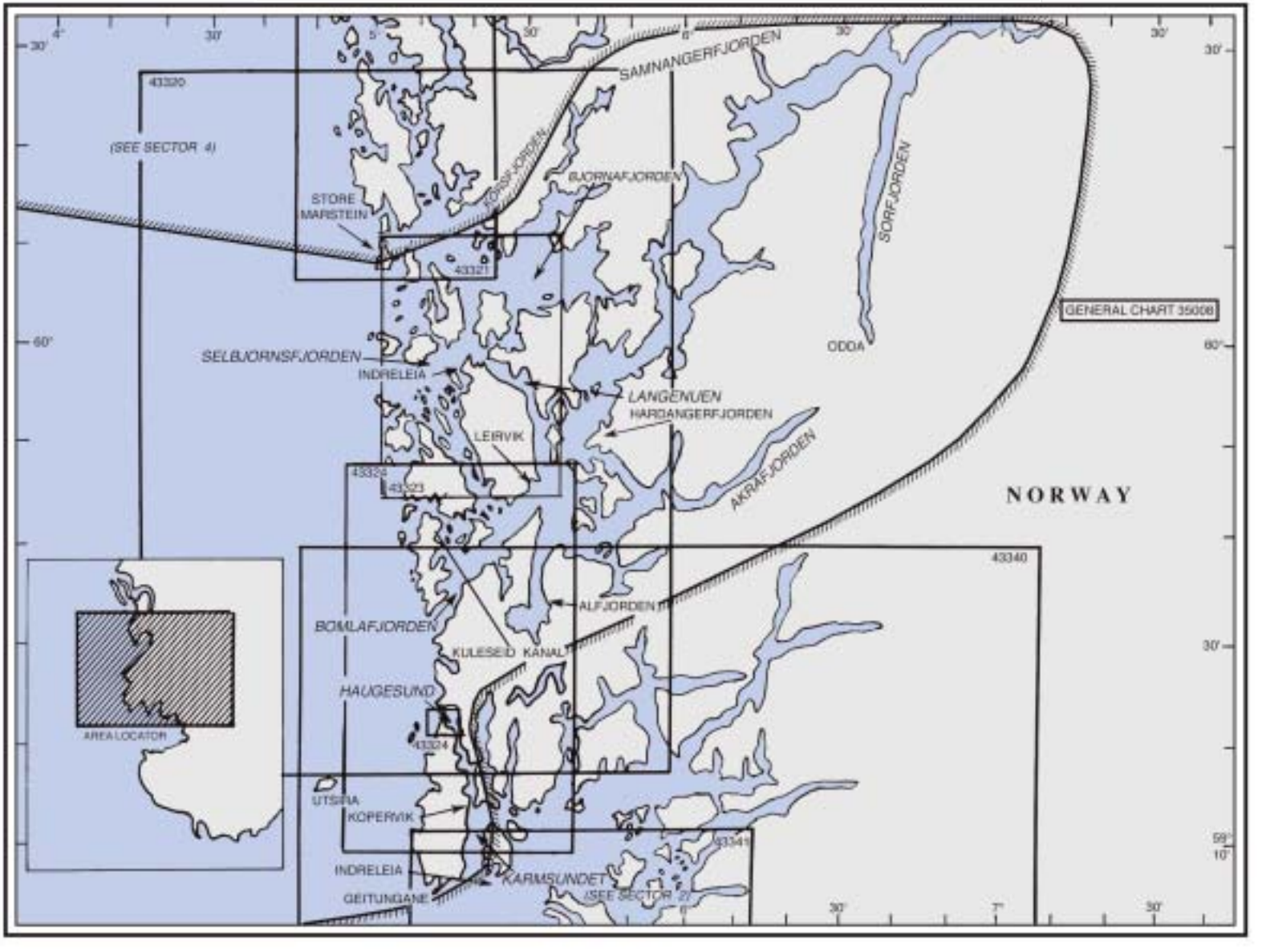
Click on "See Sector" to be hotlinked to that Sector.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **3** — CHART INFORMATION

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SECTOR 3

THE COAST OF NORWAY FROM SKUDENESFJORDEN TO KORSFJORDEN

Plan.—This sector describes the outer coast between Skudenesfjorden and Korsfjorden, and then the inner route and adjacent inlets between these two major fjords. The arrangement is N, starting from Getungane, two islets directly S of Karmoya on the N shore of Skudensfjorden, and Store Marstein, an islet on the S side of Korsfjorden..

General Remarks

3.1 Winds—Weather.—The prevailing winds on the W and S coasts of Norway reflect the average pressure distribution and its seasonal changes. With the shift from high pressure over S Norway in winter to low pressure in summer, the winds on the W coast change from S in winter to N in summer. The prevalence of winds from any one direction is not in evidence more than 40 percent of the time. The more usual situation is one of winds induced by a passing cyclone with shifting directions and velocities.

Within the fjords and along the very indented coast line the wind is usually widely different from that in the open sea, owing to land and sea breezes and topographical effects.

Because of the mountainous nature of the coast any wind blowing from a direction between S and WSW is deflected to blow as a S wind on the coast, and any wind blowing between NW and N is deflected to blow as a N wind. The winds in W Norway therefore have a tendency to blow across the mouth of the fjords. The speed of the wind also increases outward from the coast to a distance of as much as 150 miles.

There is a lot of turbulence along the Norwegian coast when winds are fresh or strong, due to the broken country. Gales occur very frequently over this area when deep depressions are moving NE between the British Isles and Iceland, under which condition a very steep gradient is apt to develop all along the W seaboard of Norway, producing strong S winds. This very steep gradient at times extends 100 to 150 miles out to sea from the coast.

Under these conditions the coast is swept by violent winds which penetrate into the more sheltered fjords with great turbulence though with reduced velocity. Spells of NW gales occur on the W coast when a suitable gradient is established by pressure falling over Scandinavia. Such gales are apt to persist but the gradient on some occasions falls off suddenly to the E of the Shetlands.

Weather conditions in this coastal sector are changeable. The prevailing winds are E from October to March and W from April to September. In winter the heaviest gale occur with SW winds and are usually accompanied by rain or snow. Northwest winds are, as a rule, dry both in summer and winter.

The most rainy months are generally October and November. Snow appears near the coast in December and in places remains until March.

Fog occurs off the coast in summer for an average period of five days each month.

Ice.—Ice in this area offers no hindrance to navigation and is present only in the upper reaches of the fjords along the coast. Floating ice is met in spring, when small masses, which are soon dispersed, may drift out of Oslofjorden and Kattegat, and occasionally from some of the larger fjords to the W and N of Lindesnes.

Tides—Currents.—North of Skudenesfjorden entrance the current sets N with a decreasing velocity. An average velocity of about 2 knots is maintained about 5 miles offshore as far N as Breidsundet.

The velocity decreases both toward the coast and seaward, and about 15 miles offshore is not more than about 0.2 knots.

The decrease seaward may be caused by a S current E of the Shetland Islands. These two currents form large weak eddies, rotating counterclockwise and centered 30 to 40 miles offshore.

Tidal currents between Skudenesfjorden entrance and Korsfjorden entrance the tidal currents about 5 miles offshore usually sets N. With long periods of SW and W gales, the set is N and fairly strong, especially during the rising tide (beginning about 5 hours 45 minutes after HW at Bergen).

Closer inshore, the tidal current component is more appreciable, resulting in a N set during the rising tide and a S set during the falling tide (beginning about 30 minutes before the HW at Bergen).

The tidal current usually sets outward from the entrances of the large fjords.

In Stokksund and Nyleid the tidal currents set N with the rising tide and S with the falling tide. Before the onset of unsettled weather, however, there may be a set in one direction, either N or S, for a considerable period of time.

In Alfjorden the tidal currents may be very strong, but there may also be tidal currents setting in opposite directions in the outer and inner parts of the fjord. The tidal currents near the land usually differ in direction from that in the middle of the fjord.

In Langenuen there is nearly always a N setting tidal current, although occasionally in fine weather it sets S. Current velocitys of 4 to 5 knots during strong S winds have been reported off Skor Light. Dangerous eddies near the shores of Langenuen have also been reported. There is usually an outgoing tidal current in Hardangerfjorden, however, there may be an incoming current during W gales at sea, but only in the outer part. The outgoing tidal currents may be very strong in Bondesundet W of Varaldsoy, off Ljones in Hissfjorden, and off Krosnes at the entrance of Sorfjorden.

Off Simadal, at the head of Eidfjorden, there is usually a weak outgoing current, which is somewhat increased during and after periods of heavy rains and after the snow melts, but this current may cease with long continued SW winds.

In Lokksundet, the channel connecting Hardangerfjorden. with Bjornefjorden the spring velocity of the current is nowhere more than 0.3 knot. With onshore winds at sea, there is a continuous N tidal current in Lokkfsundet.

Tides in the North Sea are always semidiurnal, with very little diurnal inequality between the two HW or the two LW of each tidal day.

The tides progress into the North Sea from the Atlantic ocean, between the Sheltered Islands and Norway. Within the North Sea, HW progresses counterclockwise about a nodal point off the S coast of Norway, moving S in the North Sea and W along the S coast of Norway between Kristiansand and the 6th meridian. Along the W coast of Norway the progression is N to about 60˚ N.; N of this the progression is E.

Along the W coat of Norway, tide ranges gradually increase toward the N, from 0.2m at Mandal to 0.91m at Bergen.

Generally, along the W coast of Norway, the influence of wind on the tide level is small. This is probably due to the scattering effect of offshore island and the relatively deep water close inshore.

Caution.—In winter, snow is the greatest danger. The land is often completely obscured in snow. In Indreleia, when a snowstorm threatens, careful bearing of the nearest anchorage should be taken to enable the vessel to seek shelter. Because of the tidal current, it.is dangerous to heave-to.

Skudensfjorden to Korsfjorden

3.2 The coast between Geitungane, two islets directly S of Karmoya on the N shore of Skudensfjorden, to about 60 miles N to Store Marstein, an islet W of Stora Kalsoy on the S side of the entrance to Korsfjorden, consists of several large islands, fringed with islets and rocks. The large islands include Karmoy, Bomlo, and Selbjornen. There are numerous detached dangers along the irregular outer coast.

Bomlafjorden and Selbjornsfjorden are two deep inlets which are entered from seaward and lead into the inner network of fjords.

Hardangerfjorden is a continuation of Bomlafjorden and extends, under various names, about 70 miles in a NE direction from its entrance. Indreleia (Inner Lead), comprising all of the inner channels leading N toward Bergen, is entered from Skudenesfjorden through Karmsundet, the passage on the E side of Karmoy.

North of Skudenesfjorden, the characteristic features of the Norwegian coast begin gradually to appear; the islands increase in size and number, and the mountains attain a greater elevation, but there are as yet no traces of the bold, striking outlines and savage grandeur which distinguish the coastal scenery N of Trondheim.

The entrances of Skudenesfjorden and Bomlafjorden are conspicuous from offshore. Although, when sailing toward Bomlafjorden, the elevation of the land along the coast decreases in height, when entering Bomlafjorden in clear weather, the Hardanger Mountains are easily visible.

An imaginary line drawn through the outermost islands, islets, and dangers fronting the mainland between the Bomlafjorden entrance and the Korsfjorden entrance runs irregularly, but approximately N for about 35 miles.

Selbjornsfjorden is entered about 12 miles S of Korsfjorden. These last two fjords are considered the most important N fjords of this section. They are the principal S approaches to Bergen.

The Outer Coast—Off-lying Islets and Dangers

3.3 **Beryl Oil Field** (59˚33'N., 1˚32'E.) is situated about 103 miles WNW of Utsira. There is a production platform with an adjacent flare structure linked to it by a bridge. SPM tanker loading platforms stand close NE and SE of the platform.

Ness Oil Field, Bruce Gas Field, and Linnhe Oil Field lie 4 miles W, 9 miles N, and 9 miles NE, respectively, of Beryl Oil Field.

Heimdal Gas Field (59˚35'N., 2˚15'E.) lies 20 miles E of Beryl Oil Field; gas pipelines, which may best be seen on the chart, extend S and SSW from it.

Frigg Gas Field (59˚53'N., 2˚04'E.) is situated about 90 miles W of Slatteroy and consists of a complex of platforms.

A treatment and compression platform stands in the field. Close W of it and linked to it by a bridge, stands a treatment platform. A platform containing living quarters stands close SSE of the treatment platform and is linked to it by a bridge.

A drilling platform, a flare structure, a steel platform, and a disused drilling platform stand close SSW, close W, close NNE, and close ESE, respectively, of the treatment and compression platform. Gas pipelines, which may best be seen on the chart, extend N, NE, and SW from the field.

Northeast Frigg Gas Field and East Frigg Gas Field lie 8 miles NE and 9 miles ENE, respectively, of Frigg Gas Field.

For oil and gas fields N of the above, see Sector 4. For fields S of the above, see Sector 2 and Pub. 141, Sailing Directions (Enroute) Scotland.

3.4 **Utsira** (59˚18'N., 4˚53'E.), 71m high, lies about 9 miles off the W coast of Karmoy and, because of its isolated position, is conspicuous. Utsira is inhabited; during the spring herring fishing season numerous fishing vessels visit the island. A main light is shown from a prominent light tower, 13m high, standing on the W part of the island.

Lights are shown from both sides of a sound that indents the SE side of Utsira close NW of Beiningen, a small islet. A light is shown from a rock close E of Beiningen.

Lausingen is the southernmost islet in the Utsira group and is located about 2 miles SSW of the S extremity of Utsira. This islet is low and foul on all sides. Vestreflu, a 5m depth, and Lausingbaen, a 2m depth, lie about 0.1 mile SW and 0.2 mile N, respectively, of Lausingen. Skallen, a 14m depth, lies about 0.6 mile SE of Lausingen.

Spannholmane (59˚17'N., 4˚51'E.), a group of islets, is located about 0.5 mile N of Lausingen. Holmegrunka is an 11m depth, about 0.2 mile N of Spannholmane.

Vindballen, an above-water rock, and Vindballflu, with a depth of less than 1.8m, lie within 0.3 mile SW of Beiningen. Lille Seiskjaer, partly above-water, lies about 0.3 mile SSE of Beiningen. Skarholmflu, a 4m shoal, is located 0.25 mile off the E extremity of Utsira. All other charted dangers near Utsira lie within 0.2 mile offshore.

The two harbors in Utsira are Tuavag and Nordvikvag, on its S side and N side, respectively. They are available only to small vessels with local knowledge.

Tuavag provides anchorage, in a depth of 17m. A mole, near the head of the cove, forms a boat harbor which has depths of

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1.8 to 7.6m. In the entrance to the boat harbor, there are depths of 4.9 to 5.8m. A quay has depths of 4 to 5m alongside.

Nordvikvag is free from dangers in the fairway and affords anchorage, with good holding ground, in depths of 6 to 17m. Two quays have depths of up to 5m.

Ferkingstadoyane (59˚14'N., 5˚04'E.), a group of comparatively high islets, lies nearly 3 miles W of Ferkingstadneset, which is on the W coast of Karmoy, about 5 miles N of Jarsteinen. The islets are unoccupied, but are frequented during the fishing season by lobster fishermen.

There is no harbor in the group. Fringing rocks and shoals, some of which are awash, lie within 0.25 mile of some of the islets.

