point of Byviken and Karingbergsudde Light (62°47.5'N., 18°11.2'E.), about 18 miles NE. The mainland coast in this vicinity is fronted by several large islands and islets. A number of entrance channels lead between the islands. Several small craft harbors lie along the sides of these passages.

Harnon (62°36'N., 17°59'E.), an island lying with its S extremity located about 5.7 miles NE of Skarpudden Light, is moderately high, with wooded ridges separated by deep valleys. The sides of the hills near the sea are gray, bare, and intersected by ravines. From seaward, this island appears to be the same height as the mainland behind it.

Storholmen Light is shown from a structure standing at the SW end of the island. Harno Vardkasberget, a gray hill, rises about 3.5 miles NNE of the light and is conspicuous from seaward. It is 175m high and surmounted by a small lookout tower. A prominent radio mast stands 0.3 mile ESE of this hill.

Harnoklubb Light (62°36'N., 18°04'E.) is shown from a tower, 6m high, standing on a point located on the E side of the island, 4.5 miles NE of Storholmen Light. A barren hill, 82m high, rises close WSW of the light and is surmounted by a beacon, 11m high. Close SE of and below the beacon is a large, white mark, which is conspicuous from seaward.

Harno Sodra Light is shown from a tower, 6m high, standing 0.6 mile NNE of Harnoklubb Light. A conspicuous white building, a former pilot station, is situated on the coast, 0.5 mile NNW of this light.

Lunگون (62°39'N., 18°04'E.), lying 1 mile N of Harnon, is a wooded island, which rises to a height of 50m in its N part. A light is shown from a prominent tower, 15m high, standing on the SE extremity of the island.

Anchorage can be taken, in depths of 8 to 15m, within Sundhamn, a narrow inlet indenting the NE side of the island. Local knowledge is required.

Stromskaten Light (62°40'N., 18°00'E.) is shown from a floodlit structure standing on the SW extremity of the island.

Bogrundet, a shoal bank with rocks awash, lies about 0.3 mile off the S side of the island, 1.3 miles ESE of Stromskaten Light. Hakansgrund, a shoal with a least depth of 2m, lies about 0.3 mile off the S side of the island, 0.7 mile W of the SE extremity. Both of these dangers are marked by buoys.

6.39 Hemson (62°43'N., 18°05'E.), lying close N of Lunگون, is high and hilly. The shores of this island are reddish in color in several places. Hemsöhatt, a prominent hill, rises on the SE part of the island. It is 208m high and resembles a hat with a wide brim. Another prominent hill, 223m high, stands about 2 miles NNW Hemsöhatt.

Utanojfjorden, an inlet, indents the middle of the E side of Hemson and provides anchorage to vessels with local knowledge. Storgrundet, a shoal with a least depth of 4.5m, lies near the center of the entrance. The entrance channel, which is authorized for drafts up to 6m, leads W and passes N of this shoal. Juviken, a small bay lying on the S side of the inlet, has depths of 15 to 25m, clay. Prasthushamn, a small bay lying on the N side of the inlet, has depths of 12 to 20m, clay and sand.

Two prominent radio masts stand on the shore of Prasthushamn.

Nordanoviken, a bay indenting the middle of the N side of Hemson, provides well-sheltered anchorage, in depths of 18 to 22m, clay, within its S part. Local knowledge is required. The N part of the bay is unsuitable because the depths are considerable.

Storon (62°46'N., 18°13'E.), a wooded island, lies 2 miles NE of the NE end of Hemson. It is fairly high and attains an elevation of 56m in the N part.

Karingsbergsudden Light is shown from a point on the mainland located 1.6 miles WNW of the NE extremity of Storon. Gronviksfjarden, a bay used only by small craft and pleasure boats, is entered close W of this light.

Gronviksgrundet, an islet, lies 0.4 mile SSE of Karingsbergsudden Light and is marked by a beacon at its N end.

Caution.—A submarine cable, which may best be seen on the chart, extends across the W side of Utanofjarden.

A spoil ground area, which may best be seen on the chart, lies centered 2.5 miles ENE of Harnoklubb Light.

The approaches to Harnosand and Angermanalven lie within the Hemson Semi-restricted Area, which includes the waters between the islands of Storon, Hemson, Lungon, and Harnon. The limits of this area may best be seen on the chart. Vessels proceeding through the area must keep to the designated pilotage routes.

For further information on restricted and semi-restricted areas, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

A cable ferry is in use during the ice-free part of the year between Strinningen (62°41.5'N., 17°59.1'E.) and Sanna (62°41.4'N., 17°59.8'E.). Vessels may only pass the route when the ferry is stopped at any of the ferry berths and the wires have been lowered. Vessels over 300 gross tons should call the ferry on passing any of the following radio reporting points to obtain information prior to passage:

1. Northbound—South of Stromskatan in position 62°39.2'N, 18°00.2'E.
2. Westbound—North of Ornskarsgrund in position 62°40.4'N, 18°05.4'E.
3. Southbound—East of Valon in position 62°44.3'N, 17°59.8'E.

6.40 Sodrasundet (62°36'N., 17°56'E.), forming the S approach to Harnosand, leads in a N direction between the W side of Harnon and the mainland. An overhead cable, with a vertical clearance of 20m, spans this passage about 3 miles N of the seaward entrance.

An inlet, lying at the SE end of the passage, leads to Solumshamn, which is situated on the SW part of Harnon. This inlet provides good anchorage to vessels with local knowledge, in depths of 10 to 33m, clay and sand. Vessels should not proceed too far inside a line joining the entrance points because two shoals, with least depths of 7.4m and 3.6m, lie about 0.2 mile and 0.3 mile, respectively, SSE of the N entrance point.

Anchorage can also be taken, in depths of 10 to 12m, clay and mid, within Norra Falloviken, a narrow inlet indenting the mainland, about 4.7 miles N of the seaward entrance. Local knowledge is required.

Stora Inlopp (62°39'N., 18°00'E.), the principal N approach route to Harnosand, lies between Harnon and Lungon. This channel also provides access to Angermanalven by way of Sannasundet and Abordssundet. The fairway has depths of 46 to 82m and is clear of dangers, except on its NE side.

Alandsfjarden (62°40'N., 17°56'E.), leading in a WNW direction, is a continuation of Stora Inlopp. This inlet may be entered via a channel, which is authorized for drafts up to 10m. Local knowledge is advised.

Lungosundet (62°40'N., 18°03'E.) leads between Lungon and Hemson. Vessels from the N, with local knowledge, some-

times use this passage when bound for Harnosand or Alandsfjarden. The channel is authorized for drafts up to 9.9m.

Bonskaret is a low, gray, and barren islet lying on the N side of the entrance, close off the SE side of Hemson.

Sannasundet (62°42'N., 18°00'E.) lies between the W side of Hemson and the mainland. This passage leads N for 4.5 miles from the W end of Lungosundet and is narrow in places.

Valon (62°44.2'N., 17°59.5'E.), an island marked by a light at its NE end, lies at the N end of this passage. The main route passes E of this island.

Abordssundet (62°46'N., 17°58'E.), the continuation of Sannasundet, lies between the W side of Abordson and the mainland. This passage leads NNW for about 3.5 miles and narrows at its N end.

The main route from S leading into Angermanalven (see paragraph 6.43) passes through Sannasundet and Abordssundet. It is authorized for drafts up to 10m.

Snattsundet, a narrow channel, leads between the S end of Abordson and the N end of Hemson. It is used only by small craft and local knowledge is required.

Anchorage.—A designated anchorage area, which may best be seen on the chart, lies in Alandsfjarden and is centered about 1.6 miles NW of the NW end of Harnon.

Good anchorage can be obtained in the inner part of Alandsfjarden, in depths of 10 to 20m, mud. Anchorage can be also taken, in depths of 12 to 14m, off Alandsbro, a village situated at the head of the inlet, and off Nasslandssund, a village standing close N of Alandsbro. Vessels at these anchorages may secure their sterns to dolphins.

Caution.—A submarine cable extends across Alandsfjarden, about 0.7 mile NW of the NW end of Harnon.

A ferry runs between Hemson and the mainland in Sannasundet.

6.41 Ulvvik (62°40'N., 17°52'E.) (World Port Index No. 26280), a small harbor, is situated on the N side of Alandsfjarden, about 2.2 miles NW of the NW end of Harnon. The main quay is 80m long and has depths of 6.5 to 10m alongside.

Utansjo (62°46'N., 17°56'E.) (World Port Index No. 26290) is situated on the mainland W of the island of Abordson. The entrance channel leading to the harbor is authorized for drafts up to 8.2m. This small port imports oil and exports timber products.

The pulp factory quay is 120m long and has a depth of 9m alongside. A concrete quay is situated close S of the pulp quay. It is 113m long and has a depth of 8.5m alongside. A small basin lying between these two quays provides a quay, 50m long, with depths of 4 to 6m alongside.

Harnosand (62°38'N., 17°56'E.)

World Port Index No. 26240

6.42 Harnosand (Hernosand) stands on the NW side of Harnon. The port facilities are situated along both sides of the narrow channel separating the NW side of the island from the mainland. Forest products and iron oxide are exported; oil, asphalt, sulfuric acid, and general cargo are imported.

Winds—Weather.—The harbor is considered to be one of the best in the N part of Sweden, being easy of access, spa-

cious, and well-protected from all winds.

Ice.—Ice obstruction normally occurs from January until early or mid-April. However, the port is usually kept open by icebreakers.

Tides—Currents.—Higher water levels normally occur in the fall with S and SE winds; lower water levels occur in the spring with N and NW winds. On the average, the annual maximum and minimum water levels differ by about 0.8m from the mean water level. The current in the harbor is not very troublesome.

Depths—Limitations.—The N and S harbors of the port are connected by two canals, which can be used by small craft. Vessels bound for the S harbor must enter through Sodrasundet. The main commercial facilities are situated in the N harbor. Vessels bound for the N harbor must enter through Stora Inlopp.

The approach channel, via Stora Inlopp, is authorized for drafts up to 10.5m.

Oljekajen, an oil terminal, has a quay, 62m long, with a depth of 11.2m alongside.

Djuphamnskajen, a concrete quay with a ro-ro ramp at the N end, is 260m long and has depths of 7.5 to 8m alongside.

Norra Skeppsbron Quay is 190m long and has depths of 4.3 to 4.6m alongside.

Utspranskajen, an iron piled quay, is 169m long and has depths of 6.3 to 8.1m alongside.

Sodra Skeppsbron, a concrete quay, is 310m long and has depths of 4.9 to 5.7m alongside.

There are also several small craft quays, with depths of 2 to 5m alongside.

Tankers up to 200m in length and 10.5m draft can be accommodated in the port.

Aspect.—Harnosands Hamn Light (62°38.7'N., 17°57.5'E.), a directional sector light, is shown from a prominent tower, 6m high, standing on the NW end of Harnon at the E side of the entrance to the harbor.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Sundsvall pilot station (see paragraph 6.33). All requests for pilotage must be made through the VTS station at Gavle (see paragraph 6.7). Pilots can be contacted by VHF and board in Sundsvallsbukten, about 2.5 miles E of Gubben Light (62°21'N., 17°35'E.).

It is reported that pilots can also be obtained from the Ornskoldsvik pilot station (see paragraph 6.52). Requests for pilotage must be made through the VTS station at Lulea. Pilots can be contacted by VHF and board about 2 miles S of the outermost shoal near Skagsudde (63°11'N., 19°01'E.).

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Gavle (paragraph 6.7).

Vessels must not exceed a speed of 5 knots in the harbor area.

Anchorage.—The roadstead lying close N of the N harbor provides anchorage, in depths of 14 to 45m, clay.

Caution.—Two submarine cables extend across the N harbor and may best be seen on the chart.

It is reported that a bridge is being constructed across the fjord about 2 miles NW of Harnosand.

Angermanalven

6.43 Angermanalven (62°48'N., 17°58'E.), with its tributaries, forms one of the largest river systems in Sweden. The river is navigable by ocean-going vessels as far as Nyland (63°00'N., 17°46'E.), about 20 miles above the mouth. However, it is reported that commercial vessels no longer use this port.

The principal inlets branching from Angermanalven are Norafjorden (62°50'N., 18°02'E.), Lugnviksfjorden (62°55'N., 17°55'E.), and Strinnefjorden (62°58'N., 17°53'E.), on the E side; and Bollstafjorden (62°59'N., 17°44'E.), on the W side.

Norafjorden, the entrance of which is spanned by a bridge with a vertical clearance of 18m, and Strinnefjorden are used only by small craft.

Numerous small harbors are situated along the river, where both anchorage and berthing are available. However, many of these loading places are no longer open to commercial shipping and are used only by small craft and pleasure boats.

Tides—Currents.—The water level varies between 0.5 and 0.7m above or below mean level. Higher water levels occur in autumn, during freshets, and with S, SE, and E winds. Lower water levels occur in early summer, and with N, NW, and W winds.

Ice.—Ice obstruction usually occurs from mid-January to early or mid-April.

In addition to the route via Stora Inlopp and Sannasundet, it can also be entered through channels leading N or S of Storön and N or S of a group of islets lying N of the NE end of Hemson Sannasundet and Abordssunde

The routes leading through Sannasundet and N or S of Storön are authorized for drafts up to 10m.

Depths—Limitations.—The river can be entered from the S via Stora Inlopp or Lungosundet and then through Sannasundet and Aborsundet (see paragraph 6.40).

The river can also be entered from the N through the channels leading N and S of Storön (see paragraph 6.39).

The northernmost route leads in a W direction and passes N of the N end of Storön and N of the islet of Gronviksgrundet. It continues SW and passes N of a group of islets lying off the NE end of Hemson. This route then joins the southernmost route.

The southernmost route leads in a NW direction and passes S of the S end of Storön. It continues W and NW, passing between the N coast of Hemson and Hyndan, the dome-shaped and southernmost islet of the group. This route then leads NW for 5 miles.

All these routes leading from seaward converge close off the NW extremity of Abordson in the vicinity of Veda (62°48'N., 17°56'E.) and the Hogakustenbron Bridge. From the bridge, the route leads NW and N for about 5 miles to the vicinity of Sando (62°53'N., 17°54'E.).

The entrance route leading through Sannasundet and those leading N and S of Storön are authorized for drafts up to 10m as far as Sando.

The Hogakustenbron Bridge, a suspension bridge, spans the fairway channel in the vicinity of Veda (62°48'N., 17°56'E.) and has a vertical clearance of 40m.

The main channel (Svanosund) leads W of the island of Sando and W of the island of Svanon, lying close N. A secondary



The Hogakustenbron Bridge

channel leads E of these islands. The two channels rejoin close N of Svanon and continue N and NW for about 6 miles.

The Sandobron Bridge, a high level bridge, spans the main channel between the mainland and the W side of Sando. It has a vertical clearance of 40m over a navigable width of 50m.

An overhead power cable, with a vertical clearance of 40m, extends across the main channel at the N end of Svanon.

A bridge spans the secondary channel between the mainland and the E side of Sando. It has a vertical clearance of 12m over a navigable width of 62m.

The main channel leading W of Sando and Svanon is authorized for drafts up to 8.5m as far as Vaja, which is situated close N of Dynas (62°58'N., 17°46'E.).

The secondary channel, passing E of the islands, is authorized for drafts up to 5m. However, it is reported that less water exists in this passage.

From the vicinity of Vaja, the main channel leading into Bollstafjarden (62°59'N., 17°43'E.) is authorized for drafts up to 7.7m.

Aspect.—Racons are situated at the Hogakustenbron Bridge and the Sandobron Bridge.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Sundsvall pilot station (see paragraph 6.33). All requests for pilotage must be made through the VTS station at Gavle (see paragraph 6.7). Pilots can be contacted by VHF and board in Sundsvallsbukten, about 2.5 miles E of Gubben Light (62°21'N., 17°35'E.).

It is reported that pilots can also be obtained from the Ornskoldsvik pilot station (see paragraph 6.52). Requests for pilotage must be made through the VTS station at Lulea. Pilots can be contacted by VHF and board about 2 miles S of the outermost shoal near Skagsudde (63°11'N., 19°01'E.).

Regulations.—Tankers with drafts over 7m are required to transit Svanosund, the main channel passing W of Sando, during daylight and accept the assistance of a tug.

Vessels must not exceed a speed of 7 knots when proceeding between the S end of Sando and Svanon; when proceeding through the narrow passage between the mainland and the NW end of the island of Abordson; and when in the vicinity of the ferry, which crosses Sannasundet, about 2 miles N of Stromskaten Light (62°40'N., 18°00'E.).

During the period when Angermanalven can be crossed on the ice between Frano (62°55'N., 17°51'E.) and Kinnmargen, about 1 mile N of Svanon, vessels must adhere to the same ice lead, which must not be made wider than 24m. On each side of the ice lead in the vicinity of the crossing is a red post, surmounted by a triangle, 2m high. Traffic signals are displayed from a flagstaff standing at the W side of the ice lead. By day a black ball, or at night a red light, indicates that the lead is closed. A red light over a white light indicates that the lead is open for traffic. A vessel about to pass the crossing must reduce to the slowest possible speed in good time and sound three blasts (short-long-short).

Similar regulations are enforced for the ice lead situated in the vicinity of Utansjo (62°46'N., 17°56'E.). By day brooms, sufficiently tall to avoid being snowed under, and at night white illuminated boards are set up on each side of the ice lead near the crossing. In addition, a red light is exhibited, at an elevation of 2m, on either side of the crossing. Vessels must reduce speed to 5 knots while passing through this lead.

When the ice in the alternate channel leading E of Sando is available for crossing, the passage is closed to marine traffic.

6.44 Gustavsvik (62°50'N., 17°53'E.) (World Port Index No. 26310) is situated on the W side of the river, 2.5 miles above the Hogakustenbron suspension bridge. This small harbor provides a drydock, with a depth of 8m over the sill. Vessels up to 18,000 dwt, 165m in length, and 21m beam can be handled.

A concrete quay, 100m long, is situated at the E side of the drydock and has depths of 4 to 8m alongside. Another quay, 40m long, is situated at the W side of the drydock and has a depth of 4m alongside.

Lunde (62°53'N., 17°53'E.) (World Port Index No. 26340), the site of a former shipyard, is a small harbor located on the W side of the river, close S of Sando. There is a quay, 90m long, with a depth of 4.8m alongside.

Lugnvik (62°56'N., 17°55'E.), a small harbor, is situated on the E side of Lugnviksfjarden and exports timber products. The entrance channel leading to the harbor is authorized for drafts up to 8.5m. Vessels should pass E of a shoal, with a least depth of 7.9m and marked by a buoy, which lies in the center of the entrance to the fjord.

The main quay is 42m long and has a depth of 8.8m alongside. Vessels up to 114m in length can be handled, with the assistance of a tug. There is also a wooden quay, 120m long, with a depth of 4.5m alongside. However, this quay is reported to be in poor condition and no longer used. A large prominent shed stands in the vicinity of the quay.

6.45 Kramfors (62°56'N., 17°48'E.) (World Port Index No. 26380), a small harbor, is situated about 4.5 miles NW of the island of Sando and exports timber products. The entrance channel leading to the berth is authorized for drafts up to 6.3m. The concrete quay is 150m long and has depths of 6.4 to 8m alongside.

Vaja (62°59'N., 17°43'E.) (World Port Index No. 26420), a small harbor, is situated on the SW side of Bollstafjarden, close N of Dynas. Fuel oil is imported and timber products are exported. Several prominent buildings, chimneys, and tanks stand in the vicinity of the berths.

The entrance channel leading to the berths is authorized for drafts up to 8.5m. The pulp and paper factory quay is 170m long and has depths of 8 to 9.2m alongside. There are facilities for discharging oil at the N end of this quay. The ro-ro quay is 120m long and has a depth of 8m alongside. A quay, fronting the former sawmill, is 136m long and has depths of 4.3 to 5.9m alongside.

Bollsta (62°59'N., 17°42'E.) (World Port Index No. 26430), a small harbor, is situated near the head of Bollstafjorden and exports timber products. The entrance channel leading to the berth is authorized for drafts up to 7.7m. The loading quay is 135m long and has depths of 6 to 8m alongside.

Caution.—Several unsurveyed areas extend up to about 200m from the shore between Kramfors and Dynas (62°58'N., 17°46'E.). These areas, which should be avoided, may contain the remains of mooring dolphins and ruined quays.

Angermanalven to Ornskoldsviksfjorden

6.46 Gaviksfjorden (62°52'N., 18°16'E.), a large indented bay, is entered about 3.5 miles NNE of Storön. Its shores are mostly steep-to. Ringkallen, a hill, rises on the E side of this bay. It is 280m high, reddish in color, precipitous on the S side, and has a wooded summit. A prominent radio mast stands about 0.5 mile SSW of this hill. The bay is used only by small craft, pleasure boats, and fishing vessels, with local knowledge.

Barstahamn (62°52'N., 18°24'E.), a small harbor of refuge, lies about 7 miles NE of Storön and is fronted by five islets. Barstaön, the largest of these islets, is 85m high, wooded at the summit, and appears reddish from the S. Three approach channels lead between the islets to the harbor. The S and E approach channels are authorized for drafts up to 5m; and the N channel is authorized for drafts up to 3m. Local knowledge is advised.

Algrund, a rock awash, lies in the center of the S approach channel and is marked by a buoy. Vessels should pass W of this rock. The harbor affords anchorage, in depths of 11 to 18m, clay and sand, about 0.2 mile E of the village. There is a small jetty with a depth of 3m alongside. The harbor is usually clear of ice, but during a hard winter it may be icebound during February and March.

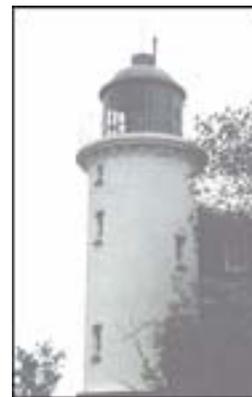
6.47 Hogbonden Light (62°52'N., 18°29'E.) is shown from a prominent tower, 14m high, standing on the NE part of an island of the same name lying 0.8 mile offshore. A conspicuous red dwelling is situated near the light tower.

The island is dome-shaped and partly wooded. It has steep sides and may be easily identified from N or S. Dangers, including a group of above-water rocks, extend up to about 0.5 mile SSW, S, and SSE of the S end of the island.

Hoglosmen, a partly wooded island, lies close N of Hogbonden but is lower than the latter. From SW, a conspicuous mountain knob is visible rising from about the middle of the island.

Furan, an islet, lies close W of the N end of Hoglosmen and is fronted on its E and S sides by foul ground.

6.48 Edsatterfjorden (62°54'N., 18°27'E.), NW of Hoglosmen, is a narrow inlet 2.5 miles long, with steep-to shores. There are no dangers in the entrance, but a shoal with a depth



Hogbonden Light

of 9.5m lies in mid-channel 1 mile inside the entrance. Anchorage is available within the bays on the N side of its outer part, in depths of 20 to 29m, clay and sand. The inner part of the inlet provides anchorage to vessels, with local knowledge, in depths of 11 to 26m, but a bar, with a least depth of 4.5m, has to be crossed.

Algsjöberget, a conspicuous hill, stands on the S side of Edsatterfjorden, 1.1 miles WNW Hoglosmen. It is 196m high and flat-topped.

Omnefjorden (62°57'N., 18°28'E.), entered 3.5 miles NNE of Edsatterfjorden, provides several good anchorages, which can be used by vessels with drafts up to 10m.

Skotbadan, a shoal bank with a least depth of 7m, lies centered about 3.2 miles NNE of Hogbonden Light, in the S approach to this inlet. Laskaren, consisting of two islets located on a shoal bank, lies in the entrance, about 0.8 mile NE of the S entrance point. Orana, a group of islets connected by foul ground and shoals, lies within 1 mile of the head of the inlet.

Small vessels, with local knowledge, may obtain anchorage, in depths of 10 to 11m, clay, off the village of Omne, near the head of the inlet that trends S from the head. Anchorage is also available, in depths of 14 to 18m, clay, off Maviken, a small craft harbor located on the N side of the inlet. Vessels entering may pass either N or S of Laskaren and Orana.

Caution.—Several islands along this stretch of coast, including Hogbonden, Hoglosmen, Furan, and Gnaggen have been designated as nature reserves.

6.49 Gnaggen Light (62°57'N., 18°37'E.) is shown from a structure standing on the N part of a small island of the same name lying 6 miles NE of Hogbonden Light. A detached shoal, with a least depth of 11.5m, lies about 1 mile E of the light.

Storgrund, with rocks awash at its SW end, lies between 0.5 mile and 1.5 miles SW of Gnaggen Light. This shoal bank is marked at the SW end by a buoy.

The mainland coast between Gnaggen Light and Skagsudde, about 18 miles NE, is mostly high and wooded. The shore is fronted by a chain of large islands and numerous rocky shoals through which several channels pass. A number of small craft harbors, fishing boat harbors, and marinas are situated among these islands. Only the outer islands and dangers are described below.

Ulvoama (63°01'N., 18°38'E.) consists of Norra Ulvon and Sodra Ulvon, two large wooded islands, which are separated from each other by Ulvosundet, a narrow strait. The S end of Sodra Ulvon is situated 1.5 miles N of Gnaggen Light.

Norra Ulvo Kasberg, a flat-topped hill, rises near the N end of Norra Ulvon, the N island. It is 141m high and conspicuous from seaward.

Askaret, a bare light-colored island, lies across the NE entrance of Ulvosundet and is marked by a light at the N side. This narrow strait can be entered by small vessels with local knowledge. Entrance channels pass N and S of Askaret and are authorized for drafts up to 6m and 4m, respectively. Anchorage can be obtained, in depths of 18 to 25m, clay, off **Ulvohamn** (63°01'N., 18°39'E.), a small fishing harbor situated on the N side of the strait. The entrance channel at the SW end of the strait is authorized for drafts up to 2.5m.

Ytternasan Light (62°58'N., 18°33'E.) is shown from a prominent tower, 8m high, standing on the N entrance point of Omnefjarden, 2 miles WNW of Gnaggen Light.



Ytternasan Light

Ullangersfjarden (63°01'N., 18°25'E.), a large inlet entered 2.5 miles N of Ytternasan Light, is deep and clear of dangers. Norrfjarden and Dockstafjarden indent the N side of this inlet.

Mjallomberget, 282m high, rises on the S shore of the inlet, 4.7 miles WNW of Ytternasan Light. This hill is prominent from seaward and its summit is surmounted by a conspicuous mast.

Valaberget, 151m high, rises on the S part of the peninsula situated between Norrfjarden and Dockstafjarden, 5.7 miles NW of Ytternasan Light. Varnsberget, 265m high, stands 0.7 mile NNW of Valaberget. These two hills are visible from seaward but are reported to be not easy to identify at a distance.

Skuleberget, 296m high, stands about 1.3 miles N of the head of Dockstafjarden, 2.7 miles NNW of Varnsberget. This hill, with a flat top and steep sides, is easy to identify, but it is hidden by other hills when bearing more than NW.

Ice usually obstructs navigation from January to April within the inlet.

Askja (63°01'N., 18°13'E.), a small harbor, lies at the head of the inlet. There is a quay, 45m long, with depths of 3 to 4m alongside. Vessels may anchor off the harbor, in depths of 9 to 15m, clay.

Docksta (63°03'N., 18°20'E.), a former loading place, lies at

the head of Dockstafjarden and contains a small shipyard. Anchorage can be taken by large vessels, in depths of 10 to 16m, clay, secured to stern moorings.

The channels leading to Askja and Docksta are authorized for drafts up to 10m.

Caution.—Two submarine power cables, which may best be seen on the chart, extend WSW between the SW side of Sodra Ulvon and the mainland.

6.50 Flasan Light (63°01'N., 18°41'E.) is shown from a prominent tower, 7m high, standing on an islet of the same name lying 0.7 mile E of the N end of Sodra Ulvon, 4.6 miles NNE of Gnaggen Light.

Storgrunden, a large shoal with a least depth of 6.5m, lies centered about 1.5 miles off the E side of Sodra Ulvon, 2.3 miles S of Flasan Light.

Varnsinsklubbarna, fringed by foul ground, lies about 2.1 miles NE of the N extremity of Norra Ulvon and at the NE end of a chain of islets and shoals, which extends between 1.2 miles and 5 miles NNE of Flasan Light.

Skagsudde Light (63°11'N., 19°01'E.) is shown from a prominent tower, 26m high, standing on a point at the S end of a small relatively low peninsula. The peninsula may be identified by its dark trees and, on nearer approach, by Skag Beacon, which consists of a stack of poles in the form of a cairn. This beacon stands on a barren hill, which rises about 1 mile NNW of the point. An area of foul ground, with two islets, extends up to about 2 miles WNW of the point.



Skagsudde Light

Skaghallan Light (63°11'N., 19°00'E.), equipped with a racon, is shown from a prominent tower, 6m high, standing on the westernmost rock of Sjalbadarna, an area of above-water rocks and foul ground lying centered 0.5 mile SSW of Skagsudde Light.

Skommarskatan Light (63°12'N., 18°53'E.), marking the W side of the entrance to Ornskoldsvikfjarden, is shown from a prominent tower, 7m high, standing on the SE end of a mainland peninsula, 3.7 miles WNW of Skagsudde Light.

It is reported that two conspicuous wind generators stand close WNW of Skommarskatan Light.

Raskarson (63°12'N., 18°53'E.), lying 0.5 mile SSE of Skommarskatan Light, is marked by a light on its NE side and by a floodlit beacon on its NW side. This small island is the northernmost of a chain of islands, islets, and foul ground, which ex-

tends SSW for about 6 miles. Skrubban, the southernmost island of the chain, lies 3.5 miles NE of the N extremity of Norra Ulvon. Some of the islands and islets in this chain are prominent from seaward due to their dark color.

Directions.—An inshore passage, authorized for drafts up to 10m, leads along this part of the coast. The route leads N and passes W of Hogbonden, Hoglosmen, and Furan. It continues NNE and passes W of Skotbadan and between Ytternasan Light and the SW end of Sodra Ulvon. The route then leads NNE and passes close W of Norra Ulvon. It continues NE across the outer approach to Natrafjarden and passes W of the chain of islands extending SSW from the vicinity of Skommarskatan Light. The route then leads through a narrow passage lying between Skommarskatan Light and the NW side of Raskarson. Local knowledge is advised.

6.51 Kopmanholmen (63°10'N., 18°35'E.) (World Port Index No. 26710) is situated at the NW end of Natrafjarden, about 6 miles NNW of the N extremity of Norra Ulvon. This small port exports timber products and imports salt and fertilizer.

Ice.—Ice usually obstructs navigation from the middle of January to the middle of April.

Depths—Limitations.—Vessels from seaward should pass between Skrubban and Varnsinsklubbarna. Algon, 156m high, is an island lying in the approach, 2.5 miles SE of the port. The entrance channels leading W and N of this island are authorized, respectively, for drafts up to 10m and 9m.

The factory pier in the S part of the harbor provides two berths. The outer berth is 98m long and has depths of 9.2 to 9.5m alongside. The inner berth is 73m long and has depths of 4 to 6m alongside. Vessels up to 160m in length and 9m draft can be accommodated.

Aspect.—Balesudden, 116m high, rises at the S end of a peninsula, about 3.5 miles E of the port. This hill is easily identified by its reddish color and by its shape which, in certain lights, resembles the gable of a house.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Lulea (paragraph 9.19).

Anchorage.—Vessels can anchor within the inner part of the fjord, in a depth of 30m, clay and sand, but the roadstead is exposed to SE winds.

Caution.—Submarine pipelines associated with a fish farm, which may be best seen on the chart, extend across the inner part of Natrafjarden.

Ornskoldsvik (63°17'N., 18°43'E.)

World Port Index No. 26730

6.52 Ornskoldsvik is situated at the NW end of Ornskoldsvikfjarden, about 9 miles NW of Skagsudde Light. This sheltered port exports timber products and engineering goods and imports oil, chemicals, and general cargo.

The port also includes the loading places situated at Domsjo (63°15.8'N., 18°44.0'E.), Alfredshem (63°15.9'N., 18°42.9'E.), Horneborg (63°16.6'N., 18°43.0'E.), and Jarved (63°16.7'N., 18°44.8'E.).

Winds—Weather.—Strong SE winds raise the water level up to 0.5m above normal and N winds lower it a similar amount.

Ice.—The port is usually kept open all year round except during extreme ice conditions, which may occur from January to March.

Depths—Limitations.—Ornskoldsvikfjarden is entered between the E side of Raskarson and the S end of the island of Malmon, lying about 0.5 mile NE. Vessels from seaward approaching this entrance should head in a NW direction and pass about 1 mile SW of Skaghallan Light.

The route through the fjord leads N for about 2.3 miles and then in a WNW direction for 5.5 miles. The fairway channel leading to Ornskoldsvik and the other loading places is authorized for drafts up to 10m.

There are two main quays at Ornskoldsvik. Stenkajen, with a ro-ro ramp at the N end, is 345m long and has a depths of 7.5 to 9.1m alongside. Sliperikajen is 165m long and has depths of 5 to 6m alongside.

There are two timber-product quays at Domsjo. Export Quay, 130m long, has a depth of 7.2m alongside; and FS Quay, 100m long, has a depth of 4.8m alongside.

There are two piers at Alfredshem. The North Pier, used for handling chemicals, is 200m long and has depths of 5 to 6m alongside. The South Pier, used for handling oil, is 135m long and has depths of 7 to 8.5m alongside.

There are five main quays, with a ro-ro ramp, at Horneborg. The largest berth is 162m long and has a depth of 11m alongside. There is also an oil terminal jetty, with berthing dolphins. It is 70m long and has a depth of 10m alongside.

There is a T-shaped oil jetty at Jarved. It is 100m long and has a depth of 10.5m alongside.

Vessels up to 213m in length, 30.5m beam, and 10m draft can be accommodated within the port.

Aspect.—Faleberget (63°13'N., 18°40'E.), rising about 6 miles W of Skommarskatan Light, is 233m high and has steep sides. This hill is visible from a considerable distance to seaward, but is not easily distinguished from the other hills in the vicinity.

Asberget (63°18'N., 18°40'E.) stands 5 miles N of Faleberget. This hill is 217m high and a radio mast is situated on the summit. It is the westernmost of three large hills which, though visible from seaward, are not easily distinguished.

Hornoberget (63°16'N., 18°50'E.), rising 4.2 miles NNW of Skommarskatan Light, is 131m high. This hill, which has a flat top, falls steeply on its E side to a somewhat lower and long plateau. Because of its peculiar form, the hill can easily be identified when approaching Ornskoldsvik.

A conspicuous radio mast stands on a hill, on the S side of the narrows at Bonassund, about 2.6 miles SW of Hornoberget.

Pilotage.—The main pilot station at Ornskoldsvik provides pilotage for the area between latitude 62°50'N (not including Gaviksfjarden and Angermanalven) and a line bearing 140° through Norrbyskar (63°33'N., 19°52'E.). All requests for pilotage must be made through the VTS station at Lulea (see paragraph 9.19).

Pilotage is compulsory for vessels, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 90m in length or 16m beam and over.

3. Category 3 vessels of 100m in length or 17m beam and over.

In certain channels for Angermanalven, pilotage is compulsory, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 80m length, 15m beam, and 5m draft and over.
3. Category 3 vessels of 90m length, 16m beam, and 5.5m draft and over.

Pilots can be contacted by VHF and board about 2 miles S of the outermost shoal near Skagsudde (63°11'N., 19°01'E.).

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Lulea (paragraph 9.19).

Vessels must not exceed a speed of 7 knots when passing through the narrows at Bonassund (63°15.5'N., 18°46.1'E.).

Anchorage.—Vessels can anchor, in depths of 13 to 28m, clay and mud, in the N part of Ornskoldsviksfjarden, clear of the pipelines. Vessels can also anchor, in a depth of 20m, clay, off Domsjo, with their sterns moored to dolphins.

It is reported that two designated anchorages, with depths of 22 to 30m and diameters of 0.5 mile, lie in the approaches and may best be seen on the chart. Anchorage A and Anchorage B lie centered, respectively, about 2.1 miles WSW and 2.8 miles S of Skagshallan Light.

Caution.—Two submarine power cables, which may best be seen on the chart, extend NNW between the NW side of Raskarson island and the mainland.

A submarine pipeline extends across the channel in the vicinity of the narrows at Bonassund (63°15.5'N., 18°46.1'E.).

A spoil ground area, which may best be seen on the chart, lies close E of Alfredshem.

Numerous mooring buoys are situated adjacent to the shore in the vicinity of Alfredshem.

A submarine cable and two pipelines, which may best be seen on the chart, extend across the fjord close S of Alfredshem (63°15.9'N., 18°42.9'E.).

A submarine pipeline extends 0.3 mile S from the shore in the vicinity of Ornskoldsvik and may best be seen on the chart.

Ornskoldsviksfjarden to Jarnasudde

6.53 Sjalnoude (63°20'N., 19°15'E.), a wooded point with steep light-colored sides, is located 10 miles NNE of Skagsudde Light. The coast between is wooded and fronted by numerous islets, rocks, and shoals.

Sjalnoude, with the hills rising N of it, appears to be higher than Skagsudde. It is reported that several prominent wind generators stand in the vicinity of the point.

Mosjobergen rises 6.5 miles W of Sjalnoude. The SE part has a round bare yellowish summit, 97m high. The NW part is formed by a wooded plateau, 155m high, which falls on its S side nearly perpendicularly from the summit for some distance and then slopes more gradually. This hill is visible from seaward and forms the best landmark along this stretch of coast.

