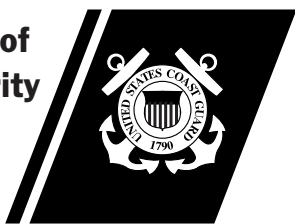


**U.S. Department of
Homeland Security**

**United States
Coast Guard**



U.S. COAST GUARD

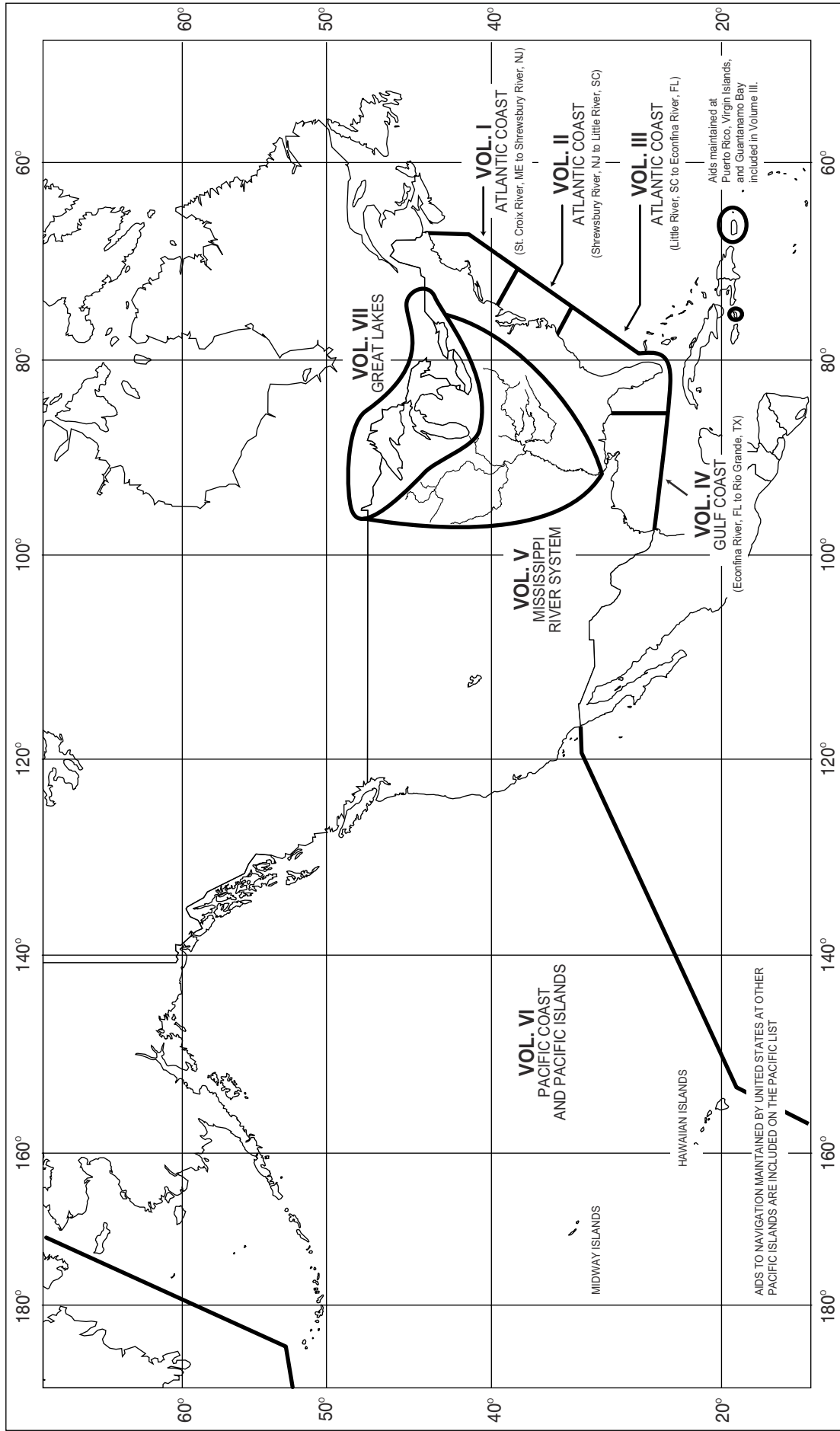
LIGHT LIST

NAV AID REFERENCE

2004 EDITION

Feb 2004

LIMITS OF LIGHT LISTS PUBLISHED BY
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DEPARTMENT OF TRANSPORTATION

Coast Guard

33 CFR Parts 62 and 66

[USCG 97-3112; CGD 97-018]
RIN 2115-AF45

Merger of the **Uniform States Waterway Marking** System With the
United States Aids to Navigation

AGENCY: Coast Guard, DOT.

ACTION: Final rule.

SUMMARY: The Coast Guard commences a five year phased-in merger of the **Uniform State Waterway Marking** System with the United States Aids to Navigation System. This merger eliminates distinctions between the two systems and creates safer, less confusing waterways.

DATES: This final rule is effective July 20, 1998.

ADDRESSES: Documents as indicated in this preamble are available for inspection or copying at the Docket Management Facility, [USCG-97-3112], U.S. Department of Transportation, room PL-401, 400 Seventh Street SW., Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT:

For questions on this rule contact Dan Andrusiak, OPN-2 Short Range Aids to Navigation Division, USCG Headquarters, telephone (202) 267-0327, For questions on viewing material in the docket, contact Carol Kelley, Coast Guard Dockets Team Leader, or

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Paulette Twine, Chief Documentary Services Division, U.S. Department of Transportation, telephone (202) 366-9329.

SUPPLEMENTARY INFORMATION:

Regulatory History

On December 23, 1997, the Coast Guard published a notice of proposed rulemaking entitled ``Merger of the **Uniform State Waterway**

Marking System and the United States Aids to Navigation System'' in the Federal Register (62 FR 67031). The Coast Guard received five letters commenting on the proposed rulemaking. No public hearing was requested, and none was held.

Background and Purpose

The **Uniform State** Waterways **Marking** System (USWMS), 33 CFR 66.10, prescribes regulatory markers and aids to navigation that may mark navigable waters that the Commandant designates as **state** waters in accordance with 33 CFR 66.05-5. The USWMS may also mark the non-navigable internal waters of a **state**.

The United States Aids to Navigation System (USATONS), 33 CFR 62, prescribes regulatory markers and aids to navigation that mark navigable waters of the United States. Navigable waters, defined by 33 CFR 62.02-25, include territorial seas and internal waters that have been or can be used for interstate commerce, either by themselves or in connection with other waterways.

Section 66.10-1(b), allows the use USATONS on **state** and non-navigable internal waters, and many states already use the USATONS instead of the USWMS.

In 1992, the National Association of **State** Boating Law Administrators (NASBLA) passed a resolution requesting that the Coast Guard:

1. Change the meaning of the red and white striped buoy from the USWMS meaning of obstruction to the USATONS meaning of safewater,
2. Change the black USWMS buoy to the green USATONS buoy, and
3. Use a phased-in implementation period for these changes.

NASBLA requested these changes because they believe the current USWMS markings, which are different from the USATONS markings, confuse boaters and could cause casualties. A comparison of these two systems showed that almost all of the requirements of the USWMS are contained in the USATONS.

The major differences between the two systems are:

1. The USWMS has the additional requirement of orange bands on regulatory buoys;
2. The USWMS allows for lights on mooring buoys whereas the USATONS is silent; and,
3. The USWMS uses the cardinal system to mark obstructions and the USATONS uses the lateral System of **marking** obstructions.

Discussion of Comments and Changes

One comment suggested that in Secs. 62.1(b)(2), 62.21(a), 66.05-1, 66.05-5(b), and 66.05-20 (c)(3) the wording ``insert date five years from the date of publication in the Federal Register of the final rule'' be changed to ``December 31, 2003''. The Coast Guard agrees with this suggestion, and will also change Sec. 66.10-1.

One comment suggested that in Sec. 62.33(b) the Coast Guard delete ``of international orange'' from the first sentence. The Coast Guard concurs and has changed Sec. 62.33(b). This change eliminates potential confusion from a belief that two different shades of orange are required.

One comment suggested that in Sec. 62.33(b) in the second sentence, change ``at the top'' to ``near the top.'' The Coast Guard agrees with this suggestion because an orange band at the very top of a buoy would cease to be a band but would result in a buoy with an orange top.

One comment suggested the Coast Guard not add the lighting requirements for mooring buoys to Sec. 62.35, but to Sec. 62.45(d)(6), which prescribes the light rhythm requirements. The Coast Guard agrees.

One comment suggested that in Sec. 62.54 the wording be changed to be less ambiguous. Specifically the comment suggested that Sec. 62.54 read ``Succinct, concise ownership identification which does not compromise signal effectiveness is permitted on aids to navigation.'' The Coast Guard disagrees with the suggested wording. Historically, ownership identification on private or **State** aids to navigation has not been a problem. Additionally, the Coast Guard does not desire at this time to expand the authority for ownership markings to Federal aids to navigation.

Another comment suggested that the reference to the ``second category'' in paragraph 66.10-15(a) be removed and this paragraph changed to read ``USWMS aids to navigation may have lateral or cardinal meaning.'' The Coast Guard agrees, The ``first category'' of USWMS aids was regulatory markers discussed in Sec. 66.10-5. This section is removed since equivalent regulatory marks exist in Sec. 62.33. Therefore, because no ``first category'' exists, discussion of a ``second category'' may be confusing.

One comment expressed concern over the change in definition of the red and white striped buoy, because this would eliminate an aid which provides the mariner specific information ``not to pass between the buoy and the nearest shore''. The comment also stated that in an area where it is hard to determine the head of navigation, the use of side marks would be impracticable. The comment suggested the creation of a black and white vertically striped buoy available for use on Inland Waters, with the meaning ``do not pass between the buoy and the nearest shore''. The Coast Guard agrees. A new section has been added that allows the use of a black and white striped buoy on Inland waters, where the head of navigation is hard to define, which warns mariners not to pass between the buoy and the nearest shore. Further, to avoid confusion, USWMS red and white striped obstruction buoys under Sec. 66.10-15(e)(3) will not be permitted to exist on a body of water for which the new USATONS black and white vertically striped buoy is used.

Another comment suggested that once the **regulations** from the two systems are merged, proper training must be given to all users. The Coast Guard agrees, and will provide education and outreach information regarding the merger of these two systems through the office of Boating Safety website (www.uscgboating.org) and through the Coast Guard Customer Information Line at 1-800-368-5647. Additionally, the Coast Guard expects that the various **State** Boating Law Administrators will modify existing educational materials to reflect the changes.

One comment suggested that in addition to changing the meaning of the red and white striped buoy, the Coast Guard also change the shape of this aid. The USATONS requires the red and white safe water mark to be spherical or display spherical top mark. This is the requirement for all newly established safe water marks and for all safe water marks at the end of the phase-in period.

One comment suggested that the costs associated with this change would impose a monetary burden on the states currently using USWMS. The replacement of USWMS aids is linked to the aid's lifecycle. Since, the existing aids will need replacement during the phase-in period, no additional costs should be incurred. Also, most existing educational materials will need to be replaced during this five year phase-in period. Further, through training and education the Coast Guard

believes any

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confusion from the existence of the two systems on one **waterway** to be minimal.

Discussion of Rule

Regulatory and Informational Markers: The USATONS provides a system for information and regulatory markers nearly identical to the USWMS. The only USWMS requirement not prescribed by the USATONS is that buoys have two horizontal orange bands, one just above the water line and one near the top of the buoy. The Coast Guard amends 33 CFR 62.33 to add the USWMS requirement of two horizontal orange bands to the USATONS.

Channel markers: The USWMS black buoy will be replaced, via a phased-in process, with the green buoy required by the USATONS. The phase-in process avoids unnecessary replacement costs to the states.

Red and white striped buoy: The meaning of the red and white striped buoy changes from the USWMS "do not pass between the buoy and nearest shore" to the USATONS "safewater all around." Obstructions marked with the USWMS red and white striped buoy can be marked, via a phased-in process, with the USATONS' sidemark prescribed in 33 CFR 62.25(b), with an isolated danger mark prescribed in 33 CFR 62.29, or with the new black and white striped buoy prescribed in 33 CFR 62.32.

Cardinal marks: In the USWMS, white buoys with a red top band mean that the mariner can pass safely south or west of the buoy, and white buoys with a black top band mean that the mariner can pass safely north or east of the buoy. The USATONS does not contain cardinal marks, and areas presently marked with these USWMS aids can be replaced with the USATONS isolated danger mark prescribed in 33 CFR 62.29, or a side mark prescribed in 33 CFR 62.25(b), or with an isolated danger mark prescribed in 33 CFR 62.29, or with the new black and white striped buoy prescribed in 33 CFR 62.32.

Mooring buoys: Unlike the USWMS, the USATONS is silent on prescribing lights on mooring buoys. The Coast Guard amends 33 CFR 62.45 to incorporate mooring buoys, allowing white lights of various rhythms.

Numbers, letters, or words on markers: The guidance in the USATONS, 33 CFR 62.43(a) & (b), is similar to that in the USWMS 33 CFR 66.10-25, so the merging of the two systems does not affect numbers, letters, or words on marks.