Urter (59˚22'N., 5˚02'E.) lies with its S end about 4 miles NE of Utsira. It includes the small islet of Urter and a number of islets and above and below-water rocks spread over an area about 2 miles long, N and S.

The Urter group is uninhabited, but is visited by fishermen during the fishing season. On Urter, there is a building for their use. There are no harbors in the group.

All the remaining islets and dangers along the coast between Geitungane and Korsfjorden entrance lie within 6 miles W of the larger islands forming this coast.

Skudensfjorden to Bomlafjorden

3.5 The coast between Skudenesfjorden and Bomlafjorden, the next N large fjord which leads in from seaward, is formed by the W coasts of Karmoy. It is part of the Haugesund peninsula. This peninsula is indented by smaller fjords, bays, and inlets, and is separated from Karmoy by Karmsundet, which forms the S reach of Indreleia.

The irregular coast of Karmoy is fringed by close-lying islets and dangers, which extend as far as 2.5 miles offshore. About 10 miles N and NW of Karmoy, in the seaward approaches to Haugesund and Bomlafjorden, there are groups of islets and numerous dangerous rocks.

Hills in the SE part of Karmoy are 61 to 79m high and are rugged. The beaches up to Veavagen, a distance N of about 10 miles, are composed mainly of white sand and rocks.

Sandvehamn (59˚11'N., 5˚11'E.) is a small harbor sheltered by two sets of breakwaters. Anchorage is available for small vessels at Sandvehamn only during good weather. Sailors should have local knowlege before attempting to anchor in this area.

Ferkingstadvag (59˚14'N., 5˚11'E.) is a good fishing harbor entered N of a short mole. It has a dredged depth of 4m and has quays with mooring rings. Fuel oil and fresh water can be supplied. Foul ground, with some above-water rocks, extends up to 0.2 mile offshore NW from the S entrance point of Ferkingstadvag.

3.6 **Akrehamn** (59˚16'N., 5˚11'E.) (World Port Index No. 23465), a harbor for small vessels and fishing boats, is on the W shore of Karmoy, midway S of Veavagen.

The approach to Akrehamn lies between the coast at the Ferkingstadvag entrance and Maroy, which lies close offshore about 3 miles N. The approach is encumbered with numerous dangers extending up to 1.5 miles offshore.

The islets forming the harbor are joined by causeways and moles, leaving an opening from the S which is entered close E of a short mole extending SE from Mortholme. There are several approaches leading in among the outer dangers, but local knowledge is required. Buoys and perches mark the channels. The inner harbor has been dredged to a depth of 4m.

Svortingen and Ryvingen, the outermost islets in the near approach to Akrehamn, are located about 1 mile WNW and 1.5 miles NNW, respectively, of Akrehamn. Both islets are dark colored and are easily seen against the beach's white sand. Svortingflu, a 9m depth, lies about 0.5 mile WNW of Svortingen.

Veavagen

3.7 **Veavagen** (59˚18'N., 5˚13'E.), a narrow inlet, runs SE for about 2.25 miles from its entrance between Kvartnesholme, about 2 miles NE of Maroy, and Veavagneset, on Karmoy about 0.2 mile farther NE. A light is shown from Veavagneset. Several islets and rocks, some marked by buoys and iron perches, lie on a foul ground area W of the entrance to Veavagen.

The approaches to Veavagen within 1.5 miles SW, W, and NW of Kvartnesholme are obstructed by numerous islets and reefs, among which there are several channels. Only the N channel, leading in between the NE side of Kvitingane and Meldrane, is recommended.

Salvoy, Dyrholme, and Kavholme lie in the foul area SW, W, and NW, respectively, of Kvartnesholme. A beacon stands on the NW extremity of Dyrholme.

Beacons marks some of the dangers in the area between Salvoy and Maroy; perches marks some of those near the approach channels.

A beacon stands on Svartholme, about 0.5 mile N of the N end of Kavholme. Between the beacon and the islet there is a group of above-water rocks named Kvitingane. A 4m depth, marked by an iron perch, and a 5m depth, marked by a buoy, lie about 0.2 mile WNW and 0.3 mile NNW, respectively, of Svartholme.

Lamholme (59˚20'N., 5˚12'E.) is located in a foul bight about 1 mile NNE of Svartholme. Rocks lie up to 0.2 mile SW of the islet. Meldrane, an above-water rock, is the outermost danger in this direction. Stroka, with a depth of 15m, lies about 0.3 mile NW of Lamholme on the N side of the entrance to Veavagen.

Breakwaters extend from each shore in a position about 1 mile SE of its entrance to Veavagen. The space between heads is about 60m. A light is shown on each side.

Anchorage.—Anchorage can be taken in Veavagen, in charted depths of 23.8m, with a mud and sand bottom, about 1 mile SSE of the entrance. There are several other anchorages on both sides of the inlet.

Caution.—A submarine pipeline crosses the head of Veavagen N of **Brekke** (59˚17'N., 5˚16'E.). It then extends NW for about 2 miles, close to the NE shore of the inlet.

Gas pipelines extend seaward from a terminal located close to the N end of the entrance to Veavagen.

3.8 **Feoy** (59˚23'N., 5˚10'E.) is an inhabited group of islands and islets lying within 2.5 miles of the W side of the N portion of Karmoy. Foynfjorden lies between Feoy and Karmoy.

Most of the islets and islands are close to one another. Some of the narrow channels that separate the islands are navigable by small vessels. Within and on the outer edge of the group, there are numerous smaller islets, rocks, and other dangers. Perches, beacons, and buoys mark some of the dangers near the channels.

Foynfjorden (59˚25'N., 5˚11'E.) has a depth of more than 14m in its fairway; some of the dangers on both sides are marked by perches and buoys. It provides a navigable channel leading N to the seaward approaches to Haugesund.

3.9 The approach to Haugesund leads in among the concentration of islets and rocks lying within 2 miles NW and N of **Osnesgavlen** (59˚25'N., 5˚14'E.), the N extremity of Karmoy. Haraldstotta, a conspicuous red granite obelisk, stands on the mainland about 1 mile NNE of Osnesgavlen.

The port of Haugesund is entered by either one of two channels which are formed at the N end of Karmsund by a chain of islets extending SSE from **Sorhaugoy** (59˚25'N., 5˚14'E.).

Vestre Karmsund, the SW and principal channel, lies between these islets and the N end of Karmoy at Osnesgavlen. It is approached directly through the outer buoyed channel.

Vibrandsoysund, the NE channel, leads in between the above-mentioned islet chain and Killingoy and Hasseloy.

Pilotage.—Pilotage is compulsory. Pilots can be obtained from Kvitsoy.

From the vicinity of the N entrance to Haugesund, the mainland coast trends in a general N direction for about 6 miles to Ryvarden, the S entrance point of Bomlafjorden.

Four islet and rock-encumbered bays and a few small coves indent the coastline. Numerous islets, shoals, and foul patches front this coastal stretch, most of them lying in the seaward approach to Bomlafjorden, where they form the N side of Sletto.

Sletto is an open stretch of sea NW of Haugesund. The depths in the area are variable, from shoals with depths of 2m to places as deep as approximately 250m.

The area is relatively narrow, and the great variations in depth cause extremely turbulent and choppy seas when waves come in from the SW to NW. The conditions become even worse when the tidal current runs against the waves.

Smorsundnes (59˚30'N., 5˚14'E.), marked by a beacon, is located on the mainland about 4 miles N of the N entrance to Haugesund.

Smorsundholme lies close NE of this point and is separated from Trettoy, NE of it, by a narrow channel named Smorsund. Viksefjorden is joined to the SE end of Smorsund by the narrow Straumen, which has depths of 0.9m in places.

Molstrevag is entered between **Langeneset** (59˚31'N., 5˚14'E.) and a point about 0.3 mile farther N. The inner part of Molstrevag is sheltered, but the entrance channels are very narrow. Some of the rocks in the bay are marked by iron perches. Among several quays at Molstrevag, the largest has depths of 5 to 7m alongside.

Anchorage.—Anchorage can be taken in Molstrevag, in 16.5m, sand bottom. The approach channels to this anchorage are narrow. Smaller vessels anchor farther in.

Haugesund (59˚25'N., 5˚16'E.)

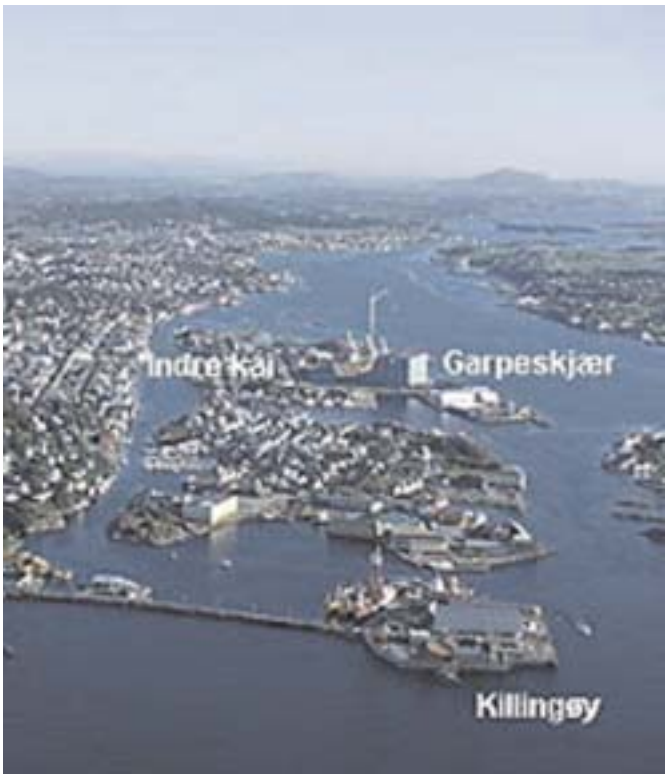
World Port Index No. 23440

3.10 Haugesund was originally a fishing port, but shipping and industry have gradually increased its importance. It has an expanding ship building and ship repairing capability for conventional vessels, supply vessels, and offshore structures.

Haugesund’s harbor facilities extend from the mainland to the adjacent islets of Risoy, Hasseloy, and Killingoy, and continuing across Karmsundet to Karmoy.

Garpeskjaershaien, on Risoy, and Killingoykaien, on Killingoy, have facilities to handle general cargo. The berth on the W side at Garpeskjaershaien is 400m long; the berth on the W side of Killingoykaien is 157m long.

Panoramic view of Smedasundet—Inner Harbor of Haugesund



Courtesy of Eirik Hustvedt

Haugesund

A bridge, with a vertical clearance of 13.5m, connects Hasseloy with the mainland. Another bridge, with a vertical clearance of 22.5m, joins Risoy with the mainland. Lights are shown from the center of the bridges to indicate the fairway.

Smedasundet, the inner harbor, separates Svinholmen, Hasseloy, and Risoy from the mainland. Vessels up to 5,000 dwt can discharge here.

Winds—Weather.—The weather at Haugesund is changeable, which is characteristic of the W coast of Norway. Cargo operations are not interfered with. The port is well sheltered from all winds and is ice free. Winter storms are frequent and may be from any quarter.

Tides—Currents.—The tidal current turns regularly 3 hours before and 3 hours after HW, so that at about HW the current is setting with its greatest velocity to the S; at LW the current is setting with its greatest velocity to the N. With strong, continuous N winds, the tidal current may set continuously S and, similarly, with strong, continuous S winds, it may set continuously N.

The tidal currents attain their maximum velocity through Vibrandsoysund, off Osnesgavlen in Vestre Karmsund, and in Salhusstraummen. In the latter channel, the current may attain a velocity of 3 knots, but in Vibrandsoysund it is seldom stronger than 2 knots. Strong winds, as mentioned above, also greatly influence the velocity.

In Smedasund and other parts of the harbor, the velocity is usually about 1 knot. Nowhere do tidal currents affect the normal use of the port.

Courtesy of Eirik Hustvedt

Garpeskjaer

Courtesy of Eirik Hustvedt

Killingoy

Depths—Limitations.—At Garpeskjaer, Berth No. 1 is 500m long and can handle vessels up to 10m draft. Berth No. 2 is 400m long and can handle vessels up to 8.7m draft.

At Killingoy Offshore Base, Berth No. 1 is 158m long and can handle vessels up to 15m draft. Berth No. 2 is 234m long and can handle vessels up to 10m draft.

In addition, there is about 1,750m quayage, with depths of 4.5 to 10.9m alongside. There are facilities for ro-ro vessels, tankers, and oil-drilling rigs. Vessels up to about 350m in length can be accommodated in the port. A dry dock can handle vessels up to 155,000 dwt.

There is a lay-up area for rigs and vessels up to about 250,000 dwt, in depths of 23 to 40m. It is reported that vessels are generally restricted to a length of 320m and a sailing draft of 10m.

Pilotage.—Pilotage is compulsory. Pilots for Haugesund are obtainable at Kvitingsoy, Skudenes, Utsira, and Kopervik.

Anchorage.—Vessels can anchor, in 18.3 to 37m, good holding ground, about 0.1 mile off the SW side of Risoy. In this anchorage caution is necessary because farther SW the depths increase suddenly.

3.11 Bomlafjorden (59˚34'N., 5˚14'E.) is entered between **Ryvarden** (59˚32'N., 5˚14'E.) and Bomlahuk, the S extremity of Bomlo. Bomlafjorden is described along with Indreleia.

Ryvarden Light is the N entrance point of Molstrevag.

Ryvarden Light

Gunnarskjersholet (Gunnarskjaershalet) (59˚33'N., 5˚08'E.) is the name given to the approach leading in from the W to Bomlafjorden. Its fairway is deep and free and has a width of about 0.5 .

Raudholmene (59˚33'N., 5˚09'E.) is a group of islets and rocks on the S side of Gunnarskjersholet, about 2 miles SW of Bomlahuk. Numerous islets, rocks and shoals, best seen on the chart, lie in the vicinity of Raudholmene. Gunnarskjersholet lies about 1 mile NW of Raudholmene.

Directions.—There is no difficulty in approaching Bomlafjorden from seaward by way of Gunnarskjaersholet. Steer for the light structure on Raudholmene on a bearing of about 099˚ and, when about 0.5 mile from the light, alter course to pass about midway between Raudholmene and Gunnarskjaer. When clear of Raudholmene, alter course E into the fairway of Bomlafjorden.

Caution.—Vessels passing close to **Sveio Broadcasting Station** (59˚37'N., 05˚19'E.) may experience electronic interference due to the station's electromagnetic fields.

Bomlafjorden to Selbjornsfjorden

3.12 The coast between the seaward entrances of Bomlafjorden and Selbjornsfjorden is irregular. It is formed by the islands of Bomlo, Goddo, and Gissoy, and the many islets, rocks, and shoals in their vicinity.

Bomlafjorden lies between the mainland, on the SE, and the islands of Bomlo, Mosteroy, and Stord, on the NW. From its entrance, the fjord runs NE for about 15 miles to Tittelsnes, where it joins with the inner fjords of Alfjorden, Bjodafjorden, and Klosterfjorden.

Bomlafjorden is a broad, deep channel. Its fairway is free from dangers and is easily navigated. The current at its entrance is usually outgoing, but is incoming in bad weather, even during NE gales.

