## **General Lighthouse Authorities**

The United Kingdom and Ireland

# Aids to Navigation Review 2020 to 2025





Northern Lighthouse Board









## Aids to Navigation Review 2020-2025

## Undertaken by the General Lighthouse Authorities:

Commissioners of Irish Lights Northern Lighthouse Board Trinity House

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## **Section 2 - Introduction**

The 3 General Lighthouse Authorities (GLA); the Commissioners of Irish Lights, the Northern Lighthouse Board and Trinity House, operate an integrated aids to navigation service throughout the coastal waters of Britain and Ireland. This service is delivered to recognised standards set by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) so as to meet the responsibilities of the British and Irish Governments under the International Maritime Organization (IMO) Safety of Life at Sea Convention (SOLAS).

The joint Mission Statement of the GLA is to:

#### "To deliver a reliable, efficient and cost effective Aids to Navigation Service for the benefit and safety of all mariners."

This is the fifth 5 yearly Review whereby a formal, simultaneous and coordinated assessment of all the Aids to Navigation (AtoN) under their responsibility is undertaken by the three GLA. This Review addresses the current and anticipated future requirements for the safe passage of national and international shipping. It also addresses the requirements of other mariners, such as fishing and leisure users.

The mandate of the GLA and their statutory responsibility is to provide sufficient aids to navigation to mitigate risks and protect the marine environment. The GLA work with Government, shipping interests, and other stakeholders to minimise this cost.

The GLA Marine Aids to Navigation Strategy to 2030 (2030 Navigating the Future), forms the strategic foundation of this Review. Various policy considerations are contained in the GLA Joint Navigation Requirement Policies (JNRP-2012) and the Marine Navigation Plan (2016). These documents expand the strategic view.

As detailed in the AtoN Review Policy document which is contained in the JNRP, it should be recognised that the nature of shipping and navigation continues to change. Consequently the AtoN infrastructure to assist safe passage requires periodic review to ensure that the AtoNs provided are appropriate. The requirement and the rate of change vary geographically depending on a number of factors. Within the GLA areas it is considered that a Strategic Plan and Operational Plan (i.e. 5 year AtoN Review) caters for the longer and short term review requirements.

The principle applied is that the amount, mix and nature of AtoNs provided are:

- Commensurate with the volume of and nature of the traffic
- Appropriate for the degree of risk
- Integrated and cost-effective
- Compliant with internationally accepted standards

The priorities in applying such principles are:-

- The safety of life at sea
- Safe passage of shipping
- The protection of the marine environment
- The maintenance of trade

Each AtoN has been studied in isolation, as well as in relation to the other AtoN in its vicinity which is referred to as the "mix" of AtoN. The review has been carried out based solely on the navigational requirements.

The GLA provide AtoN for all clsses of mariners; the traffic mix comprises vessels of many sizes and performance levels. Across all classes, there is an overwhelming reliance on GPS with its inherent vulnerabilities to man-made interference and space weather. The GLA have concerns that lessons have not been learned from over reliance on electronic navigation and also that Cyber Security is a major concern.

As environmental drivers gain prominence in the UK and Ireland, the GLA act not only to preserve the marine environment within which the ships operate but also with a wider economic and climate conscious mind-set.

## Section 3 – Review Process

## 3.1 Start of Review Process

The 2020 AtoN Review was formally announced at the Joint Users Consultative Group (JUCG) meeting in Edinburgh on  $8^{th}$  May 2019.

## 3.2 Conduct of the 2020 Review

Each GLA has carried out a review of its own area of responsibility. Where the boundaries of two or even all three, GLA meet, a concerted view has been necessary. Thus, for example, in the North Channel/Isle of Man area, all three GLA have combined to produce the recommendations covering these areas.

In producing the recommendations contained in the Review, the GLA have:

- Carried out their own internal study of the AtoN in their area of responsibility.
- Followed an identical review process.
- Completed identical Risk Assessment Forms and signoff procedures.
- Assessed AtoN individually and as part of a "mix".
- Carried out cross-border discussions with other GLA.
- Involved the Users in initial discussions and invited comment.
- Formally briefed the individual GLA User Consultative Groups on the recommendations.

## 3.3 Peer Review

In this review, the 3 GLA have each presented their draft recommendations to the others for assessment, cross examination and comment.

#### 3.4 User Consultation

Users were formally consulted during 2018/2019 both for input into the Review and comment on the draft proposals by distribution of Notice to Mariners, press release and targeted user consultation. A number of the proposed changes contained in the Review have been incorporated as a direct result of user response obtained to date on specific areas of interest.

## 3.5 Transfers to LLAs and period of transfer

The changes recommended in this Review are generally intended to be completed within the period of the Review. In the case of transfer of AtoN to a Local Lighthouse Authority (LLA) it is possible that all recommendations may not be fully completed within the period. It is important that there is an orderly transfer of such AtoN and that they are transferred in good condition. In the case of recommendations on range reductions, unless there is a significant cost saving to be achieved, these will be completed as part of the normal Enginering Projects programme.

## 3.6 The Principles applied in determining the Navigational Requirement

In this Review, the following principles are applied.

- Generally, Visual and Radio Aids to Navigation can be considered as complementary to and an essential back-up system to GNSS.
- Physical aids are important for both offshore and inshore spatial awareness and hazard marking.
- Generally, having one AtoN in view is acceptable.
- A maximum nominal range of 18 miles is considered sufficient for most lighted Visual Aids to Navigation.
- Leading lights, sectored lights and Precision Directional Lights (PDL) remain important.

- Fog signals are no longer considered to be AtoNs and are only used as hazard warning signals.
- More use can be made of sequential and synchronised lights.

## 3.7 Methodology

As in previous Reviews, the coasts of Britain and Ireland have been divided into 21 coastal areas. Areas 1 to 8 are the responsibility of Northern Lighthouse Board. Areas 9 to 14 are the responsibility of Trinity House. Areas 15 to 21 are the responsibility of Irish Lights.

- Both Qualitative and Quantitative data has been used as far as possible to inform the overall assessment of requirements.
- AIS analysis has been used as much as possible to determine the volume, type, tracks and pattern of traffic, and when carrying out risk assessments.
- Collisions & Groundings data provided by the MCA has been used to support risk assessment.
- Use has been made of Geographic Information Systems (GIS) overlay tools to assist in the overall assessment of requirements.
- Information has been incorporated from RYA cruising routes and other sources affecting the safety of the Mariner, including proposals for Oil and Gas, Renewable Energy and Aquaculture developments.
- Each AtoN has been subject to a navigational assessment under the headings below. Where changes are recommended, a full written Risk Assessment (RA) is carried out.
- A Risk Assessment may be applied either to individual AtoN or to a group of interrelated AtoN.
- The GLAs have cross checked their RAs and recommendations with each other.

Assessment of AtoNs and the format of RAs carried out include the following considerations:

- 1 Is the AtoN a significant part of a group of Aids which will be affected by the change?
- 2 Assessment of local bathymetry against the proposed change?
- 3 Frequency and accuracy of hydrographic surveys?
- 4 Traffic density, type, size, draft and speed.
- 5 Traffic patterns to be considered in relation to conflict between route and types of vessel.
- 6 Existing obstructions and developments.
- 7 Planned new obstructions or developments.
- 8 IMO international and local charted traffic routing measures.
- 9 Port & Local Information Systems e.g. VTS, Information Service, Sailing Directions and Local NtoMs.
- 10 Local knowledge of users including the availability of pilotage.
- 11 Requirement in prevailing weather conditions including luminous range, sea conditions and background lighting.
- 12 Accident or incident history recorded for this station.
- 13 Any other considerations.

## Section 4 – Background to Review & Factors relevant to the Review

## 4A Navigational Issues

#### 4A.1 Modern Navigation

The bridges of most modern commercial ships are fitted with a number of key navigational aids, which rely on inputs from GNSS for position and timing. GNSS has brought readily available and accurate position fixing to millions and has changed the manner in which the mariner conducts a voyage. An integrated bridge has GNSS inputs to radar, electronic chart, autopilot, Automatic Identification System (AIS), Global Maritime Distress and Safety System (GMDSS) Voyage Data Recorders, Emergency Position Indicating Rescue Beacon (EPIRB) and more.

However, there remains concern that in the maritime sector there is such high reliance on GPS for positioning fixing and timing due to the known vulnerability of the system to accidental or malicious interference. Glonass, and Galileo, the Russian and European equivalents of GPS, and other planned systems will only ameliorate concerns to a limited degree. The similarities of the GNSS space based signals mean that they suffer from the same weaknesses. It is essential to retain a mix of complementary systems, as the fundamental principle of marine navigation is not to rely on a single source of navigation information when alternative sources are available. A range of resilient Position Navigation and Timing (PNT) solutions are being considered.

Given that it is estimated that over 90% of UK and Irish trade is carried by sea and our waters are some of the busiest in the world, the potential for accidents, disruption of trade, environmental damage and loss of life resulting from interruption to the GNSS signals is of great concern.

#### 4A.2 e-Navigation

e-Navigation is the next evolutionary step towards safer navigation. The IALA definition is:

"e-Navigation is the harmonised collection, integration, exchange, presentation and analysis of maritime information onboard and ashore by electronic means, to enhance berth-to-berth navigation and related services, for safety and security at sea and protection of the marine environment"

The GLA vision for e-Navigation is that it will enable innovative solutions for the:

- cost effective integration and validation of the diverse information, available from multiple sources, needed for safe, secure, efficient and environmentally friendly marine navigation;
- reliable transmission of that information to appropriate users in a timely manner using the optimum communications channels; and
- coherent presentation of the information to the user, while avoiding information overload.

e-Navigation will build on existing services to facilitate the controlled, phased and prioritised introduction of new technology, systems and services for the benefit of all mariners.

The GLA approach to e-Navigation will focus on the early delivery of benefits through the integration and delivery of data that is already available, together with the development of future solutions. To achieve this, the GLA will work with other UK and Irish organisations involved in e-Navigation to encourage a coherent, holistic and efficient approach to innovation, data and infrastructure integration and delivery of information to users.

#### 4A.3 Human Factors.

The IMO e-Navigation Strategic Implementation Plan inclues provision for Guidelines on Human Centered Design, Usability Testing, Evaluation and Assessment and Software Quality Assurance. There is an identifiable increase in marine accidents resulting from misuse of and over reliance on electronic display systems and technology for navigation and passage planning. In a number of instances a series of clearly identifiable aids to navigation have been ignored in the run up to a serious incident. Increased attention needs to be paid to human factors issues relating to the use of aids to navigation by modern mariners. Consideration needs to be given to dissemination of

information relating to AtoN as well as guidance on the expected performance and appropriate use of different types of AtoN and improving the presentation of information relating to the use of such AtoN in the context of effective bridge resource management. The GLA will work through IALA, IMO and other international bodies to develop appropriate guidance on these issues.

## 4B Marine Traffic and Density

#### 4B.1 Aquaculture

Applications for aquaculture licenses are made to the various Government Departments responsible for such activities for almost every coastal region. Long-established salmon farming has been augmented by the cultivation of other fin-fish, shellfish and seaweed. The GLA are consulted by the responsible Government Departments, regarding the impact of aquaculture on the safety of navigation in specific coastal areas. This includes the marking and lighting of fish farms, floating structures, cages and trestles. Effective Maritime Spatial Planning will need to be considered in a navigational context.

## 4B.2 Fishing

The fishing industry remains an important industry throughout Britain and Ireland, both inshore and off shore. Fishing vessel traffic and its interaction with other users is an important consideration in determining AtoN provision.

## 4B.3 Marine Leisure and Tourism

In recent years the marine leisure industry has grown significantly. Satellite navigation systems, electronic chart systems and even integrated navigation systems are common but not always fully understood as to the degree of accuracy provided and the possible vulnerabilities. Furthermore, the widespread availability of GNSS receivers, including Smart Phone Apps, is increasingly encouraging mariners of all classes to navigate either closer inshore or closer to dangers, sometimes doing so in conditions of darkness and reduced visibility where they would not have previously ventured.

Since the last review in 2015 the UK and Ireland have seen an increase in cruise tourism, with increasing numbers of cruise vessels calling to ports, harbours and anchorages around our coast Parallel to this upsurge in vessel numbers there has also been an increase in vessel size and consequently in the number of passenger per vessel. Present indications are for cruise tourism around UK and Ireland to develop and diversify. This diversification has already been seen with the arrival of exploration cruise tourism calling to more remote and previously unexplored ports, loughs and estuaries around the coast. As a result, many Local Lighthouse Authorities (LLA) are having to re-access the navigational requirements in these areas, by developing and adapting traditional AtoN and utilising advances in technology in order to respond to the navigational safety needs of the cruise industry. The GLA has been working with LLA to assist them in responding to this changing need while also reviewing the general AtoN provision in line with this trend in shipping.

## 4B.4 Offshore Renewable Energy Installations (OREIs)

There continues to be a proliferation of applications for offshore windfarm sites around our coasts, this trend is set to increase as the UK and ROI Governments set higher targets for power generation from renewable sources. Many more windfarms are in the planning or consent stage. These sites present a particular challenge to the GLA to ensure they are marked correctly and do not impede safe navigation of vessels. This is especially so while in the construction phase.

In addition, there are experimental wave and tidal energy devices with numerous applications for such sites. These sites are also challenging to mark, particularly wave generators that are often difficult to detect due to low freeboard.

## 4B.5 Routing Measures and Traffic Separation Schemes (TSS)

The International Maritime Organization is the specialist agency of the United Nations responsible for maritime safety. It is the only international body that can sanction measures on an international level concerning ship routeing and areas to be avoided by ships or certain classes of ships.

Submissions regarding route proposals or areas to be avoided are the responsibility of Government, i.e. The Department of Transport, Tourism and Sport (DTTAS) in Ireland and the Department for Transport (DfT) in the UK. In the UK this role has been delegated to the Maritime and Coastguard Agency, which is an Executive Agency of the DfT.

There are 10 TSS adopted in the UK and Ireland. These are situated in the Approaches to The Humber, Dover Straits, the English Channel, Scilly Isles, Smalls, Anglesey, North Channel (Rathlin Island), Fastnet, Tuskar and The Little Minch. Associated with TSS there may also be Inshore Traffic Zones (ITZ).

A Deep Water Route for tankers exists west of the Outer Hebrides.

## 4C Technology Issues

## 4C.1 DGPS

The GLA Differential GPS infrastructure was originally installed in 1998, largely to mitigate the effects of selective availability, a purposeful error introduced to degrade the accuracy offered to civilian GPS users. Selective Availability was turned off in 2000, following which the main function of DGPS has been to provide integrity i.e. a real-time warning if a satellite, or the GPS system, was degraded and unusable.

The GLA DGPS infrastructure was last partially replaced between 2008 and 2014 and the current equipment is nearing the end of its design life. Since the last system recapitalisation, alternative technologies such as SBAS (EGNOS across Europe) and Receiver Autonomous Integrity Monitoring (RAIM) have developed further.

SBAS providers do not currently recognise a maritime user and while SBAS functionality is available in most receivers, it is not type approved. This is being addressed by the European GNSS Agency (GSA) and the European Commission (EC). GSA and the EC are considering an EGNOS maritime service with the GSA seeking to support the standardisation required to enable type approved SBAS receivers. Both of these aspects are expected to come to fruition around 2021/2022, following which type approved receivers will potentially enter the market.

RAIM is generally available in most modern maritime GNSS receivers. RAIM requires sufficient satellites in view to operate correctly and a single GNSS constellation results in periods where there are insufficient satellites with the required geometry for RAIM to function, although this is limited to short periods of the day. This is not a problem with multi-constellation GNSS receivers as there are significantly more satellites available. It is anticipated that multi-constellation GNSS receivers will become more widely available for purchase.

Finally, it is also noted that commercial augmentation services are available for those mariners that require high accuracy positioning and/or integrity with performance guarantees.

The GLAs note that while there are IMO performance specifications for marine differential services and corresponding IEC test specifications for maritime differential receivers, there is no mandatory carriage requirement for differential receivers. Some vessels opt to carry such equipment based on their requirements whilst others do not. As such, the decision to mitigate any loss of integrity resides with the mariner. The absence of a carriage requirement means the owners can make a choice on how they manage integrity issues.

The GLAs have concluded that the GLA DGPS system is now redundant in view of available shipborne systems and recommend that the GLA DGPS system should be discontinued as an aid to navigation. However, to ensure ship operators and Masters are fully aware of the intention to withdraw the service and where necessary, move to alternative solutions, the GLA intend that the DGPS System should remain operational until March 2022.

While the DGPS service is being discontinued there will be value in retaining the allocated frequency spectrum, radio masts and some of the other infrastructure pending clarification of future requirements.

## 4C.2 Automatic Identification System (AIS)

AIS has been developed as an identification transponder system which can be used for monitoring ship movements. AIS is mandatory on SOLAS vessels greater than 300grt.

Navigational safety can be enhanced by the use of AIS as an AtoN. An AtoN transmitting AIS is capable of display on the bridge Electronic Chart Display and Information System (ECDIS) and Radar. Further information is available to the mariner on the status of the AtoN such as its "health" and position.

It is also possible to use both shore based and floating aids to provide meteorological and hydrological information.

The GLA have taken into account the fact that the number of Mariners capable of seeing the AIS AtoN on an appropriate display is increasing.

There are a number of vessels who are not required to carry AIS, including the leisure, fishing and smaller commercial vessels, however a number of these vessels voluntarily carry AIS.

#### 4C.3 Virtual AIS AtoNs

A Virtual AIS AtoN is transmitted from an AIS station to establish an aid to navigation that does not physically exist. In this case, a digital information object will appear on the navigational system for a specified location, even though there is no physical AtoN. A nearby base station or AtoN station could broadcast this message. The AIS message will clearly identify this as a Virtual AIS AtoN.

Virtual AtoN are particularly useful in time-critical situations and in marking/delineating dynamic areas where navigational conditions change frequently or in applications where the use of physical aids is not practical or possible. For example, it may be appropriate to create a virtual AtoN to mark hazards to navigation on a temporary basis until a more permanent AtoN can be established. Alternatively, virtual aids to navigation may be established to mark areas where navigation conditions (for example; channel boundaries, overhead clearance, water levels) change frequently and would require dynamic marking.

There is however a growing recognition that AIS AtoN can be used on a longer term basis. IMO MSC.1/Circ.1473 (May 2014) notes that Virtual AIS AtoN should not be used for permanently marking an object for which Physical AtoN would be possible, but, may be considered for marking an object or feature where it is difficult or economically unreasonable to establish a Physical AtoN due to environmental constraints e.g. deep water, harsh sea conditions. Another case of the permanent application of Virtual AIS AtoN is for example marking a shoal that changes with time due to current or weather effects; and, where the object or feature is impossible to maintain as charted because of changes that occur over time.

#### 4C.4 Web Based AtoN

Some small harbours and marinas have entered into commercial contracts with system providers that display aids to navigation solely on web based navigation systems for the use of their customers. These include versions of Virtual AIS AtoN licenced by OFCOM and showing correct MMSI numbers. The GLA are unable to monitor or verify these systems and will not be providing AtoN in this manner.

#### 4C.5 Light Emitting Diodes (LEDs)

The use of LEDs has been extended to beacons and lighthouses with similar advantages to those seen on buoys. Off the shelf omnidirectional LED AtoN lights can currently provide a nominal range of around 18nM. However, ongoing research and development in LED technology is constantly delivering improvements in light intensity, efficacy and optical technology. It is already evident that such advances in technology are changing the way in which AtoN lights are designed. Modern LED AtoN light design is typically based on a modular approach giving advantages in manufacture, product flexibility and customer choice. If designed properly, a modular approach should also promote standardisation.

## 4C.6 Power Sources (Green Energy)

The GLA are commited to continuing to invest in green energy solutions, including solar power, wind power and alternative fuel sources, for our AtoN.

## 4D Future Developments

## 4D.1 Marine Automated Surface Ship (MASS)

The GLA are currently engaging with industry and the established regulatory working group in the UK in areas such as governance and regulation, codes, operations as well as training and skills in order to access the future requirements of MASS.

## **Section 5 – Contacts**

Any comments or observations on the Review may be sent to the appropriate GLA, as follows:

## Comments in respect of Areas 1 - 8

Director of Operations Northern Lighthouse Board 84 George Street Edinburgh Scotland EH2 3DA Email: <u>navigation@nlb.org.uk</u>

## **Comments in respect of Areas 9 - 14**

Director of Navigational Requirements Trinity House Lighthouse Service Trinity House Tower Hill London EC3N 4DH Email: <u>navigation@trinityhouse.co.uk</u>

## Comments in respect of Areas 15 - 21

Director of eNavigation and Maritime Services Commissioners of Irish Lights Harbour Road Dun Laoghaire Co. Dublin A96 H500 Ireland Email: <u>info@irishlights.ie</u>

## **Section 6 - References**

The following publications have been referred to during completion of the Review. The most recent version of each document has been used in each case.

- EU Directive for Maritime Spatial Planning (Aug 14).
- Admiralty Charts, UKHO.
- Admiralty List of Lights, Volume A, NP74, UKHO.
- Admiralty List of Radio Signals, Volume 2, NP282, UKHO.
- Admiralty Sailing Directions UKHO.
- 2030 Navigating the Future, GLA, 2016.
- Joint Navigation Requirements Policy, GLA, 2012.
- Marine Navigation Plan 2016 to 2030 GLA 2016.
- Corporate Plans of Irish Lights, Northern Lighthouse Board, Trinity House.
- Safe Seas Connected Coasts Irish Lights Strategy 2018-2023
- UK Port Freight Statistics, DfT, 2018
- UK Sea Fisheries Statistics, MMO, 2017.
- IALA Recommendations and Guidelines.
- IMO Circulars.
- Safety and Shipping Review 2015, Allianz Global Corporate & Specialty

## Section 7 - Abbreviations

| ALL     | Admiralty List of Lights                         |
|---------|--|
| AIS     | Automatic Identification System                  |
| AtoN    | Aid(s) to Navigation                             |
| BA      | British Admiralty                                |
| DGPS    | Differential Global Positioning System           |
| DfT     | Department for Transport (UK)                    |
| DTTAS   | Department of Transport, Tourism and Sport (ROI) |
| DR      | Dead Reckoning                                   |
| ECDIS   | Electronic Chart Display and Information System  |
| eLoran  | Enhanced Loran                                   |
| e-Nav   | e-Navigation                                     |
| EPIRB   | Emergency Position Indicating Radio Beacon       |
| EU      | European Union                                   |
| F       | Fixed  |
| FI      | Flashing   |
| G       | Green  |
| Galileo | European Satellite Navigation system             |
| GLA     | General Lighthouse Authorities                   |
| GLONASS | Global Navigation Satellite System (Russian)     |
| GMDSS   | Global Maritime Distress and Safety System       |
| GNSS    | Global Navigation Satellite System               |
| GPS     | Global Positioning System                        |
| IL      | Commissioners of Irish Lights                    |
| IMO     | International Maritime Organization              |
| Iso     | Isophase   |
| ITZ     | Inshore Traffic Zone                             |
| L FI    | Long Flash                                       |
| Ldg Lts | Leading Lights                                   |
| LED     | Light Emitting Diode                             |
| MMO     | Marine Management Organisation                   |
| MKD     | Minimum Keyboard and Display (AIS)               |
| nM      | Nautical Mile                                    |
| NLB     | Northern Lighthouse Board                        |
| Осс     | Occulting  |
| OREI    | Offshore Renewable Energy Installations          |
| PDL     | Precision Directionional Light                   |
| PNT     | Position, Navigation and Timing                  |
| Q       | Quick Flashing                                   |
| R       | Red  |
| Racon   | Radar Beacon                                     |
| ROI     | Republic of Ireland                              |
| SAR     | Search and Rescue                                |
| SOLAS   | Safety of Life at Sea (IMO Convention)           |
| ТН      | Trinity House                                    |
| TSS     | Traffic Separation Scheme                        |
| UK      | United Kingdom                                   |
| W       | White  |
|         |  |

## Section 8 – List of Review Areas

- Area 1 Isle of Man, North Channel, Clyde
- Area 2 Mull of Kintyre to Ardnamurchan
- Area 3 Ardnamurchan to Barra Head; Cape Wrath to The Flannan Isles
- Area 4 Scotland N. Coast, Orkney Is (exc. Pentland Firth)
- Area 5 Pentland Firth
- Area 6 Shetland Islands
- Area 7 Noss Head to Rattray Head
- Area 8 Rattray Head to St Abbs Head
- Area 9 Berwick to Sizewell (Sub-divisions B1, B2, B3)
- Area 10 Sizewell to Shoreham (Sub-divisions C1, C2, C3)
- Area 11 Shoreham to Lyme Regis (Sub-divisions D1, D2)
- Area 12 Lyme Regis to Bude (Sub-divisions E1, E2)
- Area 13 Bude to Cardigan (Sub-divisions F1, F2, F3)
- Area 14 Cardigan to Silloth (Sub-divisions G1, G2)
- Area 15 Fastnet to Tuskar
- Area 16 Tuskar to Baily
- Area 17 Baily to St John's Point Down
- Area 18 St John's Point Down to Rathlin Island
- Area 19 Rathlin East to Tory Island
- Area 20 Tory Island to Loop Head
- Area 21 Loop Head to Fastnet

## Section 9 – Inter-GLA Diagram covering Review Areas

## Navigation Review Area with GLA Contiguous Zones





## Area 1 – Isle of Man, North Channel and Clyde

## **OVERVIEW**

The Isle of Man, lying mid-way between the coasts of Cumbria and Northern Ireland, mainly consists of mountains and hills with east-west valleys. The North of the island is low lying and flat with banks and shallows off shore whilst the southern end of the island is heavily indented by small bays with isolated offshore drying rocks.

The south west coast of Scotland from Solway to Kintyre starts at the most eastern part of the Solway as low lying with shallow waters, numerous drying banks and shifting sands. As the coast runs west it becomes mainly bold and rocky, indented by bays rising to steep cliffs at the Mull of Galloway and along the Rhinns edging the North Channel, which is deep and unobstructed but experiences strong tidal flow. The Firth of Clyde, also deep and generally unobstructed, has a high and rocky coast and some sandy beaches on its eastern shore. The Firth has a number of rocky islands rising from its deep waters; Arran, Sanda and Pladda on its N and W edge and Ailsa Craig in the middle of an otherwise clear channel.

Principal ports in the area are Douglas serving the needs of the Isle of Man with Ro-Ro and fast ferry, local fishing and coastal bulk cargoes. Kirkcudbright remains an important fishing port for shell fish. The new Loch Ryan Port and Cairnryan handle Ro Ro and HSC ferries for Northern Ireland (5.4 million tonnes /year in 2018) whilst the Clyde ports handle container traffic, coal imports, crude oil imports, petroleum product exports and bulk materials totalling 9.1 million tonnes per year along with Cruise and MOD vessels. Campbeltown supports timber exports, fishing and small general cargo vessels, in addition to a NATO fuel jetty and a ferry service to Ardrossan. Smaller ports in the area serve the leisure industry, smaller fishing vessels and occasional coastal trade.

There is significant vehicle ferry traffic, linking Arran, Bute and Cumbrae to the mainland, and connecting the peninsulas of the Upper Firth of Clyde.

Traffic of all types (passenger, cargo, leisure and Government) and sizes in significant quantity operate throughout this area, either departing or arriving at local ports or as through traffic transiting the Irish sea, passing west of the Isle of Man and through the North Channel in both directions. Additionally, traffic proceeds to and from major Irish and English ports, passing south and north of the Isle of Man. Fishing occurs throughout the area. There are a substantial number of leisure users who sail in the Firth of Clyde, with smaller numbers in Loch Ryan, the Solway Firth and Isle of Man.

Marine Protected Areas (MPA) include Special Areas of Conservation (SAC) in the Solway Firth and Luce Bay; Special Protection Areas (SPA) at Ailsa Craig, the Inner Clyde Estuary, and the Upper Solway Flats and Marshes; and Nature Conservation MPAs (NCMPA) at the Clyde Sea Sill, South Arran, and Upper Loch Fyne and Loch Goil. In the Isle of Man there are five Fishery closed or restricted areas, and five Marine Nature Reserves around Ramsey.

**TSS**: There is no TSS or routing measures in this area.

AtoNs provided: 22 lights, 17 Buoys, 3 Racons, 3 unlit Beacons, 5 AIS.

Future developments in the area that may affect AtoN provision include the potential siting of a windfarm East of the Isle of Man.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Point of Ayre<br>Corsewall<br>Loch Ryan | Re-engineer with minimum 18nM range (19nM)<br>Re-engineer with minimum 18nM range (22nM)*<br>Re-engineer; maintain existing 12nM red light |
|---|--|
| Pladda                                  | Re-engineer; maintain existing 17nM range  |
| AIS & Virtual AIS<br>Capability         | Add to Point of Ayre and Corsewall   |

\* = carried forward from 2010 Review



## Area 2 – Mull of Kintyre to Ardnamurchan

## **OVERVIEW**

The West of Scotland presents an almost uninterrupted succession of deep indentations, fronted by bold rocky cliffs and headlands forming islands, narrows and sea lochs. Drying rocks and reefs are plentiful quite often with deep navigable waters immediately adjacent. The Mull of Kintyre to Ardnamurchan coast line is no exception; exposed directly to the Atlantic Ocean and the full force of winter gales, the coast is frequently obscured by low cloud and driving rain. Strong tidal streams, and eddies can be experienced in narrows and inshore.

Principal ports in the area are Oban and Fort William (Corpach). The former provides a major ferry hub for routes to the islands, fishing, small numbers of general bulk cargo, fish farm support (feed and smolt) and frequent seasonal cruise vessel traffic along with a substantial number of leisure craft. Corpach handles bulk timber and quarry products while Fort William at the South end of the Caledonian Canal sees significant leisure traffic and some cruise vessel visits. Throughout the area particularly on the islands there are a number of smaller ferry and coaster berths, fishing harbours and leisure craft moorings & marinas. A quarry terminal at Glensanda operates large bulk carriers (exporting 5.9 million tonnes in 2018).

Local lifeline ferries operate Kennacraig to Port Ellen and Port Askaig; Oban to Colonsay, Port Askaig, Craignure, Lismore, Coll, Tiree & Barra; across the Sound of Mull and to Iona and Gigha. There are further council operated ferries at Corran, Lismore, Luing, Easdale, Fort William and Jura.

Traffic routes have not substantially changed since 2015, however there has been a significant increase in vessels (ferries, leisure, cruise) visiting Oban Bay in particular (40,000 vessel movements in 2017). Traffic of all types: passenger ferry, cargo, leisure and Government in small but significant quantity operate throughout this area either departing or arriving at local ports providing essential transport for the economy of the area.

Through traffic falls into two types. Larger vessels remain within the TSS to/from the North Channel and keep to the SW of Skerryvore before turning north to the Minch or heading northwest for the deep water route or west. Smaller coastal vessels often choose to pass through the sound of Islay and to the east of Coll and Tiree. Fishing occurs throughout the area. The area is popular with adventurous leisure sailors and new marina developments have been implemented in Oban, Tobermory and Ulva (Mull).

Marine Protected Areas include SAC in the Firth of Lorn, SE Islay, Sunart, Tayvallich and Treshnish Isles; SPAs at Islay, Colonsay and Tiree; and NCMPA in Loch Creran, Loch Sunart and South to the Sound of Jura, and Loch Sween. There are Historic MPAs at Dartmouth, Duart Point and Iona.

**TSS**: A TSS lies between Rathlin Island and Mull of Kintyre for vessels approaching/exiting the North Channel.

AtoNs provided: 44 lights, 58 Buoys, 2 Racons, 2 unlit Beacons, 7 AIS.

Future developments in the area that may affect AtoN provision include tidal energy sites in the Sound of Islay and to the SW of Islay which may restrict depths for some vessels which currently use the area.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Dubh Artach<br>Skerryvore                 | re-engineer with a minimum 18 nM range re-engineer with a minimum 18 nM range* |
|---|--|
| Bhanarach Rocks (Gigha)                   | Establish an East Cardinal Mark buoy   |
| Rubha Cuil-cheanna<br>(Corran Narrows SE) | Establish a sector light for southbound traffic                                |
| Loch Spelve                               | Reinstate (unlit) starboard hand beacon  |

\* = carried forward from 2010 Review



# Area 3 – Ardnamurchan to Barra Head; Cape Wrath to the Flannan Isles

## **OVERVIEW**

Between Ardnamurchan and Cape Wrath the almost uninterrupted succession of deep indentations, fronted by bold rocky cliffs and headlands, forming islands, narrows and sea lochs continue. Strong tidal streams and eddies can be experienced in narrows and inshore.

A chain of about 30 islands known as the Hebrides lies parallel and a short distance from the mainland. These islands are in two groups the Outer and Inner Hebrides separated by the Sea of the Hebrides and the Little Minch. Further north the Outer Hebrides are separated from the mainland by the North Minch. The outer islands are exposed to the Atlantic Ocean. To the west of the Outer Hebrides, which are generally low lying, the coastal bank extends up to 15 miles offshore and in places rock pinnacles extend beyond the bank. Outside of the deep water route surveys are incomplete. The passage between the Inner and Outer Hebrides affords some shelter from the Atlantic but depths within the Little Minch are very irregular and several banks some of which are extensive lie across the NE entrance. Consequently traffic routing and reporting measures are in place. The Little Minch in bad weather forms a dangerous sea area due to the wind, tidal streams and uneven nature of the bottom producing high and turbulent seas. The sound of Harris provides a route from Little Minch to the Atlantic for coastal craft.

Throughout the area there are numerous small ports and harbours supporting the general local economy or specific operation where direct road access is poor. Collectively they provide for significant levels of trade. Ports such as Mallaig, Ullapool and Stornaway provide for ferry terminals for routes to the islands, fishing, coastal general bulk cargo, fish farm support and frequent seasonal cruise vessel traffic. Timber is exported from mainland ports such as Kishorn with substantial quarry traffic also occurring. Local life line ferries operate Mallaig to South Uist,

Armadale, Eigg, Muck, Canna & Rhum; Ullapool to Stornaway; Uig to Tarbert and Lochmaddy; Berneray to Leverburgh; Oban to Castlebay and Barra to Eriskay, with a winter service also linking Mallaig and Lochboisdale. There are also local ferries operating in Loch Nevis and between Glenelg and Kylerhea (Skye).

Traffic patterns have not substantially changed since 2015 other than the re-routing of the Lochboisdale ferry from Oban to Mallaig, and a significant increase in cruise vessels visiting the area. Traffic of all types - passenger ferry, cargo, leisure and Government - in small but significant quantities operate throughout this area either departing or arriving at local ports providing essential transport for the economy of the area. Throughout the area but particularly in the southern half there is substantial seasonal leisure craft activity. Through traffic consists of large and smaller crude and product tankers, to and from North Sea and Flotta, Scapa and the Forth, oilfield support vessels repositioning to and from the North Sea, seasonal cruise ship traffic up to and including Queen Mary II, Coaster trade to/from Orkney, Shetland or east coast ports, or Scandinavia. The routing measures for the Minch and west of the Hebrides largely govern through traffic patterns. Laden tankers over 35000 DWT use the deep water route west of the Hebrides but when in ballast often choose to navigate through the Minch north bound. All other traffic generally uses the Minch north and south bound. Fishing occurs throughout the area.

The former oil rig construction yard at Kishorn has been re-developed to attract renewable energy work and platform refurbishment facilities. Fish farm feed is transported from both Kishorn and a new feed mill at Kyleakin. A new port facility is planned for Glumaig at Stornoway to attract large cruise vessels and renewable energy developments. Marina developments have been implemented in Castlebay, Lochboisdale, Lochmaddy, Stornoway and Kyle of Lochalsh.

Marine Protected Areas include SAC in Rum, Monach Isles, North Rona, Sound of Barra, South Uist, St Kilda, Loch Maddy, Loch Eport, the Sound of Arisaig, Loch Roag. Loch Laxford, Loch Moidart, Ascrib & Dunvegan, East Mingulay and the Inner Hebrides and Minches; SPAs at the Flannan Isles, St Kilda, the Shiant Isles, North Uist, South Uist, Mingulay & Berneray, Cape Wrath, Handa, Canna & Sanday and Rum; and NCMPA in Lochs Duich, Long & Alsh, the Monach Isles, the Small Isles, Wester Ross and Loch Carron. There are also Historic MPAs at Drumbeg, Mingary Point and Kinlochnervie.

**TSS**: There is a TSS at Neist Point to separate north and south bound traffic in the Little Minch. IMO approved routing measures are in place in the Little Minch and west of the Outer Hebrides.

AtoNs provided: 58 lights, 64 Buoys, 9 Racons, 12 unlit Beacons, 21 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Butt of Lewis<br>Cape Wrath<br>Haskeir<br>Hyskeir<br>Ornsay<br>Dunvegan | Re-engineer with a minimum 21nM range; discontinue<br>DGPS service with effect from 2022<br>Re-engineer with a minimum 18nM range<br>Re-engineer with a minimum 18nM range<br>Re-engineer with a minimum 18nM range<br>Re-engineer, maintain existing 12nM range<br>Re-engineer as LED sector light |
|---|---|
| Whale Rock buoy   | Replace with Virtual AIS AtoN broadcast from St Kilda/<br>Flannans/Haskeir  |
| Portain (Sound of Harris)   | Replace buoy with lit beacon  |
| Eileanan Dubha<br>(Lochalsh)  | Trial daytime conspicuity switching for use in restricted visibility  |
| AIS & Virtual AIS<br>Capability   | Add to Neist Point, Eilean Glas and Rubh Re   |



# Area 4 – Scotland North Coast; Orkney Islands (excluding Pentland Firth)

#### **OVERVIEW**

The North coast of Scotland from Cape Wrath to Dunnet Head is mainly heavily indented cliffs with a few off lying dangers inshore.

The Orkney Islands, a group of more than 50 islands separated from mainland Scotland by the Pentland Firth are mainly low lying except for Hoy. Their coasts are much indented and generally rocky but there are also extensive sandy beaches especially on the NE side of the group. On the SW side the coasts consist of steep cliffs in places reaching 300m. About midway between South and North Ronaldsay the Orkney Islands are divided into two parts by the Stronsay Firth and Westray Firth which together form a continuous passage running NW and SE linking the Atlantic to E & W Orkney Islands. Scapa Flow, virtually a small inland sea, lies in the south part of the group with navigable entrances to the Atlantic and Pentland Firth.

