

AIDS TO NAVIGATION

Learning Objectives:

As a result of this session the participant should:

- Understand the principal buoyage systems in the United States.
- Become aware of the characteristics of the buoy and waterway marking systems
- Understand the use and meaning of lights associated with Aids to Navigation.
- Become aware of the electronic aids and navigation publication available.

Resources:

Boating Skills & Seamanship, Eleventh Edition, U.S. Coast guard Auxiliary, Chapter 5
The Squadron Boating Course 2001, The United States Power Squadrons, Section 6
Chapman Piloting Seamanship & Small Boat Handling, 62nd Edition, Hearst Marine Books, Chapter 22

Dutton's Navigation and Piloting, 14th Edition, Elbert S. Maloney, Naval Institute Press, Chapter 4

Chart No. 1, United States of America, NAUTICAL CHART Symbols Abbreviations and Terms, NOAA National Ocean Service & DOD National Imagery and Mapping Agency

Material and Equipment:

Equipment Items

Overhead Projector, as required by instructor

Material Items

Provide one copy for each participant:

U.S. Aids to Navigation Systems Handout

U.S. Aids To Navigation System Brochure

U.S. Coast Guard, Office of Aids to Navigation (202) 267-0980, www.navcen.uscg.mil

Instructor Qualification:

U.S. Coast Guard Auxiliary Trainer presence required for USCGAUX Certificate Program

U.S. Power Squadron Instructor, Council Venturing Trainer or equivalent

Time Allocation: 1.5 Hours

Session Plan:

Classroom Session

Southern Region, B.S.A.
Yachting Initiative
Program Elements

1. Module Introduction.

- a. Introduce yourself and each member of the module staff.
- b. Explain the objectives of this module.
- c. Identify the term ATON (Aids To Navigation) and Marks (Buoys, Daybeacons, fixed structures).
- d. Briefly explain the law protecting ATONS.
- e. Distribute to each participant the U.S. Aids To Navigation System brochure.

2. Buoyage Systems.

- a. Explain that the United States uses four principal buoyage systems.
 1. U.S. Aids to Navigation System (Lateral System)
 2. Intracoastal Waterway Marking System (ICW)
 3. Western Rivers System
 4. Uniform State Waterway Marking System (USWMS)

3. The U. S. Aids to Navigation System.

- a. Describe the shape, coloring, numbering, and light characteristics of buoys.
 1. Shapes and Colors
 2. Sound, Light and Combination Buoys
 3. Numbering
 4. Color of Lights
 5. Light Rhythms
 6. Daybeacons and minor Lights
 - 7 Wreck Buoys
 8. Isolated Danger Marks
 - 9 Seasonal Buoys
 10. Special Marks
 11. Information and Regulatory Marks

4. Waterways Marking Methods.

- a. Describe the Marks on navigable waterways.
 1. Red Right Returning!
 2. Lateral Marks on Navigable Waters
 3. Numbers on Lateral Marks
 4. Safe Water ATONS
 5. Preferred Channel Marks
 6. Ranges
 7. Directional Lights
 8. Daymarks with No Lateral Significance

Southern Region, B.S.A.
Yachting Initiative
Program Elements

- b. Intracoastal Waterway Marks
 - 1. Yellow Triangles, Squares, and Bands
 - 2. Dual Purpose Marks

- 5. **Variations in the U.S. System.**
 - a. Describe variations as applied to;
 - 1. Western River System
 - 2. U.S. Waterway Marking System
 - 3. Bridge Markings
 - 4. Cardinal System

- 6. **ATON Light Characteristics.**
 - a. Describe the light characteristics related to ATONs.
 - 1. Light Patterns (Flashing)
 - 2. Occulting Lights
 - 3. Safe Water ATON Lights
 - 4. Preferred Channel Lights
 - 5. Articulated Lights

- 7. **ATON Chart Symbols.**
 - a. Describe the chart symbols used to identify individual ATONs.
 - 1. Fixed Structure Lights
 - 2. Buoy Symbols

- 8. **Light Structures.**
 - a. Describe the lighted ATONs associated with fixed structures.
 - 1. Light houses
 - 2. Primary, Secondary, & Minor Light Structures
 - 3. Bridges
 - 4. Light Structure Sound Signals

