



Northern  
Lighthouse  
Board

## NORTHERN LIGHTHOUSE BOARD

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### INSPECTION/AUDIT OF LOCAL AIDS TO NAVIGATION, OFFSHORE STRUCTURES & AQUACULTURE SITES

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2021/22 REPORT



Oxcars Lighthouse

**INSPECTION/AUDIT OF LOCAL  
AIDS TO NAVIGATION, OFFSHORE  
STRUCTURES & AQUACULTURE SITES – 2021/22 REPORT**

This report is submitted to the Secretary of State pursuant to section 198(4) of the Merchant Shipping Act 1995, and to the Scottish Ministers in accordance with section 55 of the Scotland Act 2016.

This report covers the period April 2021 to March 2022 inclusive.

**1. POLICY**

- 1.1 Section 198(1) of the Merchant Shipping Act 1995 (the Act of 1995), empowers the General Lighthouse Authorities to inspect all lighthouses, buoys and beacons under Local Lighthouse Authority management. In addition, Section 195(1) of the Act vests in the General Lighthouse Authorities (GLA) the superintendence and management of all lighthouses, buoys and beacons within their areas.
- 1.2 Emphasis continues to be placed on a combination of inspecting local Aids to Navigation (AtoN) and/or auditing local AtoN Availability Statistics and Casualty Response targets against known requirements.
- 1.3 Under the UK Government's Port Marine Safety Code all Aids to Navigation (AtoN) maintained by Harbour Authorities and any other existing Local Lighthouse Authorities must be maintained in accordance with the availability criteria laid down by the General Lighthouse Authorities, and must be subject to periodic review. The characteristics of these aids to navigation must comply with the guidelines and recommendations as laid down by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). The General Lighthouse Authorities require Harbour Authorities and any other existing Local Lighthouse Authorities to be responsible for ensuring that any third party aids to navigation, within their areas of responsibility are also established and maintained to the same standards.
- 1.4 The General Lighthouse Authorities also require those responsible for Local Aids to Navigation, which lie outwith Statutory Harbour and Local Lighthouse Authorities' areas of jurisdiction, to establish and maintain their Aids to Navigation to the same standards.
- 1.5 The General Lighthouse Authorities require those responsible for Local Aids to Navigation to maintain appropriate records of AtoN Availability Statistics and AtoN casualty responses and to provide summaries of these records to the relevant GLA on an annual basis.
- 1.6 In addition, each Authority is required to establish procedures for responding to AtoN casualties within the timescales as laid down and applied by the General Lighthouse Authorities.

## **2. PURPOSE**

- 2.1 Northern Lighthouse Board, as a General Lighthouse Authority, has a statutory duty of superintendence and management, to ensure that AtoN maintained by other authorities within the NLB area of responsibility meet the agreed international standards. The Northern Lighthouse Board discharges this duty by a combination of audit, inspection, review and consenting to changes requested by any appropriate authority via the Statutory Sanction process. NLB are also routinely consulted regarding marine developments by Marine Scotland, who are responsible for the issue of marine licences under the Marine (Scotland) Act 2010; by the Scottish Government, who are responsible for granting Harbour Empowerment and Harbour Revision Orders under the Harbours Act 1964; and by the Department for Business, Enterprise and Industrial Strategy, who are responsible for oil and gas licensing under the Energy Act 2008.
- 2.2 Site visits give Local Lighthouse Authorities the opportunity to discuss with the Inspecting Officer all matters relating to their AtoN provision – i.e. the level of provision, recommendation for changes and/or review of their existing maintenance procedures.
- 2.3 Many Local Lighthouse Authorities welcome this visit, as they consider the audit/inspection to form an important external audit element of their Quality and/or Safety Management Systems.
- 2.4 Whilst inspection provides a snapshot of the standard of AtoN provision on a particular day, the audit of Local Lighthouse Authority records allows a more detailed examination of their performance over a longer period of time.
- 2.5 Within the Northern Lighthouse Board, external LLA Audits under the Port Marine Safety Code are conducted by members of the Navigation Section. Inspections of AtoN are generally carried out by Ships' staff, with other inspections undertaken during site visits and/or scheduled audits or compliance visits.
- 2.6 The General Lighthouse Authorities have very limited powers to follow up on deficiencies in the provision of AtoN by LLAs or other bodies; it is intended to seek clarification of these powers in the programmed revision of the Merchant Shipping Act.