When passing W of Bomlo, it is advisable to keep well clear of the outer dangers for, although most of them are either visible above-water or are indicated by breakers, they extend some distance seaward; during light winds the flood current frequently sets strongly toward the shore.

Most of Bomlo is moderately high and, as the off-lying islets are much lower, they are not easily distinguished until within a distance of about 10 miles.

Pilotage.—Pilotage is compulsory for most vessels.

Siggja (59˚45'N., 5˚18'E.), a peak in the N part of Bomlo about 20 miles N of the N end of Karmoy, is visible in clear weather for a distance of about 30 miles. It resembles a pyramid with a rounded top and a broad base. Siggja is normally seen before any other part of Bomlo is visible.

There are numerous anchorages on this coast, some of which would possibly afford shelter to vessels of moderate draft, although the available sources of information generally limit them to small vessels.

3.13 **Bomlo** (59˚40'N., 5˚12'E.) is an irregularly-shaped island which is divided into two parts by the Kuleseidkanal, described in paragraph 3.15. The W coast of Bomlo is somewhat protected by a number of scattered islet groups, through or E of which there is an inshore channel for small vessels with local knowledge.

Dyrneset (59˚37'N., 5˚10'E.), a point, is located about 3 miles NNW from the point of Bomlahuk. Four inlets between Dyrneset and Bomlahuk indent the island's coast; Kalavag, Eidesvik, and Roaldsfjorden, the three southernmost inlets, provide anchorages for small vessels with local knowledge, in 7.3 to 12.8m. Iron perches mark some of the dangers on the approach to the anchorage areas.

Dyrnesflu, a 1.8m depth marked by an iron perch, lies 183m offshore in a position about 0.3 mile S of Dyrneset.

Espevaer (59˚35'N., 5˚09'E.) is the largest islet in the Espevaer group lying within 2 miles NW of Bomlahuk.

Numerous above and below-water rocks lie within and on the edge of the group. Fishing vessels frequent these islets, especially during spring. Only small vessels with local knowledge can enter the group.

Nordoyane (59˚36'N., 5˚07'E.) is a group of small islets and rocks that lie within about 2 miles NW of the NW extremity of Espevaer; these waters are very foul. Navigation through them should be attempted only by small vessels with local knowledge.

Sonoyosen (59˚35'N., 5˚07'E.) is the channel between the Espevaer group and Nordoyane. It should not be used during stormy weather or without local knowledge. Iron perches mark some of the dangers near the fairway.

Vikafjorden (59˚38'N., 5˚11'E.), on the W coast of Bomlo, can be used for anchorage by small vessels, but local knowledge is necessary. Iron perches mark foul ground on the sides of the fjord.

Gissoysund (59˚38'N., 5˚10'E.), immediately N of Vikafjorden, is a passage between the coast of Bomlo and Nordre Gissoy and Sore Gissoy, the two parts of an off-lying island.

Holsoyane (59˚39'N., 5˚07'E.) is a group of islets and rocks which lies within 2.3 miles W and WNW of the N extremity of Nordre Gissoy.

3.14 Grutlefjorden (59˚40'N., 5˚10'E.) indents the W coast of Bomlo. Shoal water extends about 0.2 mile from the head of the inlet. Several of the dangers fringing the shores of the inlet are marked by iron perches. A quay at the head of the inlet has depths of 5 to 7m alongside.

Anchorage.—Anchorage can be taken, in 20.1m, on the NW side of Grutlefjorden about 0.3 mile within the entrance.

Stokvik, on the Bomlo coast about 1 mile N of Grutlefjorden, provides anchorage for small vessels in about 5.5m.

Lyklingfjorden (59˚42'N., 5˚11'E.), which indents the Bomlo coast, can accommodate small vessels with local knowledge. Lyklingfjorden is very foul; iron perches mark some of the dangers.

Store Hiskjo (59˚44'N., 5˚09'E.), Lille Hiskjo, and numerous other close-lying islets, fringing dangers, and detached rocks lie in a group close off the coast of Bomlo and NW of the entrance to Kuleseidkanal.

The channels between Bomlo and these islands and between Store Hiskjo and Lille Hiskjo are encumbered with dangers, some of which are marked by iron perches. Dangers extend about 0.5 mile offshore from the seaward sides of the islets. Hiskosen is the water area between the SE sides of Store Hiskjo and Lille Hiskjo and the coast of Bomlo.

Anchorage.—Anchorages for small vessels with local knowledge are available in several places in the channels separating Store Hiskjo and Lille Hiskjo and among the adjacent islets.

3.15 The W approach to Kuleseidkanal leads through Hiskosen, then NE through Adnanesosen, the water area between the SE side of Lille Hiskjo and the Bomlo coast, then SE through **Troytarosen** (59˚44'N., 5˚13'E.), an embayment.

Dyroy (59˚45'N., 5˚11'E.), with Dyroykalven close S, forms the N side of Adnanesosen. A 2.7m depth extending a short distance S of Dyroykalven is marked by an iron perch.

Hanaskjaer (59˚44'N., 5˚10'E.), marked by a beacon, is on the NW side of the fairway about 0.3 mile SSE of the S extremity of Lille Hiskjo. Tausastein, awash and marked by an iron beacon, lies on the W side of the fairway at the N end of a shoal in a position about 0.2 mile NNE of Hanaskjaer.

Selvagflu, marked by an iron perch, is on the edge of foul ground extending from Bomlo, on the E side of the fairway about 1 mile E of Tausastein.

Vordnesholmen (59˚45'N., 5˚13'E.) lies close off the N side of Vordnes on the S side of the channel to Kuleseidkanal.

A 7m depth is located about 0.1 mile WNW of Vordnesholmen. Foul ground, marked by an iron perch, fringes the E side of Vordnes.

Flatholmen is located about 183m NE of Vordnesholmen. Entrance into Troytarosen is made between these two islets.

Kuleseidvag (59˚44'N., 5˚14'E.) lies SE of Troytarosen and is connected to that basin by a narrow channel between Bomlo, on the NE, and the small islet Straumsholmen, on the SW. A light marks each end of the channel.

Kuleseidkanal leads NNE from Kuleseidvag to Finnasvik, at the NW end of Boroyfjorden. The canal is about 8.8m wide in its narrowest part and 4m deep. A bridge, with a vertical clearance of 13m, spans the canal near its SW end. Vessels with a length of 38m and a draft of 3.6m can use the canal. There is a speed limit of 5 knots in the canal. Lights mark each end of Kuleseidkanal.

The coast from **Storaneset** (59˚45'N., 5˚08'E.), a projection on the seaward side of Bomlo, to Slatteroy, on the S side of the Selbjornsfjorden entrance about 9 miles N, is formed by the seaward sides of Bomlo, Rogoy, Goddo, Gissoy, and numerous other islets that are near and between these islands and larger islets. Fringing dangers lie up to 1.25 miles off some of the larger islets. A maze of intricate channels leads among the islets into sheltered anchorages for small vessels, but local knowledge is necessary for their navigation.

Beacons and perches mark some of the dangers near the fairways and there are several lights.

3.16 Meling (59˚47'N., 5˚07'E.) (World Port Index No. 23300) is a safe harbor, with anchorage depths of 12.8 to 16.5m; mooring rings are available. The best anchorage is N of Litlenesholmen, a small islet in the middle of the harbor.

There are several quays with depths alongside of 3 to 9m. Fuel oil and fresh water are available.

Two lights, in range 058˚ ,are shown from the SE side of the bay and lead through the fairway of the narrow entrance. Another light is shown from the SW extremity of Litlenesholmen. A beacon stands on Kattholme, on the NW side of the entrance channel. Svelteflu, on the opposite side of the channel, is marked by an iron perch.

Strong onshore winds, especially from S, raise heavy seas in the entrance and close to it.

3.17 Mosterhamn (59˚42'N., 5˚24'E.) (World Port Index No. 23310) is located at the SE end of Mosteroy on the N side of Bomlafjorden. It is noted for its church, the oldest in Scandinavia, which was built in the 10th century by Olaf Trygvesson. There is a concrete quay, 47m long, with depths alongside from 6.2 to 7.4m. Another quay, which is 19.8m long, has depths from 3.4 to 5.9m alongside.

The outer harbor has anchorage depths of 14.6 to 18.3m, sand and clay, and is provided with mooring rings. South gales send in considerable swell. The best anchorage position is toward the E side of the harbor. Should the wind blow from S, it is better to shift farther inside and anchor in 11m abreast the N end of Fyrholme, the islet close NE of Kaninholme, where the vessel will be less exposed to the swell. The inner harbor has a depth of 7.3m, but can only be entered by vessels of very shallow draft.

When entering or leaving Mosterhamn, keep well over toward Kaninholme, as a reef, which is marked by iron perches, extends for some distance from the S shore of the harbor.

Eldoyane (59˚45'N., 5˚30'E.), a man-made peninsula, extends about 1 mile S from the SE side of Stord. A large shipyard, equipped with cranes of up to 300 tons capacity, and a drydock, which is 325m long and 52m wide, and can accommodate vessels up to 250,000 dwt, is located at Eldoyane.

3.18 Leirvik (59˚47'N., 5˚31'E.) (World Port Index No. 23340) is a roomy harbor on the SE shore of Stord. It is sheltered from the E by several islets, but is open to the SE.

The main wharf is 240m long, with depths of 6 to 12m alongside. There is 600m of private quayage, with depths of 5 to 12m alongside. There are facilities for ro-ro vessels and coastal tankers. Vessels up to 160m in length can be handled in the port.

Anchorage.—Anchorage can be taken, in 40m, sand and clay, in the W part of Leirvik. Caution should be taken to avoid a submarine cable along the N shore.

The entrance to **Fordespollen** (59˚39'N., 5˚25'E.) lies on the SE side of Bomlafjorden. The fjord extends S from its entrance for about 3 miles and has several side leads. This branch of Bomlafjorden does not freeze over in winter.

Narrow and encumbered channels lead from the SW portion of Fordespollen into Rodspollen.

Depths through the fairway of Fordespollen are ample, but there are nearby dangers, particularly in the SE part of the basin, some of which are marked by iron perches.

As there are rocks and shoals in the vicinity of the anchorages, local knowledge is essential.

3.19 The entrance to **Boroyfjorden** (59˚40'N., 5˚17'E.) lies on the NW side of Bomlafjorden. From the entrance, the fjord trends N for about 4 miles and has a maximum width, between islands and islets on either side, of about 2 miles. Finnasvik, the head of which is about 5 miles N of the Boroyfjorden entrance, is the largest of a number of bays and inlets which lead off from the main fjord. Kuleseidkanal, previously described in paragraph 3.15, is entered from the NW end of Finnasvik. Fairway depths through Boroyfjorden are ample.

Secure anchorages are located in some of the side bays and inlets. In winter, the N half of Boroyfjorden is sometimes icebound. Only small craft with local knowledge can anchor in Boroyfjorden.

Langestraumen (59˚41'N., 5˚15'E.), the narrow channel between Bomlo and Straumoy, which leads S into Tjongspollen, has a least fairway depth of 3m and is only navigable at slack water.

Stokksund (59˚45'N., 5˚23'E.), one of the channels of Indreleia, is formed between the island of Bomlo, on the W, and the island of Stord, on the E. It leads NNW for about 8 miles to a position E of **Store Klakksoy** (59˚50'N., 5˚16'E.), where it branches. One branch continues NNW for about 7 miles under the name of Nyleid and gives access to the S side of Selbjornsfjorden. The other trends N under the name of **Engesundsleid** (59˚52'N., 5˚17'E.) and becomes very narrow and shallow in some of its reaches.

The Stokksund-Nyleid route is safe in clear weather, but should not be attempted in thick weather without reliable local knowledge. Large vessels should always use the main route through Langenuen, on the E side of Stord. Langenuen, although about 3 miles longer than the Stokksund-Nyleid route, is wider, deeper, and free from dangers in the fairway.

3.20 **Sagvag** (59˚46'N., 5˚23'E.) (World Port Index No. 23330) is located at the head of a small islet-encumbered inlet. The inner channel becomes very narrow but is well marked by lights, buoys, and iron perches. A quay on the S side of Sagvag entrance has a depth of 12m. A shoal, with a depth of 5m, lies near the SW end of the quay. Small vessels with local knowledge can anchor in the inlet.

Langenuen trends N and NW for about 14 miles from its S entrance (59˚48'N., 5˚34'E.) to its junction with the E end of Selbjornsfjorden. The S part of the passage is formed between Stord, on the W, and the islands of Huglo and Tysnesoy, on the E. Langenuen continues N for an additional 10.5 miles between Selbjornsfjorden and Korsfjorden and leads between the islands of Huftaroy and Reksteren and then across the W end of Bjornafjorden.

The S part of Langenuen narrows to a width of 0.5 mile in places; the least width of the N part is about 1 mile. Great depths prevail in the channel and there are no dangers in the fairway.

Heavy squalls occasionally sweep down from the high land of Stord. In Langenuen, there is nearly always a tidal current setting N, although occasionally in fine weather it sets S.

Dangerous eddies near the shores of Langenuen have also been reported.

Laukhamarsund (59˚52'N., 5˚37'E.) is the navigable channel that separates the islands of Huglo and Skorpo on the E side of Langenuen. Skjeljaviksund extends for about 3 miles NE from its junction with Laukhamarsund and Langenuen, separating Skorpo from Tysnesoy.

Fjereflu, marked by a beacon with a spherical topmark, lies near the middle of the Skjeljaviksund entrance. An iron perch, marking a sunken rock, is located close S of the beacon. Numerous above and below-water rocks lie between Fjereflu and the NW side of Huglo. Iron perches mark some of the sunken rocks.

3.21 **Soreidsvag** (59˚56'N., 5˚30'E.) recedes N from Langenuen for nearly 3 miles and becomes narrow in its upper part.

Depths through Soreidsvag are irregular; the least fairway depth of 11.9m is found in the narrows in a position about 0.5 mile from the head of the inlet.

Rundholme, Storholme, and Flatholme, all of which are on foul ground, lie in a chain extending about 0.6 mile SE across the entrance to Soreidsvag. Some of the dangers in the chain and others within Soreidsvag are marked by iron perches or buoys. Entering vessels should pass E of Flatholme.

A quay, with depths alongside of up to 6m, is located at Flataraker, on the NE side of the entrance to Soreidsvag. Another quay, for a vehicle ferry, has depths of 4 to 5m.

Amlandssto (59˚58'N., 5˚25'E.) lies on the NE side of Langenuen,about 3 miles NW of the Soreidsvag entrance. A quay at Amlandssto has a depth of 4m alongside.

Barsund (60˚00'N., 5˚23'E.), a narrow channel, leads NE from Langenuen to the S side of Smievollosen, where it joins Leidasund. The channel continues ENE into the SW part of Soreidsvik. The fairway through this passage is deep, and most of the dangers are marked, but it should not be used without local knowledge.

A bridge, with a vertical clearance of 16m and a width of 40m, crosses Barsund and connects Klinkholmen and Sunda-holmen. An overhead cable, with a clearance of 18m, spans the channel close NE of the bridge.

A light is shown from a metal column on the SE side of Barsund, about 0.2 mile SW of the bridge. There are other lights marking the channel through Barsund and Leidasund.

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Sandvikhamni (60˚04'N., 5˚18'E.), located on the W side of Langenuen, has a quay with 4m alongside.