Reflectors and retroreflective materials: The USATONS guidance for the uses of retroreflective material, 33 CFR 62.43(c), is less restrictive than the USWMS guidance found in 33 CFR 66.10-30, so the merger does not require a change in the use of reflectors or retroreflective material.

Navigation lights: The USATONS requirements for the use of navigation lights, 33 CFR 62.45, is similar to that of the USWMS found in 33 CFR 66.10-35, so the merger does not affect the use of navigation lights.

Size, shape, material, and construction of markers: No specific guidance for size, shape, material and construction of markers exists in the USATONS. The USWMS wording on these items, found in 33 CFR 66.10-20, is not necessary and is not inserted into the USATONS.

Ownership identification: The USWMS, in 33 CFR 66.10-40, allows for the discretionary use of ownership identification on aids to

navigation. The USATONS does not prohibit use of ownership identification. Ownership identification, however, should not be placed on an aid in a way that would change the meaning of the aid to navigation. The Coast Guard adds a section to the USATONS stating language to this effect.

Changes to 33 CFR Subpart 66.05

The merging of the USWMS with the USATONS requires conforming editorial corrections to Subpart 66.05 entitled, ``**State** Aids to Navigation,'' to reflect the new rules.

Changes to 33 CFR Subpart 66.10

Sections 66.10-5, 66.10-10, 66.10-20, 66.10-25, 66.10-30, 66.10-40, and 66.10-45 are removed because the provisions of these sections are contained in the USATONS, or are being inserted into the USATONS.

The only sections remaining in subpart 66.10 are the general section, the aids to navigation section, and that portion of the navigation lights section which refers to lights on cardinal marks. These sections may be used until December 31, 2003.

General, Sec. 66.10-1: This section is revised to reflect the merger of the two systems, the implementation date, and to remove references to deleted sections.

Aids to Navigation, Sec. 66.10-15: This section provides information concerning the **marking** of channels and the cardinal system of **marking**, and as such remains until the end of the phase-in period.

Regulatory Evaluation

This rule is not a significant regulatory action under section 3(f) of Executive Order 12866 and does not require an assessment of potential costs and benefits under section 6(a)(3) of that Order. It has not been reviewed by the Office of Management and Budget under that Order. It is not significant under regulatory policies and procedures of the Department of Transportation (DOT) (44 FR 11040; February 26, 1979). The Coast Guard expects the economic impact of this rule to be so minimal that a full Regulatory Evaluation under paragraph 10e of the regulatory policies and procedures of DOT is unnecessary.

Merging the USWMS with the USATONS, via a phased-in implementation period, linked to the aid's lifecycle, will not impose an increased monetary burden on the States currently using the USWMS. There is currently no price difference between aids with the USWMS markings and aids with USATONS markings. Further, because the replacement of the aid is linked to its lifecycle, purchase of a USATONS aid is not required until the end of the USWMS aid's lifecycle, any additional costs are eliminated.

Consequently, the Coast Guard believes that this rulemaking will not impose any additional costs on the states.

Small Entities

Under the Regulatory Flexibility Act (5 U.S.C. 601-612), the Coast Guard considers whether this rule will have a significant impact on a substantial number of small entities. ``Small entities'' include small businesses, not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental

jurisdictions with populations less than 50,000. The USWMS is a system that regulates **state** aids to navigation and will not directly impact small entities. Therefore, the Coast Guard certifies under 5 U.S.C. 605(b) that this rule will not have a significant economic impact on a substantial number of small entities.

Assistance for Small Entities

In accordance with section 213(a) of the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104-121), the Coast Guard offered to assist small entities in understanding this rule so that they can better evaluate its effects on them and participate in the rulemaking process.

If you have questions concerning its provisions or options for compliance, please contact Mr. Dan Andrusiak, Short Range Aids to Navigation Division, USCG Headquarters, Telephone: (202) 267-0327.

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Collection of Information

This final rule does not provide for a collection of information under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.).

Federalism

The Coast Guard has analyzed this proposal under the principles and criteria contained in Executive Order 12612 and has determined that this rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment. Pursuant to 14 U.S.C. 85, the Coast Guard, as delegated by the Secretary, Department of Transportation, has responsibility to create all **regulations** concerning aids to navigation for all waters subject to the jurisdiction of the United States. This rule does not affect the states ability to prescribe **regulations** for its own internal non-navigable waters.

Unfunded Mandates

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), (Pub. L. 104-4, 109 Stat. 48), requires Federal agencies to assess the effects of certain regulatory actions on **State**, local, and tribal governments, and the private sector. UMRA requires a written statement of economic and regulatory alternatives for proposed and final rules that contain any Federal mandates. A ``Federal mandate'' is a new or additional enforceable duty, imposed on any **State**, local, or tribal government, or the private sector. If any Federal mandate causes those entities, to spend in aggregate, \$100 million or more in any one year the UMRA analysis is required. This rule does not impose Federal mandates on any **State**, local or tribal governments or the private sector.

Environment

The Coast Guard considered the environmental impact of this proposal and concluded that, under figure 2-1, paragraph 34(a) and (i) of Commandant Instruction M16475.1C, this rule is categorically excluded from further environmental documentation. Merging the USWMS

with the USATONS has no environmental implications. A Categorical Exclusion Determination is available in the rulemaking docket for inspection or copying where indicated under ADDRESSES.

List of Subjects

33 CFR Part 62

Navigation (water).

33 CFR Part 66

Intergovernmental relations, navigation (water).

For the reasons set out in the preamble, the Coast Guard amends 33 CFR parts 62 and 66 as follows:

PART 62--UNITED STATES AIDS TO NAVIGATION SYSTEM

1. The authority citation for part 62 continues to read as follows:

Authority: 14 U.S.C. 85; 33 U.S.C. 1233; 43 U.S.C. 1333; 49 CFR 1.46.

2. In Sec. 62.1, redesignate paragraph (b) as paragraph (b)(1), and add a paragraph (b)(2) to read as follows:

Sec. 62.1 Purpose.

* * * * *

(b)(1) * * *

(2) The **regulations** found in 33 CFR subpart 66.10 expire on December 31, 2003, at which time the provisions of this part will apply.

* * * * *

Sec. 62.21 [Amended]

3. In Sec. 62.21(a), add after the words ``The navigable waters of the United States'' the words ``and non-navigable **State** waters after December 31, 2003,''.

4. Add Sec. 62.32 to subpart B to read as follows:

Sec. 62.32 Inland waters obstruction mark.

(a) On inland waters designated by the Commandant as **State** waters in accordance with Sec. 66.05-5 of this chapter and on non-navigable internal waters of a **State** which have no defined head of navigation, a buoy showing alternate vertical black and white stripes may be used to indicate to a vessel operator that an obstruction to navigation extends from the nearest shore to the buoy.

(b) The black and white buoy's meaning is ``do not pass between the buoy and the shore''. The number of white and black stripes is discretionary, provided that the white stripes are twice the width of

the black stripes. Prior to December 31, 2003, this aid shall not be used on a **waterway** which has a red and white striped obstruction marker defined in Sec. 66.10-15(e) (3) of this chapter, unless all obstruction markers are replaced.

5. In Sec. 62.33, redesignate the introductory text as paragraph (a), redesignate existing paragraphs (a) through (d) as (a)(1) to (a)(4), and add a new paragraph (b) to read as follows:

Sec. 62.33 Information and regulatory marks.

* * * * *

(b) When a buoy is used as an information or regulatory mark it shall be white with two horizontal orange bands placed completely around the buoy circumference. One band shall be near the top of the buoy body, with a second band placed just above the waterline of the buoy so that both bands are clearly visible.

6, In Sec. 62.45, revise paragraph (d) (6) to read as follows:

Sec. 62.34 Light characteristics.

* * * * *

(d) * * *

(6) Mooring Buoys and Information and Regulatory Marks display white lights of various rhythms.

* * * * *

7. Add Sec. 62.54 to subpart B to read as follows:

Sec. 62.54 Ownership identification.

Ownership identification on private or **state** aids to navigation is permitted so long as it does not change or hinder an understanding of the meaning of the aid to navigation.

PART 66--PRIVATE AIDS TO NAVIGATION

8. The authority citation for part 66 continues to read as follows:

Authority: 14 U.S.C. 83, 85; 43 U.S.C. 1333; 49 CFR 1.46.

Sec. 66.01-10 [Amended]

9. In Sec. 66.01-10 remove paragraph (b) and remove the paragraph designation (a).

10. Revise Sec. 66.05-1 to read as follows:

Sec. 66.05-1 Purpose.

The purpose of the **regulations** in this subpart is to prescribe the conditions under which **state** governments may regulate aids to navigation owned by **state** or local governments, or private parties. With the exception on the provisions of subpart 66.10, which are valid until December 31, 2003, aids to navigation must be in accordance with

the United States Aids to Navigation System in part 62 of this subchapter.

11. In Sec. 66.05-5, revise the section heading and paragraph (b) to read as follows:

Sec. 66.05-5 Definitions.

* * * * *

(b) The term **Uniform State Waterway Marking** System (USWMS) means the system of private aids to navigation which may be operated in **State** waters. Subpart 66.10, which describes the USWMS, expires on December 31, 2003.

* * * * *

Sec. 66.05-20 [Amended]

12. In Sec. 66.05-20(c) (3) add to the beginning of the paragraph the words ``If prior to December 31, 2003,`` and uncapitalize the word ``Specification``.

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13. Revise Sec. 66.10-1 to read as follows:

Sec. 66.10-1 General.

(a) Until December 31, 2003, the **Uniform State Waterway Marking** System's (USWMS) aids to navigation provisions for **marking** channels and obstructions may be used in those navigable waters of the U.S. that have been designated as **state** waters for private aids to navigation and in those internal waters that are non-navigable waters of the U.S. All other provisions for the use of regulatory markers and other aids to navigation shall be in accordance with United States Aid to Navigation System, described in part 62 of this subchapter.

(b) The USATONS may be used in all U.S. waters under **state** jurisdiction, including non-navigable **state** waters.

Sec. 66.10-5 [Removed]

14. Remove Sec. 66.10-5.

Sec. 66.10-10 [Removed]

15. Remove Sec. 66.10-10.

16. In Sec. 66.10-15 revise paragraph (a) to read as follows:

Sec. 66.19-15 Aids to navigation.

(a) USWMS aids to navigation may have lateral or cardinal meaning.

* * * * *

Sec. 66.10-20 [Removed]

17. Remove Sec. 66.10-20.

Sec. 66.10-25 [Removed]

18. Remove Sec. 66.10-25.

Sec. 66.10-30 [Removed]

19. Remove Sec. 66.10-30.

20. Revise Sec. 66.10-35 to read as follows:

Sec. 66.10-35 Navigation lights.

A red light shall only be used on a solid colored red buoy. A green light shall only be used on a solid colored black or a solid colored green buoy. White lights shall be used for all other buoys. When a light is used on a cardinal system buoy or a vertically striped white and red buoy, it shall always be quick flashing.

Sec. 66.10-40 [Removed]

21. Remove Sec. 66.10-40.

Sec. 66.10-45. [Removed]

22. Remove Sec. 66.10-45.

Dated: June 11, 1998.

Ernest R. Riutta,

Assistant Commandant for Operations.

[FR Doc. 98-16242 Filed 6-18-98; 8:45 am]

BILLING CODE 4910-15-M

INTRODUCTION

Arrangement. Aids to navigation on the coasts are arranged in geographic order clockwise from north to south along the Atlantic coast, east to west along the Gulf of Mexico, and south to north along the Pacific coast. Seacoast aids to navigation are listed first, followed by entrance and harbor aids to navigation, listed from seaward to the head of navigation

Names of aids to navigation are printed as follows to help distinguish at a glance the type of aid to navigation listed:

Seacoast Lights and Secondary Lights

RACONS

Sound Signals

RIVER, HARBOR, AND OTHER LIGHTS

Lighted Buoys

Daybeacons and Unlighted Buoys

Light List Numbers are assigned to all aids to navigation for reference in the Light List. Aids to navigation are numbered by fives in accordance with their order of appearance in each volume of the Light List. Other numbers and decimal fractions are assigned where newly established aids to navigation are listed between previously numbered aids to navigation. The Light Lists are renumbered periodically to assign whole numbers to all aids to navigation.

International numbers are assigned to certain aids to navigation in cooperation with the International Hydrographic Organization. They consist of an alphabetic character followed by three or four numeric characters. A cross-reference listing appears after the index.

DESCRIPTION OF COLUMNS

Column (1): Light List number.

Column (2): Name of the aid to navigation.

A dash (-) is used to indicate the bold heading is part of the name of the aid to navigation. When reporting defects or making reference to such aids to navigation in correspondence, the full name of the aid, including the geographic heading, should be given.

Bearings are in degrees true, read clockwise from 000° through 359°.

Bearings on rangelines are given in degrees and tenths.

Column (3): Geographic position of the aid to navigation in latitude and longitude. *NOTE:* Position is approximate, to the nearest second, and is intended only to facilitate locating the aid on the chart.

