

**PMSC Aids to Navigation – Trinity House**  
Report by Head of Safety Management

<p><b>Purpose:</b> This report provides the Committee with information on the work the Authority has undertaken to identify and rectify deficient Aids to Navigation (AtoN) following the Trinity House annual report 2017, see Appendix 1.</p>
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**1. Background**

- 1.1. The Port Marine Safety Code requires all Aids to Navigation (AtoN) maintained by Harbour Authorities and any other existing Local Lighthouse Authorities to be maintained in accordance with the criteria laid down by the General Lighthouse Authority (GLA), and must be subject to periodic review.
- 1.2. The characteristics of these AtoN must comply with guidelines and recommendations as laid down by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). The GLA require Harbour Authorities and any other existing Local Lighthouse Authorities to be responsible for ensuring that any third party AtoN, within their area of responsibility, are also established and maintained to the same standards.
- 1.3. Trinity House (the GLA) carries out annual inspections of AtoN's for each Harbour Authority in the UK.

**2. The Broads Aids to Navigation (AtoN)**

- 2.1. The Broads has 230 Aids to Navigation on the Broads system which is the second highest count for any harbour authority in the UK only the Port of London having more. Aids to Navigation range from channel marker posts, lights on fixed structures such as bridges and piers, to signage at cable and gas crossing points.
- 2.2. Whilst the Channel Markers are directly controlled by the Broads Authority many of the other AtoN's are the responsibility of third parties such as utility companies, Network Rail and the Highways Agency. However the overall responsibility for the management of all AtoNs within the Broads lies with the Broads Authority.
- 2.3. Over the years the management of the third party AtoN's has proved extremely difficult with some utility companies not responding to letters and contacts from the Authority asking them to maintain their AtoN's which protect their assets.

- 2.4. The Trinity House Annual report, see Appendix 1, lists the Broads Authority as a poor performer primarily for the amount of third party AtoN's which are deficient in some way.

### **3. Progress**

- 3.1. In 2016 following the annual Trinity House inspection in which faults were recorded because some AtoN's just could not be found the Authority committed time and effort to planning and locating these "missing" AtoN's. This resulted in an increase of deficient AtoN's in the following annual inspection as more were identified.
- 3.2. Following a concerted effort to contact the third party owners of the AtoN's and the maintenance programme of replacing and maintaining the Authority owned AtoN's the position following the 2018 inspection is much improved with only 26.9% of deficiency which are all third party owned assets.
- 3.3. The Authority has also mapped onto its graphical information system (GIS) the location of all of the river furniture, signs, channel marker posts etc. including the formal AtoN's which will allow Rangers to regularly inspect and report on the condition of these assets.

### **4. Next steps**

- 4.1. A large number of the defective items on the current list can be rectified by rationalising the signage which is planned for 2018/19 which will result in a further reduction of defective items on the annual inspection.

Background papers: None

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Appendices: Appendix 1 – Trinity House Annual Report 2017



## TRINITY HOUSE

### **INSPECTIONS/AUDITS OF LOCAL AIDS TO NAVIGATION AND OFFSHORE STRUCTURES**

### **2017 REPORT**



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*Cover picture: Kings Lynn, Roaring Middle Light Float*

## Executive summary

- The deficiency rate continues to trend downwards, 10008 local authority AtoN were inspected, with a reported deficiency rate of 10.68% which is down 1.65% on the previous year. Section 3.2 refers.
- The consistent poor performing authorities have been heavily targeted and the numbers are reducing; there are however still a few authorities – primarily non Competent Harbour Authorities (CHAs) – which continue to rank as persistent poor performers as detailed in Section 3.2.6. These Authorities will be targeted during the inspection and audit regime of 2018.
- CHA deficiency rates have decreased further in 2017 by 1.41% which corresponds to a relatively consistent defect rate over the previous three years – around 10%. Other AtoN providers are also showing a continued downward trend in deficiencies, falling this year to 12.5%. The highest defect remains ‘requiring painting’ at 25%, but of particular concern is the number of lights extinguished which has increased this year and represents 20% of total AtoN deficiencies. Section 3.2.8 refers.
- The Offshore Renewable Energy Installations (OREI) sector continues to grow and was again inspected in full, with a slight increase in deficiency rate to 10.91%.
- Oil and Gas has seen a slight increase in total defects observed but a marked improvement noted overall, with those platforms with major defects reduced to a single platform. This relates to the close liaison with the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), resulting in a greatly improved co-operation from the platform operators. Section 4 refers.

This report is submitted to the Secretary of State pursuant to Section 198(4) of the Merchant Shipping Act, 1995.

## **1. Policy**

- 1.1 Section 198(1) of the Merchant Shipping Act 1995 (the Act of 1995), empowers the General Lighthouse Authorities (GLAs) to inspect all lighthouses, buoys and beacons under Local Lighthouse Authority management. In addition, Section 195(1) of the Act of 1995 vests in the GLAs 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 auditing local AtoN provision against known (IALA) requirements.
- 1.3 Under the UK Government's Port Marine Safety Code (revised 2016) all 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 GLAs, and must be subject to periodic review. The characteristics of these AtoN must comply with Guidelines and Recommendations as laid down by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). The GLAs require Harbour Authorities and any other existing Local Lighthouse Authorities to be responsible for ensuring that any third party AtoN, within their area of responsibility, are also established and maintained to the same standards.
- 1.4 The GLAs also require those responsible for local AtoN, which lie outside statutory Harbour and Local Lighthouse Authorities' areas of jurisdiction, e.g. AtoN established as a result of Marine and Coastal Access Act 2009, AtoN maintained by Government Agencies and the Ministry of Defence, to name but a few, to establish and maintain their AtoN to the same standards.
- 1.5 The GLAs require those responsible for local AtoN to keep appropriate records of availability statistics and failure response times, and provide to them summaries of these records.
- 1.6 In addition, each authority is required to establish procedures for responding to casualties to AtoN within the timescales as laid down and applied by the GLAs.

## **2. Purpose**

- 2.1 The manner in which Trinity House (TH) discharges its statutory duty as a General Lighthouse Authority in respect of local AtoN is therefore a combination of consent to changes, audit and inspection. This includes the duty of superintendence and management to ensure that AtoN maintained by other authorities within TH area of responsibility meet the agreed international standards.
- 2.2 Site visits:
- Allow authorities the opportunity to discuss with the Inspecting Officer all matters relating to their AtoN provision,
  - Allow TH the opportunity to discuss, face to face, the level of local AtoN provision,
  - Enable TH to more effectively review this level of provision and recommend changes to the level and / or to the maintenance regimes, taking into account safety of navigation requirements and environmental considerations.
- 2.3 Many Local Lighthouse Authorities welcome this annual visit, as they consider the audit and inspection to form an important external audit element of their port quality management systems.
- 2.4 The Local AtoN Manager (LAM) continues to work in conjunction with the Inspector of Seamarks (IOS) thus enabling TH to both inspect all AtoN whilst also being in a position to carry out audits and follow up inspections in those areas that generate the greatest risk, taking into account the navigational significance of the authorities' AtoN. Monitoring of availability statistics also provides for an element of continuous assessment for key Authorities.

