General Information

UNITED STATES COAST PILOT

(1) The United States Coast Pilot, published by the National Oceanic and Atmospheric Administration (NOAA), in conjunction with the Federal Aviation Administration (FAA), is a series of nine nautical books (volumes) that cover a wide variety of information important to navigators of U.S. coastal and intracoastal waters, and the waters of the Great Lakes. Most of Coast Pilot information cannot be shown graphically on the standard nautical charts, and is not readily available elsewhere. The topics in the Coast Pilot include, but are not limited to, channel descriptions, anchorages, bridge and cable clearances, currents, tide and water levels, prominent features, pilotage, towage, weather, ice conditions, wharf descriptions, dangers, routes, traffic separation schemes, small-craft facilities, and Federal regulations applicable to navigation.

(2) **Amendments (NMRs)** to this publication are available on the **NOAA website http://nauticalcharts.noaa.gov/nsd/cpdownload.htm, U.S. Coast Guard (USCG) Local Notices to Mariners website http://www.navcen.uscg.gov/lnm/default.htm, and National Geospatial–Intelligence Agency (NGA) Notices to Mariners website http://pollux.nss.nga.mil/untm/**. Also, hard copies are published in the USCG and NGA weekly Notices to Mariners.

Bearings

(3) These are true, and expressed in degrees from **000°** (north) to **359°**, measured clockwise. **General bearings** are expressed by initial letters of the points of the compass (e.g., **N, NNE, NE,** etc.). Whenever **precise bearings** are intended, degrees are used. **Light-sector bearings** are toward the light.

Bridges and cables

(4) Vertical clearances of bridges and overhead cables are in feet above mean high water unless otherwise stated; clearances of drawbridges are for the closed position, although the open clearances are also given for vertical-lift bridges. Whenever a bridge span over a channel does not open fully to an unlimited clearance position, a minimum clearance for the sections over the channel should be given; the same guidelines apply to swing and pontoon bridges with openings less than 50 feet horizontally. Clearances given in the Coast Pilot are those approved for nautical charting, and are supplied by the U.S. Coast Guard (bridges) and U.S. Army Corps of Engineers (cables); they may be as-built (verified by actual inspection after completion of structures) or authorized (design values specified in the permit issued prior to construction). No differentiation is made in the Coast Pilot between as-built and authorized clearances. (See charts for horizontal clearances of bridges, as these are given in the Coast Pilot only when they are less than 50 feet (15 meters). Although, there are exceptions in two Coast Pilot books; they are Coast Pilot 6 and 7, in areas where **tables** are used **all horizontal clearances** are listed.) Submarine cables are rarely mentioned.

Cable ferries

(5) Cable ferries are guided by cables fastened to shore and sometimes propelled by a cable rig attached to the shore. Generally, the cables are suspended during crossings and dropped to the bottom when the ferries dock. Where specific operating procedures are known they are mentioned in the text. Since operating procedures vary, mariners are advised to exercise extreme caution and seek local knowledge. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Courses

(6) These are true and are given in degrees clockwise from **000°** (north) to **359°**. The courses given are the courses to be made good.

Currents

(7) Stated current velocities are the averages at strength. Velocities are in knots, which are nautical miles per hour. Directions are the true directions to which the currents set (see Chapter 3, this book).

Depths

(8) Depth is the vertical distance from the chart datum to the bottom and is expressed in the same units (feet, meters or fathoms) as soundings on the applicable chart. (See Chart Datum this chapter for further detail.) The **controlling depth** of a channel is the least depth within the limits of the channel; it restricts the safe use of the channel to drafts of less than that depth.

The **centerline controlling depth** of a channel (rarely used when transiting waterways) applies only to the channel centerline or close proximity; lesser depths may exist in the remainder of the channel. The **midchannel controlling depth** of a channel is the controlling depth of only the middle half of the channel. **Federal project depth** is the design dredging depth of a channel constructed by the U.S. Army Corps of Engineers; the project depth may or may not be the goal of maintenance dredging after completion of the channel, and, for this reason, project depth must not be confused with controlling depth. **Depths alongside wharves** usually have been reported by owners and/or operators of the waterfront facilities, and have not been verified by Government surveys; since these depths may be subject to change, local authorities should be consulted for the latest controlling depths.

(9) In general, the Coast Pilot gives the project depths for deep-draft ship channels maintained by the U.S. Army Corps of Engineers. The latest controlling depths are usually shown on the charts and published in the Notices to Mariners. For other channels, the latest controlling depths are available at the time of publication. **In all cases, however, mariners are advised to consult with pilots, port and local authorities, and Federal and State authorities for the latest channel controlling depths.**

Under-keel clearances

(10) It is becoming increasingly evident that economic pressures are causing mariners to navigate through waters of barely adequate depth, with under-keel clearances being finely assessed from the charted depths, predicted tide levels, and depths recorded by echo sounders.

(11) It cannot be too strongly emphasized that even charts based on modern surveys may not show all sea-bed obstructions or the shoalest depths, and actual tide levels may be appreciably lower than those predicted.

(12) In many ships an appreciable correction must be applied to shoal soundings recorded by echo sounders due to the horizontal distance between the transducers. This separation correction, which is the amount by which recorded depths therefore exceed true depths, increases with decreasing depths to a maximum equal to half the distance apart of the transducers; at this maximum the transducers are aground. Ships whose transducers are more than 6 feet (1.8 meters) apart should construct a table of true and recorded depths using the Traverse Tables. (Refer to the topic on echo soundings elsewhere in chapter 1.)

(13) Other appreciable corrections, which must be applied to many ships, are for settlement and squat. These corrections depend on the depth of water below the keel, the hull form and speed of the ship.

(14) Settlement causes the water level around the ship to be lower than would otherwise be the case. It will always cause echo soundings to be less than they would otherwise be. Settlement is appreciable when the depth is less than seven times the draft of the ship, and increases as the depth decreases and the speed increases.

(15) Squat denotes a change in trim of a ship underway, relative to her trim when stopped. It usually causes the stern of a vessel to sit deeper in the water. However, it is reported that in the case of mammoth ships squat causes the bow to sit deeper. Depending on the location of the echo sounding transducers, this may cause the recorded depth to be greater or less than it ought to be. **Caution and common sense are continuing requirements for safe navigation.**

Distances

(16) These are in nautical miles unless otherwise stated. A nautical mile is one minute of latitude, or approximately 2,000 yards, and is about 1.15 statute miles.

Heights

(17) These are in feet (meters) above the tidal datum used for that purpose on the charts, usually mean high water. However, the heights of the decks of piers and wharves are given in feet (meters) above the chart datum for depths.

Light and fog signal characteristics

(18) These are not described in the Coast Pilot. Also, light sectors and visible ranges are generally not fully described. This information can be found in U.S. Coast Guard Light Lists.

Obstructions

(19) Wrecks and other obstructions are mentioned only if they are relatively permanent and in or near normal traffic routes.

Radio aids to navigation

(20) These are seldom described. (See United States Coast Guard Light Lists, and National Geospatial–Intelligence Agency Radio Navigational Aids.)

Ranges

(21) These are not fully described. "A **339°** Range" means that the rear structure bears **339°** from the front structure. (See United States Coast Guard Light Lists.)

Reported information

(22) Information received by NOAA from various sources concerning depths, dangers, currents, facilities, and other topics, which has not been verified by Government surveys or inspections, is often included in the Coast Pilot; such **unverified information** is qualified as "reported," and should be regarded with caution.

Time

(23) Unless otherwise stated, all times are given in local standard time in the 24-hour system. (Noon is 1200, 2:00 p.m. is 1400, and midnight is 0000.)

Winds

(24) Directions are the true directions from which the winds blow, however, sometimes (rarely) compass points are used. Unless otherwise indicated, speeds are given in knots, which are nautical miles per hour.

NAUTICAL CHARTS

Chart symbols and abbreviations

(25) NOAA's Nautical Charts are a graphic portrayal of the marine environment showing the nature and form of the coast, the general configuration of the sea bottom, including water depths, locations of dangers to navigation, locations and characteristics of man-made aids to navigation, and other features useful to the mariner.

(26) The standard symbols and abbreviations approved for use on all regular nautical charts are in **Chart No. 1**, United States of America **Nautical Chart Symbols and Abbreviations**. This product, maintained by the National Geospatial–Intelligence Agency and NOAA, is available on the internet website address, http://nauticalcharts.noaa.gov/mcd/chartno1.htm.

(27) On certain foreign charts reproduced by the United States, and on foreign charts generally, the symbols and abbreviations used may differ from U.S. approved standards. It is therefore recommended that navigators who acquire and use foreign charts and reproductions procure the symbol sheet or Chart No. 1 produced by the same foreign agency.

(28) Mariners are warned that the buoyage systems, shapes, and colors used by other countries often have a different significance than the U.S. system.

Chart Projections

(29) The **Mercator projection** used on most nautical charts has straight-line meridians and parallels that intersect at right angles. On any particular chart the distances between meridians are equal throughout, but distances between parallels increase progressively from the Equator toward the poles, so that a straight line between any two points is a rhumb line. This unique property of the Mercator projection is one of the main reasons why it is preferred by the mariner.

(30)

Chart Datum

(31) Chart Datum is the particular tidal datum to which soundings and depth curves on a nautical chart or bathymetric map are referred. The tidal datum of **Mean Lower Low Water** is used as Chart Datum along the east, west and Gulf coasts, including the coasts of Alaska, Hawaii, the West Indies and other United States and United Nations islands of the Pacific.

(32) Mean Lower Low Water is defined as the arithmetic mean of the lower low water height of each tidal day (24.84 hours) observed over the National Tidal Datum Epoch. The National Tidal Datum Epoch is the specific 19-year period adopted by NOAA, as the official time segment over which tide observations are taken and reduced to obtain mean values for tidal datums. The present Epoch is 1983 through 2001. See http://co-ops.nos.noaa.gov/datum_update.shtml.

Horizontal Datum

(33) Nautical charts are constructed based on one of a number of horizontal datums which are adopted to best represent individual regions around the world. Note that the terms horizontal datum, horizontal geodetic datum, and horizontal control datum are synonymous.

(34) The exact placement of lines of latitude and longitude on a nautical chart is dependent on the referenced horizontal datum. Charts of the United States are currently referenced primarily to the North American Datum of 1983 (NAD 83), and the World Geodetic System 1984 (WGS 84). WGS 84 is equivalent to the NAD 83 for charting purposes.

(35) NAD 83 and WGS 84 have replaced the North American Datum of 1927 and other regional datums as the primary horizontal datum to which NOAA charts are referenced. Since many geographic positions are still referenced to the older datums, NOAA has included notes on charts which show the amount to shift those positions in latitude and longitude to fit the chart's NAD 83 or WGS 84 projection.

(36) It should be noted that there are still a few nautical charts that have not been converted to the new datums. The mariner should check each chart's title block to determine the horizontal datum.

(37) It should be further noted that the physical shift between positions on older datums and NAD 83/WGS 84 was significant. The mariner should always be certain the positions they are plotting on a nautical chart are on the same datum as the chart.

Accuracy of a nautical chart

(38) The value of a nautical chart depends upon the accuracy of the surveys on which it is based. The chart reflects what was found by field surveys and what has been reported to NOAA Headquarters. The chart represents general conditions at the time of surveys or reports and does not necessarily portray present conditions. Significant changes may have taken place since the date of the last survey or report.

(39) Each sounding represents an actual measure of depth and location at the time the survey was made, and each bottom characteristic represents a sampling of the surface layer of the sea bottom at the time of the sampling. Areas where sand and mud prevail, especially the entrances and approaches to bays and rivers exposed to strong tidal current and heavy seas, are subject to continual change.

(40) In coral regions and where rocks and boulders abound, it is always possible that surveys may have failed to find every obstruction. Thus, when navigating such waters, customary routes and channels should be followed, and areas avoided where irregular and sudden changes in depth indicate conditions associated with pinnacle rocks, coral heads, or boulders.

(41) Information charted as "reported" should be treated with caution when navigating the area, because the actual conditions have not been verified by government surveys.

Source diagrams

(42) The Office of Coast Survey has recently committed to adding a source diagram to all charts 1:500,000 scale and larger. This diagram is intended to provide the mariner with additional information about the density and adequacy of the sounding data depicted on the chart. The adequacy with which sounding data depicts the configuration of the bottom depends on the following factors:

(43) •Survey technology employed (sounding and navigation equipment).

(44) •Survey specifications in effect (prescribed survey line spacing and sounding interval).

(45) •Type of bottom (e.g., rocky with existence of submerged pinnacles, flat sandy, coastal deposits subject to frequent episodes of deposition and erosion).

(46) Depth information on nautical charts is based on soundings from the latest available hydrographic survey, which in many cases may be quite old. The age of hydrographic surveys supporting nautical charts varies. Nearly half of all inshore hydrography was acquired by **leadline** (pre-1940) sounding technology.

(47) The sounding information portrayed on NOAA nautical charts is considered accurate but may not, as noted above, represent a complete picture of the seafloor because older sounding technologies only collected discrete samples. For example, a leadline survey provides only a single point sounding. **Electronic single beam echo sounders,** which came into common use during the 1940's, collected continuous soundings along the path of the survey vessel, but collected no information between survey lines. Airborne **light detection and ranging systems** (LIDAR), which NOAA began utilizing in the late 1990s, provide sounding data at a lower resolution than sonar systems, thus making small obstructions and hazards difficult to identify. Starting in the 1990s, NOAA began using **multibeam** and **side scan** sonar systems to acquire overlapping swaths of high-resolution data throughout the survey area. This technology significantly increased object detection capabilities, and is referred to as "full bottom coverage." Although "full bottom coverage" surveys are not feasible in all areas, this method is typically preferred over leadline, single beam echo sounder, and LIDAR technologies.

(48) The three primary types of bottom coverage (leadline, partial bottom coverage, full bottom coverage) are illustrated in the following graphic.

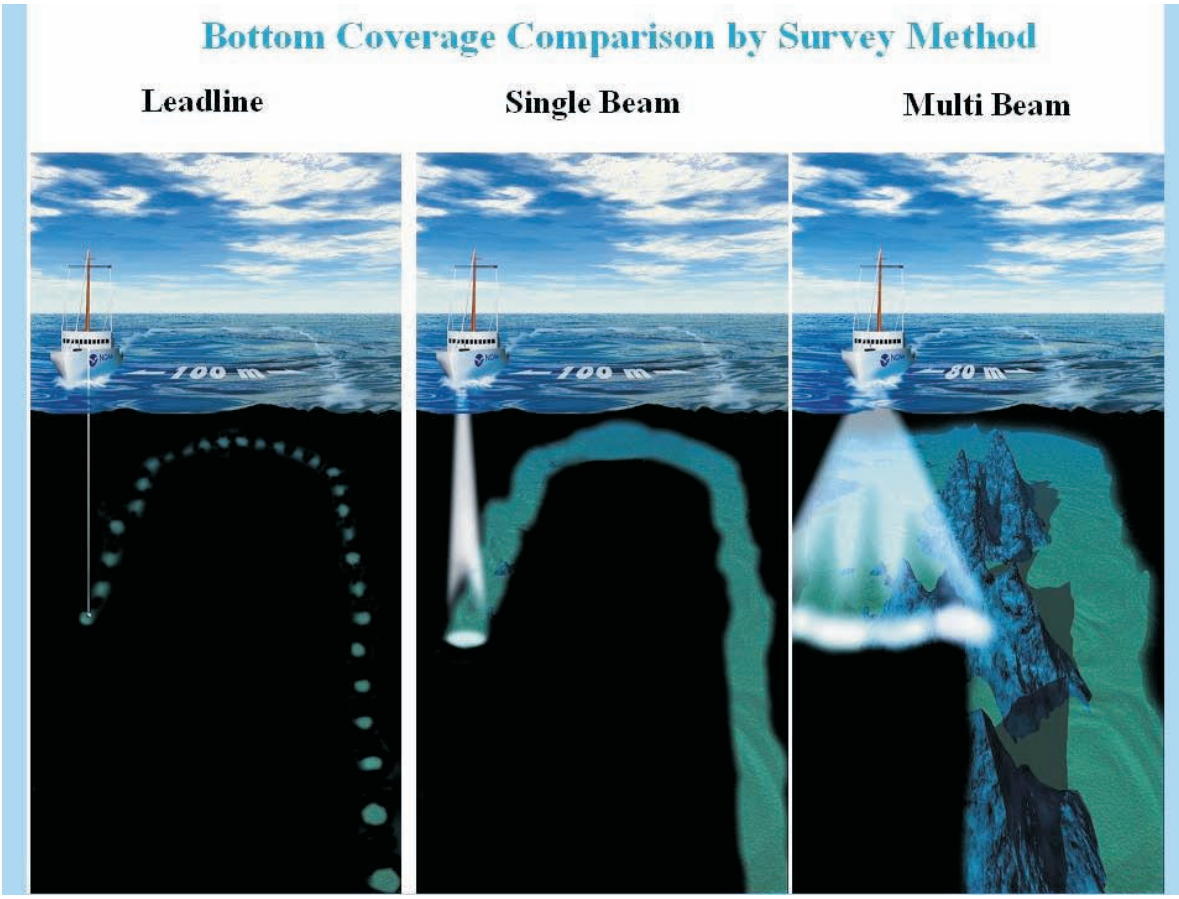
(49) The following paragraphs describe the eras of survey technology and their impact on the adequacy with which the bottom configuration is portrayed.

(50) Prior to 1940: The majority of survey data acquired prior to 1940 consisted of leadline soundings which were positioned using horizontal sextant angles. This positioning method is considered to be accurate for near shore surveys.

(51) A deficiency with pre-1940 data exists in the leadline sounding method because it represents discrete single-point sampling. Depths of areas between or outside of leadline sounding points can only be inferred or estimated leaving the possibility of undetected features, especially in areas of irregular relief.

(52) 1940 to present - partial bottom coverage: This type of sounding data is typically acquired using continuous-recording single-beam echo sounders as standalone survey systems. This survey method originally yielded a graphic record of the entire sounding line from which soundings were recorded at regular intervals. Using this graphic record, features which fell between the recorded soundings could be inserted into the data set.

(53) Since approximately 2001, single beam echo sounder data has been recorded digitally to automatically include all soundings in the data set. Although the sampling is continuous along the track of the sounding vessel, features such as discreet objects or small area shoals between sounding lines may not have been detected. Positioning of the sounding vessel in this era has progressed from horizontal sextant angles,



through land-based electronic positioning systems, to differentially corrected Global Positioning System (DGPS) satellite fixes.

(54) The spacing of sounding lines required to survey an area using a single beam echo sounder depends on several factors; such as water depths, bottom configuration, survey scale, general nature of the area, and the purpose of the survey. For example, a 1:10,000-scale survey conducted in an estuary will typically have 100-meter line spacing requirements, but may be reduced to 50 meters or less to adequately develop an irregular bottom, shoal, or some other feature that may present a hazard to navigation. Also, hydrographic project instructions for surveys may have required line spacing that deviates from these general specifications.

(55) In the late 1990's, NOAA began utilizing airborne LIDAR systems for near shore bathymetric surveying. Although LIDAR systems provide continuously recorded swath data, the resulting sounding resolution is not dense enough for the survey to be considered "full bottom coverage". Stand alone LIDAR surveys are depicted on the Source Diagram as "partial bottom coverage" areas.

(56) 1990 to present - full bottom coverage: During this period, most surveys have been conducted using either multibeam sonar systems or a combination of side scan sonar and single beam echo sounder systems to achieve "full bottom coverage". The term "full bottom coverage" refers to survey areas in which the field party has acquired continuously recorded, high-resolution sonar data in overlapping swaths. This sonar data, either multibeam bathymetry or side scan imagery, have been analyzed in an attempt to locate all hazards to navigation within the survey's limits. All position data has been determined using DGPS. Additionally, airborne LIDAR surveys in which significant anomalies have been further investigated using multibeam sonar are considered adequate for the "full bottom coverage" designation. Full bottom coverage surveys have a much better likelihood of detecting all navigationally significant features in a survey area than partial bottom coverage or leadline surveys.

(57) Full bottom coverage surveys typically extend inshore to depths of 4-8 meters (13-26 feet). Due to scaling factors, a "full bottom coverage" survey area may appear to extend further inshore once depicted on the Source Diagram. Sounding data in water depths of approximately 4-6 meters (13-19½ feet) or less (8 meters (26 feet) or less in Alaskan waters) has typically been acquired using a "partial bottom coverage" method. Caution and prudent seamanship should be used when transiting these near shore areas.