Column (4): Light characteristic for lighted aid to navigation.

Column (5): Height above water from the focal plane of the fixed light to mean high water, listed in feet. For metric conversion, see page F-1.

Column (6): Nominal range of lighted aids to navigation, in nautical miles, listed by color for alternating sector and passing lights. Not listed for ranges, directional lights or private aids to navigation.

Column (7): Structural characteristic of the aid to navigation, including; dayboard (if any), description of fixed structure, color and type of buoy, height of structure above ground.

Column (8): Remarks, including; sound signal characteristic, RACON, light sector arc of visibility, radar reflector, emergency lights, seasonal remarks, and private AtoN identification.

Abbreviations used in the Light Lists.

Al - Alternating	MHz - Megahertz
bl - blast	Mo - Morse Code
C - Canadian	Oc - Occulting
ec - Eclipse	ODAS - Anchored
ev - Every	Oceanographic
F - Fixed	Data Buoy
fl - flash	Q - Quick (Flashing)
Fl - Flashing	Ra ref - Radar
FS - Fog Signal	reflector
Fl(2) - Group flashing	s - seconds
I - Interrupted	si - silent
Iso - Isophase (Equal interval)	SPM - Single Point
kHz - Kilohertz	Mooring Buoy
LFl - Long Flash	W - White
lt - Lighted	Y - Yellow

U.S. COAST GUARD LIGHT LISTS

Coast Guard Light Lists are sold by the Superintendent of Documents, U.S. Government Printing Office (GPO) and can be ordered by phone: (202) 512-1800; FAX: (202) 512-2250; Web: <http://bookstore.gpo.gov>; or mail: Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Light Lists are also available at GPO Bookstores and from GPO Sales Agents.

NOTICES TO MARINERS

Broadcast Notices to Mariners are made by the Coast Guard through Coast Guard and Navy radio stations. These broadcast notices, which are broadcast on VHF-FM, NAVTEX, and other maritime frequencies, are navigational warnings that contain information of importance to the safety of navigation. Included are reports of deficiencies and changes to aids to navigation, the positions of ice and derelicts, and other important hydrographic information.

Radio stations broadcasting Notices to Mariners are listed in the National Ocean Service Coast Pilots and in the National Imagery and Mapping Agency publication Radio Navigational Aids (RAPUB 117).

Local Notices to Mariners are means by which the Coast Guard disseminates navigation information for the United States, its territories, and possessions. A Local Notice to Mariners is issued by each Coast Guard district and is used to report changes to, and deficiencies in, aids to navigation maintained by and under the authority of the Coast Guard. Local Notices to Mariners contain other marine information such as channel depths, naval operations, regattas, etc., which may affect vessels and waterways within the jurisdiction of each Coast Guard district. Reports of channel conditions, obstructions, menaces to navigation, danger areas, new chart editions, etc., are also included in the Local Notice to Mariners.

These notices are essential to all navigators for the purposes of keeping their charts, Lights Lists, Coast Pilots and other nautical publications up-to-date. These notices are published as often as required, but usually weekly. They may be obtained via the U.S. Coast Guard Navigation Center website. Vessels operating in ports and waterways in several districts will have to obtain the Local Notice to Mariners from each district in order to be fully informed.

Weekly Notices to Mariners are prepared jointly by the National Imagery and Mapping Agency, the U.S. Coast Guard, and the National Ocean Service, and are published weekly by National Imagery and Mapping Agency.

The Weekly Notices to Mariners advise mariners of important matters affecting navigational safety including new hydrographic discoveries, changes in channels and aids to navigation. Also included are corrections to Light Lists, Coast Pilots, and Sailing Directions. Foreign marine information is also included. This notice is intended for mariners and others who have a need for information related to oceangoing operations. Because it is intended for use by oceangoing vessels, many corrections that affect small craft navigation and waters are not included. Information concerning small craft is contained in the Coast Guard Local Notices to Mariners only. The Weekly Notices to Mariners may be obtained free of charge from commercial maritime sources and upon request to Defense Logistics Agency, Defense Supply Center Richmond, ATTN: JNB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5100 or FAX (804) 279-6510, ATTN: Accounts Manager, RMF.

NAUTICAL CHARTS AND PUBLICATIONS

Charts and Coast Pilots covering the United States and its territories are published by the [National Ocean Service](#) (NOS), Silver Spring, MD 20910, and are for sale by NOS and authorized NOS Sales Agents. A free catalog of available NOS/NOAA products can be obtained from NOS by phone: (301) 436-6990/(800) 638-8972; FAX: (301) 436-6829; or mail: National Ocean Service/NOAA, Distribution Division N/ACC3, Riverdale, MD 20737-1199.

Maps for the Mississippi River System are published by the various U.S. Army Corps of Engineers District Engineers.

Tide Tables and Tidal Current Tables are no longer printed or distributed by NOS. Private publishing companies are printing the tables using data provided by NOS. These products may be obtained from local stores that carry marine publications.

DEFECTS IN AIDS TO NAVIGATION

Mariners should realize the Coast Guard cannot keep the thousands of aids to navigation comprising the U.S. Aids to Navigation System under simultaneous and continuous observation and that it is impossible to maintain every aid to navigation operating properly and on its assigned position at all times. Therefore, for the safety of all mariners, any person who discovers an aid to navigation that is either off station or exhibiting characteristics other than those listed in the Light Lists should promptly notify the nearest Coast Guard unit. Radio messages should be prefixed "COAST GUARD" and transmitted directly to one of the U.S. Government radio stations listed in *Chapter 3, Section 300L, Radio Navigational Aids (RAPUB 117)*.

Recommendations and requests for aids to navigation and to report aids to navigation that are no longer needed should be mailed to the Coast Guard district concerned.

U.S. AIDS TO NAVIGATION SYSTEM

The waters of the United States and its territories are marked to assist navigation by the U.S. Aids to Navigation System. This system encompasses buoys and beacons, conforming to the International Association of Lighthouse Authorities (IALA) buoyage guidelines, and other short range aids to navigation.

The U.S. Aids to Navigation System is intended for use with nautical charts. The exact meaning of a particular aid to navigation may not be clear to the mariner unless the appropriate nautical chart is consulted. Information supplementing that shown on charts is contained in the Light List, Coast Pilots, and Sailing Directions.

TYPES OF MARKS

Lateral marks are buoys or beacons indicating the port and starboard sides of a route to be followed, and are used in conjunction with a *conventional direction of buoyage*.

Generally, lateral aids to navigation indicate which side of an aid to navigation a vessel should pass when channels are entered from seaward and a vessel proceeds in the conventional direction of buoyage. Since all channels do not lead from seaward, certain assumptions must be made so the system can be consistently applied. In the absence of a route leading from seaward, the conventional direction of buoyage generally follows a clockwise direction around land masses.

Virtually all U.S. lateral marks are located in IALA Region B and follow the traditional 3R rule of **red, right, returning**. In U.S. waters, returning from seaward and proceeding toward the head of navigation is generally considered as moving southerly along the Atlantic coast, westerly along the Gulf coast and northerly along the Pacific coast. In the Great Lakes, the conventional direction of buoyage is generally considered westerly and northerly, except on Lake Michigan, where southerly movement is considered as returning from sea. A summary of the port and starboard hand lateral mark characteristics is contained in the following table.

Characteristic	Port Hand	Starboard Hand
Color	Green	Red
Shape (buoys)	Cylindrical (can) or pillar	Conical (nun) or pillar
Dayboard	Green square	Red triangle
Topmark (if fitted)	Cylinder	Cone, point upward
Light Color (if lighted)	Green	Red
Reflector Color	Green	Red
Number	Odd	Even

Preferred channel marks are aids to navigation which mark channel **junctions** or **bifurcations** and often mark wrecks or obstructions. Preferred channel marks may normally be passed on either side by a vessel, but indicate to the mariner the preferred channel. Preferred channel marks are colored with red and green bands.

At a point where a channel divides, when proceeding in the "conventional direction of buoyage", a preferred channel in IALA Region B may be indicated by a modified port or starboard lateral mark as follows:

Characteristic	Preferred to starboard	Preferred to port
Color	Green with one broad red band	Red with one broad green band
Shape (buoys)	Cylindrical (can) or pillar	Conical (nun) or pillar
Dayboard	Green square, lower half red	Red triangle, lower half green
Topmark (when fitted)	Green square or cylinder	Red triangular cone, point upward
Light Color (if lighted)	Green	Red
Rhythm	Composite group flashing (2+1)	Composite group flashing (2+1)
Reflector color	Green	Red

Islands are located within IALA Region A and thus exhibit opposite color significance. Port hand marks are red with square or cylindrical shapes while starboard hand marks are green with triangular or conical shapes.

CAUTION: It may not always be possible to pass on either side of preferred channel aids to navigation. The appropriate nautical chart should always be consulted.

Non-lateral marks have no lateral significance, but may be used to supplement the lateral aids to navigation specified above. Occasionally, daybeacons or minor lights outside of the normal channel will not have lateral significance since they do not define limits to navigable waters. These aids to navigation will utilize diamond-shaped dayboards and are divided into four diamond-shaped sectors. The side sectors of these dayboards are colored white, and the top and bottom sectors are colored black, red, or green as the situation dictates.

Safe water marks are used to mark fairways, mid-channels, and offshore approach points, and have unobstructed water on all sides. They can also be used by the mariner transiting offshore waters to identify the proximity of intended landfall. Safe water marks are red and white striped and have a red spherical topmark to further aid in identification. If lighted, they display a white light with the characteristic Morse code "A".

Isolated danger marks are erected on, or moored above or near, an isolated danger, which has navigable water all around it. These marks should not be approached closely without special caution.

Isolated danger marks are colored with black and red bands, and if lighted, display a group flashing (2) white light. A topmark consisting of two black spheres, one above the other is fitted for both lighted and unlighted marks.

Special marks are not intended to assist in navigation, but rather to alert the mariner to a special feature or area. The feature should be described in a nautical document such as a chart, Light List, Coast Pilot or Notice to Mariner. Some areas

that may be marked by these aids to navigation are spoil areas, pipelines, traffic separation schemes, jetties, or military exercise areas. Special marks are yellow in color and, if lighted, display a yellow light.

Information and regulatory marks are used to alert the mariner to various warnings or regulatory matters. These marks have orange geometric shapes against a white background. The meanings associated with the orange shapes are as follows:

- 1) An open-faced diamond signifies danger.
- 2) A diamond shape having a cross centered within indicates that vessels are excluded from the marked area.
- 3) A circular shape indicates that certain operating restrictions are in effect within the marked area.

BUOYS AND BEACONS

The IALA maritime buoyage guidelines apply to buoys and beacons that indicate the lateral limits of navigable channels, obstructions, other dangers such as wrecks, and other areas or features of importance to the mariner. This system provides five types of marks: lateral marks, safe water marks, special marks, isolated danger marks and cardinal marks. (Cardinal marks are not presently used in the United States.) Each type of mark is differentiated from other types by distinctive colors, shapes and light rhythms. Examples are provided on the enclosed color illustrations.

Buoys are floating aids to navigation used extensively throughout U.S. waters. They are moored to the seabed by concrete sinkers with chain of various lengths connected to the buoy body. *Buoy positions represented on nautical charts are approximate positions only*, due to the practical limitations of positioning and maintaining buoys and their sinkers in precise geographical locations. Buoy positions are normally verified during periodic maintenance visits. Between visits, atmospheric and sea conditions, seabed slope and composition, and collisions or other accidents may cause buoys to shift from their charted locations, or cause buoys to be sunk or capsized.

Buoy moorings vary in length. The mooring lengths define a *watch circle*, and buoys can be expected to move within this circle. Actual watch circles do not coincide with the symbols representing them on charts.

CAUTION: Mariners attempting to pass a buoy close aboard risk collision with a yawing buoy or with the obstruction, which the buoy marks. Mariners must not rely on buoys alone for determining their positions due to factors limiting buoy reliability.

Beacons are aids to navigation that are permanently fixed to the earth's surface. These structures range from lighthouses to small-unlighted daybeacons, and exhibit a daymark to make these aids to navigation readily visible and easily identifiable against background conditions. The daymark conveys to the mariner, during daylight hours, the same significance, as does the aid to navigation's light at night.

CAUTION: Vessels should not pass fixed aids to navigation close aboard due to the danger of collision with rip-rap or structure foundations, or with the obstruction or danger being marked.

LIGHTED AIDS TO NAVIGATION

Most lighted aids to navigation are equipped with controls, which automatically cause the light to operate during darkness and to be extinguished during daylight. These devices

are not of equal sensitivity; therefore all lights do not come on or go off at the same time. (Mariners should ensure correct identification of aids to navigation during twilight periods when some lighted aids to navigation are lit while others are not.)

The lighting apparatus is serviced at periodic intervals to assure reliable operation, but there is always the possibility of a light being extinguished or operating improperly. The condition of the atmosphere has a considerable effect upon the distance at which lights can be seen. Sometimes lights are obscured by fog, haze, dust, smoke, or precipitation which may be present at the light, or between the light and the observer, and which is possibly unknown by the observer. Atmospheric refraction may cause a light to be seen farther than under ordinary circumstances.

