Maritime and Coastguard Agency Guidance.	Dover Strait crossings: Channel Navigation Information Service (CNIS) https://www.gov.uk/government/publications/dover-strait-crossings-channel-navigation-information-service/

5.1 Voluntary Reporting Systems

Around the UK there are voluntary reporting systems that ships in the area are strongly urged to comply with. Details of these systems can be found in the publications below:

- Admiralty charts
- IMO Ships' Routeing
- Admiralty List of Radio Signals, Vol.6
- Sailing Directions.

The location of the UK voluntary systems are:

- Fair Isle Channel
- Pentland Firth
- The Minches
- Kyle of Lochalsh
- Isles of Scilly.

Source of Information	
The list of locations can be found in:	SOLAS Chapter V Regulation 11 – Ship Reporting Systems, Section 6
	Admiralty List of Radio Signals, Vol.6, Part 1

Internationally, one of the most recognised voluntary reporting systems is the Atlantic Merchant Vessel Emergency Reporting (AMVER) system, co-ordinated by the US Coastguard.

AMVER is free to participate in and open to merchant vessels of any size and flag. Its purpose is to assist in the identification of a vessel in distress and the selection of the best placed vessels in the vicinity to go to their assistance.

It does this by collating reports sent in by merchant vessels participating in the scheme. There are four types of report a vessel can send:

1.	**Sailing Plan**	Can be sent before, on or a few hours after departure.
2.	**Position Report**	Sent within 24 hours of leaving and then every 48 hours.
3.	**Deviation Report**	If any voyage information changes that could affect the ability to predict the vessel position.
4.	**Final Arrival Report**	On arrival at the port of destination.

Source of Reference	
The AMVER website is an excellent resource to find out more about the scheme and reporting procedures.	www.amver.com

6 IALA Systems of Maritime Buoyage

The purpose of the IALA Maritime Buoyage System (MBS) is to enhance the safety of navigation. The organisation provides international standards in design, technical and performance specifications for IALA Maritime Buoyage Systems and other Aids to Navigation (AtoN).

6.1 Marine Aids to Navigation

There are six types of marks used in the IALA system:

1.	**Lateral Marks**	Generally used in well defined channels marking the port and starboard sides of the route to be followed.
2.	**Cardinal Marks**	These indicate where to find navigable water relative to a point of interest. Cardinal marks may be used to: • Indicate that the deepest water in an area is on the named side of the mark • draw attention to a feature in a channel such as a bend, junction, bifurcation or the end of a shoal.
3.	**Isolated Danger Marks**	These are moored on or above isolated dangers of limited extent which have navigable water all around them.
4.	**Safe Water Marks**	Indicate there is navigable water all around a mark. These may be used as a centreline, mid-channel or landfall buoy.
5.	**Special Marks**	Indicate a special area or feature which can be identified on the chart, Notices to Mariners or Sailing Direction, including: • Cables or pipelines • recreation zones • Ocean Data Acquisition System (ODAS) buoys • military exercise areas • spoil grounds.
6.	**Emergency Wreck Marking Buoy**	Used to mark new dangers. Will only remain in place until information about the new danger has been circulated sufficiently. Should be of a suitable size and equipped to aid detection under all sea conditions.

6.2 Leading Lines

Two separated structures with marks or lights which are aligned when viewed from the centreline or deepest route along a channel or approach.

A leading line may be used to:

- Indicate the centreline of a navigable channel
- indicate the deepest part of a waterway for deep draught vessels
- indicate the navigable channel where fixed and floating Marine Aids to Navigation are not available
- define a safe approach bearing to a harbour or river entrance
- separate two way traffic.

6.3 Sector Lights

This is a marine Aid to Navigation (AtoN), which displays different colours or rhythms over designated arcs.

A sector light may be used to indicate:

- Boundaries of a navigable waterway
- change of course position
- shoals/banks
- an area or position e.g. an anchorage
- the deepest part of a waterway
- position checks for floating aids.