The principal ports in the area lie to the east with the Orkneys dominating, collectively handling 1.05 million tonnes of cargo per annum. This includes ship to ship crude oil transfers which occur in Scapa Flow. The main ports are Kirkwall and Stromness, but throughout the Orkneys there are numerous small mixed use ports and harbours supporting the general local economy and the large number of inter island ferry routes or specific operations. Fishing, coastal general bulk cargo, fish farm support and frequent seasonal cruise vessel visits along with oil field related vessels are all part of port activity. Local ferries outside of LLA waters operate Scrabster to Stromness, Aberdeen to Kirkwall and Stromness, and Gill's Bay to South Ronaldsay. Traffic patterns have not substantially changed since 2015 other than a significant increase in cruise vessels visiting the area.

Traffic of all types - passenger ferry, cargo, leisure and Government in small but significant quantity operate particularly around and to and from Orkney providing essential transport for the economy of the area, significant numbers of crude oil tankers enter Scapa Flow from the Pentland Firth. A through route from Pentland Firth via Scapa Flow to Stromness is utilised on occasion. Traffic along the north coast consists of large and smaller crude and product tankers, to and from the North Sea and Flotta, Scapa and the Forth, oilfield support vessels repositioning to and from the North Sea, seasonal cruise ship traffic up to and including Queen Mary II, Coaster

trade to/from Orkney, Shetland or east coast ports, or Scandinavia. Fishing occurs throughout the area.

Marine Protected Areas include SAC at Durness, Faraym and Solan Bank; SPAs at North Rona & Sula Sgeir, Westray, Copinsay, Sule Skerry & Sule Stack, Rousay, Calf of Eday, Marwick Head, and Sanday; and NCMPA in Papa Westray, Wyre & Rousay Sounds, and North–West Orkney.

**TSS**: There are IMO routing measures in the Fair Isle Channel to the North of this area; an area to be avoided by laden tankers is in place around the Orkney Islands.

**AtoNs provided**: 21 lights, 14 Buoys, 2 Racons, 2 unlit Beacons, 8 AIS (including three Virtual AtoN).

Future developments that will affect AtoN provision post this review include:-

There are several potential tidal and wave energy developments planned around Orkney, although the number and planned rate of development have both reduced in recent years. Although the Flotta terminal is in decline, Scapa Flow, as one of the few locations in UK waters that allow ship to ship transfer of crude oil and petroleum products will remain an important location for the oil industry. In June 2018 Orkney Harbours issued a draft Masterplan for the expansion of harbour facilities at Kirkwall, Hatston, Scapa, Stromness, Lyness and a Deep Water harbour facility within Scapa Flow.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

Start PointRe-engineer, maintain existing 18nM rangeSkerry of NessRe-engineer as LED light with no green sector but precise cut-off<br/>at 090°

## Area 5 – Pentland Firth



#### **OVERVIEW**

The Pentland Firth is bordered by the rocky mainland coast to the south from Dunnet Head to Duncansby Head which is indented by numerous bays and coves. The Orkney Islands provide its northern boundary with similar rocky coast around Hoy, South Walls and South Ronaldsay. Within the Firth deep waters are interspersed with the islands of Stroma, Swona and Pentland Skerries. The latter, with the associated 10 mile long narrow bank substantially reducing depths results in a funnelling effect. Tidal streams within the firth are renowned and can reach up to 12 knots creating tidal races and eddies which can be dangerous particularly in combination with adverse weather. Substantial seas occur (wind against tide) in circumstances of strong westerly or SE winds. Consequently reporting measures are in place and the Firth may be closed to some or all traffic by HMCG.

The principal port in the area excluding the Orkneys is Scrabster which handled 14,500 tonnes of fish in 2017, has a Ro Ro facility for the ferry to Stromness and handles local coastal cargoes, including fuel, timber & rock salt. In addition oil industry vessels utilise the lay by facility and seasonal cruise vessel visit numbers are growing. An HSC ferry operates between Gills Bay and St Margarets Hope, with increased capacity as of 2019, and in summer a passenger ferry operates beteen John O'Groats and South Ronaldsay. The Pentland Firth remains a key route for UK and international traffic.

Traffic patterns have not substantially changed since 2015 other than a significant increase in cruise vessels visiting the area. Traffic of all types - passenger ferry, cruise, cargo, and Government in small but significant quantities operate to and from the Orkneys and Scrabster via the Pentland Firth. Significant numbers of crude oil tankers enter/leave Scapa Flow via the Pentland Firth loaded and in Ballast.

Through traffic consists of large and smaller crude and product tankers, to and from the North Sea and Flotta, Scapa and the Forth, oilfield support vessels repositioning to and from the North Sea, seasonal cruise ship traffic up to and including Queen Mary II, Coaster trade to/from east coast ports, or Scandinavia.

Trawling does not occur within the Pentland Firth due to tidal conditions but other fishing occurs around the islands, and it remains a key route for fishing vessels in transit and landing at Scrabster.

There are designated Special Protection Areas at North Caithness, East Caithness, and Hoy.

**TSS**: There are no TSS or routing measures in the area, an area to be avoided by laden tankers is in place around the Orkney Islands.

AtoNs provided: 7 lights, 0 Buoys, 2 Racons, 1 unlit Beacon, 2 AIS.

Future developments that will affect AtoN provision post 2020 review include:-

Following the establishment of the demonstrator Meygen turbine farm in the Inner Sound, larger scale tidal energy is proposed for areas of the Firth around Stroma, Duncansby Head and off South Ronaldsay, The potential for a container Hub port, often hinted at for the Orkneys, is unlikely to come to fruition in the medium term. Although the Flotta terminal is in decline, Scapa Flow, as one of the few locations in UK waters that allow ship to ship transfer of crude oil and petroleum products will remain an important location for the oil industry.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Pentland Skerries               | Re-engineer, maintain existing 23 nM range                               |
|---------------------------------|--|
| AIS & Virtual AIS<br>Capability | Add to Duncansby Head; establish permanent Virtual AtoN for Sandy Riddle |

## Area 6 – Shetland Islands



## **OVERVIEW**

The Shetland Islands, a group of more than 100 islands, holms and rocks, lie with Sumburgh Head as their southern extremity and stretch some 60 miles north to Muckle Flugga. The principal islands are Mainland, Yell and Unst. The Shetland Islands are for the most part relatively high, undulating, fringed by bold cliffs and separated by narrow sounds. Toward the N end of the group Yell and Bluemull Sounds both navigable passages run, N&S through the islands between Mainland and Yell, and Yell and Unst respectively. The high and rocky island of Fair Isle also forms part of the Shetlands dividing the otherwise deep unobstructed passage collectively known as Fair Isle Channel between Orkney and Shetland Islands. The NLB is responsible for all but port AtoNs in this area.

Principal ports in the area are Sullom Voe whose oil terminal handles 5.3 million tonnes of cargo a year, and Lerwick, an important mixed use port serving the needs of the Shetlands population and the oil industry. Lerwick is the UK's second most important fishing harbour landing some 39,800 tonnes in 2017. The port handles around 5,000 vessels per annum including cruise, Ro Ro ferry, coastal tankers, pelagic trawlers, fish farm and oil industry support as well as leisure users. Throughout the Shetlands there are numerous small mixed use harbours such as Scalloway supporting the general local economy and the large number of inter island ferry routes, fishing, leisure or specific operations. Ferries operate Lerwick to Kirkwall and Aberdeen. Numerous Local ferries operate throughout the islands. Fishing and inshore fish farming occur extensively throughout the area. Oil industry decommissioning activities are expected to increase in significance in the coming years.

Traffic patterns changes since 2015 have seen a significant reduction in oil traffic and an increase in cruise vessels visiting the area. Traffic of all types - ferry, cargo, leisure, fishing and fish farm and Government - in significant quantities operate throughout this area, inter island or either departing or arriving at local ports from the Orkneys, mainland Scotland or Scandinavia. There is significant, and growing, oil industry traffic to the west of Shetland as well as the Northern North Sea with vessels transiting through the Shetlands and using its ports. There remains substantial tanker traffic to/from Sullom Voe.

The Fair Isle Channel remains an important route for Scandinavian trade bound for the Atlantic, and for tankers loaded and in ballast for Sullom Voe or in transit to/from the west.

Marine Protected Areas include SAC at Yell Sound, Mousa, Papa Stour, Hascosay, and Sullom Voe; SPAs at Foula, Fair isle, Hermaness, Papa Stour, Noss, Fetlar, and Sumburgh Head; and NCMPA at Fetlar to Haroldswick, and Mousa. There is also a Historic MPA at Out Skerries.

**TSS**: There are no TSS in the area, IMO approved routing is in place in the Fair Isle channel. Areas to be avoided by laden tankers are in place around the Orkney Islands, Fair Isle and Shetland.

AtoNs provided: 37 lights, 4 Buoys, 3 Racons, 1 unlit Beacon, 2 AIS.

Future developments that will affect AtoN provision post 2020:-

Sullom Voe, established in the 1970s, originally had a 30 year intended life. A number of significant AtoN were established specifically for tanker traffic with the intention that these be discontinued when the terminal ceased to operate. The terminal life has now been extended and will continue to operate for the foreseeable future. The associated AtoNs continue to be required.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Foula           | Re-engineer and establish red sector to East (257° - 277°)*; maintain 17nM range          |
|-----------------|---|
| Muckle Flugga   | Re-engineer with minimum 18nM range*  |
| Out Skerries    | Re-engineer with minimum 18nM range   |
| Sumburgh Head   | Re-engineer, maintain existing 23nM range; discontinue DGPS service with effect from 2022 |
| Esha Ness       | Re-engineer with minimum 18nM range   |
| Fair Isle North | Re-engineer with minimum 18nM range   |
| Fair Isle South | Re-engineer with minimum 18nM range*  |
| Hoo Stack       | Re-engineer with LED sector light and discontinue<br>Directional light*                   |
| Bullia Skerry   | Reduce range from 5nM to 3nM  |

\* = carried forward from 2010 Review

## Area 7 – Noss Head to Rattray Head



#### **OVERVIEW**

From Noss Head the coast runs in a generally SSW direction, mainly composed of rocky cliffs fringed by drying rocks and boulders but generally clear of dangers beyond 2 cables from shore. Further South the coast line changes with cliffs reducing and receding into a large bight which forms the approach to the Dornoch Firth. At the Eastern end of this bight lies Tarbat Ness at the low lying extremity of the peninsula. Heading South from Tarbat Ness the coast again becomes rocky forming cliffs with hills behind which gradually increase in height to the SW with the entrance to Cromarty Firth forming a distinct cleft. At Rosemarkie these cliffs lead inshore and the coast line becomes a low lying tongue of sand and shingle forming the North shore to the Inverness Firth. The southern seaward shore of the Inverness Firth leads East and is initially low lying and sandy with drying banks. From Scar Nose east rocky cliffs, fringed by drying reefs prevail with some sandy stretches to Rattray Head. The Beatrice oilfield and offshore wind farms lie within the Moray Firth to the NE of Tarbat Ness whilst numerous oil installations lie to the East of Rattray Head.

Principal ports: Cromarty Firth handles general bulk agricultural and timber cargoes. Oil industry support is provided and the Firth is a major semi submersible rig layup and maintenance location. Construction of the nearby Beatrice and Moray East Windfarms has been supported from terminals within the Firth. Cruise vessels of all sizes are regular seasonal visitors. Inverness recently expanded as a mixed use port handling coastal fuel, timber, grain etc as well as an important east coast marina at the head of the Caledonian Canal. Wick provides similar facilities, and is now the Operations and Maintainance base for the Beatrice Offshore Windfarm in the Moray Firth. The coast to the east has a number of fishing harbours with the largest, Fraserburgh, landing 27,000 tonnes in 2017. Some of these harbours support limited other mixed use and marinas.

Fishing occurs extensively throughout this area.

There have been major changes to traffic patterns since 2015, mostly associated with the offshore wind industry. Construction activity at the Beatrice wind farm is now complete and the farm is now subject to Operations & Maintenance activity based on Wick. There is construction activity ongoing at the Moray East site, with a possibility of further development at Moray West. There is also potential for floating wind farm sites in this area. The Beatrice/Jacky oil field is now at end of life, with decommissioning planned to take place during the next 5 years.

Cargo, leisure & fishing vessels in significant quantity operate throughout this area either departing or arriving at local ports from other mainland Scotland ports, Europe or Scandinavia. Tankers loaded and in ballast, cruise vessels and oil support vessels for the Cromarty Firth arrive depart to/from the East or Pentland Firth. Shuttle tankers and other oil support craft anchor along the Moray coast, sheltered from the prevailing weather. Through traffic of all types and sizes to /from the Pentland Firth crosses the area on a NW/SE heading from Rattray Head to Duncansby Head. There is significant oil industry traffic to the East of Rattray Head serving the numerous oil installations in the North Sea.

Marine Protected Areas include SAC at the Dornoch Firth and Moray Firth; SPAs at the Dornoch Firth, Cromarty Firth, Inner Moray Firth, Moray & Nairn Coast, and Troup, Pennan & Lion's Heads; and an NCMPA at Noss Head.

**TSS**: There are no TSS or routing measures in this area.

AtoNs provided: 8 lights, 14 Buoys, 2 Racons, 1 unlit Beacon, 1 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

| AIS & Virtual AIS | Add to Kinnaird Head |
|-------------------|----------------------|
| Capability        |                      |





## **OVERVIEW**

From Rattray Head the coast runs in a generally SSW direction to Fifeness. The Isle of May lies toward the centre of the approach to the Firth of Forth. The coast north of the Forth is mainly composed of rocky cliffs, fringed by drying reefs. There are several sandy stretches from Rattray Head to Peterhead, north of Aberdeen and north of Montrose as well as the Mouth of the Tay. There are a number of outlying banks and deeps along the coast most notably Bell Rock lying 9.5 miles SE of Whiting Ness.

The Island of Fidra lies to the SW of the Isle of May from where the coast runs ESE to St Abb's Head. From Fidra south, the coast is a mixture of rocky cliffs fringed with reefs and sandy bays.

There are a number of offshore installations to the east. This stretch of Coast is home to a number of significant ports – Peterhead, as well as being the UK's largest fishing port landing 151,000 tonnes in 2017, is a major oil industry support base and small marina. Aberdeen is the UK primary oil industry support facility, as well as a ferry port and general bulk cargo port handling 4.1 million tonnes in 2018. Montrose provides mixed general bulk and oil industry support facilities. Dundee has similar but larger facilities and acts as a support base for offshore maintenance decommissioning activitites

The Firth of Forth under one port authority provides a number of ports and terminals which collectively handle some 27 million tonnes per annum. The Forth is a major petroleum port exporting crude oil in up to VLCC size vessels as well as handling products and gas shipments. Large numbers of feeder container vessels visit whilst general bulk facilities are at a number of locations dealing with timber, coal, aggregates etc Cruise vessels of all sizes visit the river. Oil industry support vessels are handled. Small scale fishing is undertaken from some of the Fife coast ports and there is significant numbers of leisure users based in a number of marinas within

the port authority area. There has been little change in traffic since 2005 other than an increase in cruise traffic.

A small wind farm is located close to shore at Aberdeen, and the world's first floating offshore windfarms are located off Peterhead (Hywind) and Stonehaven (Kincardine). The development of larger windfarm developments off the Firths of Tay and Forth are imminent, including the 3.5GW Seagreen site.

Dominant traffic patterns are for vessels of all sizes and types to approach/depart the Forth/Tay to the SE for the European ports and Dover Straits staying quite close to the coast to St Abb's Head, to head ENE/WSW for the Skagerrak and Scandinavian ports or NNE/SSW along the coast to/from Rattray Head. Traffic not for Scottish East coast ports navigating the UK coast stays off shore to/from Rattray Head. Aberdeen and Peterhead traffic is dominated by oil and fishing traffic heading east and NE to the oil platforms and fishing areas.

Ferries operating in this area are the Aberdeen Orkney/Shetland. Discussions over a new ferry route running from Rosyth to Eemshaven in the Netherlands are ongoing.

There is a significant fishing off shore throughout this area.

Marine Protected Areas include SAC In Berwickshire, at the Isle of May, and the Firth of Tay & Eden estuary; SPAs in the Firth of Forth, at Buchan Ness, the Ythan estuary, Fowlsheugh, the Forth Islands, Montrose Basin, the Firth of Tay & Eden estuary, and St Abbs Head to Fastcastle; and NCMPA at the Firth of Forth Banks. There is a Historic MPA at HMS Campania.

**TSS**: There are no TSS or routing measures in this area.

AtoNs provided: 9 lights, 3 Buoys, 6 Racons, 3 unlit Beacons, 3 AIS.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Bell Rock<br>Girdleness         | Re-engineer, maintain 18nM range<br>Re-engineer, maintain 22nM range; discontinue DGPS service<br>with effect from 2022 |
|---------------------------------|---|
| Earls Hill  (Stirling)          | Discontinue DGPS service with effect from 2022  |
| AIS & Virtual AIS<br>Capability | Add to Buchan Ness, Fife Ness and St Abbs Head  |

## Section 10 – Review of Trinity House Areas (9 – 14)

## Area 9 – Berwick to Sizewell



## OVERVIEW.

The area covers three sub-areas, the NE Coast; the Wash, which includes the Humber; and Yarmouth which covers the East Coast of Norfolk and Suffolk Coast.

Developments of Offshore Wind Farms will continue to affect AtoN provision in the area. There will also be increased construction activity and traffic associated with offshore renewable energy sites. The AIS analysis of traffic patterns in the area has shown changes due to the siting and increasing size of the Offshore Wind Farms, however there is no apparent appetite for the larger vessels to transit existing sites, preferring to route around the areas.

The **NE Coast** area from Berwick to Spurn Head is one in which there are numerous dangers, in the form of off-lying Islands and isolated rocks. These, together with some off-lying banks, are mainly encountered within the 20m-depth contour. The most prominent coastal feature is the headland to the north of Bridlington, marked by Flamborough Head Lighthouse. Offshore, tidal streams are regular and rarely exceed 1 knot at springs. The major commercial ports of Berwick; Blyth; Tyne; Sunderland; Seaham; Tees & Hartlepool lie within this region, together with numerous fishing and leisure ports/harbours.

The **Wash** area from Spurn to Cromer has two major outlets, the Humber and Wash into which numerous rivers drain. The estuaries are both bordered by large flats. South of the Humber, the navigable channels are restricted by numerous off-lying shoals and the coastline is low lying. Tidal streams are stronger and the tidal range at springs in the Wash increases to 6m. Traffic volumes partly due to wind farm construction vessels and work boats have increased in this area; the shallow waters with numerous sandbanks and mobile areas of the seabed require regular surveys and therefore subject to regular review. A number of commercial ports lie on the River Humber and on the rivers flowing into the Wash, in addition, in the southern part of the area there are a number of small fishing ports/harbours. Within this sub-area offshore production platforms and drilling rigs are encountered. The **Yarmouth** area is dominated by constantly changing sandbanks and shoals close offshore and a low-lying featureless coastline. The banks are subject to frequent surveys and buoyage marking the navigable channels is subject to regular review. Depths are shallower, over the offlying banks in the vicinity of Great Yarmouth and Lowestoft. Tidal ranges and rates are less than those encountered in the Wash.

**TSS:** There is an IMO recognized TSS in the approaches to the River Humber.

AtoNs provided: 11 Lights; 78 Buoys; 3 beacons; 11 Racons; and 7 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW.

| Flamborough Hd LH | Reduce Range to 18nm on re-engineering.  |
|-------------------|--|
| N Docking LB      | Monitor for position.                    |
| E Dudgeon LB      | Monitor for position.                    |
| NE Cross Sand LB  | Monitor for position.                    |
| Cockle LB         | Investigate reposition to NW and rename. |

## Area 10 – Sizewell to Shoreham



#### **OVERVIEW**

The area covers three distinctive sub-areas, Harwich, Estuary and Dover.

Developments of Offshore Wind Farms will continue to affect AtoN provision in the area. There will also be increased construction activity and traffic associated with offshore renewable energy sites. The AIS analysis of traffic patterns in the area has shown changes due to the siting and increasing size of the Offshore Wind Farms, however there is no apparent appetite for the larger vessels to transit existing sites, preferring to route around the areas.

The **Harwich** area coastline is generally low lying and featureless with outflows from several major rivers. Offshore there are numerous shoals many of which have less than 5 metres over them, with narrow navigable channels between. Tidal streams generally follow the direction of the coast and overfalls may be encountered. There is a high level of leisure craft activity based in the Harwich/Ipswich area; the River Deben; Orford Haven, River Colne and the Blackwater's. Commercial traffic for the ports of Felixstowe, Ipswich and Harwich, includes ferries and cruise vessels using Harwich International Port.

The **Estuary** area is dominated by outflows from the Thames, Medway and The Swale as well as by numerous off-lying shoals with narrow navigable channels between, some of which are subject to constant change. Consequently they are surveyed at frequent intervals and the buoyage marking the navigable channels is subject to regular review. The main channels are marked to 10 or 12 metres, where depths permit. The maximum tidal steams encountered are 2.9 knots and tend to follow the direction of the channels. Maximum tidal ranges of some 3m at the seaward limits of the area increase to over 5m in the approaches to the River Thames. The major commercial ports of London; Medway and Whitstable and the smaller ports of Brightlingsea and Wallasea lie within this region, together with fishing and leisure ports/harbours.

The **Dover Strait** is characterized by shallow water with dangerous offshore banks, shoals, and numerous wrecks which restrict vessels navigating through the area. The area comprises of three major headlands, with the exception of Dungeness, these headlands are bounded by steep cliff features of rock or chalk cliffs. The water is generally shallow to the extent that certain large vessels cannot proceed through the Strait at their maximum draft. Tidal stream rates reach a
maximum of 3.7 Knots off the Goodwin's, and are generally in the direction of the off lying shoals and banks, the area is also one of high fishing and leisure craft activity.

Due to the high volume of traffic, the constriction of the through traffic, caused by the banks and shoals, coupled with the high volume of crossing ferry traffic, between the Channel ports and the Continental ports, the area is one of high collision risk. The bulk of the deep-sea vessels trading to North European ports from other ports of the world traverse through the Dover Strait.



The major commercial ports of Ramsgate; Dover; Newhaven and Shoreham lie within this region, together with fishing and leisure ports / harbours.

**TSS:** There are IMO recognized TSS in the Sunk area and northern approaches to the Thames Estuary and in the Straits of Dover and adjacent waters. Within these schemes Deep Draft Routes have been established. An Inshore Traffic Zone (ITZ) lies to the landward of the TSS through the Dover Straits.

**AtoNs provided:** 4 Lights; 201 Buoys; 16 Racons; 1 beacon; 6 Lightvessels; 1 Lightfloat and 12 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW.

Royal Sovereign LHTo be decommissionedNorth Foreland LHIntens Red Sector can be reduced to same range as Unitens.

## Area 11 – Shoreham to Lyme Regis



## **OVERVIEW**

The area is divided into two sub-areas, Wight and Channel.

Developments of Offshore Wind Farms will continue to affect AtoN provision in the area. There will also be increased construction activity and traffic associated with offshore renewable energy sites. The AIS analysis of traffic patterns in the area has shown changes due to the siting and increasing size of the Offshore Wind Farms, however there is no apparent appetite for the larger vessels to transit existing site, preferring to route around the area.

Aquaculture developments are becoming more prominent in the area especially in Lyme Bay. These are affecting Local AtoN provision and require monitoring for their effects on TH AtoN.

The **Wight** area has three major headlands, Portland Bill, Durlston Head and St Catherine's Point, two bays and marked channels to the West and East of The Solent and Southampton Water. The coastline is distinctive and radar conspicuous, the Shambles bank is a danger to vessels navigating in the vicinity of Weymouth Bay; The Needles Channel affords a particularly narrow entrance to the Western Solent for commercial vessels, with outcrops of isolated rocks off The Needles to the east and the Shingles Bank to the West which is subject to movement at its southern extremity.

The tidal streams are greater in strength in this sub-area; off St Catherine's they can reach 3.8kts. Tidal ranges are greater towards the French coast than on the English coast, for example, at the NW Minquiers Lighted Buoy these are in the region of 9.75m. Tidal streams are very strong off Portland Bill, up to 7kts, and may cause heavy seas. Strong winds in the opposite direction to the tidal streams can lead to steep seas.

Crossing traffic between the English and French ports can lead to increased risk of collision with traffic bound to and from the Dover Strait TSS. Principal ferry routes run between Weymouth; Poole and the Solent to the Channel Islands, Cherbourg and Northern Spain. The area also has a very high level of small craft activity, including fishing and leisure.

The **Channel** area includes the Channel Islands and the Minquiers Plateau. These are surrounded by numerous rocks and shoals, which present dangers to all classes of mariner. The tidal streams in the Channel Islands are strong, and tidal ranges increase towards the French Coast. As is the case with the Wight sub-area, crossing traffic between the ports on the south coast of England, the Channel Islands and the French Ports can lead to the increased risk of collision. High Speed Craft operate on these routes and between ports in the Channel Islands. The major commercial ports of Littlehampton; Portsmouth; Southampton; Cowes and Poole lie within this region, together with fishing and leisure ports/harbours.

**TSS:** There is an IMO recognized TSS off Casquets. **AtoNs provided:** 10 Lights; 1 Light Vessel; 40 Buoys; 1 beacon; 6 Racons & 3 AIS

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW.

Needles LHRange to be reduced to 16nm on re-engineering.St Catherines LHRange to be reduced to 18nm on re-engineering.Alderney LHReview 24hr requirement on re-engineering.Portland Bill LHRange to be reduced to 18nm on re-engineering.

## Area 12 – Lyme Regis to Bude



## **OVERVIEW**

The area is divided into two sub-areas. Penzance which covers the Western part of the English Channel and the second sub-area named Land's End which encompasses the major landfall of Bishop Rock in the Isles of Scilly and Land's End.

Within the area, there has been very little development of Offshore Renewable Energy. The most recent round of leasing from the Crown Estates is not allowing for future developments in this area, although this is likely to change with Central Government's desire to promote renewable energy sources.

Aquaculture developments are becoming more prominent in the area especially close to Fowey and in Lyme Bay. These are affecting Local AtoN provision and require monitoring for their effects on TH AtoN.

The **Penzance** area coastline presents a distinctive radar target at the rock headlands of the Lizard and Start Point, with isolated rocks encountered in the bays of Penzance, Lyme Bay and Tor Bay. Tidal streams off The Lizard are reasonably strong. There are numerous ports and anchorages where shelter can be sought on this part of the coast. However, apart from Dartmouth and Tor Bay, there is little shelter during strong SW Winds Eastward of Start Point where in conditions of strong offshore winds and ground swell, entering some of the harbours in Mounts Bay is not recommended. From Penzance Bay to Lyme Bay there are a number of commercial ports, as well as small tidal harbours. Fishing and leisure craft activity is also encountered within the harbours to varying degrees.

The **Land's End** area also presents a distinctive radar target, having similar features to the Penzance sub-area, such as bold headlands and rocky cliffs, which are steep too. From St. Ives the coastline is lower and recedes around St Ives Bay to Godrevy Point.

The south-western most danger of the Isles of Scilly is marked by Bishop Rock Lighthouse, which provides a major landfall for vessels approaching the British Isles. The tidal streams around the Isles of Scilly are not that strong, however, they do increase in strength off the main

promontories. Within the Islands the traffic mainly comprises fishing and leisure craft. Commercial traffic is limited to the island ferries, although cruise liners are now using St Mary's as a port of call.

The commercial ports in the area are Teignmouth; Plymouth; Fowey and Falmouth together with numerous fishing and leisure ports/harbours.

**TSS:** There are three IMO recognized TSS: off Land's End between Seven Stones and Longships; to the South of the Scilly Islands; and to the West of the Scilly Islands. **AtoNs provided**: 15 Lights; 1 Lightvessel; 26 Buoys; 11 beacons; 5 Racons & 5 AIS

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW.

| Manacle LB      | Monitor for position.                          |
|-----------------|--|
| Runnelstone LB  | Monitor for position.                          |
| Bishop Rock LH  | Range to be reduced to 18nm on re-engineering. |
| Trevose Head LH | Range to be reduced to 18nm on re-engineering. |

## Area 13 – Bude to Cardigan



#### **OVERVIEW**

This area is divided into three sub-areas, Swansea, Cardiff and Milford. The latter area borders onto CIL jurisdiction, and therefore has been the subject of joint discussions.

Developments of Offshore Tidal Energy will likely affect AtoN provision in the area. There will also be increased construction activity and traffic associated with these sites. There have been numerous sites identified by Natural Resources Wales in and around Milford Haven for renewable energy test sites with the first subsea devices due in 2020.

The **Swansea** area covers the Bristol Channel from just West of Hartland Point to Worms Head eastwards to a line drawn between Barry and Watchet. It includes the major headlands of Hartland Point, Bull Point, Nash Point and Worms Head. Swansea and Barnstaple Bays, together with the headlands provide a radar conspicuous coastline. Swansea Bay has extensive shoals, extending west from its east side, parallel to the main shipping route.

Ground Swell from the Atlantic may be encountered, except when easterly winds have prevailed, the effects of this swell are felt mainly on the North shore as far East as Swansea Bay. Tidal stream rates and ranges increase as one proceeds up the Bristol Channel. Typical speeds off Morte Point are 3.2 knots with tidal ranges of 7.8m compared with a speed of 4.4 knots and a range of 10.2m off the Breaksea Buoy.

The **Cardiff** area covers the eastern part of the Bristol Channel and the Severn Estuary. The coastline decreases in height east of Nash Point, and east of Hurlstone Point. In general, the coastline is low lying; however, there are areas of higher coastline with cliffs. It is indented to the south by Bridgewater Bay.

Flat Holm and Steep Holm Islands lie in the approaches to the Severn Estuary, a number of banks and shoals are encountered, together with mud flats. The Bristol Channel in this sub-area narrows from approximately 10 miles wide at the Western end to 2 miles at the commencement of the River Severn. Tidal stream rates are high, reaching a maximum of 8 knots. And tidal ranges increase considerably as one proceeds eastward, reading a maximum of some 12m at

the Elbow and N W Elbow buoy stations. The area also has a very high level of small craft activity, including fishing and leisure.

The **Milford** area encompasses the Welsh Coast from the Burry Inlet round to Cardigan and includes the major headlands of St Govan's Head, St Ann's Head, St David's Head and Strumble Head. The coastline is radar conspicuous, consisting of moderately high cliffs, indented by several bays and inlets, including the Barry Inlet, Carmarthen Bay, Milford Haven, St Brides Bay, and Fishguard Bay. This is an area of numerous off-lying islands and rocks, including Caldey Island, The Smalls, Skokholm, Grassholm, The Bishops and Clerks and Ramsey Island. Shifting sands are encountered over much of the Burry Inlet and depths are therefore subject to frequent change. The harbours of Burry Port and Llanelli, Tenby and Saundersfoot are mainly used by fishing and leisure craft, as are the Afon Taf and Tywi.

Safe water anchorages are available off Caldey Island and subject to suitable weather conditions in Rhossili Bay. Milford Haven provides good shelter and a harbour of refuge. The Helwick Sands should be given a wide birth, as Westerly winds against the tide cause heavy seas and the East going tidal stream sets NE towards the sands. An area to be avoided has been established enclosing The Smalls and Grassholm. In addition laden tankers over 10 000GRT should not use the channel between Grassholm and Skomer Island unless moving between St. Brides Bay and Milford Haven. In the vicinity of The Smalls, tidal stream rates vary from 3kts to 5kts. Due to the exposed nature of the coast, tidal races and constricted channels are encountered around Skokholm, Skomer, and Grassholm and between The Bishops and Clerks and Ramsey Island. Tiderips, dangerous to small craft, are also encountered near shoals and banks south of Milford Haven and amongst some of the aforementioned Islands.

**TSS:** There is an IMO recognized TSS off the Smalls **AtoNs provided:** 18 Lights; 58 Buoys; 3 AIS & 8 Racons

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW.

| Horseshoe LB   | Monitor for position and fit AIS AtoN.          |
|----------------|---|
| Nash Point LH  | 18nm Range to be re-examined on re-engineering. |
| Lundy North LH | 18nm Range preferred on re-engineering.         |

## Area 14 - Cardigan to Silloth



## **OVERVIEW**

The southern half of this area borders CIL jurisdiction and therefore has been the subject of joint discussions, the northern part is a joint area involving all three GLAs. The area is divided into two sub-areas, Holyhead and the Irish Sea.

Developments of Offshore Wind Farms will continue to affect AtoN provision in the area. There will also be increased construction activity and traffic associated with offshore renewable energy sites. The AIS analysis of traffic patterns in the area has shown changes due to the siting and increasing size of the Offshore Wind Farms, however there is no apparent appetite for the larger vessels to transit existing sites, preferring to route around the areas.

Future tidal energy developments close to Anglesey could affect the provision of AtoN in the area if they are given consent.

Projects for a new nuclear power station in Camaes Bay, and a cable tunnel across Morecambe Bay are currently on hold but if they come to fruition it is expected these will require changes to the AtoN in the respective areas.

The **Holyhead** area lies between Cardigan and the Isle of Anglesey, where the northern seaward border adjoins the jurisdiction of CIL and NLB. Cardigan Bay forms a major feature with numerous smaller bays within, the area affords good radar returns. Tide races and tide rips are evident in Cardigan Bay which has numerous small craft harbours. Between Aberystwyth and Bardsey Island the Coastline consists of low-lying ground interspersed with rocky cliffs, dangerous shoals extend offshore. The prominent headland, formed by the Lleyn Peninsula, lies to the north, again a number of small craft harbours lie in the region principally used as yachting centres. The Menai Strait separates the Isle of Anglesey from the mainland. Tidal rates are strongest off the main headlands, with races and tide rips. The port of Holyhead operates cargo and passenger service to Ireland. Harbours and ports in the Menai Strait provide commercial, as well as fishing and leisure craft, facilities.

The **Irish Sea** area comprises a number of bays, affording suitable shelter for small coasters, fishing and leisure craft. The area is dominated by Liverpool Bay and Morecambe Bay, into each

of which flow a number of rivers. The area from Great Ormes Head to the Point of Ayr comprises a combination of low-lying coastline, backed by high land on the North Wales Coast. Rigs and production platforms are situated in both Liverpool and Morecambe Bays. A number of shoals and banks are encountered in the approaches to the Dee Estuary and the River Mersey. Liverpool Bay, the Ribble Estuary and Morecambe Bay all feature low lying coastlines, with considerable areas of drying sands. North of St Bees Head the coastline is deeply indented by several bays, which are wide and separated by bold headlands. A large proportion of the Solway Firth has continually shifting drying sandbanks with channels in-between. Tidal stream rates off the entrance to the Solway Firth are up to 2kts. These rates increase to 4kts as the Firth is approached.

The main commercial ports are Holyhead; Mostyn; Liverpool; Garston; Manchester; Fleetwood; Lancaster; Heysham Barrow; Workington and Silloth. Some of this is ferry traffic to and from Northern Ireland and the Isle of Man. A number of other smaller ports/harbours in the sub-area are principally used by fishing and leisure craft.

**TSS:** There are two IMO recognized TSS in the area: off Skerries and in Liverpool Bay. **AtoNs provided:** 8 Lights; 39 Buoys; 3 beacons; 3 Racons & 2 AIS

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW.

| Skerries LH | HWS to be standardised to 1bl ev30s       |
|-------------|---|
| Trwyn Du LH | HWS can be Horn or Bell on re-engineering |

Section 10- Review of Irish Lights Areas (15 -21)

## Area 15 - Fastnet to Tuskar



The Fastnet to Tuskar coastline particularly in the west of the region, is high and rocky with bold cliffs and headlands. The eastern area has the Coningbeg rocks and Saltee Islands projecting off the coast.

The main commercial ports in the area are Cork, Waterford and New Ross within the Waterford River estuary. The approaches to these ports are comparatively straightforward. However, the approaches to smaller leisure and fishing ports, anchorages and bays can be difficult, often with dangerous rocks and reefs.

The main fishing ports are at Schull, Baltimore, Union Hall, Cork, Ballycotton, Dungarvan, Youghal, Dunmore East, and Kilmore Quay. There is an increasing mix of commercial fishing and commercial/leisure angling.

The main leisure craft centres are at Crookhaven, Schull, Baltimore, Union Hall, Cork, Ballycotton, Dungarvan, Youghal, Dunmore East, Waterford and Kilmore Quay.

The Fastnet Rock is a common waypoint for transatlantic traffic eastbound for the Irish Sea or Bristol Channel ports or for westbound traffic to North America. The significant dangers in the offshore route are the two Kinsale Head Gas production platforms, which are subject to a 500m-exclusion zone and Fastnet Rock.

**TSS**: There are two IMO recognised Traffic Separation Schemes in force – one off Fastnet and one off Tuskar. The Offshore route between these schemes covers a distance of 140nM taking vessels clear of all headlands and the Coningbeg Buoy.

**OREIs**: Offshore activity in the area includes the Kinsale Head Gasfields consisting of two lighted production platforms and a group of wells which are planned for decommissioning in the coming years. There are also proposals in place for renewalable energy site with a wind farm between Mine Head and Hook Head in concept/ early planning stages.

AtoNs provided: 10 Lights, 19 Buoys, 4 beacons, 4 Racons, 18 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

Daunt

Area 16 - Tuskar to Baily



The Tuskar to Baily region features a series of shallow sandbanks. The coastline, with the exception of some prominent headlands, is low lying. This, combined with the distance offshore of the dangerous banks, necessitates a reliance on floating aids.

The sandbanks extend up to nine miles off the coast with some drying out at low water. These banks are subject to movement following southerly or easterly gales and are gradually changing, requiring ongoing survey in order to ensure the buoyage is in the optimum position.

In assessing the AtoN requirements in this area, it should be borne in mind that, due to the prevailing south-westerly winds, many smaller or lower powered vessels, on coastal passage, seek the shelter of the land during heavy weather from this direction, and thus pass well inside most of the off-lying sandbanks.

The main commercial ports in the area are Rosslare and Dublin. There are smaller ports at Arklow and Wicklow. The approaches to all these ports are through channels between sandbanks.