A light of low intensity will be easily obscured by unfavorable conditions of the atmosphere and little dependence can be placed on it being seen. For this reason, the intensity of a light should always be considered when expecting to sight it in thick weather. Haze and distance may reduce the apparent duration of the flash of a light. In some atmospheric conditions, white lights may have a reddish hue. Lights placed at high elevations are more frequently obscured by clouds, mist, and fog than those lights located at or near sea level.

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

The increasing use of brilliant shore lights for advertising, illuminating bridges, and other purposes, may cause marine navigational lights, particularly those in densely inhabited areas, to be outshone and difficult to distinguish from the background lighting. Mariners are requested to report such cases in order that steps may be taken to improve the conditions.

The "loom" (glow) of a powerful light is often seen beyond the limit of visibility of the actual rays of the light. The loom may sometimes appear sufficiently sharp enough to obtain a bearing. At short distances, some flashing lights may show a faint continuous light between flashes.

The distance of an observer from a light cannot be estimated by its apparent intensity. Always check the characteristics of lights so powerful lights, visible in the distance, are not mistaken for nearby lights (such as those on lighted buoys) showing similar characteristics of low intensity. If lights are not sighted within a reasonable time after prediction, a dangerous situation may exist requiring prompt resolution or action in order to ensure the safety of the vessel.

The apparent characteristic of a complex light may change with the distance of the observer. For example, a light which actually displays a characteristic of fixed white varied by

flashes of alternating white and red (the rhythms having a decreasing range of visibility in the order: flashing white, flashing red, fixed white) may, when first sighted in clear weather, show as a simple flashing white light. As the vessel draws nearer, the red flash will become visible and the characteristics will apparently be alternating flashing white and red. Later, the fixed white light will be seen between the flashes and the true characteristic of the light will finally be recognized as fixed white, alternating flashing white and red (F W A I W R).

If a vessel has considerable vertical motion due to pitching in heavy seas, a light sighted on the horizon may alternately

appear and disappear. This may lead the unwary to assign a false characteristic and hence, to err in its identification. The true characteristic will be evident after the distance has been sufficiently decreased or by increasing the height of eye of the observer.

Similarly, the effects of wave motion on lighted buoys may produce the appearance of incorrect light phase characteristics when certain flashes occur, but are not viewed by the mariner. In addition, buoy motion can reduce the distance at which buoy lights are detected.

Sectors of colored glass are placed in the lanterns of some lights in order to produce a system of light sectors of different colors. In general, red sectors are used to mark shoals or to warn the mariner of other obstructions to navigation or of nearby land. Such lights provide approximate bearing information, since observers may note the change of color as they cross the boundary between sectors. These boundaries are indicated in the Light List (Col. 8) and by dotted lines on charts. These bearings, as all bearings referring to lights, are given in true degrees from 000° to 359°, as observed from a vessel toward the light.

Altering course on the changing sectors of a light or using the boundaries between light sectors to determine the bearing for any purpose is not recommended. Be guided instead by the correct compass bearing to the light and do not rely on being able to accurately observe the point at which the color changes. This is difficult to determine because the edges of a colored sector cannot be cut off sharply. On either side of the line of demarcation between white, red, or green sectors, there is always a small arc of uncertain color. Moreover, when haze or smoke are present in the intervening atmosphere, a white sector might have a reddish hue.

The area in which a light can be observed is normally an arc with the light as the center and the range of visibility as the radius. However, on some bearings the range may be reduced by obstructions. In such cases, the obstructed arc might differ with height of eye and distance. When adjoining land cuts off a light 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 vessel farther away than by one closer to the light.

The arc drawn on charts around a light is 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 obstruction of the light occurs.

OIL WELL STRUCTURES

Oil well structures in navigable waters are not listed in the Light List. The structures are shown on the appropriate nautical charts. Information concerning the location and characteristics of those structures which display lights and sound signals not located in obstruction areas are published in Local and/or Weekly Notices to Mariners.

In general, during the nighttime, a series of white lights are displayed extending from the platform to the top of the derrick when drilling operations are in progress. At other times, structures are usually marked with one or more fixed or quick flashing white or red lights, visible for at least one nautical mile during clear weather. Obstructions, which are a part of the appurtenances to the main structure, such as mooring piles,

anchor and mooring buoys, etc., normally are not lighted. In addition, some of the structures are equipped with sound signals (bell, siren, whistle, or horn). When operating, bells sound one stroke every 15 seconds, while sirens, whistles, or horns sound a single two-second blast every 20 seconds.

CHARACTERISTICS OF AIDS TO NAVIGATION

LIGHT COLORS

Only aids to navigation with green or red lights have lateral significance. When proceeding in the conventional direction of buoyage, the mariner in IALA Region B, may see the following lighted aids to navigation:

Green lights on aids to navigation mark port sides of channels and locations of wrecks or obstructions that must be passed by keeping these lighted aids to navigation on the port hand of a vessel. Green lights are also used on preferred channel marks where the preferred channel is to starboard (i.e., aid to navigation left to port when proceeding in the conventional direction of buoyage). Red lights on aids to navigation mark starboard sides of channels and locations of wrecks or obstructions that must be passed by keeping these lighted aids to navigation on the starboard hand of a vessel. Red lights are also used on preferred channel marks where the preferred channel is to port (i.e., aid to navigation left to starboard when proceeding in the conventional direction of buoyage).

White and yellow lights have no lateral significance. The shapes, colors, letters, and light rhythms may determine the purpose of aids to navigation exhibiting white or yellow lights.

Most aids to navigation are fitted with retroreflective material to increase their visibility in darkness. Red or green retroreflective material is used on lateral aids to navigation that, if lighted, will display lights of the same color.

LIGHT RHYTHMS

Light rhythms have no lateral significance. Aids to navigation with lateral significance exhibit flashing, quick, occulting or isophase light rhythms. Ordinarily, flashing lights (frequency not exceeding 30 flashes per minute) will be used.

Preferred channel marks exhibit a composite group-flashing light rhythm of two flashes followed by a single flash.

Safe water marks show a white Morse code "A" rhythm (a short flash followed by a long flash).

Isolated danger marks show a white flashing (2) rhythm (two flashes repeated regularly).

Special marks show yellow lights and exhibit a flashing or fixed rhythm; however, a flashing rhythm is preferred.

Information and regulatory marks, when lighted, display a white light with any light rhythm except quick flashing, flashing (2) and Morse code "A".

For situations where lights require a distinct cautionary significance, as at sharp turns, sudden channel constrictions, wrecks or obstructions, a quick flashing light rhythm will be used.

SHAPES

In order to provide easy identification, certain unlighted buoys and dayboards on beacons are differentiated by shape. These shapes are laterally significant only when associated with laterally significant colors.

Cylindrical buoys (referred to as "can buoys") and square dayboards mark the left side of a channel when proceeding from seaward. These aids to navigation are associated with solid green or green and red-banded marks where the topmost band is green.

Conical buoys (referred to as "nun buoys") and triangular dayboards mark the right side of the channel when proceeding from seaward. These aids to navigation are associated with solid red or red and green-banded marks where the topmost band is red.

Unless fitted with topmarks; lighted, sound, pillar, and spar buoys have no shape significance. Their numbers, colors, and light characteristics convey their meanings.

















NUMBERS

All solid red and solid green aids to navigation are numbered, with red aids to navigation bearing even numbers and green aids to navigation bearing odd numbers. The numbers for each increase from seaward, proceeding in the conventional direction of buoyage. Numbers are kept in approximate sequence on both sides of the channel by omitting numbers where necessary.

Letters may be used to augment numbers when lateral aids to navigation are added to channels with previously completed numerical sequences. Letters will increase in alphabetical order from seaward, proceeding in the conventional direction of buoyage and are added to numbers as suffixes.

No other aids to navigation are numbered. Preferred channel, safe water, isolated danger, special marks, and information and regulatory aids to navigation may be lettered, but not numbered.

CHARACTERISTICS OF LIGHTS

Illustration	Type Description	Abbreviation
	1. Fixed. A light showing continuously and steadily.	F
	2. Occulting. A light in which the total duration of light in a period is longer than the total duration of darkness and the intervals of darkness (eclipses) are usually of equal duration.	Oc
	2.1 Single-occluding. An occulting light in which an eclipse is regularly repeated.	Oc (2)
	2.2 Group-occluding. An occulting light in which a group of eclipses, specified in numbers, is regularly repeated.	Oc (2)
	2.3 Composite group-occluding. A light, similar to a group-occluding light, except that successive groups in a period have different numbers of eclipses.	Oc (2+1)
	3. Isophase. A light in which all durations of light and darkness are equal.	Iso
	4. Flashing. A light in which the total duration of light in a period is shorter than the total duration of darkness and the appearances of light (flashes) are usually of equal duration.	FI
	4.1 Single-flashing. A flashing light in which a flash is regularly repeated (frequency not exceeding 30 flashes per minute).	FI
	4.2 Group-flashing. A flashing light in which a group of flashes, specified in number, is regularly repeated.	FI (2)
	4.3 Composite group-flashing. A light similar to a group flashing light except that successive groups in the period have different numbers of flashes.	FI (2+1)
	5. Quick. A light in which flashes are produced at a rate of 60 flashes per minute.	Q
	5.1 Continuous quick. A quick light in which a flash is regularly repeated.	Q
	5.2 Interrupted quick. A quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration.	IQ
	6. MORSE CODE. A light in which appearances of light of two clearly different durations (dots and dashes) are grouped to represent a character or characters in the Morse code.	Mo (A)
	7. Fixed and flashing. A light in which a fixed light is combined with a flashing light of higher luminous intensity.	FFI
	8. ALTERNATING. A light showing different colors alternately	AI RW

DAYBOARDS

In order to describe the appearance and purpose of each dayboard used in the U.S. System, standard designations have been formulated. A brief explanation of the designations and of the purpose of each type of dayboard in the system is given below, followed by a verbal description of the appearance of each dayboard type.

Designations:

1. First Letter - Shape or Purpose

S: Square used to mark the port (left) side of channels when proceeding from seaward.

T: Triangle used to mark the starboard (right) side of channels when proceeding from seaward.

J: Junction (square or triangle) used to mark (preferred channel) junctions or bifurcations in the channel, or wrecks or obstructions which may be passed on either side; color of top band has lateral significance for the preferred channel.

M: Safe water (octagonal) used to mark the fairway or middle of the channel.

C: Crossing (western rivers only) diamond-shaped, used to indicate the points at which the channel crosses the river.

K: Range (rectangular) when both the front and rear range dayboards are aligned on the same bearing, the observer is on the azimuth of the range, usually used to mark the center of the channel.

N: No lateral significance (diamond or rectangular-shaped) used for special purpose, warning, distance, or location markers.

2. Second letter - Key color

G - Green R - Red
B - Black W - White
Y - Yellow

3. Third letter (color of center stripe; range boards only)

4. Additional information after a (-)

-I: Intracoastal Waterway; a yellow reflective horizontal strip on a dayboard; indicates the aid to navigation marks the Intracoastal Waterway.

-SY: Intracoastal Waterway; a yellow reflective square on a dayboard; indicates the aid to navigation is a port hand mark for vessels traversing the Intracoastal Waterway. May appear on a triangular daymark where the Intracoastal Waterway coincides with a waterway having opposite conventional direction of buoyage.

-TY: Intracoastal Waterway; a yellow reflective triangle on a dayboard; indicates the aid to navigation is a starboard hand mark for vessels traversing the Intracoastal Waterway. May appear on a square daymark where the Intracoastal Waterway coincides with a waterway having opposite conventional direction of buoyage.

Descriptions:

SG: Square green dayboard with a green reflective border.

SG-I: Square green dayboard with a green reflective border and a yellow reflective horizontal strip.

SG-SY: Square green dayboard with a green reflective border and a yellow reflective square.

SG-TY: Square green dayboard with a green reflective border and a yellow reflective triangle.

SR: Square red dayboard with a red reflective border. (IALA Region "A")

TG: Triangular green dayboard with a green reflective border. (IALA Region "A")

TR: Triangular red dayboard with a red reflective border.

TR-I: Triangular red dayboard with a red reflective border and a yellow reflective horizontal strip.

TR-SY: Triangular red dayboard with a red reflective border and a yellow reflective square.

TR-TY: Triangular red dayboard with a red reflective border and a yellow reflective triangle.

JG: Dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border.

JG-I: Square dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border and a yellow reflective horizontal strip.

JG-SY: Square dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border and a yellow reflective square.

JG-TY: Square dayboard bearing horizontal bands of green and red, green band topmost, with a green reflective border and a yellow reflective triangle.

JR: Dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border.

JR-I: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border and a yellow horizontal strip.

JR-SY: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border and a yellow reflective square.

JR-TY: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with a red reflective border and a yellow reflective triangle.

MR: Octagonal dayboard bearing stripes of white and red, with a white reflective border.

MR-I: Octagonal dayboard bearing stripes of white and red, with a white reflective border and a yellow reflective horizontal strip.

CG: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with a white reflective border.

CR: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with a white reflective border.

KBG: Rectangular black dayboard bearing a central green stripe.