## **3. LOCAL ATON**

### **3.1 Inspections**

- 3.1.1 During the second year of the Covid pandemic inspections have largely been unaffected by Covid restriction as the majority are conducted by NLB vessels. Shore based inspections resumed during this period but were constrained by the impacts of Covid and the restrictions in place.
- 3.1.2 Inspections of Aids to Navigation can fall into one or more of the following categories:
  - Seaward inspection undertaken by NLB vessels (day/night) from a seaward aspect, checking the bearing, range and sectors of directional, leading and sector lights. Other aids to navigation including lights, traffic signals, lit/unlit beacons and lit/unlit buoys are also checked for light characteristic, range, conspicuity of daymark and geographical position. Automatic Identification Systems (AIS) and radio beacons (RACONS) are checked for code/signal transmitted from the aid to navigation to that received on board the vessel, including nominal range. All data is cross referenced against current

Admiralty charts, and published information within the Admiralty List of Lights and Fog Signals and the Admiralty List of Radio Signals.

- Shore based inspection (day) undertaken in response to a direct request, enquiry or in conjunction with other work in the surrounding area. The inspection includes a physical check of the structure, position, description, character, daymark, colour and general condition of the light. Additional information regarding ownership and maintenance responsibilities are also verified at this time.
- Shore based inspection (night), usually undertaken as part of a sample inspection required for the purposes of auditing a Port or Harbour Authority under the Port Marine Safety Code. Inspections are either carried out from shore or via local Pilot Boat with prior agreement from the relevant Port or Harbour Authority.

3.1.3 Inspection findings are input by the Inspecting Officer into the web-based Aids to Navigation and Reporting (*AtonRep*) software, jointly developed by Irish Lights and the Northern Lighthouse Board. Inspections submitted by NLB vessels are monitored by the Navigation section, with any reported defects registered on the *AtonRep* database and notification issued to the relevant owning authority for verification/rectification.

3.1.4 Thereafter, routine checks are made against the list of outstanding defects to ensure that these are successfully closed out within the required timescale. Statistics regarding the number of inspections and associated failures are provided to NLB's Director of Operations on a monthly basis. Monthly reports regarding outstanding/overdue inspections and those scheduled for inspection in the current year are also passed to the Marine Operations Manager, to inform vessel programming.

### 3.2 Results of 2021/22 Local Lighthouse Authority AtoN Inspections

3.2.1 There are currently 217 authorities registered in the *AtonRep* database with responsibility for marine Aid to Navigation within NLB's area of jurisdiction.

3.2.2 At 31 March 2022 there were 2289 active LLA Aids to Navigation registered on the *AtonRep* database. Consistent with previous Annual Inspection reports, these figures exclude aquaculture sites in Scottish waters.

3.2.3 1667 of the 2289 LLA AtoN (72.82%) were inspected in 2021/22. Of these, 111 were found to be defective representing a deficiency rate of 6.7%. This represents a slight decrease in failure rates over the previous year, and is consistent with historic levels.

<b>LLA Annual Inspection Failure Trend</b>										
<b>Inspection Year</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018 /19</b>	<b>2019 /20</b>	<b>2020 /21</b>	<b>2021 /22</b>
<b>No. of AtoN</b>	1958	1963	2018	2034	2043	2074	2127	2238	2252	2289
<b>No. of Inspections</b>	1747	1350	1692	1443	1710	1614	1730	1867	1823	1667
<b>No. of Failures</b>	110	108	83	64	88	71	114	107	134	111
<b>Percentage Failure</b>	6.3	8.0	4.9	4.4	5.1	4.4	6.6	5.7	7.4	6.7