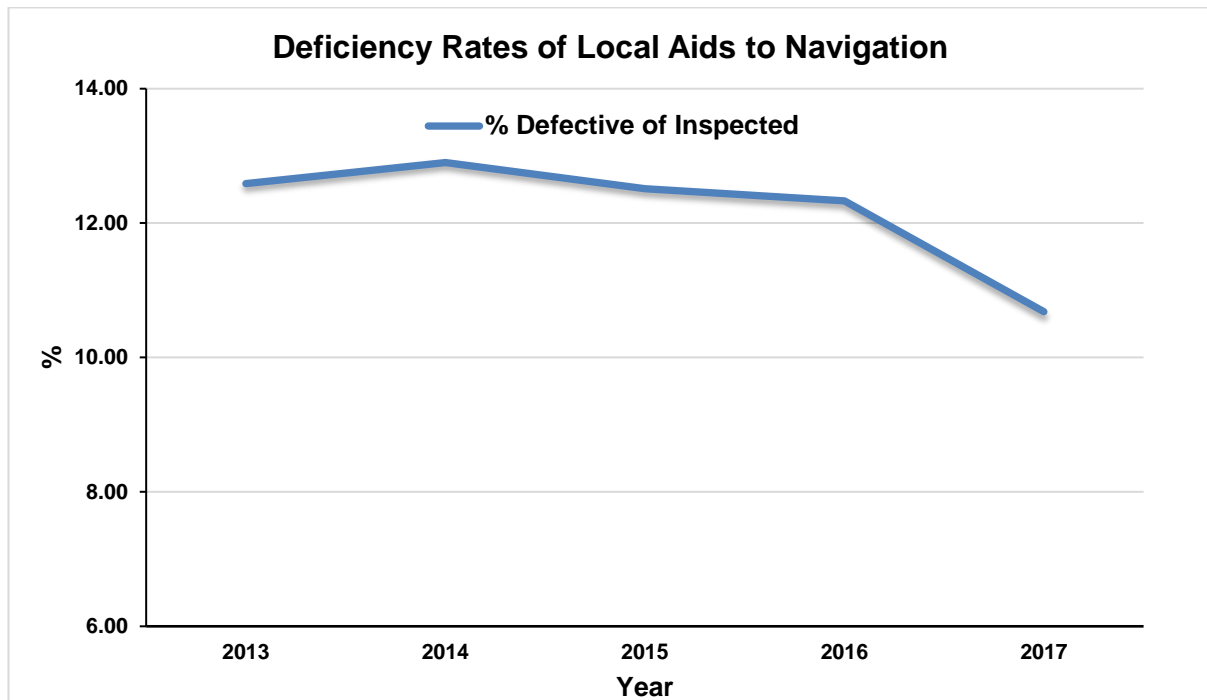
## **3. Local Aids to Navigation**

### **3.1 Inspections**

- 3.1.1 Inspections are arranged by direct contact with local authorities responsible for the provision of local AtoN. The authorities are invited to provide a representative to accompany the IOS during the inspection. The IOS is accompanied by a member of the Examiners Committee (responsible for deciding navigational requirements) when inspecting selected Ports and Harbours where considered necessary. Accompanied inspections for 2017 were Devonport, Portsmouth, Barrow, Thames Lower and West Coast Rigs.
- 3.1.2 Occasionally, inspections of local AtoN that can best be viewed from seaward and for which local authorities are unable to make a boat available, inspections are carried out either by the Commanding Officers of TH Tenders, or by the IOS utilising a TH launch.

### **3.2 Results of inspections**

- 3.2.1 A total of **10,008** AtoN were inspected and of these **1,069** were found to be other than in good and efficient order. This represents a deficiency rate of **10.68%**, continuing the decreasing trend by a further **1.65 %** over the previous year.



- 3.2.2 Trinity House aspires to inspect all local AtoN annually but this is not always achieved. This year 275 of the 10283 of the active local AtoN were not inspected for practical reasons such as bad weather (including reduced visibility), provision of local boats or access. This includes a large number of seasonal AtoN which were not inspected in due to the new LAM only assuming position in June 2017.
- 3.2.3 The continued decrease in deficiency rates is attributed to two main points:
- 2016 reported high number of 'requiring painting' in due to poor paint preparation and products used by a number of authorities, which has been corrected.
  - The strong and robust inspection and audit regime together with the established proactive use of the online reporting system has enabled targeting of key areas to be addressed.



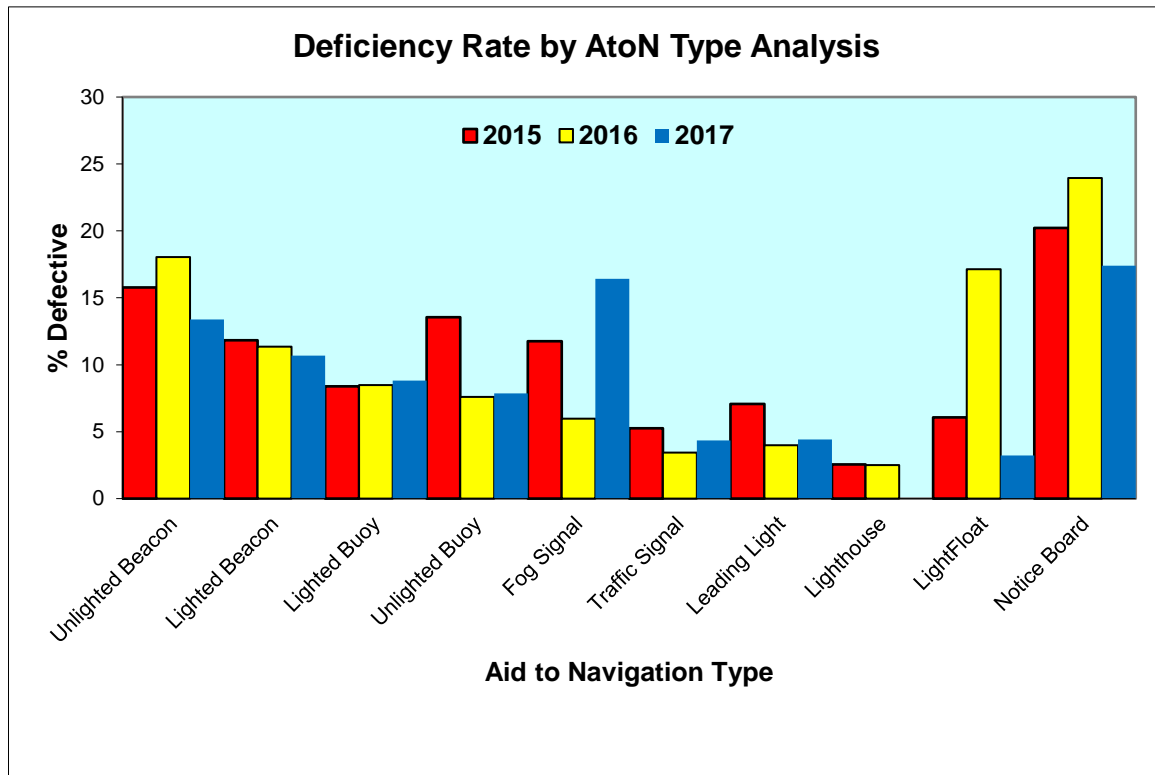
### **Notable AtoN providers**

3.2.4 The table below details those authorities, with 10 or more AtoN, with a defect rate of  $\geq 25\%$ , listed from highest % defects downwards. These will be monitored and targeted during the inspection programme for 2018.