KBG-I: Rectangular black dayboard bearing a central green stripe and a yellow reflective horizontal strip.

KBR: Rectangular black dayboard bearing a central red stripe.

KBR-I: Rectangular black dayboard bearing a central red stripe and a yellow reflective horizontal strip.

KBW: Rectangular black dayboard bearing a central white stripe.

KBW-I: Rectangular black dayboard bearing a central white stripe and a yellow reflective horizontal strip.

KGB: Rectangular green dayboard bearing a central black stripe.

KGB-I: Rectangular green dayboard bearing a central black stripe and a yellow reflective horizontal strip.

KGR: Rectangular green dayboard bearing a central red stripe.

KGR-I: Rectangular green dayboard bearing a central red stripe and a yellow reflective horizontal strip.

KGW: Rectangular green dayboard bearing a central white stripe.

KGW-I: Rectangular green dayboard bearing a central white stripe and a yellow reflective horizontal strip.

KRB: Rectangular red dayboard bearing a central black stripe.

KRB-I: Rectangular red dayboard bearing a central black stripe and a yellow reflective horizontal strip.

KRG: Rectangular red dayboard bearing a central green stripe.

KRG-I: Rectangular red dayboard bearing a central green stripe and a yellow reflective horizontal strip.

KRW: Rectangular red dayboard bearing a central white stripe.

KRW-I: Rectangular red dayboard bearing a central white stripe and a yellow reflective horizontal strip.

KWB: Rectangular white dayboard bearing a central black stripe.

KWB-I: Rectangular white dayboard bearing a central black stripe and a yellow reflective horizontal strip.

KWG: Rectangular white dayboard bearing a central green stripe.

KWG-I: Rectangular white dayboard bearing a central green stripe and a yellow reflective horizontal strip.

KWR: Rectangular white dayboard bearing a central red stripe.

KWR-I: Rectangular white dayboard bearing a central red stripe and a yellow reflective horizontal strip.

NB: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners black, with a white reflective border.

NG: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with a white reflective border.

NR: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with a white reflective border.

NW: Diamond-shaped white dayboard with an orange reflective border and black letters describing the information or regulatory nature of the mark.

ND: Rectangular white mileage marker with black numerals indicating the mile number (western rivers only).

NL: Rectangular white location marker with an orange reflective border and black letters indicating the location.

NY: Diamond-shaped yellow dayboard with yellow reflective border.

These abbreviated descriptions are used in column (7) and may also be found on the illustration of U.S. Aids to Navigation System.

OTHER SHORT RANGE AIDS TO NAVIGATION

Lighthouses are placed on shore or on marine sites and most often do not show lateral markings. They assist the mariner in determining his position or safe course, or warn of obstructions or dangers to navigation. Lighthouses with no lateral significance usually exhibit a white light.

Occasionally, lighthouses use sectored lights to mark shoals or warn mariners of other dangers. Lights so equipped show one color from most directions and a different color or colors over definite arcs of the horizon as indicated on the appropriate nautical chart. These sectors provide approximate bearing information and the observer should note a change of color as the boundary between the sectors is crossed. Since sector bearings are not precise, they should be considered as a warning only, and used in conjunction with a nautical chart.

Seasonal aids to navigation are placed into service or changed at specified times of the year. The dates shown in the Light List (Col. 8) are approximate and may vary due to adverse weather or other conditions.

Ranges are non-lateral aids to navigation employing dual beacons which, when the structures appear to be in line, assist the mariner in maintaining a safe course. The appropriate nautical chart must be consulted when using ranges to determine whether the range marks the centerline of the navigable channel and also what section of the range may be safely traversed. Ranges display rectangular dayboards of various colors and are generally, but not always lighted. When lighted, ranges may display lights of any color.

Sound signal is a generic term used to describe aids to navigation that produce an audible signal designed to assist the mariner in periods of reduced visibility. These aids to navigation can be activated by several means (e.g., manually, remotely, or fog detector). In cases where a fog detector is in use, there may be a delay in the automatic activation of the signal. Additionally, fog detectors may not be capable of detecting patchy fog conditions. Sound signals are distinguished by their tone and phase characteristics.

The devices producing the sound, e.g., diaphones, diaphragm horns, sirens, whistles, bells, and gongs determine tones.

Phase characteristics are defined by the signal's sound pattern, i.e., the number of blasts and silent periods per minute and their durations. Sound signals sounded from fixed structures generally produce a specific number of blasts and silent periods each minute when operating. Buoy sound signals are generally activated by the motion of the sea and therefore do not emit a regular signal characteristic. It is common, in fact, for a buoy to produce no sound signal when seas are calm.

The characteristic of a sound signal can be located in column (8) of the Light List. Unless it is specifically stated that a sound signal "Operates continuously", or the signal is a bell, gong, or whistle on a buoy, it can be assumed that the sound signal only operates during times of fog, reduced visibility, or adverse weather.

An emergency sound signal is sounded at some locations when the main and standby signals are inoperative. If the emergency signal is of a different type or characteristic than the main signal, its characteristic is listed in column (8) of this publication.

CAUTION: Mariners should not rely on sound signals to determine their position. Distance cannot be accurately determined by sound intensity. Occasionally, sound signals may not be heard in areas close to their location. Signals may not be heard in cases where fog exists close to, but not at, the location of the sound signal.

VARIATIONS TO THE U.S. SYSTEM

Intracoastal Waterway aids to navigation: The Intracoastal Waterway runs parallel to the Atlantic and Gulf coasts from Manasquan Inlet, New Jersey to the Mexican border. Aids to navigation marking these waters have some portion of them marked with yellow. Otherwise, the coloring and numbering of the aids to navigation follow the same system as that in other U.S. waterways.

In order that vessels may readily follow the Intracoastal Waterway route, special markings are employed. These marks consist of a yellow square and yellow triangle and indicate which side the aid to navigation should be passed when following the conventional direction of buoyage. The yellow square indicates that the aid to navigation should be kept on the left side and the yellow triangle indicates that the aid to navigation should be kept on the right side.

The **Western Rivers System**, a variation of the standard U.S. Aids to Navigation System described in the preceding sections, is employed on the Mississippi River and its tributaries above Baton Rouge, LA and on certain other rivers which flow toward the Gulf of Mexico.

The Western Rivers System varies from the standard U.S. system as follows:

- 1) Aids to navigation are not numbered.
- 2) Numbers on aids to navigation do not have lateral significance, but rather indicate mileage from a fixed point (normally the river mouth).
- 3) Diamond shaped crossing dayboards, red and white or green and white as appropriate, and are used to indicate where the river channel crosses from one bank to the other.
- 4) Lights on green aids to navigation show a single-flash characteristic, which may be green or white.
- 5) Lights on red aids to navigation show a group-flash characteristic, which may be red or white.
- 6) Isolated danger marks are not used.

Uniform State Waterway Marking System (USWMS): This system was developed in 1966 to provide an easily understood system for operators of small boats. While designed for use on lakes and other inland waterways that are not portrayed on nautical charts, the USWMS was authorized for use on other waters as well. It supplements the existing Federal marking system and is generally compatible with it.

The conventional direction of buoyage is considered upstream or towards the head of navigation.

The USWMS varies from the standard U.S. system as follows:

- 1) The color black is used instead of green.
- 2) There are three aids to navigation which reflect cardinal significance:
 - a. A white buoy with a red top indicates an obstruction and the buoy should be passed to the south or west.
 - b. A white buoy with a black top indicates an obstruction and the buoy should be passed to the north or east.

- c. A red and white vertically striped buoy indicates that an obstruction exists between that buoy and the nearest shore.

- 3) Mooring buoys are white buoys with a horizontal blue band midway between the water line and the top of the buoy. This buoy may be lighted and will generally show a slow flashing light.

BRIDGE MARKINGS

Bridges across navigable waters are generally marked with red, green and/or white lights for nighttime navigation. Red lights mark piers and other parts of the bridge. Red lights are also used on drawbridges to show when they are in the closed position.

Green lights are used on drawbridges to show when they are in the open position. The location of these lights will vary according to the bridge structure. Green lights are also used to mark the centerline of navigable channels through fixed bridges. If there are two or more channels through the bridge, the preferred channel is also marked by three white lights in a vertical line above the green light.

Red and green retroreflective panels may be used to mark bridge piers and may also be used on bridges not required to display lights.

Lateral red and green lights and dayboards may mark main channels through bridges. Adjacent piers should be marked with fixed yellow lights when the main channel is marked with lateral aids to navigation.

Centerlines of channels through fixed bridges may be marked with a safe water mark and an occulting white light when lateral marks are used to mark main channels. The centerline of the navigable channel through the draw span of floating bridges may be marked with a special mark. The mark will be a yellow diamond with yellow retroreflective panels and may exhibit a yellow light that displays a Morse code "B"(-...).

Clearance gauges may be installed to enhance navigation safety. The gauges are located on the right channel pier or pier protective structure facing approaching vessels. They indicate the vertical clearance available under the span.

Drawbridges equipped with radiotelephones display a blue and white sign which indicates what VHF radiotelephone channels should be used to request bridge openings.

ELECTRONIC AIDS TO NAVIGATION

RACONS

Aids to navigation may be enhanced by the use of **RA**dar **beacons** (RACONS). RACONS, when triggered by a vessel's radar, will transmit a coded reply to the vessel's radar. This reply serves to identify the RACON station by exhibiting a series of dots and dashes which appear on the radar display radially from the RACON. This display will represent the approximate range and bearing to the RACON. Although RACONS may be used on both laterally significant and non-laterally significant aids to navigation, the RACON signal itself is for identification purposes only. RACONS are also used as bridge marks to mark the point of best passage.

All RACONS operate in the radar X-band from 9,300 to 9,500 MHz. Some RACONS also operate in the 2,900 to 3,000 MHz radar S-band.

RACONS have a typical output of 100 to 300 milliwatts and are considered a short-range aid to navigation. Reception varies from a nominal range of 6 to 8 nautical miles when

mounted on a buoy to as much as 17 nautical miles for a RACON with a directional antenna mounted at a height of 50 feet on a fixed structure. It must be understood that these are nominal ranges and are dependent upon many factors.

The beginning of the RACON presentation occurs about 50 yards beyond the RACON position and will persist for a number of revolutions of the radar antenna (depending on its rotation rate). Distance to the RACON can be measured to the point at which the RACON flash begins, but the figure obtained will be greater than the ship's distance from the RACON. This is due to the slight response delay in the RACON apparatus.

Radar operators may notice some broadening or spoking of

the RACON presentation when their vessel approaches closely to the source of the RACON. This effect can be minimized by adjustment of the IF gain or sweep gain control of the radar. If desired, the RACON presentation can be virtually eliminated by operation of the FTC (fast time constant) controls of the radar.

Radar Reflectors

Many aids to navigation incorporate special fixtures designed to enhance the reflection of radar energy. These fixtures, called radar reflectors, help radar-equipped vessels to detect buoys and beacons, which are so equipped. They do not however, positively identify a radar target as an aid to navigation.

GLOSSARY OF AIDS TO NAVIGATION TERMINOLOGY

Alternating light: A light showing different colors alternately.

Arc of visibility: The arc of a light sector, designated by its limiting bearings as observed from seaward.

Articulated beacon: An offshore aid to navigation consisting of a pipe attached to a mooring by a pivoting or universal joint; more accurate in position than a buoy but less than a fixed light.

Beacon: A fixed navigation mark. Also, Daybeacon, Daymark.

Bearing: The horizontal direction of one point from another, expressed as the angular distance from a reference direction. It is usually measured from 000° at the reference direction clockwise through 360°. A bearing differing by 180°, or one measured in the opposite direction, from a given bearing is called a reciprocal bearing. The maximum or minimum bearing of a point for safe passage of an off-lying danger is called a danger bearing.

Bell: A sound signal producing tones by means of a hammer strike actuated mechanically on fixed aids and by sea motion on buoys.

Bifurcation: The point where a waterway divides.

Buoy: An unmanned floating device moored to the bottom as an aid to navigation that may be classified by shape, color scheme, sound, light, location, hazard, use, and season.

Characteristic: A quality, attribute, or distinguishing property of an Aid to Navigation

Composite group-flashing light: A group-flashing light in which the flashes are combined in successive groups of different numbers of flashes.

Composite group flashing light: A light similar to a group flashing light except that successive groups in a single period have different numbers of flashes.

Composite group occulting light: A group occulting light in which the occultations are combined in successive groups of different numbers of occultations.

Composite group-occulting light: A light similar to a group-occulting light except that the successive groups in a period have different numbers of eclipses.

Conventional direction of buoyage: The general direction taken by the mariner when approaching a harbor, river, estuary, or other waterway from seaward, or proceeding upstream or in the direction of the main stream of flood tide, (normally, following a clockwise direction around land masses).

Daybeacon: An unlighted beacon. A daybeacon is identified by its color and the color, shape and number of its daymark.

Dayboard: The daytime identifier of an aid to navigation presenting one of several standard shapes and colors.

Daymark: The daytime identifier of an aid to navigation. See also Daybeacon. (See column 7 of the Light List.)

Diaphone: A sound signal that produces sound by means of a slotted piston moved by compressed air. A "two-tone" diaphone produces two tones with the second tone of lower pitch.