**Fig. 1 - LLA Annual Inspection Results**



**Fig. 2 - LLA Annual Inspection Failure Trend**

### **3.3 Local AtoN Audits**

- 3.3.1 The Department for Transport UK Ports database shows a total of 688 ports in Scottish waters, however many of these are extremely limited in size and scope of operations. 253 of these are Statutory Harbour Authorities, with their own governing legislation, but again many are limited in size and most are operated by Local Authorities. 25 are classed as Competent Harbour Authorities, with additional statutory powers relating to pilotage; in general these are the most active ports in terms of commercial activity. NLB undertakes an audit cycle under the Port Marine Safety Code for all Competent and major Statutory Harbour Authorities within our area of jurisdiction.
- 3.3.2 For all other authorities with responsibility for Marine Aids to Navigation, not deemed to be either a Competent or major Statutory Harbour Authority, a formal audit is not undertaken, however the more significant of these are subject to a compliance visit.
- 3.3.3 Compliance with the Port Marine Safety Code for these authorities is voluntary, although some sections are based on statute. Therefore emphasis is placed on encouraging the authority to follow best practice, with a view to increasing the authorities' awareness of their responsibilities with regard to the provision and maintenance of their AtoN. The authorities are also encouraged to participate in a data verification exercise to ensure that their aids to navigation are registered with the Northern Lighthouse Board, and that these are also charted and published by the UK Hydrographic Office.
- 3.3.4 Face to face audits resumed during this period but were constrained by the impacts of Covid and the restrictions in place. Six harbour authorities were re-audited in 2021/22, with all six found to be fully compliant (with respect to provision and maintenance of marine aids to navigation) with the Port Marine Safety Code.

### 3.4 Local AtoN Availability

3.4.1 Local AtoN maintained by LLA and other providers are required to be maintained in accordance with the availability criteria laid down by the General Lighthouse Authorities, which are based on IALA guidelines.

3.4.2 Availability is calculated based on a three year rolling average, with the minimum/target availability for each AtoN Category as shown below:

Category 1	(99.8% Availability)
Category 2	(99.0% Availability)
Category 3	(97.0% Availability)

3.4.3 When an AtoN is reported defective, it is regarded as a casualty when the AtoN component falls below the advertised characteristics for the station and the details are then included in the calculation for availability.

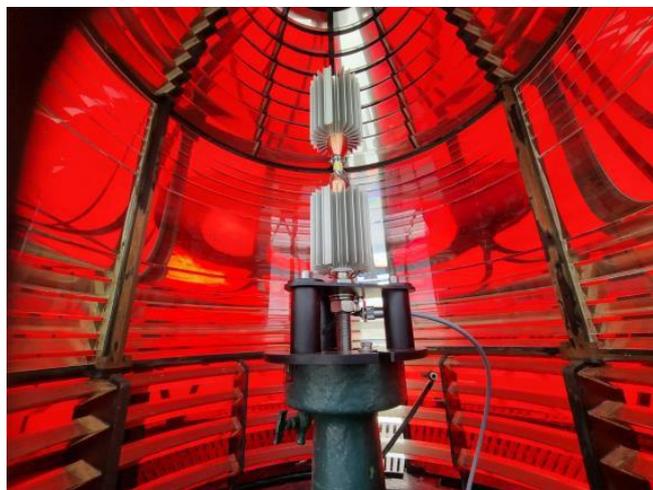
3.4.4 Northern Lighthouse Board requires all Competent and major Statutory Harbour Authorities to submit an annual return to demonstrate their performance against the required standards.

3.4.5 Utility companies and other authorities with responsibility for a large number of marine AtoN are also encouraged to maintain casualty records, either via the submission of a pre-formatted Excel spreadsheet provided by Northern Lighthouse Board, or via access to the *Aton Reporting Online* web based database. Either method provides an accurate record of their Aton defects and enables an electronically generated return of their achieved availability statistics to be submitted to the Northern Lighthouse Board for review.

### 3.5 Results of the 2021/22 Local AtoN Availability Returns

3.5.1 Of the 35 Local Lighthouse Authorities from whom Annual Returns were requested, all complied within the required timescale.

3.5.2 For the three year rolling period ending 31 March 2022, two of these authorities failed to meet the IALA standard for Category 1 AtoN; nine failed to meet the IALA standard for Category 2 AtoN and four failed to meet the IALA standard for Category 3 AtoN. In summary, twelve authorities have failed to meet the required standard of availability for a particular category of AtoN.



Oxcars LED light

3.5.3 In general, when LLAs fail to meet the target availability, this is a result of difficulties

in accessing more remote aids to navigation, and this is sometimes compounded by limited resources. This year has again been challenging as many LLAs have had difficulty in sourcing contractors to undertake AtoN maintenance/ fault repair due to staff on furlough or working from home along with difficulties accessing remote locations and/or communities and the risk that poses.