3.22 Klosterfjorden (59˚46'N., 5˚38'E.) is a large open bay which is formed between Stord, on the NW; Hille and Halsnoy, on the N and E; Fjelberg and Borgund, on the SE; Ilholmane, on the S; and the mainland peninsula which terminates N in Tittelsnes, on the SW. It is free from dangers in the fairway.

Klosterneset (59˚49'N., 5˚38'E.) and Satraneset, the NW and SW extremities of the NW extension of Halsnoy, are located about 2 miles NNE and E, respectively, of Hille.

Fluholmane, two small islets lying 0.5 mile NW of Satraneset, front the entrance of Sandvik. A rock, with a depth of less than 1.8m and marked by an iron perch, lies about 183m NW of the N islet. A 7.9m depth is charted about 0.2 mile S of the S islet. Depths of 7m lie about 183m NE of the N islet and about the same distance E of the S islet.

An iron perch marks a shoal which lies close off the N shore of the bay.

Within Sandvik, the depths range from 7.3 to 50m.

Anchorage.—Anchorage can be taken in the middle part of Sandvik, NE of Fluholmane, where the depths range from 31 to 39m.

Saebovik (59˚47'N., 5˚43'E.) indents Halsnoy for about 1 mile in a N direction between Torvaneset, about 1 mile ESE of Satraneset, and Siraneset, 1 mile farther ESE. Sjoholmane, a chain of three islets with foul ground between them, extends about 0.5 mile N from the middle of the Saebovik entrance. A rock, marked by an iron perch, lies awash close SW of the southernmost islet of Sjoholmane.

Some above and below-water rocks lie between the W shore of the bay and the northernmost islet of the chain. Two of these dangers are marked by an iron perch. On the E shore, foul ground extends about 0.1 mile offshore. An iron perch marks a rock lying close S of Siraneset.

Anchorage.—Saebovik provides anchorage in its inner part, in about 20m, sandy bottom; mooring rings are available. This anchorage is exposed to SW winds. The best approach is made E of Sjoholmane. Saebovik has two quays, with alongside depths of 3 to 5m. Fuel oil and fresh water are available.

3.23 Sundnessund (59˚44'N., 5˚44'E.) connects the head of Klosterfjorden with Skanevikfjorden to the S. The channel lies between Halsnoy, on the E, and Fjelberg and Borgund, on the W; some islets and rocks are in its S part. Fjaereskjaerflu, marked by an iron perch, lies on the W side of the N entrance of Sundnessund in a position about 0.2 mile NNE of the NE extremity of Fjelberg. General depths through the channel are ample, but there are charted depths of 12.8m near the fairway.

Fjelbergsund separates Fjelberg and Borgund and leads SE from Klosterfjorden to the S part of Sundnessund.

The channel is narrow and in places is obstructed by rocks and shoals, some of which are marked by buoys or iron perches. Kyrkjeholme lies in the middle of the SE entrance.

A light is shown from the NE side of Borgund in a position close W of Kyrkjeholme.

Two overhead cables cross Fjelbergsund near its SE entrance. There is a clearance of 25m under the lower cable.

Anchorage.—Dalevik, on the SW side of Fjelbergsund, affords secure anchorage, in 29 to 40m, clay. A small quay, with 4m alongside, is located at Fjelberg, on the opposite side of the sound. Fresh water and fuel oil are available.

Bleikjo (59˚44'N., 5˚39'E.) is the outermost of two small islets which are located close off the middle of the W side of Borgund. Flatholme, about 0.5 mile S of Bleikjo, is near the SW extremity of Borgund. Bongsen, a detached reef marked by a beacon, lies about 0.2 mile W of Bleikjo.

Alfjorden trends in a general S direction for about 15 miles from its entrance between Tittelsnes and **Svollandsneset** (59˚41'N., 5˚36'E.), on the mainland about 3 miles SE.

The outer 10 miles of the fjord has a least width of about 1 mile; it becomes quite narrow farther inside to its head. Alfjorden is deep and comparatively free from dangers. It is icebound in winter from its head to a line joining Buvik and Arhamarneset, about 13 miles S of Tittelsnes; all the side coves freeze over.

In Alfjorden, the tidal currents may be very strong. There may also be tidal currents setting in opposite directions in the outer and inner parts of the fjord. The tidal currents near the land usually differ in direction from that in the middle of the fjord. The flow is affected by the weather.

Strong N winds cause a pile up of water at the head of the fjord. Strong S winds have the opposite effect, with the velocity increasing toward Tittelsnes ,where it can exceed 3 knots.

Small vessels can anchor in a few of the coves and inlets indenting both sides of the fjord. Iron perches mark some of the dangers in these places. Quays are located in several coves on the E shore.

Eidsvag (59˚43'N., 5˚32'E.), on the W side of Alfjorden, provides anchorage for small vessels, in depths of 10 to 25m, shell and sand. A quay on the S shore of Eidsvag has depths of up to 6m. Fuel oil is available.

Vikevik (59˚35'N., 5˚35'E.), located on the E side of Alfjorden, has an angled quay, with depths of up to 5m alongside. Anchorage may not be taken in this bay as a sewer outfall extends out from the shore.

3.24 Bjodafjorden (59˚42'N., 5˚41'E.) lies S of Borgund and trends E for about 4 miles to its junction with Skanevikfjorden. The part of the channel N of Romsa is named Melenfjorden. Haugesund is the channel leading SE along the S side of the Romsa group. Romsasund is on the E side of the group. The latter two channels join in the vicinity of Kampareholme, which lies at the junction of Olsfjorden and Etnefjorden. Good anchorages, particularly for small vessels, are found in coves along the shores of Bjodafjorden. Fairway depths through the channel are ample.

The S shore of Borgund between Flatholme and **Melsneset** (59˚42'N., 5˚44'E.), its SE extremity, is very irregularly indented by a bay, some side coves, and a small inlet, which are, in general, encumbered by foul ground. Small vessel anchorages are found in a few of these places.

The mainland shore is also broken by a number of coves and trends SE for about 6 miles between Svollandsneset and **Stavanes** (59˚39'N., 5˚46'E.), the NW entrance point of Olsfjorden.

Olen

Husoy (59˚41'N., 5˚37'E.) lies within 0.25 mile offshore, close off the SE part of Svollandsneset. Good anchorage can be taken by small vessels in Bjoavag, close W of Husoy.

There is a quay in Bjoavag, with depths of 5 to 9m alongside. Another quay has depths of up to 7m alongside. Fresh water is available.

3.25 Romsa (59˚40'N., 5˚44'E.) is the largest of a group of islets, among which there are numerous above and below-water rocks. Nautoy and Tolloy, two close-lying islets, are within 1 mile SE of Romsa. Foul ground, marked in places by iron perches, lies within 0.5 mile of the W, SW, and E sides of these three main islets.

Good anchorages for small vessels are located in coves on the mainland and in the Romsa group.

A light is shown from **Kampareholme** (59˚39'N., 5˚48'E.), a small islet which lies close N of Dreganeset, at the junction of Olsfjorden and Etnefjorden.

Olsfjorden is entered between Stavanes and Dreganeset. Hanen, a rock marked by a black beacon, lies close off the W shore about 0.1 mile SSE of Stavanes. General depths through the middle of Olsfjorden are 24 to 50m.

The head of the fjord dries for a short distance offshore, as does the head of a bight at the SE end of the fjord.

The fjord has good anchorage ground throughout most of its length. The fjord is often ice-bound in winter, but local traffic keeps channels open.

3.26 Olen (59˚36'N., 5˚49'E.) (World Port Index No. 23420), on the S shore of Olsfjorden, has several small quays. The largest is 55m long, with alongside depths of 4 to 6m.

Olsvagen (59˚36'N., 5˚45'E.), at the head of the fjord, has a quay, with depths alongside of up to 5m.Anchorage can be taken N of the quay at Olsvagen, in 25m, clay.

Etnefjorden extends E from its N entrance point at **Borkjenesklubben** (59˚39'N., 5˚48'E.). The fjord is often ice-bound in winter, but local traffic keeps channels open. An iron perch marks a rock lying close S of Borkjenesklubben.

3.27 Borkjenes (59˚39'N., 5˚48'.), a quay in a bight on the N shore of Etnefjorden close NE of Borkjenesklubben, has a tile works plant.

A detached 5m depth lies on the E side of the entrance of the bight, about 0.2 mile E of Borkjenesklubben.

Between Borkjenesklubben and Holmaseidholme, about 1 mile ENE, there are a few small islets and some above and below-water rocks, all of which lie within 0.2 mile of the N shore of the fjord. Elsewhere, the shores are relatively steep-to, except in Etnepollen, a bight forming the head of Etnefjorden, and in Vagen, the narrow inlet at the SE end of the fjord. In Etnepollen, the shore bank extends about 183m offshore; in Vagen there are some detached above and below-water rocks and irregular depths in the fairway.

3.28 Etne (59˚40'N., 5˚56'.), a small quay on the SE shore of Etnepollen, is the site of a hydroelectric plant and has depths of up to 8m alongside.

Skanevikfjorden (59˚44'N., 5˚50'E.), lying between the SE side of Halsnoy and the mainland, leads NE from Melenfjorden for about 9 miles. The narrowest part of the fjord is abreast **Straumneset** (59˚46'N., 5˚56'E.), the extremity of a peninsula that projects N from the S shore.

A 2.7m depth, marked by a buoy, lies about 183m W of **Kjolbergneset** (59˚41'N., 5˚47'E.) on the mainland at the SW entrance to Skanevikfjorden.

Ebnehanen (59˚43'N., 5˚50'E.), lying about 0.1 mile off the SE shore about 2 miles NE of Kjolbergneset, is marked by an iron beacon with a black wooden superstructure.

Taraldsoy, on the SE side of Skanevikfjorden about 0.6 mile NE of Ebnehanen, lies across the entrance of Gjelmarvik. Lauvviksund leads into the bay S of Taraldsoy and Molnessund leads in along the NE side of the islet. An overhead cable, with a vertical clearance of 18m, crosses Molnessund.

Anchorage.—Good anchorage can be taken in Gjelmarvik, in 40 to 50m, coarse sand, in the middle of the bay. Above and below-water rocks and depths of 5.5m and less lie within about 0.1 mile off the mainland and the SE side of Taraldsoy.

3.29 A light is shown from **Tronskenesflu** (59˚45'N., 5˚56'E.), which lies about 3 miles ENE of Taraldsoy. A bay recedes about 1 mile SE from Tronskenesflu. The islet of Skano is located close off the middle of the SW shore. Depths in the fairway leading to the head of this bay are ample.

Skanevik (59˚45'N., 5˚56'E.) (World Port Index No. 23380) is located in the inner part of the above-mentioned bay. There are several quays, with depths alongside of up to 9m. Vessels approaching Skanevik usually pass SW of Tronskenesflu and E of Skano.

Anchorage.—Good anchorage can be taken off Skanevik, in 12.8 to 50m.

Utaker (59˚47'N., 5˚55'E.) is on the NW shore of Skanevikfjorden, about 3 miles NNW of Skanevik. A quay at Utaker has of p to 13m on its S side and 10m on its N side.

Matrefjorden (59˚48'N., 5˚58'E.) extends N for about 4 miles. The shores of the fjord are mostly steep-to. The fjord often freezes over.

Anchorage.—Anchorage can be taken at the head of Matrefjorden, E of a river mouth, in 20 to 40m, sand and soft clay. Heavy squalls can occur here during NW and NE winds.

3.30 Sunde (59˚47'N., 5˚58'E.) (World Port Index No. 23350) lies on the E shore of Matrefjorden, about 0.2 mile within the fjord entrance. There is a quay, with alongside depths of up to 5m.

Akrafjorden is entered between Straumneset and Krabbaneset, about 1 mile NE, and extends for about 16 miles in an ENE direction between steep mountains.

All the dangers lie close offshore; most of them are in the coves on either side of the outer winding reaches of the fjord. Iron perches mark some of the dangers. Strong winds can blow up or down the fjord and squalls will occur. The fjord will freeze-up as far as 5 miles from its head.

Vagsvik (59˚47'N., 6˚07'E.), on the NW shore of Akrafjorden, offers the best anchorage in the fjord,in 20m, soft clay. A quay, with depths alongside from 5 to 7m, exists at Bjellandsnes about 4 miles NE of Vagsvik. Fjaera, at the head of the fjord, has a small quay, with alongside depths of up to 4m.

3.31 Hoylandssundet, from its entrance in Skanevikfjorden, trends NW for about 5 miles, then in a generally W direction for nearly 3 miles to Husnesfjorden. A number of islets and detached rocks lie on both sides of the fairway, but most of the dangers are on the S side. The least width of the sound, between the land on either side, is about 0.5 mile, but the channel is somewhat narrower in places because of the islets and dangers. Substantial depths can be maintained throughout the sound, although shoal patches lie in and near the fairway.

Most of the dangers near the fairway are marked. Ice does not hinder navigation but may lie in the bays and coves along the N side of the channel.

Sandvollgrunn (59˚48'N., 5˚48'E.), on the E side of the fairway about 3 miles from the E entrance, has a depth of less than 1.8m and is marked by a buoy. Sandvollholme is located about 0.3 mile N of Sandvollgrunn. Bleikjo, a smaller islet, lies close S of Sandvollholme, and Kyllingane, marked by a beacon with a black wooden superstructure, lies close NW of it. A 6m depth is on the E side of the fairway about 0.2 mile W of Sandvollholme, and a 9m depth lies about 0.3 mile W of the S end of the islet. A 10m depth lies on the W side of the fairway about 1 mile SW of Bleikjo.

Store Lauvoy, with Lille Lauvoy and some rocks close off its SW end, lies on the SW side of the fairway about 1 mile WNW of Sandvollholme. Kanelen, a rock lying partly above water, is on the same side of the fairway in a position about 0.5 mile SE of the E extremity of Store Lauvoy.

Trollskjaer, an above-water rock, and Skottaflu, with a depth of less than 1.8m and marked by an iron perch, are on the S side of the fairway in positions about 0.2 mile NNE and 0.5 mile NW, respectively, of the NE extremity of Store Lauvoy. An 11m depth lies in the fairway about 0.2 mile E of Trollskjaer.

Toftevag (59˚48'N., 5˚45'E.) lies between Toftoy and Halsnoy about 1 mile S of Lille Lauvoy. A quay on the Halsnoy shore in Toftevag has up to 5m alongside. Fuel oil and fresh water are available.

Sunde (59˚50'N., 5˚43'E.), a small port, lies in the narrow entrance to Sundevag on the NW side of Hoylandssundet. There are quays with depths alongside of up to 5m.

3.32 Selbjornsfjorden (59˚57'N., 5˚09'E.) leads from seaward between the islets N of Bomlo and NW of the island of Stord, on the S, and Stolmen, Selbjorn, and Huftaroy, on the N, giving direct access to the channels of Indreleia. The entry is easy and available to large vessels; it is one of the principal approaches to Bergen from seaward.

Furen (59˚58'N., 5˚03'E.), a small, rocky islet marked by a beacon, is on the N side of the entrance about 3 miles N of **Slatteroy** (59˚54'N., 5˚04'E.). On the N side of the fairway, foul ground extends about 183m SE of Furen.