The main fishing ports are at Rosslare, Wexford, Arklow and Wicklow. There is also a significant angling industry.

The main leisure centres are at Wexford, Courtown, Arklow, Wicklow, Greystones, Bray and Dun Laoghaire.

The principal shipping routes through the region are:

- A through route for vessels bound for the North Channel or Ports on the West Coast of the U.K.
- > An offshore route to Dublin Bay.
- > A coastal route to Dublin Bay and Ports between Rosslare and Dublin.
- > The East/West corridors through the Banks.

Within the coastal route are a number of internal channels, the North and South Shears, the Rusk Channel, and channels between the Codling, India and Arklow Banks and the Blackwater and Lucifer Banks.

There is a clear requirement for the provision of suitable AtoN for the safe inshore passage around Tuskar Rock Lighthouse.

**TSS**: There is an IMO designated Traffic Separation Schemes at Tuskar Rock. There is a non IMO designated TSS in Dublin Bay.

**OREIs**: A wind farm exists at Arklow Bank which is planned to be expanded in the coming years. There are also proposals in place for wind farms at Codling, Bray and Kish banks.

AtoNs provided: 4 lights, 34 Buoys, 5 Racons, 20 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Glassgorman No.2 | Resurvey Bank - Possibly move on results |
|------------------|--|
| Codling          | Reverse decision to move the Buoy        |
| Muglins          | Establish AIS                            |

## Area 17 - Baily to St John's Point Down



This area has a coastline, which can be characterised throughout its entire length by a very lowlying featureless foreshore. There is only one notable exception to this and that is the area of the high coastal slopes of the Mourne Mountains, that border the sea on the western shore of Dundrum Bay.

Through-traffic in the Irish Sea, on passage between the Codling Superbuoy, or Kish Tower, and the South Rock Superbuoy, transits well to the east of the coast.

However, there are many harbours and ports in the area, which generate considerable coastal traffic, including commercial, fishing and leisure craft.

The principal commercial ports are Drogheda, Dundalk, Greenore, and Warrenpoint.

The principal fishing harbours are Howth, Rush, Skerries, Balbriggan, Port Oriel (Clogher Head), Kilkeel and Annalong.

The principal leisure boat harbours are Howth, Malahide, Rush, Skerries, Balbriggan, Carlingford Lough, Kilkeel and Annalong.

Most of the ports in this region have tidal limitations or restrictions, as the foreshore throughout its length is shelving and shallow, consisting mainly of sand and gravel but with some off-lying rocks in the vicinity of the south Down coast and the Skerries/Loughshinny area of the north County Dublin coast.

With the exception of Carlingford Lough, there is virtually no safe anchorage for vessels seeking shelter from strong on-shore winds in this region.

**TSS**: There are no Traffic Separation Schemes in this area.

**OREIs**: There is a proposal in place for renewable energy sites with wind farm developments off Dundalk and an additional wind farm of Drogheda.

AtoNs provided: 5 lights, 7 Buoys, 2 Beacons, 1 Racon, 8 AIS.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

Cardy Rocks Addition of a Light to the Beacon

## Area 18 - St John's Point Down To Rathlin Island



St. John's Point, Co. Down to Rathlin Island forms the west side of the North Channel, which carries seaborne traffic through a relatively narrow seaway.

This coastal area can be divided roughly in two for the purpose of describing the natural features of its terrain.

With the exceptions of the Maidens Rocks and Hunter Rock, both of which are marked, the coast from Fair Head to Black Head, at the north-eastern entrance to Belfast Lough, is quite steep-to, with deep water off, and no navigational hazards to speak of.

However, on passing South of Belfast Lough, the coast from Mew Island to the entrance to Strangford Lough is low-lying with offshore reefs and hazards. There are no inshore channels, as all craft keep well east of the major waypoint of the South Rock Type 1 buoy.

In the case of Donaghadee Sound, this buoyed passage has a number of shoal patches. It is not generally suitable for large vessels but does attract a considerable amount of Belfast traffic, which would otherwise be obliged to pass East and North of Mew Island.

Belfast and Strangford Loughs are the only two inlets, which offer shelter to vessels seeking refuge. Belfast Lough is open to the East and is of limited use in this respect. However, Audley Roads, in Strangford Lough, provides an all-weather anchorage for smaller commercial vessels, fishing boats and leisure craft.

There are two commercial ports, Belfast and Larne however there are additional commercial berths inside Belfast lough such as that at Kilroot power station and there are now plans to reinstate a berth Cloghan Point Oil Jetty. In recent years a number of cruise vessels have anchored in the Belfast Lough and operated a tender boat service into Bangor.

The Fishing ports are Kilkee, Killough, Portaferry and Portavogie.

The main Leisure ports are Ardglass, Strangford, Portaferry, Ballywalter, Portavogie, Donaghadee, Bangor and Carrickfergus, Ballycastle.

**TSS**: There is a Traffic Separation Scheme off Rathlin Island.

**OREIs**: There are no OREIs in this region at this time.

AtoNs provided: 5 lights, 12 Buoys, 8 Beacons, 3 Racons, 11 AIS, and 1 Virtual AtoN.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

Butter Pladdy Skullmartin Survey wreck/bank to east and reposition if required Reposition to the north to align with red sector

## Area 19 - Rathlin East to Tory Island



The North Irish coast between Rathlin East Lighthouse and Tory Island is relatively clear of hazards to navigation.

The three principal islands which lie off this coast, Rathlin, Inishtrahull and Tory, are each provided with sufficient AtoNs, to guide the deeper draught, North Atlantic traffic, bound in or out of the North Channel, well north of any inshore hazards which lie along the coast.

As far as the needs of inshore traffic is concerned, the mainland coast can be described as a series of prominent headlands, jutting out into comparatively deep water, with few exceptions, and a number of very deep, navigable inlets, the principal ones being Lough Foyle, Lough Swilly, Mulroy Bay and Sheephaven.

On the eastern section of the coast, Rathlin Sound is an important passage for shipping, which is well served by the lighthouses at Rathlin West and Rue Point. The tidal streams and overfalls in this area can be strong and turbulent and these two AtoNs, at either end of the sound, can greatly assist the safe transit of inshore traffic.

Inshore navigation between Inishtrahull Sound and Rathlin Island does not pose any particular problems. Any identifiable hazards are minor and so close to the mainland that they do not call for attention beyond that which is already provided.

Fanad Head and Malin Head are also relatively free of immediate dangers except for the Limeburner shoal. However, Inishtrahull Sound, which lies close East of Malin Head can be a treacherous sea passage for smaller vessels in certain weather and tidal conditions, and the unlighted Garvan Isles which lie on the landward side of the Sound are a danger to be particularly avoided. The powerful light and Racon on Inishtrahull are considered adequate for the guidance of vessels transiting the Sound or taking the offshore route.

Horn Head is quite clear of off-lying dangers, and the shoals on either side of the entrance to Mulroy Bay are sufficiently inshore as not to constitute a serious danger. The isolated Limeburner Rock, with only 2 metres of water over it, is adequately marked by a type 2 lighted buoy which also serves as a useful waypoint for offshore traffic.

Tory Sound is deep and navigable, delineated by night by the sectored local authority light on Bloody Foreland, as well as the major light on Tory Island.

The principal commercial port in the area is Foyle Port formally known as Londonderry Port. The principal fishing harbours are Greencastle and Rathmullan. The principal leisure boat harbours are Rathlin Harbour, Ballycastle, Coleraine, Portrush, Portstewart, Foyle Marina, Lough Swilly and Mulroy Bay.

TSS: In the east of this region, the Rathlin Traffic Separation System and Tanker exclusion zones require particular attention.

OREIs: There are no OREIs in this region at this time.

AtoNs provided: 8 lights, 13 Buoys, 1 Beacon, 3 Racons, 10 AIS

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

Rathlin EastReduce range to 18nmStork RockEstablish a permanent Buoy or Beacon to replace current temporary<br/>AtoN

## Area 20 - Tory Island to Loop Head



The Tory Island to Loop Head region is one of the most exposed areas in Northwest Europe, as it takes the full brunt of the prevailing winds and North Atlantic storms. There is limited all weather shelter for any large vessel seeking refuge.

The geographical features of this coastline vary considerably along its whole length from fractured coastlines in Donegal and Mayo to high sheer cliffs in Clare.

The coast from Tory island to Donegal Bay, within which is the fishing port of Killybegs, is characterised by the highest sea cliffs on the island of Ireland. The physical nature of the coastline changes dramatically between Eagle Island and the Aran Islands. The shoaled and rock strewn coasts of Mayo and Galway protrude out into the North Atlantic and present a formidable number of hazards for the inshore mariner. Blacksod Bay, Clew Bay and Killary Harbour have limited protection as places of refuge.

Galway Bay is, in general, well served by the natural protection it receives from the Aran Islands. The Bay has adequate provision of Aids to Navigation but offers limited shelter. The main commercial ports in the area are Sligo and Galway. The main fishing port in the area is Killybegs and the main leisure/tourist ports are Buncranna, Rossaveel and Killeany Bay.

**TSS**: There are no Traffic Separation Schemes in this area.

**OREIs**: Offshore activity includes the Corrib gas field that has a number of wells with further exploratory drilling expected to the North West planned. There are offshore renewable energy test sites located off Spiddal in Galway Bay and off Annagh Head. A wave energy farm is currently planned off Doonbeg.

AtoNs provided: 19 lights, 15 Buoys, 2 Beacons, 4 Racons, 20 AIS, 1 DGPS.

#### PROPOSED CHANGES FOLLOWING 2020 REVIEW

| Gola Spit      | Hand over to LLA   |
|----------------|--|
| Middle Rock    | Hand over to LLA   |
| Carrickpatrick | Establish AIS  |
| Broadhaven     | Establish AIS  |
| Slyne Head     | If/when technology allows introduce a Red Sector Range to 15nm to cover Skerd Rocks and Inishshark |

## Area 21 - Loop Head to Fastnet



The Coast in this area is characterised by high cliffs and headlands and deep bays. There are a large number of offshore islands. Approaches to ports and harbours are invariably hazardous due to the rocky nature of the area.

Severe weather conditions in this zone can force vessels to seek shelter in the numerous bays in the area. The Shannon Estuary and Bantry Bay in particular are the main ports of refuge for large vessels.

Through traffic will normally follow the offshore route outside the major islands. Coastal traffic and vessels bound for ports within the zone mainly use the inshore passages, particularly during adverse weather conditions.

There is a busy fishing trade in the area ranging from small inshore boats to large offshore trawlers and deep-sea longliners.

The principal commercial ports are Foynes, Limerick Docks, Aughinish and Bantry Terminal.

The principal fishing harbours are Fenit, Ventry, Dingle, Valentia and Castletownbearhaven.

The principal leisure boat harbours are Kilrush, Fenit, Ventry, Dingle Marina, Cahersiveen, Knightstown, Sneem and Bantry Bay.

AtoNs provided: 14 lights, 16 Buoys, 3 Beacons, 3 Racons, 18 AIS, 2 DGPS.

**TSS**: There is a TSS in operation at Fastnet.

**OREIs**: There are no OREIs in this region at this time.

## PROPOSED CHANGES FOLLOWING 2020 REVIEW

Dinish Island Directional Hand over to LLA

# Section 11 – Changes made outwith the AtoN Review Process 2015-2020

Re-established as Cardinal mark

## Areas 1-8 – Northern Lighthouse Board

## 2016:

New Rocks buoy

#### 2017:

RonaCommenced solarisation of lightTarbat NessCompleted lighthouse upgradeScurdie NessCompleted lighthouse upgradeCorran Narrows NEEstablished Directional lightSouth Carr buoyEstablished new buoy

#### 2018:

Neist PointCompleted lighthouse upgradeRubh ReCompleted lighthouse upgrade

## 2019:

| Duncansby Head<br>Copinsay<br>Kinnaird Head<br>Oban Bay North | Completed lighthouse upgrade<br>Completed lighthouse upgrade<br>Completed lighthouse upgrade<br>Replaced Cardinal mark with 7 lateral marks |
|---|---|
| entrance  | Replaced Cardinal mark with 7 lateral marks   |
| Cleit Rock  | Established unlit beacon  |
| Grocis Sgeir  | Re-established unlit beacon   |

## Areas 9-14 – Trinity House

## 2015

Mixon BeaconChange of character and replaced structureChwislen BeaconChange of character and new lightBar Light FloatHanded over to Peel Ports MerseyAlice WreckBuoy established

## 2016

| Jacoba Alida Wrock    | N & S Buove discontinued                           |
|-----------------------|--|
|                       | N & 5 Dubys discontinueu                           |
| Europa Lighthouse     | Change of character and range. Sector discontinued |
| Monkstone Lighthouse  | Reengineered to a complete new structure           |
| N Constable Buoy      | Buoy discontinued                                  |
| Outer Gabbard Buoy    | Buoy discontinued                                  |
| Bristol Channel Wreck | Buoy discontinued                                  |
| Southwold Lighthouse  | New lantern  |
| Woolpack Beacon       | Changed to Starboard lateral mark                  |
| Sunshine Wreck        | Marked temporarily with EWMB                       |
|                       |  |
|                       |  |

## 2017

| Bartholomew Ledges | Beacon Topmark discontinued |
|--------------------|-----------------------------|
| 5                  | •                           |

| Ella Wreck   | Marked temporarily with EWMB                                    |
|--|---|
| Sark Lighthouse  | Change of HWS characteristic                                    |
| Fluvius Tamar Wreck  | Marked temporarily with EWMB                                    |
| SarK Lighthouse  | Change of light characteristic                                  |
| NHR-S Buoy   | Change of position as TSS changed                               |
| Mumbles Lighthouse   | Change od HWS characteristic                                    |
| Hugo Buoy  | Buoy temporarily discontinued                                   |
| King Scar Buoy   | Change of position due to cable from windfarm                   |
|  |   |
| 2010   |   |
| 2018   |   |
| Gore Buoy  | Buoy discontinued   |
| Gore Buoy<br>Maplin Buoy                                   | Buoy discontinued<br>Topmark discontinued                       |
| Gore Buoy<br>Maplin Buoy<br>Emsstrom Wreck                 | Buoy discontinued<br>Topmark discontinued<br>Buoys discontinued |
| Gore Buoy<br>Maplin Buoy<br>Emsstrom Wreck                 | Buoy discontinued<br>Topmark discontinued<br>Buoys discontinued |
| 2018<br>Gore Buoy<br>Maplin Buoy<br>Emsstrom Wreck<br>2019 | Buoy discontinued<br>Topmark discontinued<br>Buoys discontinued |

| Berry Head Lighthouse   | Range reduction of | of light |
|-------------------------|--------------------|----------|
| Portland Bill Lighthose | Range reduction of | of light |

## Area 15-21 – Commissioners of Irish Lights

## 2015:

| Dunree          | New structure and light. Range and arc of visibility unchanged                |
|-----------------|---|
| Inisheer        | Ranges reduced to 16NM (White) and 11NM (red) a                               |
| Metal Man Sligo | Handed over to LLA  |
| Oyster Island   | Handed over to LLA  |
| Lower Rosses    | Handed over to LLA  |
| Gun Rock        | Handed over to LLA  |
| Cromwell Point  | New LED light, Red range reduced to 10NM                                      |
| 2016:           |   |
| Briggs          | Previous lateral buoy replaced by North Cardinal Buoy                         |
| 2017:           |   |
| Skulmartin      | Previous Safe Water Mark replaced by port hand buoy                           |
| Stork Rock Buoy | Temporary buoy established after previous beacon washed away                  |
| Eagle Island    | New flashing LED light  |
| 2018:           |   |
| Mow Island      | Providus flashing light replaced with new smart LED fixed and flashing Lights |
| Corlis Point    | New LED light, character changed from occulting to isophase and Sync          |
|                 | New LED light, character changed from occurring to isophase and Sync          |
| 2019:           |   |

| Smiths             | Repositioned                         |
|--------------------|--------------------------------------|
| Ballycotton        | Sectors adjusted                     |
| Loo                | AIS established                      |
| Wicklow Head       | New LED light. Range reduced to 18NM |
| Rusk No.1          | AIS established                      |
| Corlis Point Front | AIS established                      |

## Section 12 - GLA – Navigational Risk Assessment

## **Definition of Impact levels**

|              | Safety                                      | Environmental                 | Finance   |
|--------------|---|-------------------------------|---|
| Severe (3)   | Multiple loss of life                       | Major pollution<br>incident   | Loss or damage of<br>significant vessel<br>Cost > £10M                          |
| Moderate (2) | Possible loss of life<br>on a limited scale | Limited pollution<br>incident | Major damage to<br>large vessel/probable<br>loss of small vessel                |
| Minor (1)    | Unlikely to result in loss of life          | Little or no pollution        | Minor damage to<br>large vessel/possible<br>loss of small vessel<br>Cost <£500k |

Failure to provide this service may potentially result in one or more of the following:

## **Definition of Likelihood levels**

Noting current and predicted traffic patterns, the probability of an incident of this impact is assessed as:

| High (3)   | This type of incident has occurred in the past and may be repeated, or it is assessed as likely |
|------------|---|
| Medium (2) | Possible  |
| Low (1)    | A remotely possible occurrence  |



| NAVIGATION RISK ASSESSMENT – To be completed for each Aid Changed |  |                  |  |  |  |  |  |  |
|---|--|------------------|--|--|--|--|--|--|
| Name of Aid to Navigation   |  | Items Considered |  |  |  |  |  |  |
| Location  |  |                  |  |  |  |  |  |  |
| Date Considered   |  |                  |  |  |  |  |  |  |



| Unacceptable level of risk            |
|---------------------------------------|
| Acceptable level of risk with caution |
| Acceptable level of risk              |

**Process:** Make an assessment of all the risks involved, considering at least the items in the adjacent table and assessing both before and after the proposed change. Having made your assessment enter the appropriate number against Impact and Likelihood. Use the table above to determine the consequential overall risk level.



| Title        | Date |   |  |  |  |  |  |  |  |
|--------------|------|---|--|--|--|--|--|--|--|
| INTERNAL     |      |   |  |  |  |  |  |  |  |
| Director /   |      |   |  |  |  |  |  |  |  |
| Navigation   |      | - |  |  |  |  |  |  |  |
| Manager      |      |   |  |  |  |  |  |  |  |
| GLA APPROVAL |      |   |  |  |  |  |  |  |  |
| TH           |      | - |  |  |  |  |  |  |  |
| CIL          |      | - |  |  |  |  |  |  |  |
| NLB          |      |   |  |  |  |  |  |  |  |

| <u>0</u> | verall Impact and  | Likelihood Assessment   |                 |  |  |  |  |  |
|----------|--|---|-----------------|--|--|--|--|--|
| Consi    | Considered   |   |                 |  |  |  |  |  |
| 1        | Is the AtoN a significant pa<br>affected by the change?    |   |                 |  |  |  |  |  |
| 2        | Assessment of local bathyr                                 | netry against the proposed change   |                 |  |  |  |  |  |
| 3        | Frequency and accuracy of                                  | hydrographic surveys  |                 |  |  |  |  |  |
| 4        | Traffic Density, type, size,                               | draft and speed.  |                 |  |  |  |  |  |
| 5        | Traffic patterns to be consi<br>routes and types of vessel |   |                 |  |  |  |  |  |
| 6        | Existing Obstructions and o                                |   |                 |  |  |  |  |  |
| 7        | Planned new obstructions of                                |   |                 |  |  |  |  |  |
| 8        | IMO international and Loc                                  |   |                 |  |  |  |  |  |
| 9        | Port and Local<br>Information Systems                      | VTS<br>Information Service<br>Sailing Directions and Local notices to<br>Mariners |                 |  |  |  |  |  |
| 10       | Local knowledge of users i                                 | ncluding the availability of Pilotage   |                 |  |  |  |  |  |
| 11       | Requirement in prevailing range, sea conditions and b      | weather conditions including luminous ackground lighting.                         |                 |  |  |  |  |  |
| 12       | Accident or Incident Histor                                | ry recorded for this station  |                 |  |  |  |  |  |
| 13       | Any other considerations:                                  |   |                 |  |  |  |  |  |
| 15       |  |   |                 |  |  |  |  |  |
|          | Risk Assessment  | Before Change   | After<br>Change |  |  |  |  |  |
| IMPAG    | <u></u>  |   |                 |  |  |  |  |  |
| LIKEL    | IHOOD  |   |                 |  |  |  |  |  |
| ASSE     | SSED RISK  |   |                 |  |  |  |  |  |



# Record of amplifying comments against consideration number – if required:

## **DECISION**

## Section 14 – Definitive Lists of all Aids to Navigation

Any AtoN where changes have been recommended are highlighted in yellow

| Area | Name                | Туре             | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character     | Range | HWS<br>FT<br>Type | Radio Aids | Comment   |
|------|---------------------|------------------|---------------------|----------------------|---------------|-------|-------------------|------------|---|
| 1    | MAUGHOLD HEAD       | LIGHT            | 54°17.734'N         | 004°18.585'W         | FI(3) 30s     | 15    |                   |            | No change considered necessary                            |
| 1    | BAHAMA              | BUOY             | 54°20.029'N         | 004°08.571'W         | VQ(6)+LFI 10s | 4     | 2                 | AIS        | No change considered necessary                            |
| 1    | DOUGLAS HEAD        | LIGHT            | 54°08.599'N         | 004°27.947'W         | FI 10s        | 15    |                   |            | No change considered necessary                            |
| 1    | LANGNESS            | LIGHT            | 54°03.294'N         | 004°37.509'W         | FI(2) 30s     | 12    |                   |            | No change considered necessary                            |
| 1    | CHICKEN ROCK        | LIGHT            | 54°02.271'N         | 004°50.315'W         | FI 5s         | 20    |                   | RACON      | No change considered necessary                            |
| 1    | THOUSLA ROCK        | LIGHT            | 54°03.728'N         | 004°48.042'W         | FI R 3s       | 4     |                   |            | No change considered necessary                            |
| 1    | BALLACASH BANK      | BUOY             | 54°26.500'N         | 004°16.700'W         | VQ(9) 10s     | 5     | 2                 |            | No change considered necessary                            |
| 1    | POINT OF AYRE       | LIGHT            | 54°24.959'N         | 004°22.111'W         | FI(4)W 20s    | 19    |                   | RACON      | Re-engineer with minimum 18nM range; add VAtoN capability |
| 1    | WHITESTONE BANK     | BUOY             | 54°24.599'N         | 004°20.375'W         | Q(9) 15s      | 5     | 2                 |            | No change considered necessary                            |
| 1    | HESTAN ISLAND       | LIGHT            | 54°49.973'N         | 003°48.581'W         | FI(2) 10s     | 9     |                   |            | No change considered necessary                            |
| 1    | LITTLE ROSS. Rear   | LIGHT            | 54°45.944'N         | 004°05.096'W         | FI 5s         | 12    |                   |            | No change considered necessary                            |
| 1    | LITTLE ROSS. Front  | LEADING<br>LIGHT | 54°46.064'N         | 004°05.020'W         | FI(2) 5s      | 5     |                   |            | No change considered necessary                            |
| 1    | MULBERRY WRECK      | BUOY             | 54°46.346'N         | 004°21.076'W         | Q(3) 10s      | 3     | 3                 |            | No change considered necessary                            |
| 1    | MULL OF GALLOWAY    | LIGHT            | 54°38.113'N         | 004°51.447'W         | FI 20s        | 18    |                   |            | No change considered necessary                            |
| 1    | CRAMMAG HEAD        | LIGHT            | 54°39.910'N         | 004°57.903'W         | FI 10s        | 18    |                   |            | No change considered necessary                            |
| 1    | CRAIG LAGGAN        | BEACON           | 54°58.573'N         | 005°11.432'W         |               |       |                   |            | No change considered necessary                            |
| 1    | CORSEWALL           | LIGHT            | 55°00.429'N         | 005°09.564'W         | FI(5) 30s     | 22    |                   | AIS        | Re-engineer with minimum 18nM range; add VAtoN capability |
| 1    | SPIT OF SCAUR       | BUOY             | 54°57.104'N         | 005°01.461'W         | FI G 6s       | 4     | 2                 |            | No change considered necessary                            |
| 1    | LOCH RYAN           | LIGHT            | 54°58.467'N         | 005°01.845'W         | FI(2) R 10s   | 12    |                   |            | Re-engineer; maintain 12nM range                          |
| 1    | LOCH RYAN WEST      | BUOY             | 54°59.228'N         | 005°03.230'W         | QG            | 4     | 2                 |            | No change considered necessary                            |
| 1    | FORBES SHOAL        | BUOY             | 54°59.536'N         | 005°02.955'W         | FI(2) 5s      | 4     | 2                 |            | No change considered necessary                            |
| 1    | MILLEUR POINT       | BUOY             | 55°01.288'N         | 005°05.656'W         | Q             | 4     | 2                 | AIS        | No change considered necessary                            |
| 1    | LOCH RYAN FAIRWAY   | BUOY             | 54°59.770'N         | 005°03.811'W         | Iso 4s        | 5     | 2                 |            | No change considered necessary                            |
| 1    | AILSA CRAIG         | LIGHT            | 55°15.126'N         | 005°06.523'W         | FIW 4s        | 17    |                   |            | No change considered necessary                            |
| 1    | BREST ROCKS         | BEACON           | 55°18.247'N         | 004°51.190'W         |               |       |                   |            | No change considered necessary                            |
| 1    | TURNBERRY           | LIGHT            | 55°19.572'N         | 004°50.655'W         | FI W 15s      | 12    |                   |            | No change considered necessary                            |
| 1    | LADY ISLE           |                  | 55°31.632'N         | 004°44.047'W         | FI 2s         | 11    |                   | RACON      | No change considered necessary                            |
| 1    |                     | BEACON           | 55°34.624'N         | 004°41.720'W         |               |       |                   |            | No change considered necessary                            |
| 1    |                     | BUOY             | 55°32.627 N         | 005°04.898'W         |               | 3     | 3                 |            | No change considered necessary                            |
| 1    |                     | BUUY             | 55°30.643'N         | 005°04.572'W         | FI(2) R 12S   | 3     | 3                 |            | No change considered necessary                            |
| 1    | HOLY ISLAND (INNER) | LIGHT            | 55°30.736 N         | 005°04.211 W         | FIG 3S        | 6     |                   |            | No change considered necessary                            |
| 1    | HOLY ISLAND (OUTER) | LIGHT            | 55°31.042'N         | 005°03.653'W         | FI(2) 205     | 18    |                   |            | No change considered necessary                            |
| 1    |                     |                  | 55°25.512 N         | 005°07.113 W         |               | 17    |                   |            | Re-engineer; maintain 17nw range                          |
| 1    |                     | BUOY             | 55°20.828 N         | 005*18.875 W         |               | 4     | 2                 |            | No change considered necessary                            |
| 1    |                     | BUOY             | 55°34.473 N         | 005*27.092 W         | FI(2) R 125   | 4     | 2                 |            |   |
| 1    |                     | LIGHT            | 55°25 688'N         | 005°31.108 W         | El(2) 10s     | 4     | 2                 |            | No change considered necessary                            |
| 1    | ARRANMAN'S BARRELS  | BUOY             | 55°19 411'N         | 005°32.420 W         | FI(2) R 12s   | 13    | 2                 |            | No change considered necessary                            |
| 1    |                     | BUOY             | 55°17 941'N         | 005°36 992'W         | FLR 6s        | 4     | 2                 |            | No change considered necessary                            |
| 1    |                     | BUOY             | 55°16 912'N         | 005°32 477'W         |               |       | 2                 | AIS        | No change considered necessary                            |
| 1    |                     |                  | 55°16 508'N         | 005 32.477 W         |               | 15    | 2                 |            | No change considered necessary                            |
| 1    |                     |                  | 55°19 606'N         | 005 34.300 W         | El(2) 20c     | 10    |                   |            | No change considered necessary                            |
|      |                     |                  | 55 10.020 N         | 005 40.208 W         |               | 10    |                   |            |   |
| 2    |                     |                  | 00 39.905 N         |                      |               | ۷     | 2                 |            |   |
| 2    |                     | BUUY             | 55-39.193'N         | 005*43.691'W         |               | 4     | 2                 |            | No change considered necessary                            |
| 2    |                     | BUOY             | 55°40.700'N         | 005°43.325'W         |               | 4     | 2                 |            | Establish East Cardinal buoy                              |
| 2    | SGEIR NUADH         | RUOY             | 55°41.779'N         | 005°42.058'W         |               | 4     | 2                 |            | No change considered necessary                            |
| 2    | BADH ROCK           | BUOY             | 55°42.295'N         | 005°41.220'W         | FI(2) G 12s   | 4     | 2                 | _          | No change considered necessary                            |
| 2    | GAMHNA GIGHA        | LIGHT            | 55°43.778'N         | 005°41.075'W         | FI(2)W 6s     | 5     |                   |            | No change considered necessary                            |
| 2    | CATHSGEIR           | BUOY             | 55°39.662'N         | 005°47.495'W         | Q(9) 15s      | 4     | 2                 |            | No change considered necessary                            |

| Area | Name                   | Туре            | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character     | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                                 |
|------|------------------------|-----------------|---------------------|----------------------|---------------|-------|-----|-------------------------------|------------|---|
| 2    | RHINNS OF ISLAY        | LIGHT           | 55°40.402'N         | 006°30.804'W         | FI W 5s       | 18    |     |                               |            | No change considered necessary          |
| 2    | LOCH INDAAL            | SECTOR<br>LIGHT | 55°44.690'N         | 006°22.344'W         | FI(2) WR 7s   | 11    |     |                               |            | No change considered necessary          |
| 2    | OTTER ROCK             | BUOY            | 55°33.862'N         | 006°07.913'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary          |
| 2    | PORT ELLEN             | BUOY            | 55°37.000'N         | 006°12.267'W         | QG            | 4     |     | 2                             |            | No change considered necessary          |
| 2    | OTTER GANDER           | BUOY            | 55°36.600'N         | 006°12.340'W         | VQ(3) 5s      | 3     |     | 3                             |            | No change considered necessary          |
| 2    | PORT ELLEN             | SECTOR<br>LIGHT | 55°37.218'N         | 006°12.707'W         | FI WRG 3s     | 8     |     |                               |            | No change considered necessary          |
| 2    | EILEAN A CHUIRN        | LIGHT           | 55°40.129'N         | 006°01.210'W         | FI(3) 18s     | 8     |     |                               |            | No change considered necessary          |
| 2    | MCARTHUR'S HEAD        | SECTOR<br>LIGHT | 55°45.831'N         | 006°02.865'W         | FI(2) WR 10s  | 13    |     |                               |            | No change considered necessary          |
| 2    | BLACK ROCKS            | BUOY            | 55°47.503'N         | 006°04.082'W         | FI G 6s       | 4     |     | 2                             |            | No change considered necessary          |
| 2    | CARRAGH MHOR           | SECTOR          | 55°50.423'N         | 006°06.109'W         | FI(2)WR 6s    | 8     |     |                               |            | No change considered necessary          |
| 2    | CARRAGH AN T'SRUITH    | LIGHT           | 55°52.309'N         | 006°05.770'W         | FI 3s         | 9     |     |                               |            | No change considered necessary          |
| 2    | RUVAAL                 | LIGHT           | 55°56.181'N         | 006°07.409'W         | FI(3)W 15s    | 19    |     |                               |            | No change considered necessary          |
| 2    | NA CUILTEAN            | LIGHT           | 55°48.642'N         | 005°54.891'W         | FIW 10s       | 9     |     |                               |            | No change considered necessary          |
| 2    | SMALL ISLES            | LIGHT           | 55°49.977'N         | 005°56.428'W         | FI R 6s       | 5     |     |                               |            | No change considered necessary          |
| 2    | GOAT ROCK              | BUOY            | 55°50.123'N         | 005°55.670'W         | VQ(3) 5s      | 4     |     | 2                             |            | No change considered necessary          |
| 2    | EILEAN NAN GABHAR      | LIGHT           | 55°50.039'N         | 005°56.242'W         | FIW 5s        | 8     |     |                               |            | No change considered necessary          |
| 2    | NINE FEET ROCK         | BUOY            | 55°52.463'N         | 005°52.950'W         | Q(3) 10s      | 4     |     | 2                             |            | No change considered necessary          |
| 2    | SKERVUILE              | LIGHT           | 55°52.457'N         | 005°49.849'W         | FIW 15s       | 9     |     |                               |            | No change considered necessary          |
| 2    | BOW OF KNAP            | BUOY            | 55°53.050'N         | 005°41.957'W         | Q(9) 15s      | 4     |     | 2                             |            | No change considered necessary          |
| 2    | RUADH SGEIR            | LIGHT           | 56°04.321'N         | 005°39.778'W         | FI W 6s       | 9     |     |                               |            | No change considered necessary          |
| 2    | REISA AN T-STRUITH     | LIGHT           | 56°07.776'N         | 005°38.907'W         | FI(2)W 12s    | 7     |     |                               |            | No change considered necessary          |
| 2    | ARDLUING               | BUOY            | 56°11.000'N         | 005°38.500'W         | Q(6)+LFI 15s  | 3     |     | 3                             |            | No change considered necessary          |
| 2    | SCALASAIG              | SECTOR          | 56°04.007'N         | 006°10.897'W         | FI(2)WR 10s   | 8     |     |                               |            | No change considered necessary          |
| 2    |                        | LIGHT           | 5C%42.040/N         | 005840.0561104       | ELW/ Co       | 0     |     |                               |            | No shares considered accessory          |
| 2    |                        |                 | 56°13.040 N         | 005°49.056 W         |               | 9     |     | 0                             |            | No change considered necessary          |
| 2    |                        | BUUY            | 56°13.030 N         | 005°45.260 W         |               | 4     |     | 2                             | DACON      | No change considered necessary          |
| 2    |                        | LIGHT           | 50°14.772 N         | 005*40.184 W         | FI WRG 6S     | 6     |     |                               | RACON      |   |
| 2    | FLADDA                 | LIGHT           | 56°14.897'N         | 005°40.830'W         | FI(2)WRG 9s   | 11    |     |                               |            | No change considered necessary          |
| 2    | BOGHA GHAIR            | BUOY            | 56°16.490'N         | 005°40.500'W         | Q(3) 10s      | 4     |     | 2                             |            | No change considered necessary          |
| 2    | BONO ROCK              | BUOY            | 56°16.204'N         | 005°41.276'W         | Q(9) 15s      | 4     |     | 2                             |            | No change considered necessary          |
| 2    | CLEIT ROCK             | BEACON          | 56°15.769'N         | 005°37.426'W         |               |       |     |                               |            | No change considered necessary          |
| 2    | BOGHA NUADH            | BUOY            | 56°21.690'N         | 005°37.874'W         | Q(6)+L.FI 15s | 4     |     | 2                             | AIS        | No change considered necessary          |
| 2    |                        | BEACON          | 56°23.230'N         | 005°42.012'W         |               | -     |     |                               |            | Reinstate (unlit) starboard hand beacon |
| 2    | SGEIR AN FHEURAIN      | BUOY            | 56°22.795'N         | 005°31.944'W         | FI G 3s       | 2     |     | 2                             |            | No change considered necessary          |
| 2    | DUBH SGEIR (KERRERA)   | LIGHT           | 56°22.814'N         | 005°32.264'W         | FI(2)W 12s    | 5     |     |                               |            | No change considered necessary          |
| 2    |                        | BUOY            | 56°23.219'N         | 005°31.828'W         | FI(4) R 12s   | 4     |     | 2                             |            | No change considered necessary          |
| 2    | HEATHER ISLAND         | LIGHT           | 56°24.414'N         | 005°30.243'W         | FIR 2.5s      | 2     |     |                               |            | No change considered necessary          |
| 2    | KERRERA                | BUOY            | 56°24.145'N         | 005°30.813'W         | QR            | 2     |     | 3                             |            | No change considered necessary          |
| 2    | FERRY ROCKS NW         | BUOY            | 56°24.109'N         | 005°30.697'W         | QG            | 4     |     | 2                             |            | No change considered necessary          |
| 2    | FERRY ROCKS SE         | BUOY            | 56°23.996'N         | 005°30.529'W         | Q(3) 10s      | 5     |     | 2                             |            | No change considered necessary          |
| 2    | ARDBHAN                | BUOY            | 56°24.184'N         | 005°30.384'W         | FIG 5s        | 3     |     | 3                             |            | No change considered necessary          |
| 2    |                        | BUOY            | 56°24.744'N         | 005°29.365'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary          |
| 2    |                        | BUUY            | 56°24.916'N         | 005°29.232'W         |               | 4     |     | 2                             |            | INO CHARGE CONSIDERED RECESSARY         |
| 2    |                        |                 | 56°24.708'N         | 005°28.910'W         |               | 4     |     |                               |            | INO CHARGE CONSIDERED RECESSARY         |
| 2    |                        |                 | 56°25.322'N         | 005°29.291'W         |               | 4     |     | 4                             |            | INO CHARGE CONSIDERED RECESSARY         |
| 2    | OBAN, NORTH CHANNEL 9  | BUOX            | 56°25.101'N         | 005°28.950'W         |               | 2     |     | 4                             |            | INO CHARGE CONSIDERED RECESSARY         |
| 2    | OBAN, NORTH CHANNEL 7  | BUOX            | 56°25.160'N         | 005°29.060'W         |               | 2     |     | 4                             |            | INO CHARGE CONSIDERED RECESSARY         |
| 2    |                        |                 | 56°25.219'N         | 005*29.092.00        |               | 2     |     | 4                             |            | No change considered necessary          |
| 2    |                        |                 | 50°25.207 N         | 005-29.251.00        |               | 2     |     | 4                             |            |   |
| 2    | UDAN. NUK TH CHANNEL 3 | BUUY            | 56-25.275 N         | 005-29.078'W         | FIG ZS (SYNC) | 2     |     | 4                             |            | ivo change considered necessary         |