### **3.6 Overview of Local Aids to Navigation**

- 3.6.1 2021/22 saw a steady flow of Statutory Sanction applications from port and harbour authorities, utility companies, private industry, renewable energy and aquaculture operators to alter, discontinue or exhibit marine aids to navigation.

35 applications to establish new aids to navigation were received for the deployment of 30 lit buoys (including 23 special mark buoys); the establishment of 28 lights (including wind farm operational phase AtoN on 17 turbines with multiple lights on each turbine, eight with fog signals and three with AIS AtoN); three floating wind turbines (which include the use of multiple lights, AIS AtoN devices and fog signals); two tidal renewable devices (including multiple lights and AIS Aton devices). These were primarily to improve the marking of navigable channels, offshore decommissioning, harbour/marina infrastructure and renewable energy developments.

Thirteen applications to alter existing aids to navigation were received for 11 lights (mostly due to harbour improvements), six lit buoys (mostly involved in environmental monitoring) and eight virtual AIS AtoN to improve a deep-water channel.

Nineteen applications to discontinue existing aids to navigation were received and approved for eight lights, 24 lit buoys, two beacons and one siren, which were mainly associated with wind farm construction/data gathering buoyage and ongoing reviews of aids to navigation.

- 3.6.2 NLB is a statutory consultee for all Marine Licence applications under The Marine Licensing (Consultees) (Scotland) Order 2011. For the 12 month period April 2021 to March 2022, Northern Lighthouse Board responded to some 150 applications, 30 Pre-Application Consultations and 40 exempted activities requests (excluding Aquaculture, Offshore Oil and Offshore Renewables).

- 3.6.3 NLB has also provided comment to Scottish Ministers on a number of Harbour Designation, Enforcement and Revision Orders under the Harbours Act 1964, covering powers of harbour direction, pilotage direction, revised harbour limits and marine construction to develop existing harbours in support of offshore renewables, along with port and harbour infrastructure upgrades. A notable inclusion was a temporary Harbour Revision Order to facilitate operations prior to and during the COP26 conference in Glasgow.

NLB have given marking and lighting advice regarding several proposed harbour developments, including the development of Stranraer Marina; pier redevelopment at Arnish Deep Water Port in Stornoway; harbour expansion proposals within Orkney at Kirkwall and in Scapa Flow; proposed upgrade works to the outer berth at Port of Leith; flood prevention/redevelopment works at Millport, Cumbrae; and ongoing major ferry terminal projects (including the redevelopment of the 'Skye Triangle' ferry terminals Tarbert, Uig and Lochmaddy). Other notable projects were power and communications infrastructure cable replacement programs (including the R100 fibre optic cable project for Orkney and Shetland); a UAV (drone) port at Montrose and temporary danger areas for Rocket launch sites in Shetland and the Outer Hebrides.

## 4. OFFSHORE RENEWABLE ENERGY DEVELOPMENTS

### 4.1 Licensing

4.1.1 The development of Offshore Renewable Energy installations (OREI) is the largest growth area affecting the marine environment. Developers are required to seek a number of consents; with regard to Navigational Safety this is specifically the Marine Licence administered by Marine Scotland.

4.1.2 NLB have been involved with all developments in Scottish waters, both prior to and during the Marine Licensing process, providing guidance on what developments are acceptable and how to mitigate the risk of collision and allision with OREI. The process now includes developers being required to develop a 'Marking and Lighting Plan' covering all stages of construction and operation of an OREI site.

### 4.2 Offshore Wind

4.2.1 There has been considerable growth in offshore wind energy in Scottish waters over recent years, adding to the established wind farms at Robin Rigg in the Solway Firth (174 MW), Beatrice in the Moray Firth (588 MW) and the European Offshore Wind Deployment Centre off Aberdeen (93.2 MW).

4.2.2 The Hywind floating wind farm, a world first, consisting of five 6MW turbines some 15 miles East of Peterhead, was commissioned in October 2017. The Kincardine floating wind farm, East of Stonehaven, is now composed of five 9.5 MW devices with the original 2 MW turbine planned to return to site following a deep maintenance period in the Cromarty Firth.

4.2.3 Construction of the Moray East OWF (950 MW) site has now been completed, with construction buoyage removed in May 2022, following a successful inspection of Operational Lighting and Marking by the Navigation Department on board NLV Pharos. Consenting activity is ongoing for the adjacent Moray West site (850 MW). The two 5 MW wind turbine demonstrators adjacent to the Beatrice Oil Field in the Moray Firth are now non-operational, and the operators are examining decommissioning options.