Directional light: A light illuminating a sector or very narrow angle and intended to mark a direction to be followed.

Dolphin: A group of posts drawn together with wire rope. The dolphin may be in the water, on a wharf or the beach.

Eclipse: An interval of darkness between flashes of a navigational light.

Emergency light: A light of reduced intensity displayed by certain aids to navigation when the main light is extinguished.

Fixed light: A light continuously illuminated.

Flash: A relatively brief appearance of a light in comparison with its longest interval of darkness.

Flashing light: A light in which the total duration of light in each cycle is shorter than the total duration of darkness.

Floating aid to navigation: A buoy, secured in its assigned position by a mooring.

Fog signal: See sound signal.

Geographic range: The greatest distance the curvature of the earth permits an object to be seen from a particular height of eye without regard to luminous intensity or visibility conditions.

Global Positioning System (GPS): A satellite-based navigation system providing continuous worldwide coverage of position, and timing information to air, marine, and land users.

Gong: A wave actuated sound signal on buoys that uses a group of saucer-shaped bells to produce different tones.

Group-flashing light: A flashing light in which a group of flashes, specified in number, is regularly repeated.

Group-occulting light: An occulting light in which a group of eclipses, specified in number, is regularly repeated.

Horn: A sound signal that uses electricity or compressed air to vibrate a disc diaphragm.

Interrupted quick light: A quick flashing light in which the rapid alternations are interrupted at regular intervals by eclipses of long duration.

Isolated danger mark: A mark erected on, moored above, or very near an isolated danger having navigable water surrounding it.

Isophase light: A rhythmic light in which all durations of light and darkness are equal. (Formerly called equal interval light.)

Junction: The point where two waterways converge.

Lateral system: A system of aids to navigation in which the characteristics of aids indicate the sides of the channel relative to local navigable waters.

Light: The luminous signal emitted by an aid to navigation. The illuminating apparatus emitting the light signal. A lighted beacon.

Light sector: The arc over which a light is visible, described in degrees true, as observed from seaward towards the light. May be used to define distinctive color difference of two adjoining sectors, or an obscured sector.

Lighted ice buoy (LIB): A lighted buoy designed to replace a conventional buoy that is endangered by shifting and flowing ice.

Lighthouse: A lighted beacon of major importance.

Local Notice to Mariners: Document issued weekly by each U.S. Coast Guard district providing important information affecting navigation and aids to navigation on waterways within that district.

LORAN: LOng RAge Navigation system of shore-based transmitters.

Mileage number: A number assigned to aids to navigation indicating distance in miles along the river from a reference point. The number is used primarily in the Mississippi River System.

Nominal range: The maximum distance a light can be seen in clear weather. Listed for all lighted aids to navigation except private aids to navigation, range lights, and directional lights.

Occulting light: A light in which the total duration of light in each period is clearly longer than the total duration of darkness and in which the intervals of darkness (occultation) are all of equal duration.

Ocean Data Acquisition System (ODAS): Buoys that collect oceanographic and meteorological information. All ODAS buoys are yellow in color and display a yellow light.

Off shore tower: Monitored light stations built on exposed marine sites to replace lightships.

Passing light: A light which may be mounted on the structure of another light to enable the mariner to keep the structure in sight when passing out of its beam during transit.

GLOSSORY OF AIDS TO NAVIGATION TERMINOLOGY

Period: The interval of time between two identical cycles of the characteristic of the light or sound signal.

Pile: A timber or pipe driven into the seabed or riverbed to support an aid to navigation.

Port hand mark: A buoy or beacon that is left to port when proceeding in the "conventional direction of buoyage".

Preferred channel mark: A lateral mark indicating a channel junction, bifurcation, wreck, or other obstruction that, may be passed on either side.

Primary aid to navigation: An aid to navigation for the purpose of making landfalls and coastwise passages.

Quick light: A light exhibiting very rapid regular alternations of light and darkness, normally 60 flashes per minute.

RACON: A radar beacon that produces a coded response, or radar paint, when triggered by a radar signal.

Radar reflector: A fixture fitted to or incorporated into the design of an aid to navigation enhancing its ability to reflect radar energy.

Range: A line formed by projecting a line through two points.

Range lights: Two lights associated to form a range that often, but not necessarily, indicates a channel centerline.

Regulatory marks: A white and orange aid to navigation with no lateral significance used to indicate a special meaning such as danger, restricted operations, or exclusion area.

Sector: See light sector.

Siren: A sound signal that uses electricity or compressed air to actuate either a disc or a cup-shaped rotor.

Skeleton tower: A tower constructed of heavy corner members and various horizontal and diagonal bracing members.

Sound signal: A device intended to provide audible information to mariners during restricted visibility and foul weather.

Starboard hand mark: A buoy or beacon that is left to starboard when proceeding in the conventional direction of buoyage.

Topmark: One or more objects of characteristic shape and color placed on an aid to identify its purpose.

Traffic Separation Scheme: Corridors marked by buoys that separate incoming and outgoing traffic.

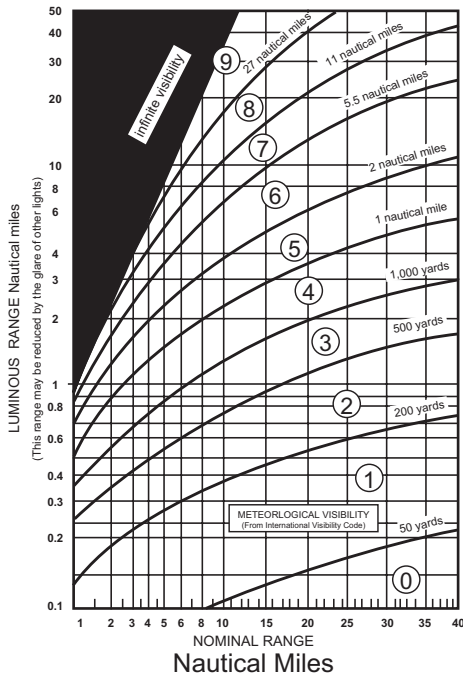
Whistle: A wave actuated buoy sound signal that produces sound by emitting air through a circumferential slot into a cylindrical chamber.

Winter light: A light that is maintained during those winter months when the regular light is extinguished. It is of lower candlepower than the regular light but usually of the same characteristic

LUMINOUS RANGE DIAGRAM

The nominal range given in this Light List is the maximum distance a given light can be seen when the meteorological visibility is 10 nautical miles. If the existing visibility is less than 10 NM, the range at which the light can be seen will be reduced below its nominal range. And, if the visibility is greater than 10 NM, the light can be seen at greater distances. The distance at which a light may be expected to be seen in the prevailing visibility is called its luminous range.

This diagram enables the mariner to determine the approximate luminous range of a light when the nominal range and the prevailing meteorological visibility are known. The diagram is entered from the bottom border using the nominal range listed in column 6 of this book. The intersection of the nominal range with the appropriate visibility curve (or, more often, a point between two curves) yields, by moving horizontally to the left border, the luminous range.



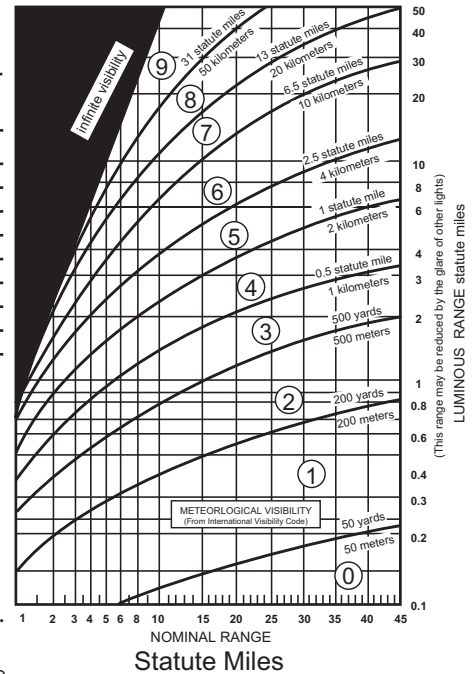
METEOROLOGICAL VISIBILITY
(From International Visibility Code)

Code	Metric	Nautical (approximate)
0	less than 50 meters	less than 50 yards
1	50-200 meters	50-200 yards
2	200-500 meters	200-500 yards
3	500-1,000 meters	500-1,000 yards
4	1-2 kilometers	1,000-2,000 yards
5	2-4 kilometers	1-2 nautical miles
6	4-10 kilometers	2-5.5 nautical miles
7	10-20 kilometers	5.5-11 nautical miles
8	20-50 kilometers	11-27 nautical miles
9	greater than 50 km	greater than 27 nm

CAUTION

When using this diagram it must be remembered that:

1. The ranges obtained are approximate.
2. The transparency of the atmosphere may vary between observer and light.
3. Glare from background lighting will reduce the range that lights are sighted.
4. The rolling motion of a vessel and/or of a lighted aid may reduce the distance that lights can be detected or identified.



GEOGRAPHIC RANGE TABLE

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer at sea level. It is necessary to add to the distance for the height of any object the distance corresponding to the height of the observer's eye above sea level.

Height Feet / Meters	Distance Nautical Miles (NM)	Height Feet / Meters	Distance Nautical Miles (NM)	Height Feet / Meters	Distance Nautical Miles (NM)
5/1.5	2.6	70/21.3	9.8	250/76.2	18.5
10/3.1	3.7	75/22.9	10.1	300/91.4	20.3
15/4.6	4.5	80/24.4	10.5	350/106.7	21.9
20/6.1	5.2	85/25.9	10.8	400/121.9	23.4
25/7.6	5.9	90/27.4	11.1	450/137.2	24.8
30/9.1	6.4	95/29.0	11.4	500/152.4	26.2
35/10.7	6.9	100/30.5	11.7	550/167.6	27.4
40/12.2	7.4	110/33.5	12.3	600/182.9	28.7
45/13.7	7.8	120/36.6	12.8	650/198.1	29.8
50/15.2	8.3	130/39.6	13.3	700/213.4	31.0
55/16.8	8.7	140/42.7	13.8	800/243.8	33.1
60/18.3	9.1	150/45.7	14.3	900/274.3	35.1
65/19.8	9.4	200/61.0	16.5	1000/304.8	37.0

Example: Determine the geographic visibility of an object, with a height above water of 65 feet, for an observer with a height of eye of 35 feet.

Enter above table;
 Height of object 65 feet= 9.4 NM
 Height of observer 35 feet= 6.9 NM
 Computed geographic visibility= 16.3 NM

COAST GUARD DISTRICT COMMANDERS

DISTRICT ADDRESS

WATERS OF JURISDICTION

FIRST	408 Atlantic Avenue Boston, MA 02110-3350 http://www.uscg.mil/d1/ PHONE: DAY 617-223-8338 NIGHT 617-223-8558	Maine, New Hampshire, Massachusetts, Vermont (Lake Champlain), Rhode Island, Connecticut, New York, to Shrewsbury River, New Jersey.
FIFTH	Federal Building; 431 Crawford Street Portsmouth, VA 23704-5004 http://www.uscg.mil/lantarea/index.html PHONE: DAY 757-398-6486 NIGHT 757-398-6231	Shrewsbury River, New Jersey to Delaware, Maryland, Virginia, District of Columbia and North Carolina.
SEVENTH	Brickell Plaza Federal Building 909 SE 1 st Avenue; Rm:406 Miami, FL 33131-3050 http://www.uscg.mil/d7/ PHONE: DAY 305-415-6730 NIGHT 305-415-6800	South Carolina, Georgia, Florida to 83°50'W, and Puerto Rico and adjacent islands of the United States.
EIGHTH	Hale Boggs Federal Building 501 Magazine St New Orleans LA 70130-3396 http://www.uscg.mil/d8/index.htm PHONE: DAY 504-589-6277 NIGHT 504-589-6225	Florida westward from 83°50'W, Alabama, Mississippi, Louisiana, Texas, the Mississippi River System except that portion of the Illinois River north of Joliet, Illinois.
NINTH	1240 East 9 th Street Cleveland, OH 44199-2060 http://www.uscg.mil/d9/uscgd9.html PHONE: DAY 216-902-6060 NIGHT 216-902-6117	Great Lakes and St. Lawrence River above St. Regis River.
ELEVENTH	Coast Guard Island Building 50-6 Alameda, CA 94501-5100 http://www.uscg.mil/D11/ PHONE: 510-437-2976	California.
THIRTEENTH	Federal Building 915 Second Avenue Seattle, WA 98174-1067 http://www.uscg.mil/d13/default.htm PHONE: DAY 206-220-7270 NIGHT 206-220-7004	Oregon, Washington, Idaho, and Montana.
FOURTEENTH	PJKK Federal Building. 300 Ala Moana Blvd, Room 9236 Honolulu, HI 96850-4982 http://www.uscg.mil/d14/ PHONE: DAY 808-541-2316 NIGHT 808-541-2500	Hawaiian, American Samoa, Marshall, Marianas, and Caroline Islands.
SEVENTEENTH	P.O. Box 25517 Juneau, AK 99802-5517 http://www.uscg.mil/d17/ PHONE: DAY 907-463-2262 NIGHT 907-463-2004	Alaska.