A light is shown from the N part of Slatteroy, an islet which lies on the S side of the fjord entrance close N of Gissoy. A radiobeacon is located at the light tower, which is 25m high and prominent. It was reported that a racon is located at the light tower.

Joringen, a low, black rocky islet, lies on the S side of Selbjornsfjorden, about 183m NE of Slatteroy.

Several small channels, which are marked in places by beacons and perches, lead S among the islets from Selbjornsfjorden.

Vestre Hokkelboaen (59˚56'N., 5˚02'E.), with a least depth of 1.8m, lies near the middle of the Selbjornsfjorden entrance in a position about 2 miles NW of the light structure on Slatteroy. Sondre Hokkelboaen, a 15m depth, and Nordre Hokkelboaen, an 18m depth, lie about 0.3 mile SE and the same distance NE, respectively, of Vestre Hokkelboaen. Indre Hokkelboaen, with a depth of 5m, is located about 0.3 mile ENE of Vestre Hokkelboaen.

Vestre Hokkelboaen and Indre Hokkelboaen are usually marked by breakers when there is any swell, but Nordre Hokkelboaen breaks only during heavy onshore gales.

Selbjornsfjorden trends in an ENE direction for about 8 miles from its entrance between Slatteroy and Furen, and at Austreneset joins the N part of Langenuen. The passage is very deep, having up to 366m in the middle part. The navigable width between dangers on either side varies from 1.25 to 2 miles.

Tides—Currents.—The tides have little or no influence on the current in Selbjornsfjorden which usually sets outward. With rising W winds, however, the current may set into the fjord.

3.33 When approaching the land between Bomlo and Korsfjorden, the mountain Tysnessata, 753m high, on Tysnesoy, is a conspicuous landmark. The summit is rounded and from NW appears wedge-shaped. All of Tysnesoy is lofty and is as high as the mainland in the vicinity. The island of Stord rises to about the same elevation as Tysnesoy; both may be seen from a great distance in clear weather.

The high land on the E side of Stord forms a plateau which rises slightly at either end to the rounded summits of **Stavegolvsfjeld** (59˚51'N., 5˚29'E.) and Midhamarsata. The former is 703m high; the latter is 748m high and is located about 3 miles farther N. Farther inland, Folgefonni, the great glacier in Hardanger, is sometimes visible. To the S, Siggja will appear like a pyramid with a broad base.

On nearing the entrance of Selbjornsfjorden, the principal landmarks that will be recognized. Besides those already mentioned, are Handfjell, with a hollow resembling a saddle on its S side, which is located about 3 miles SE of Austreneset; Brandasundsata, a hill in the NE part of Gissoy; and Kvitingen, a small islet about 1 mile W of the SW extremity of Gissoy. The light on Slatteroy will be also visible.

3.34 **Fitjarviki** (59˚57'N., 5˚19'E.) is an embayment formed between the E side of Fonno and an irregular bight on the NW side of the island of Stord. The fairway is deep and free from dangers.

Several secure anchorages for small vessels with local knowledge are located along the shores of Fitjarviki.

At the head of Fitjarviki, a quay, with depths of 3 to 6m alongside, is located at **Fitjar** (59˚55'N., 5˚20'E.). An oil quay has depths up to 6m alongside.

Anchorage.—Anchorage, by moderate sized vessels, can be taken at the head of Fitjarviki, in 27m sand and shingle.

Klubben (59˚55'N., 5˚18'E.) is the S extremity of the island of Fonno. A winding channel, which is marked in places by lights and perches, leads S of Klubben, joining Fitjarviki with Fonnosen, the area between a bight on the S side of Fonno and islets extending NW from Stord. An overhead cable, with a vertical clearance of 21m, spans this channel.

Austreneset (59˚59'N., 5˚19'E.), the N extremity of Stord, is at the junction of Selbjornsfjorden and Langenuen. Austrenesbaene, two rocks awash and each marked by an iron perch, lies on a shoal extending up to about 0.2 mile WNW from Austreneset. Nordbaen, a 16.9m depth, lies about 0.3 mile NW of the point.

Foul ground and a few small islets lie within 0.2 mile S and SW of the SE extremity of Stolmen island; **Vagholme** (59˚59'N., 5˚06'E.) is close E of it.

Stolmasund leads N between Stolmen and Selbjornen to Skoltafjorden and Mokstrafjorden. The S entrance of the sound is between Vagholme and Olfareklubben, about 0.5 mile E. It is a good and safe channel with fairway depths of 29 to 79m. Immediately N of Vagholme, shoal patches, awash in places and marked by two iron perches, lie up to 183m offshore. The E entrance point is fringed by rocks to a distance of about 91m offshore.

Several shoals and some islets are in the N part of the channel. An overhead cable, with a vertical clearance of 30m, spans Stolmasund almost 1 mile N of its S entrance.

A quay at Mylna, on the W side of Stolmasund 1 mile N of Vagholme, has depths of 5 to 7m alongside.

Caution.—A new bridge and cable crossing is under construction between Selbjorn and Stolmen. The vertical clearance is 30m, but may be lower during the construction period.

3.35 **Bekkjorviksund** (60˚01'N., 5˚12'E.) lies between the E side of Selbjornen and the W side of Huftaroy. Depths through the channel fairway are ample, but there are some nearby dangers, particularly on the SW side, where shoal patches lie up to 0.25 mile offshore.

A bridge, with a vertical clearance of 27m, spans the N portion of Bekkjorviksund. A depth of 10.5m has been reported in the center of the fairway NW of the bridge.

Anchorage.—Anchorage can be taken about 0.3 mile SSE of Ringaskjerflu, in about 33m, sand and clay. Farther N the bottom is rocky. A heavy sea sets into this anchorage during S gales. Small vessels with local knowledge can take anchorage in several nearby coves.

Selbjornsfjorden to Korsfjorden

3.36 This is the coastal sector between Furen and Store Marstein, an islet on the S side of Korsfjorden entrance about 10 miles N. It includes numerous islets and rocks fronting the islands of Stolmen, Huftaroy, and Hundvaga and is indented by Skoltafjorden, Mokstrafjorden, and Horgefjorden.

Several good anchorages for both large and small vessels are found in this area. From offshore, the openings of Selbjornsfjorden and Korsfjorden can be distinguished.

Veten (60˚01'N., 5˚15'E.), a hill in the S part of Huftaroy, should be easily identified. Maksteinen is located about 2 miles N of Fugloy and, because of its isolated position, cannot be mistaken. The lights shown from the islets of Slatteroy and Store Marstein are also good landmarks.

The outermost dangers between Furen and Store Marstein all lie within 1 mile of the nearest islet. Even with a moderate breeze, the sea breaks over them.

Marsteinsbaen (60˚08'N., 4˚59'E.) lies, awash, about 1 mile WSW of Store Marstein and is unmarked. This is a serious hazard and vessels should navigate with caution when in the area of this shoal. Hillagrunn, about 2 miles WSW of Store Marstein, has a least depth of 21m and only breaks in very heavy weather. (See paragraph 4.2).

Skoltafjorden (60˚02'N., 5˚00'E.) is entered from seaward between Skoltane and Englamarskaget and leads E to Stolmasund, Mokstrafjorden, and the N approaches to Bekkjorviksund. Ample depths can be found through the fairway, but there are a few islet groups and some detached dangers lying in mid-channel. Kalsoy, about 2 miles ENE of Skoltane, is the largest islet on the N side of the channel.

Kalsoy is about 30m high. Brorne, a group of above and below-water rocks, lies within 0.2 mile SW of the SW extremity of Kalsoy. The S and E sides of the islet are fringed by foul ground extending 0.15 mile offshore in places, and on the E side, Vardholme, Hestholme, and nearby rocks lie up to 0.3 mile offshore.

Larsaskjaer, a detached above-water rock marked by an iron perch, is located about 0.4 mile E of the SE extremity of

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Kalsoy. Vessels with local knowledge can use the narrow channel on the NW side of Kalsoy.

3.37 Fjordaflu (60˚01'N., 5˚07'E.), a 5m depth marked by a buoy, lies in the fairway of the N approach to Stolmasund. On the E side of the N approach to Stolmasund, Vadholmane, a group of several small islets and some rocks, lies up to 0.5 mile off the N side of Selbjornen. Iron perches, beacons, and buoys mark some of these rocks and other dangers closer inshore.

Stutaflu, a 4.5m depth marked by a buoy, is in the fairway of the Stolmasund approach in a position about midway between the NE extremity of Stolmen and the southwesternmost islet of Vadholmane.

Mokstrafjorden entrance is between the N end of **Mokster** (60˚04'N., 5˚06'E.) and the S extremity of Horgo, about 1 mile NE. The channel leads in a general SE direction toward the N end of Bekkjorviksund and is connected SW with Skoltafjorden and Stolmasund and NE with Hundvakosen. Ample depths prevail in the fairway.

Hysteinen, a 14m depth, lies in the Mokstrafjorden entrance, about 2 miles WNW of the N extremity of Mokster.

Nordstallen and Midstallen, with depths of 21m and 19m, lie about 0.5 mile ESE and 0.75 mile SE, respectively, of Hysteinen. These depths may break during onshore gales.

Kvitingsflu, a rocky area with a depth of 6m, lies about 0.1 mile S of Midstallen.

Helgeskjaer and other rocks, some above water, lie within 0.3 mile NW of Mokster. Blaasterstallen, a 4.5m depth, lies about 183m N of Mokster.

Stovholme (60˚03'N., 5˚06'E.) is located close offshore on the E side of the approach to Naustvag, a cove on the SE side of Mokster. Close E of the islet there is a 5.5m depth.

A mole extends N from Stovholme to Mokster; another mole, its outer end marked by a light, extends about 69m SW from Stovholme.

3.38 Mokstra Groningen (60˚03'N., 5˚07'E.) is an islet about 0.5 mile NE of the NE end of Kalsoy. Shoal water, marked by an iron perch, extends NW from Mokstra Groningen to a position about 0.2 mile ESE of the S point of Mokster.

Krabbhausane, a group of above and below-water rocks, lies within 0.3 mile E and ESE of Mokstra Groningen Two below-water rocks at the SW end of the group are each marked by an iron perch. A detached 12m depth lies about 0.3 mile S of the S most rock of the Krabbhausane group.

Terneskjaer is located on the NE side of the fjord about 0.2 mile SSE of Horgetrynet, the S point of Horgo. A 4.5m depth lies about 0.2 mile E of the same point.

A number of islets also encumber the sound between the SE side of Hundvaga and the W coast of Huftaroy, to the E. A navigable channel leads N among these latter islets from Mokstrafjorden to Hundvakosen.

Hundvakosen (60˚07'N., 5˚12'E.), a basin, lies between the E side of Hundvaga and the N end of Huftaroy. There are a number of islets at the N and S ends of Hundvakosen; the NW part is obstructed by above and below-water rocks, some of which are marked by iron perches.

Charted depths through the fairway and in the approach channels are irregular but ample.

Krosshavnsund (60˚09'N., 5˚12'E.), the channel between Staloy and Krossoy to the W leads N from Hundvakosen to Korsfjorden. Overhead cables, with a minimum vertical clearance of 35m cross, the channel.

3.39 Horgefjorden (60˚06'N., 5˚05'E.), a basin, is formed between the islet Horgo, on the S, and Stora Kalsoy, on the N, and trends E to the W side of Hundvaga. It is connected to Mokstrafjorden by a channel leading S between Hundvaga and Horgo and to Korsfjorden by the channels leading N between Hundvaga and Stora Kalsoy.

Sveinane, the southernmost danger on the N side of the Horgefjorden entrance, lies awash on the S side of Stora Kalsoy. Sverslingen is a small islet on the S side of the entrance about 1 mile SE of Sveinane. Within 91m S of Sverslingen there are numerous rocks, some of which are awash.

On the N side of Horgefjorden, Bergsholme lies at the end of a chain of islets which extends about 1 mile E from the SE end of Stora Kalsoy. Kalsoyvik is formed between the N side of these islets and the S side of Stora Kalsoy.

Reefs extend about 0.2 mile N and NE from Bergsholme. Smaskjaerflu lies about 0.2 mile NE of Bergsholme. An 11m depth lies about 0.2 mile ESE of Bergsholme.

Anchorage.—Anchorage can be taken in Kalsoyvik, near its head, in 45 to 50m, clay. A detached shoal, with depths of 3 to 3.9m, lies 183m off the S shore of Kalsoyvik nearly 0.5 mile W of Smaskjaerflu. Barnehaughflu, marked by an iron perch, lies close off the N shore NW of this detached shoal. Close SSE of Barnehaughflu, there is a 4m depth.

The best anchorage for small vessels is in the SW part of the bay. Such vessels can also anchor off Hille, in a cove NW of Barnehaughflu; an iron perch marks foul ground on the W side of the cove.

Between Stora Kalsoy and Navoy, the NW part of Hundvaga, are Hidleroy, Nautoy, Spissoy, Kvaloy, some other smaller islets, and numerous rocks. A reef extending about 91m SW from Nautoy is marked by an iron perch.

Bakkasund is the narrow channel between Nautoy and the E side of Stora Kalsoy. Kubbholme and Aerholme lie within 0.3 mile SE of Hidleroy, and about 0.1 mile E of the latter there is a 9m depth. Foul ground fringing the S end of Spissoy is marked by a buoy moored in a position about 0.2 mile NE of Aerholme. Svartaskjaer, about 0.3 mile E of Aerholme, is awash in places. Arholme is located about 0.2 mile N of Svartaskjaer and is foul on its S side. An 8m depth lies about 0.1 mile S of Arholme. Mjanesflu, lying 183m offshore about 0.2 mile E of Svartaskjaer, has a depth of less than 1.8m and is marked by an iron perch.

Austreflu, a 3m depth, marked by a buoy, lies about 0.5 mile N of the N entrance to Bakkasund. Some of the other dangers between Stora Kalsoy and Navoy are marked by buoys or iron perches.

An overhead cable, with a vertical clearance of 25.9m, spans the N entrance of Bakkasund between Kvaloy and the NW extremity of Spissoy. Another overhead cable, with a vertical clearance of 19.8m, extends from the SW extremity of Nautoy to Hidleroy.

Skudenesfjorden to Korsfjorden

3.40 General remarks.—As covered in this sector, Indreleia comprises the fjords and sounds forming the protected inland navigation route between Skudenesfjorden and Korsfjorden. Karmsundet is the first, or southernmost, reach of Indreleia. Vessels proceeding N from Stavanger to Bergen can enter Karmsundet from the N side of Skudenesfjorden. Between Haugesund, at the N end of Karmsund, and the entrance of Bomlafjorden, about 8 miles N, the route leads along the outer coast and is only partly protected by the inshore islet groups.

North of Bomlafjorden, Indreleia offers alternate routes, of which the E, through Langenuen, should be taken by large vessels. The W route leads through Stokksund and Nyleid. Both routes join N of the island of Stord.

North of Stord, the principal route passes between Huftaroy and Reksteren, through the W part of Bjornefjorden, and then E of **Lille Laugaroy** (60˚09'N., 5˚15'E.) into Korsfjorden.

The secondary route leads N through Bekkjorviksund, Mokstrafjorden, and Hundvakosen, then through the channel between Krossoy and Staloy, and E of Store Skorpo into Korsfjorden.

Pilotage.—Pilotage is compulsory in Indreleia.