Skags Flaser Light (63°12.4'N., 19°05.2'E.) is shown from a structure, 6m high, standing on the N part of an islet, 2.3 miles NE of Skagsudde Light.

Storgrund (63°12'N., 19°07'E.), a shoal with a least depth of

3.9m, lies about 1 mile SE of Skags Flaser Light and is marked by a buoy. Klinton, a shoal with a depth of 6.9m, lies 1 mile E of Skags Flaser Light and is marked by a buoy.

Nygrund, a shoal with a least depth of 1.4m, lies about 1.2 miles NNE of Klinton and is marked by a buoy.

Sjalbadan Beacon (63°15'N., 19°12'E.), 8m high and equipped with a racon, stands on an islet lying 4 miles NE of Skags Flaser Light. Finngrundet, a shoal area with rocks, awash, extends up to about 1.5 miles ENE of the beacon and is marked by two buoys.

Skagshamn (63°13'N., 19°02'E.), a well-protected fishing harbor, lies 1.3 miles W of Skags Flaser Light. The channel leading through the coastal dangers is authorized for drafts up to 6m as far as the anchorage and up to 3m as far as the berths. Local knowledge is required. Ice usually obstructs navigation in the channel from February to April.

Anchorage may be obtained in the roadstead, in a depth of 30m, clay, and within the inner harbor, in a depth of 7m, clay.

Bergofjarden (63°15'N., 19°02'E.), entered 1.5 miles N of Skags Flaser Light, provides excellent shelter to small vessels.

Skedet (63°15'N., 19°01'E.), a small harbor, is situated on the W side of this inlet. The entrance channel is authorized for drafts up to 4m. Local knowledge is required. The inlet can be obstructed by ice from the middle of November to May. Anchorage may be obtained, in a depth of 10m, mud, off Skedet.

Fanbyviken (63°20'N., 19°13'E.), a narrow inlet, is entered 1 mile W of Sjalnoude. It provides anchorage to small vessels with local knowledge, in depths of 12 to 18m, clay. The entrance channel is authorized for drafts up to 6m. The inlet is only 300m wide and does not afford much swinging room.

Caution.—Local magnetic anomalies exist between Skagsudde Light and Sjalnoude.

6.54 Husum (63°20'N., 19°09'E.) (World Port Index No. 26790) is situated 2.5 miles W of Sjalnoude and 4.5 miles NNW of Sjalbadan Beacon. This small port imports limestone, sodium sulphate, and cement and exports timber products and turpentine.

Ice.—The harbor is often obstructed by ice from January to April. It is kept open except in extreme ice conditions.

Tides—Currents.—Higher water levels occur with protracted SE winds; and lower water levels occur with N winds. The current caused by the outflow of the rivers at the head of the inlet can be somewhat troublesome when mooring, especially in the spring.

Depths—Limitations.—From seaward, vessels should approach the harbor by heading W and passing about 1.2 miles S of Sjalnoude. The main entrance channel is authorized for drafts up to 10.5m.

An inshore route, which leads NE and inside the outer dangers, is authorized for drafts up to 6m. Local knowledge is required.

In the S part of the harbor a pontoon jetty provides a berth, 90m long, with a depth of 10.2m alongside. It is connected to the shore by a bridge, 130m long.

Ravarukajen, a concrete quay, is situated close N of the pontoon jetty. The outer berth is 180m long and has a depth of 10.8m alongside. The inner berth has a fixed ro-ro ramp at the N end. It is 65m long and has a depth of 9m alongside.

Utlastningskajen, situated close N of Ravarukajen, is another

concrete quay, with a ro-ro ramp at the S end. It is 300m long and has depths of 7 to 9m alongside.

Aspect.—The woodpulp factory and chimney standing on the E side of the harbor are conspicuous from seaward. A number of prominent tanks are located in the vicinity of the quays.

Pilotage.—Pilots are provided by the station at Ornskoldsvik (see paragraph 6.52). All requests for pilotage must be made through the VTS station at Lulea (see paragraph 9.19).

Anchorage.—Anchorage may be obtained, in depths of 7 to 17m, mud, in the harbor roadstead, but it is open to SE winds.

6.55 Between Sjalnoudde (63°20'N., 19°15'E.) and the SW approaches to Norra Kvarken (63°35'N., 20°52'E.), 30 miles E, a number of shoals and banks lie between 5 and 15 miles off the coast. These dangers are mostly steep-to and great care is necessary when navigating in their vicinity. Only the outermost are described below.

Vallinsgrundet Light (63°19'N., 19°25'E.) is shown from a prominent tower, 20m high, standing on a pinnacle rock lying about 5 miles E of Sjalnoudde.

It is reported that a designated anchorage area, with a diameter of 0.5 mile, lies centered about 3.5 miles W of Vallinsgrundet Light.

Norra Langrogrunden (63°19'N., 19°41'E.) and **Sodra Langrogrunden**, 1 mile S, are located 7 miles E of Vallinsgrundet Light. These shoals and the waters lying E of them are described beginning in paragraph 8.2.

Degerfjarden (63°24'N., 19°20'E.) is a large bay entered between Sjalnoudde and Langroudden, 8 miles NE. Anchorage may be obtained by vessels with local knowledge, in a depth of 18m, sand, close NNW of an islet lying on the E side near the head of the bay. The entrance channel, which passes close E of Sjalnoudde, is authorized for drafts up to 6m. With S winds, a swell sets into the anchorage and the holding ground cannot be depended on.

Langroudden (63°24'N., 19°30'E.) is a low and wooded point, but, in clear weather, it is very prominent from seaward.

Caution.—Firing practice, with live ammunition, occasionally takes place within an area extending 5 miles between ESE

and SSE from a point located on the W side of Degerfjarden, about 7.5 miles N of Sjalnoudde.

6.56 Nordmalingsfjarden (63°28'N., 19°33'E.) is entered between Langroudden and **Jarnasudde** (63°24'N., 19°39'E.), a low wooded point located 4 miles ENE. This inlet is encumbered with numerous shoals in the S part, but there is an extensive clear area in the N part. Ice usually obstructs navigation in the inlet from December to April.

Storbadan Light (63°25'N., 19°35'E.) is shown from a prominent tower, 16m high, standing on an islet of the same name lying in the center of the entrance, 1.8 miles WSW of Jarnasudde.

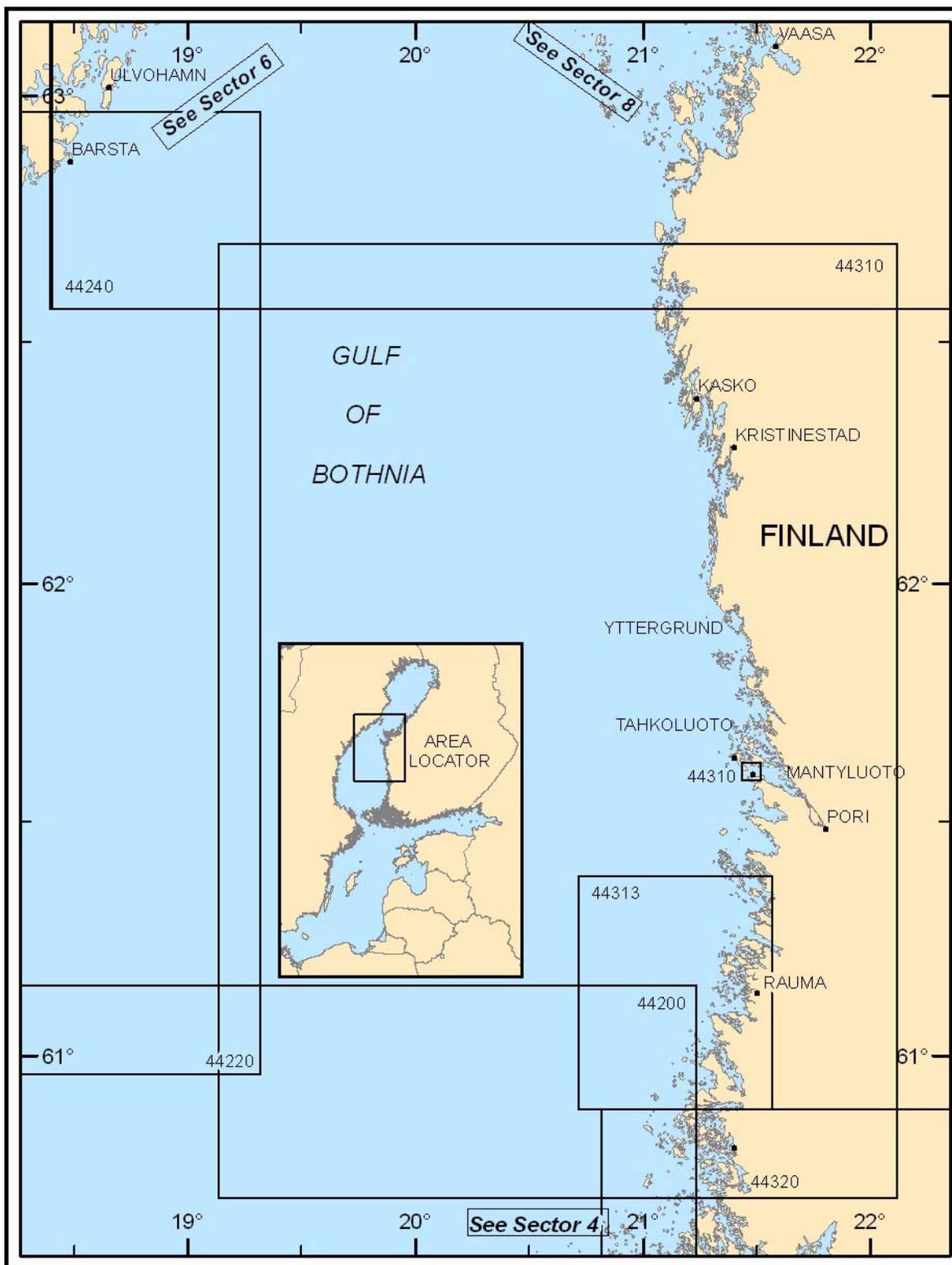
The main channel leading N into Nordmalingsfjarden passes E of Storbadan Light. The fairway is authorized for drafts up to 7m as far as Rundvik and up to 3.7m as far as Notholmen. Local knowledge is required.

Vessels with local knowledge may obtain anchorage, in depths of 4 to 13m, mud, N of Flasarna, a group of three islets lying about 6 miles NNW of Jarnasudde.

6.57 Rundvik (63°32'N., 19°27'E.) (World Port Index No. 26800), a small loading place, is situated on the W side of Nordmalingsfjarden about 2 miles from its head. Vessels can anchor, in depths of 4.5 to 6m, clay and sand, off the harbor.

A concrete pier provides berths on both sides. The N berth is 100m long, with depths of 3.2 to 5m alongside the inner part; the outer part, 70m long, has depths of 5 to 8m alongside. The S berth is 110m long, with depths of 3.9 to 5m alongside the inner part; the outer part, 70m long, has depths of 6 to 8m alongside. A mooring dolphin, marked by a light, is situated close off the pierhead. Several large sheds and a prominent chimney stand in the vicinity of the pier. Vessels up to 165m in length and 7m draft can be accommodated.

Notholmen (Nordmaling) (63°34'N., 19°29'E.) (World Port Index No. 26810), a small harbor, lies at the head of the inlet. Vessels with local knowledge may anchor, with stern moorings, in depths of 4 to 12m, close S of the harbor. There is a concrete quay, 127m long, with depths of 4 to 4.5m alongside.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).
SECTOR 7 — CHART INFORMATION

SECTOR 7

FINLAND—WEST COAST—ISOKARI TO STROMMINGSBADAN

Plan.—This sector describes the W coast of Finland and the contiguous off-lying area in the Gulf of Bothnia between Isokari (60°43'N., 21°01'E.), at the N side of the Aland Islands, and Strommingsbadan, in the vicinity of the S approach to Norra Kvarken. The descriptive sequence is N.

General Remarks

7.1 The Finnish coast is low and difficult to make out from seaward. It is fronted by numerous islands, rocks, and shoals extending as far as 12 miles offshore. It should be noted that this coast has not been completely surveyed, and that dangers in addition to those shown on the chart may exist. Vessels lacking local knowledge should exercise the appropriate caution.

Winds—Weather.—The great volume of water entering the Gulf of Bothnia from many rivers causes a uniform S surface movement during calm weather. This prevailing current in the gulf usually causes vessels from Sodra Kvarken to Norra Kvarken to be set E of their course towards the dangers off the Finnish coast.

Along the Finnish coast, there is a current setting to the N and during the autumn a branch of the N current sets W of the Aland Islands and then toward the Finnish shore. Under normal conditions the current has a velocity of not more than 1 to 2 knots. The currents in the Gulf of Bothnia have seldom been observed to exceed 1.5 knots.

A dominant factor in the movements of the current is the wind direction, which can cause great irregularities in the pattern of the currents in these waters. The currents are not only affected by the local winds, but also from those of other localities. A change in the current often precedes the striking of a storm by several hours. During gales the current generally sets with the wind, from 1 to 2 knots in the open sea and from 3 to 4 knots near shore.

The tidal range in these waters is of little consequence, but considerable change in the water level may be caused by strong winds, atmospheric pressure, and the seasonal amount of water released by the rivers. A combination of these factors raises or lowers the water in the Gulf of Bothnia, from the mean water level, by as much as 0.1m, although at the heads of the inlets it may be much more under exceptional circumstances. For example, at Haparanda, located at the head of the gulf, the level may change by up to 1.5m.

Ice.—See General Remarks in paragraph 1.1 and 4.1.

For information pertaining to winter navigation, ice, and Finnish icebreaking services, including internet web sites, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Depths—Limitations.—The coast between Isokari (60°43'N., 21°01'E.) and Sappi (61°29'N., 21°21'E.), about 45 miles NNE, is almost entirely fronted by foul ground, small islands, islets, rocks, and shoals. The depths are uneven and vessels operating within the 40m curve risk the possibility of

encountering unsurveyed dangers in some localities. This curve lies as far as 15 miles offshore in places.

The low coast between Sappi and Kasko (62°23'N., 21°14'E.), about 54 miles N, has foul ground extending as far as 10 miles from the mainland. Numerous islands and islets also front the shore. The depths are uneven and vessels operating between Sappi and Kasko are also advised to stay, as nearly as possible, in depths of not less than 40m.

Between Kasko and Strommingsbadan (62°59'N., 20°45'E.), the groups of islets and shoals fronting the coast become wider, with the outermost lying as far as 18 miles from the mainland. The coast of the mainland is low, wooded, and appears to passing vessels to be farther away than it really is. The depths are irregular off this part of the coast and the charted soundings too scattered to be relied upon during periods of low visibility. In this area, vessels are advised to stay outside the 40m curve for safe navigation.

Several inshore routes lead between the dangers fronting the mainland coast. However, these channels, which are mostly narrow and tortuous, are used only by shallow draft vessels with local knowledge.

Pilotage.—See paragraph 1.1 and paragraph 4.1 for information concerning pilotage and VTS systems in the vicinity of Isokari, the Aland Islands, and the Saaristomeri area, including the approaches to Uusikaupunki.

Regulations.—See paragraph 7.12 for information concerning the West Coast Vessel Traffic Service (VTS) system, which operates off the SW coast of Finland between Rauman Mjakkka Light (61°09'N., 21°10'E.) and Kaijakari (61°37'N., 21°22'E.).

See paragraph 10.1 for information concerning the Bothnia Vessel Traffic Service (VTS) system, which operates off the NW coast of Finland. This system is mandatory and includes the routes leading to Kasko (Kaskinen) and Kristinestad (Kristinankaupunki).

See paragraph 1.1 for regulations regarding restricted areas and semi-restricted areas in Finnish waters.

Caution.—During the winter, many buoys are removed while others may be damaged or break adrift.

Numerous logs may be found adrift at all times of the year in the coastal waters described within this sector.

Areas dangerous due to mines laid during World War II exist within these waters. There is little risk for surface navigation but risk of danger in these areas still exists when anchoring or carrying out any seabed activities.

Due to various circumstances, including the discovery of obstructions, depths within the channels leading through the offshore dangers along this stretch of coast may change frequently. Therefore, vessels are advised to contact the local authorities in order to ascertain the latest information, including the maximum authorized drafts.

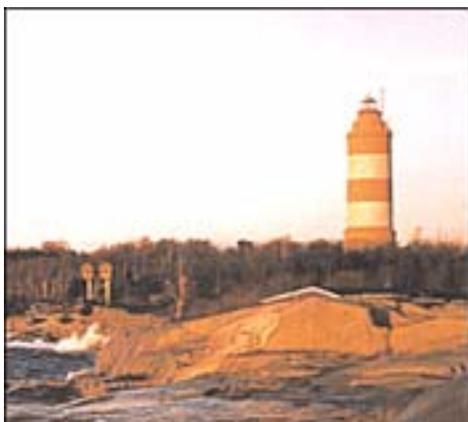
Isokari to Uusikaupunki and Rauma

7.2 Isokari (60°43'N., 21°01'E.) is an island lying about

12 miles W of Uusikaupunki. The pilot station, a yellow one-story building, is situated on the E side of the island.

A reef extends about 0.5 mile S from the S side of the island. Santkari, an islet, is located on this reef and is marked by a beacon. Foul ground, on which several above-water rocks lie, extends between 0.3 mile and 2.5 miles NW from the NW side of the island.

A light is shown from a prominent tower, 37m high, standing on the island.



Isokari Light

Sandback (60°46'N., 20°45'E.), a rock awash, is the outermost danger in this vicinity. It lies on a bank about 8.5 miles WNW of Isokari. A light, equipped with a racon, is shown from a tower, 8m high and surmounted by a helicopter platform, standing on the rock.



Sandback Light

A shoal bank, with a least depth of 6.8m, extends 1.5 miles NW from the light and is marked by a buoy.

Numerous dangers, which extend up to about 10 miles seaward, front the mainland coast in vicinity of the approaches to Uusikaupunki and Rauma. Only the outermost are described below.

Merikivi, a detached shoal with a least depth of 7.8m, lies about 2.5 miles S of Sandback Light. Etela Sandback, a rock 0.6m high, lies about 1 mile N of this rock and is fringed by shoal water.

Melanderinmatala, a rocky shoal with a least depth of 6.8m, lies about 4 miles SE of Sandback. Between the two are several

shoals with depths of 2.5 to 8.8m.

Ljungberginkivi, with a depth of 6.5m, lies 2.3 miles W of Isokari. A light is shown from a structure standing on the N side of this shoal.

Ahlstedtinmatala, with a depth of 7.8m, lies 4 miles ENE of Sandback Light and is marked by a buoy.

An isolated shoal, with a depth of 9.6m, lies 4.5 miles NE of Sandback Light.

7.3 Vekara (60°51'N., 21°01'E.), an island surrounded by shoals, lies 7.5 miles N of Isokari. A beacon stands on this island but it is reported to be totally obscured by trees.

Sammo (60°51'N., 21°06'E.), an islet fronted by shoals, lies 2.3 miles E of Vekara. A light is shown from a framework structure, 8m high, standing on this islet.

Kajakulma Light (61°00'N., 21°11'E.), equipped with a racon, is shown from a tower, 6m high, standing on an islet lying close N of a small island, about 10 miles NNE of Vekara.

A chain of islets, rocks, and shoals, which may best be seen on the chart, extends between Vekara and this Kajakulma Light.

Hylkkari Light (60°57'N., 21°10'E.) is shown from a tower, 6m high, standing on the NW side of a small island, 2.7 miles SSW of Kajakulma Light. The island is fronted by shoal banks on its NW, N, and E sides.

7.4 Lyokki Tower (60°56'N., 21°08'E.), a prominent conical structure 16m high, stands on one of a group of small islets lying 1.4 miles SSW of Hylkkari Light.



Lyokki Tower

Harmaatietot (Harmaatletot), consisting of a number of islets lying on an extensive area of rocks and shoals, is centered 2.3 miles SSW of Lyokki Tower.

Aukkomatala, an isolated shoal with a depth of 6.5m, lies about 3.2 miles NW of Lyokki Tower.

Suomenkari, one of the outermost dangers in this area, has a depth of 7.8m. This isolated shoal lies about 6 miles WNW of Lyokki Tower and 3 miles W Aukkomata.

Karlssoninmatala, the northwesternmost of a group of three shoals, is one of the outermost dangers in this area. This shoal has a depth of 9m and lies about 5.5 miles W of Kajakulma Light. Karlinmatala, with a depth of 5.3, and Jonssoninmatala, with a depth of 1m, lie 0.4 mile S and 1 mile ESE, respectively, of Karlssoninmatala.

A detached shoal, with a depth of 7.8m, lies about 1 mile

NNW of Kajakulma Light and is marked by a buoy. It is located at the W end of Vanhanpudanmatala, a chain of dangers which extends about 3 miles WNW from the mainland.

A detached shoal, with a depth of 8.5m, lies about 1.9 miles NW of Kajakulma Light and is marked by a buoy. It is located at the N end of a chain of dangers extending about 2 miles S.

7.5 Laitakari Light (61°03'N., 21°13'E.), a fishing light, is occasionally shown from a framework structure, 8m high, standing on the E side of an islet. A framework beacon, 5m high, is situated close W of the light.

A detached shoal, with a depth of 7.1m, lies about 3.5 miles NW of Kajakulma Light and is marked by a buoy. This shoal is located at the outer end of a group of dangers extending about 3 miles W from Laitakari Light. A beacon stands on an above-water rock lying in this group, about 1.2 miles W of Laitakari Light.

A detached shoal, with a depth of 5m, lies about 1.8 miles WNW of Laitakari Light and is marked by a buoy. Another detached shoal, with a depth of 9.3m, lies about 2.7 miles NW of Laitakari Light.

Rihtniemi Light (61°05'N., 21°18'E.), a rear range light, is shown from a rectangular structure standing on the NW side of a mainland peninsula, 3.4 miles NE of Laitakari Light.

Rauman Majakka Light (61°09'N., 21°10'E.), equipped with a racon, is shown from a tower, surmounted by a helicopter platform, standing on Outomatala, an isolated shoal lying 5.5 miles NW of Rihtniemi Light.



Rauman Majakka Light

Reilander, with a depth of 6.5m, lies 2.4 miles SSW of Rauman Majakka Light, near the W end of a chain of shoals extending about 5.5 miles WNW from the vicinity of Rihtniemi Light.

Sextantinmatala (61°07'N., 21°05'E.), a rocky patch with a depth of 8.5m, lies 3.2 miles SW of Rauman Majakka Light and 1.4 miles WSW of Reilander. This detached shoal is the outermost danger in this area.

7.6 Kylmapihlaja Light (61°09'N., 21°18'E.) is shown from a prominent tower on a dwelling, 32m high, standing on a small island, about 4.2 miles E of Rauman Majakka Light.

Santakari Tower (61°07'N., 21°17'E.), situated on an islet about 1.4 miles NNW of Rihtniemi Light, is 19m high and



Kylmapihlaja Light

prominent. It consists of a red wooden hexagonal tower with a pointed roof topped by a vane.



Santakari Tower

Nurmes Light (61°12'N., 21°20'E.) is shown from a prominent framework tower, 12m high, standing at the W side of a large island, about 3 miles NNE of Kylmapihlaja Light.

Nurmeksen Matala, an extensive shoal with shallow rocks, extends 3 miles WNW and 3.2 miles NW from the vicinity of Nurmes Light. The outer edges of this shoal are marked by buoys.

Caution.—An ammunition dumping ground area, the limits of which may best be seen on the chart, lies centered 21 miles NW of Sandback Light.

A submarine cable, which may best be seen on the chart, extends seaward from the mainland in the vicinity of Rihtniemi Light.

Approaches to Uusikaupunki and Rauma

7.7 The coastal route leads 23 miles NNE from N of Sandback Light (60°46'N., 20°45'E.) to WNW of Rauman Majakka Light (61°09'N., 21°10'E.).

The main approach route from W to Uusikaupunki, which is authorized for drafts up to 10m, leads SE from seaward and passes NE of Sandback (60°46'N., 20°45'E.) and SW of Isokari (60°43'N., 21°01'E.). From a position about 1 mile SSE of Isokari rear range light, the route continues in a NE direction for 6.5 miles to a position close SW of Hylkiletto (60°46'N., 21°13'E.). It then leads 1.2 miles N, 0.8 mile NE, 2 miles ENE, and about 1 mile SE through a buoyed channel to the harbor entrance fairways.

An alternate approach route from W leads about 10 miles E from a position 3.7 miles SSW of Sandback Light. It passes S of Sandback and Isokari. This route is authorized for drafts up

to 8m and joins the main Uusikaupunki approach channel.

The main approach route from N to Uusikaupunki, which is authorized for drafts up to 9m, leads SE from seaward to a position about 0.4 mile NW of Kajakulma Light (61°00'N., 21°11'E.). It then continues for about 20 miles in a S direction, passing between the numerous offshore islets and shoals, to join the main Uusikaupunki approach channel close NE of Pohjamatala (60°45'N., 21°11'E.).

There are two main approach routes leading from seaward to Rauma. The S route, which is known as the Rauma Channel, is authorized for drafts up to 10m. It leads ESE and passes about 1.2 miles WSW of Rauman Majakka Light (61°09'N., 21°10'E.) and NE of Reilander. At a position located about 1.7 miles NW of Rihtniemi Light (61°05'N., 21°18'E.), the route enters a buoyed channel and then leads about 1.5 miles ESE, 3 miles ENE, and 0.7 mile NE to the harbor basins.

The N route, which is known as the Valkeakari Channel, is authorized for drafts up to 7.5m. From a position located about 2.7 miles NE of Rauman Majakka Light (61°09'N., 21°10'E.), this route leads about 3.8 miles ESE and passes 1.5 miles NNE of Kylmapihlaja Light (61°09'N., 21°18'E.). It then leads 0.5 mile SSE through a narrow, buoyed fairway and passes close E of the island of Valkeakari. The route continues SE for about 1.8 miles to the harbor basins.

An offshore track, which is authorized for drafts up to 5.5m, connects the main N approach route to Uusikaupunki with the two main approach routes for Rauma. From a position 1.6 miles NW of Kajakulma Light, the track leads 2.3 miles N and passes 2 miles W of Laitakari Fishing Light (61°03'N., 21°13'E.). It then continues 4.5 miles NNE and joins the two main routes in the vicinity of Rauman Majakka Light.

Several secondary channels, which are available for vessels with light drafts and local knowledge, branch off the main approach routes and may best be seen on the charts.

Uusikaupunki (60°48'N., 21°24'E.)

World Port Index No. 27790

7.8 Uusikaupunki lies about 12 miles ENE of Isokari. The port area is composed of the island of Hanko and the shore fronting the W side of the town. The island is joined to the town by a causeway.

Ice.—The harbor is kept open all year with icebreaker assistance.

During the winter, if the ice situation is difficult in the Gulf of Bothnia, the traffic proceeds through Sararistomeri and via Uto.

Depths—Limitations.—The main approach route from seaward is authorized for drafts up to 10m (see paragraph 7.7).

The inner harbor has three quays. Hepokari Quay, with a ro-ro berth at the S side, is 90m long and has a depth of 7m alongside; Telakka Quay is 150m long and has a depth of 5m alongside; and Saunasilta Quay, used by coasters, is 60m long and has a depth of 3.5m alongside.

The buoyed channel leading to the inner harbor is authorized for drafts up to 7m.

The Esso Harbor Quay is 40m long and has a depth of 5m alongside. The buoyed channel leading to this harbor is authorized for drafts up to 5m.

Kemira Harbor Quay is 340m long and has a depth of 10m alongside. The harbor channel leading to this quay is authorized for drafts up to 10m.

There are facilities for passenger, general cargo, LPG, bulk, chemical, timber, and ro-ro vessels. Vessels up to 40,000 dwt, 200m in length, and 10m draft can be accommodated in the port.

Aspect.—The main approach channels are indicated by directional sector lights and lighted ranges, and are marked by buoys and beacons. A conspicuous television mast stands in the vicinity of the town.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Turku pilot station. Vessels should send a request for pilotage and an ETA at least 12 hours in advance. Pilots may be contacted by VHF and board about 3 miles WNW of Isokari.

Regulations.—Vessels with drafts greater than 8m must not exceed a speed of 7 knots in certain parts of the main approach route.

See paragraph 4.1 for information concerning VTS systems in the vicinity of Isokari, the Aland Islands, and the Saaris-tomeri area, including the approaches to Uusikaupunki.

Anchorage.—Good sheltered anchorage is available, in a depth of 7m, clay, close SW of Hepokari Quay.

Caution.—During N and E winds, the water level can fall about 0.4m below normal, which may sometimes delay deeply-loaded vessels reaching the port.

It is reported that submarine pipelines lie in the vicinity of the channel leading to Esso Harbor Quay.

The approach channels are well-marked, but care should be exercised as they are fringed by dangers, and are tortuous in places.

Rauma (61°08'N., 21°30'E.)

World Port Index No. 27780

7.9 Rauma, situated 20 miles NNE of Uusikaupunki, lies at the head of a bight, which is encumbered by islets and reefs. The port exports paper products and imports oil, coal, and grains.

Ice.—The port is kept open all year with the assistance of an icebreaker service. Since the adjacent sea area is wide and the archipelago protects the harbor from pack ice belts, it is not too difficult to keep the port open.

Tides—Currents.—The tidal range is about 0.5m.

Depths—Limitations.—Rauma Channel, authorized for drafts up to 10m (see paragraph 7.7), is the main approach route from seaward.

The port consists of inlets lying on the N and S sides of the Iso-Hakuni Peninsula. The N inlet provides access to a shipyard and a small craft harbor.

The principal commercial berths are situated along the S side of the peninsula, within a basin at its W end, and within a basin at its SE end.

Suoja Coal Quay, at the S side of the SE basin, is 110m long and has a depth of 5.7m alongside. Chemical Berth K1 and Chemical Berth K2, at the N side, are 90m and 130m long, respectively, and have depths of 5.1m and 7m alongside.

Oil Quay, at the SW end of the SE basin, is 200m long and has a depth of 9.1m alongside.



Courtesy of the Port of Rauma

Rauma Harbor



Courtesy of the Port of Rauma

Rauma

Laitsaari Quay, at the S side of the peninsula, is 285m long and has a depth of 9m alongside. Central Quay, close W of Laitsaari Quay, is 410m long and has depths of 6.1 to 6.9m alongside.

Six ro-ro berths are situated alongside the S side of the peninsula. They are 130 to 225m long and have depths of 6.2 to 10m alongside.

Petajas Bulk Quay, at the N side of the W basin, is 314m long and has a depth of 11m alongside. Container Quay, at the S side, is 130m long and has a depth of 10m alongside.

It is reported that the Container Quay is being extended and two additional ro-ro berths are under construction at the W end of the peninsula.

There are facilities for container, ro-ro, general cargo, bulk, chemical, oil, and timber product vessels. Tankers up to 180m in length and 8.8m draft can be handled. Cargo vessels are limited only by the authorized approach draft.

Aspect.—The main approach channels are indicated by directional sector lights and lighted ranges, and are marked by buoys and beacons. A conspicuous silo stands in the NW part of the harbor.

Pilotage.—Vessels should send a request for pilotage and an ETA at least 12 hours in advance of arrival. For information required to be included in the message, see Pilotage under Mantyluoto (paragraph 7.12).

Pilots can be contacted on VHF channel 13 and board at Valkeakari (61°10.6'N., 21°15.1'E.) and Rihtniemi (61°07.6'N., 21°10.1'E.).

Regulations.—A designated restricted area, which may best be seen on the chart, covers the approaches to the port. Vessels must remain within the authorized route channel in this area.

Vessel Traffic Service.—The Rauma Sector of the West Coast Vessel Traffic Service (VTS) extends S from latitude 61°22'N to the vicinity of Rauman Majakka Light (61°09'N., 21°10'E.) and includes the harbor of Rauma. For details of this VTS, see paragraph 7.12

Caution.—A submarine pipeline and a submarine cable, which may best be seen on the chart, extend across the channel from the NW end of the Iso-Hakuni Peninsula.

A designated nature reserve area, within which numerous restrictions apply, surrounds the island of Hylkikarta (61°07'N., 21°21'E.) in the S approach to the port.

Rauma to Mantyluoto

7.10 The coast between Rauma and Mantyluoto, about 29 miles N, is fronted by numerous islands, rocks, and shoals, which may best be seen on the chart. These dangers extend up to about 8 miles seaward in places. Only the outer dangers and significant landmarks are described below.

Kalla Light (61°16'N., 21°21'E.) is shown from a framework tower, 10m high, standing on the NW side of an islet lying 4.5 miles N of Nurmes Light (61°12'N., 21°20'E.).

Ulko-Royska, with a least depth of 5m, lies about 1.8 miles W of Kalla Light. This detached shoal is marked by a buoy and is the outermost danger in this vicinity.

Olkiluoto (61°14'N., 21°27'E.), a small craft harbor, is situated on the S side of the W part of a peninsula. An approach route, authorized for drafts up to 5m, leads from a position about 4 miles SW of Kalla Light. This route, which is marked by buoys and range beacons, leads ENE and ESE for about 6.5 miles to the harbor. Local knowledge is required.

Eurajoki (61°15'N., 21°30'E.), a small craft harbor, is situated on the N side of a peninsula. An approach route, authorized for drafts up to 6m, leads from a position about 2 miles NW of Kalla Light. This route, which is marked by buoys and range beacons, leads SE and ESE for about 5.5 miles to the harbor. Local knowledge is required.

Pietari (61°21'N., 21°23'E.), a small islet, lies 4.5 mile N of Kalla Light. A conspicuous beacon, consisting of poles with red and white supports forming a pyramid 18m high, stands on this islet.

Caution.—A submarine cable, which may best be seen on the chart, extends seaward from the vicinity of Kalla Light.

7.11 Sappi Light (61°29'N., 21°21'E.) is shown from a prominent tower, 31m high, standing on the NW side of an island lying in the S approaches to Mantyluoto, about 12.5 miles N of Kalla Light.

An extensive shoal area, with depths of less 10m, extends up to about 3.5 miles W and 5.5 miles SW of Sappi Light. The outer edge of this shoal area is marked by a buoy. An area, with depths less than 20m, extends up to about 5 miles WNW of the light and is also marked by a buoy.

Kaijakari Light (61°37'N., 21°22'E.) is shown from a



Sappi Light

framework tower, 16m high, standing on an islet in the N approaches to Mantyluoto, 8.5 miles N of Sappi Light.



Kaijakari Light

Kupeli Light (61°38'N., 21°20'E.), equipped with a racon, is shown from a mast, 7m high, standing 1.3 miles NNW of Kaijakari Light. Shoals extend between these lights and are marked on the seaward side by buoys.

Sumparbadar, a group of shoals with depths of less than 10m, extends up to about 4 miles NW of Kupeli Light.

Morris Lighted Beacon (61°35'N., 21°25'E.) is shown from a mast, 10m high, standing in the S approach to Mantyluoto, 2.6 miles SSE of Kaijakari Light. It is equipped with a racon.

Porin Majakka Light (61°42'N., 21°14'E.), equipped with a racon, is shown from a prominent structure with a wind generator, 18m high, standing 5.2 miles NW of Kupeli Light.



Porin Majakka Light

Mantyluoto (61°36'N., 21°29'E.)

World Port Index No. 27750

7.12 Mantyluoto (Pori), lying 55 miles NNE of Isokari, fronts the N side of an island of the same name. It is the outport for Pori, which is situated 10 miles SE along the shallow estuary of the Kokemaenjoki. A fishing harbor fronts the SE end of Reposaari, an island lying close NW of Mantyluoto. Tahkoluoto, the deep-water terminal for Pori, lies 3 miles NW of Mantyluoto, at the NW extremity of Reposaari.



Courtesy of Port of Mantyluoto

Mantyluoto from E

Winds—Weather.—The prevailing winds are from the SW.