ERA	SOUNDING TECHNOLOGY	MAXIMUM LINE SPACING	AREAS OR DEPTHS
PRE-1940	Leadline	50 Meters	Anchorages, Channel Lines
			Open Coast
			Even Bottom
		200 - 300 Meters	0 - 10 Fathoms
		0.5 Mile	10 - 15 Fathoms
		1 - 4 Miles	15 - 100 Fathoms
		Reduced as Necessary	Uneven Bottom
1940 TO 1989	Continuous Recording Echo- sounder		**Harbors & Restricted Areas**
		50 Meters	Shoal Development
		100 Meters	< 20 Fathoms
		200 Meters	20 - 30 Fathoms
		400 Meters	> 30 Fathoms
			Open Coast
			Irregular Bottom
		100 Meters	<20 Fathoms (Rocky points, spits & channel entrances)
			Smooth Bottom
		200 Meters	< 20 Fathoms (All Other Areas)
		400 Meters	20 - 30 Fathoms
		800 Meters	30 - 110 Fathoms
		1600 Meters	110 - 500 Fathoms
1989 TO PRESENT	Continuous Recording Echo- sounder (Metrication)		**Harbors & Restricted Areas**
		100 Meters	< 30 Meters
		200 Meters	30-50 Meters
		400 Meters	> 50 Meters
			Open Coast
		100 Meters	<30 Meters (Rocky points, spits & channel entrances)
		200 Meters	<30 Meters (All Other Areas)
		400 Meters	30 - 50 Meters
		800 Meters	50 - 200 Meters
		1600 Meters	200 - 900 Meters

(58) Referring to the accompanying sample Source Diagram and the above discussion of survey methods over time, a mariner transiting from Point X to Point Y, along the track indicated by the **dotted line**, would have the following information available about the relative quality of the depth information shown on the chart.

(59) •Point X lies in an area surveyed by NOAA within the 1900-1939 time period. The sounding data would have been collected by leadline. Depths between sounding points can only be inferred, and undetected features might exist between the sounding points in areas of irregular relief. Caution should be exercised.

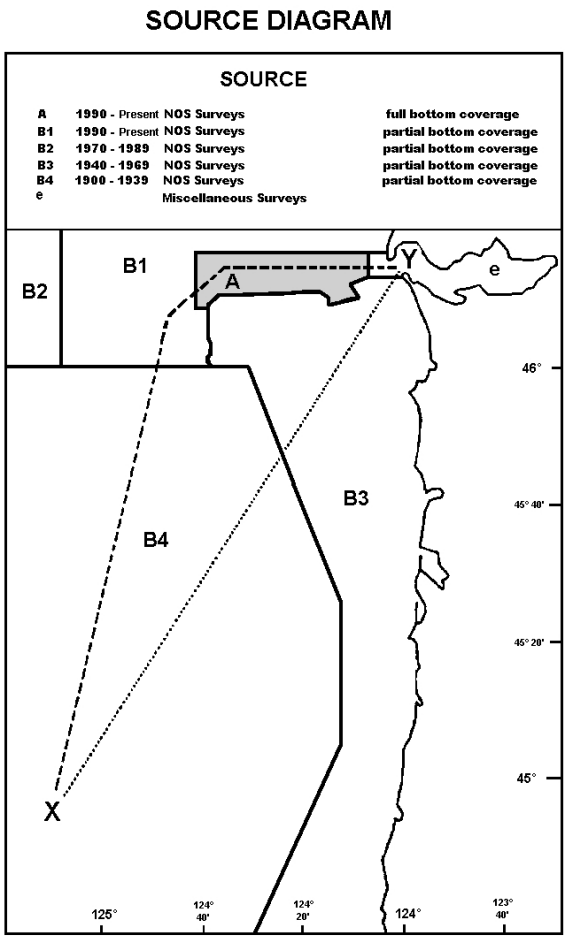
(60) •The transit then crosses an area surveyed by NOAA within the 1940-1969 time period. The sounding data would have been collected by continuous recording single beam echo sounder. It is possible that features could have been missed between sounding lines, although echo sounders record all depths along a sounding line with varying beam widths.

(61) •The transit ends in an area charted from miscellaneous surveys. These surveys may be too numerous to depict or may vary in age, reliability, origin or technology used. No inferences about the fitness of the data can be made in this area from the diagram.

(62) Referring again to the accompanying sample Source Diagram, and the above discussion of survey methods over time, a mariner could choose to transit from Point X to Point Y, along the track shown with a **dashed line**.

(63) •The transit starts again in an area surveyed by NOAA within the 1900-1939 time period. The sounding data would have been collected by leadline. Depths between sounding points can only be inferred, and undetected features might still exist between the sounding points in areas of irregular relief. Caution should be exercised.

(64) •The transit then crosses an area surveyed by NOAA within the 1990 - present time period, with partial bottom coverage. The data is collected in metric



units and acquired by continuous recording single beam echo sounder. It is possible that features could have been missed between the sounding lines, although echo sounders record all depths along a sounding line with varying beam widths.

(65) •The transit then crosses into an area surveyed by NOAA within the 1990 - present time period, having full bottom coverage. This area of the charted diagram is shaded with a blue screen to draw attention to the fact that full bottom coverage has been achieved. The data would have been collected in metric units and acquired by side scan sonar or multibeam sonar technology. Undetected features in this area, at the time of the survey, would be unlikely.

(66) •The transit ends in an area charted from miscellaneous surveys. These surveys may be too numerous to depict or may vary in age, reliability, origin or technology used. No inferences about the fitness of the data can be made in this area from the diagram.

(67) By choosing to transit along the track shown by the dashed line, the mariner would elect to take advantage of more recent survey information collected with more modern technology.

Corrections to charts

(68) It is essential for navigators to keep charts corrected through information published in the notices to mariners.

(69) NOAA's "Nautical Chart Update" website allows the mariner to update their nautical charts from one database that includes information from NOAA, NGA Notice to Mariners, U.S. Coast Guard Local Notice to Mariners, and the Canadian Coast Guard Notice to Mariners. The internet address for the Chart Update website is http://chartmaker.ncd.noaa.gov.

Print On Demand Nautical Charts

(70) Print On Demand (POD) Charts are updated weekly by NOAA with the most current U.S. Coast Guard Local Notice to Mariners, National Geospatial–Intelligence Agency Notice to Mariners, and critical safety information known to NOAA. They are available to the mariner five to eight weeks before the conventional chart is printed. POD charts are printed upon request and shipped overnight to the mariner under a partnership between NOAA and OceanGrafix, LLC. For POD information and a list of participating POD chart agents, see Internet websites http:nauticalcharts.noaa.gov/pod and http://www.oceangraphix.com. Print on Demand charts are certified by NOAA for navigational use.

Caution in using small-scale charts

(71) Dangers to navigation cannot be shown with the same amount of detail on small-scale charts as on those of larger scale. Therefore, the largest scale chart of an area should always be used.

(72) The **scales of nautical charts** range from 1:2,500 to about 1:5,000,000. Graphic scales are generally shown on charts with scales of 1:80,000 or larger, and numerical scales are given on smaller scale charts. NOS charts are classified according to scale as follows:

(73) **Sailing charts,** scales 1:600,000 and smaller, are for use in fixing the mariner's position approaching the coast from the open ocean, or for sailing between distant coastwise ports. On such charts the shoreline and topography are generalized and only offshore soundings, principal lights, outer buoys, and landmarks visible at considerable distances are shown.

(74) **General charts,** scales 1:150,000 to 1:600,000, are for coastwise navigation outside of outlying reefs and shoals.

(75) **Coast charts,** scales 1:50,000 to 1:150,000, are for inshore navigation leading to bays and harbors of considerable width and for navigating large inland waterways.

(76) **Harbor charts,** scales larger than 1:50,000, are for harbors, anchorage areas, and the smaller waterways.

(77) **Special charts**, various scales, cover the Intracoastal waterways and miscellaneous small-craft areas.

U.S. Nautical Chart Numbering System

(78) This chart numbering system, adopted by NOAA and National Geospatial–Intelligence Agency, provides for a uniform method of identifying charts published by both agencies. Nautical charts published by the National Geospatial–Intelligence Agency and by the Canadian Hydrographic Service are identified in the Coast Pilot by an asterisk preceding the chart number.

Blue tint in water areas

(79) A blue tint is shown in water areas on many charts to accentuate shoals and other areas considered dangerous for navigation when using that particular chart. Since the danger curve varies with the intended purpose of a chart a careful inspection should be made to determine the contour depth of the blue tint areas.

Caution on bridge and cable clearances

(80) For bascule bridges whose spans do not open to a full vertical position, unlimited overhead clearance is not available for the entire charted horizontal clearance when the bridge is open, due to the inclination of the drawspans over the channel.

(81) The charted clearances of overhead cables are for the lowest wires at mean high water unless otherwise stated. **Vessels with masts, stacks, booms, or antennas should allow sufficient clearance under power cables to avoid arcing.**

(82) **Submarine cables and submerged pipelines** cross many waterways used by both large and small vessels, but all of them may not be charted. For inshore areas, they usually are buried beneath the seabed, but, for offshore areas, they may lie on the ocean floor. Warning signs are often posted to warn mariners of their existence.

(83) The installation of submarine cables or pipelines in U.S. waters or the Continental Shelf of the United States is under the jurisdiction of one or more Federal agencies, depending on the nature of the installation. They are shown on the charts when the necessary information is reported to NOAA and they have been recommended for charting by the responsible agency. The chart symbols for submarine cable and pipeline areas are usually shown for inshore areas, whereas, chart symbols for submarine cable and pipeline routes may be shown for offshore areas. Submarine cables and pipelines are not described in the Coast Pilots.

(84) In view of the serious consequences resulting from damage to submarine cables and pipelines, vessel operators should take special care when anchoring, fishing, or engaging in underwater operations near areas where these cables or pipelines may exist or have been reported to exist. Mariners are also warned that the areas where cables and pipelines were originally buried may have changed and they may be exposed; extreme caution should be used when operating vessels in depths of water comparable to the vessel's draft.

(85) Certain cables carry high voltage, while many pipelines carry natural gas under high pressure or petroleum products. Electrocution, fire, or explosion with injury, loss of life, or a serious pollution incident could occur if they are broached.

(86) Vessels fouling a submarine cable or pipeline should attempt to clear without undue strain. Anchors or gear that cannot be cleared should be slipped, but no attempt should be made to cut a cable or a pipeline.

Artificial obstructions to navigation

(87) **Disposal areas** are designated by the U.S. Army Corps of Engineers for depositing dredged material where existing depths indicate that the intent is not to cause sufficient shoaling to create a danger to surface navigation. The areas are charted without blue tint, and soundings and depth curves are retained.

(88) **Disposal Sites** are areas established by Federal regulation (**40 CFR 220 through 229**) in which dumping of dredged and fill material and other nonbuoyant objects is allowed with the issuance of a permit. Dumping of dredged and fill material is supervised by the Corps of Engineers and all other dumping by the Environmental Protection Agency (EPA). (See U.S. Army Corps of Engineers and Environmental Protection Agency, this chapter, and Appendix A for office addresses.)

(89) **Dumping Grounds** are also areas that were established by Federal regulation (**33 CFR 205**). However, these regulations have been revoked and the use of the areas discontinued. These areas will continue to be shown on nautical charts until such time as they are no longer considered to be a danger to navigation.

(90) Disposal Sites and Dumping Grounds are rarely mentioned in the Coast Pilot, but are shown on nautical charts. **Mariners are advised to exercise caution in and in the vicinity of all dumping areas.**

(91) **Spoil areas** are for the purpose of depositing dredged material, usually near and parallel to dredged channels; they are usually a hazard to navigation. Spoil areas are usually charted from survey drawings from U.S. Army Corps of Engineers after-dredging surveys, though they may originate from private or other Government agency surveys. Spoil areas are tinted blue on the charts and labeled, and all soundings and depth curves are omitted. Navigators of even the smallest craft should avoid crossing spoil areas.

(92) **Fish havens** are established by private interests, usually sport fishermen, to simulate natural reefs and wrecks that attract fish. The reefs are constructed by intentional placement of assorted secondary-use materials and designated fishery habitat, ranging from old trolley cars and barges to scrap building material in areas which may be of very small extent or may stretch a considerable distance along a depth curve; old automobile bodies are a commonly used material. The Corps of Engineers must issue a permit, specifying the location and depth over the reef, before such a reef may be built. However, the reefbuilders' adherence to permit specifications can be checked only with a wire drag. Fish havens are outlined and labeled on the charts and show the minimum authorized depth when known. Fish havens are tinted blue if they have a minimum authorized depth of 11 fathoms or less or if the minimum authorized depth is unknown and they are in depths greater than 11 fathoms but still considered a danger to navigation. Navigators should be cautious about passing over fish havens or anchoring in their vicinity.

(93) **Fishtrap areas** are areas established by the U.S. Army Corps of Engineers, or State or local authority, in which traps may be built and maintained according to established regulations. The fish stakes which may exist in these areas are obstructions to navigation and may be dangerous. The limits of fishtrap areas and a cautionary note are usually charted. Navigators should avoid these areas.

Local magnetic disturbances

(94) If measured values of magnetic variation differ from the expected (charted) values by several degrees, a magnetic disturbance note will be printed on the chart. The note will indicate the location and magnitude of the disturbance, but the indicated magnitude should not be considered as the largest possible value that may be encountered. Large disturbances are more frequently detected in the shallow waters near land masses than on the deep sea. Generally, the effect of a local magnetic disturbance diminishes rapidly with distance, but in some locations there are multiple sources of disturbances and the effects may be distributed for many miles.

Compass roses on charts

(95) Each compass rose shows the date, magnetic variation, and the annual change in variation. Prior to the new edition of a nautical chart, the compass roses are reviewed. Corrections for annual change and other revisions may be made as a result of newer and more accurate information. On some general and sailing charts, the magnetic variation is shown by isogonic lines in addition to the compass roses.

Echo soundings

(96) Ship's echo sounders may indicate small variations from charted soundings; this may be due to the fact that various corrections (instrument corrections, settlement and squat, draft, and velocity corrections) are made to echo soundings in surveying which are not normally made in ordinary navigation, or to observational errors in reading the echo sounder. Instrument errors vary between different equipment and must be determined by calibration aboard ship. Most types of echo sounders are factory calibrated for a velocity of sound in water of 800 fathoms per second, but the actual velocity may differ from the calibrated velocity by as much as 5 percent, depending upon the temperature and salinity of the waters in which the vessel is operating; the highest velocities are found in warm, highly saline water, and the lowest in icy freshwater. Velocity corrections for these variations are determined and applied to echo soundings during hydrographic surveys. All echo soundings must be corrected for the vessel's draft, unless the draft observation has been set on the echo sounder.

(97) Observational errors include misinterpreting false echoes from schools of fish, seaweed, etc., but the most serious error which commonly occurs is where the depth is greater than the scale range of the instrument; a 400–fathom scale indicates 15 fathoms when the depth is 415 fathoms. Caution in navigation should be exercised when wide variations from charted depths are observed.

Electronic Navigational Chart (NOAA ENC®)

(98) The NOAA Electronic Navigational Charts (ENCs) are vector-based digital files that give information about individual charted features. NOAA ENCs are composed of information layers that can be viewed separately such as aids to navigation, soundings and shoreline. They are intended for use in electronic charting systems (ECS) as well as Electronic Chart Display and Information Systems (ECDIS). NOAA ENCs are available free of charge on the NOAA internet website, http://nauticalcharts.noaa.gov/mcd/enc/index.htm, as well as additional NOAA ENC information.

NOTICES TO MARINERS

(99) **Notices to Mariners** are published by Federal agencies to advise operators of vessels of marine information affecting the safety of navigation. The notices include changes in aids to navigation, depths in channels, bridge and overhead cable clearances, reported dangers, and other useful marine information. They

should be used routinely for updating the latest editions of nautical charts and related publications.

(100) **Local Notice to Mariners** is issued by each Coast Guard District Commander for the waters under his jurisdiction. (See Appendix A for Coast Guard district(s) covered by this volume.) These notices are usually published weekly and may be obtained without cost by making application to the appropriate District Commander, or by contacting the Coast Guard internet website address, **http://www.navcen.uscg.gov/lnm**.

(101) **Notice to Mariners,** published weekly by the National Geospatial–Intelligence Agency, is prepared jointly with NOAA and the Coast Guard. These notices contain selected items from the Local Notices to Mariners and other reported marine information required by oceangoing vessels operating in both **foreign** and **domestic** waters. Special items covering a variety of subjects and generally not discussed in the Coast Pilot or shown on nautical charts are published annually in Notice to Mariners No. 1. These items are important to the mariner and should be read for future reference. These notices may be obtained by operators or oceangoing vessels, without cost by making application to **National Geospatial–Intelligence Agency** (see National Geospatial–Intelligence Agency Procurement Information in Appendix A).

(102) All active Notice to Mariners affecting Tide and/or Tidal Current Predictions at the date of printing are published in the Tide Table and the Tidal Current Tables annually.

(103) Notices and reports of **improved channel depths** are also published by district offices of the U.S. Army Corps of Engineers (see Appendix A for districts covered by this volume). Although information from these notices/reports affecting NOAA charts and related publications is usually published in the Notices to Mariners, the local district engineer office should be consulted where depth information is critical.

(104) **Marine Broadcast Notices to Mariners** are made by the Coast Guard through Coast Guard, Navy, and some commercial radio stations to report deficiencies and important changes in aids to navigation. (See Radio Navigation Warnings and Weather, this chapter.)

(105) Vessels operating within the limits of the Coast Guard districts can obtain information affecting NOAA charts and related publications from the Local Notices to Mariners. Small craft using the Intracoastal Waterway and other waterways and small harbors within the United States that are not normally used by oceangoing vessels will require the Local Notices to Mariners to keep charts and related publications up-to-date.

AIDS TO NAVIGATION

Reporting of defects in aids to navigation

(106) Promptly notify the nearest Coast Guard District Commander if an aid to navigation is observed to be missing, sunk, capsized, out of position, damaged, extinguished, or showing improper characteristics.

(107) Radio messages should be prefixed "Coast Guard" and transmitted directly to any U.S. Government shore radio station for relay to the Coast Guard District Commander. Merchant ships may send messages relating to defects noted in aids to navigation through commercial facilities only when they are unable to contact a U.S. Government shore radio station. Charges for these messages will be accepted "collect" by the Coast Guard.

(108) It is unlawful to establish or maintain any aid similar to those maintained by the U.S. Coast Guard without first obtaining permission from the Coast Guard District Commander. In the Great Lakes, applications should be submitted through the Cleveland District Office. The licensed officer in command of a vessel which collides with any aid must report the fact promptly to the nearest Marine Safety Office or Marine Inspection Office, U.S. Coast Guard.

Lights

(109) The range of visibility of lights as given in the Light Lists and as shown on the charts is the **Nominal range,** which is the maximum distance at which a light may be seen in clear weather (meteorological visibility of 10 nautical miles) expressed in nautical miles. The Light Lists give the Nominal ranges for all Coast Guard lighted aids except range and directional lights. **Luminous range** is the maximum distance at which a light may be seen under the existing visibility conditions. By use of the diagram in the Light Lists, Luminous range may be determined from the known Nominal range, and the existing visibility conditions. Both the Nominal and Luminous ranges do not take into account elevation, observer's height of eye, or the curvature of the earth. **Geographic range** is a function of only the curvature of the earth and is determined solely from the heights above sea level of the light and the observer's eye; therefore, to determine the actual Geographic range for a height of eye, the Geographic range must be corrected by a distance corresponding to the height difference, the distance correction being determined from a table of "distances of visibility for various heights above sea level." (See Light List or Appendix B.) The maximum distances at which lights can be seen may at times be increased by abnormal atmospheric refraction and may be greatly decreased by unfavorable weather conditions such as fog, rain, haze, or smoke.

All except the most powerful lights are easily obscured by such conditions. In some conditions of the atmosphere white lights may have a reddish hue. During weather conditions which tend to reduce visibility, colored lights are more quickly lost to sight than are white lights. Navigational lights should be used with caution because of the following conditions that may exist;

(110) A light may be extinguished and the fact not reported to the Coast Guard for correction, or a light may be located in an isolated area where it will take time to correct.

(111) In regions where ice conditions prevail the lantern panes of unattended lights may become covered with ice or snow, which will greatly reduce the visibility and may also cause colored lights to appear white.

(112) Brilliant shore lights used for advertising and other purposes, particularly those in densely populated areas, make it difficult to identify a navigational light.

(113) At short distances flashing lights may show a faint continuous light between flashes.

(114) The distance of an observer from a light cannot be estimated by its apparent intensity. The characteristics of lights in an area should always be checked in order that powerful lights visible in the distance will not be mistaken for nearby lights showing similar characteristics at low intensity such as those on lighted buoys.

(115) The apparent characteristic of a complex light may change with the distance of the observer, due to color and intensity variations among the different lights of the group. The characteristic as charted and shown in the Light List may not be recognized until nearer the light.

(116) Motion of a vessel in a heavy sea may cause a light to alternately appear and disappear, and thus give a false characteristic.

(117) Where lights have different colored sectors, be guided by the correct bearing of the light; do not rely on being able to accurately observe the point at which the color changes. On either side of the line of demarcation of colored sectors there is always a small arc of uncertain color.

(118) On some bearings from the light, the range of visibility of the light may be reduced by obstructions. In such cases, the obstructed arc might differ with height of eye and distance. When a light is cut off by adjoining land and the arc of visibility is given, the bearing on which the light disappears may vary with the distance of the vessel from which observed and with the height of eye. When the light is cut off by a sloping hill or point of land, the light may be seen over a wider arc by a ship far off than by one close to.

(119) Arcs of circles drawn on charts around a light are not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show equally in all directions, the bearings between which the variation of visibility or obscuration of the light occurs.