Most of the inner fjords and sounds which are adjacent to this section of Indreleia penetrate inland in a general NE direction through the Hardangerfjorden region and have the group name of Hardangerfjordenane. This grand inlet is, perhaps, the most beautiful of all the Norwegian fjords. Its various branches extend through districts abounding in game and presenting a great diversity of magnificent scenery.

The main branch is a continuation of Bomlafjorden and extends, under various names, about 50 miles NE from its entrance. It then branches, with one branch, Sorfjorden, extending about 20 miles S, and the other, Eidfjorden, extending 15 miles E. There are also numerous smaller branches, in most of which anchorages can be found. Hardangerfjordenane is for the most part free from dangers; their shores are nearly everywhere steep-to.

Caution.—In winter, snow is the greatest danger to be apprehended, as the land is so often completely obscured for hours on end, even when quite close. In Indreleia, when a snowstorm threatens, careful bearings of the nearest anchorage should be taken to enable the vessel to seek shelter. Because of the tidal currents, it is dangerous to heave-to.

The Inner Fjords

3.41 Karmsundet (59˚09'N., 5˚21'E.) is about 17 miles long from its S entrance in Skudenesfjorden, between Skudenes, the SE extremity of Karmoy, and the SW point of Vestre Bokn, about 3 miles ENE. It lies in a generally N direction between Karmoy, on the W, and Vestre Bokn, Fosenoy, and the mainland of the Haugesund peninsula, N of Fosenoy, on the E.

Karmsundet may be considered the beginning of Indreleia. The port of Haugesund (see paragraph 3.10) is on the E side of the N end of Karmsundet, and Kopervik (see paragraph 3.42) is on the W side, about 8 miles above the S entrance of the sound. It is easily navigated and is used often. Vessels of 40,000 dwt with a draft of 9.7m can navigate the sound. Its S part is deep and its fairway is free from dangers. Special care should be taken, however, near the W end and N end of Fosenoy and in other narrow portions of the sound.

Gronestadvag (59˚12'N., 5˚23'E.) lies on the E side of Karmsundet. A beacon stands on the N entrance point of the bay. An 8m depth lies about 183m offshore, 0.15 mile NW of the beacon; a 4m depth lies about 183m W of the beacon. Kjelsflu, which is marked by an iron perch, is on the N side close within the entrance of Gronestadvag.

Foul ground fringes the S entrance point up to 183m offshore; a 5m depth lies nearly in the middle of the bay.

Small vessels with local knowledge can anchor in Gronestadvag.

Trosnavag (59˚13'N., 5˚23'E.) is another small bight on the E side of Karmsundet. Trosnavagneset, its SW entrance point, is located about 1 mile N of the beacon at the entrance of Gronestadvag. Skruholme is located about 0.1 mile NNE of Trosnavagneset. A number of rocks, one of which is awash and marked by an iron perch, lie between them. Small vessels with local knowledge can anchor in Trosnavag.

Ternholme, about 2 miles NNW of Trosnavagneset, is at the S end of a chain of islets and rocks extending about 2 miles from the S point of Fosenoy. Ternholmflu, with a depth of 4m and marked by a buoy, lies at the end of foul ground extending about 0.2 mile SSW from Ternholme.

Smorstakk, an islet easily identified by its sugarloaf shape, is the southwesternmost of the islets extending S from Fosenoy.

3.42 Kopervik (59˚17'N., 5˚19'E.) (World Port Index No. 23450) is located on the W side of Karmsundet. The harbor is situated on both sides of an inlet. Vessels wishing to anchor should do so N of Byggnesskjera, which marked by an iron perch; the bottom holding ground is a mixture of clay and rock.

Stromsund Bridge spans the inlet about 0.3 mile within the entrance. Vessels with a draft up to 5.8m can pass the bridge. The vertical clearance under the middle of the bridge is reported to be 3.3m.

Courtesy of Eirik Hustvedt

Kopervik

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Kopervik

Stangalandsvagen and Skipparvik are small inlets close S and N of the harbor. Skipparvik is spanned by a cable with a vertical clearance of 15.8m.

There is 570m of quayage with depths of 5 to 10m alongside. There are facilities for coastal tankers, ferries, and ro-ro vessels. Vessels up to 80m in length and 10m draft have been accommodated at the port.

Kaleflu, awash and marked by an iron perch, lies close off a point S of the entrance to Stangalandsvagen. Mandalsflu, a 3.9m depth marked by a buoy, is located about 0.1 mile N of Kaleflu.

A light is shown from Koparnaglen, a rock close offshore N of the approach to Kopervik. An iron perch marks a group of rocks, with depths of 1.8m and less, which lie between Koparnaglen and the shore W.

Anchorage.—Vessels awaiting pilots should anchor in about 37m with the light on Koparnaglen bearing about 290˚.

Anchorage can also be taken close E of the harbor entrance in 14.6 to 20.1m.

3.43 From Kopervik, Karmsundet trends N for about 3 miles, then continues NNW for about 3 miles to the narrows of the sound at Salhusstraummen. The E shore of this section is quite regular, and there are few islets, but the W side is indented by three separate embayments in which there are numerous islets, rocks, and detached dangers, some of which are marked by perches or buoys.

A small 15m depth lies on the W side of the fairway about 1 mile NNE of Koparnaglen.

Several above and below-water rocks, marked by two iron perches, lie along the W shore of Karmsundet, about 1 mile NNW of the bridge. A 2.9m depth, marked by an iron perch, is located close off the E shore opposite the rocks.

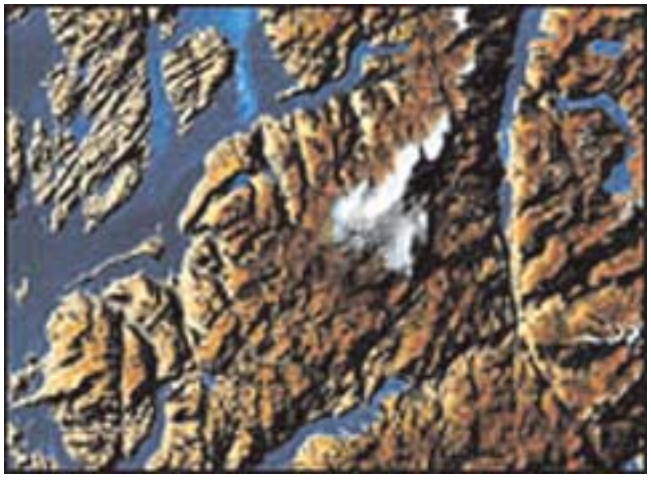
Salhusstraummen (59˚22'N., 5˚18'E.) is the narrowest part of Karmsundet. There is a bridge which has a vertical clearance of 45m and a horizontal clearance of 90m. Green lights are shown from the bridge to indicate the fairway. An overhead cable, with a vertical clearance of 47m, spans the channel about 183m S of the bridge.

A fish oil factory and an oil tank farm on the N shore of the bay have quays, with depths alongside of 6m. Quays, with depths alongside of 3 to 4m, are located at Utvik, in the SW corner of the bay.

Boviki (59˚22'N., 5˚18'E.), on the W side of the fairway, affords good anchorage, in depths of up to 31m. In the outer part of the bay, the bottom is mostly sand and shingle. From abreast the tile works and inward, it is mud. Boflu, lying in the N part of Boviki, has a depth of 2m and is marked by an iron perch. Kyrkjeflu, on the S side of Boviki about 0.2 mile offshore, has a depth of 2.7m and is marked by an iron perch.

Caution.—Three overhead cables, with vertical clearances of 60m, span Karmsundet close S of Kulorten. Mariners are cautioned that, within a distance of about 1 mile, the overhead cable gives a radar echo similar to that of a ship on a collision course.

Kulorten, marked by a tower beacon, lies 91m offshore about 0.5 mile N of Koltrepynten. Storetang, a rock with less than 1.8m, lies about 0.1 mile S of Kulorten and is marked by a buoy.



Hardangerfjorden

Koltrepynten (59˚19'N., 5˚20'E.), on the W shore of Karmsundet, is the site of an aluminum works. There is a concrete quay, 270m long, with a depth alongside of 12.8m.

It is reported that vessels of up to 100,000 dwt have been accommodated alongside. It has a large conspicuous warehouse, cranes, and a plant for discharging alumina.

3.44 The fjords and channels which continue in a NE direction from Bomlafjorden are called Hardangerfjorden. Occasionally, there are heavy squalls, and visibility is reduced. There are few other dangers, however, and the fjords are, for the most part, easy to navigate.

Generally, the shores are steep and rise to heights of about 914m, but there are many bays and small fjords where flat, fertile land is largely used for cherry and apple orchards.

The lower slopes are generally covered with pine forests, above which there is a belt of summer pasture land. The summits are, however, of bare rock, except where Folgefonni, a

glacier about 1,654m high, covers 108 square miles of the mountain region between the main fjord and Sorfjorden.

Regular ship communication is maintained between places in Hardangerfjorden and other places on the Norwegian coast.

Pilotage.—Pilotage is compulsory for most vessels.

Anchorage.—When selecting an anchorage, avoid anchoring too near shore in places exposed to avalanches.

3.45 Laukhamarsund (59˚52'N., 5˚36'E.) is the navigable channel between Huglo and Skorpo leading NW from Husnesfjorden into the SE part of Skjeljaviksund. Skolten, a rock with a depth of less than 1.8m and marked by an iron perch, lies on the N side of the fairway about 0.3 mile ENE of Kvarvaneset, the NW extremity of Huglo. Skolten is the only known danger in Laukhamarsund.

A cable, with a vertical clearance of 50m, spans a narrow portion of the sound about 0.5 mile E of Kvarvaneset.

Skorpesund (59˚55'N., 5˚38'E.) separates the island of Skorpo from the SW side of the irregular peninsula extending from the SE side of Tysnesoy. The sound is narrow and should not be used without local knowledge. Near its middle part, a reef extends from each of the shores almost halfway across the sound; an iron perch marks each of these reefs.

An overhead cable, with a vertical clearance of 25m, crosses Skorpesund about 1 mile within its SE entrance.

Seloysund, Midtoysund, and Anuglosund are the three channels, from W to E, leading N from Husnesfjorden to **Onarheimsfjorden** (59˚57'N., 5˚41'E.) among Seloy, Midtoy, and Anuglo. Several small islets and many above and below-water rocks lie in Seloysund and Anuglosund.

Midtoysund is free from dangers, except near the middle of its W side, where reefs extend about 0.1 mile offshore. At its N end, Midtoysund becomes quite narrow and has a least charted depth of 29m in the fairway.

An overhead cable crosses each of these sounds. There are vertical clearances of 17m, 30m, and 25m, respectively, under these cableless. A submarine cable is laid across Midtoysund and another across Anuglosund.

Anchorage.—Anchorage can be taken in **Rysslandsvik** (59˚52'N., 5˚44'E.), on the SE side of Husnesfjorden about 4 miles SSW of Heroy, in 14.6 to 29m, sand.

3.46 Husnes (59˚52'N., 5˚46'E.) (World Port Index No. 23355) is located on the E side of Ondarheimsvag, about 3 miles SSW of Heroy. A quay, at Husnes, is 240m long with 10.4m alongside, and can accommodate vessels up to 40,000 dwt. There is a hauling-off buoy moored off the quay. The quay is well fendered and equipped with two cranes.

Anchorage.—Anchorage can be taken off Husnes in Ondarheimsvag, in 12.8 to 16.5m, sand. This location is exposed to N winds.

Heroysund (59˚55'N., 5˚47'E.), between Heroy and the mainland to the E, affords anchorage for small vessels, but it is exposed to strong squalls; small quays and mooring rings are available. Vessels entering from S should pass between Heroy and the foul ground S of it.

An overhead cable, with a vertical clearance of 20m, spans the N part of Heroysund.

Kvinnheradsfjorden trends NE from Husnesfjorden for about 14 miles and joins Hissfjorden in the vicinity of the islet of Sild.

Tangeflu (59˚56'N., 5˚44'E.), marked by an iron beacon, lies on the SW side of the junction of Kvinnheradsfjorden and Husnesfjorden, in a position about 0.2 mile ENE of the NE extremity of Anuglo. Rocks, with depths of 4.9m and less, lie up to 0.2 mile off the N side of this islet.

Fjaereflu, on which a beacon stands, is located near the middle of Onarheimsfjorden, in a position about 2 miles NNW of Tangeflu. A 5m depth lies close SE of the rock.

Onarheim (59˚57'N., 5˚38'E.), located on the SW shore of Onarheimsfjorden, has a 35m long quay, with depths of 3 to 6m alongside. Several quays, with depths of 4m alongside, are located at Vattedal, about 1 mile NNE of Onarheim.

Anchorage.—The best anchorage in Onarheimsfjorden is located on the NE side of the fjord in Teroysund, the channel E of Teroy. Anchorage can be taken, in 9.1 to 18.3m, sand and clay.

3.47 Lokksundet (60˚03'N., 5˚43'E.) is a narrow sound separating the island of Tysnesoy from the mainland to the E and joins Onarheimsfjorden with Bjornefjorden. It is about 5 miles in length. The least depth of 12.8m is found in the narrowest part of the sound, where the width is 183m.

Moderate-size vessels visiting Hardangerfjorden and the other fjords of this region use Lokksundet when bound N to Bergen. The main channel of Indreleia is joined in Langenuen N of the island of Reksteren.

During calm weather, the current in Lokksundet always flows N, with a velocity of up to 2 knots during S winds. The current may flow S during N winds and has been reported to reach a velocity of 3 knots. There are eddies in the bays on either side of the channel.

Sandoy is on the W side of Lokksundet S entrance. A rock lies, awash, about 0.2 mile NE of its N end. **Hamarhaugflu Light** (60˚00'N., 5˚44'E.) is shown from a white lantern on piles on the SW side of a reef fringing the E entrance point of Lokksundet. A 7.8m depth lies about 0.4 mile N of Sandsoy.

An 1.5m depth, marked by a perch, lies on the W side of the channel, about 1 mile NNW of Sandsoy; a 3m depth lies about 160m SSE of the perch.

At Nymark, on the W side of the sound about 1 mile NNW of Hamarhaugflu, there is a quay with 5m alongside.

3.48 Storsundet (59˚57'N., 5˚53'E.), on the SE side of Kvinnheradsfjorden, is entered from the S between **Skorpegavlen** (59˚56'N., 5˚48'E.) and Heroy. This navigable channel has depths greater than 37m throughout the fairway. It is formed between the mainland and the S and E sides of Skorpo, Snilstveitoy, and Kalven, close-lying islets which extend in a continuous chain from Skorpegavlen to Kalvtangen, 6 miles NE. Storsundet trends ENE for about 6 miles, then continueing in a general N direction for 2.25 miles into Kvinnheradsfjorden. The sound is notorious for squalls.

Flatholmen (59˚56'N., 5˚51'E.), on the S side of Storsundet, is joined to Neset, a prominent point about 2 miles E of Skorpegavlen.

Skjeret, which is marked by a beacon, lies on the N side of the fairway in a position about 0.2 mile S of Oyeneset, the SE

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point of Snilstveitoy. A 4.5m depth is located between the rock and the point.