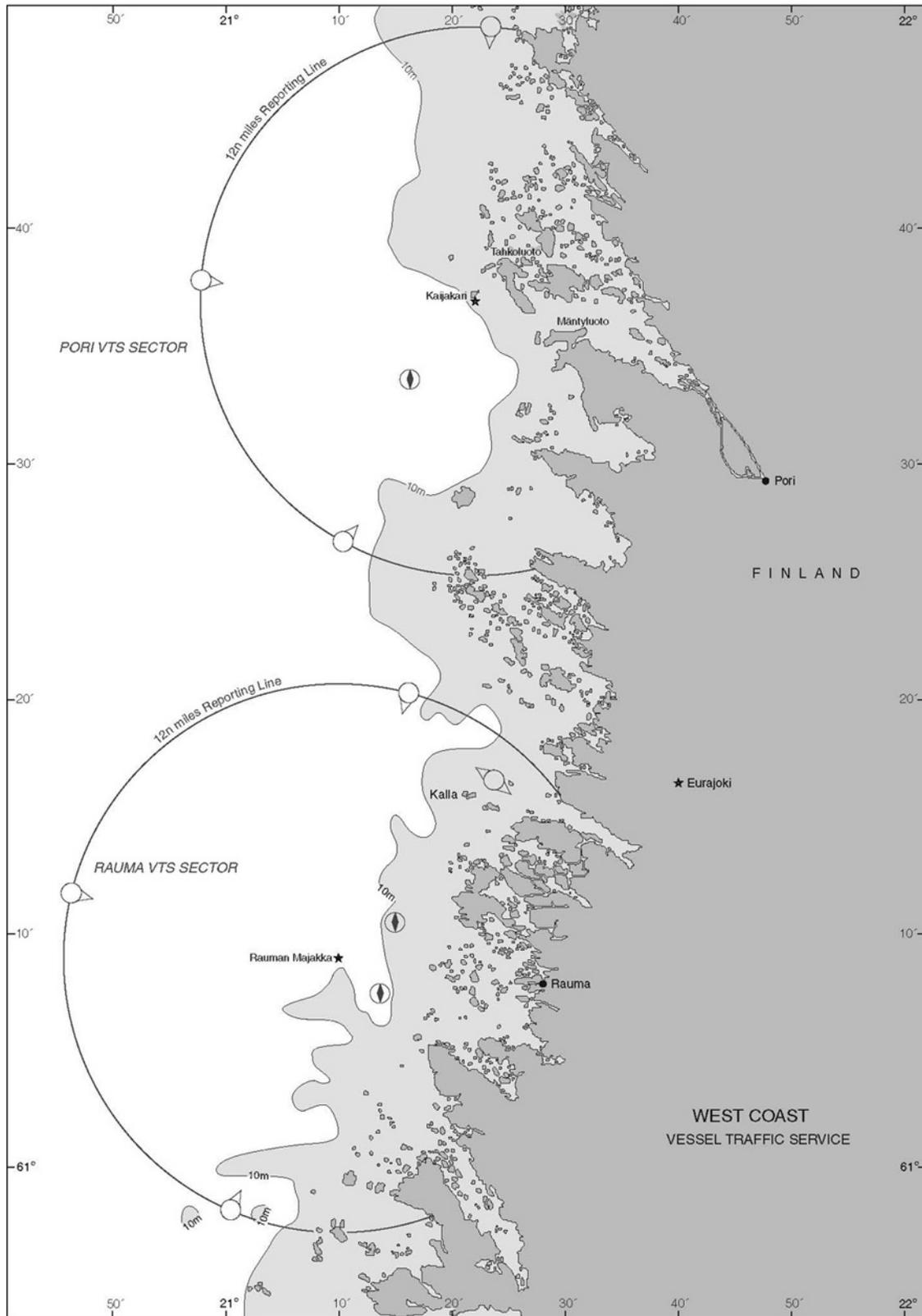
Ice.—The harbor is closed by ice for only a short time in winter, and in very favorable winters it is never closed. This is because of the area of open sea on one side and the currents setting up in the inner side by the discharge of the Kokemaenjoki (River Kumo) at the head of the bight. Icebreakers are available if required.

Depths—Limitations.—Kallo, an islet, lies close off the NW extremity of the island of Mantyluoto to which it is connected by a causeway. Kolmikulma, a shoal bank with a least depth of 0.8m, lies in the approach, about 0.5 mile W of the N end of Kallo. The harbor entrance lies between the heads of two breakwaters, which extend about 400m N from Kallo and about 500m S from the S end of Reposaari.

The main approach channel, which is authorized for drafts up to 10m, leads ENE for 3.5 miles and NE for 2 miles from the pilot boarding place. It passes close SE of Morris Lighted Beacon and close SE of Kolmikulma shoal bank. An entrance fairway then continues NE between the breakwaters and into the harbor.

An alternate approach channel, which is authorized for drafts up to 6.5m, leads E and SE from a position 1.8 miles SW of Kaijakari Light. It passes NE of Kolmikulma shoal bank and then joins the main approach channel.

The river has a depth of 2m; Pori is only used by recreational craft. The harbor at Reposaari has 250m of berthage, with depths up to 4.5m alongside, and is used by fishing vessels with drafts up to 3.9m.



Rauma and Pori (Mantyluoto) VTS Sectors

The harbor at Mantyluoto provides 2,000m of main quayage, with depths of 6.5 to 11.2m alongside. There are facilities for general cargo, ro-ro, container, bulk, and timber vessels. Vessels up to 10m draft can be handled.

Tahkoluoto(61°38'N., 21°24'E.) (World Port Index No. 27755), the deep-water terminal, can be approached by two channels. The N channel, which is authorized for drafts up to 15.3m, leads SE for 7 miles from a position about 1.5 miles NW of Porin Majakka Light. It passes close NE of the latter light and leads to the turning basin at the N side of the harbor.

The S channel, which is authorized for drafts up to 10m, leads 2 miles in a NE direction from a position about 1.5 miles SW of Kupeli Light. It passes close SE of the latter light and leads to the turning basin.

There are two berthing complexes at Tahkoluoto. The Oil Terminal, with an L-shaped pier, is situated at the NE side of the harbor. It has a berth, 145m long, with a depth of 11.5m alongside and can handle vessels with drafts up to 10m. A bulk quay is situated close W of the oil berth on the inside of a breakwater. It has a berth, 120m long, with a depth of 11.5m alongside.

The Coal Terminal is situated at the W side of the harbor. It has a quay, 450m long, with a depth of 17.5m alongside. Vessels up to 120,000 dwt and 15.3m draft can be handled.

Aspect.—The approach channels are indicated by lighted ranges and marked by buoys, which may best be seen on the chart.

A prominent chimney stands on the NE side of Reposaari, about 1 mile NNW of the root of the breakwater. A prominent radio mast stands on the S side of Reposaari, about 0.2 mile NW of the root of the breakwater. A conspicuous water tower, 64m high, is situated about 2 miles SE of Mantyluoto. A shipyard, which is used for the construction of offshore platforms, is situated at the NE side of Mantyluoto harbor.

Two bridges span the river 1.5 miles E of the breakwaters.

A conspicuous chimney stands on the W side of the harbor at Tahkoluoto.

Pilotage.—Pilotage is compulsory. Vessels should send a request for pilotage and an ETA 24 hours prior to arrival. The pilot station provides pilots for Mantyluoto, Tahkoluoto, and Reposaar.

Pilots can be contacted on VHF channel 13 and board about 4.3 miles WSW of Morris Lighted Beacon. Vessels bound for Tahkoluoto are boarded about 1.2 miles WNW of Porin Majakka Light (61°42'N., 21°14'E.).

The request for pilotage message should include the following information:

Designator	Information Required
A	Name, call sign, and flag.
B	Time (date and time—6 digits).
G	Last port of call.
I	Destination and ETA.
O	Draft (maximum).
P	Cargo and brief details of any dangerous cargo or harmful substances.

Designator	Information Required
Q	Brief details of any defects.

Vessel Traffic Service.—The West Coast Vessel Traffic Service (VTS) system operates in this area and is divided into two sectors. This system, which is mandatory, is managed by the West Coast VTS Center at Mantyluoto.

Pori VTS Sector extends in an arc, with a radius of 12 miles, from a position centered on Kaijakari Light (61°36.9'N., 21°21.9'E.) to the administrative limits of the harbors of Mantyluoto, Tahkoluoto, and Merikarvia.

Rauma VTS Sector extends in an arc, with a radius of 12 miles, from a position centered at Rauma Light (61°09.0'N., 21°09.6'E.) to the administrative limits of the harbors of Rauma, Olkiluoto, and Eurajoki.

All domestic and foreign merchant and state vessels within the VTS area shall maintain a continuous listening watch on VHF channel 9. Such vessels shall also report to the West Coast VTS Center on VHF channel 9 using the following format:

Designator	Information Required
A	Name, call sign, and flag.
B	Time (date and time— 6 digits).
C	Position (4-digit latitude plus N and 5-digit longitude plus E).
D	Position (3-digit true bearing and distance in miles from landmark).
E	True course (3 digits).
F	Speed in knots and tenths (3 digits).
G	Last port of call.
I	Destination and ETA (format as B).
L	Route (intended track).
O	Max draft (meters/centimeters-4 digits).
P	Cargo and brief details of any dangerous cargo or harmful substances.
Q	Brief details of any defects, damage, or deficiencies.
U	Vessel size and type.

Vessels must send an Advance Report 2 hours prior to entering the VTS area. This report should include the information for designators A, B, C, E, F, I, L, O, P, Q, and U.

Vessels must send an Entry Report when entering the VTS area. This report should include the information for designators A, D, E, and F.

Vessels must send a Movement Report when passing the following Reporting Points:

1. At position 61°46.4'N, 21°05.9'E or position 61°30.8'N, 21°00.3'E (12 miles before passing Kaijakari Island).
2. At position 61°08.8'N, 20°45.3'E or position

60°57.0'N, 21°08.8'E (12 miles before passing Rauman Majakka Light).

3. When passing Kalla (61°16'N., 21.1 °E.).

Vessels anchoring or berthing within the VTS area must report and provide the information for designators A, B, and D.

Vessels leaving must send a Departure Report. The report should include the information for designators A, B, G, I, L, O, P, and Q. This report may be sent by fax or telephone.

A Navigation Assistance Service is available and is recommended during reduced visibility or in the case of navigation deficiencies. This service is available on request or if the VTS Center considers it necessary.

The West Coast VTS may be contacted by e-mail, as follows:

westcoastvts@fma.fi

Anchorage.—Anchorage may taken, in a depth of 7m, mud, in an area lying 0.3 mile E of the SE end of Reposaari. However, strong winds from SW to W cause heavy seas in this roadstead.

Caution.—Anchorage is prohibited within an area, which may best be seen on the chart, lying close E of the breakwater heads due to the existence of submarine pipelines and cables.

A spoil ground area, which may best be seen on the chart, lies close NW of Tahkoluoto.

A dangerous wreck is reported to lie close SE of the main approach channel in the vicinity of Morris Lighted Beacon.

Mantyluoto to Kristinestad

7.13 The coast between Mantyluoto (Pori) and Kristinestad, about 40 miles N, is fronted by numerous islands, rocks, and shoals, which may best be seen on the chart. These dangers extend up to about 9 miles seaward in places. Only the outer dangers and significant landmarks are described below.

Fadikari (61°44'N., 21°18'E.), a shoal patch, lies near the outer edge of the coastal bank, 2.3 miles ENE of Porin Majakka Light. It has a depth of 4.8m and is marked by a buoy.

Karviankivi, a pinnacle rock with a depth of 6.3m, lies 5.5 miles NNW of Fadikari. It is located near the outer edge of the coastal bank and marked by a buoy.

Stakki (61°51'N., 21°18'E.) is the westernmost of a group of islets lying centered from 2 to 5 miles offshore, 8.5 miles NE of Porin Majakka Light. Shoals, with depths of less than 5m, extend up to about 2.5 miles WSW and 1.5 miles W of this islet. A prominent pyramid beacon, 14m high, stands on an islet lying at the S end of the group.

Hiidensilta, an extensive area of shallow shoals, lies centered 2.5 mile NW of Stakki. A patch, with a depth of 4.5m, is located at the seaward edge of this area. It lies about 4.3 miles WNW of Stakki and is marked by a buoy.

An isolated shoal patch, with a depth of 9.4m, lies about 6 miles WNW of Stakki and is the outermost danger in this vicinity.

Merikarvian Majakka Light (61°56'N., 21°17'E.), which is equipped with a racon, is shown from a mast standing on the N part of Hiidensilta, 5.6 miles NNW of Stakki.

Yttergrund Light (61°59'N., 21°18'E.) is shown from a



Merikarvian Majakka Light

prominent tower, 41m high, standing on an island lying close off the mainland, 3 miles NNE of Merikarvian Majakka Light.



Yttergrund Light

Silverbergsgrund, a shoal with a depth of 3.9m, lies about 2 miles WSW of Yttergrund Light.

Rakaren, a large shoal, lies centered 5.5 miles NW of Yttergrund Light, near the edge of the shallow coastal bank. It has a least depth of 0.8m and is marked by two buoys.

7.14 Merikarvia (61°51'N., 21°29'E.), a small mainland harbor, is situated 5 miles E of Stakki and sheltered by Brando, an island lying close offshore. It is used by coasters and recreational craft. A quay, which fronts a sawmill, can handle vessels up to 115m in length.



Merikarvia

A main approach route, which is authorized for drafts up to 4.5m, leads E for about 3.5 miles from a position located 3 miles WNW of Merikarvian Majakka Light. The route passes N of the light and then leads SE for about 8 miles to the harbor. The channel is indicated by lighted ranges and marked by

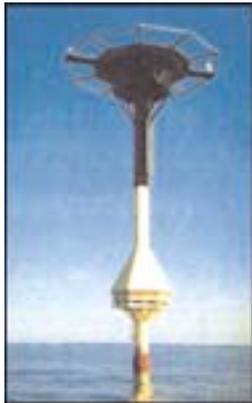
buoys. Local knowledge is required.

Small vessels can anchor, in a depth of 10m, within an outer roadstead lying about 2.5 miles NW of Brando.

Kassala (61°57'N., 21°21'E.), a small fishing harbor, lies 6.5 miles NNW of Merikarvia. It can be entered through a partly buoyed channel, which is authorized for drafts up to 3.3m. This channel branches NNE from the main route leading to Merikarvia at a position about 1.2 miles SE of Merikarvian Majakka Light.

Sideby (Siipyy) (62°02'N., 21°20'E.), a small town, is situated about 3.5 miles NNE of Yttergrund Light. It may be identified by a conspicuous yellow church, with a black roof and steeple, standing at an elevation of 61m.

7.15 Kristiinankaupungin Majakka Light (62°12'N., 21°10'E.), equipped with a racon, is shown from a prominent tower with a helicopter platform, 20m high, standing in the approach to Kristinestad, about 14 miles NNW of Yttergrund Light.



Kristiinankaupungin Majakka Light

Hojers, a shoal with a least depth of 3.9m, lies centered 5.5 miles SSW of Kristiinankaupungin Majakka Light. It is located about 5 miles offshore and marked by two buoys.

Mossbada, a large shoal area with a least depth of 2.3m, lies centered 3 miles N of Kristiinankaupungin Majakka Light. It is located 5 miles offshore, at the outer edge of the coastal bank, and is marked by buoys.

Harkmeri (62°12'N., 21°20'E.) is an islet lying 4.3 miles ESE of Kristiinankaupungin Majakka Light, in the approach to Kristinestad. A conspicuous pyramid beacon, 19m high with a ball topmark, stands on the N end of this islet.

Norra Storbadan (62°12'N., 21°20'E.), a rocky and shallow shoal, lies 2.5 miles ENE of Kristiinankaupungin Majakka Light and is marked by a prominent lighted beacon. Its N end is marked by a buoy.

Phavuori (Botomsberg) (62°17'N., 21°39'E.), a hill 130m high, stands 7.5 miles E of Kristinestad and is a conspicuous landmark. It is the only high land in this vicinity and appears as three separate hills from a distance of about 20 miles. An aeronautical light is shown from a mast standing on the SE side of the middle hill.



Harkmeri Beacon

Kristinestad (Kristiinankaupunki)
(62°17'N., 21°24'E.)

World Port Index No. 27680

7.16 Kristinestad is situated at the head of Stads Fjord, a small and narrow inlet. It is fronted by numerous small islets and rocks. The inner harbor lies within the inlet at the E side of the Bjornon Peninsula. The outer harbor lies at the W side of the peninsula, about 1.8 miles SW of the town center.

Winds—Weather.—The outer roadstead is protected from winds from all directions except those from SSW; however, these winds do not raise a heavy sea. The inner harbor is well-protected from all directions.

Ice.—Depending on the ice, the port usually closes at the end of December and reopens during April. The outer harbor may be kept open for a longer period.

Depths—Limitations.—The main approach route leading to the inner harbor from seaward is authorized for drafts up to 5m. This route leads in an ENE direction for 4.7 miles from a position located 2.3 miles S of Kristiinankaupungin Majakka Light (62°12'N., 21°10'E.). It then continues NNE for 1.5 miles and N for 2.3 miles to the harbor entrance. This route passes close N of the islet of Harkmeri.

An alternate route, which is authorized for drafts up to 5m, may only be used by day. This route leads SE for 3.5 miles from a position located 2.5 miles NNW of Kristiinankaupungin Majakka Light. It passes close S of Mossbada shoal and close NE of Norra Storbadan Lighted Beacon. The route then continues SSE to join the main channel.

The inner harbor has a wooden quay, 75m long, with a depth of 4.6m alongside, and a stone quay, 250m long, with a depth of 5.6m alongside. Vessels up to 130m in length and 5m draft can be accommodated.

The main approach route leading to the outer harbor from seaward is authorized for drafts up to 12m. This route leads in a NE direction for 6 miles from a position located 2 miles SW of Kristiinankaupungin Majakka Light. It passes close NW of the latter light and close NW of Norra Storbadan Lighted Beacon.

The outer harbor has a T-shaped coal pier, with a depth of 12m alongside, and a T-shaped oil jetty, with a depth of 10m alongside. Bulk vessels up to 240m in length and 12m draft can be accommodated; and tankers up to 23,000 dwt can be handled.

Aspect.—The approach routes are indicated by lighted ranges and beacons. The inner channels are marked by buoys and beacons.

Pilotage.—Pilotage is compulsory. Pilots, which are provided by the station at Vassa (see paragraph 8.18), may be contacted by VHF. Pilots board at position 60°11.5'N, 21°06.1'E.

Regulations.—The approach route leading to Kristinestad (Kristiinankaupunki) is situated within Sector A of the Bothnia Vessel Traffic Service (VTS) system. This system operates off the NW coast of Finland and is mandatory. For further details of the VTS system, including reporting procedures, see paragraph 10.1.

Contact Information.—The port can be contacted on VHF channel 24.

Anchorage.—Anchorage, with good shelter and good holding ground, is available, in a depth of 9m, mud, about 1.5 miles S of the inner harbor entrance.

Kristinestad to Strommingsbadan

7.17 The coast between Kristinestad and Strommingsbadan (62°59'N., 20°45'E.), about 42 miles N, is fronted by numerous islands, rocks, and shoals, which may best be seen on the chart. These dangers extend up to about 17 miles seaward in places. Only the outer dangers and significant landmarks are described below.

Salgrund Light (62°20'N., 21°12'E.) is shown from a prominent tower, 25m high, standing at the SW end of an island of the same name.



Salgrund Light

Storremmargrund Light (62°20'N., 21°13'E.), equipped with a racon, is shown from a floodlit tower, 7m high, standing 0.7 mile E of Salgrund Light.

Storgrund (62°19'N., 21°05'E.), one of the outermost dangers in this vicinity, lies 3.5 miles WSW of Salgrund Light. This shoal has a least depth of 3.4m and is marked by two buoys. A detached patch, with a least depth of 7.2m, lies about 1.6 miles WNW of Storgrund.

Yttergrund, another of the outermost dangers in this vicinity, lies about 5 miles offshore, 6.5 miles NW of Salgrund Light. This rocky shoal has a least depth of 4.9m and is marked by a buoy.

Caution.—A local magnetic anomaly exists within the area extending 2 miles W and 4 miles SW of Strommingsbadan.

7.18 Kasko (Kaskinen) (62°23'N., 21°14'E.) (World Port Index No. 27670) is situated on the W side of the island of

Kasko, about 8 miles NW of Kristinestad. This small port consists of a natural harbor lying between the islands of Kasko and Esko (Eskilso), close W of the town.

Kasko Home Page

<http://www.kaskinen.fi>

Winds—Weather.—The harbor is well-sheltered from all winds.

Ice.—During the winter this port is usually the northernmost within the Gulf of Bothnia to be kept open by icebreakers.

Depths—Limitations.—The main approach route leads NE for about 4 miles from a position located 5 miles SW of Salgrund Light. The entrance channel then leads in a N direction between Salgrund Light and Storremmargrund Light. The route is authorized for drafts up to 9m as far as the Deep Water Quay and then for drafts up to 6m as far as the Inner Harbour Quay.

Deep Water Quay is 250m long and has depths of 8 to 10m alongside. Outer Harbour Quay is 35m long and has a depth of 6.5m alongside. Inner Harbour Quay is 160m long and has a depth of 6m alongside. Vessels up to 185m in length and 9m draft can be handled.

Aspect.—The approach and entrance channels are indicated by lighted ranges and marked by buoys.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF and board about 5.5 miles SW of Salgrund Light, in position 62°15.5'N, 21°05.1'E.

Vessel Traffic Service.—The approach route leading to Kasko (Kaskinen) is situated within Sector A of the Bothnia Vessel Traffic Service (VTS). This system operates off the NW coast of Finland and is mandatory. For further details of this VTS including reporting procedures, see paragraph 10.1.

Contact Information.—The port can be contacted by e-mail, as follows:

info@kaskinen.fi

Anchorage.—Anchorage is available, in depths of 15 to 20m, within an area lying about 3 miles WSW of Salgrund. Anchorage may also be obtained, in a depth of 5m, clay, within the harbor, off the middle of the town.

7.19 Gashallan (62°35'N., 21°03'E.) is the westernmost of a group of islets lying about 3 miles offshore, 15 miles NNW of Salgrund Light. A red and white two-story former pilot watch house stands on this islet. It is 11m high and conspicuous from seaward.

Shoals, with depths of less than 5m, extend up to about 2.5 miles SW, W, and NW of Gashallan. A detached patch, with a depth of 9.8m, lies about 3.5 miles W of Gashallan.

Skomakarsgrund, with a depth of 3.7m, and Rosengrund, with a depth of 4m, lie, respectively, about 5.5 and 4.2 miles S of Gashallan. These shoals lie about 3 miles offshore and are marked by buoys.

Judasternarne (62°40'N., 20°45'E.), with a least depth of 2.5m, lies 9 miles offshore, about 10 miles NW of Gashallan, and is marked by a buoy. A lighted buoy is moored about 1.3 miles NW of this shoal.

Eriksson, a large shoal area, lies centered 2.5 miles E of Judasternarne. It has a least depth of 1.9m and is marked by three buoys. A shoal area, with depths of 8.3 to 9.8m, lies centered 1.7 miles SE of Judasternarne.

7.20 Sjogrund (62°47'N., 20°32'E.), with a least depth of 8.2m, lies 9 miles NW of Judasternarne and is marked by a buoy. This shoal is located 16.5 miles W of the mainland and is the outermost danger in along this stretch of coast.

Storkallegrund, an extensive shoal flat, lies with its outer part located 9 miles N of Judasternarne, about halfway between Sjogrund and the mainland.

Strommingsbadan (62°59'N., 20°45'E.) is a small islet lying 18.5 miles N of Judasternarne. Above-water rocks lie 1 mile S and 1.2 miles SSE of this islet. A light is shown from a prominent tower, 13m high, standing on this islet.

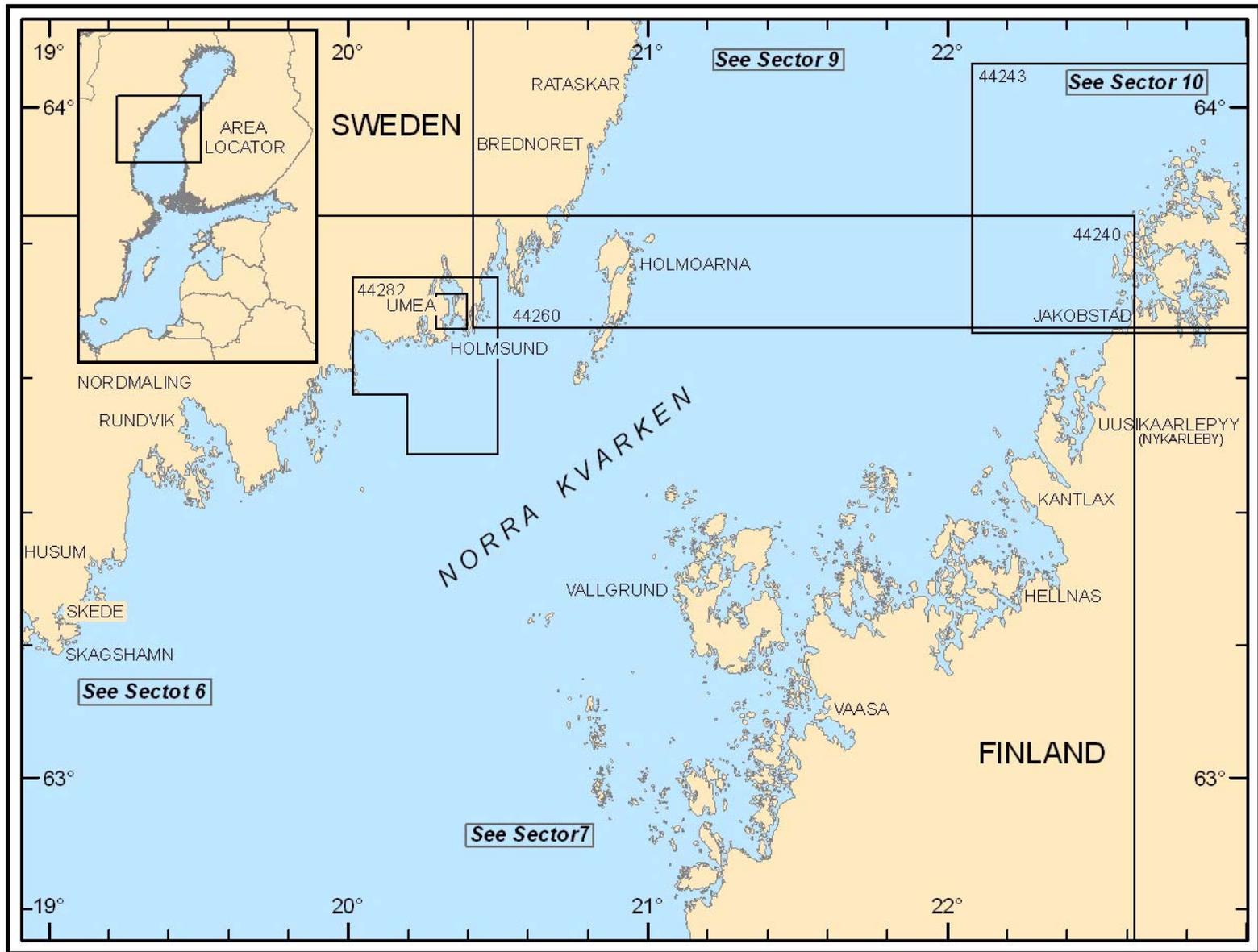
Vesterhallan, a rock, lies about 0.5 mile WSW of the light. It has a least depth of 5.5m and is marked by a buoy. Karpoff, a shoal, lies about 1.5 miles SSW of the light. It has a least depth of 2.3m and is marked by a buoy.



Strommingsbadan Light

Strommingsbadan lies near the NW edge of a shoal, with a least depth of 2.5m, which extends for about 2.3 miles in a general N-S direction and is nearly joined to another shoal, with a least depth of about 2.4m, which extends N for an additional 1.5 miles.

A description of the waters lying N of Strommingsbadan, begins in paragraph 8.13.



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

SECTOR 8 — CHART INFORMATION

SECTOR 8

NORRA KVARKEN AND THE ADJACENT SWEDISH AND FINNISH COASTS

Plan.—This sector describes Norra Kvarken and the parts of the E coast of Sweden and the W coast of Finland bordering on that passage. The descriptive sequence is NE from Jarnasudde, on the Swedish side, then N from Strommingsbadan, on the Finnish side. The routes through Norra Kvarken are then described.

General Remarks

8.1 Norra Kvarken, the narrowest part of the Gulf of Bothnia, connects Bottenhavet (Selkameri), the S part of the gulf, with Bottenviken (Perameri), the N part. This passage comprises the waters on either side of Holmoarne, a group of islands lying between 4 and 10 miles off the Swedish mainland. These islands divide Norra Kvarken into two main channels, Vastra Kvarken and Ostra Kvarken. Norra Kvarken extends about 40 miles NE from Bonden (63°26'N., 20°03'E.) and Norrskar Light (63°14'N., 20°36'E.), and is encumbered with numerous islands, rocks, and shoals.

The Swedish coast, between Jarnasudde (63°26'N., 19°39'E.) and Ratan (64°24'N., 20°54'E.), about 48 miles NE, is indented by numerous fjords, bays, and coves into which several rivers flow. Many detached dangers front the coast.

On the Finnish side of Norra Kvarken, to the SE, an extensive area, containing numerous islands, rocks, and shoals, extends about 60 miles NE between Strommingsbadan (62°59'N., 20°45'E.) and Hallgrund (63°39'N., 22°25'E.). The coast here is also indented by many fjords, bays, and coves. A few streams discharge along this coast.

Several commercially-important ports and loading places are situated in the inlets on both coasts. The principal ports are Umea, in Sweden, and Vaasa, in Finland.

The channels leading to the ports are marked by aids. Lights and buoys mark some of the dangers adjacent to the main channels of Norra Kvarken.

Both coasts are comparatively low and heavily wooded.

Winds—Weather.—Winds from the S to SW prevail over the Gulf of Bothnia in the summer months, but N winds are quite common in June. The winds show a tendency to flow parallel to the coasts in either direction in the Gulf of Bothnia.

There is a tendency for cloud coverage to be greater with on-shore winds than with offshore winds; this, combined with the fact that the predominant winds are from a W quarter, explains the more cloudy conditions on the Finnish coast, compared with the Swedish coast of the Gulf of Bothnia.

Fog is most frequent in April and least frequent in August. Good or very good visibility is common over this sector. Records show that about 80 per cent of observations show visibility greater than 10 miles during summer.

Snowfall is a common cause of poor visibility, especially from December to April.

The region is very cold during winter and the average air temperature is below freezing from late October to the middle of April.

Humidity is usually high in the winter and comparatively low in spring and summer.

Ice.—For Finland, see General Remarks in paragraph 1.1 and paragraph 4.1.

For Sweden, see General Remarks in paragraph 5.1.

For information pertaining to winter navigation, ice, and Finnish icebreaking services, including internet web sites, see Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas.

Pilotage.—See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for general information on pilotage within Finnish and Swedish waters. See also paragraph 1.1 and paragraph 5.1.

Deep-sea pilots for the Baltic Sea should be ordered through the Malmo, Lulea, or Stockholm pilot stations at least 24 hours in advance.

The main pilot stations along the Swedish part of the coast are situated at Umea and Ornskoldsvik (63°17'N., 18°44'E.). All requests for pilotage must be made through the VTS station at Lulea.

The pilotage area for Ornskoldsvik lies between a line bearing 140° through Norrbyskar (63°33'N., 19°52'E.) and latitude 62°50'N (see paragraph 6.49).

The pilotage area for Umea lies between a line bearing 140° through Norrbyskar (63°33'N., 19°52'E.) and latitude 64°03'N (see paragraph 8.9).

The main pilot station along the Finnish part of the coast is situated at Vassa (see paragraph 8.18 and paragraph 10.1).

It should be noted that ordering of pilots in the Swedish waters described within this sector is presently carried out through the main VTS systems. However, it is reported that procedures for the initial ordering of pilots via the internet will be introduced in the near future. For additional information concerning these procedures, see the following website:

Swedish Maritime Administration Home Page

<http://www.sjofartsverket.se>

Regulations.—See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for regulations pertaining to vessels within the waters of Sweden and Finland.

See paragraph 10.1 for information concerning the Bothnia Vessel Traffic Service (VTS) system, which operates off the NW coast of Finland. This system is mandatory and includes the routes leading to Vaasa and the main shipping routes situated in the S part of Norra Kvarken.

See paragraph 1.1 for details of restricted areas and semi-restricted areas in these waters.

Several offshore islands, islets, and rocky shoals within these waters have been designated as nature reserves. Landing is prohibited and many restrictions apply.

Caution.—The coast of Finland, bordering on the Gulf of Bothnia, has not been thoroughly surveyed. Dangers may exist

outside the charted and described off-lying dangers. Vessels should proceed with care when approaching this coast.

During the winter, many buoys are removed while others may be damaged or break adrift.

In the coastal waters within this sector, numerous logs may be found adrift at all times of the year.

Areas dangerous due to mines laid during World War II exist within these waters. There is still a risk of danger in these areas when anchoring or carrying out any seabed activities.

Due to various circumstances, including the discovery of obstructions, depths within the channels leading through the off-shore dangers along this stretch of coast may change frequently. Therefore, vessels are advised to contact the local authorities in order to ascertain the latest information, including the maximum authorized drafts.



Bonden Light

Sweden—Jarnasudde to Umea

8.2 The depths lying between Jarnasudde and Ratan are very irregular. The depths surrounding the detached offshore dangers may vary between 11m and 90m.

Foul ground fringes the coast, and numerous shoals and rocky patches, lying close together in some places, extend up to 8 miles offshore. Other detached rocks and shoals lie up to 13 miles offshore.

The dangers fronting the coast may best be seen on the chart and only the outermost are described below. Most of these off-lying dangers are steep-to and great care is necessary when navigating in their vicinity.

Jarnasudde (63°26'N., 19°39'E.), the E entrance point of Nordmalingsfjarden, is low and wooded.

Jarnashamn (63°26'N., 19°41'E.), a small harbor, lies in an inlet on the E side of Jarnasudde. Small vessels, with drafts up to 4.5m, can use the narrow entrance channel. Ice obstructs navigation in the fairway from the middle of December to May. Local pilots may be obtained through the pilotage area of Ornskoldsvik. Anchorage can be taken within the harbor, in depths of 4 to 7m, clay and mud. Local knowledge is advised.

Norra Langrogrundet (63°19'N., 19°41'E.), a bank with shallow ledges and rocks awash at its N end, lies 6.5 miles S of Jarnasudde. A light, equipped with a racon, is shown from a prominent tower, 21m high, standing at the N end of this bank.

Sodra Langrogrundet, a rocky bank with a least depth of 4.9m, lies 2 miles S of Norra Langrogrundet and is marked by a buoy at its W end.

Elingsgrund (63°18'N., 19°53'E.), an isolated shoal, has a depth of 5.9m and lies about 5.5 miles E of Norra Langrogrundet Light.

8.3 Bonden (63°26'N., 20°03'E.) is a moderately-high red rock resembling, from a distance, the ruins of an old castle. This rock lies 10.5 miles E of Jarnasudde and is fronted by a reef on its S side. A light is shown from a prominent tower, 20m high, standing on the rock.

A detached shoal patch, with a depth of 8m, lies about 3 miles NE of Bonden.

The area surrounding Bonden is a designated nature reserve and numerous restrictions apply. Landing is prohibited without permission.

Sydvastbrotten (63°25'N., 20°02'E.), consisting of two

light-colored rocks lying close together, is located about 1.5 miles SSW of Bonden Light and fronted by foul ground on its N side. A shoal, with a depth of 7.9m, lies 0.4 mile S of these rocks.

Tjaruskarssund (63°28'N., 19°46'E.) is the SW entrance point of Orefjarden. The coast extending between this point and Jarnasudde is thickly wooded. The shore is fronted by several islets and numerous rocks and shoals.

Efesgrund (63°23'N., 19°47'E.), a detached shoal with a depth of 6.4m, lies about 5 miles S of Tjaruskarssund and is marked by a buoy.

Lordagshallan (63°26'N., 19°54'E.), a rocky shoal area, lies centered about 3.5 miles W of Bonden. It dries in places and is marked by a beacon.

Bondensgrund (63°28'N., 19°46'E.), a detached shoal patch, lies 4 miles ESE of Bonden Light and has a least depth of 2.4m.

Sydostbrotten Light (63°21'N., 20°11'E.), equipped with a racon, is situated 7 miles SE of Bonden Light. It is shown from a prominent tower, 34m high, standing on Vernersgrundet, a detached shoal patch.

Sydostbrotten (63°23'N., 20°07'E.), an extensive chain of shoals, lies with its NE end located about 4.3 miles NNW of Sydostbrotten Light. It extends SW for about 5 miles and is awash in places.

8.4 The coast between Tjaruskarssund and Blagrundsudde (63°36'N., 20°00'E.), about 10 miles NE, is indented by many shallow inlets. The shore is fronted by small islands, islets, and numerous shoals, which extend up to about 8 miles seaward and may best be seen on the chart.

Orefjarden (63°30'N., 19°48'E.), a fjord, lies between the mainland, on the W side, and a chain of islands and islets extending S, on the E side.

Snoan (63°29'N., 19°54'E.) lies 5 miles NW of Bonden Light and is the most easily-recognized island of the chain. It is 1.3 miles long, moderate high, and has a flat top with light-colored slopes. A chapel is situated near the S end; a light is shown from the SE side of the island.

Orefjarden may be approached from the S by a buoyed channel, which is authorized for drafts up to 4m. Local knowledge is required. There are also a number of shallow alternate passages, which lead through the offshore dangers. This fjord is usually closed by ice from the middle of December to the middle of April.

Kylorn (63°32'N., 19°46'E.), a former timber-loading place,

is situated on the NW side of Orefjarden and provides an anchorage, in depths of 5 to 10m, mud and sand.

8.5 Norrbyskar (63°33'N., 19°52'E.), a former timber-loading place, is situated in the NE part of the fjord. It is now only used by small craft, including a ferries and recreational boats. There is a quay, 53m long, with depths of 3.7 to 4.3m alongside. The anchorage has depths of 7 to 13m, clay, mud, and stones. Local knowledge is required.

Hornefors (63°37'N., 19°54'E.), a former timber and pulp-loading place, is situated in Vasterfjarden, an inlet indenting the mainland about 3 miles NNE of Norrbyskar. The main quay provides 170m of berthage at its outer end, with a depth of 6.9m alongside. Vessels up to 105m in length and 6.3m draft can be handled. The main approach channel, authorized for drafts up to 6.3m, leads NW from a position 5.5 miles NE of Bonden Light. Ice usually obstructs the harbor from January to April. Local knowledge is required.