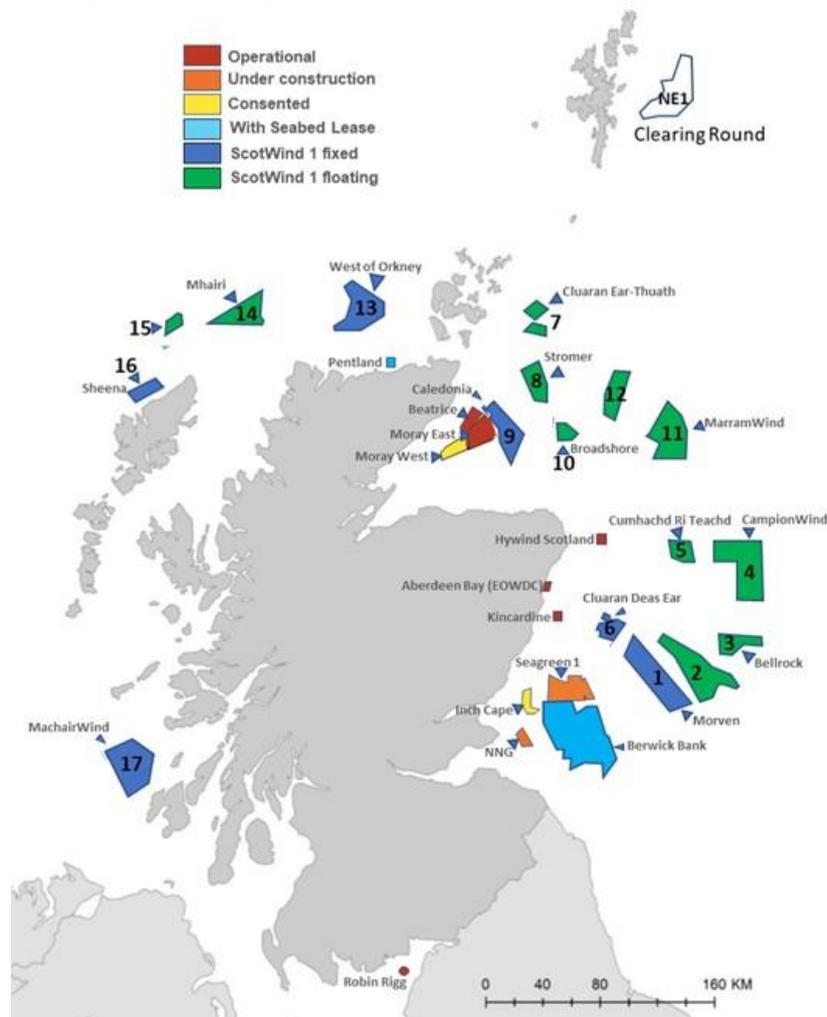


Offshore wind jackets in the Cromarty Firth awaiting deployment

4.2.4 The Outer Firth of Forth/Tay region is also the focus of considerable development

for offshore wind. The Neart na Gaoithe wind farm commenced both onshore and offshore construction in early 2020, with full commissioning expected in 2023. The larger Seagreen OWF (1.1 GW) project has also commenced construction, with an anticipated date of Final Commissioning of November 2023. The Inch Cape Offshore Wind Farm project, also located within the Outer Firth of Forth, was not successful in the most recent 2021 Contract for Difference auctions, but planning for the project continues to progress.

- 4.2.5 The Pentland Floating Offshore Windfarm, located approximately 6.5km off the coast of Dounreay, Caithness is currently progressing through the early stages of the consenting process, and will deploy a maximum of ten floating wind turbines with an installed capacity of up to 100 MW.
- 4.2.6 Early 2022 saw the announcement of successful bidders for the Crown Estate Scotland (CES) ‘ScotWind’ leasing round, with around 25 GW of capacity proposed across 17 different sites, comprising both fixed bottom and floating projects, and ranging in capacity from 95 MW up to 3 GW. Only one lease area, NE1 (East of Shetland) remains available, and is currently progressing through a CES Clearing Round.
- 4.2.7 NLB have started to actively engage with the successful bidders with regard to the ScotWind projects, and in particular the navigational safety aspects of the early survey works required to inform their long-term construction plans. These projects are looking to be coming online towards the end of the decade.