(120) Lights of equal candlepower but of different colors may be seen at different distances. This fact should be considered not only in predicting the distance at which a light can be seen, but also in identifying it.

(121) Lights should not be passed close aboard, because in many cases riprap mounds are maintained to protect the structure against ice damage and scouring action.

(122) Many prominent towers, tanks, smokestacks, buildings, and other similar structures, charted as landmarks, display flashing and/or fixed red aircraft obstruction lights. Lights shown from landmarks are charted only when they have distinctive characteristics to enable the mariner to positively identify the location of the charted structure.

Articulated lights

(123) An articulated light is a vertical pipe structure supported by a submerged buoyancy chamber and attached by a universal coupling to a weighted sinker on the seafloor. The light, allowed to move about by the universal coupling, is not as precise as a fixed aid. However, it has a much smaller watch circle than a conventional buoy, because the buoyancy chamber tends to force the pipe back to a vertical position when it heels over under the effects of wind, wave, or current.

(124) Articulated lights are primarily designed to mark narrow channels with greater precision than conventional buoys.

Daybeacons

(125) Daybeacons are unlighted aids affixed to stationary structures. They are marked with dayboards for daytime identification. The dayboards aid navigation by presenting one of several standard shapes and colors which have navigational significance. Dayboards are sometimes referred to as daymarks.

(126) Daybeacons are found on-shore and in shallow water. They are frequently used to mark channel edges.

Articulated daybeacons

(127) Articulated daybeacons are similar to articulated lights, described above, except they are unlighted.

Buoys

(128) The aids to navigation depicted on charts comprise a system consisting of fixed and floating aids with varying degrees of reliability. Therefore, prudent mariners will not rely solely on any single aid to navigation, particularly a floating aid.

(129) The approximate position of a buoy is represented by the dot or circle associated with the buoy symbol.

The approximate position is used because of practical limitations in positioning and maintaining buoys and their sinkers in precise geographical locations. These limitations include, but are not limited to, inherent imprecisions in position fixing methods, prevailing atmospheric and sea conditions, the slope of and the material making up the seabed, the fact that buoys are moored to sinkers by varying lengths of chain, and the fact that buoy body and/or sinker positions are not under continuous surveillance, but are normally checked only during periodic maintenance visits which often occur more than a year apart. The position of the buoy body can be expected to shift inside and outside of the charting symbol due to the forces of nature. The mariner is also cautioned that buoys are liable to be carried away, shifted, capsized, sunk, etc. Lighted buoys may be extinguished or sound signals may not function as a result of ice, running ice or other natural causes, collisions, or other accidents.

(130) For the foregoing reasons, a prudent mariner must not rely completely upon the charted position or operation of floating aids to navigation, but will also utilize bearings from fixed objects and aids to navigation on shore. Further, a vessel attempting to pass close aboard always risks collision with a yawing buoy or with the obstruction the buoy marks.

(131) Buoys may not always properly mark shoals or other obstructions due to shifting of the shoals or of the buoys. Buoys marking wrecks or other obstructions are usually placed on the seaward or channelward side and not directly over a wreck. Since buoys may be located some distance from a wreck they are intended to mark, and since sunken wrecks are not always static, extreme caution should be exercised when operating in the vicinity of such buoys.

Large navigational buoys (LNB)

(132) Courses should invariably be set to pass these aids with sufficient clearance to avoid the possibility of collision from any cause. Errors of observation, current and wind effects, other vessels in the vicinity, and defects in steering gear may be, and have been the cause of actual collisions, or imminent danger thereof, needlessly jeopardizing the safety of these facilities and their crews, and of all navigation dependent on these important aids to navigation.

(133) Experience shows that offshore light stations cannot be safely used as leading marks to be passed close aboard, but should always be left broad off the course, whenever sea room permits. When approaching fixed offshore light structures and large navigational buoys (LNB) on radio bearings, the risk of collision will be avoided by ensuring that radio bearing does not remain constant.

(134) It should be borne in mind that most large buoys are anchored to a very long scope of chain and, as a result, the radius of their swinging circle is considerable. The charted position is the location of the anchor. Furthermore under certain conditions of wind and current, they are subject to sudden and unexpected sheers which are certain to hazard a vessel attempting to pass close aboard.

Bridge lights and clearance gages

(135) The Coast Guard regulates marine obstruction lights and clearance gages on bridges across navigable waters. Where installed, clearance gages are generally vertical numerical scales, reading from top to bottom, and show the actual vertical clearance between the existing water level and the lowest point of the bridge over the channel; the gages are normally on the right-hand pier or abutment of the bridge, on both the upstream and downstream sides.

(136) Bridge lights are fixed red or green, and are privately maintained; they are generally not charted or described in the text of the Coast Pilot. All bridge piers (and their protective fenders) and abutments which are in or adjacent to a navigation channel are marked on all channel sides by red lights. On each channel span of a fixed bridge, there is a range of two green lights marking the center of the channel and a red light marking both edges of the channel, except that when the margins of the channel are confined by bridge piers, the red lights on the span are omitted, since the pier lights then mark the channel edges; for multiplespan fixed bridges, the main-channel span may also be marked by three white lights in a vertical line above the green range lights.

(137) On all types of drawbridges, one or more red lights are shown from the drawspan (higher than the pier lights) when the span is closed; when the span is open, the higher red lights are obscured and one or two green lights are shown from the drawspan, higher than the pier lights. The number and location of the red and green lights depend upon the type of drawbridge.

(138) Bridges and their lighting, construction and maintenance are set forth in **33 CFR 114, 115, 116, and 118,** (not carried in this Coast Pilot). Aircraft obstruction lights prescribed by the Federal Aviation Administration may operate at certain bridges.

Fog signals

(139) Caution should be exercised in the use of sound fog signals for navigation purposes. They should be considered solely as warning devices.

(140) Sound travels through the air in a variable manner, even without the effects of wind; and, therefore, the hearing of fog signals cannot be implicitly relied upon.

(141) Experience indicates that distances must not be judged only by the intensity of the sound; that occasionally there may be areas close to a fog signal in which it is not heard; and that fog may exist not far from a station, yet not be seen from it, so the signal may not be operating. It is not always possible to start a fog signal immediately when fog is observed.

Caution, channel markers

(142) Lights, daybeacons, and buoys along dredged channels do not always mark the bottom edges. Due to local conditions, aids may be located inside or outside the channel limits shown by dashed lines on a chart. The Light List tabulates the offset distances for these aids in many instances.

(143) Aids may be moved, discontinued, or replaced by other types to facilitate dredging operations. Mariners should exercise caution when navigating areas where dredges with auxiliary equipment are working.

(144) Temporary changes in aids are not included on the charts.

Uniform State Waterway Marking System

(145) Many bodies of water used by boatmen are located entirely within the boundaries of a State. The Uniform State Waterway Marking System (USWMS) has been developed to indicate to the small-boat operator hazards, obstructions, restricted or controlled areas, and to provide directions. Although intended primarily for waters within the state boundaries, USWMS is suited for use in all water areas, since it supplements and is generally compatible with the Coast Guard lateral system of aids to navigation. The Coast Guard is gradually using more aids bearing the USWMS geometric shapes described below.

(146) Two categories of waterway markers are used. Regulatory markers, buoys, and signs use distinctive standard shape marks to show regulatory information. The signs are white with black letters and have a wide orange border. They signify speed zones, Fish havens, danger areas, and directions to various places. Aids to navigation on State waters use red and black buoys to mark channel limits. Red and black buoys are generally used in pairs. The boat should pass between the red buoy and its companion black buoy. If the buoys are not placed in pairs, the distinctive color of the buoy indicates the direction of dangerous water from the buoy. White buoys with red tops should be passed to the south or west, indicating that danger lies to the north or east of the buoy. White buoys with black tops should be passed to the north or east. Danger lies to the south or west. Vertical red and white striped buoys indicate a boat should not pass between the buoy and the nearest shore. Danger lies inshore of the buoy.

Light List

(147) **Light Lists,** published by the Coast Guard, describe aids to navigation, consisting of lights, fog signals, buoys, lightships, daybeacons, and electronic aids, in United States (including Puerto Rico and U.S. Virgin Islands) and contiguous Canadian waters. Light Lists are for sale by the Government Printing Office (see Appendix A for address) and by sales agents in the principal seaports. Light Lists are also available to view on the USCG Navigation Center internet site at http://www.navcen.uscg.gov/pubs/lightlists/lightlists.htm. Mariners should refer to these publications for detailed information regarding the characteristics and visibility of lights, and the descriptions of light structures, lightships, buoys, fog signals, and electronic aids.

ELECTRONIC POSITIONING SYSTEMS

Global Positioning System (GPS)

(148) GPS permits land, sea, and airborne users to determine their three dimensional position, velocity, and time, 24 hours a day in all weather, anywhere in the world. The basic system is defined as a constellation of satellites, the navigation payloads which produce the GPS signals, ground stations, data links, and associated command and control facilities which are operated and maintained by the Department of Defense. The satellites operate in circular 20,200 km (10,900 nm) orbits at an inclination angle, relative to the equator, of 55° and with a 12-hour period. The satellites are spaced in orbit so that at any time, a minimum of six satellites are observable from any position on earth, providing instantaneous position and time information. The system provides two levels of service for position determination, **Standard Positioning Service (SPS)** and the encoded **Precise Positioning Service (PPS)**; SPS is for general public use and PPS is primarily intended for use by the Department of Defense.

(149) **Differential GPS (DGPS):**

(150) The U.S. Coast Guard Navigation Center (NAVCEN) operates the Coast Guard Maritime Differential GPS (DGPS) Service, consisting of two control centers and over 60 remote broadcast sites. The Service broadcasts correction signals on marine radiobeacon frequencies to improve the accuracy of and integrity to GPS-derived positions. The Coast Guard DGPS Service provides 10-meter accuracy in all established coverage areas. Typically, the positional error of a DGPS position is 1 to 3 meters, greatly enhancing harbor entrance and approach navigation. The System provides service for coastal coverage of the continental U.S., the Great Lakes, Puerto Rico, portions of Alaska and Hawaii, and a greater part of the Mississippi River Basin.

LORAN-C

(151) LORAN, an acronym for LOng RAnge Navigation, is an electronic aid to navigation consisting of shore-based radio transmitters. The LORAN system enables users equipped with a LORAN receiver to determine their position quickly and accurately, day or night, in practically any weather.

(152) LORAN-C was originally developed to provide radio navigation service for U.S. coastal waters and was later expanded to include complete coverage of the continental U.S. as well as most of Alaska. Twenty-four U.S. LORAN-C stations work in partnership with Canadian and Russian stations to provide coverage in Canadian waters and in the Bering Sea. LORAN-C provides better than 0.25 nautical mile absolute accuracy for suitably equipped users within the published areas.

(153) Users can return to previously determined positions with an accuracy of 50 meters or better using LORAN-C in the time difference repeatable mode. Advances in technology have allowed greater automation of LORAN-C operations. New technology has allowed the Coast Guard to establish centralized control of the continental U.S. LORAN-C system at two locations. The application of new receiver technology has improved the usability of the system.

(154) LORAN-C provides coverage for maritime navigation in U.S. coastal areas. It provides navigation, location, and timing services for both civil and military air, land and marine users. LORAN-C is approved as an en route supplemental air navigation system for both Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) operations. The LORAN-C system serves the 48 continental states, their coastal areas, and parts of Alaska.

(155) In coastal waters, LORAN-C should not be relied upon as the only aid to navigation. A prudent navigator will use radar, fathometer and any other aid to navigation, in addition to the LORAN-C receiver.

(156) **LORAN-C Charts and Publications**

(157) Navigational charts overprinted with LORAN-C lines of position are available from FAA, National Aeronautical Charting Office, AVN-530. (See Appendix A for address).

(158) A general source of LORAN-C information is the LORAN-C User Handbook written by the U.S. Coast Guard. This publication can be purchased from the Government Printing Office, Washington, DC (see Appendix A for address).

DISTRESS: COMMUNICATION PROCEDURES

Coast Guard search and rescue operations

(159) The Coast Guard conducts and/or coordinates search and rescue operations for surface vessels or aircraft that are in distress or overdue. Search and Rescue vessels and aircraft have special markings, including a wide slash of red-orange and a small slash of blue on the forward portion of the hull or fuselage. Other parts of aircraft, normally painted white, may have other areas painted red to facilitate observation. The cooperation of vessel operators with Coast Guard helicopters, fixed-wing aircraft, and vessels may mean the difference between life and death for some seaman or aviator; such cooperation is greatly facilitated by the prior knowledge on the part of vessel operators of the operational requirements of Coast Guard equipment and personnel, of the international distress signals and procedures, and of good seamanship.

(160) **NOTE:** Distress and other calls to Coast Guard communication stations may be made on any of the following HF single sideband radiotelephone channels: 424(4134 kHz), 601(6200 kHz), 816(8240 kHz), or 1205(12242 kHz).

International distress signals

(161) (1) A signal made by radiotelegraphy or by any other signaling method consisting of the group "SOS" in Morse Code.

(162) (2) A signal sent by radiotelephony consisting of the spoken word "MAYDAY."

(163) (3) The International Flag Code Signal of NC.

(164) (4) A signal consisting of a square flag having above or below it a ball or anything resembling a ball.

(165) (5) Flames on the craft (as from a burning oil barrel, etc.)

(166) (6) A rocket parachute flare or hand flare showing a red light.

(167) (7) Rockets or shells, throwing red stars fired one at a time at short intervals.

(168) (8) Orange smoke, as emitted from a distress flare.

(169) (9) Slowly and repeatedly raising and lowering arms outstretched to each side.

(170) (10) A gun or other explosive signal fired at intervals of about 1 minute.

(171) (11) A continuous sounding of any fog-signal apparatus.

(172) (12) The radiotelegraph alarm signal.

(173) (13) The radiotelephone alarm signal.

(174) (14) Signals transmitted by emergency position-indicating radiobeacons.

(175) (15) A piece of orange-colored canvas with either a black square and circle or other appropriate symbol (for identification from the air).

(176) (16) A dye marker.

Radio distress procedures

(177) Distress calls are made on 2182 kHz or VHF-FM channel 16 (MAYDAY). For less serious situations than warrant the distress procedure, the urgency signal PAN-PAN (PAHN-PAHN, spoken three times), or the safety signal SECURITY (SAY-CURITAY, spoken three times), for radiotelephony, are used as appropriate. Since radiotelegraph transmissions are normally made by professional operators, and urgency and safety situations are less critical, only the distress procedures for voice radiotelephone are described. For complete information on emergency radio procedures, see **47 CFR 83** or NGA Pub. 117. **(See Appendix A for a list of Coast Guard Stations which guard 2182 kHz and 156.80 MHz.)** Complete information on distress guards can be obtained from Coast Guard District Commanders.

(178) Distress calls indicate a vessel or aircraft is threatened by grave and imminent danger and requests immediate assistance. They have absolute priority over all other transmissions. All stations which hear a distress call must immediately cease any transmission capable of interfering with the distress traffic and shall continue to listen on the frequency used for the emission of the distress call. This call shall not be addressed to a particular station, and acknowledgment of receipt shall not be given before the distress message which follows it is sent.

Radiotelephone distress communications

(179) (1) The **radiotelephone alarm signal** (if available): The signal consists of two audio tones, of different pitch, transmitted alternately; its purpose is to attract the attention of persons on radio watch or to actuate automatic alarm devices. It may only be used to announce that a distress call or message is about to follow.

(180) (2) The **distress call**, consisting of:–the distress signal MAYDAY (spoken three times);

(181) the words THIS IS (spoken once);

(182) the call sign or name of the vessel in distress (spoken three times).

(183) (3) The **distress message** follows immediately and consists of:

(184) the distress signal MAYDAY;

(185) the call sign and name of the vessel in distress;

(186) particulars of its position (latitude and longitude, or true bearing and distance from a known geographical position);

(187) the nature of the distress;

(188) the kind of assistance desired;

(189) the number of persons aboard and the condition of any injured;

(190) present seaworthiness of vessel;

(191) description of the vessel (length; type; cabin; masts; power; color of hull, superstructure, trim; etc.);

(192) any other information which might facilitate the rescue, such as display of a surface-to-air identification signal or a radar reflector;

(193) your listening frequency and schedule;

(194) THIS IS (call sign and name of vessel in distress). OVER.

(195) (4) **Acknowledgment of receipt of a distress message:** If a distress message is received from a vessel which is definitely in your vicinity, immediately acknowledge receipt. If it is not in your vicinity, allow a short interval of time to elapse before acknowledging, in order to allow vessels nearer to the vessel in distress to acknowledge receipt without interference. However, in areas where reliable communications with one or more shore stations are practicable, all vessels may defer this acknowledgment for a short interval so that a shore station may acknowledge receipt first. The acknowledgment of receipt of a distress is given as follows:

(196) the call sign or name of the vessel sending the distress (spoken three times);

(197) the words THIS IS;

(198) the call sign or name of acknowledging vessel (spoken three times);

(199) The words RECEIVED MAYDAY.

(200) After the above acknowledgment, allow a momentary interval of listening to insure that you will not interfere with another vessel better situated to render immediate assistance; if not, with the authority of the person in charge of the vessel, transmit:

(201) the word MAYDAY;

(202) the call sign and name of distressed vessel;

(203) the words THIS IS;

(204) the call sign and name of your vessel;

(205) your position (latitude and longitude, or true bearing and distance from a known geographical position);

(206) the speed you are proceeding towards, and the approximate time it will take to reach, the distressed vessel. OVER.

(207) (5) **Further distress messages and other communications:** Distress communications consist of all messages relating to the immediate assistance required by the distressed vessel. Each distress communication shall be preceded by the signal MAYDAY. The vessel in distress or the station in control of distress communications may **impose silence** on any station which interferes. The procedure is:–the words SEELONCE MAYDAY (Seelonce is French for silence). Silence also may be imposed by nearby mobile stations other than

the vessel in distress or the station in control of distress communications. The mobile station which believes that silence is essential may request silence by the following procedure:–the word SEELONCE, followed by the word DISTRESS, and its **own** call sign.

(208) (6) **Transmission of the distress procedure by a vessel or shore station not itself in distress:** A vessel or a shore station which learns that a vessel is in distress shall transmit a distress message in any of the following cases:

(209) (a) **When the vessel in distress is not itself able to transmit the distress message.**

(210) (b) When a vessel or a shore station considers that further help is necessary.

(211) (c) When, although not in a position to render assistance, it has heard a distress message that has not been acknowledged.

(212) In these cases, the transmission shall consist of:

(213) the radiotelephone alarm signal (if available);

(214) the words MAYDAY RELAY (spoken three times);

(215) the words THIS IS;

(216) the call sign and name of vessel (or shore station), spoken three times.

(217) When a vessel transmits a distress under these conditions, it shall take all necessary steps to contact the Coast Guard or a shore station which can notify the Coast Guard.

(218) (7) **Termination of distress:** When distress traffic has ceased, or when silence is no longer necessary on the frequency used for the distress traffic, the station in control shall transmit on that frequency a message to all stations as follows:

(219) the distress signal MAYDAY;

(220) the call TO ALL STATIONS, spoken three times;

(221) the words THIS IS;

(222) the call sign and name of the station sending the message;

(223) the time;

(224) the name and call sign of the vessel in distress;

(225) the words SEELONCE FEENEE (French for silence finished).

Optimize Radar Profile

(226) Operators of disabled wooden craft and persons adrift in rubber rafts or boats that are, or may consider themselves to be, the object of a search, should hoist on a halyard or otherwise place aloft as high as possible any metallic object that would assist their detection by radar. Coast Guard cutters and aircraft are radar equipped and thus are able to continue searching in darkness and during other periods of low visibility. It is advisable for coastal fishing boats, yachts, and other small craft to have efficient radar reflectors permanently installed aboard the vessel.

File cruising schedules

(227) Small-craft operators should prepare a cruising plan before starting on extended trips and leave it ashore with a yacht club, marina, friend, or relative. It is advisable to use a checking-in procedure by telephone for each point specified in the cruising plan. Such a trip schedule is vital for determining if a boat is overdue and will assist materially in locating a missing craft in the event search and rescue operations become necessary.

DISTRESS: ASSISTANCE PROCEDURES

Surface ship procedures for assisting distressed surface vessels

(228) (1) The following immediate action should be taken by each ship on receipt of a distress message:

(229) (a) Acknowledge receipt and, if appropriate, retransmit the distress message;

(230) (b) Immediately try to take D/F bearings during the transmission of the distress message and maintain a D/F watch on 2182 kHz;

(231) (c) Communicate the following information to the ship in distress:

(232) (i) identity;

(233) (ii) position;

(234) (iii) speed and estimated time of arrival (ETA);

(235) (iv) when available, true bearing of the ship in distress.

(236) (d) Maintain a continuous listening watch on the frequency used for the distress. This will normally be:

(237) (i) 2182 kHz (radiotelephone).

(238) (e) Additionally, maintain watch on VHF-FM channel 16 as necessary;

(239) (f) Operate radar continuously;

(240) (g) If in the vicinity of the distress, post extra lookouts.