An outer anchorage lies N of Ronnskar, an island located close S of the harbor entrance, in a depth of 8m, clay and mud.

Prominent radio masts, 60 to 75m high, stand 4.5 miles SW, 1.5 miles NNE, and 7 miles ENE of Hornefors.

It is reported that commercial traffic ceased. Hornefors is now completely disused.

Approach to Umea

8.6 The coast between Blagrunsdudde and the SW entrance point of Umeafjarden, about 6.5 miles NE, is very irregular. The shore is fronted by numerous dangers, which may best be seen on the chart.

Norrmjole, a small fishing harbor, lies about 3 miles W of the SW entrance point of Umeafjarden.

Umea (63°49'N., 20°16'E.), a moderate-sized town, stands at the head of Umeafjarden, about 10 miles above the entrance.

This fjord is divided near the mouth into Osterfjarden and Vasterfjarden by Obbolaon, the largest of several islands lying within it. Both of these fjords are encumbered by numerous islets, rocks, and shoals.

The commercial port facilities, which are described in paragraph 8.9, are situated within Osterfjarden, the easternmost fjord. Vasterfjarden, the westernmost fjord, is only navigable in Strombacksfjarden, its S part.

Simphamn (63°40'N., 20°14'E.), a pleasure craft harbor, is situated on the W side of Vasterfjarden, near the S end of Strombacksfjarden. An approach channel, which is authorized for drafts up to 4m, leads N from seaward to the harbor. Small vessels may anchor, in depths of 4 to 5.5m, mud, off the harbor. Local knowledge is advised.

8.7 Gunvorsgrund Light (63°29'N., 20°27'E.), equipped with a racon, is shown from a prominent tower, 23m high, standing on a shoal lying 11.5 miles ENE of Bonden Light.

Vaktaren Light (63°37'N., 20°25'E.), equipped with a racon, is shown from a prominent tower, 21m high, standing on a shoal 7.5 miles N of Gunvorsgrund Light and 4 miles SE of the S end of Obbolaon.

Numerous dangers lie in the approach to Umeafjarden. They extend up to about 5 miles seaward and may best be seen on the chart.

Bredskar (63°39.6'N., 20°19.3'E.), a moderately-high and mostly bare island, lies close off the SE end of Obbolaon. Range lights and range beacons are situated on this island.

Storbranningen Light (63°38.3'N., 20°22.0'E.) is shown from a prominent tower, 8m high, standing 2 miles NW of Vaktaren Light.

Lillbadan Light (63°38.9'N., 20°20.5'E.) is shown from a prominent white hut, with a radar reflector, standing on an above-water rock 0.9 mile NW of Storbranningen Light.

Petlandskar (63°39.3'N., 20°23.9'E.), a small island, lies 1.3 miles NE of Storbranningen Light. Range lights are situated on this island.

Revet Light (63°39.3'N., 20°20.4'E.) is shown from a prominent floodlit tower, 11m high, standing 0.4 mile N of Lillbadan Light.

Fjardgrund Light (63°40.1'N., 20°20.5'E.) is shown from a prominent floodlit tower, 21m high and adjoining a house, standing 0.8 mile N of Revet Light.



Fjardgrund Light

8.8 Directions.—There are three channels leading into Umeafjarden, all of which join at a position W of Fjardgrund Light (63°40.1'N., 20°20.5'E.).

The main deep-water channel leads NNW from SE of Vaktaren Light (63°37'N., 20°25'E.).

The main coastal passage leads to the vicinity of Vaktaren Light. Vessels should steer in a NE direction to pass SE of the S end of Lordagshallan Shoal and NW of Bonden Light. They should then steer in an ENE direction for a position about 1.5 miles N of Gunvorsgrund Light. From this position vessels should steer in a NE direction for about 4.5 miles, using the white sector of Bergudden Light (63°47.5'N., 20°50.5'E.), situated on the NW side of Holmen, until they reach a position about 5 miles SE of Vaktaren Light.

Vessels should then head in a NNW direction and pass 0.3 mile WSW of Vaktaren Light. They should continue NNW, using the white sector of Fjardgrund Light or the Hillskar Lighted Range (63°40.8'N., 20°20.7'E.), until the alignment of Bredskar Lighted Range (63°39.7'N., 20°19.9'E.), is reached.

Vessels proceeding to the ferry terminal should remain on the Hillskar Lighted Range and continue in a NNW direction for about 3 miles.

Other vessels should steer in a NW direction, using Bredskar Lighted Range, and pass close NE of Storbranningen Light

(63°38.3'N., 20°22.0'E.) and close SW of Revet Light (63°39.3'N., 20°20.4'E.). When within about 0.3 mile of Bredskar Island, vessels should change course and steer in a N direction in order to pass about 0.3 mile W of Fjardgrund Light. They should then continue to follow the buoyed fairway into the port.

A secondary channel leads in a N direction from a position about 6 miles SSW of Vaktaren Light. Vessels should use the Bredskarssund Lighted Range (63°39.8'N., 20°18.8'E.) until they reach a position about 2.8 miles W of Vaktaren Light. They should then continue in a N direction through the buoyed fairway, using the range beacons situated on the W end of Bredskar Island. When within about 0.3 mile of Bredskar Island, vessels should change course as necessary to pass W of it. After passing between the NW side of the island and the SE end of Obbolaon, vessels should steer NE and join the main channel at a position about 0.3 mile W of Fjardgrund Light.

Another secondary channel leads in a W direction from a position about 6 miles E of Petlandskar Island. Vessels should approach, using the Petlandskar South and East Range Lights, and pass close N of the island. They should then steer in a WNW direction, using the Petlandskar South and East Range Lights, astern, and pass close SSW of Fjardgrund Light. Vessels should then join the main channel at a position about 0.3 mile W of Fjardgrund Light.

Vessels may also approach the port via the recommended track (Deep-Water Route) that is used for passing through Ostra Kvarken (see paragraph 8.24). Such vessels should depart the recommended track when about 2.5 miles SW of Nordvalen Light. They should head NNW and then in a NW direction using the white approach sector of Vaktaren Light.

Umea (63°42'N., 20°21'E.)

World Port Index No. 26890

8.9 The commercial facilities of Umea are situated at the S end of Osterfjarden. The town of Holmsund stands at the E side and is fronted by the harbor of Umea Hamn. Hillskar ferry terminal is situated at the E side of a narrow peninsula, which extends SSW from Holmsund. The town of Obbola stands at the W side. Timber products are exported; and cement, grain, and petroleum products are imported.

Ice.—Generally, the port is kept open year round. During severe ice conditions, the harbor may be closed for short periods.

Tides—Currents.—There is a range of about 0.6m between mean and ordinary low water. Strong S and SE winds cause higher water levels; N and NW winds cause lower water levels. The greatest range occurs in the spring and fall.

Within the harbor entrance channels, there is always a strong outgoing current. At the beginning of June, during the spring flood, this current attains a velocity of 4 knots.

Depths—Limitations.—The main approach channel is authorized for drafts up to 11m as far as a position W of Fjardgrund Light. The secondary channel leading from S through Bredskarssund is authorized for drafts up to 4m. The secondary channel leading from E via Petlandskar is authorized for drafts up to 4.3m.

There are three main berths, with ro-ro ramps, at Umea Hamn (Holmsund). Pirkajen Quay is 168m long and has a

depth of 10m alongside; North Quay is 360m long and has depths of 5.5 to 7.9m alongside; and South Quay is 150m long and has a depth of 11m alongside. The fairway leading to these berths is authorized for drafts up to 10.2m.

Stormskar Oil Terminal, in the S part of Umea Hamn, consists of a berth, 80m long, with a depth of 11.1m alongside. The fairway leading to this terminal is authorized for drafts up to 10.2m.

At Obbola, there is a T-shaped oil terminal jetty, 70m long, with a depth of 11m alongside. The fairway leading to this jetty berth is authorized for drafts up to 10.2m. Vessels up to 40,000 dwt and 200m in length have been handled.

There is also a chemical quay, 85m long, with depths of 4.5 to 6m alongside. The fairway leading to this quay is authorized for drafts up to 4.7m.

The ferry terminal at Hillskar has four berths. The largest berth is 160m long and has a depth of 7.5m alongside.

Holmen road bridge spans the port at the N end of Holmsund. The W section has a vertical clearance of 10m; the E section has a vertical clearance of 7m. The channel leading N of the bridge is used only by small craft.

Patholmensviken, a small craft harbor, lies 1 mile NNE of Hillskar ferry terminal. It is protected by a breakwater and has depths of 2 to 4m. Bredvik, a yacht harbor, lies close S of Obbola.

There are facilities for general cargo, bulk, ferry, tanker, and ro-ro vessels in the port. Tankers up to 57,000 dwt, 215m in length, and 10.2m draft have been accommodated.

Aspect.—Djaknebolsklinten, 132m high, stands 5 miles SW of Umea. This wooded hill has three peaks, of which the westernmost is the tallest. It is conspicuous from seaward, particularly from the S.

A water tower and a factory building standing in Obbola are conspicuous from seaward. A water tower surmounted by a structure resembling a beacon, a radio mast, and a watch tower stand in the N part of Holmsund and are all prominent.

A conspicuous wind generator, 53m high, stands on a breakwater, which extends S from the vicinity of Hillskar ferry terminal.

The approach channels are marked by lighted ranges, buoys, and beacons (see paragraph 8.8).

Pilotage.—The pilotage area for Umea lies between a line bearing 140° through Norrbyskar (63°33'N., 19°52'E.) and latitude 64°03'N. All requests for pilotage must be made through the VTS station at Lulea (see paragraph 9.19).

Pilotage is compulsory, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 80m in length and over or 15m beam and over.
3. Category 3 vessels of 90m in length and over or 16m beam and over.

In certain channels between Vaktaren and Skagsudde/Rundvik, pilotage is compulsory, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 80m in length, 15m beam, and 5m draft and over.
3. Category 3 vessels of 90m in length, 15m beam, and 5.5m draft and over.

The pilot can be contacted by VHF and boards in the vicinity of Vaktaren Light (63°37'N., 20°25'E.). In bad weather, the pi-

lot generally boards in the entrance fairway.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Lulea and Gavle. For further information, see Lulea (paragraph 9.19).

It is reported that tankers over 13,000 dwt and 7.6m draft bound for Stormskar Oil Terminal and cargo vessels over 8.5m draft bound for Umea Hamn are restricted to daylight movements.

Anchorage.—Vessels waiting for the pilot may anchor, in depths of 18 to 25m, about 1.5 miles SE of Vaktaren Light.

Anchorage can be taken, in depths of 14 to 18m, close N of Bredskar Island. Anchorage can also be taken, in depths of 15 to 16m, clay and mud, close E of Obbola, about 0.8 mile below the Holmen road bridge.

Directions.—Three entrance channels, which may best be seen on the chart, lead into the port (see paragraph 8.8).

Caution.—Several submarine cables, which may best be seen on the chart, lie across the channel close S of the Holmen road bridge.

A submarine outfall pipeline, which may best be seen on the chart, extends SE into the fairway from the S part of Obbola. Anchorage is prohibited within 150m above and 100m below this pipeline.

A mined area, which may best be seen on the chart, lies across the main fairway about 0.7 mile N of Bredskar Island. Navigation is permitted, but anchorage and fishing are prohibited due to the possible presence of sub-surface mines. Passage through the area during thunderstorms may also be dangerous.

Sweden—Umea to Ratan

8.10 Norrfjarden (63°52'N., 20°45'E.), a small local ferry harbor, is situated about 15 miles NE of Osterfjarden. The coast between, which forms the W side of Vastra Kvarken, is indented by several other fjords and is mostly low and thickly wooded. The shore is fronted by numerous small islands, rocks, and shoals. Norrfjarden is protected by a curved breakwater, 100m long, and has depths up to 4m.

Taftelandet (63°47'N., 20°33'E.) is an irregularly-shaped peninsula, which separates Taftefjarden, on the W side, from Safvarfjarden, on the E side. A lighted range, for the use of fishing vessels, is shown from Rovogern (63°44'N., 20°32'E.), one of several islets lying close off the SW side of the peninsula.

Bjuren (63°45'N., 20°36'E.), an island, lies in the SW part of Safvarfjarden. Anchorage can be taken by small vessels between this island and the Taftelandet, in a depth of 5m, mud. Local knowledge is required as the channel is narrow and intricate. It can be used by small vessels with drafts up to 3.9m. Several pairs of range beacons mark the fairway.

Tarngrunden (63°48'N., 20°47'E.) lies 2.5 miles offshore, 6.2 miles NE of Bjuren. This shoal lies at the edge of the coastal bank and is marked by a buoy.

Karingskar (63°54'N., 20°51'E.), a high and almost bare islet, lies about 1 mile offshore, 3.3 miles NE of Norrfjarden. A rocky shoal extends about 1 mile E from this islet and is marked by a buoy.

8.11 Brednoret (63°56'N., 20°48'E.), a small loading

place, is situated on the W side of Nyhamnsfjard, 2 miles NW of Karingskar. Ice usually obstructs this fjord from December to the middle of May. Anchorage can be taken, in a depth of 6m, sand and clay, close SW of Farskaren, two islets lying about 0.5 mile SE of the village. Two entrance channels, available to small vessels with drafts up to 5m, lead to the anchorage. Vessels may approach from E and pass N of Karingskar or from S and pass W of this islet. Numerous dangers lie in the approaches and local knowledge is required.

Ratan (64°24'N., 20°54'E.), a small natural harbor, is situated about 5 miles NNE of Karingskar and is described in paragraph 9.2.

For Vastra Kvarken and Ostra Kvarken, see paragraph 8.23 and paragraph 8.24, respectively.

Finland—Strommingsbadan to Vaasa

8.12 The Finnish coast, from a point on the mainland 15 miles SE of Strommingsbaden, trends very irregularly NE for about 60 miles to a point on the mainland located 2.5 miles E of Hallgrund (63°39'N., 22°25'E.), which is described in paragraph 10.2.

Many fjords, bays, and coves, which may best be seen on the chart, indent this entire stretch of coast. Hundreds of islands, islets, rocks, and other dangers encumber these inlets, fringe the shore, and extend up to about 30 miles seaward. Several large areas lying among these dangers have not been fully surveyed.

Only the outermost dangers are described below. These dangers form the SE side of Ostra Kvarken, which is the E part of Norra Kvarken. Most of the outermost dangers, islands, and islets fronting this coast are located near the entrances to several channels leading to the port of Vaasa.

Vaasa is the only place of commercial importance along this coast. Several small loading places are situated in the fjords NE of Vaasa. A description of the coast extending N of Hallgrund begins in paragraph 10.2.

Caution.—This part of the Finnish coast is low and wooded, and lacks good natural landmarks; it appears to passing vessels to be farther away than it actually is.

8.13 Strommingsbadan (62°59'N., 20°45'E.), an outer danger, lies about 25 miles WSW of the port of Vaasa and is described in paragraph 7.20.

Depths among the maze of islands and dangers extending between Strommingsbadan and Hallgrund are very irregular.

Ronnskaret (63°05'N., 20°48'E.), a large group of islets and rocks, lies centered about 6 miles NNE of Strommingsbadan. Storsanden, the outermost islet is located 5.8 miles N of Strommingsbadan.

Falliskar Beacon (63°04'N., 20°48'E.), a prominent landmark, stands on an islet of the same name within the group, 5.3 miles NNE of Strommingsbadan.

Norrskar (63°14'N., 20°39'E.), lying 16 miles NNW of Strommingsbadan, consists of two islands and several rocky islets, which are located on a reef about 3.5 miles in diameter.

Norrskar Light (63°14'N., 20°36'E.) is shown from a prominent tower, 21m high, standing on the westernmost island.

Norrkallan Light is shown from a tower, 9m high, standing on a rock, awash, about 0.6 mile W of Norrskar Light, at the



Norrskar Light

outer edge of the reef.

Vasterkallan, with a depth of 8m, lies about 2 miles WNW of Norrskar Light. This isolated shoal is marked by a buoy. A detached shoal patch, with a least depths of 8.9m, lies about 4 miles NW of Norrskar Light.

Nygrund, with a depth of 2.9m, lies 1.5 miles S of Norrskar Light. This outer shoal is marked by a buoy.

8.14 Lotsgrund Light (63°11'N., 20°43'E.) is shown from a beacon structure standing 4 miles SE of Norrskar Light.

Skvattan Beacon (63°07.8'N., 20°41.9'E.), equipped with a racon, stands on a small islet lying about 3.2 miles S of Lotsgrund Light.

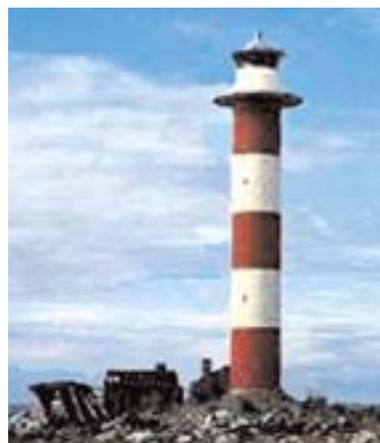
Vaasa Light (63°14'N., 20°55'E.), equipped with a racon, is shown from a prominent tower, 20m high, standing 8.5 miles E of Norrskar Light.



Vaasa Light

Utgrynnan Light (63°21'N., 20°46'E.), equipped with a racon, is shown from a prominent tower, 23m high, standing on an outer reef 8.1 miles NNE of Norrskar Light.

Rabergskallan, a detached shoal with a least depth of 0.7m, lies about 2.5 miles SSE of Utgrynnan Light and is marked by a buoy.



Utgrynnan Light

8.15 Valassaaret (63°25'N., 21°05'E.), a group of islands and islets, lies centered about 10 miles NE of Utgrynnan Light and is surrounded by reefs.

Valassaaret Light (63°25'N., 21°04'E.) is shown from a prominent framework tower, 36m high, standing on the S part of Storskar, the largest island.



Valassaaret Light

Reefs, with above-water rocks, extend up to about 3.5 miles NE of Storskar and are marked by two buoys.

An area of foul ground and shallow rocks extends up to about 8.5 miles W of Valassaaret Light and may best be seen on the chart. Medelkallen, a group of above-water rocks, lies in this area, 6 miles WSW of the light.

Ritgrund Light (63°26'N., 21°30'E.) is shown from a prominent pyramidal tower, 18m high, standing on an islet 12 miles E of Valassaaret Light. The islet is fronted by shoals and foul ground, which may best be seen on the chart.

Detached shoal patches, with depths of 9.7m, lie about 4 miles NNE and 9.5 miles NW of Ritgrund Light.

Mickelsorar (63°26'N., 21°46'E.) is a large group of islands, islets, rocks, and shoals lying centered about 7 miles E of Rit-



Ritgrund Light

grund Light. Detached shoal patches, with depths of less than 10m, extend up to 4 miles N of this group. They lie about 11 miles NE of Ritgrund Light and may best be seen on the chart.

Stubben (63°31'N., 22°10'E.), located about 18 miles ENE of Ritgrund Light, consists of Lillskar and Storskar, two small islands; a small islet; and several rocks. A shoal, with a depth of 9m, lies about 1 mile N of Lillskar and is marked by a buoy.

A light is shown from a prominent square tower, 14m high, standing on Lillskar, the westernmost island. A conspicuous wooden tower, 17m high, is situated on the middle of Storskar, the easternmost island.



Stubben Light (Lillskar)

Helsingkallan (63°36'N., 21°50'E.), a group of rocky shoals with a least depth of 2.2m, lies about 9 miles NW of Stubben Light and 13 miles offshore. This group is marked near the center by two buoys and at the NW side by a lighted buoy.

Caution.—Numerous uncharted dangers may lie between Helsingkallan and the Mickelsoror group.

A nature reserve area, within which numerous restrictions apply, surrounds the Valassaaret group.

8.16 Kantlax (63°25'N., 22°17'E.), a village, stands on the mainland and is fronted by a loading roadstead. Good sheltered anchorage can be taken, in a depth of 11m, sand and clay, close off the NE extremity of Storon, an island lying close offshore. Local knowledge is required and pilots are available from Vaasa. The anchorage can be reached by using a branch chan-

nel, which is authorized for drafts up to 3m. It leads from the NE approach route to Vaasa at a position about 1.7 miles SSW of Stubben Light and is marked by buoys and beacons.

Munsalan (63°23'N., 22°18'E.), situated 1.5 miles S of Kantlax, consists of an oil jetty, 30m long, and two mooring buoys. It is approached via a buoyed fairway, authorized for drafts up to 7m, which branches off from the outer part of the channel leading to Hellnas.

Hellnas (63°17'N., 22°14'E.), a village situated on the mainland about 20 miles NE of Vaasa, is the loading place for the sawmills in the vicinity. The protected roadstead lies about 0.7 mile N of the village. A branch channel leads from the NE approach route to Vaasa. Vessels with drafts up to 7m can be taken to within 3.2 miles NNE of the roadstead; vessels with drafts up to 3.8m can be taken to the anchorage area in the roadstead.

Monassundet (63°29'N., 22°19'E.), an inlet extending about 4 miles SE, is entered 4 miles SE of Stubben Light. An anchorage, with depths of 9 to 11m, lies about 1 mile within the entrance near the village of Monas. An approach channel, suitable for vessels with drafts up to 4m, leads 3 miles SE to the narrow entrance. The inlet is only used by small craft and recreational boats.

Hallgrund (63°39'N., 22°25'E.), a small islet, lies about 10 miles NE of Stubben Light and is described in paragraph 10.2.

Approaches to Vaasa

8.17 Several approach routes lead toward Vaasa through the many islands, islets, and dangers lying off the coast. The two main channels and the two secondary channels are described below. The other inshore passages are only used by small craft with local knowledge.

Two main routes leading from the NW are each about 27 miles in length. Norrskar South passes S of Norrskar Light and is authorized for drafts up to 8.5m. Norrskar North passes N of Norrskar Light and is authorized for drafts up to 9m.

Norrskar South, the first main route, leads from a position about 4 miles S of Norrskar Light (63°14'N., 20°36'E.). It leads 6 miles NE, using the white sector of Vaasa Light (63°14'N., 20°55'E.), and passes close NW of Lotsgrund Light (63°11'N., 20°43'E.). The route then leads about 5 miles ESE, using Norrskar Lighted Range astern, until a position 3 miles SE of Vaasa Light is reached. It continues for 6.3 miles in a SE direction through a partly-buoyed channel. The route then leads 1 mile ESE and passes close NNE of Glasrund Front Light (63°06'N., 21°11'E.), which is equipped with a racon. It continues 3.7 miles ENE, 1 mile SE, and 5.5 miles ESE through a narrow channel to the port.

Norrskar North, the second main route, leads from a position about 4.3 miles SW of Utgrynnan Light (63°21'N., 20°46'E.) and 4.4 miles NNE of Norrskar Light. It leads in a SE direction for about 9 miles to a position close NE of Vaasa Light. The route then continues in a SE direction for about 3 miles and joins the first main channel.

An alternate fairway, which is authorized for drafts up to 4.5m, leads SE for 11 miles from a position 0.7 mile SE of Vaasa Light. It passes close SW of Korso Light (63°11'N., 21°09'E.) and joins the main channel about 4 miles ENE of Glasrund Front Light.

Ronnska, a secondary route, which is authorized for drafts up to 4m, leads from a position 6 miles WSW of Faliskaret Beacon (63°04'N., 20°48'E.). It is mostly used by small vessels with local knowledge. The route leads in a general ENE direction for about 17 miles and passes through the Ronnskaret group of islets. It then joins the first main channel close NNE of Glasrund Front Light.

Ritgrund, another secondary route, which is authorized for drafts up to 4.8m, leads from a position 5 miles NNW of Ritgrund Light (63°26'N., 21°30'E.). The route leads in a general S direction for about 25 miles, passing between the island of Vallgrund and the mainland, to join the main channel. A road bridge, with a vertical clearance of 24m and an opening 60m wide, spans the channel. It connects the SE end of the island of Vallgrund to a causeway extending W from the mainland.

Stubben, an inshore route, used in daylight only, leads from a position about 2 miles N of Stubben Light (63°31'N., 22°10'E.). It leads S and SW for 26 miles, passing S of the Mickelsoror group (63°26'N., 21°46'E.), and then joins the secondary channel leading S from Ritgrund Light. This inshore route is authorized for drafts up to 7m as far as Stor Ljusen (63°26.0'N., 22°05.5'E.) and then for drafts up to 3.6m.

Regulations.—The approach route leading to Kristinestad (Kristinankaupunki) is situated within Sector A of the Bothnia Vessel Traffic Service (VTS) system. This system operates off the NW coast of Finland and is mandatory. For further details of the VTS system, including reporting procedures, see paragraph 10.1.

Caution.—It is reported that, due to more frequent surveys, the Finnish Board of Navigation advises deep-draft vessels approaching from the NW to use the route leading N of Norrskar in preference to the one passing to the S.

A designated restricted area surrounds the island of Norrskar (63°14'N., 20°36'E.).

Vaasa (63°06'N., 21°35'E.)

World Port Index No. 27650

8.18 Vaasa, formerly known as Nikolaistad, is situated on the Finnish coast bordering on Norra Kvarken. The port area comprises the facilities at the outer harbor of Vaskiluoto, those at Palosaari to the N, and those at the inner or town harbor.

Ice.—The harbors have been closed to navigation because of ice on dates varying between December 25 and January 25, and were reopened on dates ranging from March 31 to May 16. Ice-breaker service is furnished at the beginning and end of the ice season.

Tides—Currents.—The water level in the harbors rises with S winds and falls with N winds.

Depths—Limitations.—The main approach channel is authorized for drafts up to 9m (see paragraph 8.17).

The island of Vaskiluoto lies close W of the town of Vaasa and is connected to it by a causeway. A road bridge links the island to the town and also to the mainland on the S side.

Palosaari Harbor lies close NW of the N part of the town. It provides a quay, 65m long, with a depth of 3.7m alongside. The main fairway leading to this harbor from Vaskiluoto is authorized for drafts up to 4.2m.

Town Harbor fronts Vaasa. It provides 500m of total quayage, with depths up to 5m alongside.

Vaskiluoto Harbor is situated on the SW side of the island and is the site of the main commercial facilities. It is protected by a detached breakwater lying on the N side of the entrance channel.

Coal Quay is 145m long and has a depth of 10m alongside.

Reins Quay is 240m long and has depths of 6 to 8m alongside.

Ferry Pier has two ro-ro berths, 128m and 140m long, with depths of 5.7m alongside.

North Pier is 180m long and has depths of 6.4 to 9.6m alongside. It has ro-ro berths on each side of its root.

South Pier is 180m long and has depths of 6.4 to 9.6m alongside.

Oil Pier is 105m long and has a depth of 10m alongside.

There are facilities for ro-ro, passenger, automobile ferry, bulk, tanker, and general cargo vessels. Vessels up to 200m in length and 9m draft can be accommodated.

Aspect.—The approach channels are marked by directional sector lights, lighted ranges, buoys, and beacons (see paragraph 8.17).

Pilotage.—Pilotage is compulsory. Pilots are provided by the Vaasa Sea Pilot Station (see paragraph 10.1).

Vessels must send a request for pilotage 24 hours prior to arrival at the boarding place. A confirmation must be sent 6 hours in advance and any changes after this time must be forwarded not later than 3 hours before arrival. In the Gulf of Bothnia, the binding order for a pilot must be made by telephone to the appropriate pilot station 3 hours before arrival.

Pilots can be contacted by VHF and board NE of Lotsgrund Light in position 63°12.1'N, 20°45.4'E or NW of Vaasa Light in position 63°15.8'N, 20°51.2'E.

Vessels approaching from the NE may request a pilot from the station at Tankar (63°57'N., 22°51'E.) (see paragraph 10.1). Such requests must be made 24 hours in advance and arrangements may be made to embark the pilot in the vicinity of Stubben Light (63°31'N., 22°10'E.). Vessels approaching from the S may arrange to embark the pilot about 5.5 miles SW of Salgrund Light (62°20'N., 21°12'E.).

Regulations.—A speed limit of 10 knots is in effect for the section of the channel between Nygrund (63°07.6'N., 21°20.2'E.) and the port. It is reported that a speed limit of 8 knots applies to vessels with drafts over 8m.

At night, tankers carrying more than 4,000 tons of oil are prohibited in the section of the channel between Nygrund (63°07.6'N., 21°20.2'E.) and Vaasa.

Vessel Traffic Service.—The approach route leading to Vaasa is situated within Sector B of the Bothnia Vessel Traffic Service (VTS) system. This system operates off the NW coast of Finland and is mandatory. For further details of the VTS, including reporting procedures, see paragraph 10.1.

Anchorage.—Anchorage may be taken as directed by the pilot.

Caution.—A submarine track guide cable has been established in the fairway between Nygrund (63°07.6'N., 21°20.2'E.) and Nagelprick, 3.5 miles ESE, to assist navigation. The use of this guide system is only possible with a special receiver. Anchoring and fishing are prohibited in this part of the channel.

Norra Kvarken

8.19 Norra Kvarken, the narrowest part of the Gulf of Bothnia, includes the waters extending about 40 miles NE from a line joining Bonden (63°26'N., 20°03'E.), Sydostbrotten (63°21'N., 20°11'E.), and Norrskar (63°14'N., 20°36'E.). It is encumbered with numerous islands, islets, rocks, and shoals.

The part of the Gulf of Bothnia situated S of Norra Kvarken is known in Swedish as Bottenhavet and in Finnish as Selkämeri. The part of the gulf situated N of Norra Kvarken is known in Swedish as Bottenviken and in Finnish as Perämeri.

Holmoarne (63°40'N., 20°52'E.), a group of islands and rocks, divides Norra Kvarken into two channels or passages. Vastra Kvarken, on the W side, leads between the group and the dangers fronting the coast of Sweden; Ostra Kvarken, on the E side, leads between the group and the dangers fronting the coast of Finland.

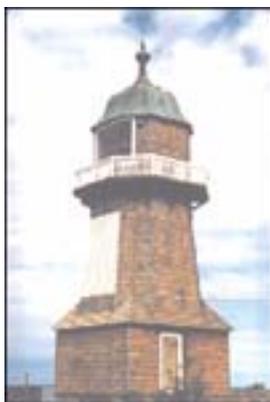
Great care is necessary when navigating within both Vastra Kvarken or Ostra Kvarken, particularly during foggy weather, which is not infrequent. Mariners should bear in mind that the currents are uncertain and their movements sometimes precede the wind.

8.20 Holmon (63°47'N., 20°54'E.), the northernmost and largest island of the Holmoarne group, lies about 4 miles off the Swedish coast. The summit of this island is situated in the N part. It is 24m high and consists of a bare ridge surrounded by woods. Several houses, a lookout tower, and a church, with a high pointed tower, stand on this ridge and are prominent from seaward.

A chain of small islets, rocks, and shoals extends about 5 miles NE from the N end of the island and is marked at its outer edge by a buoy.

Byviken (63°48'N., 20°52'E.), a small harbor protected by breakwaters, lies within a narrow bay at the NW end of the island. It has a depth of 4m and is used by fishing vessels and pleasure craft. The bay is exposed to winds and heavy seas from the N and NE. Vessels with local knowledge can anchor, in a depth of 20m, sand, close off the W shore of the bay.

A conspicuous radio mast stands close E of Byviken.



Bergudden Light

Bergudden Light (63°47.5'N., 20°50.5'E.) is shown from a prominent wooden tower, 18m high, standing on the NW side

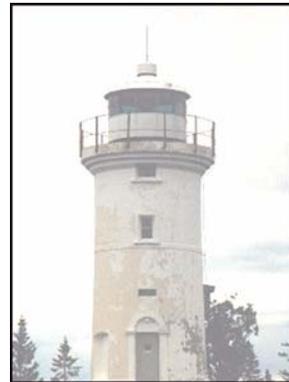
of Holmon.

Lillhallansgrund (63°49'N., 20°52'E.), a shoal with a least depth of 5.9m, lies about 1 mile N of Byviken and is marked on its SW side by a buoy.

Falkgrund (63°51'N., 20°53'E.), a shoal with a least depth of 9.9m, lies 2.3 miles NNW of the N extremity of Holmon and is marked by a buoy. Shoal patches, with depths of 7.6m and 9.4m, lie about 0.6 mile ESE and 0.7 mile SSW of Falkgrund.

Stora Fjaderagg (63°48'N., 21°00'E.), a mostly barren island, lies 1.5 miles NE of the NE extremity of Holmon. A chapel, some fishing huts, and a beacon, 7m high, are situated on the S side of the island. A prominent tower, formerly a lighthouse, 13m high, stands on the summit of the island.

An extensive shoal bank fronts the N and E sides of Stora Fjaderagg. Lillgrund, an above-water rock, and Osterbadan, a shoal with a depth of 6.9m, lie about 1 mile N and 1 mile E, respectively, of the island.



Stora Fjaderagg Tower

Vessels can take anchorage, in depths of 9 to 16m, sand, about 0.3 mile S of the S end of Stora Fjaderagg. They must approach from the E and take care to avoid the reef extending up to about 1.5 miles from the E side of the island.

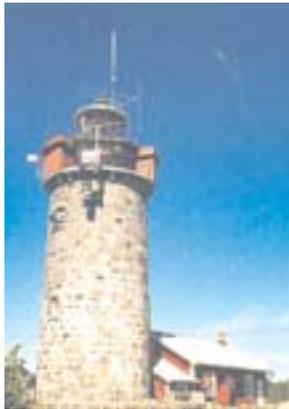
Angeson (63°44'N., 20°54'E.), low and wooded, lies close S of Holmon Island. Rocks and shoals extend up to about 1.8 seaward of the W side of this island and up to 4 miles seaward of the E side. These dangers are marked by buoys and may best be seen on the chart.

Grossgrunden (63°39'N., 20°51'E.), low and wooded, lies close S of Angeson and is fronted by shoals on each side. A beacon, with a radar reflector, stands on a group of above-water rocks about 1.5 miles WSW of the N end of this island.

Jagaroren (63°41'N., 20°55'E.), a shoal, lies about 1.6 miles ENE of the N end of Grossgrunden. A disused light tower, 12m high, stands on this shoal and is equipped with a racon.

8.21 Holmogadd (Gadden) (63°36'N., 20°47'E.), the southernmost island of the group, is bare except for a few clusters of low trees and bushes. It is separated from the S end of Grossgrunden by Gaddstrommen. A conspicuous tower, 8m high, stands on the N part of the island.

A light is shown from a prominent granite tower, 20m high, standing on the S end of the island. Some dwellings are situated close to the light tower and a cain stands on the beach close S of them.



Holmogadd Light

Gaddstrommen, a narrow passage leading between reefs, is the only navigable channel through the island group. It is marked by beacons and only used by small craft with local knowledge.

A rocky coastal bank extends about 2 miles S and 2.5 miles SE from the S end of Holmogadd. It is marked by buoys and may best be seen on the chart.

Huginsgrund (63°34'N., 20°46'E.), a shoal with a depth of 5.9m, lies 2 miles S of Holmogadd Light, at the edge of the bank, and is marked by a buoy.

Regulations.—The main shipping route in the S part of Norra Kvarken is situated within Sector B of the Bothnia Vessel Traffic Service (VTS) system. This system operates off the NW coast of Finland and is mandatory. Northbound vessels entering Norra Kvarken, with destinations of Tornio, Rahja, Raahе, Pietarsaari, Oulu, Kokkola, or Kemi, are requested to make an advance report when 20 miles S of Nordvalen Light (63°32'N., 20°47'E.). For further details of the VTS system, including reporting procedures, see paragraph 10.1.

Caution.—Submarine cables, which may best be seen on the chart, extend between the NE side of Holmon and Stora Fjaderagg, and between the SE side of Holmogadd and Nordvalen Light.

A restricted area, within which entry is prohibited without permission, surrounds the island of Holmogadd and the S part of Grossgrunden.

A designated nature area, within which numerous restrictions apply, has been established around the E part of Holmon, most of Angeson, Grossgrunden, Holmogadd, and a large number of the adjacent skerries and rocks.

Due to the numerous off-lying dangers, vessels proceeding N in the gulf are advised to keep at least 4 miles from the E side of the Holmoarne group.

8.22 Nordvalen Light (63°32'N., 20°47'E.), equipped with a racon, is shown from a prominent floodlit tower, 26m high, standing 3.5 miles S of Holmogadd Light and 11 miles N of Utgrynnan Light.

A chain of rocks and shallow shoals extend up to about 7 miles S of Nordvalen Light. The outer shoals are marked by buoys and may best be seen on the chart.

Gerdasgrundet lies 1.5 miles SSW of Norvaken Light. This

shoal has a least depth of 4.8m and is marked by a buoy.

Vastra Snipansgrundet, with a least depth of 2.3m, lies 6.2 miles SSW of Nordvalen Light. This shoal, which is the southeasternmost danger lying in the entrance to Ostra Kvarken, is marked by two buoys.

Odelgrund (63°25.5'N., 20°34.0'E.), with a depth of 11.9m, lies about 7 miles NW of Utgrynnan Light (63°21'N., 20°46'E.) and 8.5 miles SW of Nordvalen Light. This shoal lies at the outer edge of a bank extending SE from the vicinity of Gunvorsgrund Light (63°29'N., 20°27'E.) and is marked by a lighted buoy.