<b>A Number</b>	<b>Authority</b>	<b>No. of AtoN Inspected</b>	<b>No. Defective</b>	<b>% Defective</b>
A0115	British Telecom	80	40	50
A1630	Tollesbury Marina	23	11	47.83
A3005	Redcar & Cleveland Borough Council	11	5	45.45
A1200	Gosport Borough Council	10	4	40
A1210	Portsmouth City Council	15	6	40
A1875	North Norfolk District Council	46	17	36.96
A1925	Fosdyke Yacht Haven	19	7	36.84
A1855	Broads Authority	238	79	33.19
A1050	Bournemouth Borough Council	38	12	31.58
A0595	Newport City Council	11	3	27.27
A0619	Somerset County Council	11	3	27.27
A1275	Southern Water Services Limited	112	28	25

Those highlighted in red remain as poor AtoN providers from 2016; the Broads Authority however have an increased defect rate. The remaining providers show improving signs (see Section 3.2.6). New entries this year will be carefully monitored in 2018.

3.2.5 The deficiency rate by AtoN type is shown below. The significant observation this year is fog signal faults which have increased by more than 10% over the previous reporting period. This can be attributed to authorities undertaking upgrades to systems thus changes to fog signal codes, which had not been addressed to Trinity House. A detailed analysis of the defects in 2017 and of those AtoN inspected can be found at Annex 3. A listing of the Condition Codes is attached at Annex 2 and is subject to periodic review by the IOS.



Total AtoN Defective

	2015	2016	2017
<b>Unlighted Beacon</b>	512	584	427
<b>Lighted Beacon</b>	403	389	367
<b>Lighted Buoy</b>	133	144	145
<b>Unlighted Buoy</b>	151	82	82
<b>Fog Signal</b>	6	4	11
<b>Traffic Signal</b>	11	8	10
<b>Leading Light</b>	16	9	10
<b>Lighthouse</b>	1	1	0
<b>LightFloat</b>	2	6	1
<b>Notice Board</b>	19	23	14

3.2.6 The table below provides a year on year comparison of those authorities that fall into the category of having ten or more AtoN, combined with a defect rate  $\geq 25\%$ .

It should again be noted that authorities marked green have been found to have improved, those in amber remain within 15% of previous year, whilst only the Broads Authority has an increased defect rate and is shown in red.

A Number		2016			2017		
		AtoNs Inspected	No. Defective	% Defective	AtoNs Inspected	No. Defective	% Defective
A1506	Avant Homes	18	15	83.33	22	1	4.55
A1210	Portsmouth City Council	16	13	81.25	15	6	40
A1875	North Norfolk District Council	48	36	75	46	17	36.96
A0465	Saundersfoot Harbour Commissioners	22	15	68.18	4	0	0
A1470	Dover District Council	18	11	61.11	17	0	0
A1455	Shepway District Council	18	11	61.11	8	2	25
A3005	Redcar & Cleveland Borough Council	10	6	60	11	5	45.45
A0115	British Telecom	84	48	57.14	80	40	50
A1630	Tollesbury Marina	21	11	52.38	23	11	47.83
A1925	Fosdyke Yacht Haven	19	9	47.37	19	7	36.84
A0619	Somerset County Council	11	5	45.45	11	3	27.27
A1260	Hayling Island Sailing Club	22	9	40.91	22	5	22.73
A0843	Wales and West Utilities	17	6	35.29	17	2	11.76
A1250	Langstone Harbour Board	105	34	32.38	103	25	24.27
A0122	ABP Fleetwood	31	10	32.26	32	6	18.75
A0144	United Utilities	28	9	32.14	25	6	24
A0949	Offshore Shellfish Limited	10	3	30	12	1	8.33
A0245	Denbighshire County Council	64	19	29.69	62	13	20.97
A1855	Broads Authority	230	68	29.57	238	79	33.19
A1240	Isle of Wight Council	45	13	28.89	45	9	20
A1865	Great Yarmouth Borough Council	22	6	27.27	21	4	19.05
A1275	Southern Water Services Limited	115	31	26.96	112	28	25
A1180	ABP Southampton	311	82	26.37	311	54	17.36
A0590	Newport Harbour Commissioners	24	6	25	24	2	8.33

- **Avant Homes:** following long historical problems with this provider, pleased to report they are now fully compliant with a single AtoN fault last year
- **Portsmouth City Council:** Although some improvement has been noted there remain numerous defects. Gosport Council comes under the same controlling authority which jointly are showing an increased defect rate (see Section 3.2.4) and so they will be closely inspected during 2018.
- **North Norfolk District Council:** Groyne structures on this coast are in a very poor condition. AtoN provision will be monitored carefully in 2018 as some deterioration is expected.
- **Redcar & Cleveland Borough Council:** There is little evidence of any action to maintain AtoN. During the 2018 inspection the council will be addressed on planned maintenance requirements.
- **British Telecom:** Continue to be an ongoing concern. Changes in management with BT have seen a slight improvement and a major review of AtoN requirements is now underway. This will hopefully have a positive effect on results over the next two years.

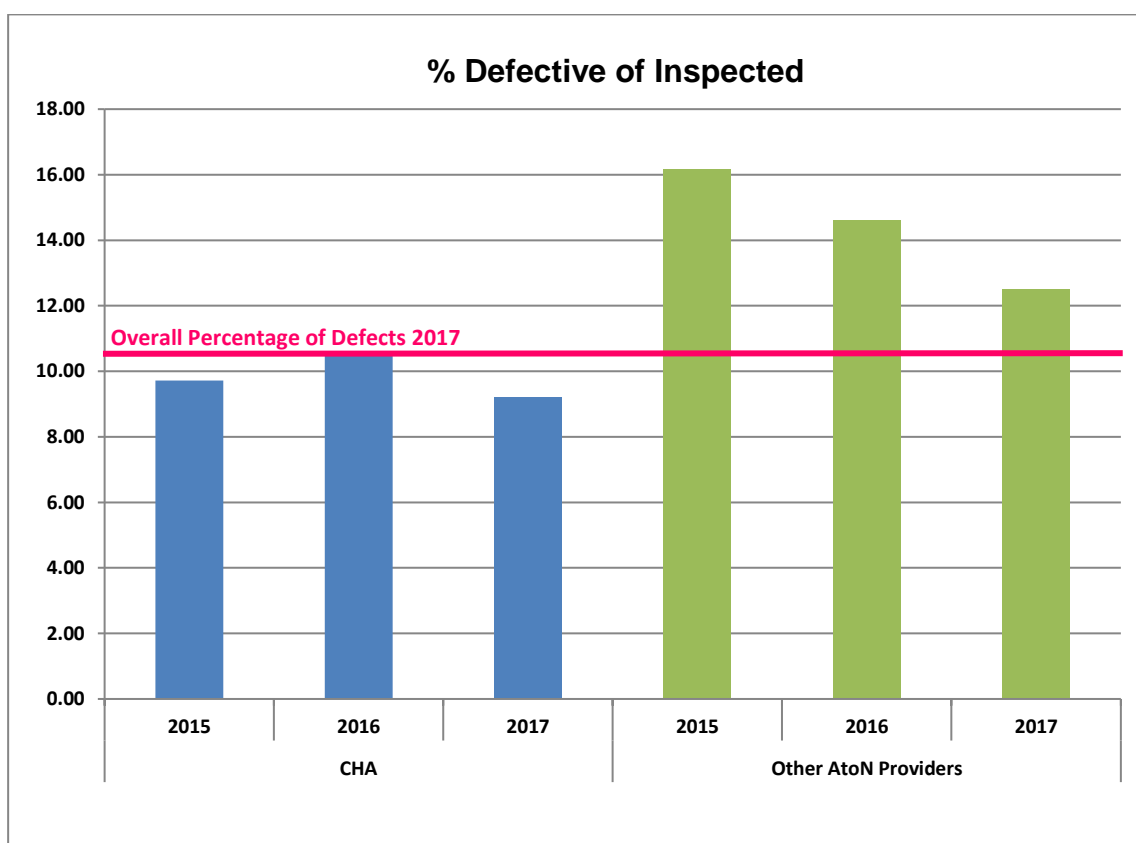
- **Tollesbury Marina:** Management changes here have seen a marked improvement in AtoN provision and maintenance; there is however still a long way to go. Detailed close up afloat inspections will be conducted in 2018. A follow up additional inspection in October 2017 indicated clear improvements in AtoN provision.
- **Broads Authority:** Continue to show a high and increasing number of defects, primarily low risk 3<sup>rd</sup> party cable crossings. Audits are planned which will include guidance on how to consolidate AtoN, working with 3<sup>rd</sup> parties to reduce deficiency rates within the authority area.