| Area | Name                  | Туре            | Latitude<br>(WGS84) | Longitude<br>(WGS84)         | Character          | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                               |
|------|-----------------------|-----------------|---------------------|------------------------------|--------------------|-------|-----|-------------------------------|------------|---------------------------------------|
| 2    | OBAN. NORTH CHANNEL 2 | BUOY            | 56°25.347'N         | 005°29.248'W                 | FI R 2s (Sync)     | 2     |     | 4                             |            | No change considered necessary        |
| 2    | OBAN. NORTH CHANNEL 1 | BUOY            | 56°25.329'N         | 005°29.082'W                 | FI G 2s (Sync)     | 2     |     | 4                             |            | No change considered necessary        |
| 2    | DUNOLLIE              | SECTOR<br>LIGHT | 56°25.374'N         | 005°29.045'W                 | FI(2)WRG 6s        | 8     |     |                               |            | No change considered necessary        |
| 2    | NORTH SPIT OF KERRERA | LIGHT           | 56°25.489'N         | 005°29.561'W                 | FIR 3s             | 5     |     |                               |            | No change considered necessary        |
| 2    | DUART POINT           | SECTOR<br>LIGHT | 56°26.835'N         | 005°38.767'W                 | FI(3)WR 18s        | 5     |     |                               |            | No change considered necessary        |
| 2    | LADY ROCK             | LIGHT           | 56°26.908'N         | 005°37.040'W                 | FI 6s              | 5     |     |                               | AIS        | No change considered necessary        |
| 2    | LISMORE               | LIGHT           | 56°27.333'N         | 005°36.449'W                 | FI 10s             | 17    |     |                               |            | No change considered necessary        |
| 2    | BRANRA ROCK           | LIGHT           | 56°32.022'N         | 005°26.598'W                 | FI(2) W 10s        | 5     |     |                               |            | No change considered necessary        |
| 2    |                       | BUOY            | 56°32.691'N         | 005°25.968'W                 | FI G 6s            | 4     |     | 2                             |            | No change considered necessary        |
| 2    | SGEIR BHUIDHE         | LIGHT           | 56°33.646'N         | 005°24.648'W                 | FI(2) WR 7s        | 9     |     |                               |            | No change considered necessary        |
| 2    | CULCHENNA SPIT        | BUOY            | 56°41.170'N         | 005°15.722'W                 | FI G 6s            | 4     |     | 2                             |            | No change considered necessary        |
| 2    | RUBHA CUIL-CHEANNA    | LIGHT           | 56°42.327'N         | 005°14.837'W                 | FI(2)G 8s & WRG 2s | 4     |     |                               |            | Establish Directional Light           |
| 2    | GEARASDAN             | BUOY            | 56°50.250'N         | 005°07.020'W                 | FI(2) 5s           | 3     |     | 3                             |            | No change considered necessary        |
| 2    | EILEAN NA CREICHE     | BUOY            | 56°50.395'N         | 005°07.378'W                 | FIR 3s             | 4     |     | 2                             |            | No change considered necessary        |
| 2    | MACLEAN ROCK          | BUOY            | 56°49.803'N         | 005°07.037'W                 | FI(2) R 12s        | 4     |     | 2                             |            | No change considered necessary        |
| 2    | CORPACH               | BUOY            | 56°50.225'N         | 005°07.124'W                 | FIR 6s             | 4     |     | 2                             |            | No change considered necessary        |
| 2    | LOCHY FLAT SOUTH      | BUOY            | 56°49.537'N         | 005°07.022'W                 | QG                 | 4     |     | 2                             |            | No change considered necessary        |
| 2    | CORRAN NARROWS NE     | LIGHT           | 56°43.616'N         | 005°13.900'W                 | FI W 5s & WRG 2s   | 4     |     |                               |            | No change considered necessary        |
| 2    | CORRAN SHOAL          | BUOY            | 56°43.687'N         | 005°14.384'W                 | QR                 | 4     |     | 2                             |            | No change considered necessary        |
| 2    | CORRAN POINT          | SECTOR<br>LIGHT | 56°43.253'N         | 005°14.539'W                 | Iso WRG 4s         | 10    |     |                               |            | No change considered necessary        |
| 2    | CORRAN FLAT           | BUOY            | 56°42.858'N         | 005°14.930'W                 | FI(4) R 10s        | 3     |     | 3                             |            | No change considered necessary        |
| 2    | CLOVULLIN FLAT        | BUOY            | 56°42.288'N         | 005°15.556'W                 | FI(2) R 15s        | 4     |     | 2                             |            | No change considered necessary        |
| 2    | SALLACHAN POINT       | BEACON          | 56°42.047'N         | 005°17.007'W                 |                    |       |     |                               |            | No change considered necessary        |
| 2    | GREY ROCKS            | LIGHT           | 56°29.790'N         | 005°42.828'W                 | FI W 3s            | 6     |     |                               |            | No change considered necessary        |
| 2    | INNINMORE BAY         | BUOY            | 56°30.365'N         | 005°43.471'W                 | Q                  | 4     |     | 2                             | AIS        | No change considered necessary        |
| 2    | YULE ROCK             | BUOY            | 56°30.023'N         | 005°43.958'W                 | FI R 15s           | 3     |     | 3                             |            | No change considered necessary        |
| 2    | ARDTORNISH            | SECTOR<br>LIGHT | 56°31.092'N         | 005°45.214'W                 | FI (2)WRG 10s      | 8     |     |                               |            | No change considered necessary        |
| 2    | AVON ROCK             | BUOY            | 56°30.787'N         | 005°46.793'W                 | FI(4) R 10s        | 4     |     | 2                             |            | No change considered necessary        |
| 2    | FIUNARY SPIT          | BUOY            | 56°32.651'N         | 005°53.156'W                 | FI G 6s            | 4     |     | 2                             |            | No change considered necessary        |
| 2    | GREEN ISLAND          | LIGHT           | 56°32.261'N         | 005°54.790'W                 | FI W 6s            | 8     |     |                               |            | No change considered necessary        |
| 2    | HISPANIA WRECK        | BUOY            | 56°34.953'N         | 005°59.110'W                 | FI(2) R 10s        | 4     |     | 2                             |            | No change considered necessary        |
| 2    | BOGHA BHUILG          | BUOY            | 56°36.131'N         | 005°59.123'W                 | FI G 5s            | 4     |     | 2                             |            | No change considered necessary        |
| 2    | RUBHA NAN GALL        | LIGHT           | 56°38.232'N         | 006°03.969'W                 | FI W 3s            | 10    |     |                               |            | No change considered necessary        |
| 2    | NEW ROCKS             | BUOY            | 56°39.070'N         | 006°03.550'W                 | Q(9) 15s           | 4     |     | 2                             | AIS        | No change considered necessary        |
| 2    | LITTLE STIRK          | BUOY            | 56°38.496'N         | 006°01.503'W                 | Q(6)+LFI 15s       | 4     |     | 2                             |            | No change considered necessary        |
| 2    | ARDMORE               | LIGHT           | 56°39.370'N         | 006°07.698'W                 | FI(2) 10s          | 13    |     |                               |            | No change considered necessary        |
| 2    | BUNESSAN              | SECTOR<br>LIGHT | 56°20.566'N         | 006°16.377'W                 | FI WR 6s           | 8     |     |                               |            | No change considered necessary        |
| 2    | BOGHA HUN A CHUHOIL   | BUOY            | 56°16.568'N         | 006°24.864'W                 | Q(6)+LFI 15s       | 4     |     | 2                             |            | No change considered necessary        |
| 2    | IONA BANK SOUTH       | BUOY            | 56°19.442'N         | 006°23.117'W                 | Q(6)+L.FI 15s      | 4     |     | 3                             |            | No change considered necessary        |
| 2    | BO NA SLIGANACH       | BUOY            | 56°19.338'N         | 006°22.952'W                 | Fl(2) G 6s         | 3     |     | 3                             |            | No change considered necessary        |
| 2    | BOGHA CHOILTA         | BUOY            | 56°18.581'N         | 006°23.424'W                 | FI G 5s            | 3     |     | 3                             |            | No change considered necessary        |
| 2    | BOGHA NAN RAMFHEAR    | BUOY            | 56°15.705'N         | 006°20.360'W                 | Q                  | 4     |     | 2                             |            | No change considered necessary        |
| 2    |                       | LIGHT           | 56°07.954 N         | 006°38.079'W                 | FI(2) 305          | 20    |     |                               | AIS        | Re-engineer with minimum 18nivi range |
| 2    | SCARINISH             | LIGHT           | 56°30.015'N         | 007 06.882 W<br>006°48.266'W | FIW 3s             | 12    |     |                               | RACONAIS   | No change considered necessary        |
| 2    | PLACAID BO            | BUOY            | 56°33.229'N         | 006°43.986'W                 | FI G 4s            | 4     |     | 2                             |            | No change considered necessary        |
| 2    | ROAN BOGHA            | BUOY            | 56°32.247'N         | 006°40.153'W                 | Q(6)+LFI 15s       | 5     |     | 2                             |            | No change considered necessary        |
| 2    | CAIRN NA BURGH MORE   | LIGHT           | 56°31.046'N         | 006°22.956'W                 | FI(3) W 15s        | 8     |     |                               |            | No change considered necessary        |
| 2    | CHIEFTAIN ROCK        | BUOY            | 56°36.646'N         | 006°30.897'W                 | FI G 6s            | 4     |     | 2                             |            | No change considered necessary        |

| Area | Name                   | Туре             | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character     | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment   |
|------|------------------------|------------------|---------------------|----------------------|---------------|-------|-----|-------------------------------|------------|---|
| 2    | CAIRN OF COLL          | LIGHT            | 56°42.264'N         | 006°26.729'W         | FI 12s        | 10    |     |                               |            | No change considered necessary                              |
| 2    | ARDNAMURCHAN           | LIGHT            | 56°43.619'N         | 006°13.555'W         | FI(2) 20s     | 18    |     |                               | AIS        | No change considered necessary                              |
| 3    | BO FASKADALE           | BUOY             | 56°48.181'N         | 006°06.381'W         | FI(3) G 18s   | 4     |     | 2                             | AIS        | No change considered necessary                              |
| 3    | EIGG                   | LIGHT            | 56°52.261'N         | 006°07.289'W         | FI W 6s       | 8     |     |                               |            | No change considered necessary                              |
| 3    | HYSKEIR                | LIGHT            | 56°58.157'N         | 006°40.835'W         | FI(3) 30s     | 24    |     |                               | RACON/AIS  | Re-engineer with minimum 18nM range                         |
| 3    | HUMLA                  | BUOY             | 57°00.443'N         | 006°37.397'W         | FI G 6s       | 4     |     | 2                             | AIS        | No change considered necessary                              |
| 3    | CANNA                  | LIGHT            | 57°02.819'N         | 006°28.002'W         | FI 10s        | 9     |     |                               |            | No change considered necessary                              |
| 3    | ARDTRECK               | LIGHT            | 57°20.384'N         | 006°25.859'W         | FI 6s         | 9     |     |                               |            | No change considered necessary                              |
| 3    | NEIST POINT            | LIGHT            | 57°25.390'N         | 006°47.330'W         | FI 5s         | 16    |     |                               | AIS        | Add VAtoN capability  |
| 3    | BO NA FAMACHD          | BUOY             | 57°26.791'N         | 006°35.850'W         | FI G 5s       | 3     |     | 3                             |            | No change considered necessary                              |
| 3    | DUNVEGAN               | SECTOR<br>LIGHT  | 57°26.826'N         | 006°36.594'W         | FI WRG 3s     | 7     |     |                               |            | Re-engineer as LED Sector Light                             |
| 3    | VATERNISH              | LIGHT            | 57°36.484'N         | 006°38.049'W         | FI 20s        | 8     |     |                               |            | No change considered necessary                              |
| 3    | EILEAN TRODDAY         | SECTOR<br>LIGHT  | 57°43.627'N         | 006°17.919'W         | FI(2) WRG 10s | 12    |     |                               | AIS        | No change considered necessary                              |
| 3    | COMET ROCK             | BUOY             | 57°44.575'N         | 006°20.596'W         | FIR 6s        | 4     |     | 2                             | AIS        | No change considered necessary                              |
| 3    | EUGENIE ROCK           | BUOY             | 57°46.468'N         | 006°27.284'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | SGEIR NAM MAOL         | BEACON           | 57°44.863'N         | 006°22.760'W         |               |       |     |                               |            | No change considered necessary                              |
| 3    | AN T-IASGAIR           | LIGHT            | 57°41.112'N         | 006°26.009'W         | FIW 6s        | 9     |     |                               |            | No change considered necessary                              |
| 3    | ST KILDA AIS           | AIS              | 57°49.162'N         | 008°35.019'W         |               |       |     |                               | AIS        | No change considered necessary                              |
| 3    | GASKER                 | LIGHT            | 57°59.053'N         | 007°17.224'W         | FI(3)10s      | 12    |     |                               |            | No change considered necessary                              |
| 3    | WHALE ROCK             | BUOY             | 57°54.373'N         | 007°59.983'W         | Q(3) 10s      | 5     |     | 2                             | RACON/AIS  | Replace with VAtoN broadcast from St Kilda/Flannans/Haskeir |
| 3    | FLANNAN ISLANDS        | LIGHT            | 58°17.294'N         | 007°35.394'W         | FI(2)30s      | 20    |     |                               | AIS        | No change considered necessary                              |
| 3    | MONACH ISLES           | LIGHT            | 57°31.549'N         | 007°41.763'W         | FI(2)15s      | 18    |     |                               |            | No change considered necessary                              |
| 3    | HASKEIR                | LIGHT            | 57°41.957'N         | 007°41.314'W         | FI 20s        | 24    |     |                               | RACON/AIS  | Re-engineer with minimum 18nM range                         |
| 3    | FIARAY BEACON (W)      | BEACON           | 57°04.036'N         | 007°26.571'W         |               |       |     |                               |            | No change considered necessary                              |
| 3    | FIARAY BEACON (E)      | BEACON           | 57°04.029'N         | 007°26.339'W         |               |       |     |                               |            | No change considered necessary                              |
| 3    | BARRA HEAD             | LIGHT            | 56°47.131'N         | 007°39.215'W         | FI 15s        | 18    |     |                               | AIS        | No change considered necessary                              |
| 3    | SGEIR NA TREANNE       | BUOY             | 56°56.502'N         | 007°29.671'W         | FI R 3s       | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | CASTLEBAY INNER        | BUOY             | 56°56.527'N         | 007°29.349'W         | FI G 3s       | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | CASTLEBAY SOUTH        | BUOY             | 56°56.090'N         | 007°27.209'W         | FI(2) R 8s    | 4     |     | 2                             | RACON      | No change considered necessary                              |
| 3    | SGEIR A SCAPE          | BUOY             | 56°56.243'N         | 007°27.260'W         | FI(2) G 8s    | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | BO VICH CHUAN          | BUOY             | 56°56.151'N         | 007°23.296'W         | Q(6)+L.FI 15s | 4     |     | 2                             | RACON      | No change considered necessary                              |
| 3    | RUBH GLAS REAR         | LEADING<br>LIGHT | 56°56.875'N         | 007°31.048'W         | F Bu          | 6     |     |                               |            | No change considered necessary                              |
| 3    | RUBH GLAS FRONT        | LEADING<br>LIGHT | 56°56.770'N         | 007°30.636'W         | F Bu          | 6     |     |                               |            | No change considered necessary                              |
| 3    | SGEIR LIATH            | BEACON           | 56°56.638'N         | 007°30.769'W         |               |       |     |                               |            | No change considered necessary                              |
| 3    | CHANNEL ROCK           | SECTOR<br>LIGHT  | 56°56.238'N         | 007°28.925'W         | FIWR 6s       | 6     |     |                               |            | No change considered necessary                              |
| 3    | DUBH SGEIR (CASTLEBAY) | LIGHT            | 56°56.409'N         | 007°28.920'W         | Q(3)G 6s      | 5     |     |                               |            | No change considered necessary                              |
| 3    | CURACHAN               | BUOY             | 56°58.587'N         | 007°20.510'W         | Q(3) 10s      | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | GRIANAMUL              | BUOY             | 57°01.567'N         | 007°23.332'W         | Q(9) 15s      | 3     |     | 3                             |            | No change considered necessary                              |
| 3    | SGEIR MEALL NA HOE     | BUOY             | 57°02.029'N         | 007°22.106'W         | VQ(3) 5s      | 3     |     | 3                             |            | No change considered necessary                              |
| 3    | BO TANNA               | BUOY             | 57°03.075'N         | 007°20.035'W         | Q(3) 10s      | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | DROVER ROCK            | BUOY             | 57°04.047'N         | 007°23.656'W         | Q(6)+LFI 15s  | 3     |     | 3                             |            | No change considered necessary                              |
| 3    |                        | BUOY             | 57°01.582'N         | 007°17.180'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary                              |
| 3    |                        | BUOY             | 57°09.085'N         | 007°17.755'W         | FIG 3s        | 4     |     | 2                             |            | No change considered necessary                              |
| 3    | GASAY ISLAND           | LIGHT            | 57°08.929'N         | 007°17.387'W         | FIWK 5S       | 7     |     |                               |            | No change considered necessary                              |
| 3    | CALVAY                 | SECTOR<br>LIGHT  | 57°08.536'N         | 007°15.392'W         | FI(2)WRG 10s  | 7     |     |                               | AIS        | No change considered necessary                              |
| 3    | MCKENZIE ROCK          | BUOY             | 57°08.250'N         | 007°13.708'W         | FI(3) R 15s   | 4     |     | 2                             | AIS        | No change considered necessary                              |
| 3    | USHENISH               | SECTOR<br>LIGHT  | 57°17.900'N         | 007°11.580'W         | FI W 20s      | 19    |     |                               |            | No change considered necessary                              |
| 3    | WEAVERS POINT          | LIGHT            | 57°36.493'N         | 007°06.001'W         | FI 3s         | 7     |     |                               |            | No change considered necessary                              |

| Area | Name                    | Туре             | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character     | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|------|-------------------------|------------------|---------------------|----------------------|---------------|-------|-----|-------------------------------|------------|--------------------------------|
| 3    | GROCIS SGEIR            | BEACON           | 57°44.190'N         | 007°01.630'W         |               |       |     |                               |            | No change considered necessary |
| 3    | SLEICHAM SPIT           | BEACON           | 57°45.090'N         | 007°02.967'W         |               |       |     |                               |            | No change considered necessary |
| 3    | CODDEM EAST             | BEACON           | 57°44.937'N         | 007°03.708'W         |               |       |     |                               |            | No change considered necessary |
| 3    | CODDEM WEST             | BEACON           | 57°44.909'N         | 007°03.820'W         |               |       |     |                               |            | No change considered necessary |
| 3    | BERNERAY SPIT           | BUOY             | 57°42.027'N         | 007°10.372'W         | FIR 3s        | 3     |     | 3                             |            | No change considered necessary |
| 3    | DROWNING ROCK           | LIGHT            | 57°42.490'N         | 007°09.325'W         | FI(2) G 8s    | 2     |     |                               |            | No change considered necessary |
| 3    | McCASKILL ROCK          | BUOY             | 57°42.299'N         | 007°09.380'W         | FI R 5s       | 2     |     | 4                             |            | No change considered necessary |
| 3    | TRENCH                  | BUOY             | 57°41.899'N         | 007°09.016'W         | Q(3) G 10s    | 3     |     | 3                             |            | No change considered necessary |
| 3    | CEANN NA DIGE           | BUOY             | 57°41.767'N         | 007°08.476'W         | QR            | 2     |     | 4                             |            | No change considered necessary |
| 3    | PORTAIN                 | BUOY             | 57°41.712'N         | 007°08.309'W         | FI G 3s       | 2     |     | 4                             |            | Replace buoy with lit beacon   |
| 3    | NF5                     | BUOY             | 57°41.531'N         | 007°07.575'W         | FI(2) G 8s    | 3     |     | 3                             |            | No change considered necessary |
| 3    | NF6                     | BUOY             | 57°41.555'N         | 007°07.934'W         | FI R 5s       | 3     |     | 3                             |            | No change considered necessary |
| 3    | NF1                     | BUOY             | 57°41.606'N         | 007°04.522'W         | FI(2)G 4s     | 3     |     | 3                             |            | No change considered necessary |
| 3    | NF2                     | BUOY             | 57°41.422'N         | 007°06.801'W         | FIR 10s       | 3     |     | 3                             |            | No change considered necessary |
| 3    | BHRUSDA                 | BUOY             | 57°41.438'N         | 007°05.627'W         | FIR 2s        | 3     |     | 3                             |            | No change considered necessary |
| 3    | SGEIR AN IARUINN        | BUOY             | 57°41.462'N         | 007°05.010'W         | FI G 5s       | 3     |     | 3                             |            | No change considered necessary |
| 3    | NARSTAY                 | LIGHT            | 57°41.370'N         | 007°04.779'W         | FI(2)R 8s     | 3     |     |                               |            | No change considered necessary |
| 3    | SUILVEN                 | BUOY             | 57°41.679'N         | 007°04.364'W         | FI(3) R 10S   | 3     |     | 3                             |            | No change considered necessary |
| 3    | CABBAGE SOUTH           | LIGHT            | 57°41.856'N         | 007°04.240'W         | FIR 3s        | 2     |     |                               |            | No change considered necessary |
| 3    | CABBAGE NORTH           | LIGHT            | 57°41.996'N         | 007°04.317'W         | FIW 5s        | 3     |     |                               |            | No change considered necessary |
| 3    | CABBAGE                 | BUOY             | 57°42.129'N         | 007°03.956'W         | FI(2)R 6s     | 4     |     | 2                             | RACON      | No change considered necessary |
| 3    | L1                      | BUOY             | 57°42.622'N         | 007°03.245'W         | FI(2)G 5s     | 3     |     | 3                             |            | No change considered necessary |
| 3    | SGEIR CHRUAIDH          | LIGHT            | 57°42.709'N         | 007°02.873'W         | FIR 5s        | 2     |     |                               |            | No change considered necessary |
| 3    | L2                      | LIGHT            | 57°42.672'N         | 007°02.265'W         | FI(2)R 10s    | 3     |     |                               |            | No change considered necessary |
| 3    | L4                      | BUOY             | 57°43.678'N         | 007°01.592'W         | FIR 2s        | 3     |     | 3                             |            | No change considered necessary |
| 3    | L2A                     | LIGHT            | 57°42.882'N         | 007°02.246'W         | FIR 8s        | 2     |     |                               |            | No change considered necessary |
| 3    | GROCIS NORTH            | BUOY             | 57°44.288'N         | 007°01.435'W         | FIR 8s        | 3     |     | 3                             |            | No change considered necessary |
| 3    | MILE SGEIR              | BUOY             | 57°43.968'N         | 007°01.579'W         | FIG 5s        | 2     |     | 4                             |            | No change considered necessary |
| 3    | COPE PASSAGE 4          | BUOY             | 57°41.761'N         | 007°03.604'W         | FIR 5s        | 3     |     | 3                             |            | No change considered necessary |
| 3    | COPE PASSAGE 3          | BUOY             | 57°41.861'N         | 007°03.436'W         | FI G 5s       | 3     |     | 3                             |            | No change considered necessary |
| 3    | COPE PASSAGE 2          | BUOY             | 57°41.375'N         | 007°03.006'W         | QR            | 3     |     | 3                             |            | No change considered necessary |
| 3    | COPE PASSAGE 1          | BUOY             | 57°41,200'N         | 007°02.667'W         | 0.6           | 4     |     | 2                             |            | No change considered necessary |
| 3    | COLASGEIR               | BUOY             | 57°47.283'N         | 007°06.057'W         | FI(2) R 8s    | 4     |     | 2                             |            | No change considered necessary |
| 3    | SGEIR VOLINISH BUOY     | BUOY             | 57°46,680'N         | 007°03.585'W         | 0             | 4     |     | 2                             |            | No change considered necessary |
| 3    |                         |                  | 57°46 265'N         | 007°02 024'W         | Oc W 3s       | 4     |     | _                             |            | No change considered necessary |
|      |                         | LIGHT            |                     |                      |               | ·     |     |                               |            |                                |
| 3    | LEVERBURGH. Front.      | LEADING<br>LIGHT | 57°46.236'N         | 007°02.040'W         | QW            | 4     |     |                               |            | No change considered necessary |
| 3    | HEB BEACON              | BEACON           | 57°46.170'N         | 007°01.899'W         |               |       |     |                               |            | No change considered necessary |
| 3    | RED ROCK                | SECTOR           | 57°46.953'N         | 007°04.479'W         | FI WRG 6s     | 6     |     |                               |            | No change considered necessary |
| 3    | JANES TOWER             | LIGHT            | 57°45.763'N         | 007°02.117'W         | Q(2)G 5s      | 4     |     |                               |            | No change considered necessary |
| 3    | BOGHA LEATHACH CAOLAIS  | BUOY             | 57°46.632'N         | 007°04.199'W         | FIR 3s        | 4     |     | 2                             |            | No change considered necessary |
| 3    | BO QUIDAM               | BUOY             | 57°46.304'N         | 007°03.740'W         | FIG 3s        | 4     |     | 2                             |            | No change considered necessary |
| 3    | HORSE ROCK              | BUOY             | 57°46.002'N         | 007°03.359'W         | QG            | 4     |     | 2                             |            | No change considered necessary |
| 3    | BO STAINAN              | BUOY             | 57°45.757'N         | 007°02.400'W         | VQ(6)+LFI 10s | 4     |     | 2                             |            | No change considered necessary |
| 3    | DUBH SGEIR (LEVERBURGH) | LIGHT            | 57°45.503'N         | 007°02.620'W         | Q(2)W 5s      | 6     |     |                               |            | No change considered necessary |
| 3    | STUMBLES ROCK           | BUOY             | 57°45.128'N         | 007°01.786'W         | FI(2) R 10s   | 4     |     | 2                             | AIS        | No change considered necessary |
| 3    | NW RODEL ROCKS          | BUOY             | 57°43.202'N         | 007°02.035'W         | FIG 8s        | 3     |     | 3                             |            | No change considered necessary |
| 3    | SGEIR GRIADACH          | BUOY             | 57°50.358'N         | 006°41.363'W         | Q(6)+LFI 15s  | 5     |     | 2                             |            | No change considered necessary |
| 3    | SGEIR INOE              | BUOY             | 57°50.935'N         | 006°33.910'W         | FIG 6s        | 2     |     | 2                             | RACON      | No change considered necessary |
| 3    | EILEAN GLAS             |                  | 57°51,413'N         | 006°38.515'W         | FI(3) W 20s   |       |     | _                             | RACON/AIS  | Add VAtoN capability           |
| 3    | SHIANTS                 | BUOY             | 57°54,577'N         | 006°25.703'W         | QG            | 4     |     | 2                             | AIS        | No change considered necessary |
| 3    | RUBH UISENIS            |                  | 57°56 263'N         | 006°28 344'\\/       | FLW 5s        | 11    |     | _                             |            | No change considered necessary |
| Ŭ    |                         |                  | 5. 50.200 N         | 200 20:014 11        |               |       |     |                               |            |                                |

| Area | Name               | Туре            | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character     | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment   |
|------|--------------------|-----------------|---------------------|----------------------|---------------|-------|-----|-------------------------------|------------|---|
| 3    | MILAID POINT       | LIGHT           | 58°01.091'N         | 006°22.019'W         | FIW 15s       | 10    |     |                               |            | No change considered necessary  |
| 3    | HEN AND CHICKENS   | BEACON          | 58°10.647'N         | 006°15.599'W         |               |       |     |                               |            | No change considered necessary  |
| 3    | SGEIR NA CIRCE     | BUOY            | 58°10.560'N         | 006°15.613'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary  |
| 3    | TIUMPAN HEAD       | LIGHT           | 58°15.677'N         | 006°08.271'W         | FI(2)W 15s    | 18    |     |                               |            | No change considered necessary  |
| 3    | BUTT OF LEWIS      | LIGHT           | 58°30.923'N         | 006°15.717'W         | FI W 5s       | 25    |     |                               | DGPS/AIS   | Re-engineer with minimum 21nM range; discontinue DGPS service with effect from 2022 |
| 3    | SLEAT POINT        | LIGHT           | 57°01.094'N         | 006°01.084'W         | FI W 3s       | 9     |     |                               |            | No change considered necessary  |
| 3    | ORNSAY             | LIGHT           | 57°08.602'N         | 005°46.869'W         | Oc W 8s       | 12    |     |                               |            | Re-engineer; maintain 12nM range  |
| 3    | ORNSAY BEACON      | LIGHT           | 57°09.087'N         | 005°46.944'W         | FIR 6s        | 4     |     |                               |            | No change considered necessary  |
| 3    | SGEIR ULIBHE       | BEACON          | 57°08.254'N         | 005°40.580'W         |               |       |     |                               |            | No change considered necessary  |
| 3    | SANDAIG            | LIGHT           | 57°10.051'N         | 005°42.288'W         | FIW 6s        | 8     |     |                               |            | No change considered necessary  |
| 3    | KYLE RHEA          | SECTOR<br>LIGHT | 57°14.225'N         | 005°39.929'W         | FI WRG 3s     | 8     |     |                               |            | No change considered necessary  |
| 3    | SGEIR GOLACH       | LIGHT           | 57°21.202'N         | 005°39.010'W         | FIW 10s       | 3     |     |                               |            | No change considered necessary  |
| 3    | BOGHA DUBH SGEIR   | LIGHT           | 57°20.924'N         | 005°37.853'W         | FI(2) R 6s    | 2     |     |                               |            | No change considered necessary  |
| 3    | SGEIR-NA-CAILLEACH | LIGHT           | 57°15.599'N         | 005°38.891'W         | FI(2) R 6s    | 4     |     |                               |            | No change considered necessary  |
| 3    | SLIOCH             | BUOY            | 57°16.235'N         | 005°34.693'W         | FI (3) G 6s   | 3     |     | 3                             |            | No change considered necessary  |
| 3    | RACOON ROCK        | BUOY            | 57°16.152'N         | 005°35.198'W         | FI G 5s       | 3     |     | 3                             |            | No change considered necessary  |
| 3    | EIGHT METRE ROCK   | LIGHT           | 57°16.599'N         | 005°42.689'W         | FI G 6s       | 4     |     |                               |            | No change considered necessary  |
| 3    | EILEANAN DUBHA     | LIGHT           | 57°16.559'N         | 005°42.321'W         | FI(2)W 10s    | 8     |     |                               |            | Trial daytime conspicuity   |
| 3    | STRING ROCK        | BUOY            | 57°16.488'N         | 005°42.885'W         | FIR 6s        | 4     |     | 2                             |            | No change considered necessary  |
| 3    | BOW ROCK           | BUOY            | 57°16.763'N         | 005°45.920'W         | Fl(2) R 12s   | 4     |     | 2                             | AIS        | No change considered necessary  |
| 3    | FORK ROCKS         | BUOY            | 57°16.836'N         | 005°44.935'W         | FI G 6s       | 4     |     | 2                             |            | No change considered necessary  |
| 3    | BLACK EYE          | BUOY            | 57°16.706'N         | 005°45.305'W         | FIR 6s        | 4     |     | 2                             |            | No change considered necessary  |
| 3    | CARRACH ROCK       | BUOY            | 57°17.180'N         | 005°45.356'W         | FI(2) G 12s   | 4     |     | 2                             | RACON      | No change considered necessary  |
| 3    | SGEIR GHOBHLACH    | LIGHT           | 57°15.693'N         | 005°52.254'W         | FI(3) W 10s   | 3     |     |                               |            | No change considered necessary  |
| 3    | CROWLIN            | LIGHT           | 57°21.216'N         | 005°51.388'W         | FIW 6s        | 6     |     |                               |            | No change considered necessary  |
| 3    | GULNARE            | BUOY            | 57°19.148'N         | 005°55.856'W         | FI G 5s       | 4     |     | 2                             |            | No change considered necessary  |
| 3    | MACMILLAN ROCK     | BUOY            | 57°21.114'N         | 006°06.300'W         | FI(2) G 12s   | 4     |     | 2                             |            | No change considered necessary  |
| 3    | SGEIR THRAID       | LIGHT           | 57°19.822'N         | 005°56.509'W         | QW            | 3     |     |                               |            | No change considered necessary  |
| 3    | EYRE POINT         | SECTOR<br>LIGHT | 57°20.010'N         | 006°01.294'W         | FI WR 3s      | 9     |     |                               |            | No change considered necessary  |
| 3    | JACKAL ROCK        | BUOY            | 57°20.340'N         | 006°04.758'W         | FI G 5s       | 3     |     | 3                             |            | No change considered necessary  |
| 3    | PENFOLD ROCK       | BUOY            | 57°20.630'N         | 006°05.530'W         | FI R 5s       | 4     |     | 2                             |            | No change considered necessary  |
| 3    | RONA               | LIGHT           | 57°34.686'N         | 005°57.544'W         | FIW 12s       | 12    |     |                               | AIS        | No change considered necessary  |
| 3    | NA GAMHNACHAIN     | BUOY            | 57°35.890'N         | 005°57.714'W         | Q             | 4     |     | 2                             |            | No change considered necessary  |
| 3    | RUBH REIDH         | LIGHT           | 57°51.527'N         | 005°48.713'W         | Fl(4) 15s     | 18    |     |                               | AIS        | Add VAtoN capability  |
| 3    | CAILLEACH HEAD     | LIGHT           | 57°55.819'N         | 005°24.224'W         | Fl(2) 12s     | 9     |     |                               |            | No change considered necessary  |
| 3    | BO CAOLAS          | BEACON          | 58°08.787'N         | 005°18.211'W         |               |       |     |                               |            | No change considered necessary  |
| 3    | STOER HEAD         | LIGHT           | 58°14.405'N         | 005°24.161'W         | FI W 15s      | 18    |     |                               |            | No change considered necessary  |
| 3    | CAPE WRATH         | LIGHT           | 58°37.531'N         | 004°59.967'W         | FI(4) 30s     | 22    |     |                               | AIS        | Re-engineer with minimum 18nM range   |
| 4    | NUN ROCK VATON     | AIS             | 58°52.650'N         | 004°58.300'W         |               |       |     |                               |            | No change considered necessary  |
| 4    | LOCH ERIBOLL       | SECTOR<br>LIGHT | 58°31.008'N         | 004°38.907'W         | FI WR 10s     | 13    |     |                               |            | No change considered necessary  |
| 4    | SULA SGEIR         | LIGHT           | 59°05.614'N         | 006°09.567'W         | FI W 15s      | 11    |     |                               |            | No change considered necessary  |
| 4    | NORTH RONA         | LIGHT           | 59°07.276'N         | 005°48.902'W         | FI(3)W 20s    | 22    |     |                               | AIS        | No change considered necessary  |
| 4    | SULE STACK VATON   | AIS             | 59°01.450'N         | 004°30.400'W         |               |       |     |                               |            | No change considered necessary  |
| 4    | SULE SKERRY        | LIGHT           | 59°05.110'N         | 004°24.397'W         | FI(2)W 15s    | 21    |     |                               | RACON/AIS  | No change considered necessary  |
| 4    | NOUP HEAD          | LIGHT           | 59°19.865'N         | 003°04.235'W         | FI 30s        | 20    |     |                               |            | No change considered necessary  |
| 4    | EDAY GRUNA         | BUOY            | 59°08.386'N         | 002°43.846'W         | Q             | 4     |     | 2                             |            | No change considered necessary  |
| 4    | CALF OF EDAY       | SECTOR<br>LIGHT | 59°14.214'N         | 002°45.820'W         | FI(3) WRG 10s | 8     |     |                               |            | No change considered necessary  |
| 4    | NORTH RONALDSAY    | LIGHT           | 59°23.359'N         | 002°22.890'W         | FIW 10s       | 24    |     |                               | RACON      | No change considered necessary  |
| 4    | RIV BEACON         | BEACON          | 59°19.217'N         | 002°34.023'W         |               |       |     |                               |            | No change considered necessary  |
| 4    | OTTERSWICK         | BUOY            | 59°17.922'N         | 002°29.993'W         | FI G 5s       | 4     |     | 2                             |            | No change considered necessary  |