Scottish Offshore Wind Market (offshorewindscotland.org.uk)

- 4.2.8 In addition to the ‘ScotWind’ leasing round, CES have also launched the ‘Innovation and Targeted Oil and Gas’ (INTOG) leasing round. This will allow developers to apply to build offshore wind farms specifically for the purpose of

providing low carbon electricity to power oil and gas installations and help to decarbonise the sector. It also provides an opportunity to enable small scale (less than 100 MW) innovation projects, including alternative outputs such as hydrogen. The INTOG leasing round is expected to provide an additional 6.2 GW of generating capacity.

- 4.2.9 When existing, proposed, and potential capacities are combined, the total generating capacity for offshore wind stands at in excess of 40 GW.

### **4.3 Wave & Tidal**

- 4.3.1 Significant interest continues in the deployment of wave & tidal renewable energy devices around the coast of Scotland, however this has yet to result in any commercial scale development.
- 4.3.2 The Meygen tidal energy site, south of Stroma, started generating power to grid in December 2016, with four 1.5 MW turbines installed by February 2017. A further two turbines are planned in the short term, and a further 49 turbines (73.5 MW) have been licensed.
- 4.3.3 Six smaller turbines, total output 600 kW, have also been installed by Nova Innovation in Bluemull Sound, Shetland.
- 4.3.4 A single 50 kW tidal energy device proposed by the Islay Energy Trust for deployment within the Sound of Islay is currently going through the Marine Licensing process.

### **4.4 Test & Development**

- 4.4.1 Scottish waters continue to attract renewable energy developers to the wave and tidal energy test sites operated by the European Marine Energy Centre (EMEC) in Orkney. A number of wave energy devices have been trialled at the Billia Croo (Hoy Mouth) site over several years, and several tidal turbines and associated infrastructure developments continue to be tested at the Falls of Warness site near Eday. Additional nursery or secondary test sites have also been developed in Orkney at St Margaret's Hope, Scapa Flow and off Westray, for wave and tidal devices respectively.
- 4.4.2 Two projects of note continue to function at the EMEC Fall of Warness tidal test site; Magellanes' ATIR device and the Orbital O2 device. NLB have been involved in discussions for the potential future deployment of additional and larger iterations of the Orbital device at the Fall of Warness site.
- 4.4.3 Additionally, two Wave Energy Converter devices are currently undergoing various stages of testing in Orkney. Mocean's 'Blue X' device underwent scale testing within the EMEC Scapa Flow site, and has consent to deploy to a new location south of Deerness for further testing. The second device, the MPS WaveSwing, is scheduled to commence short-term scale testing at the Scapa Flow site in Q2/3 of 2022.

## **5. 2021 SEAWARD INSPECTION OF OFFSHORE STRUCTURES**

### **5.1 Inspection Procedure**

- 5.1.1 In order to discharge its statutory duty as a General Lighthouse Authority in respect of offshore AtoN, NLB undertakes an annual inspection voyage to ensure that Offshore Oil & Gas operators are maintaining the AtoN for which they are responsible, to meet the agreed international standards, specifically the Standard Marking Schedule for Offshore Installations.
- 5.1.2 While the inspection provides a snapshot of the standard of provision on a particular day, the combination of historical inspection records and additional reports from any operator, owner or standby/rescue vessel (ERRV) on any outage, defect or omission, gives a condition trend reflecting the response to the annual inspection and report.
- 5.1.3 Prior to the annual inspection, the operating companies are contacted and requested to supply information on all offshore units owned or on contract to them, they are likewise given prior warning of the inspection and a copy of the inspection details request is forwarded to them.
- 5.1.4 The Inspection of each Offshore Oil Installation follows the procedure below:

#### **(a) Physical Inspection.**

This inspection is carried out from on board the 'NLV Pharos'. The inspection is carried out during the hours of darkness, initially with regard to the conspicuity of the Main White morse 'Uniform' lights, with the number, range of observation and effectiveness of synchronisation being recorded. A similar inspection is made of the Subsidiary Red morse 'Uniform' lights, the installation sound signal and the number and clarity of the platform Name Boards or Identification Panels. Any navigation, weather data or mooring buoys deployed in the proximity of the field will also be inspected,

#### **(b) Inspection Records**

The results of each inspection are recorded on a report sheet containing the latest details specific to each platform, MODU or FPSO/FSU at the time of inspection; these results are then compiled to produce a summary report.