3.2.7 The following tables provide a direct comparison between Competent Harbour Authorities (CHAs) against other AtoN providers.

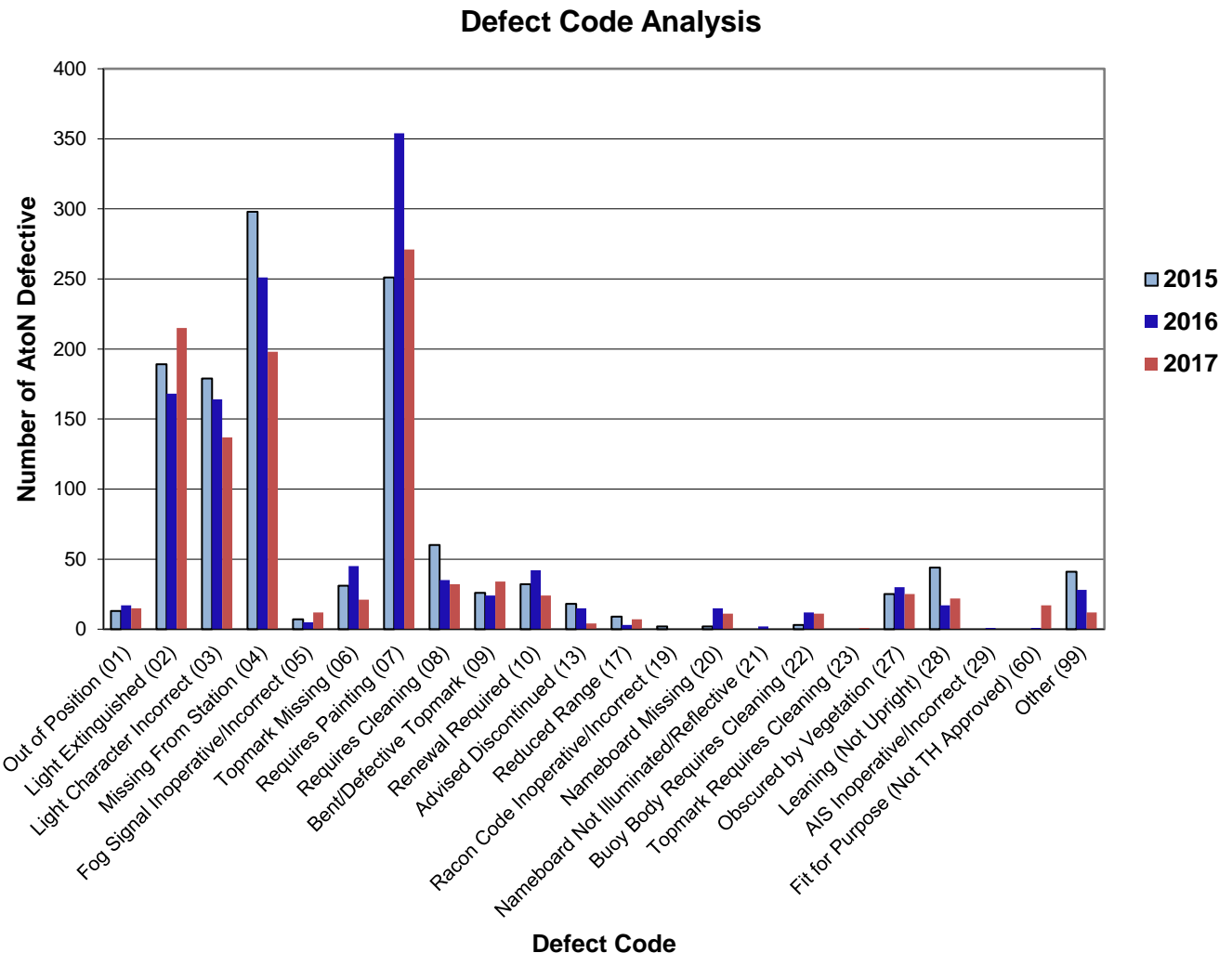
3.2.8 55% of the AtoN inspected are under the responsibilities of the CHAs and the deficiency rate with this group has decreased this year to 9.21% Other AtoN provider rates have also dropped this year to 12.50%.

#### CHA Defect Analysis

	CHA			Other AtoN Providers			All AtoN Providers		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Total AtoNs Inspected	5670	5772	5529	4351	4364	4479	10021	10136	10008
Total AtoNs Defective	551	613	509	703	637	560	1254	1250	1069
% Defective of Inspected	9.72	10.62	9.21	16.16	14.60	12.50	12.51	12.33	10.68



3.2.9 The analysis below shows defects by type and notably increase in 'Light Extinguished' (02). This appears a significant increase but is primarily related to numerous small jetty lights and up river lights with 3<sup>rd</sup> party owners. Pressure will continue on authorities to address this trend. 'Requires Painting' (07) remains the highest defect code. This primarily relates to local councils and the lack of planned maintenance regimes, which are being addressed on a case by case basis.



**\*NOTE:** This table needs to be read with caution as the Y axis of this graph is elongated by the four largest defect codes, requiring careful analysis of remaining codes.

Please see **Annex 2** for description of Inspection Condition Codes and **Annex 3** for a detailed breakdown of defect results.