U.S. AIDS TO NAVIGATION SYSTEM

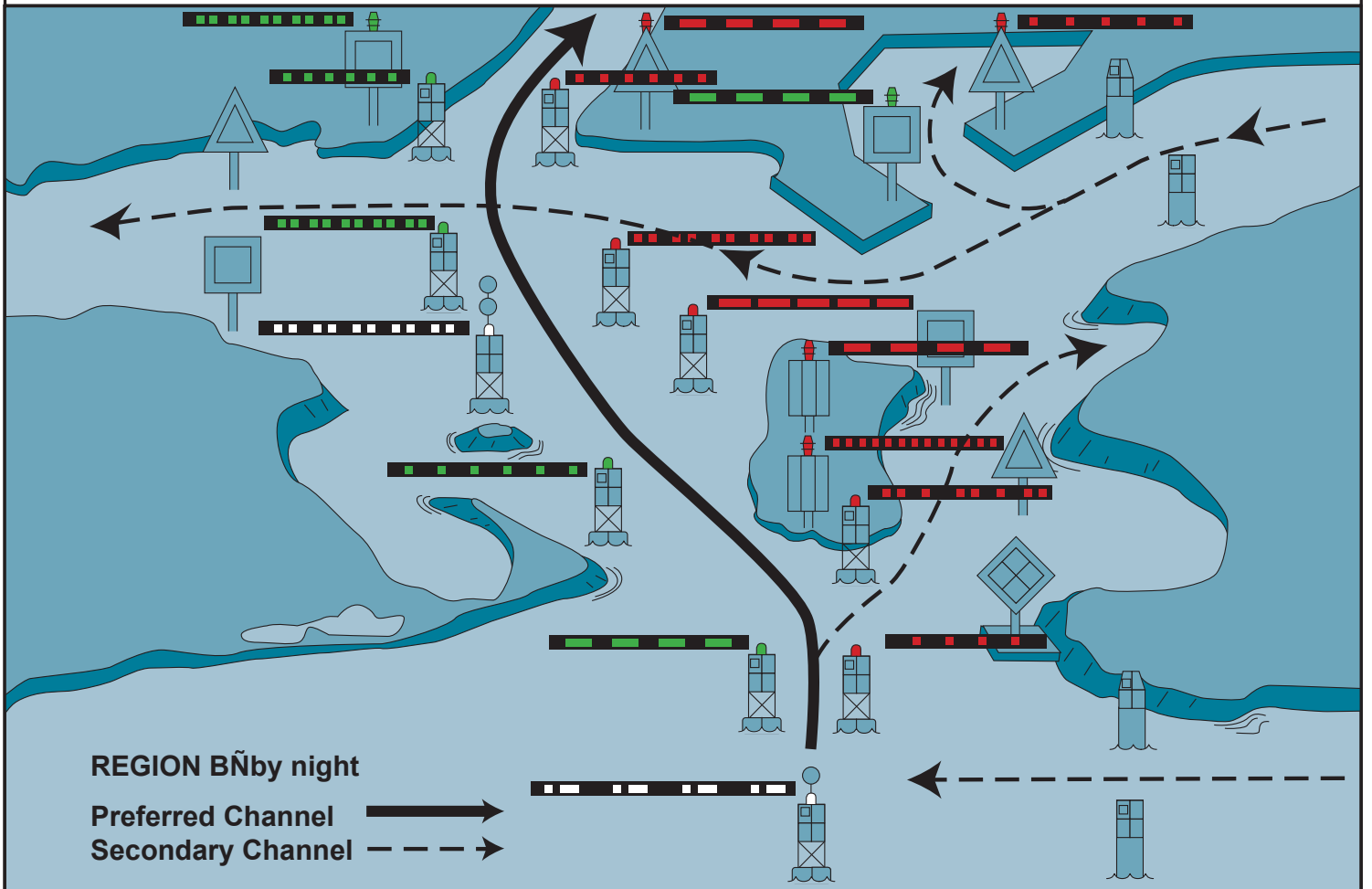
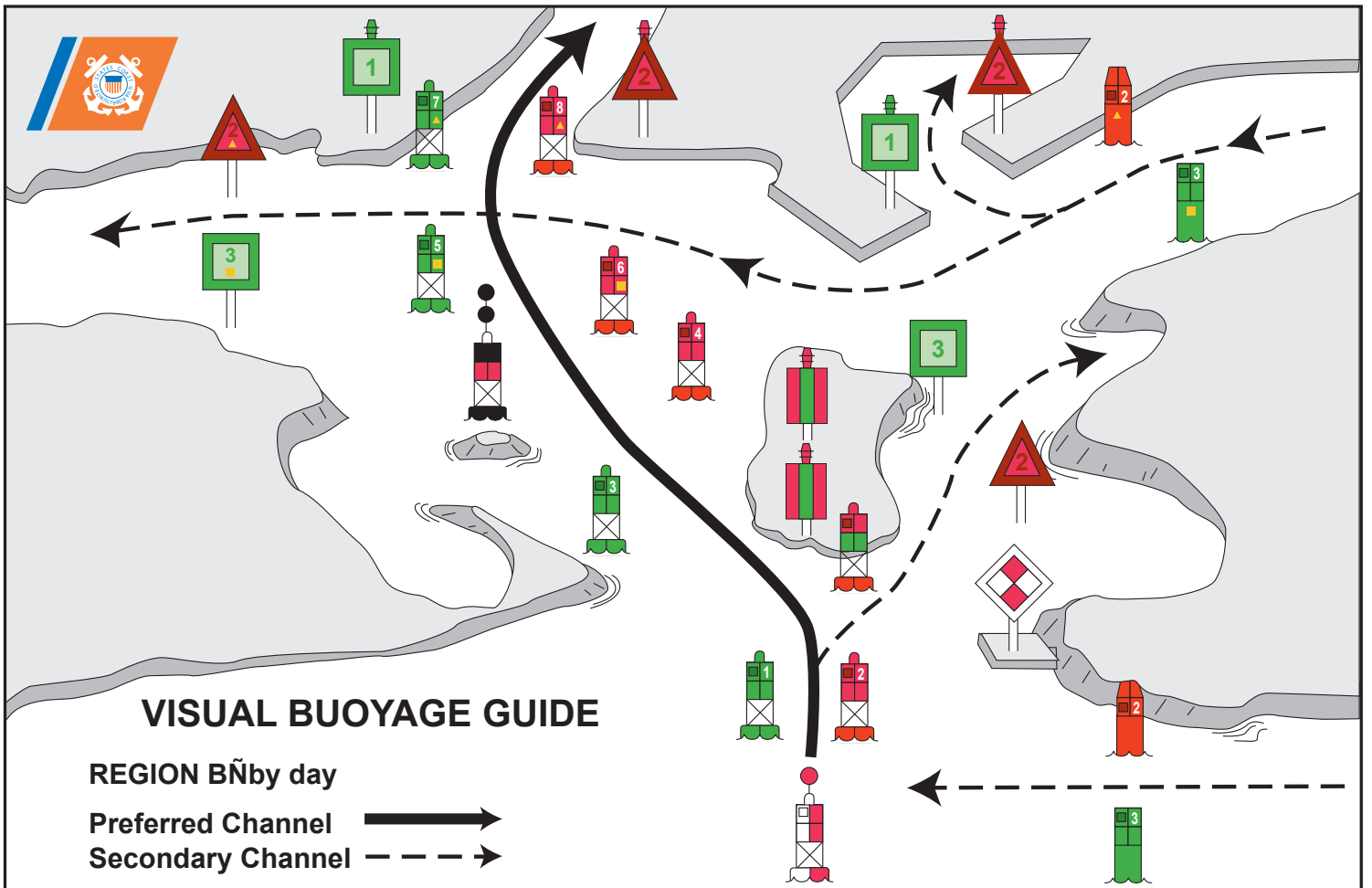
on navigable waters except Western Rivers

LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD

PORT SIDE ODD NUMBERED AIDS	PREFERRED CHANNEL NO NUMBERS MAY BE LETTERED	PREFERRED CHANNEL NO NUMBERS MAY BE LETTERED	STARBOARD SIDE EVEN NUMBERED AIDS
<p>GREEN LIGHT ONLY</p> <p>FLASHING (2) </p> <p>FLASHING </p> <p>OCCLUDING </p> <p>QUICK FLASHING </p> <p>ISO </p>	<p>PREFERRED CHANNEL TO STARBOARD TOPMOST BAND GREEN</p> <p>GREEN LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (2+1) </p>	<p>PREFERRED CHANNEL TO PORT TOPMOST BAND RED</p> <p>RED LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (2+1) </p>	<p>RED LIGHT ONLY</p> <p>FLASHING (2) </p> <p>FLASHING </p> <p>OCCLUDING </p> <p>QUICK FLASHING </p> <p>ISO </p>
<p>1 LIGHT <i>! FI G 6s</i></p> <p>9 LIGHTED BUOY <i>G "9" FI G 4s</i></p>	<p>A LIGHTED BUOY <i>GR "A" FI (2+1) G 6s</i></p>	<p>B LIGHTED BUOY <i>RG "B" FI (2+1) R 6s</i></p>	<p>2 LIGHT <i>! FI R 6s</i></p> <p>8 LIGHTED BUOY <i>R "8" FI R 4s</i></p>
<p>9 CAN <i>G "9"</i></p> <p>5 DAYBEACON <i>G "5"</i></p>	<p>U CAN <i>GR "U"</i></p> <p>S CAN <i>GR "S"</i></p>	<p>C NUN <i>RG "C"</i></p> <p>G NUN <i>RG "G"</i></p>	<p>6 NUN <i>R "6"</i></p> <p>2 DAYBEACON <i>R "2"</i></p>