Holmeflu (59˚57'N., 5˚58'E.), with a depth of less than 1.8m and marked by an iron perch, is on the S side of the fairway and extends about 0.1 mile W from Ytreholme, a small islet lying close off a salient point about 1 mile SE of Oyeneset. Two rocks lie, awash, close NE of Holmeflu; a 6.1m depth is located close SW. Elsewhere in Storsundet, the known dangers are close inshore.

Uskedal (59˚56'N., 5˚52'E.), on the SE side of Storsundet close E of Flatholmen, has quays with depths alongside of 4 to 6m. Fresh water is available. A quay, with 5m alongside, is located at Dimmelsvik, about 1 mile ESE of Skjeret.

Rosendal (59˚59'N., 6˚00'E.), located on the E shore of Storsundet, has a quay, with depths up to 6m alongside. Fuel oil is available. Another quay, with depths of up to 6m alongside, is located at Seimsfoss about 1 mile S of Rosendal.

Anchorage.—Small vessel anchorages are found in several coves along the S shore of Storsundet.

3.49 Husavagen (60˚00'N., 5˚48'E.) indents the NW shore of Kvinnheradsfjorden for nearly 2 miles in a NNE direction. The bay narrows gradually. Kyrkjevag, narrow and rock encumbered, trends NE from the head of Husavagen for about 1 mile. Depths within Husavagen are ample and all known dangers are inside the 9.1m curve, which lies within 183m offshore.

Ulke, on the NW shore of Husavagen close to the head of the bay, has a quay, 21m long, with depths of up to 6.3m alongside.

Anchorage.—Husavagen affords anchorage to vessels of considerable siz,e in about 40m, soft clay, S of Husa, which is at the head of the bay. About 1 mile S of Husa, anchorage can be taken, in about 35m, sand and clay. Husavagen is exposed to S winds.

Latrevikklubben (60˚04'N., 5˚59'E.) is the S extremity of Varaldsoy. Four coves, Latrevik, Ferjevag, Knarrevik, and Akrehamn, are on the SE side of Varaldsoy between Latrevikklubben and a point about 3 miles NE. Akreholme and two above-water rocks W of it, lie close off the entrance of Akrehamn. Three channels lead in among the islet and rocks.

The middle channel is the deepest and leads between Akreholme and the rocks to the W. The E channel, which has a depth of 5.5m, leads N of Akreholme; a rock on the S side of the fairway is marked by an iron perch.

Anchorage.—Small vessels can take good anchorage in Akrehamn, in depths of 7 to 10m, mud.

3.50 Oynafjorden (60˚06'N., 5˚55'E.), which is formed between Varaldsoy and the mainland to the W, trends N for about 5 miles and then turns NE into Bondesundet. In Bondesundet, Kraka and other nearby rocks lie within 0.15 mile of the NW shore; an iron perch marks the outer edge of these dangers.

Other dangers in the sound and some small islets lie close offshore and are generally located within or near the few coves that indent both shores.

Caution.—Because of the strong currents in Bondesundet, its use is not recommended. Submarine cables are laid SE from Mundheim, at the head of Oynafjorden, to the E shore, and SSE for 2.5 miles and then E to Varaldsoy.

Gjermundshamn (60˚04'N., 5˚55'E.), located on the SW side of the entrance to Oynafjorden, has a quay with a least depth of 7m alongside. Fuel oil and fresh water are available.

Anchorage.—Small vessels can take anchorage in Gjermundshamn, in 15 to 20m, sand and mud.

Vagen, located on the SW side of Varaldsoy, about 1 mile N of its S extremity, has quays with depths of 4 to 12m alongside.

Fuel oil is available. Two quays, with depths up to 5m alongside, are located at Mundheim. Fresh water is available.

3.51 Maurangerfjorden (60˚06'N., 6˚10'E.) trends NE from the NE part of Kvinnheradsfjorden for about 5 miles and then branches. One branch, named Nordpollen, trends NNE for about 2 miles; the other, named Austrepollen, trends ENE for about 2 miles. Great depths prevail throughout the fjord, except that numerous above and below-water rocks extend across Austrepollen within 0.5 mile of its head. The two arms are usually icebound during hard winters.

Bondhusbre, a branch of the large glacier Folgefonn, is on the S side of Maurangerfjorden. Steep cliffs are on both sides of the fjord.

Mountain squalls can be violent towards the head of the fjord, especially during E winds. Because of possible landslides, vessels should avoid approaching the shores of Maurangerfjorden too closely. Several submarine cables are laid across the fjord and its two arms. A cable, with a vertical clearance of 65m, spans the fjord about 4 miles within the entrance, close W of Sundal.

Sundal, on the S shore about 4 miles within the entrance, has a small wharf, with alongside depths of 3 to 4m. Fuel oil and fresh water are available. Eikanes, on the N shore of the fjord about 1 mile WNW of Sundal, has a small masonry quay, with alongside depths of 3.9 to 5m.

Anchorage.—Anchorage can be taken off the wharf of Sundal, in about 35m. Good anchorage can be taken near the head of Nordpollen.

3.52 Hissfjorden (60˚12'N., 6˚03'E.) extends N and NE for about 10 miles from the N portion of Kvinnheradsfjorden to its junction with Ytre Samlofjorden in the vicinity of Jondal. The shores of Hissfjorden are mostly steep-to, except along the NW side. In places along this shore small islets and rocks lie up to 0.25 mile offshore. Some of the outermost dangers are marked by iron perches. An overhead cable, with a vertical clearance of 65m, spans Hissfjorden about 2 miles SW of Jondal.

A quay at **Fosse** (60˚16'N., 6˚02'E.), on the NW shore of Hissfjorden, has alongside depths of 3 to 5m.

Kysnes (60˚12'N., 6˚07'E.), located on the SE side of Hissfjorden, has a quay, with depths of up to 5m alongside. Torsnes, about 3 miles NE of Kysnes, has a quay with depths of 5 to 6m.

A quay at **Jondal** (60˚16'N., 6˚15'E.) is 65m long, with depths of 4 to 10m alongside. Fuel oil and fresh water are available.

Anchorage.—Anchorage can be taken off the village of Jondal.

3.53 Ytre Samlafjorden (60˚21'N., 6˚18'E.) extends NE for about 6 miles from Hissfjorden to its junction with Indre Samlafjorden off of Samlaneset, a salient point on the S shore.

General depths through the main fjord are great, and the fairway is clear. There are some dangers and islets which lie close offshore and within the several bays indenting the shores on both sides.

Herand (60˚20'N., 6˚23'E.) is at the head of a bay which is entered about 2 miles S of Samlaneset. Herandsholme is the largest of several islets lying close off the SW entrance point of this bay. A quay with up to 4m alongside is located at Herand.

Anchorage.—Anchorage can be taken near the head of the bay E of Herandsholme. Care must be taken to avoid a group of rocks, marked by an iron perch, in the SE part of the anchorage.

Norheimsund is an inlet extending in a NW direction from the NW side of Ytre Samlafjorden. Fairway depths in the outer part of Norheimsund are 18.3 to 48m. The narrow inner part has a least charted depth of 11m in the deeper SW channel. There is a 6 knot speed limit in Norheimsund.

Vikoy is located on the S shore of Norheimsund about 2 miles SE of the head of the inlet. Several rocks, including an above-water rock, lie up to 0.25 mile offshore in the vicinity of Vikoy. A 9m depth lies about 0.3 mile E of the above-water rock. A buoy marks the N edge of a shoal area extending N from the S shore. A quay at a tank installation near Vikoy has a depth of 6m alongside.

Vallandsgrunn, marked by a buoy, lies on the N side of the fairway N of Vikoy. A depth of 7m is charted close E of the buoy. Between Vallandsgrunn and the shore NW, there are a number of rocks, some of which lie above water. A light is shown from near the outer edge of these rocks.

An islet, with foul ground extending about 183m SE, lies in the middle of the inner part of Norheimsundand forms two channels which lead NW to the head of the inlet. The SW channel is the better one. A buoy is moored on the S edge of the foul ground.

Norheimsund (60˚22'N., 6˚09'E.) (World Port Index No. 23230) is located at the head of the sound. Several quays, with depths alongside of 3 to 6m, are located at Norheimsund.

3.54 Tjuvaholmen (60˚22'N., 6˚16'E.) is located between Kvamsoy and the mainland to the NW. A rock close S of Tjuvaholmen is marked by an iron perch. Another iron perch marks a group of rocks close off the mainland, NW of Tjuvaholmen. An overhead cable, with a vertical clearance of 28m, spans the channels between the mainland and Tjuvaholmen and between that islet and Kvamsoy.

Oystesevagen (60˚23'N., 6˚12'E.) trends N for about 1.25 miles from its entrance. Several quays, with alongside depths of up to 7m, are located at Oystese, a village at the head of the inlet.

Anchorage.—Anchorage can be taken close off the head of the inlet. Take caution to avoid the submarine cable along the E shore and a 7.5m shoal 0.5 mile S of the head.

Fyksesundet (60˚25'N., 6˚15'E.) trends NNW for about 5 miles from the NW side of Ytre Samlafjorden. The sound varies in width from about 91m to 0.3 mile between steep mountains on either side. It is the narrowest and most gloomy branch of Hardangerfjorden. Squalls occur in the sound, especially during E winds.

A bridge, with a vertical clearance of 26.5m, spans Fyksesundet about 1 mile from the entrance to the sound. Several overhead cables, of which the least vertical clearance is 27m, and several submarine cables cross the inlet throughout its length. An overhead cable, with a vertical clearance of 17m, crosses a small bight of the sound at its N end. Steinsto, on the E shore, close NW of the entrance to the sound, has a quay with 8 to 10m alongside.

A mooring buoy is located a little over 2.5 miles within the entrance. A rock close off the SW entrance to the sound is marked by an iron perch. Rysholme lies in mid-channel, about 0.5 mile within the entrance.

Indre Samlafjorden extends in a NE direction from Samlaneset for about 8 miles to its junction with Utnefjorden.

Ytre Alvik (60˚25'N., 6˚23'E.), located on the N shore of Indre Samlafjorden, has a small quay, with 5m alongside.

Indre Alvik, also located on the N shore of Indre Samlafjorden about 2 miles further NE of Ytre Alvik, is the site of a ferro-silicon works. It has its own quays, the largest of which is 82m long, with depths of 9 to 10m alongside.

Two 7.5 ton cranes are located on the quay. Two mooring buoys are located about 91m off the quay at Indre Alvik.

Pilotage is compulsory. Anchorage can be taken in the bay W of the quays, in a clay bottom.

3.55 Utnefjorden (60˚26'N., 6˚38'E.) trends about 4 miles in a SE direction from Indre Samlafjorden to its junction with Eidfjorden and Sorfjorden. The fjord is deep and clear in the fairway.

Utne (60˚26'N., 6˚37'E.), on the SW shore, has a quay, with depths from 4 to 7m alongside. Tingnesflu, marked by an iron perch, lies close offshore about 0.2 mile NW of the quay at Utne. Numerous submarine cables are laid in Utnefjorden.

Granvinfjorden (60˚28'N., 6˚37'E.) trends in a general NE direction for about 5 miles and in places is reduced to a width of about 0.2 mile. Depths of about 134 to 200m prevail in the fairway up to the anchorage near the head of the fjord.

Granvinfjorden is reported to be ice-free.

Kvanndal lies on the NW side of Granvinfjorden, about 1 mile within its entrance. There are quays, 100m long, with depths of 4 to 11m alongside located at Kvanndal. About 1 mile farther up the fjord, on the W side, there is a quay, with up to 5m, alongside at Folkedal.

Eide, a village at the head of Granvinfjorden, has a quay, 100m long, with a depth of 12m alongside. Fuel oil and fresh water are available.

3.56 Eidfjorden (60˚25'N., 6˚43'E.) extends ENE from its junction with Utnefjorden for about 11 miles to the village of Eidfjorden. Eidfjorden is very deep and free from dangers in the fairways.

Djonno (60˚28'N., 6˚45'E.), on the N side of Eidfjorden about 3 miles NE of the entrance, has a quay, with depths of 6 to 10m alongside. Another quay at Vallavik, 2.5 miles ENE of Djonno, has depths of 5 to 6m alongside.

Eidfjord (60˚28'N., 7˚04'E.) is a scattered village on the S side of the head of Eidfjorden. A quay at Eidfjorden is 30m long, with depths of 3 to 5m alongside. Good anchorage with

clay bottom can be taken by vessels of moderate size 0.3 mile W of the quay, avoiding submarine cables NW of the village; mooring rings are available.

Ringoy (60˚27'N., 6˚47'E.), on the SE shore about 3 miles ENE of the entrance to Eidfjorden, has a quay with depths of up to 5m alongside. Fuel oil and fresh water are available. Vessels approaching the quay must avoid a reef extending a short distance from the nearby Ringoynes and which is marked by an iron perch. Brimnes, on the S shore about 4 miles further NE, has a quay with depths of up to 5m alongside.

3.57 Simadalsfjorden (60˚30'N., 7˚05'E.) extends about 2 miles ENE from Eidfjorden. Vessels are warned against anchoring in this fjord due to rock falls from the steep mountain sides and to submarine cables. The fjord often freezes during the winter.

Osafjorden (60˚30'N., 6˚55'E.) extends 6.75 miles NE from Eidfjorden to Osa and is deep and free from dangers. Squalls occur in the fjord and are worse during SE winds. During hard winters ,the inner part of Osafjorden is icebound. Small vessels can anchor off Osa, in 40m, clay. A mooring buoy is located off Osa. Several submarine cables cross the fjord.

Ulvikfjorden, a smaller inlet, trends N and NE for about 3 miles from the W side of Osafjorden. During hard winters the entire fjord is icebound. Ulvik, on the NW shore about 1 mile from the head of Ulvikfjorden, has an angled quay, with depths off its longest side of 6 to 7m.

Hetlenes, on the W shore about 0.5 mile within the entrance of the inlet, has a quay, with depths of 5 to 8m alongside. A rock, marked by an iron perch, lies close off the E shore about 0.2 mile SE Of Ulvik.

Caution.—A seaplane landing area is situated in Ulvikfjorden.

3.58 Sorfjorden (60˚24'N., 6˚42'E.) extends SSW from the junction of Utnefjorden and Eidfjorden for about 20 miles to the town and port of Odda, at its head. This fjord is one of the most beautiful branches of Hardangerfjorden. Sorfjorden is narrow and straight. Near its entrance there are extensive farm lands along both sides, but S of Hovland bare rock walls rise almost perpendicularly from the water's edge.

The width of Sorfjorden varies between about 0.2 mile and 2 miles. The narrowest part is within 1.25 miles of the head of the fjord. Throughout the length of the fjord the depths are ample and in places they exceed 366m. There are few dangers and all of these lie within 0.3 mile offshore.

Winds—Weather.—Squalls occur in Sorfjorden and are often very strong. During hard winters, ice forms in the fjord, but a channel is usually kept open.

3.59 Kinsarvikbukta (60˚23'N., 6˚43'E.) is a clear bay located on the E side of Sorfjorden. Large vessels can anchor here; the best berth is in 12.8 to 31m in a position SW of the quay, which is near the village church at the head of the bay. A rock, marked by an iron perch, lies awash close offshore W of the church. Two quays at Kinsarvik, at the head of the bay, have depths of 5 to 6m alongside.

Ullensvang (60˚19'N., 6˚39'E.), in a bight on the E shore of the fjord, has quays with depths of up to 5m alongside.