#### **(c) Defects or Faults**

Any fault or defect found during the inspection will be reported directly to the Radio/Control room operator prior to the 'NLV Pharos' leaving the location. For unmanned installations, the results are passed to Standby or ERRV vessels with a request to confirm the repair and report the correct operation to NLB. Since 2013 OPRED have required the owners/operators of Offshore Installations to record any defect of Aids to Navigation via a PON-10 notification.

#### **(d) Corrections and Additions**

During the course of the inspection any changes to the information held on record with respect to the owners/operators of the installation or their contact details will be discussed when in radio contact with the personnel on board. Similarly, any additions, removal or repositioning changes to the number and/or type of AtoN used to identify and safely mark the installation will be noted at the time of inspection and transferred to the NLB's AtonRep data system.

## **5.2 Results of the 2021 Inspection Voyage**

- 5.2.1 The 2020 Annual Seaward Inspection of Offshore Installations was conducted by the NLV Pharos, and was overseen by Coastal Inspector Adam Lewis. The inspection is carried out to ensure that all installations continue to meet the requirements for Navigational Marking as per the 'Standard Marking Schedule for Offshore Structures', and encompasses lighting, fog signals, identification panels and electronic aids to navigation such as RACONs and AIS where fitted.
- 5.2.2 NLV Pharos was scheduled to depart Kirkwall on 11 November 2021. However, operational demands required NLV Pharos to divert to Lunna Holm, Shetland. In an attempt to avoid heavy sea conditions in the Northern North Sea, NLV Pharos proceeded south, and between 16 November 2020 and 20 November 2021, inspections were carried out on 19 fixed or floating installations. No Mobile Offshore Drilling Units (MODU) were inspected.
- 5.2.3 At the time of the inspection, Northern Lighthouse Board's area of jurisdiction within the UK sector consisted of 95 fixed or floating platforms, 10 of which were unmanned and at various stages of the decommissioning process. It should be noted that the total number of installations will fluctuate year on year depending upon ongoing commissioning/decommissioning projects, and also the location of the Mobile Offshore Units.
- 5.2.4 Due to a number of intense weather systems, and operational restrictions, only installations within a narrow band adjacent to the Moray Forth were able to be inspected. Attempts were then made to utilise spare capacity within the schedules of both NLV Pharos and NLV Pole Star in early 2022. However, operational and technical issues, along with very limited weather windows prevented any further inspections taking place.
- 5.2.5 Of the 19 installations inspected, 4 failures were noted (21%); one of these failures consisted of an unlit rig – however, it should be noted that this failure occurred on an NUI installation, and had already been declared by the operator with contingencies put in place. 1 other failure was considered 'high priority', which was for the Primary white lights failing due to a faulty photo cell. The remaining 2 'low priority' failures were composed of inadequate fog signal ranges.

## **6. THE AQUACULTURE INSPECTION PROCESS**

### **6.1 Introduction**

- 6.1.1 From small beginnings in the 1960s, marine fish and shellfish farming, mainly for salmon and mussels, has grown into a significant Scottish industry helping to underpin sustainable economic growth in Scotland's rural and coastal communities.
- 6.1.2 The industry is mainly based on the Scottish Islands (Western Isles, Orkney and Shetland) and the West coast of the mainland where it employs around 2,500 people (full-time equivalent) in rural communities. The industry as a whole employs roughly up to 12,000 people either directly or in support services. There is no aquaculture in the Isle of Man.
- 6.1.3 The industry is heavily regulated and, under the Marine (Scotland) Act 2010 Part 4, the Scottish Government is responsible for licensing activities carried out in the Scottish inshore region. Through the process of marine licensing, and the conditions placed on licences, economically and socially beneficial activities are promoted while minimising adverse effects on the environment, human health and users of the sea. Where obstruction or danger to navigation is caused or is likely to result from the development of aquaculture farms, a Marine Licence is required and, through statutory consultation with NLB and the Maritime and Coastguard Agency, safety of navigation issues are taken into account. Crown Estate Scotland also has a role as a pro-active landlord and Local Authorities are responsible for granting the necessary planning permissions.