6.4 Fixed Marine Aids to Navigation – Lighthouses and Beacons

A lighthouse is a large conspicuous structure close to the shoreline or in the water. A beacon is generally of a lower range than a lighthouse. In a channel a beacon may be used as an alternative to a buoy.

The function of a lighthouse or a beacon is to:

- Mark a landfall position
- mark an obstruction or danger
- indicate the lateral limits of a channel or navigable waterway
- indicate a turning point or junction in a waterway
- mark the entrance of a Traffic Separation Scheme (TSS)
- form part of a leading line
- mark an area
- provide a refence to take a bearing for a line of position.

6.5 Floating Marine Aids to Navigation

Buoys may be fitted with sound signals and a radar reflector. The typical range of the light is 1 to 5 nautical miles. They may also be fitted with RACON or AIS AtoNs.

Light vessels/lightships/Large Navigational Buoys (LNB or LANBYs) are major floating aids to navigation and may carry one or more RACONS, AIS or AtoN. A light vessel may in addition display a white riding light to signify it is at anchor.

Sources of Information	
IALA Navguide 2018: Marine Aids to Navigation Manual	https://www.iala-aism.org/product/iala-navguide-2018-digital-copy/
Admiralty Mariner's Handbook – 10th Edition (2015) (UKHO)	Annex C
IALA website	https://www.iala-aism.org/

7 Electronic Navigation Systems

The role of the Officer of the Watch (OOW) is a complex one. It involves monitoring and interpreting information received from a range of systems on the bridge and making decisions that will ensure the safe passage of the ship at all times. Below are some of the electronic navigation systems an OOW must be familiar with.

Systems that Control the Movement of the Ship

- Steering Control System
- Automatic Track Control System
- Power Management System
- Speed and Distance Log
- Compass Systems
- Engine Control System (Telegraph/Thrusters etc).

Systems that Aid Navigation and Collision Avoidance

- Electronic Chart Display Information System (ECDIS)
- Global Navigation Satellite Systems (GNSS)
- Radar/ARPA (Automatic Radar Plotting Aid)
- Automatic Identification System (AIS)
- Echo Sounder
- Voyage Data Recorder
- Bridge Navigation Watch Alarm System (BNWAS).

System of Communications

- Global Maritime and Distress Safety System (GMDSS), including NAVTEX.

Each of these systems are an AtoN for the OOW. They help the OOW come to an informed decision about the safe navigation of the ship. Other factors the OOW should consider are: environmental factors, human factors and ship progress compared to the passage plan.

7.1 Limitations and Sources of Error

Some general limitations of these electronic navigation systems are that when used individually they provide a narrow range of information. This is why when used on their own they are only an *aid* to navigation.

The Maritime and Coastguard Agency provides guidance on the use of electronic navigation aids and this includes:

- Be aware that each item of equipment is an aid to navigation
- be aware of the factors which affect the accuracy of position fixing systems
- appreciate the need to cross check position fixing using other methods
- know how to correctly use navigational aids and their limitations
- be aware of over reliance on the output and accuracy of a single navigational aid.

An OOW should therefore:

- Understand the contents of the operating manuals for the bridge equipment, including how to configure safety critical features
- understand how equipment and software updates are managed and how to check the latest updated have been applied
- understand the procedure for identifying equipment failures and how to respond to them
- understand the limitations of each system and item of equipment.

In addition, an OOW must be aware of and able to identify any potential software anomalies within an electronic navigation system, including:

- Any deviation from the normal or anticipated operation of the software (the OOW should be by familiar with all equipment under normal working conditions)
- any unknown or persistent anomalies. These should be reported to the equipment manufacturer
- be familiar with guidance available from the equipment manufacturers.

The OOW should also be familiar with guidance available from the equipment manufacturers.

(Bridge Procedures Guide 5th Edition, 2016)

Sources of Information	
Guidance on the over-reliance on a single electronic navigational aid, as well as good practice techniques to help ensure the watch-keeper is fully conversant with the equipment at their disposal.	MGN 379 (M+F) Navigation: Use of Electronic Navigation Aids
Guidance and good practice for the OOW.	Bridge Procedures Guide 5th Edition, 2016