(241) (2) The following action should be taken when proceeding to the area of distress:

(242) (a) Plot the position, course, speed, and ETA of other assisting ships.

(243) (b) Know the communication equipment with which other ships are fitted. This information may be obtained from the International Telecommunication Union's List of Ship Stations.

(244) (c) Attempt to construct an accurate "picture" of the circumstances attending the casualty. The important information needed is included under Distress Signals and Communication Procedures, this chapter.

Should the ship in distress fail to transmit this information, a ship proceeding to assist should request what information is needed.

(245) (3) The following on-board preparation while proceeding to the distress area should be considered:

(246) (a) A rope (guest warp) running from bow to quarter at the waterline on each side and secured by lizards to the ship's side to assist boats and rafts to secure alongside;

(247) (b) A derrick rigged ready for hoisting on each side of the ship with a platform cargo sling, or rope net, secured to the runner to assist the speedy recovery of exhausted or injured survivors in the water;

(248) (c) Heaving lines, ladders, and scramble net placed ready for use along both sides of the ship on the lowest open deck and possibly crew members suitably equipped to enter the water and assist survivors;

(249) (d) A ship's liferaft made ready for possible use as a boarding station;

(250) (e) Preparations to receive survivors who require medical assistance including the provision of stretchers;

(251) (f) When own lifeboat is to be launched, any means to provide communications between it and the parent ship will prove to be of very great help;

(252) (g) A line throwing appliance with a light line and a heavy rope, ready to be used for making connection either with the ship in distress or with survival craft.

Aircraft procedures for directing surface craft to scene of distress incident

(253) The following procedures performed in sequence by an aircraft mean that the aircraft is directing a surface craft toward the scene of a distress incident,

(254) (a) Circling the surface craft at least once.

(255) (b) Crossing the projected course of the surface craft close ahead at low altitude, rocking the wings, opening and closing the throttle, or changing the propeller pitch.

(256) (c) Heading in the direction in which the surface craft is to be directed. The surface craft should acknowledge the signal by changing course and following the aircraft. If, for any reason, it is impossible to follow, the surface craft should hoist the international code flag NOVEMBER, or use any other signaling means available to indicate this.

(257) The following procedures performed by an aircraft mean that the assistance of the surface craft is no longer required:

(258) (a) Crossing the wake of the surface craft close astern at a low altitude, rocking the wings, opening and closing the throttle or changing the propeller pitch.

(259) Since modern jet-engined aircraft cannot make the characteristic sound associated with opening and closing the throttle, or changing propeller pitch, ships should be alert to respond to the signals without the sounds, when jets or turboprop aircraft are involved.

Surface ship procedures for assisting aircraft in distress

(260) 1. When an aircraft transmits a distress message by radio, the first transmission is generally made on the designated air/ground enroute frequency in use at the time between the aircraft and aeronautical station. The aircraft may change to another frequency, possibly another enroute frequency or the aeronautical emergency frequencies of 121.50 MHz or 243 MHz. In an emergency, it may use any other available frequency to establish contact with any land, mobile, or direction-finding station.

(261) 2. There is liaison between Coast Radio Stations aeronautical units, and land–based search and rescue organizations. Merchant ships will ordinarily be informed of aircraft casualties at sea by broadcast messages from Coast Radio Stations, made on the international distress frequency of 2182 kHz. Ships may, however, become aware of the casualty by receiving:

(262) (a) An SOS message from an aircraft in distress which is able to transmit on radiotelephone on 2182 kHz.

(263) (b) A message from a SAR aircraft.

(264) 3. For the purpose of emergency communications with aircraft, special attention is called to the possibility of conducting direct communications on 2182 kHz, if both ship and aircraft are so equipped.

(265) 4. An aircraft in distress will use any means at its disposal to attract attention, make known its position, and obtain help, including some of the signals prescribed by the applicable Navigation Rules.

(266) 5. Aircraft usually sink quickly (e.g. within a few minutes). Every endeavor will be made to give ships an accurate position of an aircraft which desires to ditch. When given such a position, a ship should at once consult any other ships in the vicinity on the best procedure to be adopted. The ship going to the rescue should answer the station sending the broadcast and give her identity, position, and intended action.

(267) 6. If a ship should receive a distress message direct from an aircraft, she should act as indicated in the immediately preceding paragraph and also relay the message to the nearest Coast Radio Station. Moreover, a ship which has received a distress message direct from an aircraft and is going to the rescue should take a bearing on the transmission and inform the Coast Radio Station and other ships in the vicinity of the call sign of the distressed aircraft and the time at which the

distress message was received, followed by the bearing and time at which the signal ceased.

(268) 7. When an aircraft decides to ditch in the vicinity of a ship, the ship should:

(269) (a) Transmit homing bearings to the aircraft, or (if so required) transmit signals enabling the aircraft to take its own bearings.

(270) (b) By day, make black smoke.

(271) (c) By night, direct a searchlight vertically and turn on all deck lights. Care must be taken not to direct a searchlight toward the aircraft, which might dazzle the pilot.

(272) 8. Ditching an aircraft is difficult and dangerous. A ship which knows that an aircraft intends to ditch should be prepared to give the pilot the following information:

(273) (a) Wind direction and force.

(274) (b) Direction, height, and length of primary and secondary swell systems.

(275) (c) Other pertinent weather information.

(276) The pilot of an aircraft will choose his own ditching heading. If this is known by the ship, she should set course parallel to the ditching heading. Otherwise the ship should set course parallel to the main swell system and into the wind component, if any.

(277) 9. A land plane may break up immediately on striking the water, and liferafts may be damaged. The ship should, therefore, have a lifeboat ready for launching, and if possible, boarding nets should be lowered from the ship and heaving lines made ready in the ship and the lifeboat. Survivors of the aircraft may have bright colored lifejackets and location aids.

(278) 10. The method of recovering survivors must be left to the judgment of the master of the ship carrying out the rescue operation.

(279) 11. It should be borne in mind that military aircraft are often fitted with ejection seat mechanisms. Normally, their aircrew will use their ejection seats, rather than ditch. Should such an aircraft ditch, rather than the aircrew bail out, and it becomes necessary to remove them from their ejection seats while still in the aircraft, care should be taken to avoid triggering off the seat mechanisms. The activating handles are invariably indicated by red and or black/yellow coloring.

(280) 12. A survivor from an aircraft casualty who is recovered may be able to give information which will assist in the rescue of other survivors. Masters are therefore asked to put the following questions to survivors and to communicate the answers to a Coast Radio Station. They should also give the position of the rescuing ship and the time when the survivors were recovered.

(281) (a) What was the time and date of the casualty?

(282) (b) Did you bail out or was the aircraft ditched?

(283) (c) If you bailed out, at what altitude?

(284) (d) How many others did you see leave the aircraft by parachute?

(285) (e) How many ditched with the aircraft?

(286) (f) How many did you see leave the aircraft after ditching?

(287) (g) How many survivors did you see in the water?

(288) (h) What flotation gear had they?

(289) (i) What was the total number of persons aboard the aircraft prior to the accident?

(290) (j) What caused the emergency?

Helicopter evacuation of personnel

(291) Helicopter evacuation, usually performed by the Coast Guard, is a hazardous operation to the patient and to the flight crew, and should only be attempted in event of very serious illness or injury. Provide the doctor on shore with all the information you can concerning the patient, so that an intelligent evaluation can be made concerning the need for evacuation. Most rescue helicopters can proceed less than 150 miles offshore (a few new helicopters can travel 250 to 300 miles out to sea), dependent on weather conditions and other variables. If an evacuation is necessary, the vessel must be prepared to proceed within range of the helicopter, and should be familiar with the preparations which are necessary prior to and after its arrival.

(292) **When requesting helicopter assistance:**

(293) (1) Give the accurate position, time, speed, course, weather conditions, sea conditions, wind direction and velocity, type of vessel, and voice and CW frequency for your ship.

(294) (2) If not already provided, give complete medical information including whether or not the patient is ambulatory.

(295) (3) If you are beyond helicopter range, advise your diversion intentions so that a rendezvous point may be selected.

(296) (4) If there are changes to any items reported earlier, advise the rescue agency immediately. Should the patient die before the arrival of the helicopter, be sure to advise those assisting you.

(297) **Preparations prior to the arrival of the helicopter:**

(298) (1) Provide continuous radio guard on 2182 kHz or specified voice frequency, if possible. The helicopter normally cannot operate CW.

(299) (2) Select and clear the most suitable hoist area, preferably aft on the vessel with a minimum of 50 feet (15.2 meters) radius of clear deck. This must include the securing of loose gear, awnings, and antenna wires. Trice up running rigging and booms. If hoist is aft, lower the flag staff.

(300) (3) If the hoist is to take place at night, light the pickup areas as well as possible. Be sure you do not shine any lights on the helicopter, so that the pilot is not blinded. If there are any obstructions in the vicinity, put a light on them so the pilot will be aware of their positions.

(301) (4) Point searchlight vertically to aid the flight crew in locating the ship and turn them off when the helicopter is on the scene.

(302) (5) Be sure to advise the helicopter of the location of the pickup area on the ship before the helicopter arrives, so that the pilot may make his approach to aft, amidships, or forward, as required.

(303) (6) There will be a high noise level under the helicopter, so voice communications on deck are almost impossible. Arrange a set of hand signals among the crew who will assist.

(304) **Hoist operations:**

(305) (1) If possible, have the patient moved to a position as close to the hoist area as his condition will permit–**time is important.**

(306) (2) Normally, if a litter (stretcher) is required, it will be necessary to move the patient to the special litter which will be lowered by the helicopter. Be prepared to do this as quickly as possible. Be sure the patient is strapped in, face up, and with a life jacket on (if his condition will permit).

(307) (3) Be sure that the patient is tagged to indicate what medication, if any, was administered to him and when it was administered.

(308) (4) Have patient's medical record and necessary papers in an envelope or package ready for transfer with the patient.

(309) (5) Again, if the patient's condition permits, be sure he is wearing a life jacket.

(310) (6) Change the vessel's course to permit the ship to ride as easily as possible with the wind on the bow, preferably on the port bow. Try to choose a course to keep the stack gases clear of the hoist area. Once established, maintain course and speed.

(311) (7) Reduce speed to ease ship's motion, but maintain steerageway.

(312) (8) If you do not have radio contact with the helicopter, when you are in all respects ready for the hoist, signal the helicopter in with a "come on" with your hand, or at night by flashlight signals.

(313) (9) **Allow basket or stretcher to touch deck prior to handling to avoid static shock.**

(314) (10) If a trail line is dropped by the helicopter, guide the basket or stretcher to the deck with the line; keep the line free at all times. This line will not cause shock.

(315) (11) Place the patient in basket, sitting with his hands clear of the sides, or in the litter, as described above. Signal the helicopter hoist operator when ready for the hoist. Patient should signal by a nodding of the head if he is able. Deck personnel give thumbs up.

(316) (12) If it is necessary to take the litter away from the hoist point, unhook the hoist cable and keep it free for the helicopter to haul in. **Do not secure cable or trail line to the vessel or attempt to move stretcher without unhooking.**

(317) (13) When patient is strapped into the stretcher, signal the helicopter to lower the cable, attach cable to stretcher sling (bridle), then signal the hoist operator when the patient is ready to hoist. Steady the stretcher so it will not swing or turn.

(318) (14) If a trail line is attached to the basket or stretcher, use it to steady the patient as he is hoisted. Keep your feet clear of the line, and keep the line from becoming entangled.

Medical advice and/or evacuation

(319) In the event a master of a vessel requires medical advice and/or there is a potential of evacuation the following should be volunteered by the master:

(320) Vessel's name and call sign.

(321) Vessel's position and time at position.

(322) Vessel's course, speed and next port and estimated time of arrival (ETA).

(323) Patient's name, nationality, age, race and sex.

(324) Patient's respiration, pulse and temperature.

(325) Patient's symptoms and nature of illness.

(326) Any known history of similar illness.

(327) Location and type of pain.

(328) Medical supplies carried on board vessel.

(329) Medication given to patient.

(330) Weather.

(331) Communication schedule and frequency.

Coast Guard droppable, floatable pumps

(332) The Coast Guard often provides vessels in distress with emergency pumps by either making parachute drops, by lowering on helicopter hoist, or by delivering by vessel. The most commonly used type of pump comes complete in a sealed aluminum drum about half the size of a 50-gallon oil drum. One single lever on top opens it up. Smoking is cautioned against due to the possible presence of gas fumes inside the can. The pump will draw about 90 gallons per minute. There should be a waterproof flashlight on top of the pump for night use. Operating instructions are provided inside the pump container.

(333) **Preparations for being towed by Coast Guard:**

(334) (1) Clear the forecastle area as well as you can.

(335) (2) If a line-throwing gun is used, keep everyone out of the way until line clears the boat. The Coast

Guard vessel will blow a police whistle or otherwise warn you before firing.

(336) (3) Have material ready for chafing gear.

Medical advice

(337) Free medical advice is furnished to seamen by radio through the cooperation of Governmental and commercial radio stations whose operators receive and relay messages prefixed **RADIOMEDICAL** from ships at sea to the U.S. Coast Guard and/or directly to a hospital and then radio the medical advice back to the ships. (See Appendix A for list of radio stations that provide this service.)

EMERGENCY POSITION INDICATING RADIOBEACONS (EPIRB)

(338) Emergency position indicating radiobeacons (EPIRBs), are designed to save your life if you get into trouble by alerting rescue authorities and indicating your location. EPIRB types are described in the accompanying table.

EPIRB Types

Type	Frequency	Description
Class A	121.5/243 MHz	Float-free automatically activated, detectable by aircraft and satellite. Coverage limited (see Chart). An alert from this device to a rescue coordination center may be delayed 4 – 6 or more hours. No longer recommended.
Class B	121.5/243 MHz	Manually activated version of Class A. No longer recommended.
Class C	VHF ch 15/16	Manually activated, operates on maritime channels only. Not detectable by satellite. These devices have been phased out by the FCC and are no longer recognized.
Class S	121.5/243 MHz	Similar to Class B, except it floats, or is an integral part of a survival craft. No longer recommended.
Cat I	406/121.5 MHz	Float-free, automatically activated EPIRB. Detectable by satellite anywhere in the world. . Recognized by the Global Maritime and Distress Safety System (GMDSS).
Cat II	406/121.5 MHz	Similar to Category I, except is manually activated. (Some models are also water activated).
Inmarsat E	1646 MHz	Float-free, automatically activated EPIRB. Detectable by Inmarsat geostationary satellite. Recognized by GMDSS. Currently not sold in the U.S.; however the FCC is considering recognizing these devices.

(339) **121.5/243 MHz EPIRB (Class A, B, S):** These are the most common and least expensive type of EPIRB, designed to be detected by overflying commercial or military aircraft. Satellites were designed to detect these EPIRBs, but are limited for the following reasons:

(340) (1) Satellite detection range is limited for these EPIRBs (satellites must be within line of sight of both the EPIRB and a ground terminal for detection to occur) (see Chart),

(341) (2) Frequency congestion in the band used by these devices cause a high satellite false alert rate (99.8%); consequently, confirmation is required before search and rescue forces can be deployed.

(342) (3) EPIRBs manufactured before October 1989 may have design or construction problems (e.g. some models will leak and cease operating when immersed in water), or may not be detectable by satellite. Such EPIRBs may no longer be sold.

(343) (4) Because of location ambiguities and frequency congestion in this band, two or more satellite passes are necessary to determine if the signal is from an EPIRB and to determine the location of the EPIRB, delaying rescue by an average of 4 to 6 hours. In some cases, a rescue can be delayed as long as 12 hours.

(344) (5) COSPAS-SARSAT is expected to cease detecting alerts on 121.5 MHz, perhaps by 2008.

(345) **Note:** On November 3, 2000, the National Oceanic and Atmospheric Administration (NOAA) announced that satellite processing 121.5/243 MHz emergency beacons will be terminated on February 1, 2009. Class A and B EPIRBs must be phased out by that date. The U.S. Coast Guard no longer recommends these EPIRBs be purchased.

(346) **Class C EPIRBs:** These are manually activated devices intended for pleasure craft which do not venture far offshore and for vessels on the Great Lakes. They transmit a short burst on VHF-FM channel 16 (156.8 MHz) and a longer homing signal on channel 15 (156.75 MHz). Their usefulness depended upon a coast station or another vessel guarding channel 16 and recognizing the brief, recurring tone as an EPIRB. Class C EPIRBs were not recognized outside of the United

States, and were no longer recognized in the U.S. after 1999.

(347) **406 MHz EPIRBs (Category I, II):** The 406 MHz EPIRB was designed to operate with satellites. The signal frequency (406 MHz) has been designated internationally for use only for distress. Other communications and interference, such as on 121.5 MHz, is not allowed on this frequency. Its signal allows a satellite local user terminal to accurately locate the EPIRB (much more accurately — 2 to 5 km vice 25 km — than 121.5/243 MHz devices), and identify the vessel (the signal is encoded with the vessel's identity) anywhere in the world (there is no range limitation). These devices are detectable not only by COSPAS-SARSAT satellites which are polar orbiting, but also by geostationary GOES weather satellites. EPIRBs detected by the GEOSAR system, consisting of GOES and other geostationary satellites, send rescue authorities an instant alert, but without location information unless the EPIRB is equipped with an integral GPS receiver. EPIRBs detected by COSPAS-SARSAT (e.g. TIROS N) satellites provide rescue authorities location of distress, but location and sometimes alerting may be delayed as much as an hour or two. These EPIRBs also include a 121.5 MHz homing signal, allowing aircraft and rescue craft to quickly find the vessel in distress. These are the only type of EPIRB which must be certified by Coast Guard approved independent laboratories before they can be sold in the United States.

(348) A new type of 406 MHz EPIRB, having an integral GPS navigation receiver, became available in 1998. This EPIRB will send accurate location as well as identification information to rescue authorities immediately upon activation through both geostationary (GEOSAR) and polar orbiting satellites. These types of EPIRB are the best you can buy.

(349) 406 MHz emergency locating transmitters (ELTs) for aircraft are currently available. 406 MHz personnel locating beacons (PLBs) are available in Alaska and Canada, and will soon be available throughout the U.S.

(350) The Coast Guard recommends you purchase a 406 MHz EPIRB, preferably one with an integral GPS navigation receiver. A Cat I EPIRB should be purchased if it can be installed properly.

(351) Proper registration of your 406 MHz satellite emergency position-indicating radiobeacon (EPIRB) is intended to save your life, and is mandated by Federal Communications Commission regulations. The Coast Guard is enforcing this FCC registration rule.

(352) If you purchase a new or a used 406 MHz EPIRB, you MUST register it with NOAA. If you change your boat, your address, or your primary phone number, you MUST re-register your EPIRB with NOAA. If you sell your EPIRB, make sure the purchaser re-registers the EPIRB, or you may be called by the Coast Guard if it later becomes activated. An FCC ship station license is no longer required to purchase or carry an EPIRB. Download or request 406 MHz EPIRB registration forms from www.sarsat.noaa.gov/beacon.html, and mail or fax completed forms to:

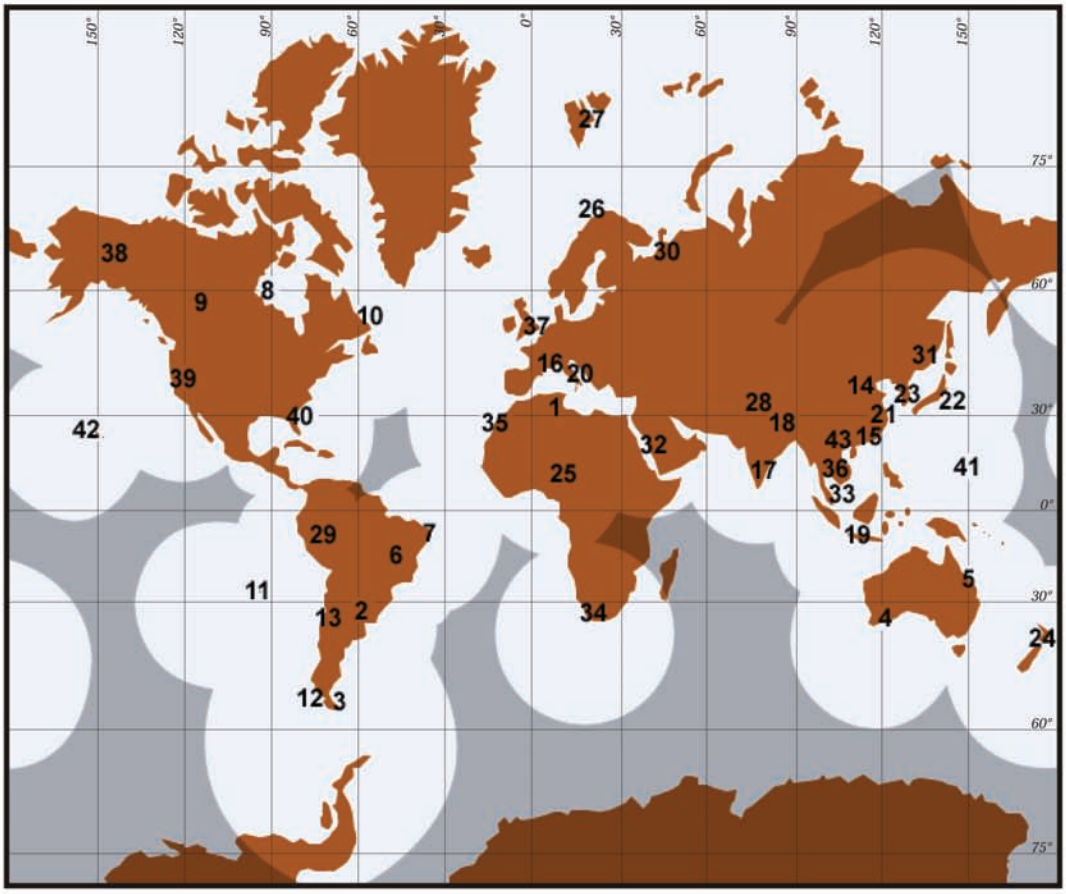
(353) SARSAT Beacon Registration
(354) E/SP3, Room 3320, FB-4
(355) NOAA
(356) 5200 Auth Road
(357) Suitland, MD 20746-4304
(358) or call toll free at **1-888-212-SAVE** (i.e. 1-888-212-7283) for further information or a copy of the registration form. From outside the U.S., call +1 (301) 457-5430 (fax: (301) 568-8649) for further information. Forms may be requested by phone or fax, or downloaded by computer (above). There is no charge for this service. IT MAY SAVE YOUR LIFE.