### **3.3 Audit regime**

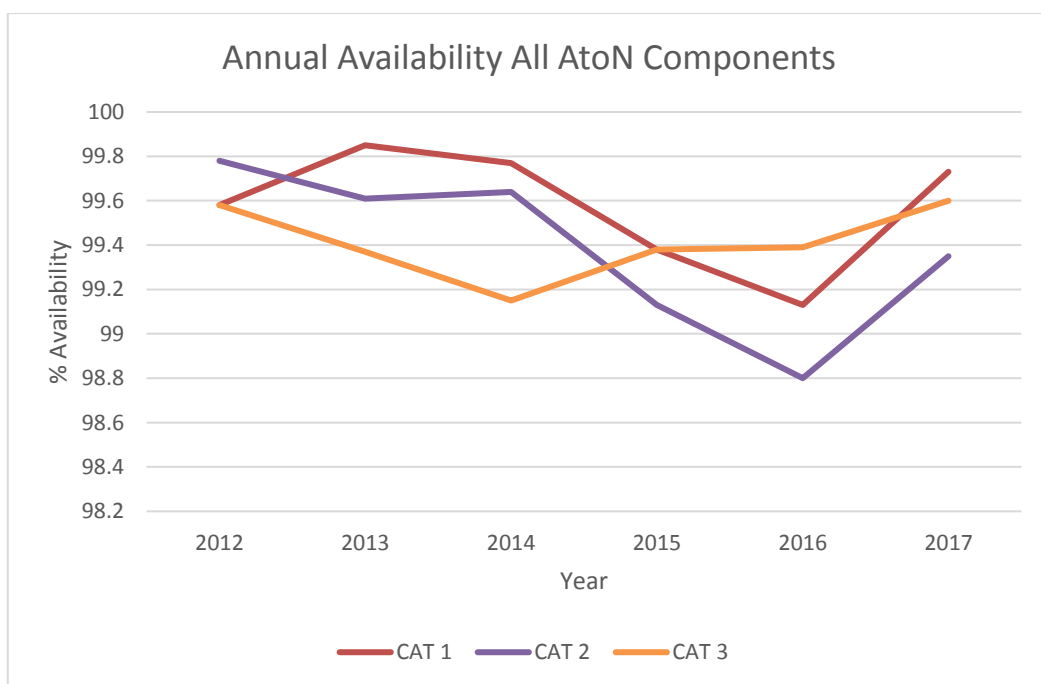
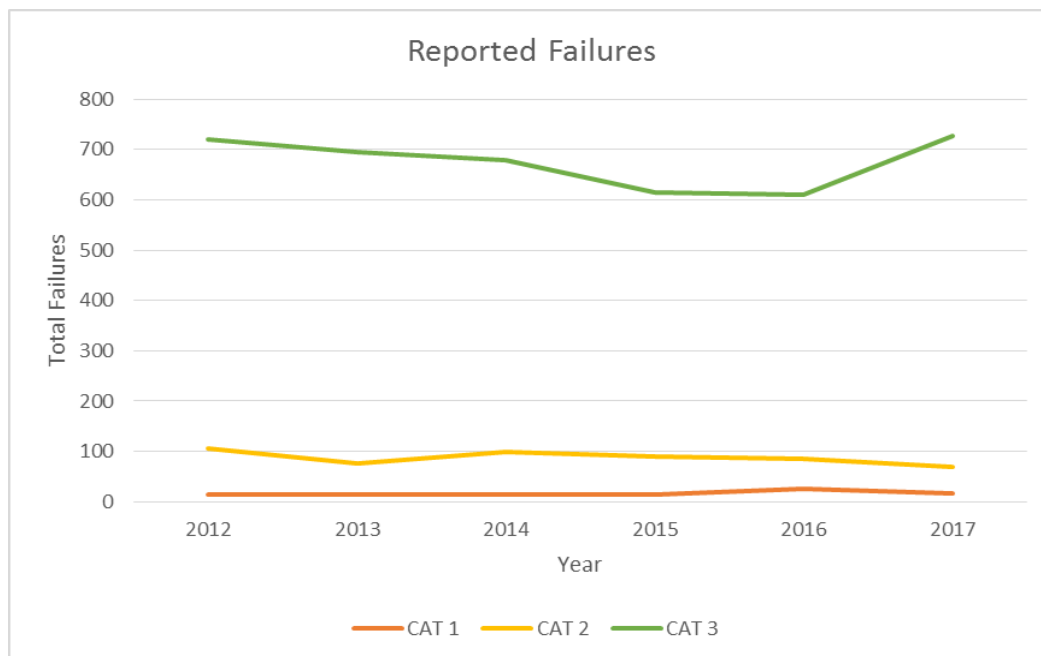
- 3.3.1 The 2017 audit programme was completed in full. There are now a total of 142 LLAs, including offshore wind farms (OWFs), that either have been, or will get, regularly audited within this figure.
- 3.3.2 A full audit programme was conducted in 2017 with a total of 64 Audits undertaken, which included 3 offshore wind farms.
- 3.3.3 No Non Conformances were issued in 2017. One Potential Improvement Notice (PIN) was issued to ABP Silloth.

### **3.4 Local AtoN availability**

- 3.4.1 All CHAs and operational OWFs are set up to report availability, and the majority are correctly reporting with just a single instance of the old quarterly reporting routines being found to still be taking place.

### **3.5 Local AtoN availability returns (Online Reporting)**

- 3.5.1 All audited LLAs declared familiarity and competency with the system although it was noted that some had not used the system since their account was established.
- 3.5.2 The following graphs show the total number of reported defects and the database generated availability statistics. An increase in the number of reported casualties within Category 3 is believed to be a result of greater engagement in the automated defect reporting process by the Local Lighthouse Authorities, initiated by the previous year's audit program that built on the established number and diligence of users. When compared against the increased availability of the same category, conclusions can be drawn that the duration of defects is reduced compared to previous years despite more individual instances being reported.



#### **4. Seaward inspection of offshore structures (oil & gas)**

- 4.1 During the 2017 seaward inspection of Offshore Structures, 144 offshore structures within TH area of responsibility were inspected. A total of 575 AtoN were inspected of which 90 were found to be defective, which represents a total defect rate of 15.65%, up from 13.64% in 2016. On a platform basis, the number with defects was 37 which is down on the figure from 2016.

		2017		2016	
TOTAL PLATFORMS INSPECTED		144		143	
TOTAL ATONS INSPECTED		575		601	
TOTAL AND % OF ATONS DEFECTIVE		90	15.65%	82	13.64%
TOTAL AND % OF PLATFORMS WITH DEFECTS		37	25.69%	54	37.76%
TOTAL AND % OF PLATFORMS WITH MULTIPLE DEFECTS		23	15.97%	13	9.09%

- 4.2 The defect rate for AtoNs has increased, while the number of platforms with defects has actually decreased. This apparent anomaly is reflected in the large increase in platforms with multiple defects.
- 4.3 Cooperation from platform operators has improved considerably, due primarily to the strong relationship in place with OPRED. Despite the increase in overall defects, it is noteworthy that those platforms with major defects were reduced in 2017 to a single platform.