| Area | Name               | Туре            | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character     | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                               |
|------|--------------------|-----------------|---------------------|----------------------|---------------|-------|-----|-------------------------------|------------|---------------------------------------|
| 4    | START POINT        | LIGHT           | 59°16.638'N         | 002°22.577'W         | FI(2) 20s     | 18    |     |                               |            | Re-engineer; maintain 18nM range      |
| 4    | PAPA STRONSAY      | LIGHT           | 59°09.349'N         | 002°34.915'W         | FI (4) 20s    | 9     |     |                               |            | No change considered necessary        |
| 4    | QUAI BOW           | BUOY            | 59°09.828'N         | 002°36.289'W         | FI(2) G 12s   | 4     |     | 2                             |            | No change considered necessary        |
| 4    | NORTH SHOAL VATON  | AIS             | 59°13.494'N         | 003°34.831'W         |               |       |     |                               |            | No change considered necessary        |
| 4    | BROUGH OF BIRSAY   | LIGHT           | 59°08.214'N         | 003°20.363'W         | FI(3) W 25s   | 18    |     |                               | AIS        | No change considered necessary        |
| 4    | SEAL SKERRY        | LIGHT           | 59°04.002'N         | 002°59.289'W         | FI R 3s       | 3     |     |                               |            | No change considered necessary        |
| 4    | LINGA SKERRY       | BUOY            | 59°02.395'N         | 002°57.557'W         | Q(3) 10s      | 4     |     | 2                             |            | No change considered necessary        |
| 4    | EGILSAY GRAAND     | BUOY            | 59°06.868'N         | 002°54.547'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary        |
| 4    | GALT SKERRY        | BUOY            | 59°05.225'N         | 002°54.182'W         | Q             | 4     |     | 2                             |            | No change considered necessary        |
| 4    | SKERTOURS          | BUOY            | 59°04.118'N         | 002°56.704'W         | Q             | 5     |     | 2                             |            | No change considered necessary        |
| 4    | BORAY SKERRIES     | BUOY            | 59°03.659'N         | 002°57.643'W         | Q(6)+LFI 15s  | 5     |     | 2                             |            | No change considered necessary        |
| 4    | VASA SKERRY        | BEACON          | 59°02.993'N         | 002°55.816'W         |               |       |     |                               |            | No change considered necessary        |
| 4    | AUSKERRY           | LIGHT           | 59°01.557'N         | 002°34.367'W         | FIW 20s       | 20    |     |                               |            | No change considered necessary        |
| 4    | COPINSAY           | LIGHT           | 58°53.792'N         | 002°40.349'W         | FI(5)W 30s    | 14    |     |                               |            | No change considered necessary        |
| 4    | PETER SKERRY       | BUOY            | 58°55.259'N         | 003°13.515'W         | FI G 6s       | 4     |     | 2                             |            | No change considered necessary        |
| 4    | RIDDOCK SHOAL      | BUOY            | 58°55.889'N         | 003°14.998'W         | FI(2) R 12s   | 4     |     | 2                             |            | No change considered necessary        |
| 4    | SAND EEL           | BUOY            | 58°56.417'N         | 003°15.342'W         | Q(3) 10s      | 4     |     | 2                             |            | No change considered necessary        |
| 4    | BARR ROCK          | BUOY            | 58°56.607'N         | 003°17.003'W         | Q             | 4     |     | 2                             | AIS        | No change considered necessary        |
| 4    | SKERRY OF NESS     | SECTOR          | 58°56.960'N         | 003°17.830'W         | FIWG 4s       | 7     |     |                               |            | Re-engineer; remove green sector      |
| 4    | HOY SOUND (HIGH)   | SECTOR<br>LIGHT | 58°56.137'N         | 003°16.400'W         | Oc WR 8s      | 19    |     |                               |            | No change considered necessary        |
| 4    | HOY SOUND (LOW)    | LIGHT           | 58°56.421'N         | 003°18.605'W         | Iso W 3s      | 12    |     |                               |            | No change considered necessary        |
| 4    | CAVA               | SECTOR          | 58°53.231'N         | 003°10.683'W         | FI WR 3s      | 10    |     |                               |            | No change considered necessary        |
| 4    | BARREL OF BUTTER   | LIGHT           | 58°53.427'N         | 003°07.583'W         | FI(2) W 10s   | 7     |     |                               |            | No change considered necessary        |
| 4    | ROYAL OAK WRECK    | BUOY            | 58°55.746'N         | 002°59.186'W         | FI(3) G 20s   | 4     |     | 2                             |            | No change considered necessary        |
| 4    | ROSENESS           | LIGHT           | 58°52.357'N         | 002°49.932'W         | FIW 6s        | 8     |     |                               |            | No change considered necessary        |
| 4    | FLOTTA GRINDS      | BUOY            | 58°50.973'N         | 003°00.783'W         | FI(2) R 10s   | 4     |     | 2                             | AIS        | No change considered necessary        |
| 5    | HOXA HEAD          | SECTOR<br>LIGHT | 58°49.315'N         | 003°02.085'W         | FI WR 3s      | 9     |     |                               |            | No change considered necessary        |
| 5    | LOTHER ROCK        | LIGHT           | 58°43.796'N         | 002°58.692'W         | FIW 2s        | 6     |     |                               | RACON      | No change considered necessary        |
| 5    | SWONA              | LIGHT           | 58°44.256'N         | 003°04.235'W         | FI 8s         | 9     |     |                               |            | No change considered necessary        |
| 5    | RUFF REEF          | LIGHT           | 58°47.433'N         | 003°07.805'W         | FIW 10s       | 6     |     |                               |            | No change considered necessary        |
| 5    | CANTICK HEAD       | LIGHT           | 58°47.229'N         | 003°07.890'W         | FI 20s        | 13    |     |                               |            | No change considered necessary        |
| 5    | TOR NESS           | LIGHT           | 58°46.704'N         | 003°17.792'W         | FI 5s         | 17    |     |                               |            | No change considered necessary        |
| 5    | DUNNET HEAD        | LIGHT           | 58°40.287'N         | 003°22.594'W         | FI(4) 30s     | 23    |     |                               |            | No change considered necessary        |
| 5    | STROMA SKERRIES    | BEACON          | 58°39.842'N         | 003°08.219'W         |               |       |     |                               |            | No change considered necessary        |
| 5    | STROMA             | LIGHT           | 58°41.754'N         | 003°07.014'W         | FI(2) 20s     | 20    |     |                               | AIS        | No change considered necessary        |
| 5    | PENTLAND SKERRIES  | LIGHT           | 58°41.408'N         | 002°55.484'W         | FI(3) 30s     | 23    |     |                               | AIS        | Re-engineer; maintain 23nM range      |
| 5    | DUNCANSBY HEAD     | LIGHT           | 58°38.646'N         | 003°01.526'W         | FI W 12s      | 21    |     |                               | RACON      | Add VAtoN capability                  |
| 5    | SANDY RIDDLE VATON | AIS             | 58°37.750'N         | 002°50.000'W         |               |       |     |                               |            | Establish Virtual AtoN                |
| 6    | FOULA              | LIGHT           | 60°06.757'N         | 002°03.875'W         | FI(3)W 15s    | 17    |     |                               |            | Re-engineer with red sector (257-277) |
| 6    | BULLIA SKERRY      | LIGHT           | 60°06.664'N         | 001°21.569'W         | FI W 5s       | 5     |     |                               |            | Reduce to 3nM range                   |
| 6    | FUGLA NESS         | SECTOR<br>LIGHT | 60°06.381'N         | 001°20.845'W         | FI(2)WRG 10s  | 10    |     |                               |            | No change considered necessary        |
| 6    | HILDASAY           | BUOY            | 60°09.040'N         | 001°19.922'W         | Q(6)+L.FI 15s | 4     |     | 2                             |            | No change considered necessary        |
| 6    | VE SKERRIES        | LIGHT           | 60°22.372'N         | 001°48.799'W         | FI(2)W 20s    | 11    |     |                               | RACON      | No change considered necessary        |
| 6    | MUCKLE ROE         | SECTOR<br>LIGHT | 60°20.978'N         | 001°27.061'W         | FI WR 3s      | 9     |     |                               |            | No change considered necessary        |
| 6    | HILLSWICK          | SECTOR<br>LIGHT | 60°27.213'N         | 001°29.797'W         | FI(4)WR 15s   | 9     |     |                               |            | No change considered necessary        |
| 6    | ESHANESS           | LIGHT           | 60°29.350'N         | 001°37.680'W         | FIW 12s       | 25    |     |                               |            | Re-engineer with minimum 18nM range   |
| 6    | HOLM OF SKAW       | LIGHT           | 60°49.871'N         | 000°46.317'W         | FI 5s         | 8     |     |                               |            | No change considered necessary        |
| 6    | MUCKLE FLUGGA      | LIGHT           | 60°51.326'N         | 000°53.146'W         | FI(2) 20s     | 22    |     |                               |            | Re-engineer with minimum 18nM range   |

| Area | Name                  | Туре                     | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character       | Range | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment  |
|------|-----------------------|--------------------------|---------------------|----------------------|-----------------|-------|-----|-------------------------------|------------|--|
| 6    | HEAD OF MULA          | SECTOR<br>LIGHT          | 60°40.760'N         | 000°57.580'W         | FI WRG 5s       | 10    |     |                               |            | No change considered necessary   |
| 6    | UYEA SOUND            | LIGHT                    | 60°41.149'N         | 000°55.474'W         | FI(2) 8s        | 7     |     |                               |            | No change considered necessary   |
| 6    | BALTA SOUND           | SECTOR<br>LIGHT          | 60°44.452'N         | 000°47.676'W         | FI WR 10s       | 10    |     |                               |            | No change considered necessary   |
| 6    | WHITEHILL             | SECTOR<br>LIGHT          | 60°34.798'N         | 001°00.223'W         | FI WR 3s        | 9     |     |                               |            | No change considered necessary   |
| 6    | OUTER SKERRY          | LIGHT                    | 60°33.034'N         | 001°18.311'W         | FI W 6s         | 8     |     |                               |            | No change considered necessary   |
| 6    | LITTLE HOLM           | LIGHT                    | 60°33.417'N         | 001°15.885'W         | Iso W 4s        | 6     |     |                               |            | No change considered necessary   |
| 6    | MUCKLE HOLM           | LIGHT                    | 60°34.832'N         | 001°16.006'W         | FI(4)W 10s      | 10    |     |                               |            | No change considered necessary   |
| 6    | POINT OF FETHALAND    | SECTOR                   | 60°38.054'N         | 001°18.697'W         | FI(3)WR 15s     | 19    |     |                               |            | No change considered necessary   |
| 6    | GRUNEY                | LIGHT<br>SECTOR          | 60°39.153'N         | 001°18.175'W         | FI WR 5s        | 8     |     |                               | RACON      | No change considered necessary   |
| 6    | BAGI STACK            | LIGHT                    | 60°43.521'N         | 001°07.540'W         | FI (4) 20s      | 10    |     |                               |            | No change considered necessary   |
| 6    | BROTHER ISLE          | SECTOR<br>LIGHT          | 60°30.946'N         | 001°14.109'W         | Dir Fl(4)WRG 8s | 10    |     |                               |            | No change considered necessary   |
| 6    | NESS OF SOUND         | SECTOR                   | 60°31.347'N         | 001°11.278'W         | FI(3)WRG 12s    | 9     |     |                               |            | No change considered necessary   |
| 6    | RUMBLE ROCK           | LIGHT                    | 60°28.171'N         | 001°07.265'W         | FIW 10s         | 4     |     |                               | RACON      | No change considered necessary   |
| 6    | FIRTHS VOE            | SECTOR<br>LIGHT          | 60°27.215'N         | 001°10.625'W         | Oc WRG 8s       | 15    |     |                               |            | No change considered necessary   |
| 6    | LUNNA HOLM            | SECTOR<br>LIGHT          | 60°27.344'N         | 001°02.512'W         | FI(3) WRG 15s   | 10    |     |                               |            | No change considered necessary   |
| 6    | MUCKLE SKERRY         | SECTOR<br>LIGHT          | 60°26.371'N         | 000°51.827'W         | FI(2)WRG 10s    | 7     |     |                               |            | No change considered necessary   |
| 6    | OUT SKERRIES          | LIGHT                    | 60°25.469'N         | 000°43.683'W         | FI W 20s        | 20    |     |                               |            | Re-engineer with minimum 18nM range  |
| 6    | WETHER HOLM           | LIGHT                    | 60°22.345'N         | 001°01.334'W         | FI W 5s         | 9     |     |                               |            | No change considered necessary   |
| 6    | SUTHER NESS           | SECTOR<br>LIGHT          | 60°22.122'N         | 001°00.202'W         | FI WRG 3s       | 10    |     |                               |            | No change considered necessary   |
| 6    | SKATE OF MARRISTER    | LIGHT                    | 60°21.358'N         | 001°01.390'W         | FI G 6s         | 4     |     |                               |            | No change considered necessary   |
| 6    | SYMBISTER NESS        | SECTOR<br>LIGHT          | 60°20.429'N         | 001°02.286'W         | FI(2)WG 12s     | 8     |     |                               |            | No change considered necessary   |
| 6    | INNER VODER BEACON    | BEACON                   | 60°16.459'N         | 001°04.928'W         |                 |       |     |                               |            | No change considered necessary   |
| 6    | INNER VODER           | BUOY                     | 60°16.435'N         | 001°05.122'W         | Q(9) 15s        | 4     |     | 2                             | AIS        | No change considered necessary   |
| 6    | MULL OF ESWICK        | SECTOR<br>LIGHT          | 60°15.743'N         | 001°05.885'W         | FI WRG 3s       | 9     |     |                               |            | No change considered necessary   |
| 6    | HOO STACK             | SECTOR<br>LIGHT          | 60°14.967'N         | 001°05.370'W         | FI(4)WRG 12s    | 7     |     |                               |            | Re-engineer with LED Sector Light; discontinue directional light                 |
| 6    | UNICORN ROCK          | BUOY                     | 60°13.513'N         | 001°08.464'W         | VQ(3) 5s        | 5     |     | 2                             |            | No change considered necessary   |
| 6    | SOLDIAN ROCK          | BUOY                     | 60°12.508'N         | 001°04.726'W         | Q(6)+LFI 15s    | 5     |     | 2                             |            | No change considered necessary   |
| 6    | ROVA HEAD             | SECTOR<br>LIGHT          | 60°11.458'N         | 001°08.598'W         | FI WRG 4s       | 12    |     |                               |            | No change considered necessary   |
| 6    | MOUSA                 | LIGHT                    | 59°59.854'N         | 001°09.506'W         | FI 3s           | 10    |     |                               |            | No change considered necessary   |
| 6    | SUMBURGH HEAD         | LIGHT                    | 59°51.231'N         | 001°16.515'W         | FI(3) 30s       | 23    |     |                               | DGPS/AIS   | Re-engineer; maintain 23nM range; discontinue DGPS service with effect from 2022 |
| 6    | FAIR ISLE (NORTH)     | LIGHT                    | 59°33.122'N         | 001°36.531'W         | FI(2) 30s       | 22    |     |                               |            | Re-engineer with minimum 18nM range  |
| 6    | FAIR ISLE (SOUTH)     | LIGHT                    | 59°30.858'N         | 001°39.206'W         | FI(4) 30s       | 22    |     |                               |            | Re-engineer with minimum 18nM range  |
| 7    | NOSS HEAD             | LIGHT                    | 58°28.761'N         | 003°03.085'W         | FI W 20s        | 18    |     |                               |            | No change considered necessary   |
| 7    | TARBAT NESS           | LIGHT                    | 57°51.908'N         | 003°46.600'W         | FI(4)W 30s      | 18    |     |                               | RACON      | No change considered necessary   |
| 7    | THREE KINGS           | BUOY                     | 57°43.730'N         | 003°54.243'W         | Q(3) 10s        | 4     |     | 2                             |            | No change considered necessary   |
| 7    | CRAIGTON POINT        | SECTOR                   | 57°30.053'N         | 004°14.086'W         | FI WRG 4s       | 11    |     |                               |            | No change considered necessary   |
| 7    | LONGMAN POINT         | LIGHT<br>SECTOR<br>LIGHT | 57°29.995'N         | 004°13.308'W         | FI WR 2s        | 5     |     |                               |            | No change considered necessary   |
| 7    | MEIKLE MEE            | BUOY                     | 57°30.260'N         | 004°12.010'W         | FI G 3s         | 4     |     | 2                             |            | No change considered necessary   |
| 7    | PETTY BANK            | BUOY                     | 57°31.615'N         | 004°08.941'W         | FI R 5s         | 4     |     | 2                             |            | No change considered necessary   |
| 7    | MUNLOCHY SHOAL        | BUOY                     | 57°32.922'N         | 004°07.645'W         | L FI 10s        | 4     |     | 2                             |            | No change considered necessary   |
| 7    | SKATE BANK NORTH EAST | BUOY                     | 57°34.290'N         | 004°06.074'W         | FI R 5s         | 3     |     | 3                             |            | No change considered necessary   |
| 7    | SKATE BANK NORTH WEST | BUOY                     | 57°34.416'N         | 004°06.676'W         | FI(4) R 10s     | 3     |     | 3                             |            | No change considered necessary   |
| 7    | CHANONRY              | LIGHT                    | 57°34.441'N         | 004°05.567'W         | Oc W 6s         | 12    |     |                               |            | No change considered necessary   |
| 7    | CRAIGMEE              | BUOY                     | 57°35.298'N         | 004°04.981'W         | FI R 6s         | 4     |     | 2                             |            | No change considered necessary   |

| Area | Name                 | Туре       | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character             | Range | HWS      | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment  |
|------|----------------------|------------|---------------------|----------------------|-----------------------|-------|----------|-------------------------------|------------|--|
| 7    | RIFF BANK WEST       | BUOY       | 57°35.690'N         | 004°04.395'W         | FI Y 5s               | 5     |          | 2                             |            | No change considered necessary   |
| 7    | RIFF BANK NORTH WEST | BUOY       | 57°36.580'N         | 004°03.590'W         | FIR 3s                | 4     |          | 3                             |            | No change considered necessary   |
| 7    | RIFF BANK SOUTH      | BUOY       | 57°36.726'N         | 004°00.954'W         | Q(6)+LFI 15s          | 5     |          | 2                             |            | No change considered necessary   |
| 7    | RIFF BANK NORTH      | BUOY       | 57°37.229'N         | 004°02.740'W         | FI(2) R 12s           | 4     |          | 2                             |            | No change considered necessary   |
| 7    | NAVITY BANK          | BUOY       | 57°38.167'N         | 004°01.167'W         | FI(3) G 15s           | 4     |          | 2                             |            | No change considered necessary   |
| 7    | RIFF BANK EAST       | BUOY       | 57°38.383'N         | 003°58.158'W         | FLY 10s               | 5     |          | 2                             | AIS        | No change considered necessary   |
| 7    | HALLIMAN BEACON      | BEACON     | 57°44.001'N         | 003°19.307'W         |                       |       |          |                               |            | No change considered necessary   |
| 7    | HALLIMAN             | BUOY       | 57°44.334'N         | 003°18.567'W         | Q                     | 9     |          | 2                             | RACON      | No change considered necessary   |
| 7    | KINNAIRD HEAD        | LIGHT      | 57°41.875'N         | 002°00.265'W         | FIW 5s                | 22    |          |                               |            | Add VAtoN capability   |
| 7    | CAIRNBULG BRIGGS     | LIGHT      | 57°41.105'N         | 001°56.461'W         | FIW 10s               | 10    |          |                               |            | No change considered necessary   |
| 8    | RATTRAY HEAD         | LIGHT      | 57°36.615'N         | 001°49.006'W         | FI(3)W 30s            | 18    |          |                               | RACON      | No change considered necessary   |
| 8    | BUCHAN NESS          | LIGHT      | 57°28.227'N         | 001°46.474'W         | FI 5s                 | 18    |          |                               | RACON      | Add VAtoN capability   |
| 8    | CRUDEN SCAURS        | BUOY       | 57°23.173'N         | 001°50.368'W         | FI R 10s              | 4     |          | 2                             | AIS        | No change considered necessary   |
| 8    | GIRDLE NESS          | LIGHT      | 57°08.339'N         | 002°02.916'W         | FI(2)W 20s            | 22    |          |                               | DGPS/RACON | Re-engineer; maintain 22nM range; discontinue DGPS service with effect from 2022 |
| 8    | SCURDIE NESS         | LIGHT      | 56°42.106'N         | 002°26.238'W         | FI(3)W 20s            | 20    |          |                               | RACON      | No change considered necessary   |
| 8    | BELL ROCK            | LIGHT      | 56°26.065'N         | 002°23.230'W         | FI W 5s               | 18    |          |                               | RACON      | Re-engineer; maintain 18nM range   |
| 8    | NORTH CARR           | BUOY       | 56°18.064'N         | 002°32.945'W         | Q(3) 10s              | 4     |          | 2                             | AIS        | No change considered necessary   |
| 8    | NORTH CARR BEACON    | BEACON     | 56°17.702'N         | 002°34.352'W         |                       |       |          |                               |            | No change considered necessary   |
| 8    | FIFE NESS            | SECTOR     | 56°16.747'N         | 002°35.196'W         | Iso WR 10s            | 15    |          |                               | AIS        | Add VAtoN capability   |
| 8    | ISLE OF MAY          | LIGHT      | 56°11.139'N         | 002°33.457'W         | FI(2)W 15s            | 22    |          |                               |            | No change considered necessary   |
| 8    | EAST VOWS            | BEACON     | 56°10.840'N         | 002°50.154'W         |                       |       |          |                               |            | No change considered necessary   |
| 8    | EARL'S HILL          | DGPS       | 56°04.284'N         | 004°03.610'W         |                       |       |          |                               | DGPS       |  |
| 8    | BASS ROCK            |            | 56°04.603'N         | 002°38.463'W         | FL (3) 20s            | 10    |          |                               | 20.0       | No change considered necessary   |
| 8    | SOUTH CARR           | BEACON     | 56°03.443'N         | 002°37.699'W         |                       |       |          |                               |            | No change considered necessary   |
| 8    | SOUTH CARR BUOY      | BUOY       | 56°03.600'N         | 002°37.650'W         | 9                     | 4     |          | 2                             |            | No change considered necessary   |
| 8    | ST ABBS HEAD         | LIGHT      | 55°54,979'N         | 002°08.286'W         | FI 10s                | 18    |          | _                             | RACON      | Add VAtoN capability   |
| 9    | BARIEY               | BLIOY      | 52° 38 050' N       | 001° 52 900' E       | VO (6) + I El 15s     | 5     |          | 2                             |            | No change considered necessary   |
| 9    | BAMBURGH             | LIGHTHOUSE | 55° 36 993' N       | 001° 42 452' W       | $O_{\rm C}(2)$ WRG 8s | 14    |          | 2                             |            | No change considered necessary   |
| 9    | CANADA & GEORGIOS    | BUOY       | 53° 42.347' N       | 000° 07.116' E       | VQ (3) 5s             | 5     |          | 2                             |            | No change considered necessary   |
| 9    | COQUET               | LIGHTHOUSE | 55° 20.033' N       | 001° 32.387' W       | FI (3) WR 20s         | 19    | Horn (1) | -                             |            | No change considered necessary   |
| 9    | EMMANUEL HEAD        | BEACON     | 55° 41 148' N       | 001° 46 801' W       |                       |       | 305      |                               |            | No change considered necessary   |
| 9    |                      | LIGHTHOUSE | 55° 36 921' N       | 001° 39 346' W       | FL (2) W/R 15s        | 10    |          |                               |            | No change considered necessary   |
| 9    |                      | BUOY       | 54° 12 743' N       | 000° 14 584' W       | Q (3) 10s             | 5     | Bell     | 2                             |            | No change considered necessary   |
| 0    |                      |            | 54° 06 090' N       | 000° 04 062' W       |                       | 24    | Horn (2) | -                             | DODO       |  |
| 9    |                      |            | 55° 40 240' N       | 000 04.962 W         | PT (4) 135            | 24    | 90s      | 3                             | DGFS       | No change considered percessary  |
| 9    |                      | LIGHTHOUSE | 55° 39 493' N       | 001° 47.590' W       |                       | 3     |          | 5                             |            | No change considered necessary   |
| 9    | HELIGH               | LIGHTHOUSE | 55° 40 093' N       | 001° 47.530 W        | Oc WRG 6s             | 5     |          |                               |            | No change considered necessary   |
| 9    | INGER NIELSON        | BUOY       | 54° 30.905' N       | 002° 36.325' F       | VQ (3) 5s             | 5     |          | 2                             |            | No change considered necessary   |
| 9    | LONGSTONE            | LIGHTHOUSE | 55° 38.623' N       | 001° 36.653' W       | FI 20s                | 18    |          | -                             | AIS        | No change considered necessary   |
| 9    | NEWTON               | BUOY       | 55° 32.171' N       | 001° 35.848' W       | FLR 5s                | 4     |          | 3                             |            | No change considered necessary   |
| 9    | PLOUGH ROCK          | BUOY       | 55° 40.240' N       | 001° 45.996' W       | Q (9) 15s             | 3     |          | 3                             |            | No change considered necessary   |
| 9    | PLOUGH SEAT          | BUOY       | 55° 40.370' N       | 001° 44.967' W       | QR                    | 3     |          | 3                             |            | No change considered necessary   |
| 9    | RIDGE                | BUOY       | 55° 39.700' N       | 001° 45.966' W       | Q (3) 10s             | 3     |          | 3                             |            | No change considered necessary   |
| 9    | SALTSCAR             | BUOY       | 54° 38.109' N       | 001° 00.099' W       | VQ                    | 5     | Bell     | 2                             |            | No change considered necessary   |
| 9    | SHORESTON            | BUOY       | 55° 35.880' N       | 001° 39.317' W       | QR                    | 3     |          | 3                             |            | No change considered necessary   |
| 9    | NORTH SMITHIC        | BUOY       | 54° 06.214' N       | 000° 03.905' W       | VQ                    | 5     | Bell     | 2                             |            | No change considered necessary   |
| 9    | SOUTH WEST SMITHIC   | BUOY       | 54° 02.414' N       | 000° 09.204' W       | Q (9) 15s             | 5     |          | 2                             |            | No change considered necessary   |
| 9    | NORTH SUNDERLAND     | BUOY       | 55° 34.621' N       | 001° 37.117' W       | FI R 2.5s             | 3     |          | 3                             |            | No change considered necessary   |
| 9    | SWEDMAN              | BUOY       | 55° 37.650' N       | 001° 41.617' W       | FI G 2.5s             | 3     |          | 3                             |            | No change considered necessary   |
| 9    | TRITON               | BUOY       | 55° 39.585' N       | 001° 46.816' W       | QG                    | 3     |          | 3                             |            | No change considered necessary   |
| 9    | WHITBY               | LIGHTHOUSE | 54° 28.667' N       | 000° 34.094' W       | FI WR 5s              | 18    |          |                               |            | No change considered necessary   |
| Area | Name                  | Туре       | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character        | Range | HWS     | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                             |
|------|-----------------------|------------|---------------------|----------------------|------------------|-------|---------|-------------------------------|------------|-------------------------------------|
| 9    | BLAKENEY OVERFALLS    | BUOY       | 53° 03.021' N       | 001° 01.392' E       | FI (2) R 5s      | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | BRIDGIRDLE            | BUOY       | 53° 01.742' N       | 000° 43.994' E       | FI R 2.5s        | 3     |         | 3                             |            | No change considered necessary      |
| 9    | BURNHAM FLATS         | BUOY       | 53° 07.520' N       | 000° 34.894' E       | Q (9) 15s        | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | EAST DOCKING          | BUOY       | 53° 09.820' N       | 000° 50.392' E       | FI R 2.5s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH DOCKING         | BUOY       | 53° 14.819' N       | 000° 41.493' E       | Q                | 5     |         | 2                             |            | Monitor for Position                |
| 9    | INNER DOWSING         | BUOY       | 53° 19.100' N       | 000° 34.800' E       | Q (3) 10s        | 7     |         | 1                             | RACON      | No change considered necessary      |
| 9    | MIDDLE OUTER DOW SING | BUOY       | 53° 24.819' N       | 001° 07.790' E       | FI (3) G 10s     | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH OUTER DOWSING   | BUOY       | 53° 33.517' N       | 000° 59.590' E       | Q                | 9     |         | 1                             | RACON/AIS  | No change considered necessary      |
| 9    | SOUTH INNER DOW SING  | BUOY       | 53° 12.119' N       | 000° 33.694' E       | Q (6) + LFI 15s  | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | DUDGEON               | BUOY       | 53° 16.620' N       | 001° 16.889' E       | Q (9) 15s        | 7     |         | 1                             | RACON      | No change considered necessary      |
| 9    | EAST DUDGEON          | BUOY       | 53° 19.719' N       | 000° 58.691' E       | Q (3) 10s        | 5     |         | 2                             |            | Monitor for Position                |
| 9    | HJORDIS (Beacon)      | BEACON     | 52° 59.018' N       | 000° 58.144' E       | FI (2) 5s        | 5     |         |                               |            | No change considered necessary      |
| 9    | LYNN KNOCK            | BUOY       | 53° 04.422' N       | 000° 27.206' E       | QG               | 4     |         | 2                             |            | No change considered necessary      |
| 9    | PROTECTOR             | BUOY       | 53° 24.848' N       | 000° 25.145' E       | FI R 2.5s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH RACE            | BUOY       | 53° 14.989' N       | 000° 43.893' E       | FI G 5s          | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | SOUTH RACE            | BUOY       | 53° 07.810' N       | 000° 57.342' E       | Q (6) + LFI 15s  | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | WEST RIDGE            | BUOY       | 53° 19.069' N       | 000° 44.493' E       | Q (9) 15s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | OUTER SAND            | BUOY       | 53° 36.412' N       | 000° 29.394' E       | Q (3) 10s        | 7     |         | 1                             | RACON/AIS  | No change considered necessary      |
| 9    | SOUTH SAND            | BUOY       | 53° 34.620' N       | 000° 25.200' E       | Q (6) + LFI 15s  | 5     |         | 1                             |            | No change considered necessary      |
| 9    | SCOTT PATCH           | BUOY       | 53° 11.120' N       | 000° 36.394' E       | VQ (3) 5s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | EAST SHERINGHAM       | BUOY       | 53° 02.221' N       | 001° 14.890' E       | Q (3) 10s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | WEST SHERINGHAM       | BUOY       | 53° 02.951' N       | 001° 06.761' E       | Q (9) 15s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | VINA                  | BEACON     | 52° 59.082' N       | 000° 39.235' E       |                  |       |         |                               |            | No change considered necessary      |
| 9    | NORTH WELL            | BUOY       | 53° 03.022' N       | 000° 27.896' E       | LFI 10s          | 5     | Whistle | 1                             | RACON      | No change considered necessary      |
| 9    | WOOLPACK              | BUOY       | 53° 02.672' N       | 000° 31.445' E       | FIR 10s          | 5     |         | 2                             |            | No change considered necessary      |
| 9    | EAST BARNARD          | BUOY       | 52° 25.138' N       | 001° 46.390' E       | Q (3) 10s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | MIDDLE CAISTER        | BUOY       | 52° 38.986' N       | 001° 45.659' E       | FI (2) R 5s      | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | NORTH CAISTER         | BUOY       | 52° 40.762' N       | 001° 45.715' E       | FI (3) R 10s     | 5     |         | 2                             |            | No change considered necessary      |
| 9    | COCKLE                | BUOY       | 52° 44.026' N       | 001° 43.589' E       | VQ (3) 5s        | 5     |         | 2                             |            | Reposition NW and rename            |
| 9    | MIDDLE CORTON         | BUOY       | 52° 33.609' N       | 001° 47.977' E       | FI G 2.5s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | SOUTH CORTON          | BUOY       | 52° 33.243' N       | 001° 48.467' E       | Q (6) + LFI 15s  | 5     | Bell    | 2                             |            | No change considered necessary      |
| 9    | WEST CORTON           | BUOY       | 52° 34.111' N       | 001° 47.467' E       | FI (3) G 10s     | 4     |         | 2                             |            | No change considered necessary      |
| 9    | CROMER                | LIGHTHOUSE | 52° 55.482' N       | 001° 18.990' E       | FI 5s            | 21    |         |                               | RACON      | No change considered necessary      |
| 9    | CROSS SAND            | BUOY       | 52° 37.025' N       | 001° 59.136' E       | LFI 10s          | 5     |         | 1                             | RACON      | No change considered necessary      |
| 9    | EAST CROSS SAND       | BUOY       | 52° 40.050' N       | 001° 53.800' E       | FI (4) R 15s     | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH EAST CROSS SAND | BUOY       | 52° 44.220' N       | 001° 53.800' E       | VQ (3) 5s        | 5     |         | 1                             |            | Monitor for Position                |
| 9    | DR 1                  | BUOY       | 53° 06.700' N       | 002° 40.700' E       | LFI 10s          | 5     |         | 1                             |            | No change considered necessary      |
| 9    | MIDDLE HAISBRO        | BUOY       | 52° 54.223' N       | 001° 41.587' E       | FI (2) G 5s      | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH HAISBRO         | BUOY       | 53° 00.222' N       | 001° 32.288' E       | Q                | 5     |         | 1                             | RACON/AIS  | No change considered necessary      |
| 9    | SOUTH HAISBRO         | BUOY       | 52° 50.823' N       | 001° 48.287' E       | Q (6) + LFI 15s  | 5     | Bell    | 1                             |            | No change considered necessary      |
| 9    | HAMMOND KNOLL         | BUOY       | 52° 49.744' N       | 001° 57.586' E       | Q (9) 15s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | EAST HAMMOND KNOLL    | BUOY       | 52° 52.323' N       | 001° 58.635' E       | Q (3) 10s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | HEMSBY                | BUOY       | 52° 41.800' N       | 001° 46.180' E       | FI R 2.5s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | HOLM APPROACH         | BUOY       | 52° 30.880' N       | 001° 50.220' E       | Q (3) 10s        | 7     |         | 1                             |            | No change considered necessary      |
| 9    | NORTH HOLM            | BUOY       | 52° 33.730' N       | 001° 47.289' E       | Q                | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH EAST HOLM       | BUOY       | 52° 32.916' N       | 001° 48.490' E       | FI R 2.5s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | NORTH WEST HOLM       | BUOY       | 52° 31.468' N       | 001° 46.588' E       | FI (4) G 15s     | 5     |         | 2                             |            | No change considered necessary      |
| 9    | SOUTH HOLM            | BUOY       | 52° 26.850' N       | 001° 47.150' E       | VQ (6) + LFI 10s | 5     |         | 2                             |            | No change considered necessary      |
| 9    | HOLM SAND             | BUOY       | 52° 33.283' N       | 001° 46.621' E       | Q (9) 15s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | SOUTH WEST HOLM       | BUOY       | 52° 27.870' N       | 001° 46.990' E       | FI (2) G 5s      | 5     |         | 2                             |            | No change considered necessary      |
| 9    | WEST HOLM             | BUOY       | 52° 29.497' N       | 001° 46.990' E       | FI (3) G 10s     | 5     |         | 2                             |            | No change considered necessary      |
| 9    | EAST JACOBA           | BUOY       | 53° 03.830' N       | 002° 42.199' E       | Q (3) 10s        | 5     |         | 2                             |            | No change considered necessary      |
| 9    | WEST JACOBA           | BUOY       | 53° 03.830' N       | 002° 41.930' E       | Q (9) 15s        | 5     |         | 2                             | RACON      | No change considered necessary      |
| 9    | LOWESTOFT             | LIGHTHOUSE | 52° 29.223' N       | 001° 45.353' E       | FI 15s           | 23    |         |                               |            | No change considered necessary      |
| 9    | NEWARP                | BUOY       | 52° 48.374' N       | 001° 55.686' E       | LFI 10s          | 7     |         | 1                             | RACON/AIS  | Discontinue when NE Cross Monitored |

| Area | Name                     | Туре       | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character         | Range | HWS     | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|------|--------------------------|------------|---------------------|----------------------|-------------------|-------|---------|-------------------------------|------------|--------------------------------|
| 9    | EAST NEWCOME             | BUOY       | 52° 28.508' N       | 001° 49.209' E       | FI (2) R 5s       | 5     |         | 2                             |            | No change considered necessary |
| 9    | NORTH NEWCOME            | BUOY       | 52° 28.390' N       | 001° 46.370' E       | FI (4) R 15s      | 5     |         | 2                             |            | No change considered necessary |
| 9    | NEWCOME SAND             | BUOY       | 52° 26.334' N       | 001° 47.164' E       | QR                | 5     |         | 2                             |            | No change considered necessary |
| 9    | SCROBY ELBOW             | BUOY       | 52° 36.555' N       | 001° 46.260' E       | FI (2) G 5s       | 5     | Bell    | 2                             |            | No change considered necessary |
| 9    | NORTH SCROBY             | BUOY       | 52° 41.390' N       | 001° 46.470' E       | VQ                | 5     |         | 2                             |            | No change considered necessary |
| 9    | NORTH WEST SCROBY        | BUOY       | 52° 40.376' N       | 001° 46.329' E       | FI (3) G 10s      | 5     |         | 2                             |            | No change considered necessary |
| 9    | SOUTH WEST SCROBY        | BUOY       | 52° 35.135' N       | 001° 46.695' E       | FI G 2.5s         | 5     | Bell    | 2                             |            | No change considered necessary |
| 9    | SMITHS KNOLL             | BUOY       | 52° 43.525' N       | 002° 17.884' E       | Q (6) + LFI 15s   | 7     |         | 1                             | RACON      | No change considered necessary |
| 9    | SOUTHWOLD                | LIGHTHOUSE | 52° 19.632' N       | 001° 40.886' E       | FIW 10s           | 24    |         |                               | AIS        | No change considered necessary |
| 9    | STANFORD                 | BUOY       | 52° 27.358' N       | 001° 46.670' E       | FI R 2.5s         | 5     |         | 2                             |            | No change considered necessary |
| 9    | WHITE SWAN               | BUOY       | 52° 33.399' N       | 001° 44.237' E       |                   |       |         | 4                             |            | No change considered necessary |
| 9    | SOUTH WINTERTON RIDGE    | BUOY       | 52° 47.224' N       | 002° 03.485' E       | Q (6) + LFI 15s   | 5     |         | 2                             |            | No change considered necessary |
| 10   | ALICE                    | BUOY       | 51° 32.332' N       | 001° 04.218' E       | FI (2) 5s         | 5     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH MARGATE            | BUOY       | 51° 23.833' N       | 001° 16.646' E       | FI G 2.5s         | 3     |         | 3                             |            | No change considered necessary |
| 10   | ALDEBURGH RIDGE          | BUOY       | 52° 06.490' N       | 001° 36.950' E       | QR                | 3     |         | 3                             |            | No change considered necessary |
| 10   | MIDDLE BAWDSEY           | BUOY       | 51° 58.880' N       | 001° 33.593' E       | FI (3) G 10s      | 5     |         | 2                             |            | No change considered necessary |
| 10   | NORTH EAST BAWDSEY       | BUOY       | 52° 01.730' N       | 001° 36.092' E       | FI G 10s          | 5     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH BAWDSEY            | BUOY       | 51° 57.226' N       | 001° 30.215' E       | Q (6) + LFI 15s   | 5     | Bell    | 1                             |            | No change considered necessary |
| 10   | BENCH HEAD               | BUOY       | 51° 44.557' N       | 001° 01.186' E       | FI (3) G 10s      | 3     |         | 3                             |            | No change considered necessary |
| 10   | BLACK DEEP               | BUOY       | 51° 48.315' N       | 001° 36.955' E       | QR                | 4     |         | 2                             |            | No change considered necessary |
| 10   | COLNE BAR                | BUOY       | 51° 44.611' N       | 001° 02.567' E       | FI (2) G 5s       | 3     |         | 3                             |            | No change considered necessary |
| 10   | SOUTH CORK               | BUOY       | 51° 51.331' N       | 001° 24.094' E       | Q (6) + LFI 15s   | 3     |         | 3                             |            | No change considered necessary |
| 10   | CUTLER                   | BUOY       | 51° 58.530' N       | 001° 27.500' E       | QG                | 3     |         | 3                             |            | No change considered necessary |
| 10   | DEBEN                    | BUOY       | 51° 59.291' N       | 001° 23.522' E       |                   | -     |         | 4                             |            | No change considered necessary |
| 10   | EAGLE                    | BUOY       | 51° 44.109' N       | 001° 03.630' E       | QG                | 4     |         | 3                             |            | No change considered necessary |
| 10   | NORTH EAGLE              | BUOY       | 51° 44.711' N       | 001° 04.317' E       | Q                 | 3     |         | 3                             |            | No change considered necessary |
| 10   | NORTH INNER GABBARD      | BUOY       | 51° 59.129' N       | 001° 55.988' E       | Q                 | 5     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH INNER GABBARD      | BUOY       | 51° 49.922' N       | 001° 51.892' F       | Q (6) + I FI 15s  | 5     |         | 2                             |            | No change considered necessary |
| 10   | WEST INNER GABBARD       | BUOY       | 51° 52 061' N       | 001° 49 368' E       | $E(3) \times 10s$ | 5     |         | 2                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 49 837' N       | 001° 59 993' F       | 0                 | 5     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH GALLOPER           | BUOY       | 51° 43 981' N       | 001° 56 389' E       | Q(6) + 1 E 15s    | 5     |         | 1                             | RACON      | No change considered necessary |
| 10   | NORTH FAST GUNFLEET      | BUOY       | 51° 49 931' N       | 001° 27 794' E       | O(3) 10s          | 5     |         | 2                             | 10.0011    | No change considered necessary |
| 10   |                          | BUOY       | 51° 45 331' N       | 001°21.754°E         | O(6) + 1 = 15     | 5     | Bell    | 2                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 56 756' N       | 001 21.095 E         |                   | 5     | Dell    | 1                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 38 200' N       | 001 00.000 E         | ELR 5c            | 3     |         | 1                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 59 470' N       | 001 00.002 E         | 111(35            | 5     |         | 4                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51 30.479 N         | 001 23.220 E         | Q (2) 10c         | 7     |         | 4                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51 30.005 N         | 001 40.429 E         |                   | 5     |         | 1<br>2                        |            | No change considered necessary |
| 10   |                          | BUOY       | 51 43.001 N         | 001 03.007 E         |                   | 5     |         | 2                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51 44.292 N         | 001 02.137 E         | FI (2) K 35       | 4     |         | 3                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 58.000 N        | 001° 23.288 E        |                   |       |         | 4                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 58.308' N       | 001° 23.198° E       | 2/0               | -     | Dell    | 4                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 48.123 N        | 001° 39.394 E        |                   | 5     | Bell    | 1                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 36.776' N       | 001° 05.501° E       | FIG 5S            | 4     | Bell    | 2                             |            | No change considered necessary |
| 10   | MEDUSA                   | BUOY       | 51° 51.230' N       | 001° 20.355' E       | FIG5s             | 3     |         | 3                             |            | No change considered necessary |
| 10   |                          | BUOY       | 51° 41.347' N       | 001° 12.612' E       | Q                 | 4     |         | 3                             |            | No change considered necessary |
| 10   | NOORD HINDER ROUTE SOUTH | BUOY       | 51° 49.530' N       | 002° 25.950' E       | FI Y 10s          | 5     |         | 2                             |            | No change considered necessary |
| 10   |                          | BUOY       | 52° 02.000' N       | 001° 28.200' E       | LFI 10s           | 1     | Bell    | 2                             |            | No change considered necessary |
| 10   | OXLEY                    | BUOY       | 52° 02.091' N       | 001° 27.696' E       |                   | _     |         | 4                             |            | No change considered necessary |
| 10   | ROUGH                    | BUOY       | 51° 55.190' N       | 001° 31.003' E       | VQ                | 5     |         | 2                             |            | No change considered necessary |
| 10   | EAST SHIPWASH            | BUOY       | 51° 57.079' N       | 001° 37.890' E       | VQ (3) 5s         | 5     |         | 2                             |            | No change considered necessary |
| 10   | NORTH SHIPWASH           | BUOY       | 52° 01.730' N       | 001° 38.272' E       | Q                 | 7     | Whistle | 1                             | RACON /AIS | No change considered necessary |
| 10   | NORTH WEST SHIPWASH      | BUOY       | 51° 58.980' N       | 001° 37.012' E       | FIR 5s            | 5     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH SHIPWASH           | BUOY       | 51° 52.713' N       | 001° 33.972' E       | Q (6) + LFI 15s   | 5     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH SHIPWASH DUPLICATE | BUOY       | 51° 52.760' N       | 001° 34.070' E       | Q (6) + LFI 15s   | 1     |         | 2                             |            | No change considered necessary |
| 10   | SOUTH WEST SHIPWASH      | BUOY       | 51° 54.750' N       | 001° 34.213' E       | FI Y 2.5s         | 5     |         | 2                             |            | No change considered necessary |