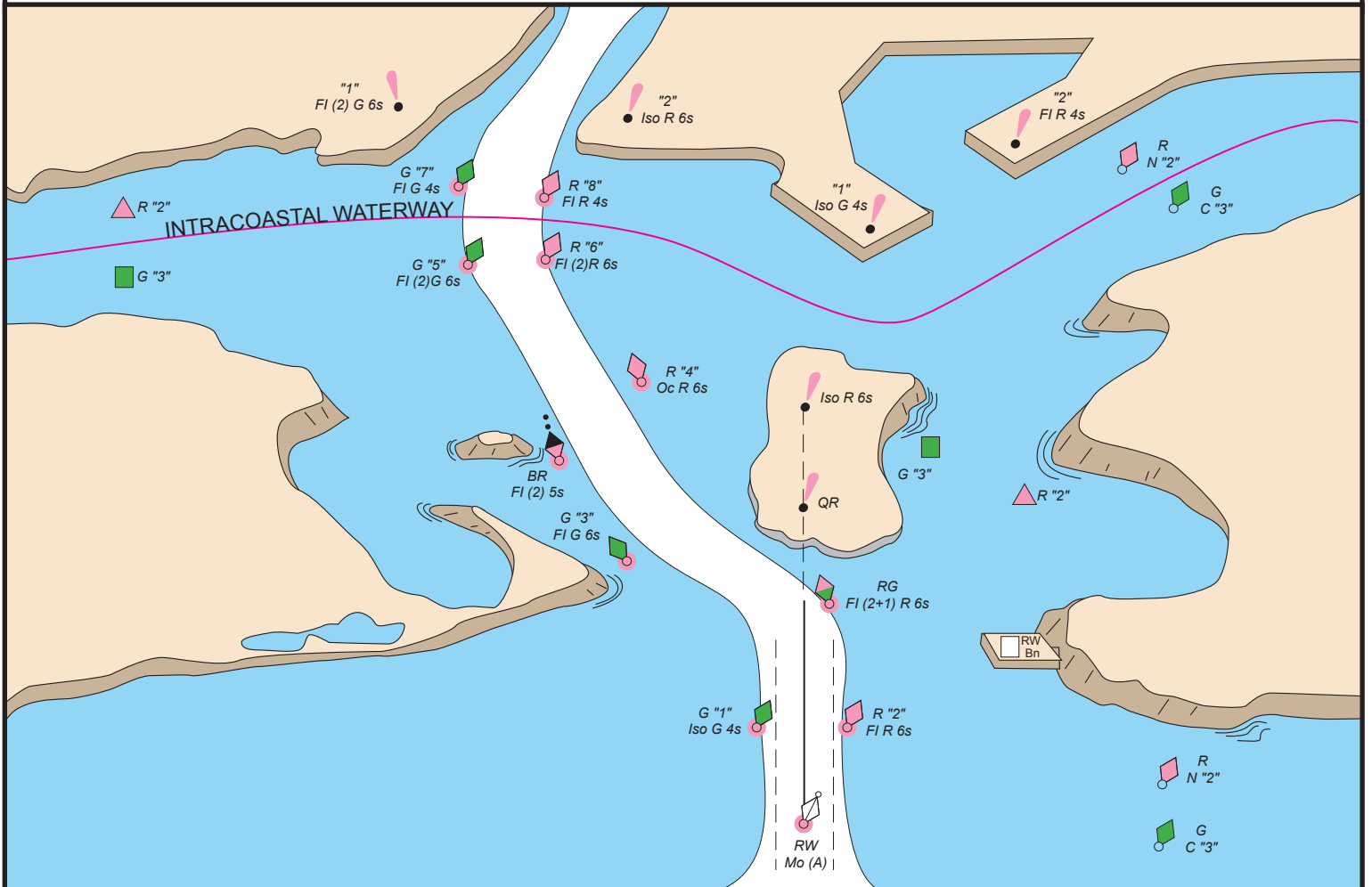
AIDS TO NAVIGATION HAVING NO LATERAL SIGNIFICANCE

<p>ISOLATED DANGER NO NUMBERS MAY BE LETTERED</p> <p>WHITE LIGHT ONLY</p> <p><i>FI (2) 5s</i> </p> <p>A LIGHTED <i>BR "A" FI (2) 5s</i></p> <p>C UNLIGHTED <i>BR "C"</i></p>	<p>SAFE WATER NO NUMBERS MAY BE LETTERED</p> <p>WHITE LIGHT ONLY MORSE CODE</p> <p><i>Mo (A)</i> </p> <p>A MR <i>RW "A"</i></p> <p>B SPHERICAL <i>RW "B"</i></p> <p>UNLIGHTED AND/OR SOUND <i>RW "N"</i></p>
<p>DAYBOARDS MAY BE LETTERED</p> <p>WHITE LIGHT ONLY</p> <p>NR </p> <p>NG </p> <p>NB </p> <p><i>RW Bn</i> <i>GW Bn</i> <i>BW Bn</i></p>	<p>RANGE DAYBOARDS MAY BE LETTERED</p> <p>KGW KWG KWB KBW KWR KRW KRB KBR KGB KBG KGR KRG</p>
<p>TYPICAL INFORMATION AND REGULATORY MARKS</p> <p>INFORMATION AND REGULATORY MARKERS</p> <p>WHEN LIGHTED, INFORMATION AND REGULATORY MARKS MAY DISPLAY ANY LIGHT RHYTHM EXCEPT QUICK FLASHING, FLASHING (2), AND MORSE "A"</p> <p>WHITE LIGHT ONLY</p> <p>NW </p> <p>DANGER </p> <p><i>W Bn</i></p> <p>EXCLUSION AREA RESTRICTED OPERATIONS DANGER</p> <p>5 MPH</p>	<p>SPECIAL MARKS MAY BE LETTERED</p> <p>YELLOW LIGHT ONLY</p> <p>FIXED FLASHING </p> <p>A UNLIGHTED <i>Y "A" C "A"</i></p> <p>C UNLIGHTED <i>Y "C" N "C"</i></p> <p>A UNLIGHTED <i>Y "A" Bn</i></p> <p>SHAPE OPTIONAL—BUT SELECTED TO BE APPROPRIATE FOR THE POSITION OF THE MARK IN RELATION TO THE NAVIGABLE WATERWAY AND THE DIRECTION OF BUOYAGE.</p> <p>B LIGHTED <i>Y "B" FI</i></p>
<p>MOORING BUOY</p> <p>WHITE WITH BLUE BAND</p> <p>MAY SHOW WHITE REFLECTOR OR LIGHT</p>	<p>Aids to navigation marking the Intracoastal Waterway (ICW) display unique yellow symbols to distinguish them from aids marking other waters. Yellow triangles indicate aids should be passed by keeping them on the starboard (right) hand of the vessel. Yellow squares indicate aids should be passed by keeping them on the port (left) hand of the vessel. A yellow horizontal band provides no lateral information, but simply identifies aids as marking the ICW.</p>





FICTITIOUS NAUTICAL CHART





U.S. AIDS TO NAVIGATION SYSTEM on the Western River System

AS SEEN ENTERING FROM SEAWARD

<p>PORT SIDE OR RIGHT DESCENDING BANK</p> <p>GREEN OR WHITE LIGHTS FLASHING ISO</p> <p>176.9 MILE BOARD</p>	<p>PREFERRED CHANNEL MARK JUNCTIONS AND OBSTRUCTIONS COMPOSITE GROUP FLASHING (2+1)</p> <p>PREFERRED CHANNEL TO STARBOARD TOPMOST BAND GREEN FI (2+1) G</p> <p>PREFERRED CHANNEL TO PORT TOPMOST BAND RED FI (2+1) R</p> <p>DAYBOARDS HAVING NO LATERAL SIGNIFICANCE MAY BE LETTERED WHITE LIGHT ONLY</p>	<p>STARBOARD SIDE OR LEFT DESCENDING BANK</p> <p>RED OR WHITE LIGHTS FLASHING (2) ISO</p> <p>123.5 MILE BOARD</p>
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<p>TYPICAL INFORMATION AND REGULATORY MARKS</p> <p>INFORMATION AND REGULATORY MARKERS WHEN LIGHTED, INFORMATION AND REGULATORY MARKS MAY DISPLAY ANY LIGHT RHYTHM EXCEPT QUICK FLASHING AND FLASHING (2)</p> <p>NW WHITE LIGHT ONLY</p>	<p>SPECIAL MARKS--MAY BE LETTERED</p> <p>SHAPE: OPTIONAL--BUT SELECTED TO BE APPROPRIATE FOR THE POSITION OF THE MARK IN RELATION TO THE NAVIGABLE WATERWAY AND THE DIRECTION OF BUOYAGE.</p> <p>YELLOW LIGHT ONLY FIXED FLASHING</p>
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UNIFORM STATE WATERWAY MARKING SYSTEM (USWMS)

Note: The USWMS is presently merging with the U.S. Aids to Navigation System and will be discontinued on December 31, 2003. Vessel operators may encounter both types of systems during this transitional period.

STATE WATERS AND DESIGNATED STATE WATERS FOR PRIVATE AIDS TO NAVIGATION

<p>REGULATORY MARKERS</p> <p>EXPLANATION MAY BE PLACED OUTSIDE THE CROSSED DIAMOND SHAPE, SUCH AS DAM, RAPIDS, SWIM AREA, ETC.</p> <p>THE NATURE OF DANGER MAY BE INDICATED INSIDE THE DIAMOND SHAPE, SUCH AS ROCK, WRECK, SHOAL, DAM, ETC.</p> <p>TYPE OF CONTROL IS INDICATED IN THE CIRCLE, SUCH AS SLOW, NO WAKE, ANCHORING, ETC.:</p> <p>FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.:</p> <p>BUOY USED TO DISPLAY REGULATORY MARKERS MAY SHOW WHITE LIGHT MAY BE LETTERED</p>	<p>LATERAL SYSTEM</p> <p>MAY SHOW GREEN REFLECTOR OR LIGHT MAY SHOW RED REFLECTOR OR LIGHT</p> <p>USUALLY FOUND IN PAIRS PASS BETWEEN THESE BUOYS</p> <p>3 PORT SIDE 4 STARBOARD SIDE LOOKING UPSTREAM</p> <p>SOLID BLACK BUOY SOLID RED BUOY</p> <p>CARDINAL SYSTEM</p> <p>MAY SHOW WHITE REFLECTOR OR LIGHT MAY SHOW WHITE REFLECTOR OR QUICK FLASHING WHITE LIGHT</p> <p>7 BLACK-TOPPED WHITE BUOY 8 RED-TOPPED WHITE BUOY MAY BE NUMBERED PASS TO NORTH OR EAST OF BUOY PASS TO SOUTH OR WEST OF BUOY</p> <p>9 RED-STRIPED WHITE BUOY MAY BE LETTERED DO NOT PASS BETWEEN BUOY AND NEAREST SHORE</p> <p>INLAND (STATE) WATERS OBSTRUCTION MARK</p> <p>BLACK-STRIPED WHITE BUOY</p> <p>Used to indicate an obstruction to navigation, extends from the nearest shore to the buoy. This means "do not pass between the buoy and the nearest shore." This aid is replacing the red and white striped buoy within the USWMS, but cannot be used until all red and white striped buoys on a waterway have been replaced.</p>
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CONVERSION TABLES

FEET TO METERS

(1 foot = 0.3048 meters) - (1 meter = 3.2808 feet)

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
0	0	35	10.7	70	21.3	105	32.0	140	42.7	175	53.3
1	0.3	36	11.0	71	21.6	106	32.3	141	43.0	176	53.6
2	0.6	37	11.3	72	22.0	107	32.6	142	43.3	177	54.0
3	0.9	38	11.6	73	22.3	108	32.9	143	43.6	178	54.3
4	1.2	39	11.9	74	22.6	109	33.2	144	43.9	179	54.6
5	1.5	40	12.2	75	22.9	110	33.5	145	44.2	180	54.9
6	1.8	41	12.5	76	23.2	111	33.8	146	44.5	181	55.2
7	2.1	42	12.8	77	23.5	112	34.1	147	44.8	182	55.5
8	2.4	43	13.1	78	23.8	113	34.4	148	45.1	183	55.8
9	2.7	44	13.4	79	24.1	114	34.8	149	45.4	184	56.1
10	3.1	45	13.7	80	24.4	115	35.1	150	45.7	185	56.4
11	3.4	46	14.0	81	24.7	116	35.4	151	46.0	186	56.7
12	3.7	47	14.3	82	25.0	117	35.7	152	46.3	187	57.0
13	4.0	48	14.6	83	25.3	118	36.0	153	46.6	188	57.3
14	4.3	49	14.9	84	25.6	119	36.3	154	46.9	189	57.6
15	4.6	50	15.2	85	25.9	120	36.6	155	47.2	190	57.9
16	4.9	51	15.5	86	26.2	121	36.9	156	47.6	191	58.2
17	5.2	52	15.9	87	26.5	122	37.2	157	47.9	192	58.5
18	5.5	53	16.2	88	26.8	123	37.5	158	48.2	193	58.8
19	5.8	54	16.5	89	27.1	124	37.8	159	48.5	194	59.1
20	6.1	55	16.8	90	27.4	125	38.1	160	48.8	195	59.4
21	6.4	56	17.1	91	27.7	126	38.4	161	49.1	196	59.7
22	6.7	57	17.4	92	28.0	127	38.7	162	49.4	197	60.1
23	7.0	58	17.7	93	28.4	128	39.0	163	49.7	198	60.4
24	7.3	59	18.0	94	28.7	129	39.3	164	50.0	199	60.7
25	7.6	60	18.3	95	29.0	130	39.6	165	50.3	200	61.0
26	7.9	61	18.6	96	29.3	131	39.9	166	50.6	300	91.4
27	8.2	62	18.9	97	29.6	132	40.2	167	50.9	400	121.9
28	8.5	63	19.2	98	29.9	133	40.5	168	51.2	500	152.4
29	8.8	64	19.5	99	30.2	134	40.8	169	51.5	600	182.9
30	9.1	65	19.8	100	30.5	135	41.2	170	51.8	700	213.4
31	9.5	66	20.1	101	30.8	136	41.5	171	52.1	800	243.8
32	9.8	67	20.4	102	31.1	137	41.8	172	52.4	900	274.3
33	10.1	68	20.7	103	31.4	138	42.1	173	52.7	1000	304.8
34	10.4	69	21.0	104	31.7	139	42.4	174	53.0	2000	609.6

STATUTE MILES (St M) TO NAUTICAL MILES (NM)

(1 St M = 5,280 feet) - (1 NM = 6,076.1 feet)

St M	NM	St M	NM	St M	NM	St M	NM	St M	NM	St M	NM
1	0.9	21	18.3	41	35.6	61	53.0	81	70.4	101	87.8
2	1.7	22	19.1	42	36.5	62	53.9	82	71.3	102	88.6
3	2.6	23	20.0	43	37.4	63	54.8	83	72.1	103	89.5
4	3.5	24	20.9	44	38.2	64	55.6	84	73.0	104	90.3
5	4.4	25	21.7	45	39.1	65	56.5	85	73.9	105	91.2
6	5.2	26	22.6	46	40.0	66	57.4	86	74.7	106	92.1
7	6.1	27	23.5	47	40.8	67	58.2	87	75.6	107	93.0
8	7.0	28	24.3	48	41.7	68	59.1	88	76.4	108	93.8
9	7.8	29	25.2	49	42.6	69	60.0	89	77.3	109	94.7
10	8.7	30	26.1	50	43.5	70	60.8	90	78.2	110	95.6
11	9.6	31	26.9	51	44.3	71	61.7	91	79.1	111	96.5
12	10.4	32	27.8	52	45.2	72	62.6	92	80.0	112	97.3
13	11.3	33	28.7	53	46.1	73	63.4	93	80.9	113	98.2
14	12.2	34	29.6	54	46.9	74	64.3	94	81.7	114	99.1
15	13.0	35	30.4	55	47.8	75	65.2	95	82.6	115	99.9
16	13.9	36	31.3	56	48.7	76	66.0	96	83.4	116	100.8
17	14.8	37	32.2	57	49.5	77	66.9	97	84.3	117	101.7
18	15.6	38	33.0	58	50.4	78	67.8	98	85.2	118	102.5
19	16.5	39	33.9	59	51.3	79	68.7	99	86.0	119	103.4
20	17.4	40	34.8	60	52.1	80	69.5	100	86.9	120	104.3