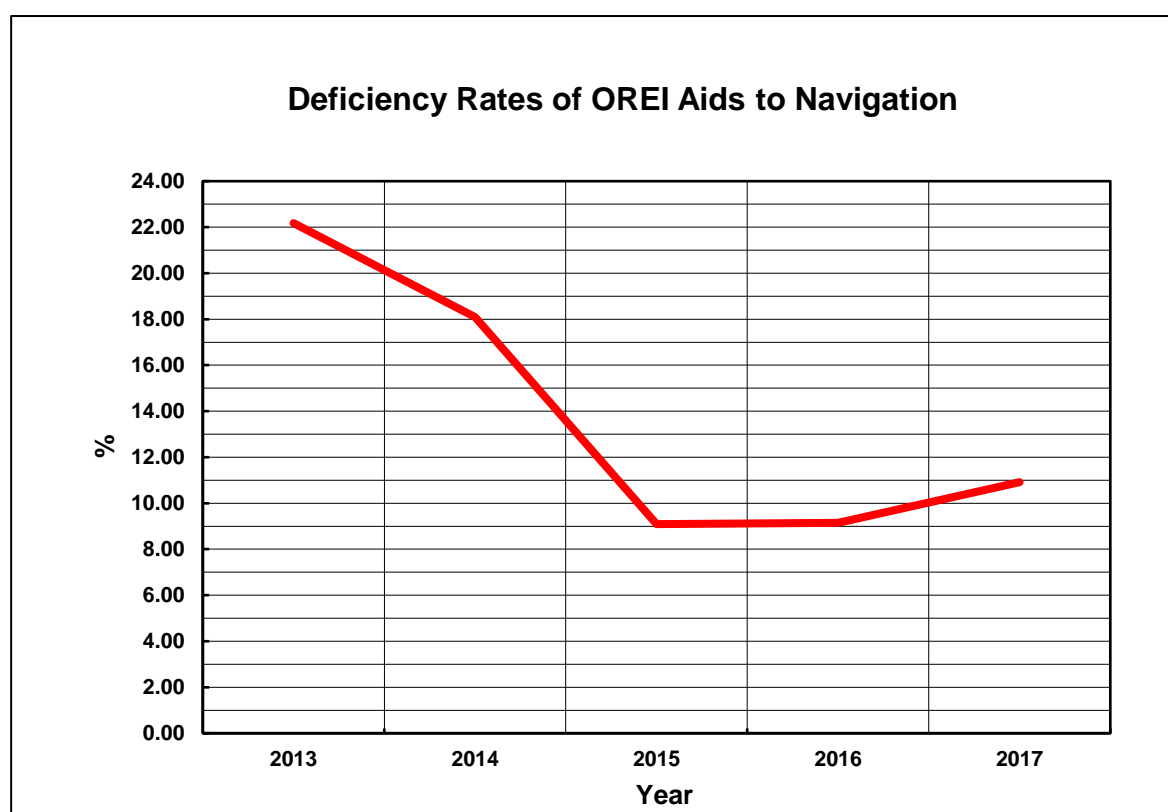
## 5. Offshore Renewable Energy Installations (OREI)

### 5.1 Inspections

There were 33 OREI sites with aids to navigation, all of which were visited in 2017. Of the 428 active aids to navigation relating to the 33 sites, 330 were inspected and 36 were found to be defective, giving a deficiency rate of 10.91%. Annex 4 details the full breakdown of inspection codes used and for what type of aid to navigation. The 2017 deficiency rate is an increase on that of 2016 (9.15%) and is largely due to aids to navigation failures on a number of Offshore Wind Farms that are over 5 years old and those on ageing Meteorological Masts.

In order to give a meaningful deficiency rate; a group of unlighted wind turbines at an OREI site are treated as one aid to navigation for reporting and inspection purposes and therefore the total of 24 unlighted wind turbines in fact represents 1367 individual unlighted wind turbine structures in reality.

The trend graph below highlights the significant progress made in this sector's AtoN provision over the last 5 years:



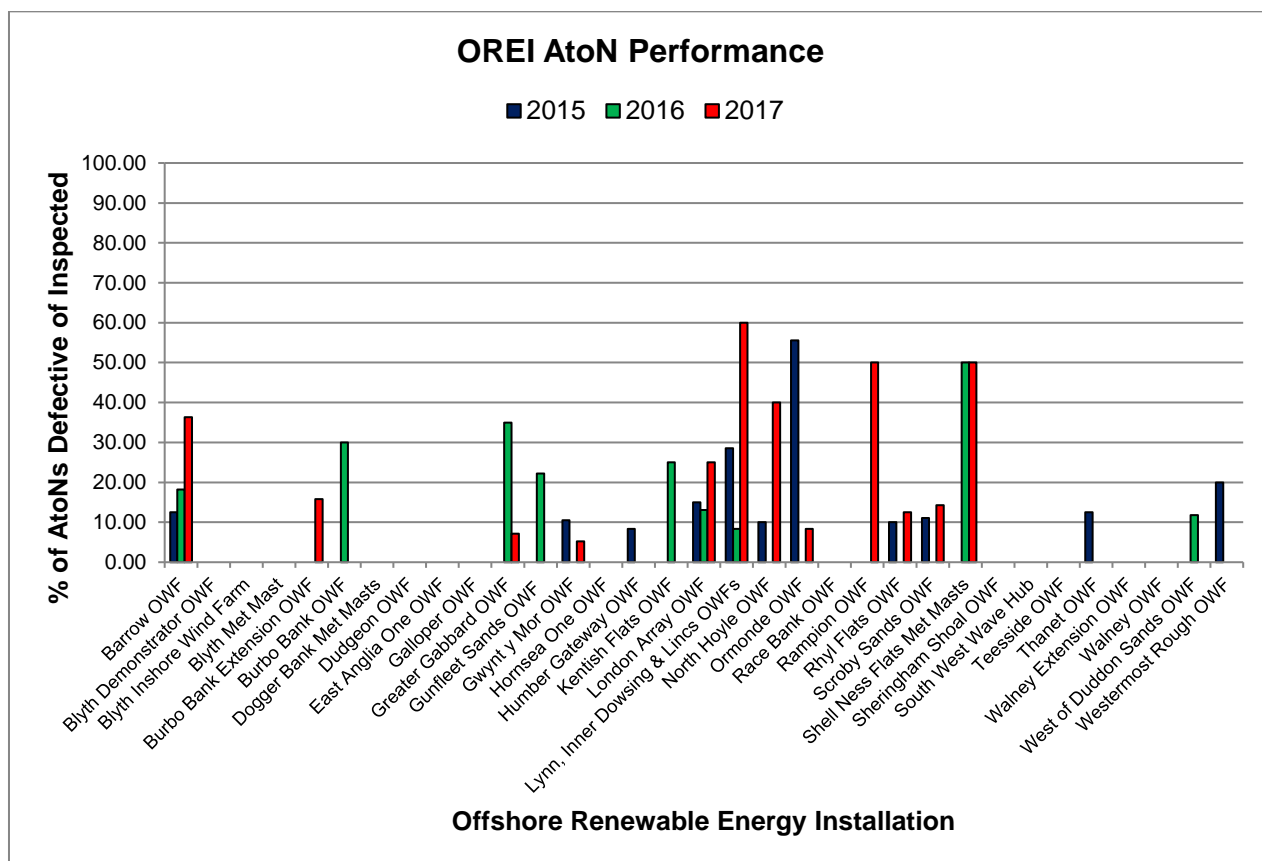
### 5.2 Inspection results by % AtoN defective

The table below details all OREI sites against their respective % of AtoNs defective. 6 of the sites below (highlighted in red) had a deficiency rate of more than 20%, which is of concern and Trinity House intend to target these sites in the 2018 inspection and audit regime.

It should be noted that the 24 Hornsea One OWF (offshore wind farm) construction phase buoys were not deployed until 31 October 2017 and therefore Trinity House was unable to schedule an inspection before the end of the year, resulting in the 0 AtoNs inspected for this site.