### **6.2 Hazards to Navigation**

- 6.2.1 Fish farms often encroach on charted anchorage areas and areas frequented by smaller fishing vessels and leisure craft, as well as lying adjacent to larger vessel routes. Growth of the industry has also resulted in live fish carriers and other vessels navigating much closer inshore than large vessels would traditionally venture.
- 6.2.2 Finfish plastic ring cages present a collision hazard and are often accompanied by sizeable steel or concrete feed barges. Mussel lines are perceived to offer a particular hazard, due to their low visual conspicuity and potential to foul propellers. Oyster beds are sited in shallow water but may project steelwork constructions with the ability to damage vessels or foul anchors. Most sites have significant mooring arrangements, often with outlying buoys and trailing lines, with the capacity to foul propellers or anchors. This practice is strongly discouraged by NLB in responses to licence applications and during site inspections.
- 6.2.3 There are specific hazards when sites are left fallow, with the AtoN removed but with remaining surface or sub-surface obstructions; or with the abandonment of (usually mussel) sites. The latter often require protracted multi-agency efforts to rectify.

### **6.3 Hazard Mitigation**

- 6.3.1 Hazard mitigation is provided by ensuring that aquaculture sites are marked as accurately as possible on charts and by requiring the site operator to provide aids to navigation. These are usually in the form of yellow Special Mark poles or buoys, with or without short range navigation lights. These are generally sited on the seaward side of the farm, or to mark the navigable route through a channel.

## 6.4 The Aquaculture Inspection Process

6.4.1 The initial stage of a site inspection involves an examination of the site's Marine Licence, to establish that the NLB's marking and lighting recommendations are present and correctly correspond to NLB records. The site manager is requested to produce any further documentation appertaining to all on site AtoN inspection and maintenance activities.

6.4.2 A boat visit to the site (s) is requested, and the following procedures carried out:

- GPS co-ordinates (WGS 84 datum) of the site extremities and navigational markers are recorded.
- Any navigational lights are tested to check they are operating properly and display the correct lighting characteristic.
- All navigational marks are inspected to ensure they are in a suitable condition.

6.4.3 The inspection concludes with a discussion with the site manager. The Coastal Inspector provides a brief summary of their findings and what actions the stakeholder is required to take. Where necessary, the Coastal Inspector will also highlight the importance of ensuring sites are correctly marked for the safety of the mariner, and that correct navigational marking is part of the organisations lease agreement, Planning Permission and Marine Licence and that repeated failures may result in revocation of any of these.

6.4.4 Subsequent to the inspection, a detailed written report is forwarded to the site operator.

## 6.5 2021/22 Inspections

6.5.1 Due to the COVID-19 pandemic and staffing issues, NLB were unable to carry out a physical site inspection programme throughout most of 2021/22. A single inspection week to the Loch Linnhe area was planned and undertaken when COVID restrictions were minimised in October 2021.

6.5.2 Thirteen aquaculture site inspections were undertaken, with the following results observed:

Site Type	Number Inspected	Correctly Marked as per Marine Licence	Partially Marked	Percentage Marked Correctly
Shellfish	0	-	-	-
Finfish	13	5	5	38.5%
Combined	13	5	5	<b>38.5%</b>

6.5.3 A new Coastal Inspector (aquaculture) was recruited to commence work in April 2022, coincident with the lifting of most COVID restrictions in Scotland. After two years of restrictions there is a significant backlog of inspection work to be completed.

## 6.6 Finfish Compliance Follow-up

6.6.1 The Scottish Salmon Producers Organisation (SSPO) is the representative trade body for Scotland's salmon producers. Following the 2019/2020 annual report the NLB identified a key initiative to improve compliance rate across the finfish sector in the form of direct engagement and collaboration with the SSPO. In Q1 of 2021 the aquaculture Coastal Inspector met with directors from the SSPO. The aim of the meeting was to highlight the less than acceptable compliance levels across the sector, and to communicate the necessity for SSPO members to fully comply with navigational marking conditions. The SSPO shared NLB's concerns with regards to compliance and were surprised that this issue was not being fully addressed by the industry. The SSPO's response was swift – notifying the Managing Directors of the major finish producers and urging them to take immediate action.

## **6.7 Collaboration with Other Agencies**

6.7.1 The NLB, MCA, and MS-LOT continue to work collaboratively to address issues and seek improvements to the Scottish aquaculture regulatory regime, to ensure the industry operates under best practice for the safety of both itself and that of other marine users.