Waldersgrund, a detached shoal with a depth of 11.9m, lies about 1 mile ESE of Odelgrund and is marked by a buoy.

8.23 Vastra Kvarken (63°42'N., 20°43'E.) is bordered on the W side by the dangers fronting the Swedish coast and on the E side by the Holmoarne group (see paragraph 8.20). This passage leads in a general NNE direction for 23 miles from a position 5 miles SE of Vaktaren Light (63°37'N., 20°25'E.) to the vicinity of Karingskar (63°54'N., 20°51'E.).

A coastal passage leads to the vicinity of Vaktaren Light (see paragraph 8.8).

The recommended route, which may best be seen on the chart, leads NNE using the white sector of Bergudden Light (63°47.5'N., 20°50.5'E.). When about 2 miles from the light tower, vessels should steer more to the N and adjust their course in order to pass WNW of the light and ESE of Tarngrunden (see paragraph 8.8).

The route then leads in a NNE direction and passes close WNW of Lillhallansgrund and Falkgrund. After passing Falkgrund, vessels should steer more to the NE and head for a position 2.3 miles ESE of Karingskar. They should then head NNE using the white sector of Bergudden Light, astern.

Vessels entering from the N should head in a SSW direction using the white sector of Bergudden Light. When about 7 miles from the light structure and E of Karingskar, they should head SW to pass close W of Falkgrund shoal. The route then leads SSW and passes close WNW of Lillhallansgrund and about 0.4 mile WNW of Bergudden Light. When about 1.5 miles SSW of the light, vessels should adjust course and steer in a SSW direction using the white sector of Bergudden Light, astern.

Pilotage.—The pilotage area for Umea lies between a line bearing 140° through Norrbyskar (63°33'N., 19°52'E.) and latitude 64°03'N. The main boarding station is in the vicinity of Vaktaren Light. All requests for pilotage through Vastra Kvarken must be made through the VTS station at Lulea (see paragraph 9.19).

Caution.—Submarine cables, which may best be seen on the chart, lie across the N part of the passage. They extend NW between the NE side of Holmon, in the vicinity of Byviken harbor, and the mainland coast of Sweden.

A submarine cable, which may best be seen on the chart, lies across the S part of the passage. It extends WNW between the W side of Holmogadd and the mainland coast in the vicinity of Umea.

Buoys moored within Vastra Kvarken are sometimes displaced by drift ice in the early part of the navigation season, and may also be fouled by timber rafts.

An area, within which anchoring, fishing, and diving are prohibited, extends across Vastra Kvarken in the vicinity of Ber-

gudden Light and may best be seen on the chart.

8.24 Ostra Kvarken (63°33'N., 20°51'E.), the main off-shore passage in Norra Kvarken, is bordered on the NW side by the dangers fronting the S and E sides of the Holmoarne group and on the SE side by the dangers fronting the coast of Finland.

Depths—Limitations.—A Deep-Water Route, which is marked by buoys, has been established through Ostra Kvarken. It extends for about 8 miles SW and 7 miles ENE of Nordvalen Light (63°32'N., 20°47'E.) and has a least depth of 16.2m.

The recommended track passing through Ostra Kvarken is authorized for drafts up to 13m.

Directions—Vessels should proceed in a N direction up the gulf to a position located about 8 miles WNW of Norrskar Light (63°24'N., 20°36'E.). The recommended track then leads NE from this position to the S entrance of the Deep-Water Route. It passes about 6 miles SE of Sydostbrotten Light (63°21'N., 20°11'E.), close SE of Odelgrund (63°25.5'N., 20°34.0'E.), and close NW of Waldersgrund, using the white

sector of Nordvalen Light (63°32'N., 20°47'E.).

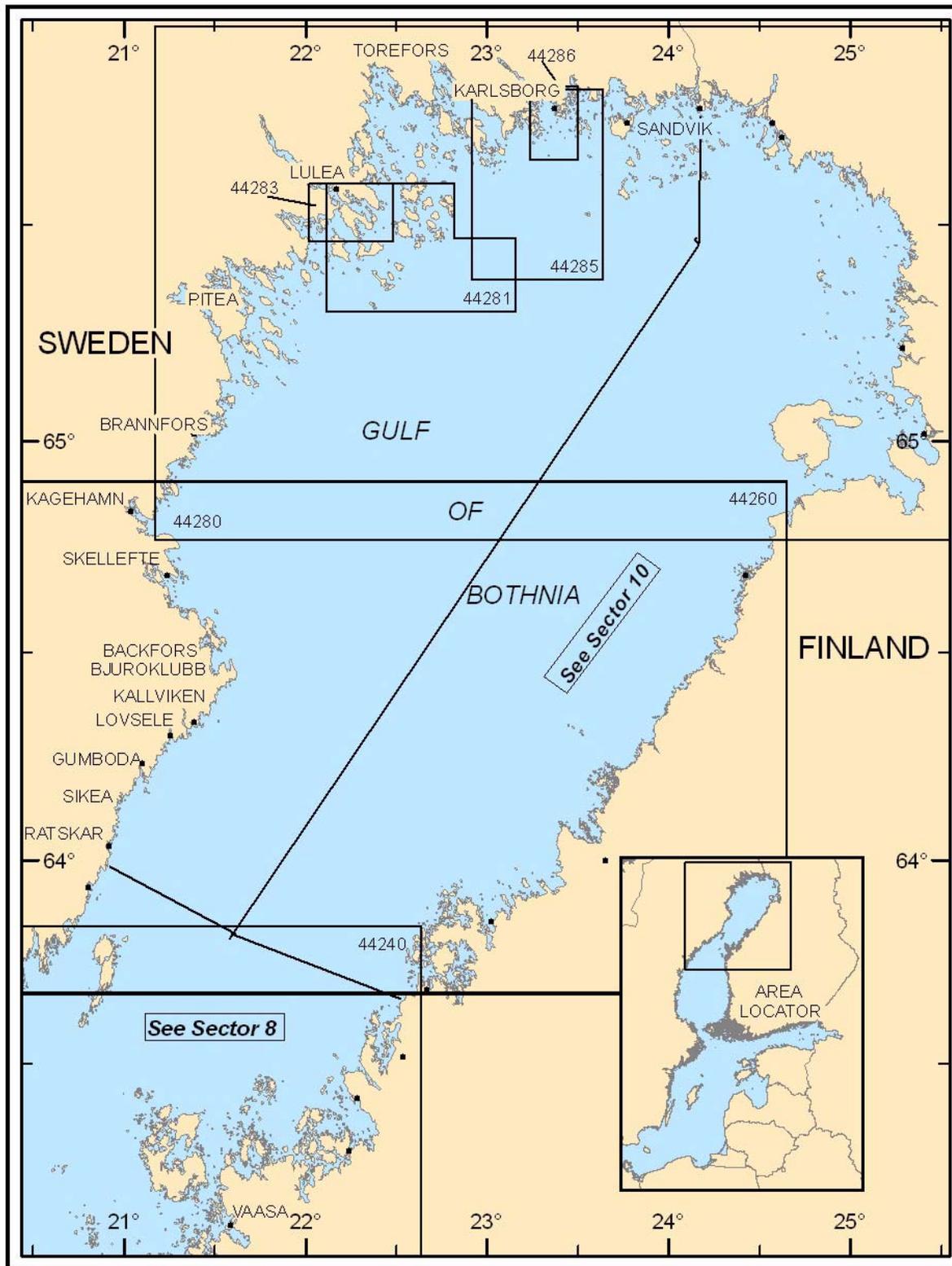
From a position about 5 miles SW of Nordvalen Light, the recommended track (Deep-Water Route) leads in a NE direction to pass close WNW of the shoals lying SW of the light. It then rounds the light, at a distance between 0.2 mile and 0.6 mile, and leads ENE toward a position located 11.7 miles NNE of Valassaaret Light (63°25'N., 21°04'E.), using the white sector of Nordvalen Light, astern.

Vessels bound for Umea or intending to use the coastal route through Vastra Kvarken should depart the recommended track (Deep-Water Route) in a NW direction when about 2.5 miles SW of Nordvalen Light.

Caution.—A submarine cable, which may best be seen on the chart, lies across the passage. It extends NNW from the vicinity of Ritgrund Light (63°26'N., 21°30'E.), rounds the island of Stora Fjaderagg, and extends W to the mainland coast of Sweden.

Care should be taken when approaching the S part of the passage as the Swedish side, being high, may tend to appear closer than the low Finnish side.

Sweden—East Coast—Ratan to the Finnish Border



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

SECTOR 9 — CHART INFORMATION

SECTOR 9

SWEDEN—EAST COAST—RATAN TO THE FINNISH BORDER

Plan.—This sector describes the E coast of Sweden up to the N part of the Gulf of Bothnia. The descriptive sequence is NNE from Ratan to Ranefjarden, then E to the Finnish border.

General Remarks

9.1 The water in the N part of the Gulf of Bothnia is discolored and almost fresh because of the numerous rivers discharging into it.

The coast of Sweden between Ratan and Tomsvarten (64°58'N., 21°23'E.), about 67 miles NNE, is fronted by numerous islands, rocks, and shoals. Although soundings off this part of the coast are very irregular, vessels should remain in depths of not less than 50m to ensure that they stay a safe distance from all off-lying dangers.

Between Pitea (65°19'N., 21°29'E.) and the Finnish border, shoals lie as far as 20 miles seaward of the outermost islets. Consequently, when vessels are in the vicinity of these dangers, the coast will be visible only in very clear weather. The depths are irregular. In a few places soundings give good warning of approach to dangers. However, for the most part, the shoals are steep-to.

In thick weather, the greatest care should be taken when approaching the land. Off this coast, the water is very muddy, especially during and just after freshets in the rivers, making it impossible to detect dangers by discoloration.

Ice.—See General Remarks in paragraph 5.1.

Pilotage.—See paragraph 1.1, paragraph 5.1, and Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for general information on pilotage.

The main pilot stations along this part of the coast are situated at Skelleftehamn and Lulea. All requests for pilotage must be made through the VTS station at Lulea.

The pilotage area for Skelleftehamn lies between a line bearing 152° from position 65°24'N, 21°49'E and latitude 64°03'N. The pilotage area for Lulea lies between a line extending 152° from position 65°24'N, 21°49'E and the Finnish border. For further information, see paragraph 9.10 and paragraph 9.19.

It should be noted that ordering of pilots in the Swedish waters described within this sector is presently carried out through the main VTS systems. However, it is reported (2007) that procedures for the initial ordering of pilots via the internet will be introduced in the near future. For additional information concerning these procedures, see the following website:

Swedish Maritime Administration Home Page

<http://www.sjofartsverket.se>

Regulations.—See paragraph 1.1 and Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for regulations pertaining to vessels in Swedish waters, including restricted areas and semi-restricted areas.

Caution.—Parts of the coast and some areas off the coast are

incompletely surveyed.

Special marks and buoys are occasionally placed temporarily on and off the coast, during the summer season, for the purpose of making surveys. Vessels are warned not to mistake these special marks for the navigational aids.

During the winter, many buoys in these waters are removed, while others may be damaged or break adrift.

In the coastal waters within this sector, numerous logs may be found adrift at all times of the year.

Areas dangerous due to mines laid during World War II exist within these waters described in this sector. There is still a risk of danger in these areas when anchoring or carrying out any seabed activities.

Due to various circumstances, including the discovery of obstructions, depths within the channels leading through the off-shore dangers along this stretch of coast may change frequently. Therefore, vessels are advised to contact the local authorities in order to ascertain the latest information, including the maximum authorized drafts.

Ratan to Skelleftehamn

9.2 Rata Storgrund (63°59'N., 21°07'E.), with a least depth of 2.7m, lies about 6 miles E of the mainland coast. This shoal area consists of rock and shingle, and is marked on its W side by a buoy. A light is shown from a prominent tower, 17m high, standing on the S and shallowest part of the shoal.

Rickleagrunden, a group of shoals, lies centered about 5.5 miles N of Rata Storgrund Light. The group has a least depth of 2.9m and is marked by a buoy moored on its W side.

Rataskar Light (64°00'N., 20°54'E.) is shown from a tower on a building, 8m high, standing on the W side of a wooded island of the same name lying close off the coast, 5.5 miles W of Rata Storgrund Light.



Rataskar Light

Ratan Sodra Light is shown from a tower standing on the mainland 0.2 mile W of the S extremity of Rataskar.

Ratan (64°24'N., 20°54'E.) is a small natural harbor situated

on the mainland. It lies abreast the middle of the sound between the coast and the island of Rataskar, close E.

The harbor can be approached from the SSE or the NE via channels, which are available to vessels with drafts up to 2m. The main quay is 95m long and has a depth of 4.5m alongside.

It is reported that the harbor is no longer open to commercial shipping and is used only by recreational craft.

Rataskar Beacon, octagonal shaped with a high pointed roof, is conspicuous. The prominent yellow lookout tower of the former pilot station is situated close S of this beacon. A number of knobby mountain tops are visible in clear weather behind the beacon; however, at close range, these mountain tops are obscured by the coastal land.

A large white spot on Norrklubb, the N part of Rataskar, is conspicuous. It is painted on a cliff and partially obscured by bushes. Norrklubb Beacon, a round-topped cairn, 4m high, stands on the N extremity of Rataskar and is prominent.

Dodmanskar, an islet overgrown with brush, lies about 1 mile NNE of Norrklubb. A conspicuous large and dark rock, with a flat top, is located at the E side of this islet.

Soderklubb Beacon, a round-topped cairn, 4m high, stands on an islet lying close S of Rataskar.

Vessels with local knowledge can anchor in the N roadstead between the mainland and Norrklubb, the N part of Rataskar. This anchorage has depths of 10 to 13m, clay, but is exposed to N winds.

Anchorage may also be obtained in the harbor, between Rataskar and the mainland, in a depth of 4m, clay.

9.3 Rataskar Anchorage (64°02'N., 20°55'E.) lies about 2 miles NNE of Rataskar. It is the loading place for Dalkarlska, which stands 3 miles NW. The roadstead has a depth of 7m, sand, and is suitable for vessels with drafts up to 5m. It is exposed to SE and E winds. The anchorage can be approached from the SE, but local knowledge is required.

Sikea (64°09'N., 20°59'E.), a very small natural harbor, is situated near the head of Sikeafjarden, about 10 miles N of Ratan. The fairway leading to the harbor passes N of Rickleagrunden and is authorized for vessels with drafts up to 4.6m. There is a pier, 93m long, with a depth of 3m alongside. The harbor is no longer open to commercial shipping and is only used by recreational craft.

Vanskaren Light (64°10'N., 21°08'E.) is shown from a tower, 11m high, standing on the outermost of a group of treeless islets situated about 4 miles E of Sikea.

9.4 Gumboda (64°14'N., 21°06'E.) is a small natural harbor situated within Gumbodafjarden, 3.5 miles NNW of Vanskaren Light. Approach channels lead from the S, passing W of Vanskaren Light, and from the E, passing N of the light. The S fairway is available to vessels with drafts up to 6.5m. The E fairway is available to vessels with drafts up to 4.9m. Local knowledge is required.

The harbor is closed to commercial shipping and used only by recreational craft. It is reported that tugs towing timber occasionally find refuge here.

Gumbodahamn affords anchorage to vessels with local knowledge inside Sparren, in depths of 6 to 10m, sand and clay. Vessels can also anchor, in depths of 16 to 24m, clay, about 0.2 mile W of Lilla Vanskar, which lies 0.6 mile WNW

of Vanskaren Light.

Bodbergen, 58m high, stands 1 mile NNE of the head of Gumbodafjarden. This hill has two rocky summits, the westermmost of which is the higher and conspicuous from seaward.

Vardstuteberg and Markberget, 95m and 104m high, stand about 3 and 4 miles NE, respectively, of the head of Gumbodafjarden. Both of these rocky crests are conspicuous from seaward.

9.5 Lovsele (64°18'N., 21°15'E.) is a loading place within Lovselefjarden, which is entered about 8 miles NNE of Vanskaren Light.

Knavringen, with a least depth of 7.9m, lies about 2 miles S of Blekeudden, the E entrance point of the fjord. Kallan, a rock awash, lies close N of Knavringen. A main channel leads from S and passes W of Kallan. Local knowledge is required. The fairway is available to vessels with drafts up to 4.9m. There is a quay, 150m long, with a depth of 4.8m alongside, but only 50m of berthage along the central part is available.

The harbor is closed to commercial shipping and used only by recreational craft.

Anchorage can be obtained by vessels with local knowledge within the fjord, in depths of 5 to 8m, mud, but the roadstead is exposed from S.

Varberget is a bare, conspicuous summit, 46m high, rising close to the shore, 2.7 miles NE of the W entrance point. Storklubben, an islet, lies about 0.2 mile SSE of the W entrance point and can be easily recognized.

9.6 Sorkallen (64°14'N., 21°28'E.), with a least depth of 6.2m, lies about 5 miles offshore, 10 miles NE of Vanskaren Light.

Trindkallen (64°16'N., 21°31'E.), with a least depth of 4.3m, lies about 2.5 miles NNE of Sorkallen. These shoals form the outermost dangers in this vicinity.

Kallviken (64°20'N., 21°22'E.) a loading place, is entered 3.5 miles NE of Lovsele. The main approach route to the roadstead leads from S. Vessels can use the fairways passing either E of Kallviksklubben (64°18'N., 21°23'E.) or W of Laskar (64°18.2'N., 21°21.4'E.). The least depth in these entrance channels is 3.9m.

The roadstead has depths of 3 to 4.5m, clay and sand. It is very confined and can only accommodate a few small vessels. Vessels can also anchor, in a depth of 9m, near the mouth of the fjord.

Viksberget (64°21'N., 21°22'E.), a narrow rocky ridge with two prominent summits, is 60m high.

Bredberget, 71m high, rises about 1 mile NNE of Viksberget. This prominent hill is steep on its N side but slopes to the S.

Oxberget, 33m high, is steep on its SW side and surmounted by a white cairn beacon. This hill stands on the E side of the entrance to Kallviken. Kallviksskar, an islet, lies close inshore on the W side of the entrance. It is also marked by a white cairn beacon.

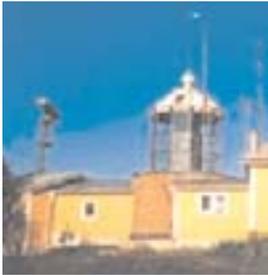
9.7 The coast between Kallviken and Bjuroklubb, 11 miles NNE, is wooded and fronted by numerous shoals, which extend up to 3 miles offshore in places.

Blackkallen Light (64°20'N., 21°31'E.) is shown from a prominent tower, 13m high, standing on a rock fronted by

shoals about 1.5 miles offshore, 3.5 miles ENE of Kallviken.

Grundskaten (64°26'N., 21°37'E.), the SE extremity of Bjuron, a wooded peninsula, is located 6.5 miles NNE of Blackkallen Light. This point is fronted by a reef, which extends 0.5 mile seaward and is marked by a buoy. Shoals with depths of less than 10m front the coast between the light and Grundskaten and extend up to about 3 miles offshore in places.

Bjuroklubb (64°29'N., 21°35'E.) is a steep point, 43m high, which forms the end of a narrow promontory extending 1.5 miles NNW from the N side of Bjuron. A light is shown from a prominent stone tower, 8m high, standing on the point, with a yellow house situated very near it. A light is also shown from a structure situated on the NE extremity of the point.



Bjuroklubb Light

An area of shoals lies centered about 1.5 miles E of Bjuroklubb Light and is marked on its W side by a buoy.

Hokmarksberget, located 8 miles WSW of Bjuroklubb Light, consists of two hills, which lie in a N and S direction. The W side is steep and shows up well from seaward, especially when N of Bjuroklubb.

Kulberget, standing about 4 miles SW of the N extremity of Bjuroklubb, has several summits. The southwesternmost summit, 65m high, is the tallest and a prominent radio mast is situated 1 mile E of it.

9.8 Gardfjarden (64°28'N., 21°43'E.), an inlet, lies on the N side of Bjuron, about 0.7 mile SSW of Bjuroklubb Light. Vessels can anchor, in depths of 9 to 14m, clay and sand, within this inlet, but winds between N and NNE raise some sea.

The roadstead within the inlet can be approached through two channels. Local knowledge is required. An inshore fairway leading from SE passes between the E side of Bjuron and the off-lying shoals. Another fairway leads from NE. Vessels with drafts up to 6.8m can reach the anchorage.

Bjuroklubb Harbor, a small oil depot, is situated at the SE end of Gardfjarden. There is a quay, 70m long, with depths of 5 to 6.2m alongside. The channel leading to the quay is available to vessels with drafts up to 4.8m.

Ice is an obstruction to navigation in this area from the end of November to the beginning of May.

Anchorage may also be obtained by vessels with local knowledge, in depths of 7 to 12m, clay and sand, within Bratstafjarden, an inlet lying close W of Gardfjarden. The fairway leading to this anchorage is available to vessels with drafts up to 6.1m.

Caution.—A magnetic anomaly is reported to exist off Bjuroklubb.

9.9 Vanoren (64°32'N., 21°33'E.), the E extremity of a low wooded peninsula, lies on the N side of Gardfjarden, 2.5 miles NNW of Bjuroklubb Light. It is fronted on the NE side by shoals, which extend about 1 mile seaward and are marked by a buoy.

Skotgronnan (64°36'N., 21°30'E.), fronted by shoals, is a low, sandy island with a knoll on its SW end lying about 7.5 miles NNW of Bjuroklubb Light and 1.3 miles off the coast. A beacon, fitted with a radar reflector, stands near its N end.

Skelleftebukten (64°41'N., 21°15'E.), a bay 5 miles long, lies at the mouth of the Skelleftealv, the principal river along this part of the coast. It is encumbered by numerous islets, rocks, and shoals, which may best be seen on the chart.

The bay is entered between Korsoren, a small peninsula lying 3 miles W of Skotgronnan, and Skelleftenaset, a large peninsula located about 5 miles NNW.

Burea (64°37'N., 21°14'E.), a former small port, is situated in the SW part of Skelleftebukten. A conspicuous church, with a red roof and black spire, stands in the town. The harbor is now only used by recreational craft.

Skelleftehamn (64°41'N., 21°14'E.)

World Port Index No. 27080

9.10 Skelleftehamn (Skelleftea), a large industrial harbor, is situated on the N side of Skelleftebukten. This harbor is the port for Skelleftea, a town standing on the N bank of the river, 8 miles NW.

Ice.—The port is usually closed by ice from the beginning of December to the middle of May.

Tides—Currents.—Ordinary HW and LW are about 0.5m above and below mean water level, respectively. The water level usually rises in the autumn with SE and SW winds, and falls with prolonged N and NE winds. Lower water levels usually occur in the spring and early summer. The average annual maximum and minimum water levels deviate 0.6m from the mean level.

With the breaking up of ice in the spring, the outgoing river current runs strongly for about 4 to 6 weeks and may attain a velocity of 1.5 to 2 knots.

Depths—Limitations.—Most of the port facilities are situated on the shores of Kallholmsfjarden. This inlet lies between Nasdden, on the NE side, and a narrow peninsula formed by a line of connected former islands on the S side. The narrow peninsula projects 1.5 miles SE from the head of the bay and ends at Ronnskar.

The port may be approached from either E or SE through routes, which are shown on the chart. The approach from E, which is suitable for vessels with drafts up to 11m, is recommended, especially in poor visibility. The approach from SE can be used by vessels with drafts up to 7m.

The channel leading from E passes at least 1 mile clear of the fronting dangers. The channel leading from SE passes between Skotgronnan and the mainland.

The principal facilities at Skelleftehamn, on the N and W sides of Kallholmsfjarden, are described below:

1. The oil quay is 70m long and has a depth of 10.2m alongside. It can handle tankers up to 200m in length and 9.3m draft.

2. Siporexkajen, a cement berth, is 47m long and has a depth of 5.8m alongside. The channel leading to this berth is available to vessels with drafts up to 5.5m.

3. The general cargo quay is 375m long and has depths of 6.4 to 9m alongside. There are also two ro-ro berths with depths up to 9.3m alongside. Vessels up to 25,000 dwt, 160m in length, and 8.5m draft have been handled at this quay.

The principal facilities at Ronnskar, at the S end of Kallholmsfjarden, are described below:

1. North Quay is 580m long and provides five berths with depths of 5.7 to 13.4m alongside. Vessels up to 40,000 dwt, 200m in length, and 11m draft have been accommodated at this quay.

2. South Quay, a T-shaped pier with dolphins, provides a berth, 120m long, with a depth of 9m alongside.

The pier at Orviken has a berth, 75m long, with depths of 3.4 to 4.6m alongside. It is in poor condition and no longer used by commercial vessels.

Aspect.—Gasoren Light (64°40'N., 21°19'E.) is shown from a prominent tower, 13m high, standing about 0.8 mile E of Ronnskar. A prominent dwelling, with a red roof, is located near the light.



Gasoren Light

Sor-Olsgrundet Light, equipped with a racon, is shown from a structure, 12m high, standing about 1 mile S of Ronnskar.

Bureberget, a dark wooded hill, stands on the SW side of the bay, 4.5 miles SSW of Gasoren Light. It is 99m high and prominent from seaward. This hill slopes gradually on the S side and a radio mast, 32m high, is situated close SE of the summit.

Noppelberget rises 1.2 miles NNE of Skelleftea. This hill is bare, light gray, and rocky. It is 140m high and easily identified from the SE.

A conspicuous chimney, 145m high, and a prominent warehouse, 300m long, are situated on Ronnskar and may be seen from a considerable distance to seaward.

A conspicuous radio mast, 60m high, stands near Orviken about 3 miles W of Gasoren Light.

A church, a water tower, and a radio mast, which are all prominent, are situated at Skelleftehamn.

Pilotage.—A main pilot station is situated at Skelleftehamn. Pilots can be contacted on VHF channel 13 and board about 2.5 miles E of Gasoren Light. Requests for pilotage must be made through the VTS station at Lulea.

The pilotage area lies between a line bearing 152° from position 65°24'N, 21°49'E and latitude 64°03'N. Pilotage is compulsory within this area for the following:

1. All Category 1 vessels.
2. Category 2 vessels of 80m in length, 15m beam, and 5m draft and over.
3. Category 3 vessels of 90m in length, 16m beam, and 5.5m draft and over.

In certain channels between Nygran and Pitea, pilotage is compulsory for the following:

1. All Category 1 vessels.
2. Category 2 and 3 vessels of 70m in length, 14m beam, and 4.5m draft and over.

Pilots for Pitea are also provided by this station and board about 5 miles E of Gasoren Light.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Lulea (paragraph 9.19).

Anchorage.—The outer anchorage lies in position 64°40'N, 21°19'E and has depths of 11 to 26m.

Skelleftehamn to Pitea

9.11 The coast between the entrance to Skelleftehamn and Nygran (65°01'N., 21°42'E.), about 22 miles NNE, is well-wooded and fronted by numerous small islands, islets, rocks, and shoals.

Kagnashallan Light (64°45'N., 21°18'E.) is shown from a structure standing on the E extremity of Kagnaset. Kagnaset is an area that appears from E as a chain of sloping hills, high to the S, but steeper at the N end.

Finnhallan (64°47'N., 21°15'E.), standing on the N side of Kagnaset, rises above the cliffs and is wooded. Two above-water rocks lie at the foot of this prominent hill.

Armbagen (64°41'N., 21°26'E.), with a least depth of 8.5m, lies about 3 miles ENE of Gasoren Light and is marked by a buoy on the SE side. Villan, with a depth of 9.7m, lies about 1.7 miles N of Armbagen. Fordarvet, with a depth of 6m, lies about 4.5 miles N of Armbagen. It lies 3.2 miles offshore at the E end of the foul ground fronting Kagnashallan Light and is marked by a buoy. Utiken, with a depth of 10m, lies 3.5 miles NNE of Fordarvet and about 6 miles offshore.

The above four shoals form the outermost dangers along this part of the coast. Numerous shoal patches lie inside of these dangers and may best be seen on the chart.

Kagefjarden (64°49'N., 21°07'E.), an inlet situated SW of Ostnaset, is entered 5 miles NW of Kagnashallan Light.

Bergskaret (64°48'N., 21°07'E.), a partly-wooded islet, lies on the S side of the entrance to Kagefjarden, 6 miles NW of Kagnashallan Light. A sector light, which indicates the entrance route, is shown from a tower, 7m high, standing on this islet.

9.12 Kagehamn (Storkage) (64°50'N., 21°02'E.) (World Port Index No. 27090), a small port used for exporting timber, is situated on the S side of Kagefjarden.

Tides—Currents.—Strong S winds cause higher water levels and N winds cause lower water levels. The current in the entrance channel is not troublesome.

Ice.—The port is usually closed by ice from November to the middle of May.

Depths—Limitations.—Kagefjarden can be entered from the NE or ESE. A marina is situated at the former W quay at Kagehamn. The main E quay is 200m long and has a depth of 7.2m alongside. Two cross quays, 30m and 40m long, are situated at the ends of the main quay and have depths of 3.5 to 7.2m alongside. Vessels up to 8,000 dwt, 110m in length, and 6.7m draft can reach the harbor and berth alongside.

Pilotage.—Pilots are available from the station at Gasoren (Skelleftehamn) and must be ordered through VTS Lulea. Local knowledge is required.

Anchorage.—Vessels may anchor, in depths of 9 to 18m, clay, off the NW point of Bergskaret or, in depths of 16 to 24m, sand, close NE of the islet.

9.13 Romelson (64°53'N., 21°17'E.), lying 6.3 miles NE of Bergskaret Light, is a high wooded island of dark appearance. It is tallest in the center and drops off toward the N end. The land behind this island has several mountain hillocks.

Hamnskaret, a small islet, lies about 0.5 mile off the middle of the E side of Romelson. A few trees and a white hut with a black roof stand on this islet.

Utkiken, with a least depth of 10m, lies about 6 miles SE of Romelson and is the outermost shoal in this vicinity.

Furuogrund (64°55'N., 21°14'E.), a former timber-loading place, is situated 0.5 mile NW of Romelson. The small natural harbor is now only used by recreational craft. The channel leading to the harbor from SE is available to small craft with drafts up to 5.5m. Local knowledge is required.

Byske (64°57'N., 21°14'E.), a small craft harbor, is situated at the head of Byskefjarden, 2 miles N of Furuogrund. Vessels may obtain anchorage, in a depth of 7m, off the entrance to Byskefjardento. Local knowledge is required because of the shoals in the approaches.

A prominent church, with a white tower surmounted by a spire, stands in the town at Byske. A large warehouse and a conspicuous red sawmill, with a chimney, are situated at Ytterstfors, on the W side of Byskefjarden.

Norra Degerberget, standing 9.5 miles NW of Byske, is 217m high and has a bare rocky crest. This hill is steep on the S side and sloping on the N. It can be easily identified from SE and, because of the shape, it is often referred to as “Likkistan” or “The Coffin.”

Sidra Degerberget, rising about 2 miles SW of Norra Degerberget, is the tallest of the two hills. This hill is 229m high, but it is rounded, wooded, and not so easily distinguished from seaward.

9.14 Brannfors (65°01'N., 21°24'E.), a small craft harbor, is situated at the head of Abyfjarden, 6 miles NE of Byske. A channel, which is available to vessels with drafts up to 7.3m, leads through the numerous shoals lying in the approach. Local knowledge is required. There is a quay, 180m long, with depths of 2.7 to 4.6m alongside, but most of the wharves are derelict.

Selaxgrundet, with a depth of 8.8m, lies about 4.2 miles SE of the entrance to Abyfjarden and is the outermost shoal in this vicinity.

It is reported that a prominent radio mast, 60 high, stands about 3 miles NNE of Brannfors.

Ronnskar (65°02'N., 21°33'E.), an island lying 4 miles ENE of Brannfors, is wooded except at its SE end. A chapel, some buildings, and a beacon, 17m high, are situated on the SE part of this island.

Kinnbacksjarden (65°03'N., 21°28'E.) is a good harbor of refuge lying close WNW of Ronnskar. Local knowledge is essential. A channel, available to vessels with draft up to 3.5m, leads from seaward to an anchorage, with depths of 5 to 12m, mud and sand.

9.15 The approaches to the ports of Pitea and Lulea are encumbered by numerous islands, islets, rocks, and shoals, which may best be seen on the chart. Only the outermost dangers are described below.

Nygran Light (65°01'N., 21°42'E.), equipped with a racon, is shown from a prominent tower, 21m high, standing on a shoal about 7.5 miles E of Brannfors. The light tower has a helicopter landing platform and is floodlit.

Norstromsgrund Light (65°07'N., 22°19'E.), equipped with a racon, is shown from a prominent tower, 29m high with a helicopter platform, standing about 16.8 miles ENE of Nygran Light.



Norstromsgrund Light

Norstromsgrund (65°10'N., 22°25'E.), an extensive shoal with a least known depth of 1.5m, lies with its shallowest part located about 4 miles NE of Norstromsgrund Light. Grytet, a detached shoal patch with a least depth of 6.4m, lies 2.3 miles NE of Norstromsgrund Light.

Rodkallen (65°19'N., 22°22'E.), one of the outermost islets in the approaches, lies 12.5 miles NNE of Norstromsgrund Light. It is mostly barren and fronted by foul ground.

Rodkallen Sodra Light (65°19'N., 22°22'E.) is shown from a yellow and red building, 18m high, standing on the S part of the islet. The metal framework tower of a former light is situated 0.4 mile NW of Rodkallen Sodra Light. It is 21m high and prominent. A number of huts and a chapel stand between the two structures.

Borussiagrund Light (65°21'N., 22°16'E.), equipped with a racon, is shown from a prominent floodlit tower, 17m high, standing 3.5 miles NW of Rodkallen Light.

Simprund (64°58'N., 22°04'E.), an isolated shoal patch, lies about 10 miles ESE of Nygran Light. It has a least depth of 7m and is marked by buoys.

9.16 Falkensgrund (65°01'N., 22°41'E.), a detached shoal patch, lies about 11 miles SE of Norstromsgrund Light. It has a least depth of 9.4m and is marked by a buoy.

Svalansgrund (65°05'N., 22°38'E.), a detached shoal patch,



Rodballen Sodra Light



Rodballen Disused Light Tower

lies about 5 miles NNW of Falkensgrund. It has a least depth of 7.9m and is marked by a buoy.

Edvardsklack (65°15'N., 22°34'E.), a shoal with a least depth of 4.6m, lies about 6.5 miles SE of Rodkallen Light.

Edwardsgrundet, a shoal with a least depth of 2.4m, and Marakallen, a shoal with rocks awash, lie about 2.5 miles NW and NE, respectively, of Edvardsklack.

Farstugrundet Light (Farstugrunden) (65°20'N., 22°45'E.), equipped with a racon, is shown from a tower, 25m high, standing 9.5 miles E of Rodkallen Light.

Grillklippan (65°23'N., 22°31'E.), a small islet, lies about 6.5 miles WNW of Farstugrundet Light. A racon is situated on this islet.

Larsgrundet Light (65°28'N., 22°28'E.) is shown from a prominent tower, 18m high, standing on a small islet, 11 miles NW of Farstugrundet Light.

Kadetten (65°23'N., 22°41'E.), an isolated shoal with a least depth of 7.8m, lies about 4 miles NNW of Farstugrundet Light and is marked by a buoy.

Smaskaren (65°29'N., 22°44'E.), a small island, lies 9 miles N of Farstugrundet Light; a chapel stands on its SE end.

Kallen (65°28'N., 22°43'E.) is a moderately-high barren rock lying close S of Smaskaren. It can be easily identified up to a distance of 4 miles by vessels approaching from E.

Manshallorna and Bjasshallen are two small above-water rocks lying, respectively, 0.6 mile E and 1.3 miles NE of Kallen.

Jacksgrundet, with a depth of 6.8m, and Vasterbotten, with a depth of 9.8m, are two isolated shoal patches lying, respectively, about 0.9 mile SE and 1.7 miles ESE of Kallen.

Uddskaret lies about 5 miles NNE of Kallen. A prominent chapel stands near the S end of this island.

Hollorsgrundet, an extensive shoal, lies 3.5 miles E of Uddskaret and has a least depth of 6.4m.

Caution.—Several areas, within which surveys are not complete and uncharted shoals may exist, lie in the inner approaches to Pitea and Lulea, and may be seen on the chart.

Restricted areas, which may best be seen on the chart, lie within the inner approaches to Pitea and Lulea. See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for information and regulations pertaining to restricted areas and semi-restricted areas in Swedish waters.

Pitea (65°19'N., 21°29'E.)

World Port Index No. 27190

9.17 Pitea is situated about 18 miles NNW of Nygran Light and on the NE side of Inrefjarden. The port consists of Pitea Sodra Hamn, the inner harbor; Skuthamn, a harbor situated on the NE side of Yttrefjarden; and Haraholmen, a deep-water harbor, lying 6 miles SE of Pitea at the NW end of Bondon, a low wooded peninsula.

Ice.—The harbors and loading places in the approach to Pitea are normally blocked by ice from the middle of December to early May; however, Haraholmen is kept free of ice.

Tides—Currents.—The water level may vary from 0.9m below mean level to 0.9m above. Winds from the N cause lower water levels and winds from the S cause higher water levels. The variations in level are greatest in the spring and fall. Deviations up to 1.2m have been observed.

The current from the Pitealv River sets through the inner fjords, attaining at times, in the spring and fall, a velocity of 2 to 3 knots.