OREI	AtoNs Inspected	No. Defective	% Defective
Barrow OWF	11	4	36.36
Blyth Demonstrator OWF	7	0	0.00
Blyth Inshore Wind Farm	2	0	0.00
Blyth Met Mast	1	0	0.00
Burbo Bank Extension OWF	19	3	15.79
Burbo Bank OWF	10	0	0.00
Dogger Bank Met Masts	2	0	0.00
Dudgeon OWF	23	0	0.00
East Anglia One OWF	2	0	0.00
Galloper OWF	13	0	0.00
Greater Gabbard OWF	14	1	7.14
Gunfleet Sands OWF	18	0	0.00
Gwynt y Mor OWF	19	1	5.26
Hornsea One OWF	0	0	0.00
Humber Gateway OWF	11	0	0.00
Kentish Flats OWF	8	0	0.00
London Array OWF	20	5	25.00
Lynn, Inner Dowsing & Lincs OWFs	15	9	60.00
North Hoyle OWF	10	4	40.00
Ormonde OWF	12	1	8.33
Race Bank OWF	8	0	0.00
Rampion OWF	10	5	50.00
Rhyl Flats OWF	8	1	12.50
Scroby Sands OWF	7	1	14.29
Shell Ness Flats Met Masts	2	1	50.00
Sheringham Shoal OWF	7	0	0.00
South West Wave Hub	6	0	0.00
Teesside OWF	4	0	0.00
Thanet OWF	3	0	0.00
Walney Extension OWF	11	0	0.00
Walney OWF	20	0	0.00
West of Duddon Sands OWF	17	0	0.00
Westermest Rough OWF	10	0	0.00

The graph below shows OREI performance at inspection, over the last 3 years. Trinity House is encouraged by the significant improvements made at 4 of the 5 sites highlighted for targeting in the 2016 report: Burbo Bank OWF, Greater Gabbard OWF, Gunfleet Sands OWF and Kentish Flats OWF; with only one defective aid to navigation found across the 4 sites.



It should be noted that the Shell Ness Flats Met Masts are programmed to be decommissioned and removed during 2018.

The significant increases in deficiency rates at the following sites are acknowledged by Trinity House and we have worked with the relevant Operators in order to resolve these issues and will continue to do so into 2018:

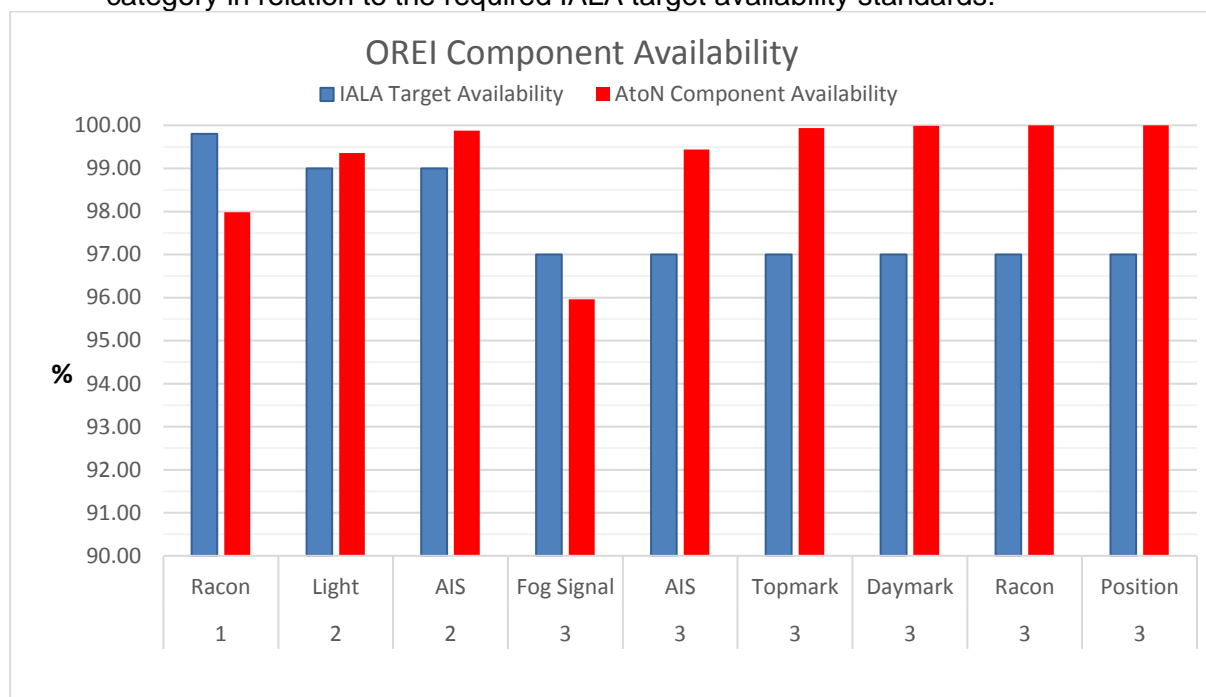
- Barrow OWF (Barrow Offshore Wind Ltd)
- London Array OWF (London Array Ltd)
- Lynn, Inner Dowsing & Lincs OWFs (Centrica Energy)
- North Hoyle OWF (Npower Renewables Ltd)
- Rampion OWF (E.ON UK)

Three of the five sites above are some of the earliest established and a number of their AtoN deficiencies are simply down to equipment reaching the end of their useful life and in need of replacement. Trinity House expect a vast improvement to their AtoN provision next year.

### 5.3 AtoN component availability statistics

All 33 OREI sites continued to report on their AtoN component availability and therefore we now have over two years' worth of reliable data.

The graph below shows the overall data for all AtoN components within each IALA category in relation to the required IALA target availability standards:



The above clearly shows a failure to meet the IALA target availability for both Cat 1 racon and Cat 3 fog signal components. However, as there is only one Cat 1 racon component any failure to this single component will have a significant impact on this availability percentage; which is detailed in the table. The Cat 3 fog signal failure is more concerning and relates to two offshore wind farm sites in particular, also detailed in the table below; which shows each individual OREI site that has failed to meet the IALA target availability for a particular category of components:

OREI	Category of Components	IALA Target Availability %	Availability % at 31/12/2017
East Anglia One OWF	1	99.80	97.98
Ormonde OWF	2	99.00	90.23
Shell Ness Flats Met Masts	2	99.00	91.26
East Anglia One OWF	2	99.00	97.80
Gunfleet Sands OWF	2	99.00	97.90
Thanet OWF	2	99.00	98.03
London Array OWF	3	97.00	94.23
Ormonde OWF	3	97.00	96.32

Trinity House will be monitoring the above sites closely during 2018 and engaging with the relevant authorities as appropriate, in order to achieve a more satisfactory level of availability performance from the OREI sector, both from an individual site perspective and as a whole.



