

A Aids to Navigation and Marine Safety

A1 Aids to Navigation

1 Canadian Aids to Navigation System and Private Buoy Regulations

CANADIAN AIDS TO NAVIGATION SYSTEM

The Canadian Aids to Navigation System is comprised of a mix of visual, aural and electronic aids to navigation which, when used singly or in combination, help the mariner to determine position and course, warn of dangers or obstructions and indicate 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.

Other Publications

For proper understanding and interpretation of their function, aids to navigation are to be used in conjunction with available marine publications, in particular, nautical charts, *List of Lights, Buoys and Fog Signals, Radio Aids to Marine Navigation, Sailing Directions*, the *Canadian Aids to Navigation System* booklet GPS/DGPS and the *Owner's Guide to Private Buoys*. Information concerning nautical charts and Sailing Directions may be obtained from the Canadian Hydrographic Service, Department of Fisheries and Oceans, Ottawa. (See Notice No. 14 for further details).

Retro-Reflective Material

Most buoys and many land-based aids are equipped with light retro-reflective material. This reflective material is coloured to signify the type or lateral significance of the aid and, for buoys at close range, displays the identification symbols, letters or numbers.

On lighted buoys, this material serves as a back-up to the light. On unlighted buoys, which are normally used in channels intended for daytime use, its role is to assist any vessel caught out after dark.

To make the best use of this retro-reflective material, the Canadian Coast Guard recommends that vessels depending on aids to navigation be equipped with searchlights to enable them to make use of this reflective material when necessary. It is recommended that large vessels be equipped with searchlights with at least 75,000 candelas, and small vessels carry a hand-held search light with at least a 3 watt bulb and 6 volt battery with a nominal power of 4,000 candelas.

Lateral Aids

The lateral system of buoyage in use in Canadian waters is taken from [International Association of Marine Aids to Navigation and Lighthouse Authorities](#) (IALA) Region B (see IALA Maritime Buoyage System 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, into a harbour or with the flood current.

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.

However, their predominant use is in the form of buoys in the Canadian system.

Cardinal aids indicate the location of hazards and of the safest or deepest water by reference to the cardinal points 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).

Aural Aids

Aural 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 for sound. Fog signals on shore are operated when visibility is reduced to less than 2 nm.

Electronic Aids

The electronic aids used in the Canadian system include radar reflectors, radar beacons and AIS-AtoN.

Radar reflectors are passive devices which are used to strengthen the radar image of aids to navigation whereas radar beacons are active devices which, by means of a coded radar image, provide precise identification of the location they are marking.

The advent of e-Navigation and its many possibilities is being monitored and implemented for potential impacts and opportunities to meet the World Wide navigation changing needs. Actions to date include the introduction of new technologies enabling 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 which only displayed on electronic navigation equipment and does not physically exist.
- Synthetic AIS AtoN exist as a hybrid of physical and virtual types; they are transmitted from AIS stations at a distance from a physical AtoN. 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. Real and Synthetic types use solid lines, while Virtual use dotted lines. Further information about each aid appears when interacting with them through electronic navigation equipment.

Note:

A detailed listing of all lighted visual aids and all fog signals is contained in the [List of Lights, Buoys and Fog Signals](#) publication.

A detailed listing of Radio Beacons and Radar 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)