Depths—Limitations.—Pitea Sodra Hamn, the inner harbor, has depths of 5.2 to 5.8m, but is closed to commercial shipping. A channel, which is authorized for vessels with drafts up to 4.8m, leads through Munksundet to this harbor.

Skuthamn provides 435m of total berthage, with depths of 4 to 6.3m alongside, but the quays are in poor condition. This harbor is only used as a reserve waiting area for small vessels. A channel, which is authorized for vessels with drafts up to 5.3m during daylight, leads through Pitsundet to this harbor.

Four approach channels lead from seaward to Bondofjarden on the NE side of which lies Haraholmen (65°14'N., 21°38'E.).

The main channel leading from seaward to Haraholmen passes about 1 mile E of Nygran Light (65°01'N., 21°42'E.). It continues NNW for about 11.5 miles and then leads NE for about 2.5 miles across the fjord. This route is available to vessels with drafts up to 11.5m.

A secondary channel passes about 5 miles E of Nygran Light. It continues N for 6 miles and then NW for about 7 miles along the NE part of the fjord before joining the main channel. This route is available to vessels with drafts up to 10m.

Two side channels, available to vessels with drafts up to 6m, lead W of Nygran Light and join the main channel at Leskar Light (65°08'N., 21°38'E.).

Haraholmen Oil Quay is 60m long and has a depth of 12.5m alongside. It can accommodate tankers up to 75,000 dwt, 240m in length, and 11.5m draft.

Haraholmsajen, the main quay, is 580m long and has a depth of 12.4m alongside. A ro-ro ramp projects from the center of

this quay and propellers, installed below it, are used to keep the berths free of ice.

Aspect.—Kalen, a wooded hill with gradual slopes, is one of the most conspicuous features along this part of the coast. It is 130m high and rises about 9.5 miles NW of Nygran Light.

Hogberget, standing 2 miles NE of Kalen, is 85m high. This hill is considerably smaller and more thinly wooded than Kalen. It appears from some directions to have several summits.

Degerberget, standing about 10 miles NNE of Hogberget, rises on the E part of Pitholm. It is 80m high with two summits. This hill slopes toward the S and is steeper toward the N. From the S, to the W of Nygran Light, a notch is visible on the E side of the southernmost summit.

Leskar Light is shown from a prominent tower, 9m high, standing on the easternmost of two wooded islets lying close together, 7.5 miles NNW of Nygran Light. The westernmost islet is considerably the larger and more densely wooded.

RenoragrunDET Light, equipped with a radar reflector, is shown from a tower standing 3.8 miles NNW of Leskar Light.

The approach routes and entrance fairways are indicated by lighted ranges and marked by buoys and beacons.

Pilotage.—Pilots for Pitea are provided by the main pilot station at Skelleftehamn. Pilots can be contacted on VHF channel 13 and board about 2.5 miles E of Gasoren Light. Requests for pilotage must be made through the VTS station at Lulea. Vessels must forward a request for pilotage at least 5 hours prior to arrival. See paragraph 9.19 for more information.

Regulations.—A mandatory Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Gavle and Lulea. For further information, see Lulea (paragraph 9.19).

Anchorage.—Javrefjarden affords anchorage, in depths of 14 to 19m, mud, about 2 miles WSW of Leskar Light, but it is exposed to E and S winds.

Anchorage may also be obtained, in depths of 9 to 11m, mud, W of Huvan (65°13.8'N., 21°34.5'E.), an island lying at the N end of Bondofjaren, but S winds raise some sea.

Vessels can anchor off Skuthamn, on the E side of Yttrefjarden, in depths of 7 to 9m, mud.

Caution.—A submarine cable, which may best be seen on the chart, lies in the outer approaches and extends between Ronnskar and Nygran Light.

Pitea to Lulea

9.18 An inshore channel, suitable for vessels with drafts up to 3.3m, leads between Pitea and Lulea. Local knowledge and large scale Swedish charts are required for this route. The fairway leads for about 26 miles in a NE direction from Bondofjarden through the numerous islands and shoals fronting the mainland. It approaches Lulea via Germandofjarden and the narrow passage of Tjuvholmsundet (65°32.5'N., 22°11.1'E.). It is reported (2001) that the latter narrow passage has a depth of only 3m.

Caution.—Vessels over 15m in length or 4m beam must report on VHF channel 14 to the Vessel Traffic Service (VTS) system Traffic Information Center at Lulea (see paragraph 9.19) before attempting to transit the narrow passage of Tjuvholmsundet.

In Tjuvholmsundet, the current may at times be extremely swift and unpredictable, attaining a velocity of 3 knots during spring freshets.

It is reported (2002) that less depths than charted exist within the entrance channels leading to Pitea and the local authorities should be contacted for the latest information concerning maximum authorized drafts.

Lulea (65°35'N., 22°10'E.)

World Port Index No. 27220

9.19 Lulea, the northernmost port in Sweden, stands on a peninsula at the SE end of Lulefjarden. It is one of the principal ports in the country. The harbor serves as the S outlet for one of the largest iron ore mines in the world situated at Kiruna 146 miles NNW. The N outlet is at Narvik in Norway.

Ice

The approaches to the port are usually closed to navigation by ice from the beginning of January to the end of April. In unusually warm winters, the harbor can be kept open during the entire winter. An icebreaker is available.

Tides—Currents

Water level normally varies between 0.8m below mean level with N winds and 0.9m above mean level with S winds, but in strong wind conditions the level can vary by up to 1.4m above or below mean level.

Within Sandoleden the current is unpredictable but may attain a velocity of 3 knots during the flood tide at springs.

Depths—Limitations

The Southeast Approach Channel, which forms the main deep-water entrance route, is known locally as Sandoleden. However, strictly speaking, the name applies only to that part of the route located NW of Vitfagelrannan Light.

From seaward, this channel leads in a NW direction for 20 miles to the port. The fairway passes about 1 mile NE of FarstugrunDET Light (65°20'N., 22°45'E.), close NE of LarsgrunDET Light (65°28'N., 22°28'E.), and close NE of Vitfagelrannan Light (65°29.2'N., 22°25.5'E.). It then continues via a channel, which is dredged to a depth of 12.2m, through the narrow cut at KlubbnaSet (65°30'N., 22°22'E.) and across Sandofjarden to the port.

This route is authorized for vessels with drafts up to 11.1m. Vessels larger than 45,000 dwt and all tankers are limited to a maximum draft of 11.1m.

The South Approach Channel, the secondary entrance route, is known locally as Sandgronmleden. From seaward the fairway passes about 1.5 miles W of Norstromsgrund Light (65°10'N., 22°25'E.) and leads NNE for 7.5 miles. It then leads N for about 5 miles and passes 1.5 miles W of Rodkallen Sodra Light (65°19'N., 22°22'E.). The fairway continues NNE for about 5 miles passing, 1.5 miles E of Borussiagrund Light (65°21'N., 22°16'E.) and through a narrow cut, dredged to a depth of 10m, lying between the shoals fronting the SE end of GrasjalgrunDET

(65°24'N., 22°17'E.) and the NW end of Sandgronnorna (65°23'N., 22°23'E.). It then leads NE for 3 miles and N for 2.5 miles, passing SE and E of Junkon, to join the main deep-water route (Southeast Approach Channel) close SE of Vitfagelrannan Light (65°29.2'N., 22°25.5'E.). This route is authorized for vessels with drafts up to 8.7m.

The principal facilities of the port are situated along the NE and E sides of Grasjalfjarden, to the S of the town, and along the NW side of Sandofjarden, to the SE of the town.

Lulefjarden, with depths of 7 to 9m, lies N of Grasjalfjarden. The passage connecting these two parts of the harbor is spanned by a bascule bridge. The bridge opening has a navigable width of 30m. The vertical clearance, when the bridge is closed, is 7.3m. It is reported that Lulefjarden is now only used by recreational craft.

The main facilities in Sandofjarden are, as follows:

1. Victoriahamnen is situated at the easternmost end of the peninsula of Svarton. The outer quay is 770m long and has depths of 9 to 12.3m alongside. The inner basin quay is 150m long and has a depth of 7.8m alongside.

2. Malmhamn (Sandskar), an ore quay, is situated 0.7 mile E of Victoriahamnen. It is 250m long and has a depth of 12.1m alongside.

3. Stromoren lies between Victoriahamnen and Uddebo Hamn. It contains a pier and a small craft harbor. The quay at the S side of the pier, which is equipped with a ro-ro ramp, is 120m long and has a depth of 9m alongside.

4. Uddebo Hamn is situated at the SE end of the peninsula of Svarton, 0.6 mile WNW of Victoriahamnen. The Old Oil Quay is 20m long and has a depth of 7.8m alongside. It can accommodate tankers up to 215m in length and 7.4m draft.

5. The New Oil Quay is 60m long and has a depth of 12.2m alongside. It can accommodate tankers up to 45,000 dwt, 299m in length, and 11.2m draft.

The main facilities in Grasjalfjarden are described below. There are six quays on the NE and E sides, as follows:

1. The Jarnverket Quays (SSAB Quay) is 498m long and has a depth of 8m alongside.

2. The Malmka Quayj (LKAB Quay) is 415m long and has a depth of 13m alongside.

3. The Cement Quay is 60m long and has a depth of 9m alongside.

4. The SJ-Kolkaj Quay is 190m long and has a depth of 6m alongside.

5. The Djupkajen Quay is 150m long and has a depth of 8m alongside.

6. The Hamnoiren Quay is 100m long and has a depth of 6m alongside.

There are facilities for tanker, ro-ro, bulk, general cargo, and timber vessels. Vessels up to 110,300 dwt, 265m in length, 38.5m beam, and 11.1m draft have been accommodated in the port.

Aspect

Mattsundberget (65°33'N., 21°56'E.) rises about 5.2 miles WSW of Lulea and is best seen from the ESE. This hill is 143m high, with a long slope on its S side. A prominent radio



Lulea—Malmhamn Ore Quay



Lulea—Victoriahamnen

mast stands 0.8 mile SW of the summit.

Hertsogerget (65°36'N., 22°12'E.), 77m high, rises about 1 mile NNE of Lulea. This hill slopes gradually S, but is steeper on the N side, and is best seen from SE.

Vitfagelrannan Light (65°29.2'N., 22°25.5'E.) is shown from a prominent tower, 15m high, standing 1.5 miles NW of Larsgrundet Light.

A conspicuous water tower, 61m high, is situated about 1 mile SW of Lulea, at Bergnaset. A radio mast, 41m high, stands close to the tower.

The main channels are indicated by lighted ranges, sector lights, and beacons, which may best be seen on the chart. The dredged fairway is marked by lighted buoys and cairns.

Pilotage

The station at Lulea provides pilotage for the area between a line extending 152° from position 65°24'N, 21°49'E and the Finnish border. All requests for pilotage for Lulea, Skelleftea, Umea, and Ornskoldsvik must be made through the Lulea VTS station.

The pilots can be contacted (call sign: Lulea Pilot) on VHF channel 11.

Pilotage is compulsory in the area for vessels, as follows:

1. All Category 1 vessels.
2. Category 2 vessels of 80m in length and over or 15m beam and over.

3. Category 3 vessels of 90m in length and over or 16m beam and over.

In certain channels between the Finnish border and a line extending 148° from position 65°45'N, 22°41'E, pilotage is compulsory for the following vessels:

1. All Category 1 vessels.
2. Category 2 and 3 vessels of 70m in length and over, 14m beam and over, and 4.5m draft and over.

Pilots can be contacted by VHF and board vessels about 2 miles SW of Rodkallen Sodra Light (65°19'N., 22°22'E.) or 1 mile E of Farstugrunden Light (65°20'N., 22°45'E.).

The station also provides deep-sea pilots for the Baltic Sea.

Regulations

Sandoledden is considered to be that part of the fairway leading from Vitfagelrannan Light through the dredged narrow cut at Klubbnasen and across Sandofjarden.

Vessels with drafts exceeding 3.5m are not permitted to pass each other within Sandofjarden.

In order to assist in steering through Sandoledden, vessels over 150m in length must show a blue light at night on the forestay in the vicinity of the jackstaff.

Large vessels must not attempt to transit Sandoledden during winds of Force 8 and above.

Vessel Traffic Service

Reporting and Information System—A Reporting and Information System has been established in the Gulf of Bothnia and is operated by Vessel Traffic Services (VTS) at Lulea and Gavle.

The system is mandatory for vessels over 300 grt; and vessels, including tows, of over 45m in length.

Vessels must report to VTS Lulea on the VHF channel 14 when passing the following Reporting Points (RP):

1. Farstugrunden (65°20.4'N., 22°46.6'E.)—Inbound only
2. Rodkallen Sodra (65°18.0'N., 22°18.4'E.)—Inbound only.
3. Larsgrundet (65°27.5'N., 22°30.0'E.)—Inbound only.
4. Klubbnasen (65°30.0'N., 22°22.9'E.)—Inbound and outbound.
5. Dynan (65°24.7'N., 22°21.8'E.)—Inbound and outbound.
6. Persgrundet (65°27.4'N., 22°26.3'E.)—Inbound and outbound.

Reports must include the vessel's name, call sign, position, and destination.

Vessels must report their name, position, and destination when arriving at or leaving a berth (including an anchorage), when changing route, when being involved in an accident (including groundings and collisions), and on the occurrence of any defect affecting the safety of navigation. The report should be sent 10 minutes prior to leaving a berth.

Participating vessels must maintain a continuous listening watch on the assigned VHF channel after the first report.

Smaller vessels than those described above, which are fitted with VHF, should maintain a continuous VHF watch on channel 14 and 16.

Lulea VTS may be contacted by e-mail, as follows

vtslulea@sjofartsverket.se

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

1. Kalkholmen (65°32.1'N., 22°25.5'E.).
2. Storbrandon SW (65°29.1'N., 22°30.2'E.).
3. Storbrandon S (65°28.8'N., 22°33.7'E.).
4. Kluntama W (65°27.6'N., 22°36.0'E.).
5. Kluntama SE (65°27.2'N., 22°37.8'E.).
6. 65°26.6'N, 22°45.0'E, (8 miles N of Farstugrunden Light.
7. The arc of a circle with a radius of 7 miles centered on Grillklippan Light (65°22.7'N., 22°31.0'E.) and joining position (6) and position (8).
8. Position 65°22.7'N, 22°14.2'E.
9. Liljeudden (65°25.1'N., 22°14.0'E.).
10. Germandon (65°28.8'N., 22°10.3'E.).
11. Lulnaset (65°30.5'N., 22°08.0'E.).

Local Vessel Traffic Service.—A local mandatory Vessel Traffic Service (VTS) system is operated from a Traffic Information Center at the combined harbor office and pilot station at Lulea. The area covered extends inward to Lulea from Rodkallen (65°19'N., 22°22'E.), in the S approach, and from Farstugrunden Light (65°20'N., 22°45'E.), in the SE approach. There is radar coverage of the area.

The system is mandatory for vessels over 300 grt and vessels, including tows, of over 45m in length.

Vessels are required to maintain a constant listening watch on VHF channel 14 while in the area and to report, as follows:

1. 30 minutes before arrival at the first Reporting Point (see list below). Vessels equipped with an Automated Identification System (AIS) are exempt from this report.
2. On entering or leaving the VTS area.
3. On passing certain Reporting Points (see list below).
4. On arrival at or departure from a berth or anchorage.
5. In the occurrence of any defect affecting the vessel's safe navigation or maneuverability.

The VTS Traffic Information Center will, on request, maintain a watch on VHF channel 16 for those vessels unable to operate watches on dual VHF channels.

Vessels over 15m in length or 4m beam must contact the VTS Traffic Information Center prior to attempting the passage through Tjuvholmsundet (see paragraph 9.18).

The VTS Traffic Information Center will provide, on request, information concerning ice conditions, traffic, and navigational aids.

The Reporting Points (RP) are, as follows:

1. Farstugrunden (65°20.0'N., 22°47.0'E.).
2. Larsgrundet (65°27.5'N., 22°30.0'E.).
3. Klubbnasen (65°30.5'N., 22°22.0'E.).
4. Rodkallen (65°18.1'N., 22°18.4'E.).
5. Dynan (65°24.7'N., 22°21.8'E.).
6. Persgrundet (65°27.4'N., 22°26.3'E.).

Anchorage

Vessels waiting to enter the port may anchor, in a depth of 24m, clay, about 2 miles N of Farstugrunden Light (65°20'N.,

22°45'E.).

Large vessels may anchor, in depths of 21 to 33m, about 1 mile SE of Larsgrundet Light (65°28'N., 22°28'E.), on the N side of the main channel.

Caution

Local magnetic anomalies exist in the vicinity of the South Approach Channel.

Lulea to the Finnish Border

9.20 The coast between Lulea and the Finnish border, about 50 miles ENE, is fronted by numerous islands, rocks, and shoals. These dangers, which may best be seen on the chart, extend up to 20 miles offshore. The islands are wooded and not easily distinguished from seaward. Only the outermost dangers are described below.

Maloren (65°32'N., 23°34'E.), located 23.5 miles ENE of Farstugrunden Light (65°20'N., 22°45'E.), is the southernmost of the islands lying off the coast between Lulea and the Finnish border. This island is composed of sand and fronted by foul ground. It lies near the W end of an extensive shoal area.

Maloren Light (65°32'N., 23°34'E.), equipped with a racon, is shown from a prominent tower, 17m high, standing on the NE side of the island.



Maloren Light

A light is also shown from a structure situated on the W side of the island. A conspicuous chapel, with a spire and a belfry, stands on the island, along with numerous houses and huts.

9.21 Lutsarsgrund Light (65°40'N., 23°20'E.) is shown from a prominent tower, 14m high, standing on a rock, 10 miles NNW of Maloren Light.

Storo Light (65°42'N., 23°06'E.) is shown from a prominent tower, 10m high, standing at the S extremity of a peninsula, 6 miles WNW of Lutsarsgrund Light.

Halsoklippor Light (65°43'N., 23°27'E.), equipped with a racon, is shown from a prominent tower, 6m high, standing on a rock, 4.5 miles NE of Lutsarsgrund Light.

Trutskarsbaden Light (65°44'N., 23°23'E.) is shown from a prominent tower, 7m high, standing on a rock, 4.5 miles NNE of Lutsarsgrund Light.

Vippgrund Light (65°45'N., 23°28'E.), equipped with a racon, is shown from a framework tower standing on a small is-

land, 1.6 miles N of Halsoklippor Light.

Anchorage.—Anchorage may be obtained, during good weather, in a depth of 20m, about 3.5 miles SW of Maloren.

Caution.—Vessels should not attempt to approach the coast from seaward between Farstugrundet Light (65°20'N., 22°45'E.) and Maloren, except by the authorized channels and routes. No authorized channels or routes exist between Maloren and Kemi 1 Light (65°23'N., 24°06'E.) (Finnish), 16 miles SSE.

9.22 Sandskar (65°35'N., 22°45'E.), lying 5 miles NE of Maloren, may be identified by its light-colored sand hills, 21m high. This island is partly wooded and a narrow tongue of land with a few trees extends 1.5 miles N from its main body. The isthmus by which this tongue is joined to the N side is bare and light-colored. The S extremity of the island is also mostly bare, with a chapel and some huts standing close to the edge of the woodland.

Sjoasen (65°32'N., 23°21'E.), with a least depth of 7.6m, is an isolated shoal lying about 5 miles W of Maloren Light.

Launaja, with a least depth of 4.2m, and Kanningen, with a least depth of 7.7m, lie, respectively, about 3 miles and 7 miles SE of Maloren Light.

Flatbotten, with a least depth of 7.7m, lies 3 miles NNW of Maloren Light. Torget, with a least depth of 7.4m, lies 1 mile NW of Flatbotten. Nordvastgrundet, with a least depth 4.4m, lies centered 1.5 miles W of Torget and is marked by a buoy at its SE end.

Utbredan, with a least depth of 6.7m, lies about 7.3 miles WNW of Maloren Light. Karten, with a least depth of 5.8m, lies 1.1 miles W of the N end of Utbredan.

Dynan, with a depth of 6.8m, lies 1.3 miles WNW of Karten. Another detached shoal patch, with a depth of 7.8m, lies 1 mile NW of Karten.

Stolpgrundet, with a least depth of 7.4m, lies about 5 miles W of Utbredan. A detached patch, with a depth of 7.8m, lies 1 mile NNE of this shoal.

The above shoal patches form the outermost dangers in this vicinity.

Caution.—Restricted areas, which may best be seen on the chart, lie within the inner approaches to Torehamn and Kalix. See Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas for information and regulations pertaining to restricted areas and semi-restricted areas in Swedish waters.

Magnetic anomalies exist in the vicinity of the islands fronting Torehamn and Kalix.

9.23 Torehamn (65°54'N., 22°39'E.) (World Port Index No. 27250) is a loading place at the head of Torefjarden, which is entered about 5 miles E of Ranefjarden. There is a small natural harbor which handles lumber, cement, fertilizer, flour, and general cargo.

Ice.—Ice usually obstructs navigation in Torefjarden from the beginning of November to the middle of May.

Tides—Currents.—Winds from N lower the water level by as much as 1.8m and S winds raise water levels as much as 1.7m.

Depths—Limitations.—The recommended track, which may best be seen on the chart, leads 34 miles in a NW direction

from a position 1.5 miles SW of Maloren Light. It passes between Torget and Nordvastgrundet Shoals, 1.5 miles SW of Lutsarsgrund Light, and close SW of Storo Light. The route leads through Gunnarsfjarden (65°37'N., 23°26'E.), Storofjarden (65°44'N., 23°00'E.), and Ranofjarden (65°45'N., 22°57'E.) before finally turning NNW along the E side of Torefjarden to the port.

The fairway channel is authorized for drafts up to 8m as far as the anchorage located in the bight NW of Skagsudden (65°42'N., 23°06'E.). From this anchorage to the port the fairway is authorized for drafts up to 6m.

The main quay is 186m long, with depths of 6.5 to 8m alongside. There is also a small craft harbor with a depth of 2m.

Aspect.—Palangeberget (65°48'N., 22°57'E.) is a prominent flat-topped hill, 106m high. Rormyrberget, 78m high, is the prominent summit of the island of Ranon (65°43'N., 22°55'E.).

The approach channel is indicated by lighted ranges and sector lights. The fairway is marked, in places, by buoys and beacons.

Pilotage.—Pilotage is compulsory. Pilots must be requested through the Lulea VTS station and will board vessels about 1 mile E of Farstugrunden Light (65°20'N., 22°45'E.) (see paragraph 9.19).

Anchorage.—Anchorage may be obtained by vessels with local knowledge in the bight NW of Skagsudden (65°42'N., 23°06'E.), where there is good shelter, in depths of 14 to 22m, mud.

Anchorage may be obtained by vessels with local knowledge, in a depth of 9m, mud, about 0.5 mile N of Stora Faron (65°42'N., 22°44'E.), an island lying in the S part of Torefjarden. The fairway leading to this anchorage has a least depth of 6.4m.

9.24 Karlsborg (65°48'N., 23°17'E.) (World Port Index No. 27280), an important timber-exporting center, is the port for Kalix, which stands on the E side of Kalix Alv, 5 miles NW.

Ice.—Ice usually obstructs navigation from the beginning of November to the end of May.

Tides—Currents.—The maximum observed range of water level is 1.5m above and below mean water level. The greatest variation occurs in September and October. A rise of the water level is caused by strong S and SW winds, and a fall is caused by strong N and NW winds.

During freshets and in mid-summer a strong current setting out of Kalix Alv may be experienced in the approach to the river entrance, but it is not sufficiently strong enough to hinder navigation.

Depths—Limitations.—The recommended track, which may best be seen on the chart, leads 7.5 miles NNW from a position 1 mile NNW of Maloren Light to a position NE of Vikstromsgrundet Shoal. It then leads N for about 2.5 miles to a position about 1 mile S of Halsoklippor Light (65°43'N., 23°27'E.). The route continues in a NW direction for 4.5 miles, passing close SW of Trutskarsbaden Light (65°44'N., 23°23'E.), into Repskarsfjarden. The facilities at Karlsborg, at the NW end of Repskarsfjarden, and Axelsvik, at the NE side, can then be easily entered.

The main approach channel leading from seaward (Maloren) to Gunnarsfjarden is authorized for drafts up to 8.8m. The channel from Gunnarsfjarden to Repskarsfjarden is authorized

for drafts up to 6.6m. The main fairway leading to Karlsborg from Repskarsfjarden is authorized for drafts up to 5.7m. A buoyed channel, which is authorized for drafts up to 1.5m, leads up the river to a small craft harbor at Kalix.

The main facilities at Karlsborg consist of Massakajen, a wood pulp quay fronting the sulphate factory, which is 140m long and has a depth of 6.9m alongside, and Trakajen, a stone and concrete quay, which is 270m long and has a depth of 6.2m alongside.

The main facilities at Axelsvik (65°46'N., 23°22'E.) consist of an oil quay, 60m long, with a depth of 10m alongside. Tankers up to 25,000 dwt and 6.6m draft can be handled, but the berth is very exposed.

Aspect.—Golihatten, a wooded hill, 69m high, stands 2 miles N of Axelsvik and is prominent.

Two chimneys stand in the SW part of Karlsborg and are prominent from seaward. The pulpmill chimney is red and 52m high and the sawmill chimney is yellow and 42m high.

The approach channel is indicated by lighted ranges and sector lights. The fairway is marked, in places, by buoys and beacons.

Pilotage.—Pilotage is compulsory. Pilots must be requested through the Lulea VTS station and will board vessels about 1 mile E of Farstugrunden Light (65°20'N., 22°45'E.) (see paragraph 9.19).

Anchorage.—Anchorage may be obtained, in depths of 13 to 14m, mud, in the S part of Repskarsfjarden, about 0.9 mile W of Trutskarsbaden Light (65°44'N., 23°23'E.).

Anchorage may be obtained by small vessels, in depths of 8 to 10m, mud, within Rossorsundet, about 1.8 miles SSW of Karlsborg.

9.25 Inshore route.—An inshore route, well marked by buoys, leads from Lulea to Harparanda (65°50'N., 24°08'E.), about 50 miles ENE. It is used by small vessels, with local knowledge, and is authorized for drafts up to 3.2m.

Several shallow entrance channels branch off from this inshore route and lead to numerous small craft harbors. Most of these small harbors were former timber-loading places that are now used only by local fishing vessels and recreational craft.

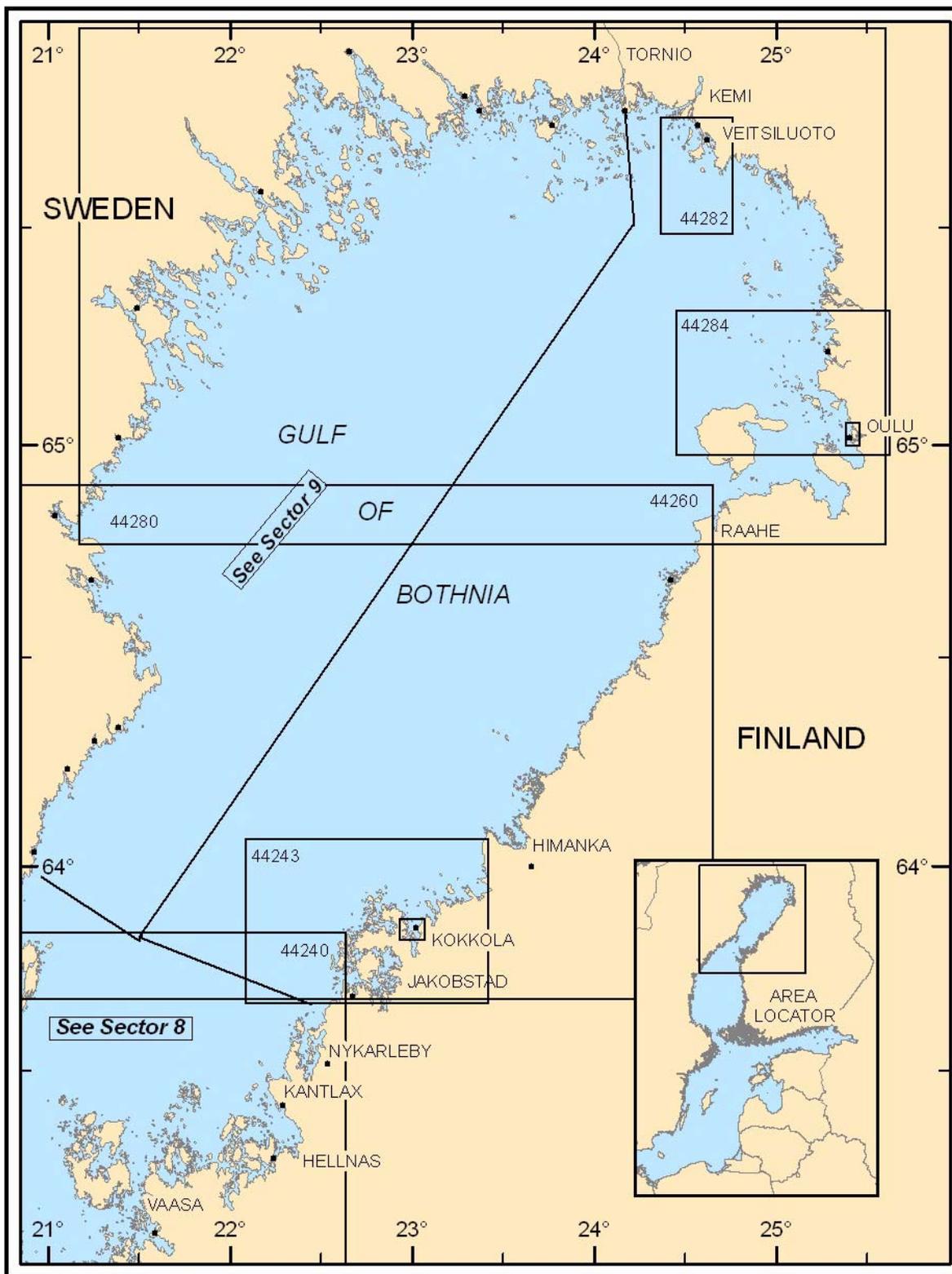
9.26 Sandvik (65°44'N., 23°46'E.) (World Port Index No. 27330), a small timber-loading place, is situated on the N side of the island of Seskarö, at the head of Sanviken. A concrete quay, 150m long, fronts a sawmill and has depths of 5.4 to 5.7m alongside. The entrance channel, which is authorized for drafts up to 3.2m, leads off the inshore route.

Anchorage can be taken, in depths of 8 to 11m, mud, on the SE side of Sandviken, close to the quay.

Granviken Anchorage, with depths of 6 to 9m, consists of an area lying N and on either side of Kojuluoto, an islet located 0.6 mile NNW of the quay at Sandvik.

Haparanda (65°50'N., 24°08'E.), a small Swedish frontier town, is situated on the W bank of the Torneälven River, 1.2 miles above the mouth. The depth in the river and the small harbor is only 1.5m. This town is connected by bridges to Tornio, a Finnish town standing on the E bank.

The border between Finnish and Swedish waters in this vicinity extends S, close to the meridian of 24°10'E.



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

SECTOR 10 — CHART INFORMATION

SECTOR 10

FINLAND—WEST COAST—HALLGRUND TO THE SWEDISH BORDER

Plan.—This sector describes the Finnish coast bordering on the Gulf of Bothnia between Norra Kvarken and the Swedish border, at the head of the gulf. The descriptive sequence is N from Hallgrund, an islet lying near the coast in the NE part of Norra Kvarken.

General Remarks

10.1 This section of the coast of Finland forms the E shore of Bottenviken, the N part of the Gulf of Bothnia. Like the coast to the S, it is low and has few natural landmarks. Vessels must rely almost exclusively on lighthouses, beacons, and other aids to navigation.

Ice.—See General Remarks in paragraph 1.1 and paragraph 4.1.

For information pertaining to winter navigation, ice, and Finnish icebreaking services, including internet web sites, see Pub. 140, *Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas*.

Pilotage.—The Baltic Pilotage Authorities Commission, a regional organization, recommends that vessels constrained by their draft, or vessels not registered in one of the Baltic States and infrequently sailing the area, take a deep-sea pilot.

See Pub. 140, *Sailing Directions (Planning Guide) North Atlantic Ocean and Adjacent Seas* for information on deep-sea pilotage.

Vessels desiring deep-sea pilotage to any coastal pilot station in Finland should send a request at least 24 hours in advance. Deep-sea pilots are normally available from the main pilot stations at Tankar and Vaasa.

Within the Gulf of Bothnia, pilots for Finnish ports are provided by these main pilot stations and board, as follows:

1. Kemi and Tornio:
 - a. Kemi N—position 65°33.1'N, 24°26.9'E.
 - b. Kemi S—position 65°30.0'N, 24°22.0'E.
2. Oulu:
 - a. Oulu N (for vessels with drafts between 8 and 10m)—position 65°11.5'N, 24°20.6'E.
 - b. Oulu S (for vessels with drafts of 8m or less—position 65°07.1'N, 24°16.6'E.
3. Raahe—position 64°38.8'N, 24°12.3'E.
4. Pietarsaari—position 63°44.5'N, 22°28.5'E.
5. Kokkola—position 63°00.5'N, 22°49.1'E.
6. Kalajoki—position 64°16.0'N, 23°30.0'E.
7. Kaskinen, Kristiinankaupunki, and Vaasa:
 - a. Vaasa N (for the NW approach)—position 63°15.8'N, 20°51.2'E..
 - b. Vaasa S (for Vaskiluoto)—position 63°12.1'N, 20°45.4'E.
 - c. Kaskinen—position 62°15.5'N, 21°05.1'E.
 - d. Kristiinankaupunki—position 62°11.5'N, 21°06.1'E.

All vessels must send a request for pilotage 24 hours prior to arrival at the appropriate boarding place. A confirmation must

be sent 6 hours in advance and any changes after this time must be forwarded not later than 3 hours before arrival. In the Gulf of Bothnia, the binding order for a pilot must be made by telephone to the appropriate pilot station 3 hours before arrival.

Regulations.—Bothnia Vessel Traffic Service (VTS) has been established off the NW coast of Finland. This system, which is mandatory, provides vessels with information to assist safe navigation. The VTS Area is divided into four sectors, as follows:

1. Sector A—Routes leading to Kasko (Kaskinen) and Kristinestad (Kristiinankaupunki).
2. Sector B—Routes leading to Vaasa and lying in the S part of Norra Kvarken.
3. Sector C—Routes leading to Kokkola and Pietarsaari.
4. Sector D—Routes leading to Kemi, Oulu, Raaha, and Tornio.

The above sectors extend seaward to the international boundary with Sweden.

All merchant (commercial) and state vessels shall report on VHF channel 67 in accordance with the rules below and keep a continuous listening watch. Pleasure craft, equipped with VHF, are also requested to keep a continuous listening watch on VHF channel 67.

Reports are acknowledged by the VTS Center, which provides information on other vessels, fairway channel and weather conditions, and additional factors affecting safe navigation. The languages used are Finnish, Swedish, and English.

Vessels shall report as follows:

1. While in Sector B, northbound vessels entering Norra Kvarken, with destinations of Tornio, Rahja, Raahe, Pietarsaari, Oulu, Kokkola, or Kemi, are requested to make an Advance Report when 20 miles S of Nordvalen Light (63°32'N., 20°47'E.). The VTS Center will forward the information in the Advance Report to the Pilotage Service and the Icebreaker Service. This Advance Report does not exempt vessels from making other mandatory reports.
2. All vessels calling at ports within the VTS Area shall report 1 hour prior to arrival at the pilot boarding position. Vessels exempted from pilotage assistance are also obliged to report.
3. All vessels shall report on approaching the port.
4. All vessels intending to anchor shall report on anchoring.
5. All vessels shall report on leaving a port.
6. All vessels shall report on leaving an anchorage.
7. All passenger vessels maintaining a regular scheduled service between Finnish and Swedish ports in Norra Kvarken should report only in cases when their time of arrival or departure differs by 30 minutes or more from the normal timetable. Any change of timetables should be reported to the VTS Center in advance.
8. All vessels entering or leaving a shipping route (channel) but not calling at an official pilot boarding position and all vessels crossing the shipping route shall report 1 hour be-

fore they enter or leave the route.

9. All vessels shall report when their ETA is changed by 30 minutes or more, when they are navigating in a deviant manner, or when they observe anything affecting safe navigation.

All reports to the VTS Center, including the Advance Report, shall state the following:

1. Vessel's name, call sign, and type.
2. Location (Latitude and Longitude or Reporting Point).
3. Course and speed.
4. Port of departure and/or destination and ETA(LT).
5. Whether vessel requires pilotage assistance.
6. Draft in the fairway (meters and centimeters).

See paragraph 1.1 for details concerning restricted areas and semi-restricted areas within Finnish waters.

Caution.—The area has not been thoroughly surveyed. Off-lying dangers may exist to seaward of those charted. Most of the coast is fringed by close-lying islands, islets, rocks, and shoals. The recommended routes leading to the ports and loading places are described and should be strictly followed. Vessels without local knowledge should proceed with caution when approaching this coast.

Due to various circumstances, including the discovery of obstructions, depths within the channels leading through the offshore dangers along this stretch of coast may change frequently. Therefore, vessels are advised to contact the local authorities in order to ascertain the latest information, including the maximum authorized drafts. All depths are to be considered as in fresh water.