| Area | Name                | Туре         | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character        | Range | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|------|---------------------|--------------|---------------------|----------------------|------------------|-------|-----------------|-------------------------------|------------|--------------------------------|
| 10   | STORM               | BUOY         | 51° 52.410' N       | 001° 38.225' E       | VQ (6) + LFI 10s | 5     |                 | 2                             |            | No change considered necessary |
| 10   | SUNK CENTRE         | LIGHT VESSEL | 51° 50.100' N       | 001° 46.020' E       | FI (2) 20s       | 16    | Horn (2)<br>60s |                               | RACON /AIS | No change considered necessary |
| 10   | EAST SUNK 1         | BUOY         | 51° 51.062' N       | 001° 59.993' E       | lso 5s           | 5     |                 | 2                             |            | No change considered necessary |
| 10   | EAST SUNK 2         | BUOY         | 51° 48.686' N       | 001° 51.875' E       | LFI 10s          | 5     |                 | 2                             |            | No change considered necessary |
| 10   | SUNK INNER          | LIGHT FLOAT  | 51° 51.170' N       | 001° 34.400' E       | ISO 3S           | 12    | Horn (1)<br>30s |                               | RACON /AIS | No change considered necessary |
| 10   | NORTH SUNK 1        | BUOY         | 51° 56.113' N       | 001° 46.927' E       | lso 5s           | 5     |                 | 2                             |            | No change considered necessary |
| 10   | NORTH SUNK 2        | BUOY         | 51° 54.289' N       | 001° 46.340' E       | LFI 10s          | 5     |                 | 2                             |            | No change considered necessary |
| 10   | SOUTH SUNK 1        | BUOY         | 51° 38.572' N       | 001° 47.363' E       | lso 5s           | 5     |                 | 2                             |            | No change considered necessary |
| 10   | SOUTH SUNK 2        | BUOY         | 51° 42.403' N       | 001° 46.669' E       | LFI 10s          | 5     |                 | 2                             |            | No change considered necessary |
| 10   | SOUTH WEST SUNK     | BUOY         | 51° 38.318' N       | 001° 43.745' E       | FL (2) Y 10S     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | WEST SUNK 1         | BUOY         | 51° 52.606' N       | 001° 41.119' E       | FI (4) Y 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | WEST SUNK 2         | BUOY         | 51° 49.275' N       | 001° 40.722' E       | FI Y 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 10   | EAST SUNK           | BUOY         | 51° 53.230' N       | 002° 07.506' E       | ISO 2.5S         | 9     |                 | 1                             | RACON      | No change considered necessary |
| 10   | SWIN SPITWAY        | BUOY         | 51° 41.951' N       | 001° 08.347' E       | Iso 10s          | 5     | Bell            | 2                             |            | No change considered necessary |
| 10   | TRINITY             | BUOY         | 51° 49.030' N       | 001° 36.391' E       | Q (6) + LFI 15s  | 5     |                 | 1                             |            | No change considered necessary |
| 10   | WALKER              | BUOY         | 51° 53.802' N       | 001° 33.903' E       | Q (9) 15s        | 7     |                 | 1                             |            | No change considered necessary |
| 10   | WALLET 2            | BUOY         | 51° 48.881' N       | 001° 22.994' E       | FIR 5s           | 5     |                 | 2                             |            | No change considered necessary |
| 10   | WALLET 3            | BUOY         | 51° 45.031' N       | 001° 11.292' E       | FI (3) G 15s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | WALLET 4            | BUOY         | 51° 46.531' N       | 001° 17.225' E       | FI (4) R 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | WALLET 6            | BUOY         | 51° 44.431' N       | 001° 11.846' E       | FI (2) R 5s      | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                     | BUOY         | 51° 42.861' N       | 001° 07.317' E       | LFI 10s          | 5     | Bell            | 2                             |            | No change considered necessary |
| 10   | WEIR                | BUOY         | 52° 02.321' N       | 001° 27.586' E       |                  | _     |                 | 4                             |            | No change considered necessary |
| 10   | WHITAKER            | BUOY         | 51° 41.431' N       | 001° 10.506' E       | Q (3) 10s        | 5     | Bell            | 2                             |            | No change considered necessary |
| 10   |                     | BUOY         | 51° 39.536' N       | 001° 09.393' E       | FI (2) G 10s     | 3     |                 | 3                             |            | No change considered necessary |
| 10   | WHITING HOOK        | BUOY         | 52° 02.980' N       | 001° 31.823' E       | FIR 10s          | 3     |                 | 3                             |            | No change considered necessary |
| 10   | ARGUS               | BUOY         | 51° 29.297' N       | 000° 58.715' E       | FI Y 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 10           | BUOY         | 51° 33.792' N       | 001° 07.834' E       | FI (3) R 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 11           | BUOY         | 51° 34.082' N       | 001° 06.697' E       | FI (3) G 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 12           | BUOY         | 51° 33.244' N       | 001° 05.944' E       | FI (2) R 5s      | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 13           | BUOY         | 51° 32.822' N       | 001° 03.067' E       | FI (2) G 5s      | 4     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 14           | BUOY         | 51° 31.832' N       | 001° 00.428' E       | FLR 2.5s         | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 2            | BUOY         | 51° 41.981' N       | 001° 22.893' E       | FI (2) R 55      | 5     |                 | 2                             | DACON      | No change considered necessary |
| 10   | BARROW 3            | BUOY         | 51° 42.021' N       | 001° 20.243° E       | Q (3) 10s        | 5     |                 | 2                             | RACON      | No change considered necessary |
| 10   | BARROW 4            | BUOY         | 51° 39.881 N        | 001° 17.494° E       |                  | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 5            | BUOY         | 51° 40.031 N        | 001° 16.206 E        |                  | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                     | BUOY         | 51 57.301 IN        | 001 14.004 E         | FI (4) K 155     | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                     | BUOY         | 51° 25 051' N       | 001 13.471 E         |                  | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BARROW 9            | BUOY         | 51° 35 342' N       | 001° 10.297' E       | VO(3) 5s         | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                     | LIGHTHOUSE   | 50° 44 025' N       | 000° 14 488' E       | FL (2) 20s       | 16    |                 | 2                             |            | No change considered necessary |
| 10   |                     | BLIOY        | 51° 44.023 N        | 000 14.400 E         | FLG 5s           | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                     | BUOY         | 51° 34 732' N       | 001° 15 596' E       | FL (3) R 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 11       | BUOY         | 51° 34 250' N       | 001° 13 475' E       | FL (3) G 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 12       | BUOY         | 51° 33 931' N       | 001° 13 511' E       | FI (4) R 15s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 2        | BUOY         | 51° 45 631' N       | 001° 32 192' E       | FL (4) R 15s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 3        | BUOY         | 51° 42 393' N       | 001° 26 655' E       | FL (3) G 15s     | 4     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 4        | BUOY         | 51° 41.421' N       | 001° 28.482' F       | FI (2) R 5s      | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 5        | BUOY         | 51° 39.531' N       | 001° 22.993' F       | VQ (3) 5s        | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 6        | BUOY         | 51° 38.521' N       | 001° 24.403' F       | FI R 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 7        | BUOY         | 51° 37.081' N       | 001° 17.694' E       | QG               | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 8        | BUOY         | 51° 36.358' N       | 001° 20.426' E       | Q (9) 15s        | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP 9        | BUOY         | 51° 35.131' N       | 001° 15.094' E       | Q (6) + LFI 15s  | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP MIDDLE 1 | BUOY         | 51° 41.960' N       | 001° 27.590' E       | FI Y 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BLACK DEEP MIDDLE 2 | BUOY         | 51° 37.370' N       | 001° 20.040' E       | FI Y 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
|      |                     |              |                     |                      |                  |       |                 |                               |            |                                |

| Area | Name              | Туре         | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character       | Range | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|------|-------------------|--------------|---------------------|----------------------|-----------------|-------|-----------------|-------------------------------|------------|--------------------------------|
| 10   | BLACKTAIL SPIT    | BUOY         | 51° 31.482' N       | 000° 56.748' E       | FI (3) G 10s    | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BRAKE             | BUOY         | 51° 16.984' N       | 001° 28.195' E       | FI (4) R 15s    | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BROADSTAIRS KNOLL | BUOY         | 51° 20.884' N       | 001° 29.475' E       | FI R 2.5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | BULLOCK BANK      | BUOY         | 50° 46.937' N       | 001° 07.597' E       | VQ              | 5     |                 | 1                             |            | No change considered necessary |
| 10   | COLUMBINE         | BUOY         | 51° 24.263' N       | 001° 01.348' E       | FI G 2s         | 4     |                 | 3                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 23.863' N       | 001° 00.028' E       | FI (3) G 10s    | 3     |                 | 3                             |            | No change considered necessary |
| 10   | COPPERAS          | BUOY         | 51° 23.810' N       | 001° 11.180' E       | QG              | 3     |                 | 3                             |            | No change considered necessary |
| 10   |                   | BUOY         | 50° 33.707' N       | 000° 03.925' W       | FLY 52          | 5     |                 | 1                             |            | No change considered necessary |
| 10   |                   | BUOY         | 50° 39.137 N        | 000° 32.601° E       | FLY 10c         | 10    |                 | 1                             |            | No change considered necessary |
| 10   |                   | BUOY         | 50° 52.036 N        | 001° 02.200' E       |                 | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 08.008 IN       | 001° 34.020 E        | FI (4) F 155    | 5     |                 | 1                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 12.935 N        | 001° 25.500 E        |                 | 5     | Roll            | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 25 833' N       | 001 20.220 E         | O(3) 10s        | 5     | Dell            | 2<br>1                        |            | No change considered necessary |
| 10   | BUNGENEOO         | LIGUTUQUQE   | 51 23.033 N         | 001 42.091 E         |                 | 3     | Horn (3)        | 1                             |            |                                |
| 10   | DUNGENESS         | LIGHTHOUSE   | 50° 54.806' N       | 000° 58.560' E       | FI 10s          | 21    | 60s             |                               |            | No change considered necessary |
| 10   | DYNAMO            | BUOY         | 51° 50.060' N       | 001° 33.880' E       | FI Y 2.5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | EAST CANT         | BUOY         | 51° 28.532' N       | 000° 55.598' E       | QR              | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 15.675' N       | 001° 35.695' E       | Q (3) 10s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | EAST MARGATE      | BUOY         | 51° 27.033' N       | 001° 26.395' E       | FI R 2.5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | EAST VARNE        | BUOY         | 50° 58.236' N       | 001° 20.895' E       | VQ (3) 5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | ELBOW             | BUOY         | 51° 23.234' N       | 001° 31.594' E       |                 | 5     |                 | 2                             |            | No change considered necessary |
| 10   | F1                | BUOY         | 51° 11.235' N       | 001° 44.922' E       | FI (4) Y 15S    | 5     |                 | 1                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 20.414 N        | 001° 56.190 E        | FI (4) Y 155    | 5     |                 | 1                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 28.233 N        | 001° 49.890 E        |                 | 5     |                 | 2                             |            | No change considered necessary |
| 10   | FISHERMAN 2       | BUOY         | 51° 34 296' N       | 001 23.520 E         | FI B 2.5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | FISHERMAN 3       | BUOY         | 51° 34 780' N       | 001 23.300 E         | FLG 5s          | 5     |                 | 2                             |            | No change considered necessary |
| 10   | FISHERMAN 4       | BUOY         | 51° 34 770' N       | 001°22.030°E         | FI (2) R 5s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | FISHERMAN 5       | BUOY         | 51° 35 250' N       | 001° 21 840' E       | FI (2) G 5s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | FISHERMAN 6       | BUOY         | 51° 35.080' N       | 001° 21.560' E       | FL (3) R 10s    | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   |              | 51° 04 450' N       | 002° 00 277' E       | FL 102          | 15    | Horn (1)        | -                             |            |                                |
| 10   |                   |              | 51° 24.150 N        | 002° 00.377 E        | FI 15c          | 15    | 10s<br>Horn (1) |                               |            | No change considered necessary |
| 10   | GOODWIN EAST      | LIGHT VESSEL | 51 13.204 N         | 001 30.373 E         | FLIDS           | 15    | 30s             |                               | RACON/AIS  |                                |
| 10   | GOODWIN FORK      | BUOY         | 51° 14.379' N       | 001° 26.697' E       | Q (6) + LFI 15s | 5     | Bell            | 2                             |            | No change considered necessary |
| 10   | GOODWIN KNOLL     | BUOY         | 51° 19.584' N       | 001° 32.194' E       | FI (2) G 5s     | 4     | Llore (1)       | 2                             |            | No change considered necessary |
| 10   | GREENWICH         | LIGHT VESSEL | 50° 24.538' N       | 000° 00.095' W       | FI 5s           | 15    | Hom (1)<br>30s  |                               | RACON /AIS | No change considered necessary |
| 10   | GULL              | BUOY         | 51° 19.584' N       | 001° 31.295' E       | VQ (3) 5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | GULL STREAM       | BUOY         | 51° 18.284' N       | 001° 29.695' E       | QR              | 5     |                 | 2                             |            | No change considered necessary |
| 10   | HAM GAT           | BUOY         | 51° 23.083' N       | 000° 58.318' E       | QG              | 3     |                 | 3                             |            | No change considered necessary |
| 10   | INNER FISHERMAN   | BUOY         | 51° 36.145' N       | 001° 20.079' E       | QR              | 5     |                 | 2                             |            | No change considered necessary |
| 10   | INNER LONG SAND   | BUOY         | 51° 38.775' N       | 001° 25.435' E       | lso 2s          | 5     |                 | 2                             |            | No change considered necessary |
| 10   | INNER PRINCES     | BUOY         | 51° 29.597' N       | 001° 03.470' E       | FI Y 2.5s       | 5     |                 | 2                             |            | No change considered necessary |
| 10   | INTER BANK        | BUOY         | 51° 16.484' N       | 001° 52.221' E       | FI Y 5s         | 5     |                 | 1                             | RACON      | No change considered necessary |
| 10   | KNOB              | BUOY         | 51° 30.692' N       | 001° 04.277' E       | lso 5s          | 5     | Whistle         | 1                             |            | No change considered necessary |
| 10   | KNOCK JOHN        | BUOY         | 51° 33.661' N       | 001° 11.357' E       | FI (2) R 5s     | 5     |                 | 2                             |            | No change considered necessary |
| 10   | KNOCK JOHN 1      | BUOY         | 51° 33.717' N       | 001° 10.833' E       | Q (6) + LFI 15s | 5     |                 | 2                             |            | No change considered necessary |
| 10   | KNOCK JOHN 2      | BUOY         | 51° 33.112' N       | 001° 09.847' E       | FLR 5s          | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 33.278' N       | 001° 09.692' E       |                 | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 32.323' N       | 001° 07.906' E       | FI (3) K 105    | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 32.490' N       | 001° 07.750° E       |                 | 5     |                 | 2                             |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 31.956 N        | 001° 06.406 E        | FI (4) G 105    | 5     |                 | ∠<br>۸                        |            | No change considered necessary |
| 10   |                   | BUOY         | 51° 22 664' N       | 001 20.073 E         | 06              | 5     | Boll            | 4                             |            |                                |
| 10   | MAPLIN BANK       | BUOY         | 51° 35.502' N       | 001° 04.697' E       | FI (3) R 10s    | 3     |                 | 3                             |            | No change considered necessary |
|      |                   |              | 4                   |                      | ·               |       | ·               |                               | 4          | ·                              |

| Area | Name                          | Туре         | Latitude<br>(WGS84) | Longitude<br>(WGS84)   | Character       | Range | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                          |
|------|-------------------------------|--------------|---------------------|------------------------|-----------------|-------|-----------------|-------------------------------|------------|----------------------------------|
| 10   | MAPLIN EDGE                   | BUOY         | 51° 35.332' N       | 001° 03.647' E         | FI G 2.5s       | 4     |                 | 4                             |            | No change considered necessary   |
| 10   | MIDDLE FALLS                  | BUOY         | 51° 18.634' N       | 001° 46.991' E         | FI (3) R 10s    | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | MIDDLE PRINCES                | BUOY         | 51° 29.195' N       | 001° 09.000' E         | FI Y 5s         | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | MIDDLE VARNE                  | BUOY         | 50° 58.936' N       | 001° 19.897' E         | VQ (9) 10s      | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | MPC                           | BUOY         | 51° 06.125' N       | 001° 38.253' E         | FI Y 2.5s       | 5     |                 | 1                             | RACON /AIS | No change considered necessary   |
| 10   | NORTH EAST GOODWIN            | BUOY         | 51° 20.314' N       | 001° 34.164' E         | Q (3) 10s       | 7     |                 | 1                             | RACON      | No change considered necessary   |
| 10   | NORTH EAST SPIT               | BUOY         | 51° 27.933' N       | 001° 29.894' E         | VQ (3) 5s       | 5     |                 | 1                             | RACON /AIS | No change considered necessary   |
| 10   | NORTH EAST VARNE              | BUOY         | 50° 59.800' N       | 001° 22.700' E         | Q (3) 10s       | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | NORTH EAST WHITING            | BUOY         | 52° 03.610' N       | 001° 33.322' E         | Q (3) 10s       | 3     |                 | 3                             |            | No change considered necessary   |
| 10   | NORTH FORELAND                | LIGHTHOUSE   | 51° 22.494' N       | 001° 26.705' E         | FI (5) WR 20s   | 19    |                 |                               | DGPS/AIS   | Intens Red Sector can be reduced |
| 10   | NORTH GOODWIN                 | BUOY         | 51° 18.120' N       | 001° 30.350' E         | FI G 2.5s       | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | NORTH OAZE                    | BUOY         | 51° 30.032' N       | 000° 57.648' E         | QR              | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | NORTH PRINCES                 | BUOY         | 51° 29.248' N       | 001° 18.346' E         | QG              | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | NORTH RED SAND TOWERS         | BUOY         | 51° 28.732' N       | 000° 59.318' E         | FI (3) R 10s    | 5     | Bell            | 2                             |            | No change considered necessary   |
| 10   | NORTH SHIVERING SAND<br>TOWER | BUOY         | 51° 30.012' N       | 001° 04.757' E         | Q               | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | NORTH WEST GOODWIN            | BUOY         | 51° 16.720' N       | 001° 28.470' E         | Q (9) 15s       | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | NORTH WEST VARNE              | BUOY         | 51° 00.800' N       | 001° 22.700' E         | Q               | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | OAZE                          | BUOY         | 51° 28.977' N       | 000° 56.917' E         | FI (4) Y 10s    | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | OAZE BANK                     | BUOY         | 51° 29.179' N       | 000° 56.771' E         | QG              | 4     |                 | 2                             |            | No change considered necessary   |
| 10   | OAZE DEEP                     | BUOY         | 51° 30.000' N       | 001° 00.000' E         | FI (2) G 5s     | 4     |                 | 2                             |            | No change considered necessary   |
| 10   |                               | BUOY         | 51° 34 020' N       | 001° 25 100' E         | O(3) 10s        | 5     |                 | 2                             |            | No change considered necessary   |
| 10   |                               | BUOY         | 51° 34 610' N       | 001° 28 338' E         |                 | 5     |                 | 2                             |            | No change considered necessary   |
| 10   |                               | BUOY         | 51° 28 790' N       | 001° 19 870' E         | VO(6) + 1 E 10  | 5     |                 | 2                             |            | No change considered necessary   |
| 10   |                               | BUOY         | 51° 22 983' N       | 000° 58 568' E         |                 | 3     |                 | 3                             |            | No change considered necessary   |
| 10   | PRINCES 1                     | BUOY         | 51° 20 233' N       | 000 30.300 E           |                 | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | PRINCES 2                     | BUOY         | 51° 28 813' N       | 001° 13 076' E         | FI (2) R 5s     | 5     |                 | 2                             |            | No change considered necessary   |
| 10   |                               | BUOY         | 51 20.013 N         | 001 13.076 E           |                 | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | PRINCES 3                     | BUOY         | 51 29.332 N         | 001 13.096 E           | FI (2) B 100    | 5     |                 | 2                             |            | No change considered necessary   |
| 10   |                               | BUOY         | 51 20.032 N         | 001 09.697 E           | FI (3) K 105    | 4     |                 | 2                             |            | No change considered necessary   |
| 10   | PRINCES 5                     | BUOY         | 51° 29.389 N        | 001° 10.000 E          |                 | 4     |                 | 2                             |            | No change considered necessary   |
| 10   | PRINCES 6                     | BUOY         | 51° 29.180' N       | 001° 06.580° E         | FI (4) R 155    | 5     | D. II           | 2                             |            | No change considered necessary   |
| 10   | PRINCES 7                     | BUOY         | 51° 29.593' N       | 001° 07.110° E         | Q (9) 15s       | 5     | Bell            | 2                             |            | No change considered necessary   |
| 10   | PRINCES 8                     | BUOY         | 51° 29.140' N       | 001° 03.000° E         | FI (2) R 5s     | 5     |                 | 2                             |            | No change considered necessary   |
| 10   |                               |              | 51° 23.630' N       | 000° 26 086' E         | QR<br>FL 20s    | 12    | Horn (2)        | 3                             |            | No change considered necessary   |
| 10   |                               | EIGHTHOUGE   | 50 45.454 N         | 000 20.000 E           |                 | 12    | 30s             |                               |            |                                  |
| 10   | ROYAL SOVEREIGN BUOY          | BUOY         | 50° 44.216' N       | 000° 25.834' E         | QR              | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | RYE FAIRWAY                   | BUOY         | 50° 54.020' N       | 000° 48.050' E         | LFI 10s         | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SANDETTIE                     | LIGHT VESSEL | 51° 09.355' N       | 001° 47.122' E         | FI 5s           | 15    | Horn (1)<br>30s |                               | RACON /AIS | No change considered necessary   |
| 10   | SOUTH BRAKE                   | BUOY         | 51° 15.794' N       | 001° 26.845' E         | FI (3) R 10s    | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH EAST GOODWIN            | BUOY         | 51° 12.985' N       | 001° 34.445' E         | FI (3) R 10s    | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH EAST MARGATE            | BUOY         | 51° 24.053' N       | 001° 20.396' E         | Q (3) 10s       | 3     |                 | 3                             |            | No change considered necessary   |
| 10   | SOUTH EAST MOUSE              | BUOY         | 51° 31.190' N       | 001° 04.070' E         | QG              | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH FALLS                   | BUOY         | 51° 13.834' N       | 001° 43.922' E         | Q (6) + LFI 15s | 5     |                 | 1                             |            | No change considered necessary   |
| 10   | SOUTH GOODWIN                 | BUOY         | 51° 10.605' N       | 001° 32.265' E         | FI (4) R 15s    | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH KNOCK                   | BUOY         | 51° 34.132' N       | 001° 34.292' E         | Q (6) + LFI 15s | 5     | Whistle         | 1                             |            | No change considered necessary   |
| 10   | SOUTH PRINCES                 | BUOY         | 51° 28.740' N       | 001° 18.260' E         | QR              | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH SHIVERING SAND TOWER    | BUOY         | 51° 29.751' N       | 001° 04.828' E         | Q (6) + LFI 15s | 5     | Bell            | 2                             |            | No change considered necessary   |
| 10   | SOUTH VARNE                   | BUOY         | 50° 55.636' N       | 001° 17.296' E         | Q (6) + LFI 15s | 5     |                 | 1                             |            | No change considered necessary   |
| 10   | SOUTH WEST BARROW             | BUOY         | 51° 32.123' N       | 001° 00.117' E         | Q (9) 15s       | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH WEST GOODWIN            | BUOY         | 51° 08.500' N       | 001° 28.880' E         | Q (6) + LFI 15s | 9     |                 | 1                             | AIS        | No change considered necessary   |
| 10   | SOUTH WEST SANDETTIE          | BUOY         | 51° 09.775' N       | 001° 45.662' E         | Q (9) 15s       | 5     |                 | 2                             |            | No change considered necessary   |
| 10   | SOUTH WEST WHITING            | BUOY         | 52° 00.960' N       | 001° 30.693' E         | Q (6) + LFI 15s | 3     |                 | 3                             |            | No change considered necessary   |
| 10   | SPILE                         | BUOY         | 51° 26.432' N       | 000° <u>5</u> 5.698' E | FI G 2.5s       | 3     |                 | 3                             |            | No change considered necessary   |
| 10   | SUNK HEAD MIDDLE              | BUOY         | 51° 46.050' N       | 001° 31.540' E         | FI Y 2.5s       | 5     |                 | 2                             | RACON      | No change considered necessary   |
|      |                               | -            |                     |                        |                 |       |                 |                               |            |                                  |

| Area     | Name                      | Туре         | Latitude<br>(WGS84)            | Longitude<br>(WGS84)             | Character               | Range  | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|----------|---------------------------|--------------|--------------------------------|----------------------------------|-------------------------|--------|-----------------|-------------------------------|------------|--------------------------------|
| 10       | VARNE                     | LIGHT VESSEL | 51° 01.286' N                  | 001° 23.897' E                   | FI R 5s                 | 15     | Horn (1)<br>30s |                               | RACON /AIS | No change considered necessary |
| 10       | WEST GOODWIN              | BUOY         | 51° 15.614' N                  | 001° 27.375' E                   | FI G 5s                 | 5      |                 | 2                             |            | No change considered necessary |
| 10       | WEST OAZE                 | BUOY         | 51° 28.975' N                  | 000° 55.413' E                   | lso 5s                  | 5      |                 | 2                             |            | No change considered necessary |
| 10       | WEST SOUTH-WEST SANDETTIE | BUOY         | 51° 12.355' N                  | 001° 51.121' E                   | FI G 5s                 | 5      |                 | 2                             |            | No change considered necessary |
| 10       | WEST SUNK                 | BUOY         | 51° 44.331' N                  | 001° 25.792' E                   | Q (9) 15s               | 5      |                 | 2                             |            | No change considered necessary |
| 10       | WEST SWIN                 | BUOY         | 51° 33.402' N                  | 001° 01.968' E                   | QR                      | 5      |                 | 3                             |            | No change considered necessary |
| 10       | WHITSTABLE STREET         | BUOY         | 51° 24.000' N                  | 001° 01.540' E                   | FI R 2s                 | 3      |                 | 3                             |            | No change considered necessary |
| 10       | WOODBRIDGE HAVEN          | BUOY         | 51° 57.992' N                  | 001° 23.628' E                   | Mo (A) 15s              | 1      |                 | 2                             |            | No change considered necessary |
| 11       | ALDERNEY                  | LIGHTHOUSE   | 49° 43.748' N                  | 002° 09.858' W                   | FI (4) 15s              | 12     |                 |                               |            | Review 24hr on reengineering   |
| 11       | ANVIL POINT               | LIGHTHOUSE   | 50° 35.514' N                  | 001° 57.600' W                   | FI 10s                  | 9      |                 |                               |            | No change considered necessary |
| 11       | BLANCHARD                 | BUOY         | 49° 25.373' N                  | 002° 17.414' W                   | Q (3) 10s               | 5      | Bell            | 2                             |            | No change considered necessary |
| 11       | BOULDER                   | BUOY         | 50° 41.565' N                  | 000° 49.089' W                   | FI G 2.5s               | 5      |                 | 2                             |            | No change considered necessary |
| 11       | BRIDGE                    | BUOY         | 50° 39.625' N                  | 001° 36.884' W                   | VQ (9) 10s              | 5      |                 | 1                             | RACON      | No change considered necessary |
| 11       | CASQUETS                  | LIGHTHOUSE   | 49° 43.321' N                  | 002° 22.622' W                   | Fl (5) 30s              | 18     |                 |                               | RACON /AIS | No change considered necessary |
| 11       | CHANNEL                   | LIGHT VESSEL | 49° 54.459' N                  | 002° 53.744' W                   | FI 15s                  | 15     | Horn (1)<br>20s |                               | RACON /AIS | No change considered necessary |
| 11       | EAST LEPE                 | BUOY         | 50° 45.930' N                  | 001° 21.070' W                   | FI (2) R 5s             | 5      | Bell            | 2                             |            | No change considered necessary |
| 11       | EAST SHAMBLES             | BUOY         | 50° 31.260' N                  | 002° 20.080' W                   | Q (3) 10s               | 5      | Bell            | 2                             |            | No change considered necessary |
| 11       | EASTBOROUGH HEAD          | BUOY         | 50° 41.535' N                  | 000° 39.090' W                   | Q (3) 10s               | 5      | Bell            | 2                             |            | No change considered necessary |
| 11       | FAIRWAY                   | BUOY         | 50° 38.235' N                  | 001° 38.984' W                   | LFI 10s                 | 5      | Bell            | 1                             |            | No change considered necessary |
| 11       | GURNARD                   | BUOY         | 50° 46.200' N                  | 001° 18.840' W                   | Q                       | 5      |                 | 2                             |            | No change considered necessary |
| 11       | GURNARD LEDGE             | BUOY         | 50° 45.514' N                  | 001° 20.586' W                   | FI (4) G 15s            | 5      |                 | 2                             |            | No change considered necessary |
| 11       | HAMSTEAD LEDGE            | BUOY         | 50° 43.864' N                  | 001° 26.185' W                   | FI (2) G 5s             | 5      |                 | 2                             |            | No change considered necessary |
| 11       | HANOIS                    | LIGHTHOUSE   | 49° 26.100' N                  | 002° 42.143' W                   | FI (2) 13 s             | 20     | Horn (2)<br>60s |                               |            | No change considered necessary |
| 11       | HURST POINT               | LIGHTHOUSE   | 50° 42.478' N                  | 001° 33.023' W                   | FI (4) WRW (intens) 15s | 13     |                 |                               |            | No change considered necessary |
| 11       | LEPE SPIT                 | BUOY         | 50° 46.784' N                  | 001° 20.636' W                   | Q (6) + LFI 15s         | 3      |                 | 3                             |            | No change considered necessary |
| 11       | LYMINGTON BANK            | BUOY         | 50° 43.100' N                  | 001° 30.850' W                   | FI (2) R 5s             | 5      | Bell            | 2                             |            | No change considered necessary |
| 11       | MIDDLE SHINGLES           | BUOY         | 50° 41.214' N                  | 001° 34.664' W                   | FI (3) R 10s            | 5      |                 | 2                             |            | No change considered necessary |
| 11       | MIXON                     | BEACON       | 50° 42.382' N                  | 000° 46.318' W                   | Q (6) + LFI 15s         | 2      |                 |                               |            | No change considered necessary |
| 11       | N1                        | BUOY         | 50° 41.260' N                  | 000° 56.520' W                   | FL (2+1) Y 6S           | 7      |                 | 1                             |            | No change considered necessary |
| 11       | N2                        | BUOY         | 50° 41.030' N                  | 000° 56.740' W                   | FL (2+1) Y 6S           | 7      |                 | 1                             |            | No change considered necessary |
| 11       | N3                        | BUOY         | 50° 41.628' N                  | 000° 56.742' W                   | FI (3) Y 15s            | 5      |                 | 2                             |            | No change considered necessary |
| 11       | N4                        | BUOY         | 50° 41.861' N                  | 000° 57.242' W                   | FLY 7.5S                | 5      |                 | 2                             |            | No change considered necessary |
| 11       | N5                        | BUOY         | 50° 41.991' N                  | 000° 56.969 W                    |                         | 4      |                 | 2                             |            | No change considered necessary |
| 11       |                           | BUUT         | 50° 42.354 N                   | 000 57.196 W                     | FI F 2.55               | 4      | Horn (2)        | 2                             |            | No change considered necessary |
| 11       | NAB TOWER                 | LIGHTHOUSE   | 50° 40.075' N                  | 000° 57.155' W                   | FI 10s                  | 12     | 30s<br>Horn (2) |                               | RACON /AIS | No change considered necessary |
| 11       | NEEDLES                   | LIGHTHOUSE   | 50° 39.734' N                  | 001° 35.500' W                   | Oc (2) WRG 20s          | 17     | 30s             |                               |            | Reduce range to 16nm.          |
| 11       | NEW GROUNDS               | BUOY         | 50° 41.841' N                  | 000° 58.490' W                   | VQ (3) 5s               | 5      |                 | 2                             |            | No change considered necessary |
| 11       | NORTH EAST SHINGLES       | BUOY         | 50° 41.964' N                  | 001° 33.404' W                   | Q (3) 10s               | 5      |                 | 2                             |            | No change considered necessary |
| 11       |                           | BUOY         | 50° 42.684' N                  | 001° 35.514' W                   | Fl (3) G 10s            | 3      | <u> </u>        | 4                             |            | No change considered necessary |
| 11       | NORTH WEST MINQUIERS      | BUOY         | 48° 59.642' N                  | 002° 20.583' W                   | Q                       | 5      | Bell            | 1                             |            | No change considered necessary |
| 11       |                           | BUOY         | 50° 38.180' N                  | 000° 56.880° W                   | VQ (9) 10s              | 5      |                 | 1                             |            | No change considered necessary |
| 11       | OWERS                     | BUOY         | 50° 38 500' N                  | 000° 37.700° W                   | O(6) + 1 = 15c          | 5      | Roll            | 1                             | PACON      | No change considered necessary |
| 11       |                           | BUOY         | 50° 36 415' N                  | 000 41.090 W                     |                         | 1      | Dell            | 3                             | RACON      | No change considered necessary |
| 11       |                           | LIGHTHOUSE   | 50° 30 848' N                  | 002° 27 384' W                   | FL (4) 20s              | 18     | Horn (1)        | U                             |            | No change considered necessary |
|          |                           | BLIOY        |                                | 0019 47 5501 14                  | × (,, 200               | F      | 30s             | 0                             |            |                                |
| 11       |                           | BUOY         | 50° 40.414' N                  |                                  |                         | 5      |                 | 2                             |            | No change considered necessary |
| 11       |                           | BUOY         | 50° 40.485 N                   | 000 00.089 W                     | El (3) G 10s            | 5      |                 | ა<br>ი                        |            |                                |
| 11       | SARK                      | LIGHTHOUSE   | 49° 26.186' N                  | 001 23.036 W                     | FI 15s                  | 18     | Horn (1)        | 2                             |            | No change considered necessary |
|          | SCONCE                    | BUOY         | E08 40 5041 N                  |                                  | 0                       | -      | 30s             | 0                             |            |                                |
| 11<br>11 | SCONCE<br>SHINGLES ELBOW  | BUOY         | 50° 42.534' N<br>50° 40.374' N | 001° 31.435' W<br>001° 36.054' W | u<br>FI (2) R 5s        | 5<br>5 | Rell            | 2                             |            | No change considered necessary |
| L        | 1                         | 1            | 1                              | 1                                |                         |        | 1 1             | 1                             | 1          |                                |