(359) **Inmarsat E EPIRBs:** Inmarsat E EPIRBs transmit a distress signal to Inmarsat geostationary satellites which includes a registered identity similar to that of the 406 MHz EPIRB and a location derived from a GPS navigational satellite receiver inside the EPIRB. Inmarsat EPIRBs may be detected anywhere in the world between 70 degrees North latitude and 70 degrees South latitude. Since geostationary satellites are used, alerts are transmitted nearly instantly to a rescue coordination center associated with the Inmarsat coast earth station receiving the alert. Alerts received over the Inmarsat Atlantic Ocean Regions are routed to the Coast Guard Atlantic Area command center in New York, and alerts received over the Inmarsat Pacific Ocean Region are routed to the Coast Guard Pacific Area command center in San Francisco.

The COSPAS-SARSAT system

(360) COSPAS: Space System for Search of Distress Vessels (a Russian acronym); SARSAT: Search and Rescue Satellite-Aided Tracking. COSPAS-SARSAT is an international satellite system designed to provide distress alert and location data to assist search and rescue (SAR) operations, using satellites and ground facilities to detect and locate the signals of distress beacons operating on 121.5 and 406 MHz (Megahertz). The system provides distress alert and location data to Rescue Coordination Centers for 121.5 MHz beacons within the coverage area of ground stations (Local User Terminals–LUTs), and for 406 MHz beacons activated anywhere in the world. The goal of the system is to support all organizations in the world with responsibility for SAR operations.

Areas of Coverage for the Cospas-Sarsat Low-altitude Earth Orbit (LEOSAR) System for Search and Rescue



1	Ouargla, Algeria	**15**	Hong Kong, China	**29**	Callao, Peru
2	Parana, Argentina	**16**	Toulouse, France	**30**	Arkhangelsk, Russia
3	Rio Grande, Argentina	**17**	Bangalore, India	**31**	Nakhodka, Russia
4	Albany, Australia	**18**	Lucknow, India	**32**	Jeddah, Saudi Arabia
5	Bundaberg, Australia	**19**	Jakarta, Indonesia	**33**	Singapore
6	Brasilia, Brazil	**20**	Bari, Italy	**34**	Cape Town, South Africa
7	Recife, Brazil	**21**	Keelung, ITDC	**35**	Maspalomas, Spain
8	Churchill, Canada	**22**	Yokohama, Japan	**36**	Bangkok, Thailand
9	Edmonton, Canada	**23**	Daejeon, Korea	**37**	Combe Martin, UK
10	Goose Bay, Canada	**24**	Wellington, New Zealand	**38**	Alaska, USA
11	Easter Island, Chile	**25**	Abuja, Nigeria	**39**	California, USA
12	Punta Arenas, Chile	**26**	Tromsoe, Norway	**40**	Florida, USA
13	Santiago, Chile	**27**	Spitsbergen, Norway	**41**	Guam
14	Beijing, China	**28**	Lahore, Pakistan	**42**	Hawaii, USA
				43	Haiphong, Vietnam

Testing EPIRBs

(361) The Coast Guard urges those owning EPIRBs to periodically examine them for water tightness, battery expiration date and signal presence. FCC rules allow Class A, B, and S EPIRBs to be turned on briefly (for three audio sweeps, or one second only) during the first five minutes of each hour. Signal presence can be detected by an FM radio tuned to 99.5 MHz, or an AM radio tuned to any vacant frequency and located close to an EPIRB. 406 MHz EPIRBs can be tested through its self-test function, which is an integral part of the device.

(362) **Radar beacons (Racons)** are low-powered radio transceivers that operate in the marine radar X-band frequencies. When activated by a vessel's radar signal, **Racons** provide a distinctive visible display on the vessel's radarscope from which the range and bearing to the beacon may be determined. (See Light List and NGA Pub. 117 for details.)

RADIO: NAVIGATION WARNINGS, INFORMATION AND WEATHER

(363) Marine radio warnings and weather are disseminated by many sources and through several types of transmissions. Morse code radiotelegraph broadcasts of navigational warnings and other advisories are not described, since these transmissions are normally copied only by professional radio operators. U.S. Coast Guard NAVTEX, high-frequency (HF) narrow-band direct printing (radio telex), HF radiofacsimile, and radiotelephone broadcasts of maritime safety information are summarized here. (For complete information on radio warnings and weather see NGA Pub. 117 and the joint National Weather Service/Navy publication **Selected Worldwide Marine Weather Broadcasts**.)

Coast Guard radio stations

(364) Coast Guard radio stations provide urgent, safety, and scheduled marine information broadcasts with virtually complete coverage of the approaches and coastal waters of the United States, Puerto Rico, and the U.S. Virgin Islands.

(365) **Urgent and safety radiotelephone broadcasts** of important Notice to Mariners items, storm warnings, and other vital marine information are transmitted upon receipt, and urgent broadcasts are repeated 15 minutes later; additional broadcasts are made at the discretion of the originator. **Urgent** broadcasts are preceded by the urgent signal PAN-PAN (PAHN-PAHN, spoken three times). **Both the urgent signal and message are transmitted on 2182 kHz and/or VHF-FM channel 16. Safety** broadcasts are preceded by the safety signal SECURITY (SAY-CURITAY, spoken three times). **The Safety signal is given on 2182 kHz and/or VHF-FM channel 16, and the message is given on 2670 kHz and/or VHF-FM channel 22A.**

(366) Scheduled radiotelephone broadcasts include routine weather, small-craft advisories, storm warnings, navigational information, and other advisories. Short-range broadcasts are made on **2670 kHz** and/or **VHF-FM channel 22A,** following a preliminary call on **2182 kHz** and/or **VHF-FM channel 16.** (See Appendix A for a list of stations and their broadcast frequencies and times for the area covered by this Coast Pilot.)

(367) Weather information is not normally broadcast by the Coast Guard on VHF-FM channel 22A in areas where NOAA Weather Radio service is available. See note below regarding VHF-FM channel 22A.

(368) HF single-sideband broadcasts of high seas weather information is available on the (carrier) frequencies 4428.7, 6506.4, 8765.4, 13113.2, and 17307.3 kHz from Portsmouth, VA and San Francisco, CA.

(369) Narrow-band direct printing (radio telex or sitor) broadcasts of NAVAREA and other navigational warnings are transmitted on the following assigned frequencies:

(370) Atlantic ice reports: 5320, 8502, and 12750 kHz.

(371) Other Atlantic warnings: 8490, 16968.8 kHz.

(372) Pacific: 8710.5, 8714.5, 8718, 13077, 13084.5, 17203, 22567, and 22574.5 kHz.

(373) HF radiofacsimile broadcasts of weather and ice charts are made on the following frequencies:

(374) Atlantic: 3242, 7530, 8502 (ice only), 12750 (ice only) kHz.

(375) Pacific: 4298 (Kodiak), 4336, 8459 (Kodiak), 8682, 12730, 17151.2 kHz.

National Standard Abbreviations for Broadcasts

(376) A listing of Standard Abbreviations for Textual Maritime Safety Broadcasts is contained in tables T-28 through T-30. These abbreviations were jointly approved by the U.S. Coast Guard, National Weather Service, National Geospatial–Intelligence Agency, and the Radio Technical Commission for Maritime Services. In addition to appearing in radio broadcasts of the U.S. Coast Guard and National Weather Service, they appear in Notices to Mariners of the U.S. Coast Guard and National Geospatial–Intelligence Agency, and in NAVTEX.

Coast Guard VHF-FM Channel 22A Broadcast Warnings

(377) The Coast Guard broadcasts urgent and routine maritime safety information to ships on channel 22A (157.10 MHz), the ship station transmit frequency portion of channel 22, of Appendix 18 of the International

Telecommunications Union (ITU) Radio Regulations. This simplex use of channel 22A is not compatible with the international duplex arrangement of the channel (coast transmit 161.70 MHz, ship transmit 157.10 MHz). As a result, many foreign flag vessels having radios tuned to the international channel 22 can not receive these maritime safety broadcasts. A 1987 Coast Guard survey of foreign vessels in U.S. waters indicated that half of foreign vessels in U.S. waters did not have equipment on board capable of receiving channel 22A broadcasts.

(378) Operators of vessels which transit U.S. waters and who do not have VHF-FM radios tunable to USA channel 22A are urged to either obtain the necessary equipment, to monitor the radiotelephone frequency 2182 kHz and tune to 2670 kHz when a broadcast is announced, or to carry a NAVTEX receiver.

NAVTEX Marine Information Broadcasts

(379) NAVTEX is a maritime radio warning system consisting of a series of coast stations transmitting radio teletype (CCIR Recommendation 476 standard narrow band direct printing, sometimes called Sitor or ARQ/FEC) safety messages on the international standard medium frequency 518 kHz. Coast stations transmit during preset time slots so as to minimize interference with one another. Routine messages are normally broadcast four to six times daily. Urgent messages are broadcast upon receipt, provided that an adjacent station is not transmitting. Since the broadcast uses the medium frequency band, a typical station service radius ranges from 100-500 NM day and night. Interference from or receipt of stations farther away occasionally occurs at night.

(380) Each NAVTEX message broadcast contains a four-character header describing identification of station (first character), message content (second character), and message serial number (third and fourth characters). This header allows the microprocessor in the shipborne receiver to screen messages, selecting only those stations relevant to the user, messages of subject categories needed by the user, and messages not previously received by the user. Selected messages are printed on a roll of paper as received, to be read by the mariner at his convenience. Unwanted messages are suppressed. Suppression of unwanted messages is more and more important to the mariner as the number of messages, including rebroadcasts, increases yearly. With NAVTEX, a mariner will no longer find it necessary to listen to, or sift through, a large number of irrelevant data to obtain the information necessary for safe navigation.

(381) Vessels regulated by the Safety of Life at Sea (SOLAS) Convention, as amended in 1988 (cargo vessels over 300 tons and passenger vessels, on international voyages), and operating in areas where NAVTEX service is available, have been required to carry NAVTEX receivers since 1 August 1993. The USCG discontinued broadcasts of safety information over MF Morse frequencies on that date.

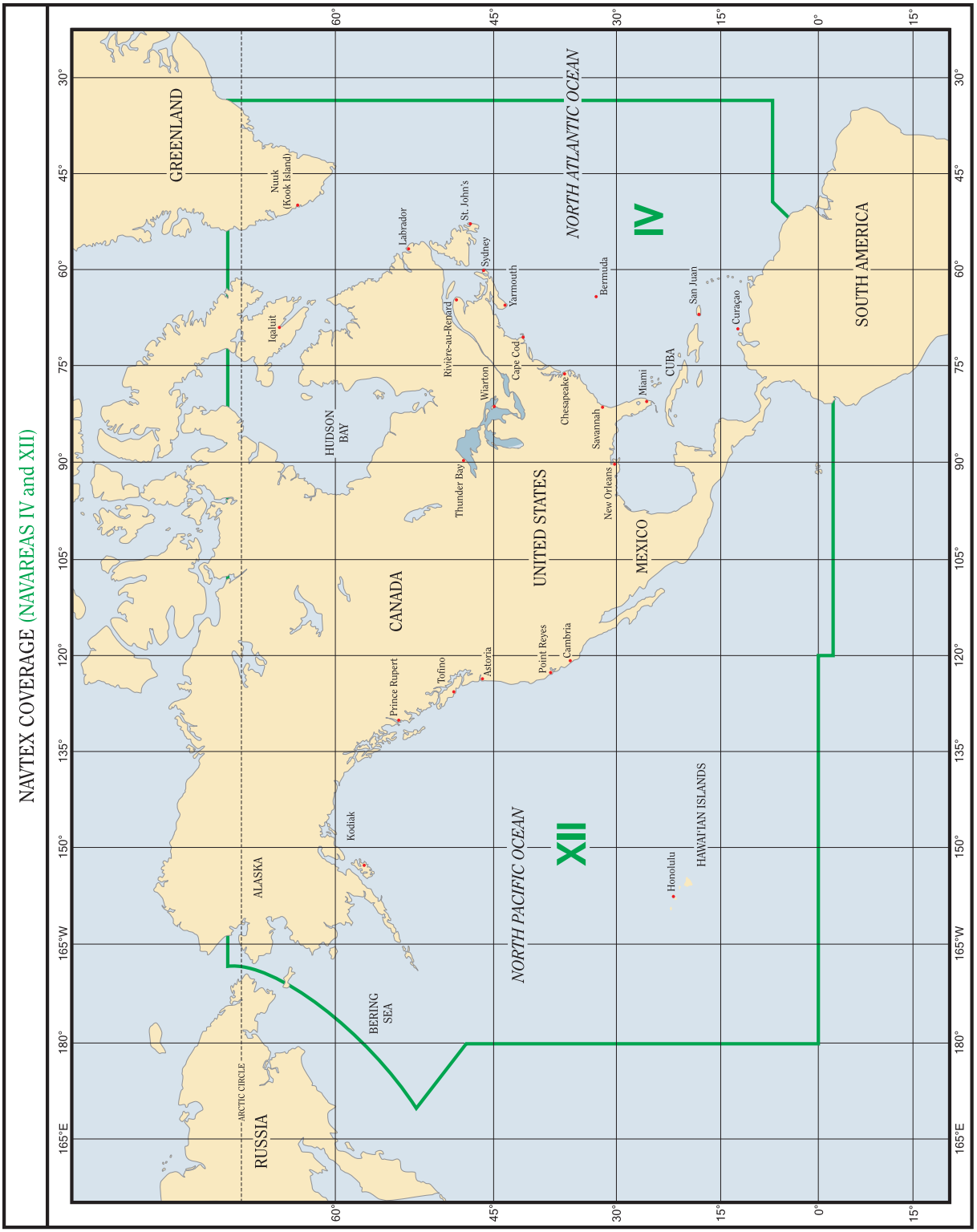
(382) The USCG voice broadcasts (Ch. 22A), often of more inshore and harbor information, will remain unaffected by NAVTEX. With NAVTEX, mariners who do not have the knowledge of Morse code necessary to receive safety messages, or who have difficulty receiving them on a timely basis, should find a significant advantage in owning a NAVTEX receiver. Mariners not able to man a radio on a 24-hour basis in order to hear critical warning messages (e.g. commercial fishermen) should also find a significant advantage in owning a NAVTEX receiver.

(383) See Appendix A, U.S. NAVTEX Transmitting Stations, for a list of NAVTEX broadcast stations (Atlantic and Pacific Oceans) and message content.

(384) **NOAA Weather Radio** provides continuous broadcasts of the latest weather information directly from NWS offices. In addition to general weather information, marine weather is provided by stations along the sea coasts and the Great Lakes. During severe weather, NWS forecasters can interrupt the regular broadcasts and substitute special warning messages. The forecasters can also activate specially designed warning receivers. These receivers either sound an alarm alerting the listener to the forthcoming broadcast or, when operated in a muted mode, automatically turn on so that the warning message is heard.

(385) NOAA Weather Radio taped messages are repeated every 4 to 6 minutes and are routinely revised every 1 to 3 hours, or more frequently if necessary. The stations operate 24 hours daily. The broadcasts are made on seven **VHF-FM frequencies, 162.40, to 162.55 MHz. The 162.475 MHz frequency** is only used in special cases where needed to avoid channel interference. A number of manufacturers offer special weather radios to operate on these frequencies, with or without emergency warning alarm, and many AM/FM radios on the market now offer the "weather band" as an added feature. The broadcasts can usually be heard as far as 40 miles from the antenna site, sometimes more. The effective range depends on many factors, including the height of the broadcast antenna, terrain, quality of the receiver, and the type of receiving antenna. As a general rule, listeners close to or perhaps beyond the 40 mile range should have a good quality receiver system to get reliable reception. (See Appendix A for a list of these stations in the area covered by this Coast Pilot.)

(386) **Marine Weather Services Charts (MSC)**, published by the National Weather Service, list frequencies and


NAVTEX COVERAGE (NAVAREAS IV and XII)
GREENLAND
Nuuk (Kook Island)
Iqaluit
Labrador
St. John's
Sydney
Yarmouth
Bermuda
NORTH ATLANTIC OCEAN
IV
San Juan
Curaçao
SOUTH AMERICA
Rivière-au-Renard
Cape Cod
Chesapeake
Savannah
Miami
CUBA
HUDSON BAY
Wiarton
Thunder Bay
New Orleans
UNITED STATES
MEXICO
CANADA
Point Reyes
Cambria
Astoria
Tofino
Prince Rupert
Kodiak
ALASKA
NORTH PACIFIC OCEAN
XII
Honolulu
HAWAI'IAN ISLANDS
BERING SEA
ARCTIC CIRCLE
RUSSIA
165°E
180°
165°W
150°
135°
120°
105°
90°
75°
60°
45°
30°
15°
0°

schedules of broadcasts of stations giving weather forecasts and warnings. The charts are available from FAA, National Aeronautical Charting Office, AVN-530. (See Appendix A for address.)

Commercial radiotelephone coast stations

(387) Broadcasts of coastal weather and warnings are made by some commercial radiotelephone coast stations (marine operators) on the normal transmitting frequencies of the stations. Vessels with suitable receivers and desiring this service may determine the frequencies and schedules of these broadcasts from their local stations, from Selected Worldwide Marine Weather Broadcasts, or from the series of Marine Weather Services Charts published by NWS.

Local broadcast-band radio stations

(388) Many local radio stations in the standard AM and FM broadcast band give local marine weather forecasts from NWS on a regular schedule. These stations are listed on the series of Marine Weather Services Charts published by NWS.

Reports from ships

(389) The master of every U.S. ship equipped with radio transmitting apparatus, on meeting with a tropical cyclone, dangerous ice, subfreezing air temperatures with gale force winds causing severe ice accretion on superstructures, derelict, or any other direct danger to navigation, is required to cause to be transmitted a report of these dangers to ships in the vicinity and to the appropriate Government agencies.

(390) During the West Indies hurricane season, June 1 to November 30, ships in the Gulf of Mexico, Caribbean Sea area, southern North Atlantic Ocean, and the Pacific waters west of Central America and Mexico are urged to cooperate with NWS in furnishing these special reports in order that warnings to shipping and coastal areas may be issued.

Time Signals

(391) The **National Institute of Standards and Technology (NIST)** broadcasts time signals continuously, day and night, from its radio stations **WWV,** near Fort Collins, Colorado, (40°49'49"N., 105°02'27"W.) on frequencies of 2.5, 5, 10, 15, and 20 MHz, and **WWVH,** Kekaha, Kauai, Hawaii (21°59'26"N., 159°46'00"W.) on frequencies 2.5, 5, 10, and 15 MHz. Services include time announcements, standard time intervals, standard audio frequencies, Omega Navigation System status reports, geophysical alerts, BCD (binary coded decimal) time code, UT1 time corrections, and high seas storm information.

(392) Time announcements are made every minute, commencing at 15 seconds before the minute by a female voice and at 7½ seconds before the minute by a male voice, from WWVH and WWV, respectively. The time given is in Coordinated Universal Time (UTC) and referred to the time at Greenwich, England, i.e., Greenwich Mean Time.

(393) **NIST Time and Frequency Dissemination Services, Special Publication 432**, gives a detailed description of the time and frequency dissemination services of the **National Institute of Standards and Technology.** Single copies may be obtained upon request from the National Institute of Standards and Technology, Time and Frequency Division, Boulder, CO 80303. Quantities may be obtained from the Government Printing Office (see Appendix A for address).

CAUTIONARY INFORMATION

Destructive Waves

(394) Unusual sudden changes in water level can be caused by tsunamis or violent storms. These two types of destructive waves have become commonly known as **tidal waves,** a name which is technically incorrect as they are not the result of tide-producing forces.