Hallgrund to Pietarsaari

10.2 Hallgrund (63°39'N., 22°25'E.) is a small and low islet lying about 2.5 miles offshore on the W side of the approach to Uusikaarlepyy. It is fronted by shoals on the N and E sides.

Socklohallan, a large islet with several small islets lying close off its S end, is located close to and extends about 0.3 mile S from Hallgrund. Tuvan, a small islet, lies about 0.2 mile NE of Hallgrund. Torson, a wooded island, lies 2 miles SSW of Hallgrund.

Hallgrund Light is shown from a framework tower standing on Socklohallan. Hallgrund Beacon, a conspicuous pyramid-shaped tower, 21m high, is situated 0.2 mile S of the light.



Hallgrund Beacon

A partly-buoyed approach channel, authorized for drafts up to 4m, leads in a S direction and passes E of Hallgrund and

Torsen. This channel leads to the anchorage for Uusikaarlepyy. Vessels, with local knowledge, may anchor, in depths of 12 to 14m, clay, about 0.7 mile E of the S end of Torson.

Uusikaarlepyy (63°31'N., 22°32'E.) (World Port Index No. 27580), a small town, is situated 3 miles from the mouth of a shallow river estuary and cannot be reached by ocean-going vessels.

Kallan Light (63°45.2'N., 22°31.5'E.) is shown from a prominent tower, 19m high, standing on Kallan, an above-water rock lying about 0.5 mile off the S end of an extensive area of foul and rocky ground.



Kallan Light

Hellstenen, another above-water rock, lies on the foul ground about 0.8 mile NNE of Kallan. Storviken, an isolated rock that covers 0.7m, lies 0.5 mile N of Hellstenen.

Nygrundet Light (Pietarsaaren Majakka) (63°44'N., 22°32'E.) is shown from a prominent yellow tower standing on a rocky shoal, awash, about 0.7 mile SSE of Kallan Light. A racon is situated at this light.



Nygrundet Light

Alholmsfjarden, within which the port of Pietarsaari is situated, lies about 8 miles NE of Hallgrund and 4 miles SE of

Kallan Light. It is part of a large bay filled with numerous wooded islands, rocks, and shoals.

Masskar Tower (63°44'N., 22°35'E.), a red structure with a gray pointed roof, stands on Masskar Island, about 2 miles SE of Kallan Light. It is 21m high and prominent from seaward.



Masskar Tower

The main entrance into Alholmsfjarden leads between Kallan Light and Nygrundet Light. The outermost danger on the N side of the approach is an isolated shoal, lying about 1.3 miles NNW of Kallan Light. It has a least depth of 7.5m and is marked by a buoy.

Storgrundet, a detached shoal bank, lies about 3 miles SW of Kallan Light and is the outermost danger on the S side of the approach. It has a least depth of 3.2m and is marked by buoys.

Gammalgrundet, with depths of less than 2m, is an extensive shoal lying on the S side of the entrance. It is situated on a large shallow bank, which extends about 3.5 miles N from the mainland.

Pietarsaari (63°41'N., 22°40'E.)

World Port Index No. 27570

10.3 Pietarsaari, formerly known as Jakobstad, is situated within Alholmsfjarden, about 8 miles NE of Hallgrund. This sheltered harbor lies on the NW side of Adholme and E of Adon, a peninsula located 1 mile W.

Pietarsaari Home Page

<http://www.portofpietarsaari.fi>

Depths—Limitations.—The main approach channel from seaward leads between Kallan Light and Nygrundet Light. The entrance fairway, which is authorized for drafts up to 9m, passes between numerous islets and shoals fronting the harbor. The principal facilities are described below.

The Ro-Ro Quay is 160m long and has a depth of 7.4m alongside. Laucko Quay is 150m long and has a depth of 9m alongside. It is used as an oil berth and can handle tankers up to 200m in length.

New Quay is 200m long and has a depth of 7.4m alongside. Allhomen Pier provides a ro-ro berth. It has depths of 4.9m alongside the E side and 6m alongside the W side.

Vessels up to 47,940 dwt, 217m in length, and 9m draft have been accommodated in the harbor.

Aspect.—The main entrance fairway leading to the harbor is indicated by lighted ranges and marked by lights, buoys, and beacons.

The commercial harbor is situated on the NW side of Lepaluoto, a peninsula extending 2 miles N of the town.

The spire of a church and a water tower situated in the S part of the town are conspicuous from seaward. A prominent chimney stands 2.5 miles N of the church spire.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Tanker Pilot Station (Bothnia Pilot). For further information, see paragraph 10.1.

During inclement weather, vessels may be directed to a more sheltered area by VHF.

Regulations.—The main routes leading to Pietarsaari are situated within Sector C of the Bothnia Vessel Traffic Service (VTS) system. This system operates off the NW coast of Finland and is mandatory. For further details of the VTS system, including reporting procedures, see paragraph 10.1.

At night tankers carrying more than 4,000 tons of oil are prohibited from navigating in the channel between the oil berth and the sea.

Contact Information.—The port can be contacted by e-mail, as follows:

satama@pietarsaari.fi

Anchorage.—Vessels with local knowledge may anchor N of Masskar, in a depth of 16m, mud. Anchorage may also be taken in the roadstead about 1.5 miles E of Masskar, in depths of 11 to 12m.

Pietarsaari to Kokkola (Ykspihlaja)

10.4 Kokkola Light (64°00'N., 22°52'E.), equipped with a racon, is located 17.5 miles NNE of Kallen Light. It is shown from a prominent tower, 23m high, standing on the W side of Kredens Shoal. The coast between is fronted by numerous small islands, islets, rocks, and patches of foul ground extending up to about 11 miles offshore.



Kokkola Light

Orgrundet Beacon (63°47'N., 22°33'E.), 12m high, stands on the N extremity of Orgrundet Island, about 2.2 miles NNE of Kallan Light.

Lillgrundet (63°51'N., 22°37'E.), marked by range beacons, is situated about 6.4 miles NNE of Kallan Light and surrounded by foul ground.

An inshore channel leading from sea to Ykspihlaja, which is authorized for drafts up to 3m, passes S and E of Lillgrundet. It is suitable only for small vessels during daylight.

Koppargrundet Beacon (63°55.7'N., 22°43.1'E.), consisting of a prominent steel mast, stands in an islet about 5.8 miles SW of Kokkola Light.

Tankar (63°57'N., 22°51'E.) lies about 3 miles SSW of Kokkola Light and is fronted by shoals extending up to about 1.7 miles seaward. A main pilot station (Bothnia Pilot) is situated on this island. A harbor used by small craft is located at the E side.

Tankar Light is shown from a prominent metal tower, 29m high, standing near the center of the island.



Tankar Light

A secondary passage leading from sea to Ykspihlaja, which is authorized for vessels with drafts up to 5.2m, is entered about 2 miles NW of Tankar. It passes NE of the island and joins the primary channel close NE of Repskaret, 3.5 miles SE. The fairway is indicated by a lighted range, buoys, and beacons.

Trullevin (63°57'N., 23°03'E.), marked by range beacons, is a small island lying about 5.8 miles SE of Kokkola Light.

An inshore channel leading from sea to Ykspihlaja, which is authorized for drafts up to 2.5m, passes close W of this island. It is indicated by range beacons and is partly buoyed.

Caution.—An explosives dumping area, which may best be seen on the chart, lies centered 13 miles NW of Kokkola Light.

Kokkola (Ykspihlaja) (63°51'N., 23°06'E.)

World Port Index No. 27560

10.5 The harbor of Kokkola (Ykspihlaja), formerly known as Karleby, is situated 2.5 miles W of the town and 20 miles NE of Hallgrund. It lies between the mainland and an island,



Kokkola



Kokkola (General Port)

and is divided into two parts by a breakwater.

The principal imports handled are oil, liquid chemicals, and zinc concentrates. Timber products and zinc are exported.

Kokkola Home Page

<http://www.portofkokkola.fii>

Winds—Weather.—Winds, from NW through N to NE, sometimes cause a heavy sea in the harbor.

Ice.—Ice obstructions exist from December through April; however, efforts are made to keep the harbor open by means of icebreakers. Ice class restrictions apply in winter.

Tides—Currents.—The water level may vary as much as 0.6m, depending on the wind.

Depths—Limitations.—The main approach channel, which is authorized for drafts up to 13m, leads from the NW and passes close SW of Kokkola Light. Local knowledge is required to enter the harbor. For the secondary entrance channels, see paragraph 10.4. The principal facilities are described below. Depths are to be considered as in fresh water.

Deep Quay is 600m long and has a depths of 11 to 13m alongside.

Outokumpu Quay is 210m long and has a depth of 11m alongside.

Kemira Quay, a liquid chemical and gas berth, is 160m long and has a depth of 9.5m alongside.

Oil Quay, at the S side of the breakwater, is 83m long and has a depth of 9.5m alongside.

Shore Quay is situated in the S part of the harbor. The N side



Kokkola—Deep Quay

is 100m long and has a depth of 7.1m alongside. The S side is 320m long and has a depth of 9.5m alongside.

Ro-Ro Quay, in the S part, is 85m long and has a depth of 6m alongside.

Stone Quay, in the S part, is 137m long and has a depth of 7.1m alongside.

There are facilities for LPG, tanker, general cargo, bulk, and ro-ro vessels. There are no restrictions for length or beam. Vessels with drafts (fresh water) up to 13m can be accommodated.

Aspect.—The main fairway channel is entered from NW of Kokkola Light. It is indicated by lighted ranges and marked by lighted buoys and beacons.

Bergbadan Beacon, equipped with a racon, stands on an islet at the S side of the main channel, about 2 miles SSE of Kokkola Light.

A water tower and several prominent tanks and chimneys stand in the vicinity of the harbor area.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Tankar Pilot Station (Bothnia Pilot). For further information, see paragraph 10.1.

Arrangements may be made to embark the pilot in the vicinity of Kokkola Light.

Regulations.—Inbound tankers carrying more than 4,000 tons of oil are prohibited from entering any of the approach channels at night. Tankers departing the port are permitted to use the main channel at night.

Vessel Traffic Service.—The main routes leading to Kokkola are situated within Sector C of the Bothnia Vessel Traffic Service (VTS). This system operates off the NW coast of Finland and is mandatory. For further details of the VTS system, including reporting procedures, see paragraph 10.1.

Contact Information.—The port can be contacted by e-mail, as follows:

satama@kokkola.fi

Caution.—Vessels may experience difficulties while berthing alongside the quays during strong N winds.

It is reported that an all-weather terminal quay (covered) is under construction within the port.

Kokkola (Ykspihlaja) to Raahе

10.6 Ykskivi Shoal (64°13'N., 23°11'E.), lying about 15 miles NNE of Kokkola Light, has a least depth of 4.2m.

Ohtakari (64°05'N., 23°24'E.), a small island lying close offshore, is located 15 miles ENE of Kokkola Light. A fishing light is occasionally shown from the E side of this island.

A line of shoals, with depths of less than 10m, extends SE between Ykskivi Shoal and Ohtakari.

Himanka (64°04'N., 23°39'E.) lying 6.5 miles ESE Ohtakari, is a loading place situated near the mouth of a river. It lies in the E part of the head of a bay, which is fronted by a chain of small islands, islets, and rocks. There is a wharf with a depth of 1.8m alongside. Anchorages are available in the immediate approach. A fairway channel, authorized for drafts up to 4.2m, leads from seaward as far as the anchorages. Pilotage is compulsory and pilots may be obtained from the station at Tankar.

The intervening coast between Himanka and Rahja, 10 miles NNE, is low and much indented by small bays and inlets. The shore is fronted by numerous small islands and rocks. The 10m curve lies up to 5 miles off this part of the coast.

Ulkokalla (64°20'N., 23°27'E.), 6m high, lies 10 miles NE of Ykskivi Shoal and about 10 miles offshore. A light is shown from a prominent tower, 14m high, standing near the N side of this islet. A house with a red roof is situated close to the light.



Ulkokalla Light

10.7 Hevoskari (64°12'N., 23°34'E.), lying about 7.5 miles NE of Ohtakari, is the outermost of the islands fronting this part of the coast.

Maakalla, 6m high, lies 2 miles SE of Ulkokalla. A light is occasionally shown from this barren islet.

Both of these islets are fronted by foul ground and surrounded by shoals and rocky patches, with depths of less than 10m, lying up to about 3 miles seaward.

Only vessels with local knowledge should pass between Ulkokalla and the mainland shore.

Rahja (64°12'N., 23°44'E.) is a small timber-loading place situated about 28 miles NE of Kokkola. Two quays on the SW side of the harbor provide 265m of commercial berthage for

vessels with drafts up to 8.5m. Three anchorages, with depths of 6 to 11m, lie within an inlet W of Rahja but are suitable only for small vessels. Pilotage is compulsory. Pilots can be obtained from the Tankar pilot station.

Lepanen (64°14'N., 23°39'E.), marked by a light, is the northernmost of a chain of small islands extending from the shore. Aijankallio Beacon, equipped with a racon, is located about 1 mile W of Lepanen. Roima Lighted Beacon, equipped with a racon, is located about 1 mile ENE of Lepanen. The main channel leading from sea to Rahja, which is authorized for drafts up to 8.5m, passes close SW of the island and is indicated by lighted ranges.

Kalajoki (64°16'N., 23°56'E.), a small craft harbor, is situated about 7 miles NE of Rahja, at the head of a bay. The coast in this vicinity is fronted by a flat which has depths of less than 5m and extends up to about 4 miles seaward. Above and below-water rocks extend up to about 1.5 miles NNW from Lehtoniemi, the W entrance point of the bay. Local knowledge is required for entry.

Pertunmatala (64°21'N., 23°54'E.), lying 4.5 miles NNE of Lehtoniemi, is a small group of above and below-water rocks located about 1.2 miles offshore.

10.8 Nahkiainen Light (64°37'N., 23°54'E.) is shown from a prominent tower with a helicopter platform, 24m high, standing on Ulkonahkiainen, a rocky shoal area. Detached shoal patches, with depths of less than 10m, extend up to about 2 miles seaward of the light. They are marked by buoys and may best be seen on the chart.



Nahkiainen Light

An isolated shoal patch, with a depth of 7.3m, lies 4.5 miles SSE of the light.

Raahe Light (64°39'N., 24°14'E.), equipped with a racon, is shown from a prominent tower, 24m high, standing 9 miles ENE of Nahkiainen Light.

Maanahkiainen, a detached shoal, has a least depth of 3.5m and lies about 3 miles SSW of the light.

Caution.—A local magnetic anomaly exists within a small area located 9 miles SSW of Nahkiainen Light.

A local magnetic anomaly exists in the area lying between Nahkiainen Light and Raahe Light.



Raahe Light

Raahe (64°41'N., 24°25'E.)

World Port Index No. 27530

10.9 Raahe is situated 15 miles ENE of Nahkiainen Light. The coast in this vicinity is fronted by many small islands, islets, and shoals. Rautaruukki, the outer harbor, is protected by detached breakwaters which have been formed by causeways joining several islets. Lapaluoto, the inner harbor, is protected by a number of small islands. The town stands 2.5 miles NE of the port.

Raahe Home Page

<http://www.portofraahe.fi>

Winds—Weather.—The harbors are, to a great extent, protected against N, E, and S winds and to some degree against W winds.

Ice.—The harbor is kept open year round with icebreaker assistance.

Tides—Currents.—There are no regular tides or currents.

Depths—Limitations.—The main approach channel leading from seaward, which is authorized for drafts up to 8m, passes N of Nahkiainen Light and close S of Raahe Light.

The principal wharves include Lapaluoto Quay, which is 100m long and has a depth of 8m alongside; Import Quay, which is 370m long and has a depth of 8m alongside; Export Quay, which is 270m long and has a depth of 8m alongside; and Oil Quay, which is 207m long and has a depth of 8m alongside. There are facilities for tanker, bulk, ro-ro, and general cargo vessels. Vessels up to 40,000 dwt, 200m in length, and 8m draft can be accommodated in the port.

Aspect.—On approaching the coast, a range of hills, 100 to 120m high, can be seen rising about 7 miles inland, 10 miles SSE of the town.

The main entrance channel is indicated by lighted ranges, lighted buoys, and beacons. Heikinkari Light, the front range light, is situated 3.4 miles E of Raahe Light and is equipped



Courtesy of Port of Raahe

Raahe



Tauvo Light

with a racon.

A church, with a conspicuous tower, stands in the town and a square water tower is situated 0.3 mile SW of it. A prominent chimney, 110m high, stands 2.5 miles SW of the church in the vicinity of the harbor.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Perameri Pilot Station (Bothnia Pilot) located at Hailuoto (see paragraph 10.10). For further information concerning pilotage in the approaches, see paragraph 10.1.

Vessel Traffic Service.—The main routes leading to Raahe are situated within Sector D of the Bothnia Vessel Traffic Service (VTS). This system operates off the NW coast of Finland and is mandatory. For further details of the VTS, including reporting procedures, see paragraph 10.1.

Contact Information.—The port can be contacted by e-mail, as follows:

satama@raahe.fi

Anchorage.—Anchorage may be taken seaward of Raahe Light, in depths of 15 to 20m. Vessels, with local knowledge, may also obtain sheltered anchorage S of the fairway, in a depth of 11m, about 0.6 mile NE of Heikinkari Light.

Raahe to Oulu

10.10 The coast extends in a general NE direction from Raahe to Oulu, a distance of 32 miles. The intervening coast is indented by several bays and a number of rivers flow into the sea in this area. The 10m curve lies up to 9 miles offshore.

Tauvo (64°49'N., 24°33'E.), a peninsula, projects from the mainland about 8 miles NNE of Raahe. It is fronted by rocks extending up to about 1 mile seaward. A light is shown from a prominent framework structure, 30m high, standing near the NW extremity of this peninsula.

Hailuoto (65°03'N., 24°46'E.), a low and wooded island, lies with its S extremity located 8.5 miles N of Tauvo.

Marjaniemi Light (65°02'N., 24°34'E.) is shown from a



Marjaniemi Light on Hailuoto

prominent tower, 25m high, standing on the W extremity of Hailuoto.

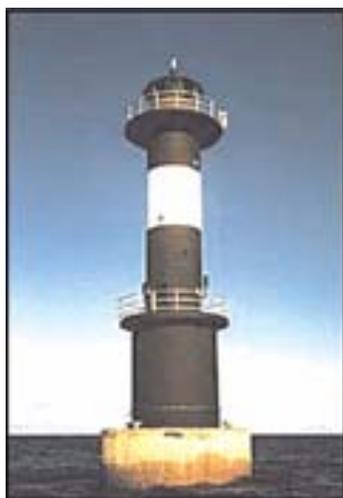
Pilotage.—Pilotage is provided by Bothnia Pilot from the main pilot station situated near the W point of Hailuoto island and close by Marjaniemi Light (65°02'N., 24°34'E.). This station provides pilots for Raahe, Rahja, Oulu, Kemi, and the Tornio/Roytta Channels (see paragraph 10.1).

Merikallat (65°02'N., 24°05'E.), a shoal area of sand and stones, lies between 10 and 14 miles W of Hailuoto. It has a least depth of 6.7m and is marked by buoys.

Artunmatala (65°15'N., 24°07'E.), with a least depth of 8m, lies about 17 miles NNW of Marjaniemi Light. This shoal, which is marked by a buoy, is the outermost patch with a depth of less than 10m lying off this stretch of coast.

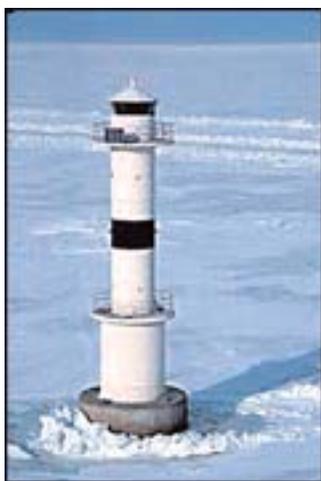
Oulu 1 Light (65°11'N., 24°30'E.), equipped with a racon, is shown from a prominent tower, 24m high, standing about 9 miles N of Marjaniemi Light.

Oulun Portti Lighted Beacon is situated 3.4 miles W of this light. An isolated shoal patch, with a depth of 8.2m, lies about 0.6 mile S of the lighted beacon and is marked by a buoy.



Oulu 1 Light

Oulu 2 Light ($65^{\circ}10'N.$, $24^{\circ}35'E.$) is shown from a prominent tower, 24m high, standing 2.3 miles ESE of Oulu 1 Light.



Oulu 2 Light

Oulu 3 Light ($65^{\circ}09'N.$, $24^{\circ}40'E.$) is shown from a prominent tower, 24m high, standing 2.5 miles SE of Oulu 2 Light.

Luodematala Light ($65^{\circ}10'N.$, $25^{\circ}00'E.$), equipped with a racon, is shown from a structure, 29m high, standing 10.3 miles E of Oulu 2 Light.

Directions.—The waters fronting Oulu are encumbered by numerous islets, rocks, and shoal areas. Recommended routes (channels), which may best be seen on the chart, lead through these dangers and obstructions to the port.

The fairways are indicated by lighted ranges and marked by buoys and beacons.

The main approach channel from seaward, which is authorized for drafts up to 10m, is entered about 24 miles WNW of Marjaniemi Light. This route leads E for about 20 miles and passes close S of Oulun Portti Lighted Beacon and 0.5 mile S



Oulu 3 Light

of Oulu 1 Light. It then leads in a SE direction for about 24 miles, passing NE of Hailuoto, to the port. The fairway passes close NE of Oulu 2 Light and close SW of Oulu 3 Light.

Two alternate channels, which are authorized for drafts up to 8m, lead N or E of Merikallat shoal and merge together. This route then leads NE for about 7 miles and joins the main channel 1.5 miles SW of Oulu 1 Light.

Another alternate channel, which is authorized for drafts up to 6.1m, leads about 6 miles SE. This route passes close N of Oulu 1 Light and joins the main channel about 0.5 mile NW of Oulu 2 Light.

A secondary channel, which is authorized for drafts up to 4.2m, is entered about 6 miles SW of Marjaniemi Light. This route leads N and NE for about 14 miles. It passes 1.6 miles W of Marjaniemi Light and joins the main channel in the vicinity of Oulu 3 Light.

Another secondary channel, which is authorized for drafts up to 3.5m, is entered about 8 miles NW of Marjaniemi Light. It leads 6 miles ESE and joins the first secondary channel 3.2 miles NNW of Marjaniemi Light. The secondary channels are used only in daylight.

A shallow inshore channel, for small craft with local knowledge, leads from Raahe to Oulu. It passes between the S side of Hailuoto and the mainland.

A main coastal route, which is authorized for drafts up to 10m, leads between the approaches to Oulu and the approaches to Kemi. This channel leaves the main approach route about 4.3 miles SE of Luodematala Light and leads NE and E for 3 miles through a narrow passage. It then leads about 27 miles in a NW direction to a position 4.5 miles W of Harkaletto Light ($65^{\circ}30'N.$, $24^{\circ}50'E.$). From this position the channel leads 7 miles W to join the main approach route for Kemi (see paragraph 10.13).

Caution.—Local magnetic anomalies exist within an area, the limits of which are shown on the chart, centered 9 miles W of Tauvo Light.

Oulu (65°01'N., 25°28'E.)

World Port Index No. 27520

10.11 Oulu, formerly known as Uleaborg, lies on the S side of the Oulujoki River (Ulea River), about 10 miles E of Hailuoto. It is an important harbor and industrial city.

Ouku Home Page

<http://www.ouluport.com>

Ice.—The port is normally closed for almost half the year by ice, but icebreakers are available.

Depths—Limitations.—The main channel leading from seaward to the port is authorized for drafts up to 10m (see paragraph 10.10).

The port consists of five harbor areas, which provide facilities for general cargo, ro-ro, bulk, tanker, chemical, and timber-product vessels.

Pateniemi lies 5 miles NNW of the town. A channel, which is authorized for drafts up to 6.3m, leads N to this harbor. There is a berth, 85m long, with a depth of 6.3m alongside. It is reported that this harbor is no longer open to commercial shipping.

Toppila lies 1.5 miles NW of the town. Toppila Quay, 990m long, is situated on the N side of this harbor and has a depth of 6.1m alongside. Hietasaari Quay, 600m long, is situated on the S side and has a depth of 6.1m alongside. It is reported that this harbor is used only for the discharge of cement.

An overhead power cable, with a vertical clearance of 50m, spans the entrance to Toppila harbor.

Vihreasaari lies at the SW extremity of the southernmost islet fronting the town. Oil Quay, 72m long and T-shaped, is situated on the N side of this harbor and has a depth of 10m alongside. Bulk Quay, 150m long, is situated on the S side and has a depth of 10m alongside.

Oritkari lies 1 mile SW of the town on the S bank of the river. Main Quay, situated at the S side, is 270m long and has a depth of 9m alongside. North Quay, situated at the N side, is 170m long and has a depth of 10m alongside. There are also three ro-ro berths, with depths of 7 to 10m alongside.

Nuottasaari lies 0.5 mile WSW of the town on the S bank of the river. Nuottasaari Quay, 320m long, has a depth of 6.4m alongside. Two chemical quays, situated close W, have depths of 7.5m and 9.5m alongside.

Vessels up to 50,000 dwt, 200m in length, and 10m draft can be accommodated within the port.

Aspect.—The recommended entrance channels are indicated by lighted ranges and marked by lighted buoys and beacons. Several chimneys and silos standing in the vicinity of the harbor at Oritkari are prominent from seaward.

Pilotage.—Pilotage is compulsory deep-sea pilots are provided by the Perameri Pilot Station, Bothnia Pilot (see paragraph 10.10). For further information concerning pilotage, see also paragraph 10.1.

Vessel Traffic Service.—The main routes leading to Oulu are situated within Sector D of the Bothnia Vessel Traffic Service (VTS). This system operates off the NW coast of Finland and is mandatory. For further details of the VTS, including re-



Courtesy of Port of Oulu

Oulu

porting procedures, see paragraph 10.1.

Anchorage.—The roadstead between Oulu and Pateniemi, 5.5 miles N, affords anchorage, in depths of 7 to 8m, mud.

Anchorage may also be taken, in depths of 10 to 14m, clay and sand, about 3 miles WNW of Oulu.

Caution.—Numerous quantities of timber may be found lying in the vicinity of the harbor at Pateniemi.

Oulu to Kemi

10.12 The coast between Oulu and Kemi, 49 miles NNW, is low, wooded, and fronted by numerous islands, islets, rocks, and shoals. Some of these dangers lie up to 30 miles seaward of the E shore of the gulf.

Other than the direct approach from seaward, there are two routes leading from Oulu to Kemi. The principal coastal approach route is authorized for drafts up to 10m (see paragraph 10.10). The secondary inshore route, which detours via Martinniemi and Iin Roytta, is authorized for drafts up to 5.5m.

Martinniemi (65°13'N., 25°17'E.), a loading place with a small harbor, lies about 11 miles N of Oulu and is approached from the Oulu to Kemi inshore route. The entrance channel is authorized for drafts up to 4.2m. Anchorage may be taken, in a depth of 8m, good holding ground, about 0.4 mile off the harbor breakwaters or, in a depth of 16m, about 1.3 miles WSW of the breakwaters. Local knowledge is required.

It was reported that the harbor is only used by small craft and is no longer open to commercial traffic.

Iin Roytta (65°16'N., 25°12'E.), a small craft harbor, lies at the SE end of an island of the same name. It is protected by breakwaters, which extend from the E and S ends of the island, and has depths of 2 to 3m.

An outer anchorage lies about 0.5 mile W of the island and has a depth of 16m. An inner anchorage lies about 0.2 mile E of the S extremity of the island and has a depths of 7 to 9m. The anchorages are approached from the Oulu to Kemi inshore route. The entrance channel is authorized for drafts up to 5.5m. Local knowledge is required.

Harkaletto Light (65°30'N., 24°50'E.) is shown from a concrete tower, 11m high, standing on an islet 15 miles SSE of Kemi.

Kemi 1 Light (65°23'N., 24°06'E.) is shown from a prominent tower, 21m high with a helicopter platform, standing in the SW approach to Kemi. A racon is situated at this light.



Kemi 1 Light

Rajamatalat, an isolated shoal patch with a least depth of 6.6m, lies about 4 miles N of Kemi 1 Light. Mutkamatala, with a least depth of 5.7m, is a shoal patch lying on the E side of the main approach channel, 8.5 miles NE of Kemi 1 Light.

Kemi 2 Light (65°30'N., 24°22'E.) is shown from a mast, with a wind generator, standing 10 miles NE of Kemi 1 Light.



Kemi 2 Light

Lallin Moyly, an isolated shoal patch with a depth of 3.5m, lies about 2 miles NNW of Kemi 2 Light.

10.13 Keminkraaseli Light (65°36.6'N., 24°33.8'E.) is shown from a prominent concrete tower, 25m high, standing 8 miles NE of Kemi 2 Light. A racon is situated at this light.

Pohjantahti Beacon (65°37.6'N., 24°22.4'E.), equipped with a racon, is situated about 7 miles N of Kemi 2 Light.

Directions.—The approach to this section of the Finnish coast is difficult due to the wide belt of islands, islets, shoals, and rocks fronting the coast at the N end of the Gulf of Both-



Keminkraaseli Light

nia. These dangers may best be seen on the chart.

Recommended routes (channels), which may best be seen on the chart, lead through these dangers and obstructions to the ports. The inner fairways are indicated by lighted ranges and marked by buoys and beacons.

From seaward, the land in the approach to Kemi is uniformly low and cannot be distinguished from the offshore islands. However, good references are provided by the lighthouses, both Finnish and Swedish, and by the off-lying islands of Maloren (65°31'N., 23°34'E.) and Sandskar (65°35'N., 23°45'E.).

The main approach route leading to Kemi, which is authorized for drafts up to 10m, begins in the vicinity of Kemi 1 Light and leads NE and NNE for about 20 miles. It passes close NW of Kemi 2 Light and about 2 miles W of Keminkraaseli Light.

The principal coastal route from Oulu, which is authorized for drafts up to 10m, joins the main channel about 1 mile NNE of Kemi 2 Light (see paragraph 10.10).

Caution.—Local magnetic anomalies exist within an area lying between about 1.2 miles and 6 miles W of Harkaletto Light (65°30'N., 24°50'E.).

Kemi (65°44'N., 24°34'E.)

World Port Index No. 27410

10.14 The port of Kemi is situated at the mouth of a river that flows into the head of the Gulf of Bothnia. The town, which is fronted by a small craft harbor, is served by two commercial harbors. Ajos, the outer harbor, lies at the SW end of a peninsula, about 4.5 miles SSW of the town. Veitsiluoto, the inner harbor, lies at the SW side of an island, 3 miles SSE of the town.

Kemi Home Page

<http://www.portofkemi.fi>

The principal imports are oil and chemicals. Steel and timber products are exported.

Ice.—The harbor is normally frozen over from the beginning of December to the end of May. Attempts are made to keep the harbor open with the assistance of icebreakers. The Finnish Board of Navigation determines the restrictions and requirements for vessels allowed to enter the harbor at this time.

Tides—Currents.—The tides are negligible, but winds will cause the water level to vary. During S winds, the water level may rise up to 1.5m above normal. During N winds, the level may fall as much as 0.8m.

Depths—Limitations.—The principal entrance channel leading from seaward to the harbor at Ajos is authorized for drafts up to 10m (see paragraph 10.13).

The installations at Ajos are protected by a detached breakwater, which lies at the W side of the harbor. Quay No. 1 has two berths on each side and a ro-ro ramp. The NW side provides 185m of quayage, with depths of 7.3 to 8.3m alongside. The SE side provides 160m of quayage, with a depth of 11.4m alongside.

Quay No. 2 has three berths along the SE side. It provides 290m of quayage, with a depth of 9.3m alongside. Quay No. 3 has two berths along the NW side. It provides 185m of quayage, with a depth of 5.3m alongside. Quay No. 4 has one berth along the SE side. It provides 90m of quayage, with a depth of 5.3m alongside.

The oil jetty, located at the SE side of the harbor, provides a berth, 90m long, with a depth of 11.4m alongside. Tankers up to 244m in length and 10m draft can be accommodated.

The main branch channel leading to Veitsiluoto is authorized for drafts up to 7m.



Kemi—Veitsiluoto

The harbor at Veitsiluoto is centered around a pier which extends 235m SSW from the island. Berth No. 1, which is 135m long, extends W from the root of the pier; Berth No. 2 and Berth No. 3, situated along the W side of the pier, provide 209m of quayage; Berth No. 4 and Berth No. 5, situated along the E side of the pier, provide 230m of quayage; and Berth No. 6, which is 120m long, is situated close E of the pier. A ro-ro ramp is located at the E side of the pier root. Vessels up to 7m draft can be handled alongside within this harbor.

Aspect.—The inner entrance fairways are indicated by light-

ed ranges and marked by buoys and beacons.

A church with a tower and the town hall situated at Kemi are prominent from seaward. Several conspicuous chimneys stand in the vicinity of the harbor at Veitsiluoto.

Three conspicuous wind generators, 35m high, stand on the S side of Ajos.

Pilotage.—Pilotage is compulsory. Pilots board in either Kemi N: (65°33.1'N., 24°26.9'E.) or Kemi S: (65°29.3'N., 24°19.0'E.).

Vessel Traffic Service.—The main routes leading to Kemi are situated within Sector D of the Bothnia Vessel Traffic Service (VTS). This system operates off the NW coast of Finland and is mandatory. For further details of the VTS, including reporting procedures, see paragraph 10.1.

Anchorage.—Anchorage can be taken, in a depth of 16m, about 0.9 mile SSW of the oil jetty head, close W of the main entrance channel.

Kemi to the Swedish Border

10.15 Tornio (Roytta) (65°50'N., 24°09'E.), which is situated about 1.5 miles above the mouth of the Torniojoki River, can only be reached by small craft. Roytta, the commercial harbor for this industrial town, lies about 5 miles S and is situated close to the border between Sweden and Finland, on the SW side of the island of Sellei.

The border between Finnish and Swedish waters in this vicinity extends S, close to the meridian of 24°10'E.

Ice.—From the middle of January to the beginning of May, the harbor is generally frozen over.

Depths—Limitations.—The main entrance channel leading to Roytta is authorized for drafts up to 8m. It initially follows the main route leading from seaward to Kemi to a position about 6 miles NNE of Kemi 2 Light. The channel then leads in a general NW direction for about 11 miles to the harbor.

There are three main berths, the largest being 185m long, with a depth of 8m alongside. Vessels up to 160m in length and 8m draft can be handled. There are facilities for timber, general cargo, bulk, and LPG vessels.

Aspect.—The main entrance fairway is indicated by lighted ranges and marked by buoys. A conspicuous chimney stands in the vicinity of the harbor.

Pilotage.—Pilotage is compulsory. Pilots are provided by the Perameri Pilot Station (Bothnia Pilot) located at Hailuoto (see paragraph 10.10). For further information concerning pilotage, see paragraph 10.1.

Vessel Traffic Service.—The main routes leading to Tornio are situated within Sector D of the Bothnia Vessel Traffic Service (VTS). This system operates off the NW coast of Finland and is mandatory. For further details of the VTS, including reporting procedures, see paragraph 10.1.

Anchorage.—Anchorage can be obtained, by vessels with local knowledge, in a depth of 8m, close E of the fairway, about 1.2 miles SSE of the front range light.