- 9. **Electronic Aids to Navigation.**
 - a. Briefly describe some of the electronic aids available.
 - 1. Loran-C
 - 2. The Global Positioning System (GPS)
 - 3. Radio Direction Finders
 - 4. Voice Recorded Information

- 10. **Navigation Publications.**
 - a. Describe briefly some of the publications that are available.
 - 1. Local Notice to Mariners
 - 2. Chart No. 1, Nautical Chart Symbols, Abbreviations, and Terms
 - 3. The Light List (Available in 7 volumes)

Southern Region, B.S.A.
Yachting Initiative
Program Elements

U.S. Aids to Navigation Systems Handout

Introduction

In 1936, The International Geneva Convention specified a set on navigation standards, however, the United States and other countries were not signatories. After World War II, the navigation aids were reestablished in Europe. Starting in 1946, the navigation rules established by the International Geneva Convention were generally followed but with significant differences in interpretation from one country to another, resulting in nine different systems. In 1965, the International Association of Lighthouse Authorities established a committee to harmonize the existing rules. Five types of marks were defined – lateral, cardinal, isolated danger, safe water, and special – with specific rules for each.

The International Association of Lighthouse Authorities (IALA) Systems

The IALA has established two uniform systems of colors and shapes for buoyage. They are referred to as IALA System A and IALA System B. Together, these systems regulate navigational markings throughout the most of the world. Generally, System A is used in the Eastern Hemisphere, while System B encompasses the Western Hemisphere. There are exceptions, Japan, Korea and the Philippines use System B. The essential difference between the two systems is the placement of the red lateral buoys on the right side of the channel as view from the sea for IALA-B, and on the opposite side (left) for IALA-A. In North American the system is IALA-B, along with its U.S. variations.

The U.S. Aids to Navigation System

The U.S. Aids to Navigation System of buoyage is uniformly used in all federal-jurisdiction areas and on many other bodies of water where it can be applied. In this **lateral system**, buoy shape, coloring, numbering and light characteristics are determined by their position with respect to the navigable channel, and followed from seaward and toward the head of navigation. The general conventional direction of buoyage is considered southerly along the Atlantic Coast, northerly then westerly along the Gulf Coast and northerly along the Pacific Coast. The Great Lakes are considered westerly and northerly, except Lake Michigan which is considered southerly.

The Intracoastal Waterway (ICW)

The ICW runs parallel to the Atlantic and Gulf coasts from Manasquan Inlet on the New Jersey shore to the Mexican border. The purpose of the ICW is to provide a protected route for vessels making coastwise passages. Distances along the ICW are in statute miles to facilitate reference to small-craft charts of the waterway. The conventional direction of buoyage is the ICW is generally southerly along the Atlantic coast and westerly along the Gulf coast.

Southern Region, B.S.A.
Yachting Initiative
Program Elements

The Western Rivers System

This system is used on the Mississippi River and its tributaries above Baton Rouge, Louisiana and on some other rivers that flow toward the Gulf of Mexico. One significant difference is the numbers on the ATONs show mileage (statute) from a fixed point—usually the river mouth.

Uniform State Waterway Marking System (USWMS)

While designed primarily for use on lakes and other inland waterways not portrayed on nautical charts, the USWMS is also authorized for use on other waters as well. It supplements the existing federal marking system and is generally compatible with it. One significant difference is using black for port-hand buoys instead of green.

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

Cardinal System

Isolated offshore buoys do not fit the general framework of an “approach direction”, thus a second system of buoyage known as the Cardinal System was established. This system sets up a buoy or mark in such a way as to indicate on what side a hazard can be safely passed.

[The USCG will not use cardinal buoys in the foreseeable future.]

Resources

Chapman Piloting, Seamanship & Small Boat Handling, 62nd Edition, Elbert S. Maloney, Hearst Marine Books

Dutton’s Navigation and Piloting, 14th Edition, Elbert S. Maloney, Naval Institute Press.

U.S. Aids To Navigation System Brochure, U.S. Coast Guard, Office of Aids to Navigaton