(395) **Tsunamis (seismic sea waves)** are caused by sea-bottom earthquakes. Many such seismic disturbances do not produce sea waves and others produce small sea waves, but the occasional large waves can be very damaging to shore installations and dangerous to ships in harbors.

(396) These waves travel great distances and can cause tremendous damage on coasts far from their source. The wave of April 1, 1946, which originated in the Aleutian Trench, demolished nearby Scotch Cap Lighthouse and caused damages of 25 million dollars in the Hawaiian Islands 2,000 miles away. The wave of May 22-23, 1960, which originated off Southern Chile, caused widespread death and destruction in islands and countries throughout the Pacific. A more recent tsunami, the result of a December 26, 2004 earthquake off the island of Sumatra, Indonesia, caused widespread damage throughout the Indian Ocean. Damage was heavy as far away as the east coast of Africa. It caused over 200,000 deaths (as far away as South Africa) and 13 billion dollars worth of damage

(397) The speed of tsunamis varies with the depth of the water, reaching 300 to 500 knots in the deep water of the open ocean. In the open sea they cannot be detected from a ship or from the air because their length is so great, sometimes a hundred miles, as compared to their height, which is usually only a few feet (a meter or

2). The waves only build to disastrous proportions when they approach shore.

(398) There are usually a series of waves with crests 10 to 40 minutes apart, and the highest may occur several hours after the first wave. Sometimes the first noticeable part of the wave is the trough which causes a recession of the water from shore, and people who have gone out to investigate this unusual exposure of the beach have been engulfed by the oncoming crest. Such an unexplained withdrawal of the sea should be considered as nature's warning of an approaching wave.

(399) Improvements have been made in the quick determination and reporting of earthquake epicenters, but no method has yet been perfected for determining whether a sea wave will result from a given earthquake. NOAA's Pacific Tsunami Warning Center in Hawaii has deployed a warning system which has field reporting stations (seismic and tidal) in most countries around the Pacific. When a warning is broadcast, waterfront areas should be vacated for higher ground, and ships in the vicinity of land should head for the deep water of the open sea.

Storm surge

(400) A considerable rise or fall in the level of the sea along a particular coast may result from strong winds and sharp change in barometric pressure. In cases where the water level is raised, higher waves can form with greater depth and the combination can be destructive to low regions, particularly at high stages of tide. Extreme low levels can result in depths which are considerably less than those shown on nautical charts. This type of wave occurs especially in coastal regions bordering on shallow waters which are subject to tropical storms.

(401) **Seiche** is a stationary vertical wave oscillation with a period varying from a few minutes to an hour or more, but somewhat less than the tidal periods. It is usually attributed to external forces such as strong winds, changes in barometric pressure, swells, or tsunamis disturbing the equilibrium of the water surface. Seiche is found both in enclosed bodies of water and superimposed upon the tides of the open ocean. When the external forces cause a short-period horizontal oscillation on the water, it is called **surge**.

(402) The combined effect of seiche and surge sometimes makes it difficult to maintain a ship in its position alongside a pier even though the water may appear to be completely undisturbed, and heavy mooring lines have been parted repeatedly under such conditions. Pilots advise taut lines to reduce the effect of the surge.

Immersion Hypothermia

(403) Immersion hypothermia is the loss of heat when a body is immersed in water. With few exceptions, humans die if their core temperature of approximately 99.7° F drops below 78.6° F. Cardiac arrest is the most common direct cause of death. During prolonged immersion, the main threat to life is cold or cold and drowning combined.

(404) The length of time that a human survives in water depends on the water temperature, and to a lesser extent, on the person's behavior and body type. The table below shows approximate human survival time in the sea. Body type can cause deviations, as small people become hypothermic more rapidly than large people. The cooling rate can be slowed by the person's behavior and insulated gear. The Heat Escape Lessening Posture (HELP) was developed for those in the water alone and the Huddle for small groups. Both require a PFD (personal flotation device), or life preserver. HELP involves holding the arms close to the body, keeping the thighs together, and raising the knees to protect the groin area. In the Huddle, people face each other and keep their bodies as close together as possible. These positions improve survival time to approximately two times that of a swimmer and one and a half times that of a person in the passive position.

(405) Near-drowning victims in cold water (less than 70° F) are revivable for much longer periods than usual. Keys to a successful revival are immediate cardiopulmonary resuscitation (CPR) and administration of pure oxygen. Total re-warming is not necessary at first. The whole revival process may take hours and require medical help.

Survival Time Versus Water Temperature

Water Temperature	Exhaustion or Unconsciousness	Expected Time of Survival
32°F	15 min.	15-45 min.
32°41°F	15-30 min.	30-90 min.
41°-50°F	30-60 min.	1-3 hrs.
50°-59°F	1-2 hrs.	1-6 hrs.
59°-68°F	2-7 hrs.	2-40 hrs.
68°-77°F	3-12 hrs.	3 hrs-indef.
77°F and above	indefinite	indefinite

Wind Chill and Frostbite

(406) When the body is warmer than its surroundings, it begins to lose heat. The rate of loss depends on barriers such as clothing and insulation, the speed of air movement and air temperature. Heat loss increases dramatically in moving air that is colder than skin temperature

(91.4° F). Even a light wind increases heat loss, and a strong wind can lower the body temperature if the rate of loss is greater than the body's heat replacement rate.

(407) When skin temperature drops below 50° F, there is a marked constriction of blood vessels, leading to vascular stagnation, oxygen want and cellular damage. The first indication that something is wrong is a painful tingling. Swelling of varying extent follows, provided freezing has not occurred. Excruciating pain may be felt if the skin temperature is lowered rapidly, but freezing of localized portions of the skin may be painless when the rate of change is slow. Possible effects of cold include cold allergy (welts), chilblains, which appear as reddened, warm, itching, swollen patches on the fingers and toes, and trench foot and immersion foot, which present essentially the same picture. Both result from exposure to cold and lack of circulation. Wetness can add to the problem as water and wind soften the tissues and accelerate heat loss.

(408) Frostbite usually begins when the skin temperature falls within the range of 14° to 4° F. Ice crystals form in the tissues and small blood vessels. The rate of heat loss determines the rate of freezing, which is accelerated by wind, wetness, extreme cold and poor blood circulation. Parts of the body susceptible to freezing are those with surfaces large in relation to their volume, such as toes, fingers, ears, nose, chin and cheeks.

(409) Injuries from the cold may, to a large extent, be prevented by maintaining natural warmth through the use of proper footgear and adequate, dry clothing, by avoiding cramped positions and constricting clothing and by active exercise of the hands, legs and feet.

MARINE POLLUTION

The Federal Water Pollution Control Act or Clean Water Act

(410) The Federal Water Pollution Control Act (FWPCA) or Clean Water Act (CWA) was passed to restore and maintain the chemical, physical and biological integrity of our nation's waters.

No-Discharge Zones

(411) Section 312 of the FWPCA gives the Environmental Protection Agency (EPA) and States the authority to designate certain areas as No-Discharge Zones (NDZ) for vessel sewage. Freshwater lakes, freshwater reservoirs, or other freshwater impoundments whose entrances and exits prohibit traffic by regulated vessels (vessels with installed toilets) are, by regulation, NDZs. Rivers that do not support interstate navigation vessel traffic are also NDZs by regulation. Water bodies that can be designated as NDZs by States and EPA include: the Great Lakes and their connecting waterways, freshwater lakes and impoundments accessible through locks, and other flowing waters that support interstate navigation by vessels subject to regulation.

(412) Inside No-Discharge Zone waters, discharge of any sewage, whether treated or untreated, is completely prohibited.

(413) Discharge of sewage in waters not designated as No-Discharge Zones is regulated by the Marine Sanitation Device Standard (see **40 CFR 140** in Chapter 2.)

Oil Pollution

(414) The FWPCA also prohibits the discharge of quantities of either oil or hazardous substance which may be harmful into or upon the navigable waters of the United States. This prohibition also applies to adjoining shorelines, waters of the contiguous zone, activities connected with the Outer Continental Shelf Lands Act (OSLA) and Deepwater Port Act of 1974, and such discharges which may affect natural resources belonging to the United States or under its exclusive management authority, including those resources under the Fishery Conservation and Management Act of 1976. In the event a spill does occur in violation of the Act the person in charge of a vessel or onshore or offshore facility is required to notify the Coast Guard as soon as he has knowledge of the spill. Such notification is to be by the most rapid means available to the National Response Center (1-800-424-8802, nationwide 24 hour number).

The Act to Prevent Pollution from Ships

(415) The Act to Prevent Pollution from Ships (33 U.S.C. 1901) implements into U.S. law the International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 (MARPOL 73/78). Annex I of MARPOL 73/78 deals with oil and oily waste, Annex II with hazardous chemicals and other substances referred to as Noxious Liquid Substances (NLS), and Annex V deals with the prevention of marine pollution by plastics and other garbage produced during vessel operations.

(416) Annex I of MARPOL 73/78 is applicable to oceangoing tankers over 150 gross tons and all other oceangoing ships over 400 gross tons. The MARPOL 73/78 requirements include oily waste discharge limitations, oily-water separating equipment, monitoring and alarm systems for discharges from cargo areas, cargo pump rooms and machinery space bilges. Ships to which Annex I MARPOL 73/78 is applicable are also required to have an International Oil Pollution Prevention (IOPP) Certificate verifying that the vessel is in compliance with the requirements of MARPOL 73/78 and that any

required equipment is on board and operational. Vessels must also maintain an Oil Record Book recording all oil transfers and discharges. The Oil Record Book is available from USCG Supply Center Baltimore or any local Captain of the Port.

(417) Annex II of MARPOL 73/78 is applicable to oceangoing vessels and non-self propelled oceangoing ships which carry Noxious Liquid Substances (NLS) in bulk. The Annex II requirements include discharge restrictions for various classes of cargo residues; the maintenance of a Cargo Record Book for recording all NLS cargo and residue transfers and discharges; and a Procedures and Arrangements Manual describing the correct procedures for off loading and prewashing cargo tanks.

(418) Annex II NLS cargoes are classified in one of four categories, A, B, C, or D. Category A is the most hazardous to the environment. Category A and other substances which tend to solidify in tanks must be prewashed in port under the supervision of a Prewash Surveyor prior to departure from the off loading terminal. Vessel discharges must be underwater when discharge at sea is allowed. Tanks which carry Category B and C NLS must be tested to ensure that after tank stripping only a minimal amount of residues will remain. Reception facilities must be able to assist in cargo stripping operations by reducing back pressure during the final stages of off loading.

(419) Terminals and ports receiving oceangoing tankers, or any other oceangoing ships of 400 GT or more, carrying residues and mixtures containing oil, or receiving oceangoing ships carrying NLSs, are required to provide adequate reception facilities for the wastes generated. Coast Guard Captains of the Port issue a Certificate of Adequacy to terminals or ports to show that they are in compliance with federal reception facility requirements. An oceangoing tanker or any other oceangoing ship of 400 GT or more required to retain oil or oily residues and mixtures on board and an oceangoing ship carrying a Category A, B or C NLS cargo or NLS residue in cargo tanks that are required to be prewashed, may not enter any port or terminal unless the port or terminal holds a valid Certificate of Adequacy or unless the ship is entering under force majeure.

(420) Annex V is applicable to all recreational, fishing, uninspected and inspected vessels, and foreign flag vessels on the navigable waters and all other waters subject to the jurisdiction of the United States, out to and including the Exclusive Economic Zone (200 miles).

(421) Annex V prohibits the disposal of any and all plastic material from any vessel anywhere in the marine environment. Dunnage, lining and packing materials which float may be disposed of beyond 25 miles from the nearest land. Other garbage that will not float may be disposed of beyond 12 miles of land, except that garbage which can pass through a 25mm mesh screen (approximately 1 square inch) may be disposed of beyond 3 miles. Dishwater is not to be considered garbage within the meaning of Annex V when it is the liquid residue from the manual or automatic washing of dishes or cooking utensils. More restrictive disposal regimes apply in waters designated "Special Areas." This Annex requires terminals to provide reception facilities at ports and terminals to receive plastics and other garbage from visiting vessels.

(422) The civil penalty for each violation of MARPOL 73/78 is not more than $25,000. The criminal penalty for a person who knowingly violates the MARPOL Protocol, or the regulations (**33 CFR 151, 155, 157, and 158**), consists of a fine of not more than $250,000 and/or imprisonment for not more than 5 years; U.S. law also provides criminal penalties up to $500,000 against organizations which violate MARPOL.

Packaged Marine Pollutants

(423) On October 1, 1993, new regulations under the Hazardous Materials Transportation Act (HMTA) took effect, implementing MARPOL Annex III in the United States. MARPOL Annex III deals with the prevention of marine pollution by harmful substances in packaged form.

(424) Annex III of MARPOL 73/78 applies to all ships carrying harmful substances in packaged form. Annex III provides standards for stowage, packing, labeling, marking, and documentation of substances identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code). On 5 November 1992, the U.S. Research and Special Programs Administration (RSPA) amended the Hazardous Materials Regulations (HMR, 49 CFR 100-177) to list and regulate these marine pollutants in all modes of transportation.

(425) Marine pollutants are divided into two classes: marine pollutants and severe marine pollutants. A solution or mixture containing 10% or more of any marine pollutant falls into the class of "marine pollutant." The "severe marine pollutant" class consists of those materials that contain 1% or more of any specified "severe marine pollutant" substance. Marine pollutants that do not meet the criteria for any other hazard class are transported as an environmentally hazardous substance.

Ocean Dumping

(426) The Marine Protection Research and Sanctuaries Act of 1972, as amended (33 USC 1401 et seq.), regulates the dumping of all material, except fish waste,

into ocean waters. Radiological, chemical and biological warfare agents and other high level radioactive wastes are expressly banned from ocean disposal. The U.S. Army Corps of Engineers issues permits for the disposal of dredged spoils; the Environmental Protection Agency is authorized to issue permits for all other dumping activities. Surveillance and enforcement to prevent unlawful transportation of material for dumping or unlawful dumping under the Act has been assigned to the U.S. Coast Guard. The Act provides civil penalties of up to $50,000 and criminal penalties of up to $50,000 and/or one year imprisonment.

MINECLEARING: CAUTION

Keep Clear of Mineclearance Vessels (COLREGS 1972)

(427) (a) United States vessels engaged in mineclearing operations or exercises are hampered to a considerable extent in their maneuvering powers.

(428) (b) With a view to indicating the nature of the work on which they are engaged, these vessels will show the signals hereinafter mentioned. For the public safety, all other vessels, whether steamers or sailing craft, must endeavor to keep out of the way of vessels displaying these signals and not approach them inside the distances mentioned herein, especially remembering that it is dangerous to pass between the vessels of a pair or group sweeping together.

(429) (c) All vessels towing sweeps are to show:

(430) **BY DAY**–A black ball at the fore mast and a black ball at the end of each fore yard.

(431) **BY NIGHT**–All around green lights instead of the black balls, and in a similar manner.

(432) (d) Vessels or formations showing these signals are not to be approached nearer than 1,000 meters. Under no circumstances is a vessel to pass through a formation of minesweepers.

(433) (e) Mineclearance vessels should be prepared to warn merchant vessels which persist in approaching too close by means of any of the appropriate signals from the International Code of Signals.

(434) (f) In fog, mist, falling snow, heavy rainstorms, or any other conditions similarly restricting visibility, whether by day or night, mineclearance vessels while towing sweeps when in the vicinity of other vessels will sound signals for a vessel towing (1 prolonged blast followed by 2 short blasts).

Helicopters Conducting Mineclearance Operations

(435) (g) The United States is increasingly employing helicopters to conduct mineclearance operations or exercises. When so engaged, helicopters, like vessels, are considerably hampered in their ability to maneuver. Accordingly, surface craft approaching helicopters engaged in mineclearance operations should take safety precautions similar to those described in (b) and (d) above with respect to mineclearance vessels.

(436) (h) Helicopters towing mineclearance gear and accompanying surface escorts, if any, will use all available means to warn approaching ships of the operations or exercises being conducted. Also, measures will be taken where practicable to mark or light the gear or objects being towed.

(437) (i) Mineclearance helicopters are equipped with a rotating beacon which has selectable red and amber modes. The amber mode is used during towing operations to notify/warn other vessels that the helicopter is towing. While towing, the helicopter's altitude varies from 15 to 95 meters above the water and speeds vary from 0 to 30 knots.

(438) (j) General descriptions and approximate dimensions for towed mineclearance gear currently being used in conjunction with helicopters are as follows:

(439) (1) Mechanical sweep gear consisting, in part, of large lengths of submerged cables and explosive cutters. The only items normally visible on the surface are three to five international orange floats, depending upon the quantity of gear in use, which generally define the dimensions of the tow. The maximum width is 100 meters and the maximum distance behind the helicopter is 600 meters.

(440) (2) Acoustical sweep device weighing approximately 70 pounds (32 kg). This device is towed behind the helicopter on a 250-meter orange polypropylene tow cable. When dead in the water, the gear will rise to the surface, supported by a yellow float.

(441) (3) A hydrofoil platform containing equipment used for magnetic influence sweeping. The platform is towed on the end of a 140-meter cable and trails electrodes in the water which extend 185 meters behind the platform. Very often, the aforementioned acoustical sweep device is towed in conjunction with this platform by attaching it to the end of one of the electrodes by a 30-meter polypropylene tow line. In this configuration, the total length of the tow is 215 and 350 meters, respectively, behind the hydrofoil platform and helicopter. Special care must be exercised when crossing astern of the hydrofoil platform as the towed cable is barely visible, and the attached acoustic device is submerged just beneath the surface and is not visible to surface vessels.

(442) (k) Helicopters employed in mineclearance operations and their tows may function at night as well as day, and in various types of weather conditions. The major danger to any surface vessel is getting the various cables wrapped in its screws. Small craft also are

subject to the risk of collision with the hydrofoil platform.

Submarine Emergency Identification Signals and Hazard to Submarines

(443) U.S. submarines are equipped with signal ejectors which may be used to launch identification signals, including emergency signals. Two general types of signals may be used: smoke floats and flares or stars. A combination signal which contains both smoke and flare of the same color may also be used. The smoke floats, which burn on the surface, produce a dense, colored smoke for a period of fifteen to forty-five seconds. The flares or stars are propelled to a height of three hundred to four hundred feet (90 to 120 meters) from which they descend by small parachute. The flares or stars burn for about twenty-five seconds. The color of the smoke or flare/star has the following meaning:

(444) (a) **GREEN OR BLACK**–Used under training exercise conditions only to indicate that a torpedo has been fired or that the firing of a torpedo has been simulated.

(445) (b) **YELLOW**–Indicates that submarine is about to come to periscope depth from below periscope depth. Surface craft terminate antisubmarine counter-attack and clear vicinity of submarine. Do not stop propellers.

(446) (c) **RED**–Indicates an emergency condition within the submarine and that it will surface immediately, if possible. Surface ships clear the area and stand by to give assistance after the submarine has surfaced. In case of repeated red signals, or if the submarine fails to surface within reasonable time, she may be assumed to be disabled. Buoy the location, look for submarine buoy and attempt to establish sonar communications. Advise U.S. Naval authorities immediately.

(447) (d) **WHITE**–Two white flares/smoke in succession indicates that the submarine is about to surface, usually from periscope depth (non-emergency surfacing procedure). Surface craft should clear the vicinity of the submarine.

(448) A Submarine Marker Buoy consists of a cylindrically shaped object about 3 feet by 6 feet with connecting structure and is painted international orange. The buoy is a messenger buoy with a wire cable to the submarine; this cable acts as a downhaul line for a rescue chamber. The buoy may be accompanied by an oil slick release to attract attention. A submarine on the bottom in distress and unable to surface will, if possible, release this buoy. If an object of this description is sighted, it should be investigated and U.S. Naval Authorities advised immediately.

(449) Transmission of the International Distress Signal (SOS) will be made on the submarine's sonar gear independently or in conjunction with the red emergency signal as conditions permit. Submarines may employ any or all of the following additional means to attract attention and indicate their position while submerged:

(450) Release of dye marker.

(451) Release of air bubble.

(452) Ejection of oil.

(453) Pounding on the hull.

(454) United States destroyer-type vessels in international waters will, on occasion, stream a towed underwater object at various speeds engaged in naval maneuvers. All nations operating submarines are advised that this underwater object in the streamed condition constitutes a possible hazard to submerged submarines.

Vessels Constrained by their Draft

(455) International Navigation Rules, Rule 28, states that a vessel constrained by her draft may, in addition to the lights prescribed for power-driven vessels in Rule 23, exhibit where they can best be seen three all-around red lights in a vertical line, or a cylinder.

Special signals for surveying vessels

(456) Vessels engaged in survey operations and limited in their ability to maneuver because of the work being performed (handling equipment over-the-side such as water sampling or conductivity-temperature-density (CTD) casts, towed gear, bottom samplers, etc., and divers working on, below or in proximity of the vessel) are required by Navigation Rules, International-Inland, Rule 27, to exhibit:

(457) (b)(i) three all-round lights in a vertical line where they can best be seen. The highest and lowest of these lights shall be red and the middle light shall be white;

(458) (ii) three shapes in a vertical line where they can best be seen. The highest and lowest of these shapes shall be balls and the middle one a diamond;

(459) (iii) when making way through the water, masthead lights, sidelights and a sternlight, in addition to the lights prescribed in subparagraph (b)(i); and

(460) (iv) when at anchor, in addition to the lights or shapes prescribed in subparagraphs(b)(i) and (ii) the light, lights or shapes prescribed in Rule 30, Anchored Vessels and Vessels Aground.