Swedish

SWEDISH	English	SWEDISH	English
A			
a, alv, alven	stream, river	fiskegarn	fish trap
ankarplats	anchorage	fiskehamn	fishing harbor
ankarsattning	roadstead, anchorage	fiskelage	fishing village
arna, arne	group of islands or rocks	fiskevatten	fisheries
as	ridge	fjall	mountain, hill
B			
back	brook	fjard, fjarden....	fjord, bay, inlet, lake, sound, channel, strait
backe.....	hill	fjord, fjorden	fjord
badan, bade, baden	reef, rock	flack, flak	flat, shoal
bak	beacon	flat	flat
bank	bank	flod	flood, river
barrskog	coniferous woods	flyg	aeronautical
bassang	basin	flytdocka	floating dock
bat	boat	forbjuden	prohibited
berg, berget.....	mountain, hill	forbjudet område.....	prohibited area
bergspets.....	peak, summit	forhållningsboj	mooring buoy
block	boulders	forstord	destroyed
boj.....	buoy	fortojningsring.....	mooring ring
borg.....	castle, fort	fot	foot
branning.....	rock awash	framtradante	conspicuous, prominent
branningar	breakers	fyr.....	light
brant.....	steep, precipitous	fyrhus	lighthouse
bredning.....	wide place in river or channel	fyrskipp.....	lightship
bro	bridge	fyrtorn	light tower
brottsjo.....	breakers	G	
brygga.....	jetty, wharf	gammal, gamla	old
bukt, bukten	bight, bay	gap.....	opening, inlet, passage
by	town	gard	farm, country place
D			
dal	valley	gatt.....	opening, entrance
dammar	weirs	grans	boundary, limit
djup, djupet.....	channel, sound	gron	green
djupranna.....	deep channel	grund, grundet	shoal
domkyrk	cathedral	grundklack.....	shoal head
dy	mud	grus.....	gravel
dykdalb	dolphin	gul	yellow
E			
ebb	ebb	H	
elv	river	hak, hake	hook (of land), pointed shoal
ensamt	isolated rock	hal.....	hole, mouth
enslingje	range line	hals	neck (of land)
F			
fabrik	factory	halvo, halvon.....	peninsula
fabriksskorten.....	chimney	hammar	conspicuous point
famn.....	fathom	hamn.....	anchorage, bay, harbor
farja.....	ferry	handelshamn	commercial harbor
fartprovsbana.....	measured distance	hav	bay, sea, ocean
farvatten, farled	fairway	havsbukt	gulf
fastning	fortress	hog	height, hill
		hogslat	tableland
		hogvatten.....	high water
		hojd	hill
		holm, holme, holmen	island
		hus	house
		hufvud, huvud	cape, head

SWEDISH	English	SWEDISH	English
I			
inlopp.....	entrance	lund	grove
innerst	innermost	lusthus	summerhouse
inre	inner	lysboj.....	light buoy
insegling	entrance	M	
insjo	lake	mad.....	marsh, stretch of water with flat bottom
is	ice	magasin	storehouse, warehouse
issignaler	ice signals	marke.....	mark
J			
jarnvag	railroad	medlerst, mellerst.....	central
K			
kabellangd	cable length	mellan.....	between, middle
kaidam	pier	minerada området.....	mined area
kaj.....	quay, wharf	missvisning	variation
kalv.....	small islet near a larger one, calf	mol	mill
kanal	canal	molo	mole
kap.....	cape	mudder	mud
karantan	quarantine	muddrad	dredged
kase.....	beacon	mun	mouth
klabbe	bare rocky islet close inshore	mynning	river mouth, estuary
klack	underwater head	N	
klapper	pebbles	nabb.....	nose, point
klint	summit of a steep hill or cliff	nas	cape, point
klippa.....	cliff, rock above water	nedre.....	lower
klippgrund	rock, rocky	nodhamn.....	refuge harbor
klockboj.....	bell buoy	nord, norr.....	north
kobb	islet, rock	nordost.....	northeast
koping.....	market town, district	nordvast, nordvest	northwest
krigshamn	war harbor	norra, nordlig.....	northern
kulle.....	hill	ny.....	new
kummel.....	landmark, cairn	O	
kust	coast	oar, oarna.....	islands
kustvakt	coast guard	o, on.....	island
kvarn.....	mill	ogrupp	island group
kyrka.....	church	oklar	foul
L			
landningstrappa	landing stage	oljecistern.....	oil tank
landtunga	spit of land, neck of land	oljeledning.....	oil pipeline
lasarett	hospital	oljehamn.....	oil harbor
lastageplats	loading place	omrade.....	district, ground
lastbrygga	cargo jetty, pier	oresund.....	the sound
lag	low	orlogsvarv.....	naval shipyard
lage	station, berth	ost, oster	east
lagvatten	low water	ostersjon	the baltic
led	channel	ostr, ostlig.....	eastern
lera.....	clay	overskoljte	submerged
lill, lilla	little	ovre	upper
livraddningsstation	lifesaving station	P	
ljudboj	whistle buoy	pir	pier
ljudpipa.....	whistle	platt	flat
lod.....	lead	plattboj	can buoy
lopp.....	channel	prick	spar buoy
lots.....	pilots	R	
lotsstation	pilot station	raddningsstation	lifesaving station
R			
		radiofyr.....	radiobeacon
		ranna.....	channel
		redd	roadstead

SWEDISH	English	SWEDISH	English
rev	reef, spit, bank	syd, sodre	south
rod	red	sydost	southeast
ros, rose	cairn, heap of stones	sydvast, sydvest.....	southwest
rott	red		
S			
samhalle.....	settlement	tavla.....	board daymark
sand	sand	tidssignal	time signal
sjo	sea	tidvatten.....	tide
sjogras	seagrass	tidvattensdocka.....	wet dock
sjomarke	seamark	tippningsplats	spoil ground
sjukhus.....	hospital	topp	summit
skal	shells	tidssignal	time signal
skans	fort, redoubt	tidvatten.....	tide
skar	above-water rock, rocky islet	torn	tower
skargard	fringing rocks, islets, and shoals	torrdocka	drydock
skog	woods	trianglepunkt	triangulation point
skogbevaxt.....	wooded	tullkammare	custom office
skorsten	chimney	tunga.....	tongue
skrent	slope, bluff		
skyddsomrade.....	protection area	U	
slatprick	plain spar buoy	udde.....	cape, point, headland
slick	ooze	undervattenskabel.....	submarine cable
slip	marine railway	undre	lower
slott.....	castle	utkikstorn	lookout tower
sluss	lock		
sma	small	V	
soder, sodre, syd.....	south	vagbrytare.....	breakwater
sodra, sydlig	southern	vaderkvarn.....	windmill
spets.....	point	vall.....	steep coast
spetsboj.....	conical buoy	varv.....	shipyard
spir.....	spire	vast, vest.....	west
spirboj.....	spar buoy	vastra, vastlig.....	western
stad	town	vatten.....	water
stang	pole, spar	vattenstandssignalstation.....	tide signal station
stangda farvatter	closed waters	vattentorn	water tower
stangmark	pole beacon	vik	bay, creek
sten	stone	vit	white
stor, stora	great or large	vrak	wreck
strand.....	beach	vrakboj	wreck or obstruction buoy
strom.....	current		
sund,sundet	sound	Y	
svart	black	ytstrom	surface current
		yterest	outermost
		ytte, ytter	outer

Russian—Estonian—Latvian—Lithuanian

RUSSIAN (r)	ESTONIAN (e)	LATVIAN (la)	LITHUANIAN (li)	English	RUSSIAN (r)	ESTONIAN (e)	LATVIAN (la)	LITHUANIAN (li)	English
A					E				
aar (e)	coast	edela (e).....	southwest		elling (r)	slipway			
abajas (e)	bay	ezers (la).....	lake		F				
akmens (la)	stone				faarvater (e).....	channel, strait			
alev, -id (e).....	market town, borough				farvater (r)	channel, fairway			
allvett (e)	above water	G							
alumine (e)	lower, front				gavan' (r)	harbor, basin, bay			
ankruplats, ankrupagaid (e).....	anchorage	glubok-iy, -aya, -oye (r)	deep		golotsy (r)	mountain, peak			
asula, asundus (e)	settlement	golomyann-yy, -aya, -oye (r).....	open sea		golova (r).....	head (of pier)			
austrumi (la)	east	gora (r)	mountain, hill		gorlo (r)	strait			
B					gorod (r)	city, town			
baak (e).....	beacon	gorodok (r)	small town		granitsa (r).....	boundary			
bakan (r)	large buoy	greben (r).....	ridge		grund (e).....	shoal			
baklysh (r)	rock above water	gryada, gryady (r).....	mountains, hill, bank, ridge		H				
balts (la).....	white				haabjas (e).....	boat			
banka (r)	shoal, bank				hall (e)	gray			
bar (r).....	bar				hoone (e)	house			
bashnya (r).....	tower	I							
basseyn (r)	basin, wet dock	ida (e)	east		il (r)	mud			
bel-yy-aya, -oye (r).....	white	ilist-yy, -aya, -oye (r).....	muddy		J				
bereg (r)	shore, river bank, coast				jaa (e)	ice			
beregov-oy, -aya, -oye (r)	coastal				jaam (e)	railroad station			
berezhn-y, -aya, -oye (r)	inner, close offshore				jame (e)	thick, heavy			
bochka (r)	mooring buoy, barrel buoy				jarsk (e)	steep			
bol'sh-oy,-aya,-oye (r)	great, large				jarv, -ed (e)	lake			
bryuaga (r)	pier, landing stage				joesuu (e).....	river mouth			
buek (r)	small boat or float				joed (e)	rivers			
bugor (r).....	hill, mound				jogi (e)	river			
bukhta (r)	bight, inlet, bay, roadstead				joom (e).....	reef, sand bank			
bukhtochka (r)	cove, bay	K							
burun (r).....	breaker	kaevand (e)	channel		kagu (e)	southeast			
buy (r).....	buoy	kai (e)	quay		kalasadam (r).....	fishing harbor			
C									
chern-yy, -aya, -oye (r)	black								
ciems (la)	village, hamlet								
D									
damba (r)	seawall, dike								
del'ta (r)	delta								
derevnya (r)	village								
derevo (r)	tree								
dienvidi (la)	south								
dlinn-yy, -aya, -oye (r).....	long								
dok (r).....	dock								
dolgota (r).....	longitude								
dolina (r).....	valley								
dom (r).....	house								
doroga (r).....	road								
dyun-y, a (r).....	dunes, dune								

RUSSIAN (r)	
ESTONIAN (e)	
LATVIAN (la)	
LITHUANIAN (li)	English
kalda (e)	coast
kalju (e)	rock
kallas (e)	shore
kallutus (e)	tide
kalnas (li)	hill
kamen' (r)	rock, stone
kamenny (r)	masonry, stony, rocky
kamni (r)	rocks, stones
kamyennaya banka (r)	rocky shoal
kamyennaya gryada (r)	spit
kanal (e)	canal
kanal (r)	channel, canal
kants (e)	fort
kapp (e)	cape
kare (e)	grassy islet
kari (e)	reef, shallow, shoal
karestik	rapids, cataract
karestiku (e)	waterfalls
kari (e)	reef, shallow
kekur (r)	pillar, rock
kesk (e)	middle, central
keskmine (e)	middle, central
kevad (e)	spring
khholm (r)	hillock
khram (r)	temple
khrebet (r)	ridge, mountain range, mountains
kindlus (e)	fort
kink (e)	hill
kirde (e)	northeast
kirik, kirikud (e)	church
kitsus (e)	narrows
kivi (e)	stone, rock
koleno (r)	reach (of a channel, etc.), bend
kollane (e)	yellow
korga (r)	rocky shoal
korge (e)	high
korotk -iy, -aya, -oye (r)	short
korsten (e)	chimney
kosa (r)	spit
koshka (r)	drying shoal
kosk (e)	waterfall, rapids
kovsh (r)	cove
kran (r)	crane
krasn-yy, -aya, -oye (r)	red
krest (r)	cross
krutoy, -aya, -oye, -ye (r)	steep
kruus (e)	gravel
kryazh (r)	ridge, hill, mountains
kuiv (e)	dry
kungas (r)	flat-bottomed craft
kurk (e)	channel, strait, sound
kula, -d (e)	village
kulm (e)	cold
kultuk (r)	bay
kungas (e)	hill

RUSSIAN (r)	
ESTONIAN (e)	
LATVIAN (la)	
LITHUANIAN (li)	English

L

laas, laane (e)	west
laev (e)	vessel
laevasild (e)	pier
laguna (r)	lagoon
laht (e)	bay, inlet, sound, harbor
laid (e)	island
lainetemurd (e)	breakers
lakhti (r)	bay, cove, bight, gulf
led (r)	ice
lednik (r)	glacier
lesnoy (r)	wooded, forest
liiva kunkad (e)	sand dunes
liivakivi (e)	sandstone
liman (r)	estuary, lake, lagoon, bay
linn (e)	town, city
lodu (e)	bog, marsh
loode, loe (e)	northwest
loots (e)	pilot
loss (e)	castle
lotsman (r)	pilot
lotsmanskaya stantsiya (r)	pilot station
louna (e)	south
lounaida (e)	southeast
lounalaane (e)	southwest
luda, ludka (r)	small rocky islet
lumi (e)	snow
lyuna (e)	south

M

maa (e)	shoal, islet, land
maabumis sild (e)	landing stage
maamark (e)	landmark
machta (r)	mast
madal (e)	low, shallow, shoal
madal vesi (e)	low water
madalik, -ud (e)	shoal, shoals
malen'k -iy, -aya, -oye (r)	little, small
mal -yye, -aya, -oye (r)	little, small
marios (li)	lagoon
materik (r)	mainland, continent
maed (e)	mountains, hills
magi (e)	mountain, hill
markpuu (e)	conspicuous tree
mayak (r)	lighthouse
mel' (r)	shoal
melk -iy, -aya, -oye (r)	shallow, shoal
melkovodn -y, -aya, -oye (r)	shallow
merekael (e)	sound, strait
merelaht (e)	gulf, bay
meremark (e)	seamark
mererand (e)	seashore
mererohi (e)	seaweed
meresopp (e)	creek

RUSSIAN (r)	
ESTONIAN (e)	
LATVIAN (la)	
LITHUANIAN (li)	English
merevool (e)	stream
meri (e)	sea, bight, ocean
mets (e)	wood, forest
milya (r)	mile
mol (r)	mole, jetty
more (r)	sea, sound
morskaya kapusta (r)	kelp
most (r)	bridge
muda (e)	mud
munakivid (e)	boulders, shingle
must (e)	black
muul (e)	mole
myel (r)	shoal
myelk -y, -aya, -oye (r)	shallow
mys (r)	cape, headland, point

N

nadvodn -y, -aya, -oye (r)	above water
navolok (r)	cape, headland
neem (e)	cape, point
nina (e)	cape, point
nizhn -iy, -yaya, -eye (r)	lower
nizk -iy, -aya, -oye (r)	low
nord (e)	north
nos (r)	cape, spit, point
nov -yy, -aya, -oye (r)	new
nukk (e)	cape, point

O

oblast' (r)	administrative division
obryv (r)	bluff, precipice
ogon (r)	light (or fire)
oja (e)	stream
okean (r)	ocean
opasnot' (r)	danger
org (e)	valley
ost (e)	east
osta (la)	port, harbor
ostrov (r)	island
ostrovok (r)	islet
osyp' (r)	landslide
otmel (r)	shoal, bank or reef extending from shore
ots (e)	point, cape
ozero (r)	lake

P

paak (e)	beacon
paare (e)	bar
pakhta (r)	bluff, stoney bank
paastejaam (e)	lifesaving station
paat (e)	boat
pank (e)	banks, spit
parre (e)	bar
pealvett (e)	underwater
peastepaat (e)	lifeboat

RUSSIAN (r)	
ESTONIAN (e)	
LATVIAN (la)	
LITHUANIAN (li)	English
peen (e)	fine
pehme (e)	soft
perebor, perekat (r)	bar, ledge, shoals
peredn -iy, -yaya, -eye (r)	front
peresheyek (r)	isthmus
perv -yy, -aya, -oye (r)	first
peschan -yy, -aya, -oye (r)	sandy
pesok (r)	sandbank
pik (r)	peak, mountain
pikhya (e)	north
pilseta (la)	town, city
pirs (r)	jetty, pier
plavnja (r)	mud flat
poberezh'ye, pomor'ye (r)	coast, seashore
podvodn -yy, -aya, -oye (r)	submerged
pohi (e)	north
pohja (e)	north, northern
pohjaida (e)	northeast
pohjalaane (e)	northwest
poi (e)	buoy
poluostrov (r)	peninsula
pomor'ye (r)	coast
poosaar (e)	peninsula
port (r)	port, harbor
poselok (r)	village
priberezh'ye (r)	coast, shore
prikladnoy chas (r)	mean high water interval
priliv (r)	flood (tide)
primorskiy (r)	maritime
pristan' (r)	pier, jetty, landing
pritok (r)	tributary
prokhod (r)	passage, pass
proliv (r)	strait, channel
protok (r)	canal, channel, watercourse
protoka (r)	channel in river delta
pruum (e)	brown
put' (r)	route, way
punane (e)	red
puu (e)	woods, trees
pyatno (r)	shoal patch

R

raba (e)	swamp, marsh
radiomayak (r)	radiobeacon
ragas (li)	point
ragas (la)	point, cape, headland
rahu (e)	bank, reef, rocky islet, rock above water
rand (e)	shore, coast
ranna (e)	coast, shore
rani (e)	pebbles
ravnina (r)	plain
razvaliny (r)	ruins
reid (e)	roadstead
reka, rechka (r)	river, stream
reyd (r)	roadstead

RUSSIAN (r)
 ESTONIAN (e)
 LATVIAN (la)
 LITHUANIAN (li) English

rif (r) reef
 riff (e) reef
 roheline (e) green
 rossyp' (r) sandbank
 rozhok (r) cape
 rukav (r) channel, stream, branch
 rungas (e) cliff

S

saar, saar (e) island
 sadam, -ad (e) harbor, port
 sala (li, la) island
 salm (e) strait
 savi (e) clay
 seleniye, selo (r) settlement, village
 seljandiku (e) ridge of land
 seredina (r) middle
 seriy (r) gray
 sever (r) north
 severn -yy, -aya, -oye (r) northern
 shar (r) strait
 shchel' (r) gap, gorge
 shest (r) pole, staff
 shirota (r) latitude
 shkhery (r) skerries
 sihtpagid (e) range beacons
 silm (e) narrow channel
 siniy (r) blue
 sinnine (e) blue
 sissesoit (e) entrance
 skala (r) rock, cliff
 sneg (r) snow
 somnitel'no (r) is doubtful
 soo, -d (e) marsh, bog
 sopka (r) hill, volcano, mountain
 sporny (r) conflicting
 sredn -yy, -yaya, -eye (r) middle
 stamik (r) shoal, rock
 stanovichche (r) camp, fishing village
 star -yy, -aya, -oye (r) old
 stolb (r) post, column, upright rock
 strelka (r) narrow spit
 stvornyy znak (r) range beacon
 sukh -oy, -aya, -oye (r) dry
 suu (e) mouth
 suud (e) south
 suur (e) large, big
 sugavus (e) depth
 suzem, susha (r) dry land

T

techeniye (r) current
 temn -y, -aya, -oye (r) dark color
 tine (r) ooze, mud
 tolcheya (r) confused sea

RUSSIAN (r)
 ESTONIAN (e)
 LATVIAN (la)
 LITHUANIAN (li) English

toll (e) customs
 tolst -yy, -aya, -oye (r) thick
 tonk -iy, -aya, -oye (r) thin
 tonn (e) buoy
 torn (e) tower
 tousu (e) flood
 tret -iy, 'ya, 'ye (r) third
 tserkov' (r) church
 tuleboi (e) light buoy
 tulelaev (e) light vessel
 tuli (e) light
 tullepak (e) lighted beacon

U

udu (e) fog
 urbkivi (e) boulder
 ust'ye (r) river mouth, channel
 utes (r) cliff, crag
 uus (e) new
 ulemine (e) upper, rear

V

valge (e) white
 vana (e) old
 vareded (e) ruins
 vaike (e) small, little
 vain (e) strait
 varav (e) entrance
 veeneelus (e) tide-rip
 vekha (r) spar buoy
 verkhn -iy, -yaya, -eye (r) upper
 vershina (r) summit, peak
 vileboi (e) whistle-buoy
 vkhod (r) entrance, inlet
 vneshn -iy, -yaya, -eye (r) outer
 vnutrenn -iy, -yaya, -eye (r) inner
 vodopad (r) waterfall
 vodorosl' morskaya (r) seaweed
 vodovorot (r) whirlpool, eddy
 volnolom (r) breakwater
 voolu (e) current
 vorota (r) entrance, strait, channel pass
 vostochn -yy, -aya, -oye (r) eastern
 vostok (r) east
 vozyshenie (r) high land
 vrakk (e) wreck
 vtor -oy, -aya, -oye (r) second
 vulkan (r) volcano
 vyerkhn -u, -yaya, -eye (r) upper
 vyssh -iy, -aya, -eye (r) higher

Y

yakornoye mesto (r) anchorage
 Yar(y) (r) cliff(s), steep bank(s)

Finnish

FINNISH	English	FINNISH	English
A		M	
alempi.....	lower	majakka.....	lighthouse, beacon
ankkuripaikka.....	roadstead	maki.....	hill, mountain
ankkuripohja.....	anchorage	matala.....	shallow, shoal bank
aukko.....	strait, channel	matalikko.....	bank, shoal
E		meri.....	sea, ocean
etela.....	south	merimerkki.....	beacon, seamark
etelainen.....	southern	merkki.....	mark, sign
H		metsa.....	forest
hieta, hiekka.....	sand	musta.....	black
I		muta.....	mud
iso.....	great, large	N	
ita.....	east	niemeke.....	point (of land)
itainen.....	eastern	niemi.....	peninsula, point, cape, island
J		P	
jaa.....	ice	pieni.....	small
jarvi.....	lake	pikku.....	small, little
joki.....	river	pohja.....	north, bottom, ground
jyrkka.....	bluff	pohjoinen.....	northern
K		poiju.....	buoy
kallio.....	rock, cliff, mountain	pookin.....	tower
kanaali.....	channel	punainen.....	red
kannas.....	isthmus	purjehdusmerkki.....	beacon, mark
kanava.....	channel	puro.....	stream
kari.....	reef, shoal, island	R	
kaupunki.....	city, town	rannikko.....	coast
kello.....	bell	ranta.....	shore, beach, bank
keltainen.....	yellow	reimari.....	spar buoy
kirkko.....	church	reitti.....	strait, course, channel
kivi.....	rock, stone	reivi.....	reef
kumpeli.....	beacon	riutta.....	reef
kyla.....	village	S	
kynnys.....	bar	saari.....	island, section of island, peninsula
L		salmi.....	strait, channel, bay
lahti.....	bay, gulf, cove, inlet	satama.....	harbor
laituri.....	pier, quay, jetty	savi.....	clay
laivaranta.....	wharf, quay	selka.....	body of water
lansi.....	west	silta.....	bridge, pier
lantinen.....	western	sininen.....	blue
lieju.....	mud	sisa.....	inside, inner
linna.....	fort, castle	sisamainen.....	inner
linnotus.....	fort	sora.....	gravel
loisto.....	light	suomi.....	finland
luoto.....	island, shoal, peninsula, rocky islet	suu.....	mouth, entrance, inlet
luotsi.....	pilots	suuri.....	big, great
		T	
		taipale.....	isthmus
		talo.....	house, building
		tie.....	road, course

FINNISH	English	FINNISH	English
torni	tower, steeple	valkoinen.....	white
tulli	customs	vayla	channel, fairway
tumma.....	dark	vesi	body of water
	U	viheria, vihrea	green
ulkomainen	outer	viitta	spar buoy
	V	vuori	mountain
vaalea.....	light (color)		Y
vaara	hill, mountain	ylempi	upper

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.

Index—Gazetteer

	Position				Sec. Para.		Position				Sec. Para.
	°	'	°	'			°	'	°	'	
A											
ABORDSSUNDET	62	46 N	17	58 E	6.40	BYSKE	64	57 N	21	14 E	9.13
AEGNA LIGHT	59	36 N	24	44 E	1.8	BYVIKEN	62	33 N	17	53 E	6.37
AGO LIGHT	61	33 N	17	28 E	6.23	BYVIKEN	63	48 N	20	52 E	8.20
AHVENAN-MEREN CHANNEL	59	32 N	20	18 E	4.6	C					
AJAX SHOAL	59	44 N	23	13 E	2.4	CAMPSGRUND	60	42 N	17	51 E	6.2
ALA	61	13 N	17	10 E	6.19	D					
ALAND ISLANDS	60	05 N	19	47 E	4.9	DEGERFJARDEN	63	24 N	19	20 E	6.55
ALANDSFJARDEN	62	40 N	17	56 E	6.40	DIGSKAR	60	10 N	26	16 E	2.13
ALMON	62	23 N	17	28 E	6.31	DOCKSTA	63	03 N	18	20 E	6.49
ALNOSUNDET	62	26 N	17	24 E	6.32	DOMMASKAR	59	45 N	22	30 E	4.2
ANGERMANALVEN	62	48 N	17	58 E	6.43	DRAGHALLAN LIGHT	62	20 N	17	26 E	6.32
ANGESON	63	44 N	20	54 E	8.20	E					
ARGON	61	33 N	17	27 E	6.23	EDSATTERFJARDEN	62	54 N	18	27 E	6.48
ARGOS GRUND LIGHT	60	38 N	18	22 E	5.11	EDVARDSLACK	65	15 N	22	34 E	9.16
ARHOLMA	59	50 N	19	07 E	5.2	EFESGRUND	63	23 N	19	47 E	8.3
ARKHIPELAG BOL'SHOY FISKAR	60	24 N	27	56 E	2.24	EGGEGRUND LIGHT	60	44 N	17	34 E	6.4
ARMBAGEN	59	38 N	19	58 E	4.4	ELINGRUND	63	19 N	19	53 E	8.2
ARMBAGEN	64	41 N	21	26 E	9.11	EMSALO	60	15 N	25	37 E	2.13
ARNOVIKEN	61	43 N	17	24 E	6.27	ENSJKAR	61	14 N	17	17 E	6.14
ARTUNMATALA	65	15 N	24	07 E	10.10	ESPOONLAHTI	60	05 N	24	40 E	2.11
ASKJA	63	01 N	18	13 E	6.49	EURAJOKI	61	15 N	21	30 E	7.10
ASTHOLMSUDDE	62	23 N	17	44 E	6.31	EYSTRASALTBANKEN	61	46 N	18	52 E	6.28
AVIKREBUKTEN	62	28 N	17	44 E	6.37	F					
AXELSVIK	65	46 N	23	22 E	9.24	FABODVALLSHARARNA	61	12 N	17	11 E	6.15
B											
BALSON	61	43 N	17	32 E	6.27	FADIKARI	61	44 N	21	18 E	7.13
BANKA RUISMATALA	60	25 N	28	13 E	2.24	FALKENSGRUND	65	01 N	22	41 E	9.16
BANKA SHREDNYAYA	60	11 N	28	20 E	2.31	FALKGRUND	63	51 N	20	53 E	8.20
BARSTAHAMN	62	52 N	18	24 E	6.46	FALLISKAR BEACON	63	04 N	20	48 E	8.13
BENGTSKAR	59	43 N	22	30 E	4.2	FANBYVIKEN	63	20 N	19	13 E	6.53
BERGO LIGHT	61	49 N	17	25 E	6.28	FARSTUGRUNDEN LIGHT	65	20 N	22	45 E	9.19
BERGOFJARDEN	63	15 N	19	02 E	6.53	FARSTUGRUNDET LIGHT	65	20 N	22	45 E	9.16
BERGSKARET	64	48 N	21	07 E	9.11	FINNGRUNDEN	60	59 N	18	36 E	6.3
BERGUDDEN LIGHT	63	47 N	20	51 E	8.20	FINNGRUNDET LIGHT	60	59 N	18	36 E	6.3
BJORN BEACON	60	57 N	17	14 E	6.11	FINNHALLAN	64	47 N	21	15 E	9.11
BJORN LIGHT	60	38 N	17	59 E	5.11	FISKE	61	31 N	17	13 E	6.22
BJUREN	63	45 N	20	36 E	8.10	FIARDGRUND LIGHT	63	40 N	20	20 E	8.7
BJUROKLUBB	64	29 N	21	35 E	9.7	FLASAN LIGHT	63	01 N	18	41 E	6.50
BLACKALLEN LIGHT	64	20 N	21	31 E	9.7	FLOTJAN	59	49 N	19	47 E	4.5
BLOMMAN	61	12 N	17	16 E	6.15	FORSMARK	60	24 N	18	13 E	5.7
BOGSKAR	59	30 N	20	21 E	4.4	FURUOGRUND	64	55 N	21	14 E	9.13
BOISTO	60	20 N	26	30 E	2.15	G					
BOKULLANKIVI LIGHT	59	51 N	21	25 E	4.3	GARDFJARDEN	64	28 N	21	43 E	9.8
BOLLSTA	62	59 N	17	42 E	6.45	GASHALLAN	61	01 N	17	17 E	6.10
BONAN LIGHT	60	44 N	17	19 E	6.5	GASHALLAN	62	35 N	21	03 E	7.19
BONDEN	63	26 N	20	03 E	8.3						
BONDENSGRUND	63	28 N	19	46 E	8.3						
BORUSSIAGRUND LIGHT	65	21 N	22	16 E	9.15						
BRAMON	62	13 N	17	43 E	6.30						
BRANNFORS	65	01 N	21	24 E	9.14						
BREDNORET	63	56 N	20	48 E	8.11						
BREDSKAR	63	40 N	20	20 E	8.7						
BRITAS KLACK	61	53 N	17	28 E	6.28						
BUREA	64	37 N	21	14 E	9.9						

	Position				Sec. Para		Position				Sec. Para
	°	'	°	'			°	'	°	'	
L						MYS STIRSUDDEN	60	11 N	29	01 E	2.31
LAGSKAR	59	50 N	19	55 E	4.5	MYS USTINSKIY	59	55 N	28	59 E	1.21
LAHEPERE LAHT	59	22 N	24	12 E	1.8						
LAITAKARI LIGHT	61	03 N	21	13 E	7.5	N					
LALATTA LIGHT	60	17 N	26	33 E	2.15	NAANTALI	60	28 N	22	02 E	4.16
LANGDEN	59	47 N	23	15 E	2.4	NAHKIAINEN LIGHT	64	37 N	23	54 E	10.8
LANGHAREN	60	41 N	17	17 E	6.9	NAISSAAR	59	34 N	24	31 E	1.8
LANGROUDDEN	63	24 N	19	31 E	6.55	NARVA JOESUU	59	28 N	28	03 E	1.17
LAPPOHJA	59	54 N	23	16 E	2.5	NARVA LAHT	59	33 N	27	30 E	1.15
LARSGRUNDET LIGHT	65	28 N	22	28 E	9.16	NARVA LIGHT	59	28 N	28	03 E	1.17
LASKER	64	18 N	21	21 E	9.6	NORDMALINGSFIJARDEN	63	28 N	19	33 E	6.56
LELLERINSAARET	60	24 N	26	58 E	2.18	NORDVALEN LIGHT	63	32 N	20	47 E	8.22
LEPANEN	64	14 N	23	39 E	10.7	NORRA KVARKEN	63	40 N	20	53 E	8.19
LETIPEA NEEM	59	33 N	26	37 E	1.14	NORRA LANGROUNDET	63	19 N	19	41 E	8.2
LILLA TARNSKAR	59	45 N	22	58 E	2.2	NORRA STORBADAN	62	12 N	21	20 E	7.15
LILLBADAN LIGHT	63	39 N	20	21 E	8.7	NORRBYSKAR	63	33 N	19	52 E	8.5
LILLGRUND	62	03 N	17	40 E	6.30	NORRFJARDEN	63	52 N	20	45 E	8.10
LILLGRUNDET	63	51 N	22	37 E	10.4	NORRSKAR	63	14 N	20	39 E	8.13
LILLHALLANSGRUND	63	49 N	20	52 E	8.20	NORRSKAR LIGHT	63	14 N	20	36 E	8.13
LILLHARUN	59	44 N	21	24 E	4.3	NORRSUNDET	60	56 N	17	10 E	6.12
LIMO LIGHT	60	43 N	17	22 E	6.5	NORRUTHARET LIGHT	61	16 N	17	18 E	6.20
LJUSNE	61	12 N	17	08 E	6.17	NORSTROMSGRUND	65	10 N	22	25 E	9.15
LJUSNEFJARDEN	61	13 N	17	12 E	6.15	NORSTROMSGRUND LIGHT	65	07 N	22	19 E	9.15
LOKSA SADAM	59	35 N	25	42 E	1.12	NORTHOLMEN	63	34 N	19	29 E	6.57
LOMONOSOV	59	55 N	29	46 E	3.5	NOTHOLMEN	63	34 N	19	29 E	6.57
LONDONSKAYA OTMEL	59	59 N	29	30 E	3.3	NURMES LIGHT	61	12 N	21	20 E	7.6
LORDAGSHALLAN	63	26 N	19	54 E	8.3	NYGRAN LIGHT	65	01 N	21	42 E	9.15
LORUDDEN	62	14 N	17	40 E	6.30	NYGRUNDET LIGHT	63	44 N	22	32 E	10.2
LOTSGRUND LIGHT	63	11 N	20	43 E	8.14	NYHAMN LIGHT	59	58 N	19	57 E	4.5
LOVIISA	60	27 N	26	14 E	2.16						
LOVISA	60	27 N	26	14 E	2.16	O					
LOVSELE	64	18 N	21	15 E	9.5	ODELGRUND	63	25 N	20	34 E	8.22
LOVSTABUKTEN	60	38 N	17	45 E	6.2	OHTAKARI	64	05 N	23	24 E	10.6
LUGNVIK	62	56 N	17	55 E	6.44	OLDBERGSGRUND LTBUOY	60	19 N	18	59 E	5.10
LULEA	65	35 N	22	10 E	9.19	OLEG	59	35 N	21	58 E	4.2
LUNDE	62	53 N	17	53 E	6.44	OLKILUOTO	61	14 N	21	27 E	7.10
LUNGON	62	39 N	18	04 E	6.38	OLOFSGRUND	61	34 N	17	28 E	6.24
LUNGOSUNDET	62	40 N	18	03 E	6.40	OMNEFJARDEN	62	57 N	18	28 E	6.48
LUODEMATALA LIGHT	65	10 N	25	00 E	10.10	OREFJARDEN	63	30 N	19	48 E	8.4
LUPPI	60	14 N	27	02 E	2.18	OREGRUND	60	20 N	18	27 E	5.7
LUTSKARSGRUND LIGHT	65	40 N	23	20 E	9.21	OREGRUNDS SKARGARD	60	16 N	18	36 E	5.4
LUZHSKAYA GUBA	59	44 N	28	19 E	1.19	ORGRUNDET BEACON	63	47 N	22	33 E	10.4
LYOKKI TOWER	60	56 N	21	08 E	7.4	ORNSKOLDSVIK	63	17 N	18	43 E	6.52
						ORO	59	49 N	22	20 E	4.2
M						ORRENGRUND	60	16 N	26	27 E	2.15
MAARIANHAMINA	60	06 N	19	55 E	4.8	ORRSKARSHAMMEN	61	13 N	17	10 E	6.18
MAJAKARTTI	60	19 N	27	35 E	2.21	ORSKAR LIGHT	60	32 N	18	23 E	5.11
MAKIHUOTO	59	55 N	24	20 E	2.8	OSMUSSAAR ISLAND	59	18 N	23	22 E	1.2
MALOREN	65	32 N	23	34 E	9.20	OSTRA KVARKEN	63	33 N	20	51 E	8.24
MALOREN LIGHT	65	32 N	23	34 E	9.20	OSTROV DOLGIY KAMEN	60	28 N	27	52 E	2.24
MANTYLUOTO	61	36 N	21	29 E	7.12	OSTROV GOGLAND	60	03 N	26	59 E	1.5
MARHALLAN	60	02 N	19	52 E	4.7	OSTROV IGRIVVY	60	36 N	28	28 E	2.25
MARIEHAMN	60	06 N	19	55 E	4.8	OSTROV KOPYTIN	60	26 N	27	42 E	2.23
MARJANIEMI LIGHT	65	02 N	24	34 E	10.10	OSTROV KOTLIN	60	00 N	29	46 E	3.3
MARKET	60	18 N	19	08 E	5.9	OSTROV KOZLINYY	60	27 N	27	47 E	2.23
MARKETSKALLEN	60	19 N	19	02 E	5.9	OSTROV KREPYSH	60	38 N	28	32 E	2.26
MARTINNIEMI	65	13 N	25	17 E	10.12	OSTROV MAYACHNYY	60	34 N	28	26 E	2.25
MASSKAR TOWER	63	44 N	22	35 E	10.2	OSTROV MOSHCHNYY	60	00 N	27	50 E	1.5
MATTSUNDBERGET	65	33 N	21	56 E	9.19	OSTROV NERVA	60	15 N	27	57 E	2.22
MERIKALLAT	65	02 N	24	05 E	10.10	OSTROV RODSHER	59	58 N	26	41 E	1.4
MERIKARI	60	21 N	27	06 E	2.18	OSTROV RONDO	60	27 N	28	22 E	2.24
MERIKARVIA	61	51 N	21	29 E	7.14	OSTROV SESKAR	60	02 N	28	23 E	1.5
MERIKARVIAN MAJAKKA LIGHT	61	56 N	21	17 E	7.13	OSTROV SOMMERS	60	12 N	27	39 E	2.22
MICKELSORAR	63	26 N	21	46 E	8.15	OSTROV SYARKKYALUOTO	60	18 N	28	48 E	2.31
MO	63	33 N	19	52 E	8.5	OSTROV VIHREVOY	60	34 N	28	26 E	2.25
MOHNI SAAR	59	41 N	25	48 E	1.12	OTROV BOLSHOY TYUTERS	59	51 N	27	11 E	1.4
MOHNISAAR	59	41 N	25	48 E	1.3	OTTERHALLAN LIGHT	61	16 N	17	18 E	6.20
MOLDOVA	59	26 N	27	03 E	1.15	OULU	65	01 N	25	28 E	10.11
MONASSUNDET	63	29 N	22	19 E	8.16	OULU 1 LIGHT	65	11 N	24	30 E	10.10
MORGONLANDET	59	46 N	22	42 E	4.2	OULU 2 LIGHT	65	10 N	24	35 E	10.10
MORRIS LT BEACON	61	35 N	21	25 E	7.11	OULU 3 LIGHT	65	09 N	24	40 E	10.10
MUNSALAN	63	23 N	22	18 E	8.16						
MUUGA	59	30 N	24	56 E	1.10	P					
MYRAN	61	36 N	17	28 E	6.24	PAKLISKI LAHT	59	20 N	24	00 E	1.6
MYS KRESTOVYY	60	31 N	28	14 E	2.24	PAKRI NEEM	59	23 N	24	02 E	1.6
MYS KURGAL'SKIY	59	47 N	28	06 E	1.18	PALDISKI	59	21 N	24	02 E	1.7
MYS KYURENNIYEMI	60	16 N	28	55 E	2.31						
MYS LOUNATRIVI	60	01 N	27	00 E	1.5						
MYS SHEPELEVSKIY	59	59 N	29	08 E	1.22						