| Area  | Name                | Type         | Latitude      | Longitude      | Character            | Range | HWS             | Inter-<br>GLA | Radio Aids | Comment                        |
|-------|---------------------|--------------|---------------|----------------|----------------------|-------|-----------------|---------------|------------|--------------------------------|
| , aca |                     | .,,,,        | (WGS84)       | (WGS84)        |                      | nunge |                 | Виоу<br>Туре  |            |                                |
| 11    | SOLENT BANK         | BUOY         | 50° 44.230' N | 001° 27.370' W | FI (3) R 10s         | 5     |                 | 2             |            | No change considered necessary |
| 11    |                     | BUOY         | 50° 38.835' N | 000° 49.289' W | VQ (6) + LFI 10s     | 5     | D.II            | 2             |            | No change considered necessary |
| 11    |                     | BUOY         | 48° 54.342' N | 002° 19.382' W | Q (9) 15s            | 5     | Bell            | 1             |            | No change considered necessary |
| 11    | SOUTH WEST SHINGLES | BUUY         | 50° 39.293' N | 001° 37.522° W | FLR 2.5S             | 5     |                 | 2             | DODO       | No change considered hecessary |
| 11    | STCATHERINES        | LIGHTHOUSE   | 50° 34.539 N  | 001° 17.873 W  |                      | 25    |                 | <u>م</u>      | DGPS       |                                |
| 11    |                     | BUOY         | 50° 41.085 N  | 001° 22 554' W |                      | 5     | Poll            | 3             |            | No change considered necessary |
| 11    | WARDEN              | BUOY         | 50° 45 234' N | 001° 33.554 W  | FI B 5s              | 5     | Dell            | 2             |            | No change considered necessary |
| 11    | WEST CLEFE          | BUOY         | 50° 29 785' N | 001 24.085 W   | O (9) 15s            | 5     | Bell            | 2             |            | No change considered necessary |
| 12    | WOOI PACK           | BEACON       | 49° 54 399' N | 002 24.403 W   | O(6) + 1 E 15s       | 2     | Den             | 2             |            | No change considered necessary |
| 12    | BANN SHOAI          | BUOY         | 50° 20.030' N | 005° 51,110' W | FLG 2.5s             | 7     |                 | 1             | RACON /AIS | No change considered necessary |
| 12    | BARTHOLOMEW LEDGES  | BEACON       | 49° 54.364' N | 006° 19.889' W | QR                   | 1     |                 |               |            | No change considered necessary |
| 12    | BERRY HEAD          | LIGHTHOUSE   | 50° 23.974' N | 003° 29.006' W | FI (2) 15s           | 18    |                 |               |            | No change considered necessary |
| 12    | BISHOP ROCK         | LIGHTHOUSE   | 49° 52.371' N | 006° 26.734' W | Fl (2) 15s           | 20    |                 |               | RACON /AIS | Reduce to 18NM                 |
| 12    | CANNIS ROCK         | BUOY         | 50° 18.384' N | 004° 39.945' W | Q (6) + LFI 15s      | 5     | Bell            | 2             |            | No change considered necessary |
| 12    | CARN BASE           | BUOY         | 50° 01.480' N | 005° 46.180' W | Q (9) 15s            | 5     |                 | 1             |            | No change considered necessary |
| 12    | CRESSAR             | BEACON       | 50° 07.236' N | 005° 31.130' W |                      |       |                 |               |            | No change considered necessary |
| 12    | CROW ROCK           | BEACON       | 49° 56.263' N | 006° 18.491' W | FI (2) 10s           | 2     |                 |               |            | No change considered necessary |
| 12    | EDDYSTONE           | LIGHTHOUSE   | 50° 10.843' N | 004° 15.936' W | FI (2) 10s           | 17    | Horn (1)<br>30s |               | RACON /AIS | No change considered necessary |
| 12    | EUROPA POINT        | LIGHTHOUSE   | 36° 06.580' N | 005° 20.690' W | Iso W 10s            | 18    |                 |               |            | No change considered necessary |
| 12    | GEAR ROCK           | BEACON       | 50° 06.620' N | 005° 31.617' W | FI (2) 10s           | 1     |                 |               |            | No change considered necessary |
| 12    | GODREVY             | LIGHTHOUSE   | 50° 14.549' N | 005° 24.015' W | FIWR 10s             | 8     |                 |               |            | No change considered necessary |
| 12    | GUNNER              | BUOY         | 49° 53.636' N | 006° 25.075' W |                      |       |                 | 2             |            | No change considered necessary |
| 12    | GWINEAS             | BUOY         | 50° 14.505' N | 004° 45.365' W | Q (3) 10s            | 5     | Bell            | 2             |            | No change considered necessary |
| 12    | HATS                | BUOY         | 49° 56.206' N | 006° 17.136' W | VQ (6) + LFI 10s     | 4     |                 | 3             |            | No change considered necessary |
| 12    | HOMESTONE           | BUOY         | 50° 19.615' N | 003° 33.552' W | QR                   | 3     |                 | 3             |            | No change considered necessary |
| 12    | JAMES EAGAN LAYNE   | BUOY         | 50° 19.550' N | 004° 15.250' W | QR                   | 3     |                 | 3             |            | No change considered necessary |
| 12    | LIZARD              | LIGHTHOUSE   | 49° 57.612' N | 005° 12.128' W | FI 3s                | 26    | Horn (1)<br>30s |               | DGPS       | No change considered necessary |
| 12    | LONGSHIPS           | LIGHTHOUSE   | 50° 04.012' N | 005° 44.812' W | FI (2) WR 10s        | 15    | Horn (1)<br>10s |               |            | Awaiting Reengineering         |
| 12    | LOW LEE             | BUOY         | 50° 05.556' N | 005° 31.380' W | Q (3) 10s            | 5     |                 | 2             |            | No change considered necessary |
| 12    | MANACLE             | BUOY         | 50° 02.806' N | 005° 01.913' W | Q (3) 10s            | 5     | Bell            | 2             |            | Monitor for Position           |
| 12    | MEW STONE           | BUOY         | 50° 19.920' N | 003° 31.890' W | VQ (6) + LFI 10s     | 5     |                 | 2             |            | No change considered necessary |
| 12    | MOUNTAMOPUS         | BUOY         | 50° 04.636' N | 005° 26.261' W | Q (6) + LFI 15s      | 5     |                 | 2             |            | No change considered necessary |
| 12    | NORTH BARTHOLOMEW   | BUOY         | 49° 54.496' N | 006° 19.985' W | FIR 5s               | 5     |                 | 2             |            | No change considered necessary |
| 12    |                     | BUOY         | 50° 28.167' N | 003° 24.860' W | Q                    | 5     |                 | 2             |            | No change considered necessary |
| 12    |                     | BUUY         | 49° 54.246' N | 006° 22.806' W |                      | 5     |                 | 2             |            | No change considered necessary |
| 12    |                     | LIGHTHOUSE   | 50° 09.899' N | 005° 40.295 W  | FI (4) 155           | 16    |                 |               |            | No change considered necessary |
| 12    |                     | RUOV         | 49° 54.273 N  | 000° 18.221 W  |                      | 9     |                 | 2             |            | No change considered necessary |
| 12    | ROUND ISLAND        | LIGHTHOUSE   | 49° 58.739' N | 004 28.370 W   | FI 10s               | 18    | Horn (4)        | 2             |            | Awaiting Reengineering         |
| 12    |                     | BUOY         | 49° 53 096' N | 006° 25 185' W |                      |       | 605             | 2             |            | No change considered necessary |
| 12    | RUNNEL STONE        | BUOY         | 50° 01 186' N | 005° 40 359' W | $O_{1}(6) +  F  15s$ | 5     | Whistle         | 1             |            | Monitor for Position           |
| 12    | RUNNELSTONE HIGH    | BEACON       | 50° 02 243' N | 005° 40 605' W |                      | Ũ     | White           | •             |            | No change considered necessary |
| 12    | RUNNELSTONE LOW     | BEACON       | 50° 02.208' N | 005° 40,599' W |                      |       |                 |               |            | No change considered necessary |
| 12    | RYEMAN (RAYMOND)    | BEACON       | 50° 07.236' N | 005° 30.327' W |                      |       |                 |               |            | No change considered necessary |
| 12    | SEVEN STONES        | LIGHT VESSEL | 50° 03.616' N | 006° 04.337' W | FI (3) 30s           | 15    | Horn (3)<br>60s |               | RACON /AIS | Awaiting Reengineering         |
| 12    | SKERRIES BANK       | BUOY         | 50° 16.315' N | 003° 33.771' W | FIR 5s               | 5     |                 | 2             |            | Decision to retain and light   |
| 12    | SOUTH EMSSTROM      | BUOY         | 50° 28.033' N | 003° 24.860' W | Q (6) + LFI 15s      | 5     |                 | 2             |            | No change considered necessary |
| 12    | SPANISH LEDGE       | BUOY         | 49° 53.936' N | 006° 18.856' W | Q (3) 10s            | 5     | Bell            | 2             |            | No change considered necessary |
| 12    | SPENCERS LEDGE      | BUOY         | 49° 54.780' N | 006° 22.060' W | Q (6) + LFI 15s      | 5     |                 | 2             |            | No change considered necessary |
| 12    | STAGNES             | BEACON       | 49° 53.562' N | 006° 20.725' W |                      |       |                 |               |            | No change considered necessary |
| 12    | ST ANTHONY          | LIGHTHOUSE   | 50° 08.469' N | 005° 00.964' W | Iso WR 15s           | 16    | Horn (1)<br>30s |               |            | Awaiting Reengineering         |

| Area | Name                      | Туре       | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character        | Range | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|------|---------------------------|------------|---------------------|----------------------|------------------|-------|-----------------|-------------------------------|------------|--------------------------------|
| 12   | ST MARTINS DAYMARK        | BEACON     | 49° 57.990' N       | 006° 15.971' W       |                  |       |                 |                               |            | No change considered necessary |
| 12   | START POINT               | LIGHTHOUSE | 50° 13.344' N       | 003° 38.539' W       | FI (3) 10s       | 18    | Horn (1)        |                               |            | No change considered necessary |
| 12   | STEEPLE ROCK              | BUOY       | 49° 55 460' N       | 006° 24 240' W       | Q (9) 15s        | 5     | 305             | 2                             |            | No change considered necessary |
| 12   | STONES                    | BUOY       | 50° 15,635' N       | 005° 25.461' W       | 0                | 5     | Bell            | 1                             |            | No change considered necessary |
| 12   | TATER DU                  | LIGHTHOUSE | 50° 03.143' N       | 005° 34.647' W       | ~<br>FI (3) 15s  | 20    | 20              |                               |            | Awaiting Reengineering         |
| 12   | TINS WALBERT              | BEACON     | 49° 53.841' N       | 006° 21.323' W       |                  | ī     |                 |                               |            | No change considered necessary |
| 12   | TREVOSE HEAD              | LIGHTHOUSE | 50° 32.954' N       | 005° 02.113' W       | FI 7.5s          | 21    |                 |                               |            | Reduce to 18NM                 |
| 12   | UDDER ROCK                | BUOY       | 50° 18.934' N       | 004° 33.846' W       | VQ (6) + LFI 10s | 5     | Bell            | 2                             |            | No change considered necessary |
| 12   | WEST ROCK                 | BUOY       | 50° 19.860' N       | 003° 32.470' W       | Q (6) + LFI 15s  | 5     |                 | 2                             |            | No change considered necessary |
| 12   | WOLF ROCK                 | LIGHTHOUSE | 49° 56.719' N       | 005° 48.550' W       | FI 15s           | 16    | Horn (1)<br>30s |                               | RACON /AIS | No change considered necessary |
| 13   | BREAKSEA                  | BUOY       | 51° 19.879' N       | 003° 19.075' W       | FI 10s           | 9     | 000             | 1                             | RACON/AIS  | No change considered necessary |
| 13   | ENGLISH AND WELSH GROUNDS | BUOY       | 51° 27.129' N       | 002° 59.937' W       | LFI 10s          | 7     | Whistle         | 1                             | RACON      | No change considered necessary |
| 13   | ANTHORN                   | BEACON     | 54° 54.673' N       | 003° 17.237' W       |                  |       |                 |                               | LORAN      | No change considered necessary |
| 13   | AVON                      | BUOY       | 51° 27.929' N       | 002° 51.728' W       | FI G 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | BAGGY LEAP                | BUOY       | 51° 08.930' N       | 004° 16.969' W       | FI (2) G 10s     | 5     |                 | 2                             |            | No change considered necessary |
| 13   | BIDEFORD BAR              | BUOY       | 51° 04.890' N       | 004° 14.620' W       | QG               | 1     |                 | NS                            |            | No change considered necessary |
| 13   | BIDEFORD FAIRWAY          | BUOY       | 51° 05.260' N       | 004° 16.239' W       | LFI 10s          | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | BULL POINT                | LIGHTHOUSE | 51° 11.946' N       | 004° 12.074' W       | FI (3) 10s       | 20    |                 |                               |            | No change considered necessary |
| 13   | CALDEY ISLAND             | LIGHTHOUSE | 51° 37.895' N       | 004° 41.058' W       | FI (3) WR 20s    | 13    |                 |                               |            | No change considered necessary |
| 13   | CARDIFF SPIT              | BUOY       | 51° 24.575' N       | 003° 07.125' W       | QR               | 5     |                 | 2                             |            | No change considered necessary |
| 13   | CLEVEDON                  | BUOY       | 51° 27.389' N       | 002° 54.917' W       | VQ               | 5     |                 | 2                             |            | No change considered necessary |
| 13   | COPPERAS ROCK             | BUOY       | 51° 13.799' N       | 004° 00.570' W       | FI G 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | CROW POINT                | LIGHTHOUSE | 51° 03.974' N       | 004° 11.382' W       | FI WR 2.5s       | 6     |                 |                               |            | No change considered necessary |
| 13   | EAST CULVER               | BUOY       | 51° 17.979' N       | 003° 15.395' W       | Q (3) 10s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | EAST HELWICK              | BUOY       | 51° 31.797' N       | 004° 12.670' W       | VQ (3) 5s        | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | EAST MIDDLE GROUNDS       | BUOY       | 51° 27.750' N       | 002° 54.985' W       | FI R 5s          | 5     |                 | 2                             |            | No change considered necessary |
| 13   | EAST NASH                 | BUOY       | 51° 24.059' N       | 003° 34.103' W       | Q (3) 10s        | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | EAST SCARWEATHER          | BUOY       | 51° 27.978' N       | 003° 46.770' W       | Q (3) 10s        | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | EEL POINT                 | BUOY       | 51° 38.856' N       | 004° 42.237' W       | FI G 2.5s        | 3     |                 | 3                             |            | No change considered necessary |
| 13   | FAIRY                     | BUOY       | 51° 27.858' N       | 003° 42.073' W       | Q (9) 15s        | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | FLATHOLM                  | LIGHTHOUSE | 51° 22.540' N       | 003° 07.122' W       | FI (3) WR 10s    | 15    |                 |                               |            | No change considered necessary |
| 13   | GILTAR                    | BUOY       | 51° 39.026' N       | 004° 42.117' W       | FI R 2.5s        | 3     |                 | 4                             |            | No change considered necessary |
| 13   | GREY SAND HILL            | BUOY       | 51° 03.653' N       | 004° 12.156' W       | QR               | 1     |                 | 4                             |            | No change considered necessary |
| 13   | GROUNDS                   | BUOY       | 51° 32.780' N       | 003° 53.400' W       | VQ (3) 5s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | HARTLAND POINT            | LIGHTHOUSE | 51° 01.326' N       | 004° 31.530' W       | FI (6) 15s       | 8     |                 |                               |            | No change considered necessary |
| 13   | НОРЕ                      | BUOY       | 51° 24.849' N       | 003° 02.677' W       | Q (3) 10s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | HORSESHOE                 | BUOY       | 51° 15.029' N       | 004° 12.919' W       | Q                | 5     |                 | 2                             |            | Monitor & Fit AIS              |
| 13   | HUGO                      | BUOY       | 51° 28.550' N       | 003° 48.030' W       | QR               | 4     |                 | 3                             |            | Temp Withdrawn                 |
| 13   | INSTOW FRONT              | LIGHTHOUSE | 51° 03.620' N       | 004° 10.664' W       | Oc 6s            | 15    |                 |                               |            | No change considered necessary |
| 13   | INSTOW REAR               | LIGHTHOUSE | 51° 03.518' N       | 004° 10.356' W       | Oc 10s           | 15    |                 |                               |            | No change considered necessary |
| 13   | KENFIG                    | BUOY       | 51° 29.440' N       | 003° 46.060' W       | VQ (3) 5s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | LAVERNOCK SPIT            | BUOY       | 51° 23.019' N       | 003° 10.816' W       | VQ (6) + LFI 10s | 5     |                 | 2                             |            | No change considered necessary |
| 13   | LEDGE                     | BUOY       | 51° 29.928' N       | 003° 58.771' W       | VQ (6) + LFI 10s | 5     |                 | 2                             |            | No change considered necessary |
| 13   | LUNDY NORTH               | LIGHTHOUSE | 51° 12.104' N       | 004° 40.640' W       | FI 15s           | 17    |                 |                               |            | 18NM Preferred                 |
| 13   | LUNDY SOUTH               | LIGHTHOUSE | 51° 09.723' N       | 004° 39.351' W       | FI 5s            | 15    |                 |                               |            | No change considered necessary |
| 13   | LYNMOUTH FORELAND         | LIGHTHOUSE | 51° 14.731' N       | 003° 47.201' W       | FI (4) 15s       | 18    |                 |                               |            | No change considered necessary |
| 13   | MACKENZIE                 | BUOY       | 51° 21.749' N       | 003° 08.226' W       | QR               | 5     |                 | 2                             |            | No change considered necessary |
| 13   | MERKUR                    | BUOY       | 51° 21.879' N       | 003° 15.945' W       | QR               | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | MIDDLE HOLM               | BUOY       | 51° 21.719' N       | 003° 06.716' W       | FI G 2.5s        | 5     |                 | 2                             |            | No change considered necessary |
| 13   | MIDDLE NASH               | BUOY       | 51° 24.828' N       | 003° 39.413' W       | Q (6) + LFI 15s  | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | MIDDLE RIDGE              | BUOY       | 51° 04.625' N       | 004° 13.804' W       | FI G 5s          | 3     |                 | 4                             |            | No change considered necessary |
| 13   | MIXON                     | BUOY       | 51° 33.127' N       | 003° 58.771' W       | FI (2) R 5s      | 5     | Bell            | 2                             |            | No change considered necessary |
| 13   | MONKSTONE                 | LIGHTHOUSE | 51° 24.886' N       | 003° 06.008' W       | FI 5s            | 12    |                 |                               |            | No change considered necessary |
| 13   | MORTE STONE               | BUOY       | 51° 11.329' N       | 004° 14.919' W       | FI G 5s          | 5     |                 | 2                             |            | No change considered necessary |

| Area | Name                   | Туре       | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character        | Range | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids  | Comment                        |
|------|------------------------|------------|---------------------|----------------------|------------------|-------|-----------------|-------------------------------|-------------|--------------------------------|
| 13   | MUMBLES                | LIGHTHOUSE | 51° 34.009' N       | 003° 58.268' W       | FI (4) 20s       | 15    | Horn (1)<br>30s |                               |             | No change considered necessary |
| 13   | NASH POINT             | LIGHTHOUSE | 51° 24.050' N       | 003° 33.131' W       | FI (2) WR 15s    | 21    |                 |                               | DGPS        | Possible to Reduce to 18NM     |
| 13   | NEWCOME                | BUOY       | 51° 30.008' N       | 002° 46.708' W       | FI (3) R 10s     | 4     |                 | 2                             |             | No change considered necessary |
| 13   | NEWPORT DEEP           | BUOY       | 51° 29.358' N       | 002° 59.107' W       | FI (3) G 10s     | 5     | Bell            | 2                             |             | No change considered necessary |
| 13   | NORTH BRISTOL CHANNEL  | BUOY       | 51° 19.688' N       | 003° 29.913' W       | Q                | 5     |                 | 2                             | RACON       | No change considered necessary |
| 13   | NORTH CARDIFF          | BUOY       | 51° 26.529' N       | 003° 07.176' W       | QG               | 5     |                 | 2                             |             | No change considered necessary |
| 13   | NORTH ELBOW            | BUOY       | 51° 26.969' N       | 002° 58.647' W       | QG               | 4     | Bell            | 2                             |             | No change considered necessary |
| 13   | NORTH HIGHCLIFF        | BUOY       | 51° 39.376' N       | 004° 40.767' W       | Q                | 3     |                 | 3                             |             | No change considered necessary |
| 13   | NORTH ONE FATHOM       | BUOY       | 51° 20.837' N       | 003° 13.126' W       | Q                | 5     |                 | 2                             |             | Surveyed prior to move.        |
| 13   | NORTH WEST ELBOW       | BUOY       | 51° 26.279' N       | 002° 59.927' W       | VQ (9) 10s       | 5     | Bell            | 2                             |             | No change considered necessary |
| 13   | OUTER PULLEY           | BUOY       | 51° 04.338' N       | 004° 12.920' W       | FI G 2.5s        | 4     |                 | 4                             |             | No change considered necessary |
| 13   | PULLEY                 | BUOY       | 51° 04.080' N       | 004° 12.700' W       | FI G 10s         | 4     |                 | 4                             |             | No change considered necessary |
| 13   | SAND RIDGE             | BUOY       | 51° 15.009' N       | 003° 49.772' W       | QG               | 3     |                 | 3                             |             | No change considered necessary |
| 13   | SKOKHOLM               | LIGHTHOUSE | 51° 41.634' N       | 005° 17.218' W       | FI WR 10s        | 8     |                 |                               |             | No change considered necessary |
| 13   | SMALLS                 | LIGHTHOUSE | 51° 43.276' N       | 005° 40.192' W       | FI (3) 15s       | 18    | Horn (2)<br>60s |                               | RACON /AIS  | Awaiting Reengineering         |
| 13   | SOUTH BISHOP           | LIGHTHOUSE | 51° 51.162' N       | 005° 24.718' W       | FI 5s            | 16    | Horn (3)<br>45s |                               | RACON       | Awaiting Reengineering         |
| 13   | SOUTH CROW POINT       | BUOY       | 51° 03.582' N       | 004° 11.566' W       | FI (3) R 10s     | 1     |                 | 4                             |             | No change considered necessary |
| 13   | SOUTH MIDDLE GROUNDS   | BUOY       | 51° 27.629' N       | 002° 58.677' W       | VQ (6) + LFI 10s | 5     |                 | 2                             |             | No change considered necessary |
| 13   | SOUTH SCARWEATHER      | BUOY       | 51° 27.608' N       | 003° 51.572' W       | Q (6) + LFI 15s  | 5     |                 | 2                             |             | No change considered necessary |
| 13   | SOUTH WEST INNER GREEN | BUOY       | 51° 34.210' N       | 003° 57.124' W       | Q (3) 10s        | 5     | Bell            | 2                             |             | Moved & change to E Cardinal   |
| 13   | SPANIEL                | BUOY       | 51° 38.057' N       | 004° 39.737' W       | Q (3) 10s        | 3     |                 | 3                             |             | No change considered necessary |
| 13   | ST ANNS HEAD           | LIGHTHOUSE | 51° 40.876' N       | 005° 10.422' W       | FI WR 5s         | 18    | Horn (2)<br>60s |                               |             | Await Reengineering            |
| 13   | ST GOWAN               | BUOY       | 51° 31.927' N       | 004° 59.765' W       | Q (6) + LFI 15s  | 7     |                 | 1                             | RACON /AIS  | No change considered necessary |
| 13   | STRUMBLE HEAD          | LIGHTHOUSE | 52° 01.788' N       | 005° 04.424' W       | FI (4) 15s       | 26    |                 |                               |             | No change considered necessary |
| 13   | TAIL PATCH             | BUOY       | 51° 23.529' N       | 003° 03.666' W       | QG               | 5     |                 | 2                             |             | No change considered necessary |
| 13   | TUSKER                 | BUOY       | 51° 26.848' N       | 003° 40.743' W       | FI (2) R 5s      | 5     | Bell            | 2                             |             | No change considered necessary |
| 13   | WELSH HOOK             | BUOY       | 51° 28.518' N       | 002° 51.858' W       | Q (6) + LFI 15s  | 5     |                 | 2                             |             | No change considered necessary |
| 13   | WEST CULVER            | BUOY       | 51° 17.470' N       | 003° 19.000' W       | VQ (9) 10s       | 5     |                 | 2                             |             | No change considered necessary |
| 13   | WEST HELWICK           | BUOY       | 51° 31.397' N       | 004° 23.649' W       | Q (9) 15s        | 7     |                 | 1                             | RACON       | No change considered necessary |
| 13   | WEST NASH              | BUOY       | 51° 25.978' N       | 003° 45.952' W       | VQ (9) 10s       | 5     | Bell            | 2                             |             | No change considered necessary |
| 13   | WEST SCARWEATHER       | BUOY       | 51° 28.308' N       | 003° 55.571' W       | Q (9) 15s        | 7     | Bell            | 1                             | RACON       | No change considered necessary |
| 13   | WESTON                 | BUOY       | 51° 22.609' N       | 003° 05.736' W       | FI (2) R 5s      | 5     |                 | 2                             |             | No change considered necessary |
| 13   | WOLVES                 | BUOY       | 51° 23.129' N       | 003° 08.876' W       | VQ               | 5     |                 | 2                             |             | No change considered necessary |
| 13   | WOOLHOUSE              | BUOY       | 51° 39.346' N       | 004° 39.687' W       | Q (6) + LFI 15s  | 3     |                 | 3                             | <b>DODO</b> | No change considered necessary |
| 13   | WORMLEIGHTON           | BEACON     | 52° 11.890' N       | 001° 21.845' W       |                  |       |                 | 0                             | DGPS        | No change considered necessary |
| 14   |                        | BUUY       | 53° 26.714' N       | 004° 30.870° W       |                  | 5     |                 | 2                             |             | No change considered necessary |
| 14   |                        | LIGHTHOUSE | 52° 44.997' N       | 004° 47.984 W        |                  | 18    |                 | 2                             |             | No change considered necessary |
| 14   |                        | BUOY       | 53° 21.515 N        | 004° 35.299 W        | FIG 2.55         | 5     |                 | 2                             |             | No change considered necessary |
| 14   |                        | BUOY       | 52 34.021 N         | 004 13.571 W         |                  | 2     |                 | 2                             |             | No change considered necessary |
| 14   |                        | BUOY       | 52° 41 190' N       | 004° 25 320' W       | O(9) 15          | 5     | Bell            | 2                             |             | No change considered necessary |
| 14   |                        | BUOY       | 54° 24.628' N       | 003° 33,689' W       | Q (9) 15s        | 5     | Den             | 2                             |             | No change considered necessary |
| 14   | CHWISI EN ROCK         | BEACON     | 52° 56.985' N       | 004° 33.504' W       | El (2) 10s       | 2     |                 | -                             |             | No change considered necessary |
| 14   | COAL ROCK              | BUOY       | 53° 25.915' N       | 004° 32.790' W       | Q(6) + LFI 15s   | 1     |                 | 2                             |             | No change considered necessary |
| 14   | CONSTABLE W            | BUOY       | 53° 23.145' N       | 003° 49.245' W       | Q (9) 15s        | 5     |                 | 2                             | RACON       | No change considered necessary |
| 14   | DANGER PATCH           | BUOY       | 53° 57.362' N       | 003° 05.681' W       | FI (3) R 10s     | 5     |                 | 2                             |             | No change considered necessary |
| 14   | DINMOR                 | BUOY       | 53° 19.346' N       | 004° 03.273' W       | QG               | 3     |                 | 3                             |             | No change considered necessary |
| 14   | EAST HOYLE SPIT        | BUOY       | 53° 22.374' N       | 003° 18.637' W       | FI G 5s          | 3     |                 | 3                             |             | No change considered necessary |
| 14   | ETHEL ROCK             | BUOY       | 53° 26.644' N       | 004° 33.670' W       | VQ               | 5     |                 | 2                             |             | No change considered necessary |
| 14   | FISHER BANK            | BUOY       | 53° 56.210' N       | 003° 09.700' W       | FI R 2.5s        | 5     |                 | 2                             |             | No change considered necessary |
| 14   | FURLONG                | BUOY       | 53° 25.415' N       | 004° 30.470' W       | FI G 2.5s        | 5     |                 | 2                             |             | No change considered necessary |
| 14   | GUT                    | BUOY       | 53° 41.764' N       | 003° 08.980' W       | LFI 10s          | 5     |                 | 2                             |             | No change considered necessary |
| 14   | HE1                    | BUOY       | 53° 26.325' N       | 003° 18.079' W       | Q (9) 15s        | 5     |                 | 2                             |             | No change considered necessary |

| Area | Name                               | Туре                           | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character                | Range  | HWS             | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment                        |
|------|------------------------------------|--------------------------------|---------------------|----------------------|--------------------------|--------|-----------------|-------------------------------|------------|--------------------------------|
| 14   | HE2                                | BUOY                           | 53° 24.899' N       | 003° 12.883' W       | FI G 2.5s                | 3      |                 | 3                             |            | No change considered necessary |
| 14   | HE3                                | BUOY                           | 53° 24.510' N       | 003° 12.717' W       | QG                       | 3      |                 | 3                             |            | No change considered necessary |
| 14   | HILBRE ISLAND                      | LIGHTHOUSE                     | 53° 23.000' N       | 003° 13.710' W       | FIR 3s                   | 5      |                 |                               |            | No change considered necessary |
| 14   | HOYLE                              | BUOY                           | 53° 23.156' N       | 003° 21.378' W       | QR                       | 3      |                 | 3                             |            | No change considered necessary |
| 14   | JORDANS SPIT                       | BUOY                           | 53° 35.764' N       | 003° 19.279' W       | Q (9) 15s                | 5      |                 | 2                             |            | No change considered necessary |
| 14   | КІМҮА                              | BUOY                           | 53° 09.416' N       | 004° 27.270' W       |                          |        |                 | 3                             |            | No change considered necessary |
| 14   | KING SCAR                          | BUOY                           | 53° 57.051' N       | 003° 04.740' W       | FI (2) G 5s              | 5      |                 | 2                             |            | No change considered necessary |
| 14   | KING WILLIAM BANK                  | BUOY                           | 54° 26.007' N       | 004° 00.075' W       | Q (3) 10s                | 5      |                 | 2                             |            | No change considered necessary |
| 14   | LANGDON                            | BUOY                           | 53° 22.755' N       | 004° 38.649' W       | Q (9) 15s                | 5      |                 | 2                             |            | No change considered necessary |
| 14   | LIGHTNING KNOLL                    | BUOY                           | 53° 59.841' N       | 003° 14.280' W       | LFI 10s                  | 5      |                 | 2                             |            | No change considered necessary |
| 14   | LUNE DEEP                          | BUOY                           | 53° 56.070' N       | 003° 12.900' W       | Q (6) + LFI 15s          | 5      |                 | 1                             | RACON /AIS | No change considered necessary |
| 14   | MIDDLE HOYLE                       | BUOY                           | 53° 22.816' N       | 003° 19.187' W       | FI R 5s                  | 3      |                 | 3                             |            | No change considered necessary |
| 14   | MORECAMBE                          | BUOY                           | 53° 52.000' N       | 003° 22.000' W       | Q (9) 15s                | 5      |                 | 1                             |            | No change considered necessary |
| 14   | NORTH WEST HOYLE                   | BUOY                           | 53° 23.316' N       | 003° 23.878' W       | FIR 2.5s                 | 3      |                 | 3                             |            | No change considered necessary |
| 14   | NORTH WORKINGTON                   | BUOY                           | 54° 40.106' N       | 003° 38.179' W       | Q                        | 5      |                 | 2                             |            | No change considered necessary |
| 14   | PATCHES                            | BUOY                           | 52° 25.822' N       | 004° 16.370' W       | Q (9) 15s                | 5      |                 | 2                             |            | No change considered necessary |
| 14   | PERCH ROCK                         | BEACON                         | 53° 18.750' N       | 004° 02.155' W       | FIR 5s                   | 1      |                 |                               |            | No change considered necessary |
| 14   | POINT LYNAS                        | LIGHTHOUSE                     | 53° 24.976' N       | 004° 17.352' W       | Oc 10s                   | 18     |                 |                               | DGPS       | No change considered necessary |
| 14   | RHOSNEIGR                          | BUOY                           | 53° 19.066' N       | 003° 43.975' W       |                          | -      |                 | 4                             |            | No change considered necessary |
| 14   | BIVER LUNE                         | BUOY                           | 53° 58 631' N       | 003° 00 032' W       | Q (9) 15s                | 5      |                 | 2                             |            | No change considered necessary |
| 14   | SELKER                             | BUOY                           | 54° 16 139' N       | 003° 29 579' W       | El (3) G 10s             | 5      | Bell            | 2                             |            | No change considered necessary |
| 14   |                                    | BUOY                           | 53° 55 462' N       | 003° 08 960' W       | FLG 2.5s                 | 5      | Dell            | 2                             |            |                                |
| 14   | SKERRIES                           | LIGHTHOUSE                     | 53° 25.274' N       | 003 08.500 W         | FI (2) 15s               | 20     | Horn (2)        | 2                             | RACON /AIS | Standardise HWS in Future      |
| 14   | SOUTH STACK                        | LIGHTHOUSE                     | 53° 18.403' N       | 004° 41.973' W       | FI 10s                   | 24     | 60s<br>Horn (1) |                               |            | No change considered necessary |
| 14   |                                    | BLIOY                          | 54° 37 006' N       | 003° 38 579' W       | 1/0 (6) + 1 El 10s       | 5      | 30S<br>Bell     | 2                             |            |                                |
| 14   | ST BEES                            | LIGHTHOUSE                     | 54° 30 818' N       | 003° 38 205' W       |                          | 18     | Dell            | 2                             |            |                                |
| 14   | ST TUDWALS                         | LIGHTHOUSE                     | 52° 47 012' N       | 003° 30.203 W        | FLWP 15s                 | 14     |                 |                               |            | No change considered necessary |
| 14   |                                    | BUOY                           | 52 47.912 N         | 004° 20.273 W        | OR                       | 3      |                 | 3                             |            | No change considered necessary |
| 14   |                                    |                                | 53° 18 777' N       | 004° 02.023 W        | El 5e                    | 12     | Boll (1) 30s    | 5                             |            | HWS 0.5NM Horp or Bell         |
| 14   |                                    | BUOY                           | 53° 25 615' N       | 004° 31 370' W       | VO                       | 5      |                 | 2                             |            |                                |
| 14   | WEST MOUSE                         | BEACON                         | 53° 25.056' N       | 004° 33 267' W       | VQ                       | 5      |                 | 2                             |            | No change considered necessary |
| 14   |                                    | BLACON                         | 53° 20.014' N       | 004 33.207 W         |                          | 2      |                 | 2                             |            | No change considered necessary |
| 14   |                                    | Buoy (Lightod)                 | 53 40.014 N         | 000°21 461'W         |                          | 5      |                 | 3                             | A19        | No change considered necessary |
| 15   |                                    |                                | 51 29.979 N         | 009 31.401 W         |                          | 10     |                 | 3                             | AIS        | No change considered necessary |
| 15   | BALLINACOURTY POINT<br>BALLYCOTTON | Lighthouse                     | 51°49.522'N         | 007°59.169'W         | FI WR 10s (Red. Vis.)    | 18     |                 |                               | AIS        | No change considered necessary |
| 15   | BALTIMORE                          | Beacon<br>(Unlighted)          | 51°28.417'N         | 009°23.272'W         | Unlit                    |        |                 |                               |            | Transfer to LLA                |
| 15   | BAR ROCKS                          | Buov (Lighted)                 | 51°54.855'N         | 007°50.053'W         | Q (6) + LFI 15s          | 4      |                 | 3                             |            | No change considered necessary |
| 15   |                                    | Buoy (Lighted)                 | 52°08.363'N         | 006°22.108'W         | Q (3) 10s                | 6      |                 | 1                             | AIS        | No change considered necessary |
| 15   | BLACK TOM                          | Buoy (Lighted)                 | 51°36.408'N         | 008°37,959'W         | FI G 5s                  | 5      |                 | •                             | AIS        | No change considered necessary |
| 15   |                                    | Buoy (Lighted)                 | 51°55 334'N         | 007°48 529'W         | $O(3) 10^{\circ}$        | 4      |                 | 3                             | 7.00       | No change considered necessary |
| 15   |                                    | Buoy (Lighted)                 | 52°06.074'N         | 006°31 871'W         | O(3) 105                 | 6      |                 | 2                             | AIS        | No change considered necessary |
| 15   | BULL ROCK BEACON                   | Beacon                         | 51°30.758'N         | 009°32.205'W         | Fl (2) R 6s 0.5          | 4      |                 | 2                             |            | Transfer to LLA                |
| 15   | BUIMAN                             | (Lighted)<br>Buoy (Lighted)    | 51°40.136'N         | 008°29.739'W         | Q (6) + LFI 15s          | 6      |                 | 3                             | AIS        | No change considered necessary |
| 15   |                                    | Beacon                         | 51°52.927'N         | 007°51.131'W         | Unlit                    |        |                 |                               |            | No change considered necessary |
| 15   |                                    | (Uningrited)<br>Buoy (Lighted) | 52°03 198'N         | 006°38 567'\\/       | $\Omega(6) \pm 1$ fl 15s | 9      |                 |                               | AIS Racon  | No change considered necessary |
| 15   |                                    | Lighthouse                     | 51°30 250'N         | 009°32 063'W         | O(3) 10 = 0.5            | 2<br>2 |                 |                               |            | No change considered necessary |
| 15   |                                    | Buoy (Lightod)                 | 51°42 025'N         | 008 32.003 W         |                          | 6      |                 | 1                             | AIS        |                                |
| 15   |                                    | Buoy (Lighted)                 | 51°20 207'N         |                      |                          | U<br>A |                 | 1<br>2                        |            |                                |
| 15   |                                    | Buoy (Lighted)                 | 51 30.207 IN        | 008 40.897 W         |                          | 4      |                 | 3                             | AIS        |                                |
| 15   |                                    | Lighthouse                     | 52°0° 025'N         | 006 17.503 W         |                          | 4      |                 |                               | AIS        | No change considered peoperant |
| 10   |                                    |                                | 51000 250 N         | 000 39.337 W         |                          | 10     |                 | -                             | AIS Bases  |                                |
| GI   | FASINEI                            |                                | 51 23.358 N         | 0009 30.178 W        |                          | 10     |                 | <u> </u>                      | AIS, Racon |                                |
| 15   | FUNDALE                            | Buoy (Lighted)                 | 52~11.044'N         | 006-19.775 W         | FI(2) K TUS              | 4      |                 | 2                             |            | no change considered necessary |