(461) A vessel engaged in hydrographic survey operations (making way on a specific trackline while sounding the bottom) is not restricted in its ability to maneuver and therefore exhibits at night only those lights required for a power-driven vessel of its length.

(462) **Warning signals for Coast Guard vessels while handling or servicing aids to navigation** are the same as those prescribed for surveying vessels.

VHF-FM Radiotelephone

(463) VHF-FM channel 16 (156.800 MHz) is the international distress, urgency, safety, calling and reply frequency for vessels and public and private coastal stations. In 1992, the Federal Communications Commission (FCC) designated VHF-FM channel 9 (156.450 MHz) for use as a general purpose calling frequency for non-commercial vessels, such as recreational boats. This move was designed to relieve congestion on VHF-FM channel 16. Non-commercial vessels are encouraged to use VHF-FM channel 9, for routine communications but distress, urgency, and safety calls should continue to be initially made on VHF-FM channel 16.

(464) The following table provides the frequency equivalents and general usage of selected VHF-FM channels which appear in the Coast Pilot. The letter "A" appended to a channel number indicates that U.S. operation of the particular channel is different than the international operation, i.e., U.S. stations transmit and receive on the same frequency and international stations use different frequencies.

(465) All channels given below are designated for both ship-to-ship and ship-to-coast communications except as noted.

SELECT NAVIGATION RULES

Improper use of searchlights

(466) No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel underway. The International Code Signal "PG2" may be made by a vessel inconvenienced by the glare of a searchlight in order to apprise the offending vessel of the fact.

Use of Radar

(467) Navigation Rules, International-Inland, Rule 7, states, in part, that every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist. Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(468) This rule places an additional responsibility on vessels which are equipped and manned to use radar to do so while underway during periods of reduced visibility without in any way relieving commanding officers of the responsibility of carrying out normal precautionary measures.

(469) Navigation Rules, International-Inland, Rules 6, 7, 8, and 19 apply to the use of radar.

Danger signal

(470) Navigation Rules, International-Inland, Rule 34(d), states that when vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.

Narrow channels

(471) Navigation Rules, International-Inland, Rule 9(b) states: A vessel of less than 65.6 feet (20 meters) in length or a sailing vessel shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway.

Control of shipping in time of emergency or war

(472) In time of war or national emergency, merchant vessels of the United States and those foreign flag vessels, which are considered under effective U.S. control, will be subject to control by agencies of the U.S. Government. The allocation and employment of such vessels, and of domestic port facilities, equipment, and services will be performed by appropriate agencies of the War Transport Administration. The movement, routing, and diversion of merchant ships at sea will be controlled by appropriate naval commanders. The movement of merchant ships within domestic ports and dispersal anchorages will be coordinated by the U.S. Coast Guard. The commencement of naval control will be signaled by a general emergency message. (See NGA Pub. 117 for emergency procedures and communication instructions.)

REGULATED WATERS

Traffic Separation Schemes (Traffic Lanes)

(473) To increase the safety of navigation, particularly in converging areas of high traffic density, routes incorporating traffic separation have been adopted by the IMO in certain areas of the world. In the interest of safe navigation, it is recommended that through traffic use these schemes, as far as circumstances permit, by day and by night and in all weather conditions.

(474) The International Maritime Organization (IMO) is recognized as the only international body responsible for establishing and recommending measures on an

Channel	Ship Frequency (MHz)		Channel Usage
	Transmit	Receive	
1A	156.050	156.050	Port Operations and commercial (see footnote 2)
5A	156.250	156.250	Port Operations (see footnote 1)
6	156.300	156.300	Intership safety
7A	156.350	156.350	Commercial
8	156.400	156.400	Commercial (ship-to-ship only)
9	156.450	156.450	Boater Calling Commercial/Non-commercial
10	156.500	156.500	Commercial
11	156.550	156.550	Commercial .VTS in selected areas.
12	156.600	156.600	Port Operations. VTS in areas.
13	156.650	156.650	Intership Navigation (Bridge-to-bridge). (see footnote 4)
14	156.700	156.700	Port Operations. VTS in selected areas.
15	———————-	156.750	Environmental (Receive only). Used by Class C EPIRBs.
16	156.800	156.800	International Distress, Safety and Calling. (See footnote 5)
17	156.850	156.850	State control
18A	156.900	156.900	Commercial
19A	156.950	156.950	Commercial
20	157.000	161.600	Port Operations (duplex)
20A	157.000	157.000	Port Operations
21A	157.050	157.050	U.S. Coast Guard only
22A	157.100	157.100	Coast Guard Liaison/Maritime Safety Information Broadcasts. (Channel 15)
23A	157.150	157.150	U.S. Coast Guard only
24	157.200	161.800	Public Correspondence (Marine Operator)
25	157.250	161.850	Public Correspondence (Marine Operator)
26	157.300	161.900	Public Correspondence (Marine Operator)
27	157.350	161.950	Public Correspondence (Marine Operator)
28	157.400	162.000	Public Correspondence (Marine Operator)
63A	156.175	156.175	Port Operations and Commercial, VTS. (see footnote 2)
65A	156.275	156.275	Port Operations
66A	156.325	156.325	Port Operations
67	156.375	156.375	Commercial. (see footnote 3)
68	156.425	156.425	Non-Commercial
69	156.475	156.475	Non-Commercial
70	156.525	156.525	Digital Selective Calling (voice communications not allowed)
71	156.575	156.575	Non-Commercial
72	156.625	156.625	Non-Commercial (Intership only)
73	156.675	156.675	Port Operations
74	156.725	156.725	Port Operations
77	156.875	156.875	Port Operations (ship-to-ship, to and from pilots docking ships)
78A	156.925	156.925	Non-Commercial
79A	156.975	156.975	Commercial. Non-Commercial in Great Lakes only
80A	157.025	157.025	Commercial. Non-Commercial in Great Lakes only
81A	157.075	157.075	U.S. Government only-Environmental protection operations
82A	157.125	157.125	U.S. Government only
83A	157.175	157.175	U.S. Coast Guard only
84	157.225	161.825	Public Correspondence (Marine Operator)
85	157.275	161.875	Public Correspondence (Marine Operator)
86	157.325	161.925	Public Correspondence (Marine Operator)
87	157.375	161.975	Public Correspondence (Marine Operator)
88	157.425	162.025	Public Correspondence only near Canadian border.
88A	157.425	157.425	Commercial, Intership only.

Channel	Ship Frequency (MHz)		Channel Usage
	Transmit	Receive	

Footnotes to table:

1. Houston, New Orleans and Seattle areas.
2. Available only in New Orleans/Lower Mississippi area.
3. Used for bridge-to-bridge communications in Lower Mississippi River. Intership only.
4. Ships>20m in length maintain a listening watch on this channel in US waters.
5. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.

international level concerning ships' routing. In deciding whether or not to adopt or amend a traffic separation scheme, IMO will consider whether the scheme complies with the design criteria for traffic separation schemes and with the established methods of routing. IMO also considers whether the aids to navigation proposed will enable mariners to determine their position with sufficient accuracy to navigate the scheme in accordance with Rule 10 of the International Regulations for Preventing Collisions at Sea (72 COLREGS).

(475) General principles for navigation in Traffic Separation Schemes are as follows:

(476) 1. A ship navigating in or near a traffic separation scheme adopted by IMO shall in particular comply with Rule 10 of the 72 COLREGS to minimize the development of risk of collisions with another ship. The other rules of the 72 COLREGS apply in all respects, and particularly the steering and sailing rules if risk of collision with another ship is deemed to exist.

(477) 2. Traffic separation schemes are intended for use by day and by night in all weather, ice-free waters or under light ice conditions where no extraordinary maneuvers or assistance by icebreaker(s) is required.

(478) 3. Traffic separation schemes are recommended for use by all ships unless stated otherwise. Bearing in mind the need for adequate underkeel clearance, a decision to use a traffic separation scheme must take into account the charted depth, the possibility of changes in the seabed since the time of last survey, and the effects of meteorological and tidal conditions on water depths.

(479) 4. A deep water route is an allied routing measure primarily intended for use by ships which require the use of such a route because of their draft in relation to the available depth of water in the area concerned. Through traffic to which the above consideration does not apply should, if practicable, avoid following deep water routes. When using a deep water route mariners should be aware of possible changes in the indicated depth of water due to meteorological or other effects.

(480) 5. The arrows printed on charts merely indicate the general direction of traffic; ships should not set their courses strictly along the arrows.

(481) 6. Vessels should, so far as practicable, keep clear of a traffic separation line or separation zone.

(482) 7. Vessels should avoid anchoring in a traffic separation scheme or in the area near its termination.

(483) 8. The signal "YG" meaning "You appear not to be complying with the traffic separation scheme" is provided in the International Code of Signals for appropriate use.

(484) **Note**–Several governments administering Traffic Separation Schemes have expressed their concern to IMO about the large number of infringements of Rule 10 of the 72 COLREGS and the dangers of such contraventions to personnel, vessels and environment. Several governments have initiated surveillance of traffic separation schemes for which they are responsible and are providing documented reports of vessel violations to flag states. As in the past, the U.S. Coast Guard will investigate these reports and take appropriate action. Mariners are urged to comply at all times with the 72 COLREGS.

(485) 9. Notice of temporary adjustments to traffic separation schemes for emergencies or for accommodation of activities which would otherwise contravene Rule 10 or obstruct navigation may be made in Notices to Mariners. Temporary adjustments may be in the form of a precautionary area within a traffic lane, or a shift in the location of a lane.

(486) 10. The IMO approved routing measures which affect shipping in or near U.S. waters are:

(487) In the Approaches to Portland, Maine

(488) In the Approaches to Boston, Massachusetts

(489) In the Approaches to Narragansett Bay, Rhode Island and Buzzards Bay, Massachusetts

(490) Off New York

(491) Off Delaware Bay

(492) In the Approaches to Chesapeake Bay

(493) In the Approaches to Cape Fear River

(494) In the Approaches to Galveston Bay

(495) Off San Francisco

(496) In the Santa Barbara Channel

(497) In the Approaches to Los Angeles-Long Beach

(498) In the Strait of Juan de Fuca

(499) In Puget Sound and its Approaches

(500) In Prince William Sound, Alaska

(501) When approved or established, traffic separation scheme details are announced in Notice to Mariners, and later depicted on appropriate charts and included in the U.S. Coast Pilot.

Territorial Sea

(502) The 12 nautical mile territorial sea was established by Presidential Proclamation 5928, December 27, 1988, and is also the outer limit of the **U.S. contiguous zone** for the application of domestic law. **The 3 nautical mile line (charted), previously identified as the outer limit of the territorial sea, is retained because the proclamation states that it does not alter existing State or Federal law. The 9 nautical mile natural resources boundary** off Texas, the Gulf coast of Florida, and Puerto Rico, and the 3 nautical mile line elsewhere remain the inner boundary of the Federal fisheries jurisdiction and limit of states' jurisdiction under the Submerged Lands Act (P.L. 83-31; 67 Stat. 29, March 22, 1953). These maritime limits are subject to modification, as represented on future charts. The lines shown on the most recent chart edition take precedence.

Exclusive Economic Zone of the United States

(503) Established by a Presidential Proclamation on March 10, 1983, the Exclusive Economic Zone (EEZ) of the United States is **a zone contiguous to the territorial sea, including zones contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant and the United Nations Trusteeship Agreement), and United States overseas territories and possessions. The EEZ extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured**. In cases where the maritime boundary with a neighboring state remains to be determined, the boundary of the EEZ shall be determined by the United States and other state concerned in accordance with equitable principles.

(504) Within the EEZ, the United States has asserted, to the extent permitted by international law, (a) sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, both living and nonliving, of the seabed and subsoil and the superjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and (b) jurisdiction with regard to the establishment and use of artificial islands, and installations and structures having economic purposes, and the protection and preservation of the marine environment.

(505) Without prejudice to the sovereign rights and jurisdiction of the United States, the EEZ remains an area beyond the territory and territorial sea of the United States in which all states enjoy the high seas freedoms of navigation, overflight, the laying of submarine cables and pipelines, and other internationally lawful uses of the sea.

(506) This Proclamation does not change existing U.S. policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna that are not subject to U.S. jurisdiction and require international agreements for effective management.

(507) The United States will exercise these sovereign rights and jurisdiction in accordance with the rules of international law.

(508) The seaward limit of the EEZ is shown on the nautical chart as a line interspersed periodically with EXCLUSIVE ECONOMIC ZONE. **The EEZ boundary is coincidental with that of the Fishery Conservation Zone.** (See **Fishery Conservation Zone**, and **territorial sea**, this chapter.)

U.S. Fishery Conservation Zone (FCZ)

(509) The United States exercises exclusive fishery management authority over all species of fish, except tuna, within the fishery conservation zone, **whose seaward boundary is 200 miles from the baseline from which the U.S. territorial sea is measured;** all anadromous species which spawn in the United States throughout their migratory range beyond the fishery conservation zone, except within a foreign country's equivalent fishery zone as recognized by the United States; all U.S. Continental Shelf fishery resources beyond the fishery conservation zone. Such resources include American lobster and species of coral, crab, abalone, conch, clam, and sponge, among others.

(510) No foreign vessel may fish, aid, or assist vessels at sea in the performance of any activity relating to fishing including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing, within the fishery conservation zone, or fish for anadromous species of the United States or Continental Shelf fishery resources without a permit issued in accordance with U.S. law. These permits may only be issued to vessels from countries recognizing the exclusive fishery management authority of the United States in an international agreement. The owners or operators of foreign vessels desiring to engage in fishing off U.S. coastal waters should ascertain their

eligibility from their own flag state authorities. Failure to obtain a permit prior to fishing, or failure to comply with the conditions and restrictions established in the permit may subject both vessel and its owners or operators to administrative, civil, and criminal penalties. (Further details concerning foreign fishing are given in **50 CFR 611**.)

(511) Reports of foreign fishing activity within the fishery conservation zone should be made to the U.S. Coast Guard. Immediate reports are particularly desired, but later reports by any means also have value. Reports should include the activity observed, the position, and as much identifying information (name, number, homeport, type, flag, color, size, shape, etc.) about the foreign vessel as possible, and the reporting party's name and address or telephone number.

(512) An article similar to the above is carried annually in NGA Notice to Mariners No. 1.

(513) The seaward limit of the FCZ is shown on the nautical chart as a line interspersed periodically with a symbol of a fish. The **FCZ boundary is coincidental with that of the Exclusive Economic Zone**. (See **Exclusive Economic Zone** and **territorial sea**, this chapter.)

U.S. GOVERNMENT AGENCIES PROVIDING ADDITIONAL MARITIME SERVICES

DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

(514) The Animal and Plant Health Inspection Service is responsible for protecting the Nation's animal population, food and fiber crops, and forests from invasion by foreign pests. They administer agricultural quarantine and restrictive orders issued under authority provided in various acts of Congress. The regulations prohibit or restrict the importation or interstate movement of live animals, meats, animal products, plants, plant products, soil, injurious insects, and associated items that may introduce or spread plant pests and animal diseases which may be new to or not widely distributed within the United States or its territories. Inspectors examine imports at ports of entry as well as the vessel, its stores, and crew or passenger baggage.

(515) The Service also provides an inspection and certification service for exporters to assist them in meeting the quarantine requirements of foreign countries. (See Appendix A for a list of ports where agricultural inspectors are located and inspections conducted.)

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration (NOAA)

(516) The National Oceanic and Atmospheric Administration (NOAA) conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to improve our understanding and stewardship of the environment.

(517) NOAA provides services to the nation and the public through five major organizations: the National Ocean Service, the National Weather Service, the National Marine Fisheries Service, the National Environmental Satellite, Data and Information Service, and NOAA Research; and numerous special program units. In addition, NOAA research and operational activities are supported by the Nation's seventh uniformed service, the NOAA Corps, a commissioned officer corps of men and women who operate NOAA ships and aircraft, and serve in scientific and administrative positions.

National Ocean Service (NOS)

(518) The National Ocean Service produces nautical charts, the Coast Pilot, and related publications for safe navigation of marine commerce, and provides basic data for engineering and scientific purposes and other commercial and industrial needs. The principal facilities of NOS are located in Silver Spring, MD, Norfolk, VA (Atlantic Marine Center), and Seattle, WA (Pacific Marine Center). NOAA ships are based at the marine centers. (See Appendix A for addresses.)

(519) **Sales agents** for NOAA nautical charts and the Coast Pilot are located in many U.S. ports and in some foreign ports. Catalogs showing the limits of NOAA nautical charts are available free from: FAA/National Aeronautical Charting Office, AVN-530. (See Appendix A for address, or call 1-800-638-8972.) Local authorized sales agents can be located using the query form at http://www.naco.faa.gov/Agents.asp. This form is used to locate aeronautical and nautical sales agents so the "Nautical Agents" button must be selected.

(520) **Nautical charts** are published primarily for the use of the mariner, but serve the public interest in many other ways. They are compiled principally from NOAA basic field surveys, supplemented by data from other Government organizations.

(521) **Tides and Currents**. The **Center for Operational Oceanographic Products and Services (CO-OPS)** collects and distributes observations and predictions of water levels and currents to ensure safe, efficient and environmentally sound maritime commerce.

(522) Water level, tides, and current observations and predictions are available on the Internet at http://tidesandcurrents.noaa.gov. From this Home

Page, users can choose a variety of information, including water level, tidal predictions, observed water level data, tides online (including a listing of all water level stations currently in storm surge mode), sea levels online, Great Lakes online, and PORTS.

(523) **PORTS (Physical Oceanographic Real-Time System)** is a centralized data acquisition and dissemination system that provides real-time water levels, currents, and other oceanographic and meteorological data from bays and harbors. This information is provided via telephone voice response (for most ports) and the Internet. Accurate real-time water level information allows U.S. port authorities and maritime shippers to make sound decisions regarding loading of tonnage (based on available bottom clearance), maximizing loads, and limiting passage times, without compromising safety.

(524) There are PORTS systems in 13 major ports in the United States. The table below lists the ports and the telephone number for voice access to the PORTS data.

Port or Waterway	Voice Access Phone Number
Anchorage, Port of, Alaska	1-866-257-6787
Chesapeake Bay	1-866-247-6787
Columbia River	not available
Delaware River and Bay	1-866-307-6787
Houston/Galveston	1-866-447-6787
Los Angeles/Long Beach	not available
Narragansett Bay, Rhode Island	1-866-757-6787
New Haven, Connecticut	not available
New York/New Jersey Harbor	1-866-217-6787
San Francisco Bay	1-866-727-6787
Soo Locks, Michigan	301-713-9596 (toll)
Tampa Bay, Florida	1-866-827-6787
Tacoma, Washington	not available

(525) **Tide Tables** and **Tidal Current Tables** are no longer published by NOAA. Many local publishers and printers throughout the country publish regional and localized tide and tidal current predictions in booklet, calendar, and other formats. The data printed in these local and regional publications is, in many cases, obtained directly from NOAA. For availability of localized prediction tables consult marinas and marine supply companies in your area. Two publishing firms are printing complete east and west coast tide and tidal current predictions for US ports and coastal areas–

(526) **ProStar Publications**

(527) (http://www.prostarpublications.com)

(528) **International Marine Division of McGraw Hill**

(529) (http://books.mcgraw-hill.com).

(530) **Caution**.–When using the Tide Tables, slack water should not be confused with high or low water. For ocean stations there is usually little difference between the time of high or low water and the beginning of ebb or flood currents; but for places in narrow channels, landlocked harbors, or on tidal rivers, the time of slack current may differ by several hours from the time of high or low water. The relation of the times of high or low water to the turning of the current depends upon a number of factors, so that no simple general rule can be given.

(531) **Tidal Current Charts** are not being maintained or reprinted by NOAA.

National Weather Service (NWS)

National Data Buoy Center Meteorological Buoys

(532) The National Data Buoy Center (NDBC) deploys moored meteorological buoys which provide weather data directly to the mariner as well as to marine forecasters. In 1998, a disproportionate number of these buoys have had mooring failures due to abrasion of the nylon mooring line by trawls, tow lines, etc.

(533) These buoys have a watch circle radius (WCR) of 2,000 to 4,000 yards from assigned position (AP). In addition, any mooring in waters deeper than 1,000 feet will have a floating "loop" or catenary that may be as little as 500 feet below the surface. This catenary could be anywhere within the buoy's WCR. Any underwater activity within this radius may contact the mooring causing a failure.

(534) To avoid cutting or damaging a moor, mariners are urged to exercise extreme caution when navigating in the vicinity of meteorological buoys and to remain well clear of the watch circle. If a mooring is accidentally contacted or cut, please notify NDBC at (228) 688-2835 or (228) 688-2436.

(535) For further information relating to these buoys consult the NDBC home page (**http://seaboard.ndbc.noaa.gov**).

