A Aids to Navigation and Marine Safety

A1 Aids to Navigation

1 The Canadian Aids to Navigation System and *Private Buoy Regulations*

THE CANADIAN AIDS TO NAVIGATION SYSTEM

The Canadian Aids to Navigation System is comprised of a mix of visual, audible and electronic aids to navigation, which are provided to assist mariners in determining position and course, to warn of dangers or obstructions or to advise of the location of the best or preferred route.

Visual Aids

Visual aids are short range aids to navigation including buoys, daybeacons, daymarks and lights. In Canada, a combined Lateral-Cardinal system of visual aids is used. Knowledge of the characteristics of each of these basic types of aids is a prerequisite to the safe use of the system.

Lateral Aids

The lateral system of buoyage in use in Canadian waters is taken from the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Region B. Lateral aids may be in the form of either buoys or fixed aids. These aids indicate the location of hazards and the safest or deepest water by indicating the side on which they are to be passed.

The correct interpretation of lateral aids requires knowledge of the direction of buoyage known as the “upstream direction.” In general, the upstream direction is the direction taken by a vessel when proceeding from seaward toward the headwaters of a river or into a harbour.

When a vessel is proceeding in the upstream direction, starboard hand aids must be kept to starboard (right) and port hand aids must be kept to port (left).

Cardinal Aids

Cardinal aids may be in the form of either buoys or fixed aids.

Cardinal aids indicate the location of hazards and the safest or deepest water by reference to the cardinal point of the compass. There are four cardinal marks: North, East, South and West, which are positioned so that the safest or deepest water is to be found to the named side of the mark (e.g. to the north of a north cardinal mark).

Audible Aids

Audible aids are sound producing devices, which serve to warn the mariner of a danger under low visibility conditions. Buoy-mounted bells and whistles require wave action in order to produce sound. Fog signals on shore are operated when visibility is reduced to less than 2 nautical miles.

Electronic Aids

The electronic aids used in the Canadian system include radar reflectors, radar beacons and Automatic Identification System Aids to Navigation (AIS AtoN).

Radar reflectors are passive devices which are used to enhance the radar image of aids to navigation whereas radar beacons (RACON) are active devices which, by returning an identifiable radar signal, provide precise identification of the location they are marking.

E-Navigation concepts are being implemented to meet the changing needs of navigation. Actions to date include the introduction of new types of electronic aids to navigation.

An Automatic Identification System aid to navigation (AIS AtoN) is a digital aid to navigation that is broadcast by an authorized service provider using the AIS Message 21 (Aids-to-navigation report) and may be displayed on properly configured shipborne and shore-based navigation equipment such as the Electronic Chart Display Information System (ECDIS), radar, or an Integrated Navigation System (INS). It is used to supplement existing aids to navigation and aid systems, in situations where physical aid placement is impractical, or in special circumstances, such as seasonal slowdown areas. AIS AtoN provide a positive and all-weather means of identification to mariners.

The following types of AIS AtoN may be used in Canada:

- Physical AIS AtoN is based on a signal transmitted from an aid to navigation that physically exists;
- Virtual AIS AtoN is based on a signal transmitted from a source other than a physical AtoN, indicating an aid that is only displayed on electronic navigation equipment and does not physically exist.
- Synthetic AIS AtoN are divided into two types and are transmitted from AIS stations located at a distance from an existing conventional aid to navigation. The Monitored variant includes a communications link between the aid and the station, thereby confirming its position, whereas the Predicted variant does not.

Every AIS AtoN is assigned a Maritime Mobile Service Identity (MMSI) number.

A diamond-shaped symbol is used to represent an AIS AtoN on chart and radar systems that interface with the AIS. Physical and Synthetic types are represented by solid lines, while Virtual aids are represented by dotted lines. Further information about each aid appears when interacting with them through electronic navigation equipment.

Other Publications

To facilitate the proper understanding and interpretation of their function, aids to navigation are to be used in conjunction with *The Canadian Aids to Navigation System* and other marine publications, in particular, nautical charts, *List of Lights, Buoys and Fog Signals*, *Radio Aids to Marine Navigation*, Navigational Warnings (NAVWARN), *Notices to Mariners* (NOTMAR), *Canadian Sailing Directions*, and *An Owner's Guide to Private Buoys*. Information concerning nautical charts and *Canadian Sailing Directions* may be obtained from the Canadian Hydrographic Service (see Notice No. 14 for further details).

Note:

A detailed listing of all lighted visual aids, fog signals and radar beacons is contained in the *List of Lights, Buoys and Fog Signals* publication.

A detailed listing of radio beacons is contained in the *Radio Aids to Marine Navigation* publication.

A detailed listing of AIS AtoN is contained in the interactive map at the Canadian e-Navigation portal.

PRIVATE BUOY REGULATIONS

What is a "private buoy"?

The term is defined as follows in section 1 of the *Private Buoy Regulations*, made under the authority of the *Canada Shipping Act, 2001*: *"*means a buoy that is not owned by the federal government, a provincial government or a government agency.*"*

The *Private Buoy Regulations* prescribes the size, colour, shape and markings required for each buoy, as well as the responsibilities of the person(s) placing them, and provides for prohibitions.

No person shall place in any Canadian waters a private buoy that interferes with or is likely to interfere with the navigation of any vessel, or that misleads or is likely to mislead the operator of any vessel (Sec. 3).

The *Private Buoy Regulations* are administered and enforced by the Minister of Transport, who has the authority to require changes to the private buoy and may remove from the waters a private buoy that does not comply with these Regulations (Sec. 7).

Authority: *Canada Shipping Act 2001*, *Private Buoy Regulations*
Transport Canada (Navigation Protection Program)