| Area | Name                      | Туре                  | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character                | Range | HWS E | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment   |
|------|---------------------------|-----------------------|---------------------|----------------------|--------------------------|-------|-------|-------------------------------|------------|---|
| 15   | GALLEY HEAD               | Lighthouse            | 51°31.798'N         | 008°57.210'W         | FI (5) W 20s             | 23    |       |                               |            | Reduction of range to 18nm                                      |
| 15   | HELVICK                   | Buoy (Lighted)        | 52°03.611'N         | 007°32.251'W         | Q (3) 10s                | 6     |       | 2                             |            | No change considered necessary                                  |
| 15   | HOOK HEAD                 | Lighthouse            | 52°07.424'N         | 006°55.770'W         | FI W 3s                  | 18    |       |                               | AIS, Racon | No change considered necessary                                  |
| 15   | KOWLOON BRIDGE            | Buoy (Lighted)        | 51°27.580'N         | 009°13.761'W         | Q (6) + LFI 15s          | 5     |       | 2                             | AIS        | No change considered necessary                                  |
| 15   | LITTLE GOAT ISLAND        | Beacon<br>(Unlighted) | 51°29.031'N         | 009°36.169'W         | Unlit                    |       |       |                               |            | No change considered necessary                                  |
| 15   | LOO                       | Buoy (Lighted)        | 51°28.438'N         | 009°23.458'W         | FI G 3s                  | 3     |       | 3                             | AIS        | No change considered necessary                                  |
| 15   | MINE HEAD                 | Lighthouse            | 51°59.556'N         | 007°35.225'W         | FI (4) W 30s             | 12    |       |                               | AIS        | No change considered necessary                                  |
| 15   | OLD HEAD OF KINSALE       | Lighthouse            | 51°36.287'N         | 008°32.018'W         | FI (2) W 10s             | 20    |       |                               | AIS        | Reduction of range to 18nm                                      |
| 15   | POWER                     | Buoy (Lighted)        | 51°45.595'N         | 008°06.679'W         | Q (6) + LFI 15s          | 6     |       | 2                             | AIS        | No change considered necessary                                  |
| 15   | RED BANK                  | Buoy (Lighted)        | 52°04.999'N         | 006°41.652'W         | VQ(9) 10s                | 6     |       | 2                             | AIS        | No change considered necessary                                  |
| 15   | ROCHES POINT              | Lighthouse            | 51°47.586'N         | 008°15.287'W         | FI WR 3s (Red. Vis.)     | 18    |       |                               | AIS        | No change considered necessary                                  |
| 15   | SMITHS                    | Buoy (Lighted)        | 51°48.430'N         | 008°00.670'W         | FI (3) R 10s             | 4     |       | 1                             |            | No change considered necessary                                  |
| 15   | SOUTH ROCK BUOY (WEXFORD) | Buoy (Lighted)        | 52°10.810'N         | 006°12.848'W         | Q (6) + LFI 15s          | 6     |       | 1                             | AIS        | No change considered necessary                                  |
| 16   | BAILY                     | Lighthouse            | 53°21.691'N         | 006°03.158'W         | FIW 15s                  | 18    |       |                               | AIS        | No change considered necessary                                  |
| 16   | BENNET BANK               | Buoy (Lighted)        | 53°20.172'N         | 005°55.130'W         | Q (6) + LFI 15s          | 5     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | BREACHES                  | Buoy (Lighted)        | 53°05.721'N         | 005°59.856'W         | FI (2) R 6s              | 4     |       | 2                             |            | Resurvey from previous review                                   |
| 16   | CALMINES                  | Buoy (Lighted)        | 52°14.997'N         | 006°17.781'W         | FI R 3s (Sync and Seq+1) | 4     |       | 2                             |            | No change considered necessary                                  |
| 16   | CODLING BUOY              | Buoy (Lighted)        | 53°03.020'N         | 005°40.815'W         | Q (3) 10s                | 9     |       | 1                             | AIS, Racon | Reverse decision to reposition                                  |
| 16   | EAST CODLING              | Buoy (Lighted)        | 53°08.560'N         | 005°46.130'W         | FI (4) R 10s             | 4     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | EAST KISH                 | Buoy (Lighted)        | 53°14.349'N         | 005°53.618'W         | FI (2) R 10s             | 4     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | GLASSGORMAN NO. 1         | Buoy (Lighted)        | 52°37.689'N         | 006°07.459'W         | FI (2) R 6s              | 5     |       | 1                             |            | No change considered necessary                                  |
| 16   | GLASSGORMAN NO. 2         | Buoy (Lighted)        | 52°45.348'N         | 006°05.343'W         | FI (4) R 10              | 4     |       | 2                             | AIS        | Survey required of bank. Consider reposition                    |
| 16   | HORSESHOE                 | Buoy (Lighted)        | 52°56.835'N         | 005°58.466'W         | FIR 3s                   | 4     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | KISH BANK                 | Lighthouse            | 53°18.650'N         | 005°55.542'W         | FI (2 ) W 20s (24hr)     | 21    |       |                               | AIS, Racon | Reduction of range to 18nm and change to hours of darkness only |
| 16   | LUCIFER                   | Buoy (Lighted)        | 52°17.035'N         | 006°12.671'W         | VQ (3) 5s                | 5     |       |                               | AIS        | No change considered necessary                                  |
| 16   | MOULDITCH                 | Buoy (Lighted)        | 53°08.430'N         | 006°01.230'W         | FIR 10s                  | 6     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | MUGLINS                   | Lighthouse            | 53°16.524'N         | 006°04.579'W         | FIR 5s                   | 11    |       |                               |            | Establish AIS   |
| 16   | NORTH ARKLOW              | Buoy (Lighted)        | 52°53.862'N         | 005°55.263'W         | Q                        | 6     |       | 1                             | AIS        | Pending resurvey  |
| 16   | NORTH BLACKWATER          | Buoy (Lighted)        | 52°32.225'N         | 006°09.520'W         | Q                        | 5     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | NORTH BURFORD             | Buoy (Lighted)        | 53°20.507'N         | 006°01.493'W         | Q                        | 6     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | NORTH INDIA               | Buoy (Lighted)        | 53°03.173'N         | 005°53.473'W         | VQ                       | 6     |       | 2                             |            | No change considered necessary                                  |
| 16   | NORTH KISH                | Buoy (Lighted)        | 53°18.549'N         | 005°56.432'W         | VQ                       | 6     |       |                               |            | No change considered necessary                                  |
| 16   | NORTH LONG                | Buoy (Lighted)        | 52°21.432'N         | 006°16.967'W         | Q                        | 6     |       | 2                             |            | No change considered necessary                                  |
| 16   | RUSK NO. 1                | Buoy (Lighted)        | 52°28.539'N         | 006°11.799'W         | FI (2) G 5s SYNC         | 5     |       | 3                             | AIS        | No change considered necessary                                  |
| 16   | RUSK NO. 2                | Buoy (Lighted)        | 52°28.638'N         | 006°12.613'W         | FI (2) R 5s SYNC         | 4     |       |                               |            | No change considered necessary                                  |
| 16   | RUSK NO. 4                | Buoy (Lighted)        | 52°31.089'N         | 006°10.841'W         | FI (3) R 6s              | 4.5   |       | 3                             |            | No change considered necessary                                  |
| 16   | RUSK NO. 6                | Buoy (Lighted)        | 52°32.666'N         | 006°10.425'W         | FI R 3s                  | 4     |       | 3                             |            | No change considered necessary                                  |
| 16   | SOUTH ARKLOW              | Buoy (Lighted)        | 52°40.196'N         | 005°58.886'W         | Q(6) + LFI 15s           | 7     |       |                               | AIS, Racon | No change considered necessary                                  |
| 16   | SOUTH BLACKWATER          | Buoy (Lighted)        | 52°22.757'N         | 006°12.866'W         | Q (6) + LFI 15s          | 5     |       | 2                             |            | No change considered necessary                                  |
| 16   | SOUTH BURFORD             | Buoy (Lighted)        | 53°18.060'N         | 006°01.298'W         | VQ (6) + LFI 10s         | 6     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | SOUTH CODLING             | Buoy (Lighted)        | 53°04.730'N         | 005°49.784'W         | VQ (6) + LFI 10s         | 6     |       | 1                             |            | No change considered necessary                                  |
| 16   | SOUTH HOLDENS             | Buoy (Lighted)        | 52°15.146'N         | 006°17.249'W         | FI G 3s (Sync) (Seq+1)   | 4     |       |                               |            | No change considered necessary                                  |
| 16   | SOUTH INDIA               | Buoy (Lighted)        | 53°00.349'N         | 005°53.346'W         | Q (6) + LFI 15s          | 6     |       | 2                             | AIS        | No change considered necessary                                  |
| 16   | SOUTH LONG                | Buoy (Lighted)        | 52°14.740'N         | 006°15.800'W         | FI G 6s (Sync and Seq)   | 6     |       | 2                             |            | No change considered necessary                                  |
| 16   | SOUTHEAST BLACKWATER      | Buoy (Lighted)        | 52°25.644'N         | 006°08.420'W         | Q(3) 10S                 | 5     |       | 2                             | AIS, Racon | No change considered necessary                                  |
| 16   | SPLAUGH                   | Buoy (Lighted)        | 52°14.363'N         | 006°16.784'W         | FI R 6s (Sync and Seq)   | 6     |       |                               | AIS        | No change considered necessary                                  |
| 16   | TUSKAR                    | Lighthouse            | 52°12.175'N         | 006°12.445'W         | Q(2) W 7.5s (24hr)       | 24    |       |                               | AIS, Racon | Reduction of range to 18nm                                      |
| 16   | WEST BLACKWATER           | Buoy (Lighted)        | 52°25.865'N         | 006°13.572'W         | FI G 6s                  | 4     |       | 2                             |            | No change considered necessary                                  |
| 16   | WEST CODLING              | Buoy (Lighted)        | 53°06.962'N         | 005°54.558'W         | FI G 10s                 | 5     |       |                               |            | No change considered necessary                                  |
| 16   | WEST HOLDENS              | Buoy (Lighted)        | 52°15.763'N         | 006°18.747'W         | FI (3) G 9s (Seq+2)      | 5     |       | 2                             |            | No change considered necessary                                  |
| 16   | WEST LONG                 | Buoy (Lighted)        | 52°18.130'N         | 006°17.971'W         | QG                       | 4.5   |       | 1                             |            | No change considered necessary                                  |
| 16   | WICKLOW HEAD              | Lighthouse            | 52°57.947'N         | 005°59.889'W         | FI (3) W 15s             | 18    |       |                               | AIS, Racon | No change considered necessary                                  |
| 17   | BURREN ROCK               | Beacon<br>(Lighted)   | 53°29.353'N         | 006°02.460'W         | FI G 5s 0.3              | 5     |       |                               |            | No change considered necessary                                  |

| Area | Name                   | Туре                        | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character   | Range    | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids  | Comment   |
|------|------------------------|-----------------------------|---------------------|----------------------|---|----------|-----|-------------------------------|-------------|---|
| 17   | CARDY ROCKS            | Beacon<br>(Unlighted)       | 53°37.912'N         | 006°10.859'W         | Unlit   |          |     |                               |             | Add light to beacon   |
| 17   | DUNANY                 | Buoy (Lighted)              | 53°53.530'N         | 006°09.502'W         | FI R 3s 0.4                                       | 4        |     | 2                             | AIS         | No change considered necessary                                    |
| 17   | GREEN ISLAND           | Lighthouse                  | 54°01.959'N         | 006°05.754'W         | Oc W 3s   | 11       |     |                               | AIS         | No change considered necessary                                    |
| 17   |                        | Lighthouse                  | 54°01.196'N         | 006°04.740'W         | Fl (3) 10s - (fl0.5 ,ecl1.0)x2,<br>fl0 5 ecl 6 5) | 10       |     |                               | AIS         | No change considered necessary                                    |
| 17   | HELLYHUNTER            | Buoy (Lighted)              | 54°00.351'N         | 006°02.052'W         | Q (6) + LFI 15s                                   | 6        |     | 2                             | AIS, Racon  | No change considered necessary                                    |
| 17   | ΗΟΨΤΗ ΒUΟΥ             | Buoy (Lighted)              | 53°23.727'N         | 006°03.593'W         | FI G 5s   | 4        |     | 3                             | AIS         | No change considered necessary                                    |
| 17   | IMOGENE                | Buoy (Lighted)              | 53°57.415'N         | 006°07.042'W         | FI (2) R 10s                                      | 4        |     | 1                             | AIS         | No change considered necessary                                    |
| 17   | ROCKABILI              | Lighthouse                  | 53°35.811'N         | 006°00.297'W         | FI WR 12s   | 17/13    |     |                               | AIS         | No change considered necessary                                    |
| 17   | ROWAN ROCKS            | Buoy (Lighted)              | 53°23.877'N         | 006°03.269'W         | Q (3) 10s   | 4        |     | 3                             |             | No change considered necessary                                    |
| 17   | SOUTH ROWAN            | Buoy (Lighted)              | 53°23.790'N         | 006°03.941'W         | QG  | 4        |     | 3                             |             | No change considered necessary                                    |
| 17   | TAYLOR ROCK            | Buoy (Lighted)              | 53°30.222'N         | 006°01.871'W         | Q   | 4        |     | 3                             |             | Survey for possible reposition                                    |
| 17   | VIDAL BANK             | Lighthouse                  | 54°01.799'N         | 006°05.433'W         | Oc W 3s   | 11       |     |                               | AIS         | No change considered necessary                                    |
| 18   | BAR PLADDY             | Buoy (Lighted)              | 54°19.344'N         | 005°30.501'W         | Q (6) + LFI 15s                                   | 5        |     | 3                             | AIS         | No change considered necessary                                    |
| 18   | BLACK HEAD (ANTRIM)    | Lighthouse                  | 54°46.016'N         | 005°41.338'W         | FI W 3s   | 27       |     |                               | AIS         | Reduction of range to 18nm  |
| 18   | BRIGGS                 | Buoy (Lighted)              | 54°41.182'N         | 005°35.732'W         | Q FI  | 5        |     | 1                             | AIS         | No change considered necessary                                    |
| 18   | BUTTER PLADDY          | Buoy (Lighted)              | 54°22.453'N         | 005°25.741'W         | Q (3) 10s 0.3 0.7                                 | 5        |     | 3                             |             | Survey required of bank. Consider reposition                      |
| 18   | CARN                   | Buoy (Lighted)              | 54°39.845'N         | 005°32.240'W         | FI(2).G. 6s SYNC                                  | 5        |     | 3                             |             | No change considered necessary                                    |
| 18   | DEPUTY                 | Buoy (Lighted)              | 54°39.513'N         | 005°31.944'W         | FI G 3s 0.3 SYNC                                  | 4        |     | 3                             |             | No change considered necessary                                    |
| 18   | DONAGHADEE             | Lighthouse                  | 54°38.707'N         | 005°31.860'W         | Iso WR 4s   | 16/10    |     |                               |             | No change considered necessary                                    |
| 18   | EAST MAIDEN            | Lighthouse                  | 54°55.748'N         | 005°43.669'W         | FI (3) 15s  | 18       |     |                               | AIS, Racon  | No change considered necessary                                    |
| 18   | FORELAND               | Buoy (Lighted)              | 54°39.640'N         | 005°32.307'W         | FI (2) R 6s SYNC                                  | 5        |     | 3                             |             | No change considered necessary                                    |
| 18   |                        | Beacon                      | 54°39.390'N         | 005°32.393'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 18   | GOVERNOR               | Buov (Lighted)              | 54°39.360'N         | 005°31.991'W         | FIR 3s 0.3 SYNC                                   | 4        |     | 3                             | AIS         | No change considered necessary                                    |
| 18   |                        | Beacon<br>(Uplighted)       | 54°17.499'N         | 005°32.750'W         | Unlit   |          |     | _                             |             | No change considered necessary                                    |
| 18   | HIGHLANDMAN (HIGHLAND  | Beacon<br>(Unlighted)       | 54°57.286'N         | 005°43.935'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 18   | MEW ISLAND             | Lighthouse                  | 54°41.923'N         | 005°30.824'W         | FFI(4) W 30s (Red. Vis.)                          | 18       |     |                               | AIS, Racon  | No change considered necessary                                    |
| 18   | NORTH HUNTER           | Buoy (Lighted)              | 54°53.046'N         | 005°45.114'W         | Q   | 6        |     | 2                             |             | No change considered necessary                                    |
| 18   |                        | Beacon                      | 54°25.638'N         | 005°24.970'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 18   |                        | (Unlighted)<br>Virtual AtoN | 54°38 630'N         | 005°27 100'W/        | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 18   |                        | Buoy (Lighted)              | 54°31 848'N         | 005°24 910'W         |   | 5        |     | 2                             | AIS         | Reposition to porth to align with red sector of Ballywalter Light |
| 10   | SKOLWAKTIN             | Beacon                      | 54°22 227'N         | 005°27.154'\\/       |   | J        |     | _                             |             | No obango considered pocessony                                    |
| 10   | SKULMARTIN BEACON      | (Unlighted)                 | 54 52.527 N         | 005°45 284'W         |   | 6        |     | 2                             | A19         |   |
| 18   |                        | Buoy (Lighted)              | 54°24 478'N         | 005°21 993'W         |   | 9        |     | 1                             | AIS Racon   |   |
| 10   | SOUTH ROCK (DOWN)      | Beacon                      | 5429.9491           | 005005 4 40%44       |   | 5        |     |                               | 710, 110011 |   |
| 18   | SOUTH ROCK BEACON      | (Unlighted)                 | 54°23.948 N         | 005°25.148'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 18   | ST JOHN'S POINT (DOWN) | Lighthouse                  | 54°13.605'N         | 005°39.611'W         | Q(2) 7.5s (Red. Vis.)                             | 25       |     |                               | AIS         | Reduction of range to 18nm  |
| 18   | ST. PATRICK'S ROCKS    | Beacon<br>(Unlighted)       | 54°18.584'N         | 005°30.937'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 18   | STRANGFORD             | Buoy (Lighted)              | 54°18.626'N         | 005°28.689'W         | LFI 10s   | 6        |     | 2                             | AIS         | No change considered necessary                                    |
| 18   | WATER ROCKS            | Beacon<br>(Unlighted)       | 54°14.441'N         | 005°37.696'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 19   | BLUICK ROCK            | Beacon<br>(Unlighted)       | 55°13.017'N         | 006°56.322'W         | Unlit   |          |     |                               |             | No change considered necessary                                    |
| 19   | BUNCRANA               | Lighthouse                  | 55°07.604'N         | 007°27.881'W         | Iso WR 4s   | 13/10    |     |                               |             | No change considered necessary                                    |
| 19   | COLPAGH                | Buoy (Lighted)              | 55°10.343'N         | 007°31.573'W         | FI R 6s 0.6                                       | 4.5      |     | 3                             |             | No change considered necessary                                    |
| 19   | DRAKE WRECK            | Buoy (Lighted)              | 55°17.073'N         | 006°12.438'W         | Q (6) + LFI 15s                                   | 5        |     | 3                             |             | No change considered necessary                                    |
| 19   | DUNREE                 | Lighthouse                  | 55°11.888'N         | 007°33.250'W         | FI (2) WR 5s                                      | 12/9     |     |                               | AIS         | No change considered necessary                                    |
| 19   | FANAD HEAD             | Lighthouse                  | 55°16.575'N         | 007°37.921'W         | FI (5) WR 20s                                     | 18/14    |     |                               | AIS         | No change considered necessary                                    |
| 19   | FOYLE                  | Buoy (Lighted)              | 55°15.322'N         | 006°52.616'W         | LFI 10s   | 7        |     | 2                             | AIS, Racon  | No change considered necessary                                    |
| 19   | INCH FLAT              | Buoy (Lighted)              | 55°05.684'N         | 007°30.758'W         | FI (2 ) R 6s                                      | 4        |     | 3                             |             | No change considered necessary                                    |
| 19   | INCH SPIT              | Buoy (Lighted)              | 55°06.832'N         | 007°29.616'W         | FIR 3s 0.3  | 4        |     | 3                             |             | No change considered necessary                                    |
| 19   | INISHOWEN              | Lighthouse                  | 55°13.556'N         | 006°55.749'W         | FI (2) WRG 10s (Red. Vis.)                        | 18/14/14 |     |                               |             | No change considered necessary                                    |
| 19   | INISHTRAHULL           | Lighthouse                  | 55°25.864'N         | 007°14.628'W         | FI (3) W 15s (Red. Vis.)                          | 18       |     |                               | AIS, Racon  | No change considered necessary                                    |

| Area | Name                             | Туре                                    | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character   | Range   | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment   |
|------|----------------------------------|---|---------------------|----------------------|---|---------|-----|-------------------------------|------------|---|
| 19   | KINNEGAR                         | Buoy (Lighted)                          | 55°06.743'N         | 007°30.723'W         | FI G 10s  | 3       |     |                               |            | No change considered necessary                                  |
| 19   | LIMEBURNER                       | Buoy (Lighted)                          | 55°18.551'N         | 007°48.428'W         | Q 1s 0.3  | 6       |     |                               | AIS        | No change considered necessary                                  |
| 19   | RATHLIN EAST (ALTACARRY<br>HEAD) | Lighthouse                              | 55°18.111'N         | 006°10.313'W         | Fl (4)W 20s (24hr)-(fl0.2,ec2.3)x3,<br>fl0.2 ec 12.3 =20s | 26      |     |                               | AIS, Racon | Reduction of range to 18nm and change to hours of darkness only |
| 19   | RATHLIN WEST                     | Lighthouse                              | 55°18.052'N         | 006°16.815'W         | FI R 5s (Red. Vis.)                                       | 22      |     |                               | AIS        | Reduction of range to 18nm                                      |
| 19   | RUE POINT                        | Lighthouse                              | 55°15.533'N         | 006°11.474'W         | FI (2) W 5s   | 14      |     |                               | AIS        | No change considered necessary                                  |
| 19   | SALTPANS                         | Buoy (Lighted)                          | 55°07.717'N         | 007°29.842'W         | Q (3) 10s   | 5.5     |     | 3                             |            | No change considered necessary                                  |
| 19   | SKERRIES BUOY                    | Buoy (Lighted)                          | 55°13.900'N         | 006°36.900'W         | Fl.R.5s (0.3)   | 5       |     | 1                             | AIS        | No change considered necessary                                  |
| 19   | STORK ROCK BUOY (TEMP)           | Buoy (Lighted)                          | 55°13.345'N         | 006°35.408'W         |   | 4.5     |     | 3                             |            | Replace with permanent buoy or beacon                           |
| 19   | SWILLYMORE                       | Buoy (Lighted)                          | 55°15.116'N         | 007°35.792'W         | FI G 3s 0.4   | 5       |     | -                             | AIS        | No change considered necessary                                  |
| 19   | TUNS                             | Buoy (Lighted)                          | 55°14.004'N         | 006°53.440'W         | FLR 3s  | 5       |     | 2                             | AIS        | No change considered necessary                                  |
| 19   | WHITE STRAND                     | Buoy (Lighted)                          | 55°09.059'N         | 007°29.935W          |   | 3       |     | 3                             | 410        | No change considered necessary                                  |
| 20   | ACHILLBEG                        | Lighthouse                              | 53°51.509'N         | 009°56.835W          | FI WR 5s fl 1.0+ eci 4.0 =5.0                             | 14/16/9 |     |                               | AIS        | No change considered necessary                                  |
| 20   | ARANMORE                         | Lighthouse                              | 55°00.903 N         | 008°33.666 W         | FI (2) W 205  | 18      |     |                               | AIS        |   |
| 20   | BALLAGH ROCKS                    | Lighthouse                              | 54°59.963 N         | 008°28.839 W         |   | 5       |     |                               | A16        | No change considered necessary                                  |
| 20   |                                  | Lighthouse                              | 53°09.253 N         | 009°15.839 W         | FLWR 3S   | 19/14   |     |                               | AIS        | No change considered necessary                                  |
| 20   |                                  | Lighthouse                              | 54 04.055 N         | 010 19.230 W         |   | 10/14   |     |                               | AIS        | No change considered necessary                                  |
| 20   |                                  | Buoy (Lighted)                          | 53°14.003'N         | 008 37.033 W         | FLR 3s (Sync)   | 10/0    |     | 1                             | AIS        |   |
| 20   | BLACKROCK BOOT (GALWAT)          | Lighthouse                              | 54°05 923'N         | 010°03 628'W         | FL (2) WR 7.5s  | 12/9    |     | •                             | AIS        |   |
| 20   |                                  | Buoy (Lighted)                          | 54°05.884'N         | 010°02 977'W         | O(3) 10s  | 3       |     | З                             | 710        | No change considered necessary                                  |
| 20   | BROADHAVEN                       | Lighthouse                              | 54°16.065'N         | 009°53.330'W         |   | 17/12   |     |                               |            | Establish AIS   |
| 20   | BUILLOCKMORE                     | Buov (Lighted)                          | 54°33.987'N         | 008°30.145'W         | Q (9) 15s   | 5       |     | 2                             | AIS        | No change considered necessary                                  |
| 20   |                                  | Buov (Lighted)                          | 53°14.078'N         | 009°34.352'W         | FIG 5s  | 5       |     | 1                             | AIS        | No change considered necessary                                  |
|      |                                  | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |                     |                      |   |         |     |                               |            |   |
| 20   | CARRICKBEALATROHA                | Beacon<br>(Unlighted)                   | 54°59.185'N         | 008°28.744'W         | Unlit   |         |     |                               |            | No change considered necessary                                  |
| 20   | CARRICKPATRICK                   | Buoy (Lighted)                          | 54°15.557'N         | 009°09.141'W         | Q (3) 10s   | 5.5     |     | 2                             |            | Establish AIS   |
| 20   | CASHLA BAY                       | Lighthouse                              | 53°15.834'N         | 009°33.982'W         | Dir Iso WRG 5s (24hr)                                     | 8       |     |                               |            | Transfer to LLA   |
| 20   | CLOUGHCORMICK                    | Buoy (Lighted)                          | 53°50.560'N         | 009°43.184'W         | Q (9) 15s 0.3   | 4       |     | 3                             |            | No change considered necessary                                  |
| 20   | DILLISK ROCKS                    | Buoy (Lighted)                          | 53°48.330'N         | 009°43.180'W         | FI G 5s   | 4       |     | 2                             |            | No change considered necessary                                  |
| 20   | DORINISH                         | Buoy (Lighted)                          | 53°49.479'N         | 009°40.483'W         | FI G 3s 0.3   | 3       |     | 3                             |            | No change considered necessary                                  |
| 20   | EAGLE ISLAND                     | Lighthouse                              | 54°17.022'N         | 010°05.564'W         | FI (3) W15s   | 18      |     |                               | AIS        | No change considered necessary                                  |
| 20   | EERAGH                           | Lighthouse                              | 53°08.909'N         | 009°51.402'W         | FIW 15s   | 18      |     | -                             | AIS        | No change considered necessary                                  |
| 20   | FINNIS                           | Buoy (Lighted)                          | 53°02.812'N         | 009°29.126'W         | Q (3) 10s   | 5       |     | 2                             | AIS        | No change considered necessary                                  |
| 20   | GOLA SPIT                        | Buoy (Lighted)                          | 55°04.915'N         | 008°20.396W          |   | 4       |     | 3                             |            | Hand over to LLA  |
| 20   | INISHEER                         | Lighthouse                              | 53°02.797N          | 009°31.613W          | ISO WR 12S  | 18/11   |     |                               | AIS, Racon | No change considered necessary                                  |
| 20   |                                  | Lighthouse<br>Ruov (Lightod)            | 53 49.594 N         | 009 40.239 W         |   | 5       |     | 2                             | AIS        | No change considered necessary                                  |
| 20   |                                  | Buoy (Lighted)                          | 53°07 329'N         | 009 09.725 W         | FLG 3s  | 5       |     | 3                             | AIS        |   |
| 20   |                                  | Beacon                                  | 54°58.946'N         | 008°28.581'W         | Unlit   |         |     | 0                             | /10        | No change considered necessary                                  |
| 20   |                                  | (Unlighted)<br>Buoy (Lighted)           | 53°13 683'N         | 009°05 996'W         | FLG 3s (Sync)   | 5.5     |     |                               | AIS        | No change considered necessary                                  |
| 20   |                                  | Buoy (Lighted)                          | 55°04.505'N         | 008°21.029'W         | FI (2) R 6s   | 3       |     | 3                             | 7.00       | Hand over to LLA  |
| 20   |                                  | Lighthouse                              | 54°39.816'N         | 008°49.951'W         | FIWR 15s  | 12/10   |     | -                             | AIS. Racon | No change considered necessary                                  |
| 20   | ROTTEN ISLAND                    | Lighthouse                              | 54°36.879'N         | 008°26.435'W         | FI WR 4s  | 15/11   |     |                               | _,         | No change considered necessary                                  |
| 20   | SLYNE HEAD                       | Lighthouse                              | 53°23.997'N         | 010°14.051'W         | FI (2) W 15s  | 19      |     |                               | AIS, Racon | Amend sectors: reduce White to 18nm add Red 15nm                |
| 20   | ST JOHN'S POINT (DONEGAL)        | Lighthouse                              | 54°34.162'N         | 008°27.657'W         | FIW 6s  | 14      |     |                               | AIS        | No change considered necessary                                  |
| 20   | STRAW ISLAND                     | Lighthouse                              | 53°07.065'N         | 009°37.840'W         | FI (2) W 5s   | 12      |     |                               | AIS        | No change considered necessary                                  |
| 20   | TORY ISLAND                      | Lighthouse                              | 55°16.357'N         | 008°14.964'W         | FI (4) W 30s (24hr)                                       | 18      |     |                               | AIS, Racon | No change considered necessary                                  |
| 20   | WHEAT ROCK                       | Buoy (Lighted)                          | 54°18.843'N         | 008°39.099'W         | Q (6) + LFI 15s   | 6       |     | 2                             | AIS        | No change considered necessary                                  |
| 21   | ARDNAKINNA POINT                 | Lighthouse                              | 51°37.104'N         | 009°55.092'W         | FI (2) WR 10s   | 14      |     |                               | AIS        | No change considered necessary                                  |
| 21   | ASDEE                            | Buoy (Lighted)                          | 52°35.093'N         | 009°34.545'W         | FI R 3s   | 4       |     | 2                             |            | No change considered necessary                                  |
| 21   | BALLYBUNNION                     | Buoy (Lighted)                          | 52°32.528'N         | 009°46.944'W         | Q   | 6       |     | 2                             | AIS, Racon | No change considered necessary                                  |
| 21   | BEAL BAR                         | Buoy (Lighted)                          | 52°35.175'N         | 009°39.052'W         | FI.G.3s (Sync)  | 5       |     | 1                             |            | No change considered necessary                                  |
| 21   | BEAL SPIT                        | Buoy (Lighted)                          | 52°34.820'N         | 009°39.972'W         | FI (2) G 6s (Sync)  | 4       |     | 2                             |            | No change considered necessary                                  |

| Area | Name                                | Туре                | Latitude<br>(WGS84) | Longitude<br>(WGS84) | Character                | Range    | HWS | Inter-<br>GLA<br>Buoy<br>Type | Radio Aids | Comment  |
|------|-------------------------------------|---------------------|---------------------|----------------------|--------------------------|----------|-----|-------------------------------|------------|--|
| 21   | BLACKHORSE ROCKS                    | Beacon<br>(Lighted) | 51°28.437'N         | 009°41.683'W         | Q 1s 0.2                 | 5        |     |                               |            | No change considered necessary                                       |
| 21   | BULL ROCK                           | Lighthouse          | 51°35.521'N         | 010°18.073'W         | FI W 15s                 | 18       |     |                               | AIS, Racon | No change considered necessary                                       |
| 21   | CARRIGAHOLT                         | Buoy (Lighted)      | 52°34.921'N         | 009°40.504'W         | FI (2) R 6s (Sync)       | 4        |     | 2                             |            | No change considered necessary                                       |
| 21   | CARRIGAVADDRA BUOY                  | Buoy (Lighted)      | 51°38.757'N         | 009°45.989'W         | VQ (3) 5s                | 4        |     | 2                             |            | No change considered necessary                                       |
| 21   | COLT ROCK                           | Beacon<br>(Lighted) | 51°38.068'N         | 009°55.087'W         | FI (2) R 10s 0.5 1.5     | 5        |     |                               |            | No change considered necessary                                       |
| 21   | CORLIS POINT FRONT                  | Lighthouse          | 52°37.100'N         | 009°36.363'W         | Iso W. 4 secs (fl2, ec3) | 10       |     |                               | AIS        | No change considered necessary                                       |
| 21   | CORLIS POINT REAR (QUERRIN<br>QUAY) | Lighthouse          | 52°37.693'N         | 009°35.336'W         | Iso W. 4secs (fl2, ec2)  | 10       |     |                               |            | No change considered necessary                                       |
| 21   | CROMWELL POINT (FORT)               | Lighthouse          | 51°56.022'N         | 010°19.280'W         | FI WR 2s                 | 17/15    |     |                               | AIS        | No change considered necessary                                       |
| 21   | CROOKHAVEN                          | Lighthouse          | 51°28.593'N         | 009°42.273'W         | LFI WR 8s                | 13/11    |     |                               | AIS        | No change considered necessary                                       |
| 21   | DINISH ISLAND DIRECTIONAL<br>LIGHT  | Lighthouse          | 51°38.779'N         | 009°54.315'W         | Dir Oc WRG 5s - 24 Hrs   | 15/12/12 |     |                               | AIS        | Hand over to LLA - will be disestablished and new LLA LL established |
| 21   | DOONAHA                             | Buoy (Lighted)      | 52°35.545'N         | 009°39.014'W         | FI R 3S (Sync)           | 4        |     | 1                             | AIS        | No change considered necessary                                       |
| 21   | FOOT                                | Buoy (Lighted)      | 51°55.733'N         | 010°17.062'W         | VQ (3) 5s                | 4        |     | 3                             | AIS        | No change considered necessary                                       |
| 21   | GEORGE                              | Buoy (Lighted)      | 51°39.024'N         | 009°49.695'W         | FI (2) 10s               | 4.5      |     | 3                             |            | No change considered necessary                                       |
| 21   | HARBOUR ROCK                        | Beacon<br>(Lighted) | 51°55.813'N         | 010°18.937'W         | Q (3) W 10s              | 5        |     |                               |            | No change considered necessary                                       |
| 21   | HORNET                              | Buoy (Lighted)      | 51°38.859'N         | 009°52.171'W         | VQ (6) + LFI 10s         | 4        |     | 3                             |            | No change considered necessary                                       |
| 21   | INISHTEARAGHT                       | Lighthouse          | 52°04.541'N         | 010°39.677'W         | FI (2) W 20s             | 18       |     |                               | AIS, Racon | No change considered necessary                                       |
| 21   | KILCREDAUN                          | Buoy (Lighted)      | 52°34.440'N         | 009°41.196'W         | QR (Sync)                | 4        |     | 2                             |            | No change considered necessary                                       |
| 21   | KILSTIFFIN                          | Buoy (Lighted)      | 52°33.801'N         | 009°43.843'W         | FIR 3s                   | 6        |     | 1                             | AIS        | No change considered necessary                                       |
| 21   | LETTER POINT                        | Buoy (Lighted)      | 52°35.440'N         | 009°35.884'W         | FI R 7s                  | 4        |     | 2                             |            | No change considered necessary                                       |
| 21   | LOOP HEAD                           | Lighthouse          | 52°33.672'N         | 009°55.938'W         | FI (4) W 20s             | 23       |     |                               | AIS        | Reduction of range to 18nm   |
| 21   | MAIDEN ROCK                         | Buoy (Lighted)      | 51°49.023'N         | 009°48.034'W         | FI G 5s                  | 3        |     | 3                             | AIS        | No change considered necessary                                       |
| 21   | MIZEN HEAD                          | Lighthouse          | 51°26.991'N         | 009°49.225'W         | Iso W 4s                 | 12       |     |                               | AIS        | No change considered necessary                                       |
| 21   | ROANCARRIGMORE                      | Lighthouse          | 51°39.183'N         | 009°44.823'W         | FI WR 5s                 | 11/9     |     |                               | AIS        | No change considered necessary                                       |
| 21   | SHEEP'S HEAD                        | Lighthouse          | 51°32.591'N         | 009°50.923'W         | FI (3) WR 15s            | 15/9     |     |                               | AIS        | No change considered necessary                                       |
| 21   | SKELLIGS ROCK                       | Lighthouse          | 51°46.108'N         | 010°32.519'W         | FI (3) W 15s             | 12       |     |                               | AIS        | No change considered necessary                                       |
| 21   | TAIL OF BEAL                        | Buoy (Lighted)      | 52°34.393'N         | 009°40.746'W         | QG (Sync)                | 5        |     | 2                             | AIS        | No change considered necessary                                       |
| 21   | VALENTIA DIRECTIONAL LIGHT<br>PEL   | Lighthouse          | 51°55.514'N         | 010°18.416'W         | Oc WRG 4s - 24 Hrs       | 11       |     |                               |            | No change considered necessary                                       |
| 21   | WALTER SCOTT                        | Buoy (Lighted)      | 51°38.541'N         | 009°54.234'W         | Q (6) + LFI 15s          | 4        |     | 3                             | AIS        | No change considered necessary                                       |