Anchorage.—Anchorage can be taken off Ullensvang, in 25.6m, but vessels must be prepared for sudden violent squalls.

A quay at Lofthus, close N of Ullensvang, has 5m alongside. Fuel oil and fresh water are available. Quays at Lutro and Instanes, on the E shore of the fjord about 2 and 3 miles, respectively, NNE of Lofthus, have alongside depths of up to 5m.

Grimo (60˚23'N., 6˚39'E.) and Aga, on the W shore of the fjord about 2 miles and 7 miles, respectively, SSW of the entrance to Sorfjorden, each have a quay, with depths alongside of up to 7m. Na, on the W shore about 3 miles SSW of Aga, has two quays, with depths of up to 5m alongside.

Espe (60˚12'N., 6˚36'E.), located on the E shore, has quays with depths of 6 to 10m alongside.

Tyssedal (60˚07'N., 6˚34'E.), located on the E shore, has about 335m of quayage. One 45-ton crane and one 2.5-ton crane are available. Depths alongside the larger of the quays range from 12 to 14m. The largest of the several quays at a zinc works at Eitrem, on the W shore, 1 mile SW of Tyssedal is 73m long with depths from 9 to 11m alongside.

3.60 Odda (60˚05'N., 6˚33'E.) (World Port Index No. 23240) is located at the S end of Sorfjorden. Facilities of the port are adjacent to the town at the head of the fjord and at Eitrem, about 1 mile NNW. Odda is known for its extensive electro-chemical and electro-metallurgical industries.

Wind—Weather.—During the summer months there is usually considerable haze and rain, much of the haze being attributable to the smog given off by the plants in the town. There is some smoke control. Because the harbor is protected from the winds, such control is inadequate.

Tides—Currents.—The spring tidal rise is 0.6m. A slight tidal current sets outward through Sorfjorden.

Depths—Limitations.—The E and W shores of the harbor are steep-to. The 18.3m curve lies about 0.3 mile N of the head of the fjord and in the NW part of the harbor rounds Eitrheimnes to a position about the same distance S of that point. Shoal water extends about 183m S from Eitrheimsnes.

General depths in the middle part of the harbor are 35 to 50m. Depths in the anchorage area range from 29m to about 44m.

There are quays, with reported depths of 5.1 to 13.7m alongside. There are facilities for container and bulk vessels.

Vessels up to 26,000 dwt and 9.1m draft, and chemical tankers up to 10,000 dwt, can be accommodated.

Aspect.—The harbor of Odda is formed by the S part of Sorfjorden. It is entered through the narrows, about 1 mile N of the head of the fjord, which is formed by a small peninsula terminating S in Eitrheimsnes and the shore, to the E.

Except for the head of the fjord where the town of Odda is located, the harbor is surrounded by mountains. The E and W shores rise steeply from the water's edge to heights of 1,067m and 1,189m. There are no beaches as such.

Signals.—VHF channel 16 is guarded from 0900 to 1600 and has a range as far as the entrance to Sorfjorden.

Anchorage.—Vessels can anchor in the W part of the basin N of the town, in 29.3m, clay, well sheltered from all winds. The holding ground is good to the W portion of the basin. Caution must be taken to avoid submarine cables and outfall pipelines.

Caution.—Navigation through the fjords leading to Odda presents no difficulties, but, because of the many fierce squalls, caution is always necessary.

3.61 Bjornafjorden (60˚06'N., 5˚25'E.) trends E for about 13 miles from Langenuen. It is bound on the S by the N sides of the islands of Reksteren and Tysnesoy and on the N and E by the mainland.

The fairway leading through the length of Bjornafjorden is clear and deep. On the S side of the fjord, a number of islets and rocks lie within 2 miles off the N side of Tysnesoy and about 1 mile off the NE end of Reksteren.

On the NW side islands, islets and rocks lie up to 2 miles off the mainland. Elsewhere, the shores of Bjornafjorden are relatively steep-to. In the side fjords there are some islets and dangers.

Store Vernoy (60˚05'N., 5˚26'E.) is separated from the NE side of Reksteren by a narrow channel which dries. It is the largest of a group of islets lying within 1.5 miles E of the NE point of Reksteren. Numerous small islets and above and below-water rocks are in this group.

Veaneset (60˚03'N., 5˚29'E.) is the NW extremity of Tysnesoy. From Veaneset, the N side of Tysnesoy trends very irregularly ENE for about 7 miles to Krossnes, on the W side of the Lokksundet entrance. It is indented by several bays and coves.

Off the N coast of Tysnesoy there are some larger islets, including Store Godoy and Lille Godoy, and many close-lying small islets and above and below-water rocks.

Godoysund, a channel which is navigable by small vessels with local knowledge, separates Store Godoy and Lille Godoy. Iron perches mark some of the dangers in both approaches to Godoysund. A overhead cable and several submarine cables cross the channel.

Tysnesvik (60˚03'N., 5˚32'E.) is entered about 1.25 miles E of Veaneset. Above and below-water rocks are on both sides of the entrance and within the inlet. Some of the dangers in the entrance to Tysnesvik are marked by two iron perches and a buoy.

Vage, on the W shore of Tysnesvik, has a quay, with depths of 4 to 13m alongside. Two other quays have depths of up to 7m alongside.

Gripnesvag (60˚04'N., 5˚40'E.) is a small inlet about 1 mile WSW of Krossnes. The entrance channel is narrow and has a least depth of 4.5m.

3.62 Soreidsvik (60˚03'N., 5˚28'E.) is entered between Veaneset and Raftodden, a projection on Reksteren about 1 mile WSW. From the entrance, Soreidsvik trends S for about 4 miles, and, except at its head, is deep and free from dangers in the fairway.

Many small bays and coves indent the shores of the inlet; small quays are located at several of these places.

Aquay at **Bruntveit** (60˚02'N., 5˚26'E.), on the W shore of the inlet, has a quay, with a least alongside depth of 5m.

Uggdalseidet, close to the SE head of the inlet, has quays with depths of up to 5m alongside. Fuel oil is available.

Indroy (60˚09'N., 5˚25'E.), on the N side of Bjornafjorden, lies in a bight of the mainland, with its S extremity about 2 miles ENE of Rotingtangen. Ytroy lies close W of Indroy.

Hauglandssund, between Indroy and the mainland E of it, is entered between Skjerholme and Bjornahaug, the S extremity of the mainland, about 0.5 mile E. A light is shown from a rock close SW of Bleikja, an islet in mid-channel, about 0.5 mile NW of Bjornahaug.

Hauglandssund is narrow in places but free from dangers in the fairway. A depth of 6m is available through the sound. Vessels must not exceed a speed of 8 knots in Hauglandssund when N of Bleikja.

A quay, 46m long, with depths of 4 to 8m alongside, is located at Halgjem, on the mainland about 0.5 mile N of Bleikja.

Stegleholme (60˚09'N., 5˚41'E.) is the farthest S of several islets fronting Strandvik to a distance of 0.5 mile off the NE shore of Bjornafjorden. Knapholme and Storholme are other islets in the group. Foul ground extends about 0.1 mile SE from Storholme. Overhead cables, with respective vertical clearances of 20m and 15m, connect Stegleholme to Storholme and Storholme to the mainland.

Strandvik (60˚10'N., 5˚41'E.) (World Port Index No. 23220), which has several quays with depths of up to 8m alongside, is on the mainland NW of Knapholme. A reef extending about 183m SW from Knapholme is marked by an iron perch.

Saevareidfjorden is entered between Storholme and a mainland point about 1 mile E. This side fjord trends N and NE from Bjornafjorden for about 3 miles to Saevareid at its head. Depths through the fairway are ample, and most of the shore is steep-to. A depth of 4.3m is charted about 0.2 mile off the E shore in a position nearly 1 mile NE of Storholme.

Very heavy squalls are experienced in Saevareidfjorden, especially off Mulsodden, a projection on the NW shore about 1 mile NNE of Storholme.

Saevareid (60˚11'N., 5˚45'E.) (World Port Index No. 23250) has several small quays. The largest is 43m long, with depths of 7.8 to 19.3m alongside. A salmon farm installation is moored at the W end of the quay.

3.63 Lygrepollen (60˚04'N., 5˚46'E.), located at the E end of Bjornefjorden, is available only to small vessels with local knowledge. The entrance channel is very narrow and is fringed by islets and above and below-water rocks, some of which are marked by aids. The least depth in the fairway is 5.5m.

About 1 mile within the entrance, the basin becomes deeper and broader and then leads off into three separate branches.

Overhead cables, with a least vertical clearance of 20m, span the entrance. Several submarine cables are laid across the entrance and in the N branches.

Anchorage.—Small vessels can take anchorage in various coves inside the bay.

3.64 Fusafjorden (60˚10'N., 5˚32'E.) is a deep inlet which extends in a NNE direction from the N side of Bjornefjorden.

About 7 miles within the entrance, Eikelandsfjorden branches E for 3.5 miles, and Adlandsfjorden branches NE for the same distance. The fairway is free from dangers. Except for Sandholmane, the islets and dangers in the fjord are close offshore.

Sandholmane, a group of small islets and nearby rocks, lies on the W side of the fairway about 3 miles within the

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Fusafjorden entrance. A rock, with a depth of 2.5m and marked by a buoy, is located about 0.2 mile NNE of the northernmost islet of Sandholmane.

Raudholmane (60˚10'N., 5˚28'E.), a group of above and below-water rocks, lies up to 0.3 mile offshore about 1 mile WSW of Sandholmane. Two iron perches mark two detached rocky patches, with depths of less than 1.8m, lying about 183m SW and SSW of Raudholmane.

Another iron perch marks a rock lying, awash, near Ferstadvag, about 0.2 mile SW of Raudholmane. Depths of 2.4m are charted up to 183m offshore in the vicinity of Mobergvik, about 0.5 mile N of Raudholmane.

Os (60˚11'N., 5˚28'E.) (World Port Index No. 23200) is located on the SW shore of Fusafjorden. An angled quay at Os has a depth of 4m alongside.

Hattevik lies at the head of a small inlet on the W side of Fusafjorden, about 3 miles NE of Os. It has a quay, with 4 to 6m alongside. Ferry service is maintained between Hattevik and Fusa, across the fjord about 3 miles E.

Fusa, where there is a quay with 4 to 7m alongside, is located in a cove. An iron perch marks a shoal close off the W entrance point of the cove.

Eilelandsfjorden extends in a ENE direction for about 4 miles from Altaneset, the N entrance point.

Gjerdevikflu, awash, marked by an iron perch and with depths of 3 to 4m extending close NE, lies about 1 mile ESE of Altaneset. This shoal and other known dangers along the S shore of the fjord all lie within 0.2 mile offshore.

On the N shore a small islet, about 1 mile NE of Altaneset, lies about the same distance offshore and is connected by a shoal to the shore. Bergsvik, on the S shore of the fjord about 2 miles E of Altaneset, has a quay with depths of 5m alongside. Eikelandsosen, at the head of the fjord, has a projecting quay with depths of up to 4m along its N side.

Small vessels can anchor SSE of the quay, avoiding submarine cables. West winds send in a considerable sea.

3.65 Adlandsfjorden (60˚15'N., 5˚38'E.) is formed between the SE side of Bogoy and a mainland peninsula which terminates in Altaneset. Adlandsfjorden'n entrance is between Altaneset and Holsundskjaer, about 1 mile W. Holsundskjaer, consisting of above and below-water rocks, extends about 0.2 mile SSW from the S end of Bogoy. The southernmost danger is marked by an iron perch; close N of the perch there is a beacon.

Adlandsholme lies in the middle of the fjord about 2 miles NNE of Altaneset. Two other small islets lie between Adlandsholme and Bogoy. Samnoyholme lies about 0.2 mile SW of Adlandsholme, with rocks marked by perches between the islets. A light is shown from the E extremity of Adlandsholme.

Samnoy, a village on Bogoy about 0.5 mile SW of Adlandsholme, has a small quay with depths of 2 to 7m alongside. A narrow 5.5m channel leads to the quay. Three rocks, each marked by an iron perch, lie in the approach to Samnoy.

3.66 Holmefjorden (60˚17'N., 5˚40'E.) lies at the head of Adlandsfjorden. Iron perches mark some of the dangers in the approach. Two quays have least depths of about 5 and 6m alongside. Fresh water is available.

The entrance to Samnangerfjorden lies between Holsundskjaer and the mainland to the W. About 7 miles above the entrance, Samnangerfjorden divides; one branch continuing N for about 2 miles to Trengeried, at its head while the other trends in a general NE direction for about 4 miles to Arland, at the head of a basin.

A shoal, marked by an iron perch, lies close NW of Holsundskjaer. Hovdeflu, a 1.8m depth marked by an iron perch, lies close off Hovdanes the W extremity of Bogoy, which point is located about 1 mile NNW of Holsundskjaer.

Two rocks lie awash close off the opposite shore of the fjord in a position about 0.5 mile SSW of Hovdeflu.

A light is shown from Hovdanes.

Bogavik (60˚16'N., 5˚35'E.) is located on the W shore of Samnangerfjorden, about 1 mile N of Hovdanes. A quay located in a cove at Bogavik has a least depth of 6m alongside.

A light is shown from the W shore of Samnangerfjorden, about 2 miles NE of Bogavik.

Boroy, on the E side of Samnangerfjorden close off the NW side of Bogoy, is separated from that island by Boroysund. A depth of 7.3m can be taken through this very narrow channel, but in it there is a 1.8m depth marked by an iron perch.

A depth of 3.7m is available through Kluresund, the narrow channel separating Boroy from the mainland to the N. Iron perches mark dangers on either side of the fairway through Kluresund. Both channels lead into Tveitevag. This inlet is about 2 miles long and very narrow in places.

Solbjorg (60˚18'N., 5˚37'E.), located on the W shore of the fjord about 1 mile W of the N extremity of Boroy, has a quay, with depths of 4 to 5m alongside.

Rolsflu, a rock awash and marked by an iron perch, is on the W side of the fjord about 2 miles NNW of the N end of Boroy. It lies near the end of a reef extending about 0.2 mile N of a point extending N from the shore.

A light is shown from Utskot, on the E side of Samnangerfjorden, about 2 miles N of Boroy.

Skjeljavag (60˚22'N., 5˚40'E.) is located on the NE shore of the NW branch of Samnangerfjorden, about 2 miles N of Utskot. A quay located on the W side of the head of this branch has depths of 5 to 7m alongside. A 10-ton crane is available.

3.67 Gaupholmen (60˚22'N., 5˚42'E.) lies 183m off the S shore of the E branch of Samnangerfjorden, about 3 miles NE of Utskot. Furoyi is located close off the S shore about 1 mile E of Gaupholmen.

A quay, close to Gaupholmen, has depths of up to 7m alongside. Fuel oil and fresh water are available.

A light is shown from the W side of the fjord, about 0.5 mile W of Gaupholmen.

Tysse, about 0.5 mile E of Furoyi, has a quay, with depths of 3 to 5m alongside. A doctor is available. There is bus and rail transportation to Bergen.

Anchorage.—Moderate-sized vessels can anchor in the area between Furoyi and Tysse.

A rock, marked by an iron perch, lies awash close off the W side of Haukaneset, a prominent point on the N shore nearly 1 mile N of Furoyi.