Marine Weather Forecasts

(536) The National Weather Service provides marine weather forecasts and warnings for the U.S. coastal waters, the Great Lakes, offshore waters, and high seas areas. Scheduled marine forecasts are issued four times daily from **National Weather Service Offices** with local areas of responsibility, around the United States,

Guam, American Samoa, and Puerto Rico. (See Appendix A for National Weather Service Offices located in the area covered by this Coast Pilot.)

(537) Typically, the forecasts contain information on wind speed and direction, wave heights, visibility, weather, and a general synopsis of weather patterns affecting the region. The forecasts are supplemented with special marine warnings and statements, radar summaries, marine observations, small-craft advisories, gale warnings, storm warnings and various categories of tropical cyclone warnings e.g., tropical depression, tropical storm and hurricane warnings. Specialized products such as coastal flood, seiche, and tsunami warnings, heavy surf advisories, low water statements, ice forecasts and outlooks, and lake shore warnings and statements are issued as necessary. (For further information, go to **http://weather.gov/om/marine/home.htm.)**

(538) The principal means of disseminating marine weather services and products in coastal areas is **NOAA Weather Radio**. This network of more than 900 transmitters, covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories, is operated by the NWS and provides continuous broadcasts of weather information for the general public. These broadcasts repeat recorded messages every 4 to 6 minutes. Messages are updated periodically, usually every 2-3 hours and amended as required to include the latest information. When severe weather threatens, routine transmissions are interrupted and the broadcast is devoted to emergency warnings. (See Appendix A for NOAA Weather Radio Stations covered by this Coast Pilot.)

(539) In coastal areas, the programming is tailored to the needs of the marine community. Each coastal marine forecast covers a specific area. For example, "Cape Henlopen to Virginia Beach, out 20 miles." The broadcast range is about 40 miles from the transmitting antenna site, depending on terrain and quality of the receiver used. When transmitting antennas are on high ground, the range is somewhat greater, reaching 60 miles or more. Some receivers are equipped with a warning alert device that can be turned on by means of a tone signal controlled by the NWS office concerned. This signal is transmitted for 13 seconds preceding an announcement of a severe weather warning.

(540) NWS marine weather products are also disseminated to marine users through the broadcast facilities of the Coast Guard, Navy, and commercial marine radio stations. Details on these broadcasts including times, frequencies, and broadcast content are listed on the NWS internet site, **Marine Product Dissemination Information**, (http://www.nws.noaa.gov/om/marine/home.htm). For marine weather services in the coastal areas, the NWS publishes a series of Marine Weather Services Charts showing locations of NOAA Weather Radio stations, sites, telephone numbers of recorded weather messages and NWS offices, and other useful marine weather information.

(541) Ships of all nations share equally in the effort to report weather observations. These reports enable meteorologists to create a detailed picture of wind, wave, and weather patterns over the open waters that no other data source can provide and upon which marine forecasts are based. The effectiveness and reliability of these forecasts and warnings plus other services to the marine community are strongly linked to the observations received from mariners. There is an especially urgent need for ship observations in the coastal waters, and the NWS asks that these be made and transmitted whenever possible. Many storms originate and intensify in coastal areas. There may be a great difference in both wind direction and speed between the open sea, the offshore waters, and on the coast itself.

(542) Information on how ships, commercial fishermen, offshore industries, and others in the coastal zone may participate in the marine observation program is available from **National Weather Service Port Meteorological Officers (PMOs)**. Port Meteorological Officers are located in major U.S. port cities where they visit ships in port to assist masters and mates with the weather observation program, provide instruction on the interpretation of weather charts, calibrate barometers and other meteorological instruments, and discuss marine weather communications and marine weather requirements affecting the ships' operations. (For further information on the Voluntary Observing Ship Program and Port Meteorological Officers, go to www.vos.noaa.gov.)

Space Environment Center (SEC)

(543) The Space Environment Center disseminates space weather alerts and forecasts (information concerning solar activity, radio propagation, etc.).

(544) For general information, see Appendix A for address and phone number.

National Environmental Satellite, Data, and Information Service (NESDIS)

(545) Among its functions, NESDIS archives, processes, and disseminates the non-realtime meteorological and oceanographic data collected by government agencies and private institutions. Marine weather observations are collected from ships at sea on a voluntary basis. About one million observations are received annually at NESDIS's National Climatic Center. They come from vessels representing every maritime nation. These observations, along with land data, are returned to the mariners in the form of climatological summaries and

atlases for coastal and ocean areas. They are available in such NOAA publications as the **U.S. Coast Pilot, Mariners Weather Log**, and **Local Climatological Data, Annual Summary**. They also appear in the National Geospatial–Intelligence Agency's **Pilot Chart Atlases** and **Sailing Directions Planning Guides**.

DEPARTMENT OF DEFENSE

National Geospatial–Intelligence Agency (NGA)

(546) The National Geospatial–Intelligence Agency provides hydrographic, navigational, topographic, and geodetic data, charts, maps, and related products and services to the Armed Forces, other Federal Agencies, the Merchant Marine and mariners in general. Publications include Sailing Directions, List of Lights, Distances Between Ports, Radio Navigational Aids, International Code of Signals, American Practical Navigator (Bowditch), and Notice to Mariners. (See National Geospatial–Intelligence Agency Procurement Information in Appendix A.)

U.S. Army Corps of Engineers (USACE)

(547) The U.S. Army Corps of Engineers has charge of the improvement of the rivers and harbors of the United States and of miscellaneous other civil works which include the administration of certain Federal laws enacted for the protection and preservation of navigable waters of the United States; the establishment of regulations for the use, administration, and navigation of navigable waters; the establishment of harbor lines; the removal of sunken vessels obstructing or endangering navigation; and the granting of permits for structures or operations in navigable waters, and for discharges and deposits of dredged and fill materials in these waters.

(548) **Restricted areas** in most places are defined and regulations governing them are established by the U.S. Army Corps of Engineers. The regulations are enforced by the authority designated in the regulations, and the areas are shown on the large-scale charts of NOS. Copies of the regulations may be obtained at the District offices of the U.S. Army Corps of Engineers. The regulations also are included in the appropriate Coast Pilot.

(549) Information concerning the various ports, improvements, channel depths, navigable waters, and the condition of the Intracoastal Waterways in the areas under their jurisdiction may be obtained direct from the District Engineer Offices. (See Appendix A for addresses.)

Fishtraps

(550) The U.S. Army Corps of Engineers has general supervision of location, construction, and manner of maintenance of all traps, weirs, pounds, or other fishing structures in the navigable waters of the United States. Where State and/or local controls are sufficient to regulate these structures, including that they do not interfere with navigation, the U.S. Army Corps of Engineers leaves such regulation to the State or local authority. (See **33 CFR 330** (not carried in this Pilot) for applicable Federal regulations.) Construction permits issued by the Engineers specify the lights and signals required for the safety of navigation.

(551) **Fish havens**, artificial reefs constructed to attract fish, can be established in U.S. coastal waters only as authorized by a U.S. Army Corps of Engineers permit; the permit specifies the location, extent, and depth over these mounds of rubble.

U.S. Naval Observatory

(552) The U.S. Naval Observatory (USNO) provides the following services: automated data services for Loran-C, GPS and NAVSAT information: data service (menu driven) parameters - 8 bit, no parity, 1 stop, 1200 to 2400 BAUD, access password CESIUM133. Time service: 900-410-8463 or 202-762-1401. General information: 202-762-1467.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration (FDA)

(553) Under the provisions of the Control of Communicable Diseases Regulations (**21 CFR 1240**) and Interstate Conveyance Sanitation Regulations (**21 CFR 1250**), vessel companies operating in interstate traffic shall obtain potable water for drinking and culinary purposes only at watering points found acceptable to the Food and Drug Administration. Water supplies used in watering point operations must also be inspected to determine compliance with applicable Interstate Quarantine Regulations (**42 CFR 72**). These regulations are based on authority contained in the Public Health Service Act (PL 78–410). Penalties for violation of any regulation prescribed under authority of the Act are provided for under Section 368 (42 USC 271) of the Act.

(554) **Vessel Watering Points**.–FDA annually publishes a list of Acceptable Vessel Watering Points. This list is available from most FDA offices or from Interstate Travel Sanitation Subprogram Center for Food Safety and Applied Nutrition, FDA (HFF-312), 200 C Street SW., Washington, D.C. 20204. Current status of

watering points can be ascertained by contacting any FDA office. (See Appendix A for addresses.)

Public Health Service

(555) The Public Health Service administers foreign quarantine procedures at U.S. ports of entry.

(556) All vessels arriving in the United States are subject to public health inspection. Vessels subject to routine boarding for quarantine inspection are only those which have had on board during the 15 days preceding the date of expected arrival or during the period since departure (whichever period of time is shorter) the occurrence of any death or ill person among passengers or crew (including those who have disembarked or have been removed). The master of a vessel must report such occurrences immediately by radio to the quarantine station at or nearest the port at which the vessel will arrive.

(557) In addition, the master of a vessel carrying 13 or more passengers must report by radio 24 hours before arrival the number of cases (including zero) of diarrhea in passengers and crew recorded in the ship's medical log during the current cruise. All cases that occur after the 24 hour report must also be reported not less than 4 hours before arrival.

(558) "Ill person" means person who:

(559) 1. Has a temperature of 100°F (or 38°C) or greater, accompanied by a rash, glandular swelling, or jaundice, or which has persisted for more than 48 hours; or

(560) 2. Has diarrhea, defined as the occurrence in a 24 hour period of three or more loose stools or of a greater than normal (for the person) amount of loose stools.

(561) Vessels arriving at ports under control of the United States are subject to sanitary inspection to determine whether measures should be applied to prevent the introduction, transmission, or spread of communicable disease.

(562) Specific public health laws, regulations, policies, and procedures may be obtained by contacting U.S. Quarantine Stations, U.S. Consulates or the Chief Program Operations, Division of Quarantine, Centers for Disease Control, Atlanta, Ga. 30333. (See Appendix A for addresses of U.S. Public Health Service Quarantine Stations.)

DEPARTMENT OF HOMELAND SECURITY

U.S. Citizenship and Immigration Services

(563) The Immigration and Naturalization Service administers the laws relating to admission, exclusion, and deportation of aliens, the registration and fingerprinting of aliens, and the naturalization of aliens lawfully resident in the United States.

(564) The designated ports of entry for aliens are divided into three classes. Class A is for all aliens. Class B is only for aliens who at the time of applying for admission are lawfully in possession of valid resident aliens' border-crossing identification cards or valid nonresident aliens' border-crossing identification cards or are admissible without documents under the documentary waivers contained in **8 CFR 212.1(a)**. Class C is only for aliens who are arriving in the United States as crewmen as that term is defined in Section 101(a) (10) of the Immigration and Nationality Act. (The term "crewman" means a person serving in any capacity on board a vessel or aircraft.) No person may enter the United States until he has been inspected by an immigration officer. A list of the offices covered by this Coast Pilot is given in Appendix A

U.S. Coast Guard

(565) The Coast Guard has among its duties the enforcement of the laws of the United States on the high seas and in coastal and inland waters of the U.S. and its possessions; enforcement of navigation and neutrality laws and regulations; establishment and enforcement of navigational regulations upon the Inland Waters of the United States, including the establishment of a demarcation line separating the high seas from waters upon which U.S. navigational rules apply; administration of the Oil Pollution Act of 1961, as amended; establishment and administration of vessel anchorages; approval of bridge locations and clearances over navigable waters; administration of the alteration of obstructive bridges; regulation of drawbridge operations; inspection of vessels of the Merchant Marine; admeasurement of vessels; documentation of vessels; preparation and publication of merchant vessel registers; registration of stack insignia; port security; issuance of Merchant Marine licenses and documents; search and rescue operations; investigation of marine casualties and accidents, and suspension and revocation proceedings; destruction of derelicts; operation of aids to navigation; publication of Light Lists and Local Notices to Mariners; and operation of ice-breaking facilities.

(566) The Coast Guard, with the cooperation of coast radio stations of many nations, operates the **Automated Mutual-assistance Vessel Rescue System (AMVER).** It is an international maritime mutual assistance program which provides important aid to the development and coordination of search and rescue (SAR) efforts in many offshore areas of the world. Merchant ships of all nations making offshore passages are encouraged to voluntarily send movement (sailing) reports and periodic position reports to the AMVER Center at Coast Guard New York via selected radio stations. Information from these reports is entered into an electronic

computer which generates and maintains dead reckoning positions for the vessels. Characteristics of vessels which are valuable for determining SAR capability are also entered into the computer from available sources of information.

(567) A worldwide communications network of radio stations supports the AMVER System. Propagation conditions, location of vessel, and traffic density will normally determine which station may best be contacted to establish communications. To ensure that no charge is applied, all AMVER reports should be passed through specified radio stations. Those stations which currently accept AMVER reports and apply no coastal station, ship station, or landline charge are listed in each issue of the "AMVER Bulletin" publication. Also listed are the respective International radio call signs, locations, frequency bands, and hours of operation. The "AMVER Bulletin" is available from AMVER Maritime Relations, U.S. Coast Guard, Battery Park Building New York, NY 10004, TEL: 212-668-7764, FAX 212-668-7684. Although AMVER reports may be sent through nonparticipating stations, the Coast Guard cannot reimburse the sender for any charges applied.

(568) Information concerning the predicted location and SAR characteristics of each vessel known to be within the area of interest is made available upon request to recognized SAR agencies of any nation or vessels needing assistance. Predicted locations are only disclosed for reasons related to marine safety.

(569) Benefits of AMVER participation to shipping include: (1) improved chances of aid in emergencies, (2) reduced number of calls for assistance to vessels not favorably located, and (3) reduced time lost for vessels responding to calls for assistance. An AMVER participant is under no greater obligation to render assistance during an emergency than a vessel who is not participating.

(570) All AMVER messages should be addressed to **Coast Guard New York** regardless of the station to which the message is delivered, except those sent to Canadian stations which should be addressed to **AMVER Halifax** or **AMVER Vancouver** to avoid incurring charges to the vessel for these messages.

(571) Instructions guiding participation in the AMVER System are available in the following languages: Chinese, Danish, Dutch, English, French, German, Greek, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, and Swedish. The AMVER Users Manual is available from: AMVER Maritime Relations; Commander, Atlantic Area, U.S. Coast Guard, Federal Building, 431 Crawford Street, Portsmouth, VA 23704-5004; Commander, Pacific Area, U.S. Coast Guard, Coast Guard Island, Alameda, CA. 94501-5100; and at U.S. Coast Guard District Offices, Marine Safety Offices, Marine Inspection Offices, and Captain of the Port Offices in major U.S. ports. Requests for instructions should state the language desired if other than English.

(572) For AMVER participants bound for U.S. ports there is an additional benefit. AMVER participation via messages which include the necessary information is considered to meet the requirements of 33 CFR 160. (See **160.201,** chapter 2, for rules and regulations.)

(573) **AMVER Reporting Required.** U.S. Maritime Administration regulations effective August 1, 1983, state that certain U.S. flag vessels and foreign flag "War Risk" vessels must report and regularly update their voyages to the AMVER Center. This reporting is required of the following: (a) U.S. flag vessels of 1,000 gross tons or greater, operating in foreign commerce; (b) foreign flag vessels of 1,000 gross tons or greater, for which an Interim War Risk Insurance Binder has been issued under the provisions of Title XII, Merchant Marine Act, 1936.

(574) Details of the above procedures are contained in the AMVER Users Manual. The system is also published in NGA Pub. 117.

(575) Search and Rescue Operation procedures are contained in the International Maritime Organization (IMO) SAR Manual (MERSAR). U.S. flag vessels may obtain a copy of MERSAR from local Coast Guard Marine Safety Offices and Marine Inspection Offices or by writing to U.S. Coast Guard (G-OSR), Washington, D.C. 20593-0001. Other flag vessels may purchase MERSAR directly from IMO.

(576) The Coast Guard conducts and/or coordinates **search and rescue** operations for surface vessels and aircraft that are in distress or overdue. (See Distress Signals and Communication Procedures this chapter.)

(577) **Documentation** (issuance of certificates of registry, enrollments, and licenses), admeasurements of vessels, and administration of the various navigation laws pertaining thereto are functions of the Coast Guard. Yacht commissions are also issued, and certain undocumented vessels required to be numbered by the Federal Boat Safety Act of 1971 are numbered either by the Coast Guard or by a State having an approved numbering system (the latter is most common). Owners of vessels may obtain the necessary information from any Coast Guard District Commander, Marine Safety Office, or Marine Inspection Office. Coast Guard District Offices, Coast Guard Stations, Marine Safety Offices, Captain of the Port Offices, Marine Inspection Offices, and Documentation Offices are listed in Appendix A. (Note: A Marine Safety Office performs the same functions as those of a Captain of the Port and a Marine Inspection Office. When a function is at a different

address than the Marine Safety Office, it will be listed separately in Appendix A.)

U.S. Customs and Border Protection

(578) The U.S. Customs and Border Protection administers certain laws relating to: entry and clearance of vessels and permits for certain vessel movements between points in the United States; prohibitions against coastwise transportation of passengers and merchandise; salvage, dredging and towing by foreign vessels; certain activities of vessels in the fishing trade; regular and special tonnage taxes on vessels; the landing and delivery of foreign merchandise (including unlading, appraisement, lighterage, drayage, warehousing, and shipment in bond); collection of customs duties, including duty on imported pleasure boats and yachts and 50% duty on foreign repairs to American vessels engaged in trade; customs treatment of sea and ship's stores while in port and the baggage of crewmen and passengers; illegally imported merchandise; and remission of penalties or forfeiture if customs or navigation laws have been violated. The Customs Service also cooperates with many other Federal agencies in the enforcement of statutes they are responsible for. Customs districts and ports of entry, including customs stations, are listed in Appendix A.

(579) The Customs and Border Protection office may issue, without charge, a **cruising license,** valid for a period of up to 6 months and for designated U.S. waters, to a yacht of a foreign country which has a reciprocal agreement with the United States. A foreign yacht holding a cruising license may cruise in the designated U.S. waters and arrive at and depart from U.S. ports without entering or clearing at the customhouse, filing manifests, or obtaining or delivering permits to proceed, provided it does not engage in trade or violate the laws of the United States or visit a vessel not yet inspected by a Customs Agent and does, within 24 hours of arrival at each port or place in the United States, report the fact of arrival to the nearest customhouse. Countries which have reciprocal agreements granting these privileges to U.S. yachts are: Argentina, Australia, Austria, Bahama Islands, Belgium, Bermuda, Canada, Denmark, Finland, Germany, Great Britain, Greece, Honduras, Ireland, Italy, Jamaica, Liberia, Marshall Islands, the Netherlands, New Zealand, Norway, Sweden, and Turkey. Further information concerning cruising licenses may be obtained from the headquarters port for the customs district in which the license is desired. U.S. yacht owners planning cruises to foreign ports may contact the nearest customs district headquarters as to customs requirements.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

(580) The U.S. Environmental Protection Agency provides coordinated governmental action to assure the protection of the environment by abating and controlling pollution on a systematic basis. The ocean dumping permit program of the Environmental Protection Agency provides that except when authorized by permit, the dumping of any material into the ocean is prohibited by the "Marine Protection, Research, and Sanctuaries Act of 1972, Public Law 92–532," as amended (33 USC 1401 et seq.).

(581) Permits for the **dumping of dredged material** into waters of the United States, including the territorial sea, and into ocean waters are issued by the U.S. Army Corps of Engineers. Permits for the dumping of fill material into waters of the United States, including the territorial sea, are also issued by the U.S. Army Corps of Engineers. Permits for the dumping of other material in the territorial sea and ocean waters are issued by the Environmental Protection Agency.

(582) U.S. Army Corps of Engineers regulations relating to the above are contained in **33 CFR 323-324**; Environmental Protection Agency regulations are in **40 CFR 220-229**. (See Disposal Sites, this chapter.)

(583) Persons or organizations who want to file for an application for an ocean dumping permit should write the Environmental Protection Agency Regional Office for the region in which the port of departure is located. (See Appendix A for addresses of regional offices and States in the EPA coastal regions.)

(584) The letter should contain the name and address of the applicant; name and address of person or firm; the name and usual location of the conveyance to be used in the transportation and dumping of the material involved; a physical description where appropriate; and the quantity to be dumped and proposed dumping site.

(585) Everyone who writes EPA will be sent information about a final application for a permit as soon as possible. This final application is expected to include questions about the description of the process or activity giving rise to the production of the dumping material; information on past activities of applicant or others with respect to the disposal of the type of material involved; and a description about available alternative means of disposal of the material with explanations about why an alternative is thought by the applicant to be inappropriate.

FEDERAL COMMUNICATIONS COMMISSION (FCC)

(586) The Federal Communications Commission controls non-Government radio communications in the United States, Guam, Puerto Rico, and the Virgin Islands. Commission inspectors have authority to board ships to determine whether their radio stations comply with international treaties, Federal Laws, and Commission regulations. The commission has field offices in the principal U.S. ports. (See Appendix A for addresses.) Information concerning ship radio regulations and service documents may be obtained from the Federal Communications Commission, Washington, D.C. 20554, or from any of the field offices.

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