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***Date***

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P Marshall, Welsh Government

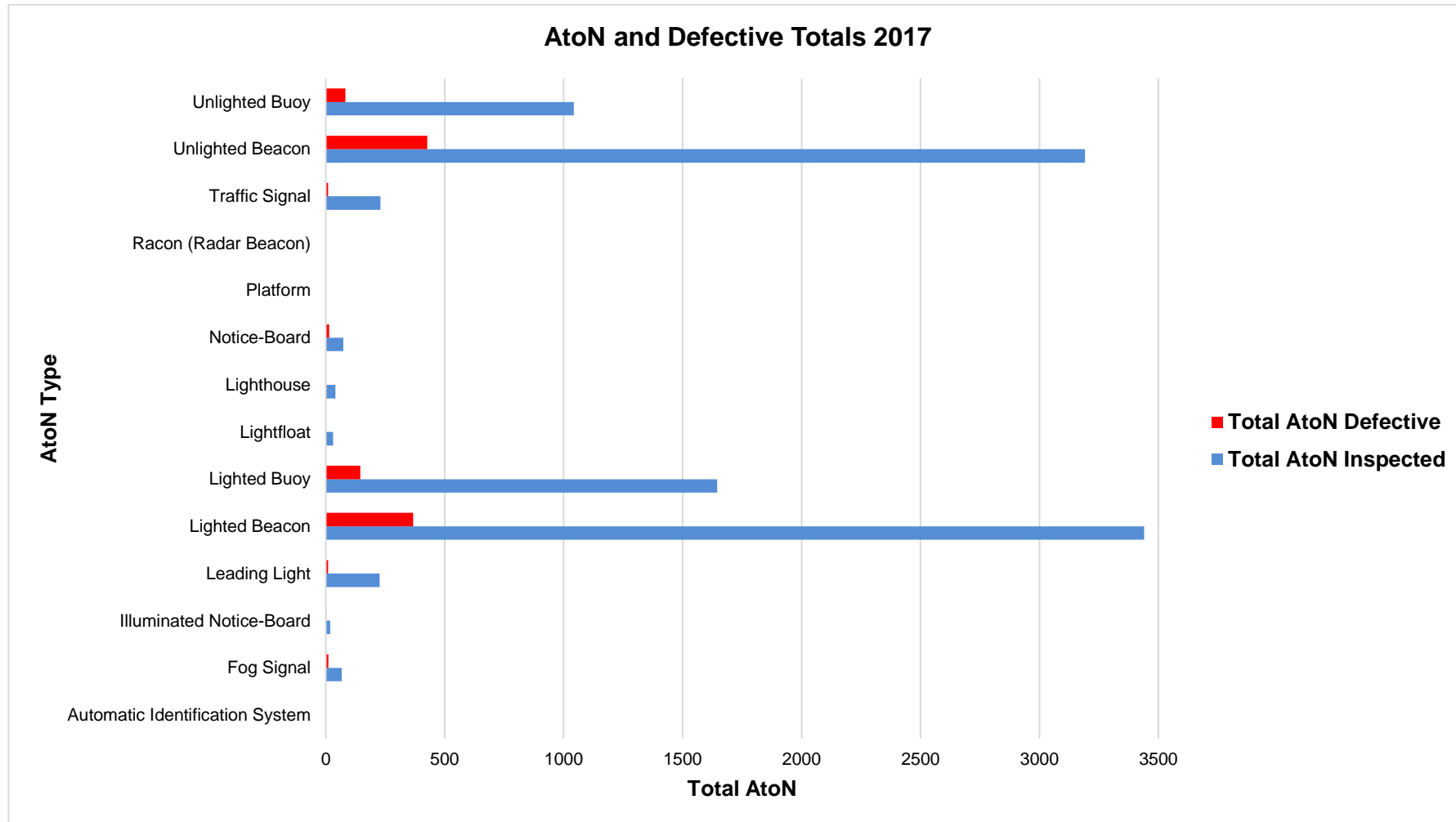
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Director of Navigational Requirements  
Captain N Palmer  
Captain N Hope  
Captain S Gobbi  
Rear Admiral D Snelson  
Commodore B Walworth  
Captain Tony Tibbott  
Navigation Directorate

## Annexes

### Annex 1 – AtoNs and defective totals 2017



## **Annex 2 – Inspection condition codes**

Detailed below are the condition codes for use when reporting the results of inspections of local AtoN and Offshore Structures.

CODE	DESCRIPTION
00	Correct/Good Order
01	Out of Position
02	Light Extinguished
03	Light Character Incorrect
04	Missing from Station
05	Fog Signal Inoperative/Incorrect
06	Topmark Missing
07	Requires Painting
08	Requires Cleaning
09	Bent/Defective Topmark
10	Renewal Required
11	Light Not Seen
12	Not Seen (Not Found/Located)
13	Advised Discontinued
14	Multiple Defects – [inactive for inspection purposes but not for reporting purposes of this Report]
15	Seasonal/Occasional
16	Not Yet Established
17	Reduced Range
18	Lights Not Synchronised
19	Racon Code Incorrect
20	Nameboard Missing
21	Nameboard Not Illuminated/Reflective
22	Buoy Body Requires Cleaning
23	Topmark Requires Cleaning
24	Fog Signal Not Inspected
25	Not due for Inspection at this Time
26	Audit/Inspection Suspended
27	Obscured by Vegetation
28	Leaning (Not Upright)
29	AIS Inoperative/Incorrect
50	Good Order (Not IALA Recommended)
60	Fit for Purpose (Not TH Approved)
99	Other

### Annex 3 – AtoN defect analysis

Row Labels	Automatic Identification System	Fog Signal	Illuminated Notice-Board	Leading Light	Lighted Beacon	Lighted Buoy	Lightfloat	Lighthouse	Notice-Board	Platform	Racon (Radar Beacon)	Traffic Signal	Unlighted Beacon	Unlighted Buoy	Total AtoN In
Advised Discontinued												4			4
Bent/Defective Topmark					12	2							19	1	34
Buoy Body Requires Cleaning						10								1	11
Fit for Purpose (Not TH Approved)														17	17
Fog Signal Inoperative/Incorrect		11			1										12
Fog Signal Not Inspected		19			1										20
Good Order	1	37	15	216	3005	1464	30	40	60	1	1	197	2747	879	8693
Leaning (Not Upright)													21	1	22
Light Character Incorrect				2	123	9						3			137
Light Extinguished			2	6	175	25						3		4	215
Light Not Seen					7	2									9
Missing From Station					3	14			12				128	41	198
Nameboard Missing					5	5								1	11
Not Seen (Not Found/Located)			1			14							14	12	41
Not Yet Established					17	11						2	4	11	45
Obscured by Vegetation													25		25
Other					3	7							2		12
Out of Position					7	5							2	1	15
Reduced Range				1	5	1									7
Renewal Required						3							17	4	24
Requires Cleaning					1	24	1						2	4	32
Requires Painting				1	31	38			2				192	7	271
Seasonal/Occasional					43	9						21		58	131
Topmark Missing					1	1							19		21
Topmark Requires Cleaning						1									1
<b>Total AtoN Inspected</b>	<b>1</b>	<b>67</b>	<b>18</b>	<b>226</b>	<b>3440</b>	<b>1645</b>	<b>31</b>	<b>40</b>	<b>74</b>	<b>1</b>	<b>1</b>	<b>230</b>	<b>3192</b>	<b>1042</b>	<b>10008</b>
<b>Total AtoN Defective</b>	<b>0</b>	<b>11</b>	<b>2</b>	<b>10</b>	<b>367</b>	<b>145</b>	<b>1</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>427</b>	<b>82</b>	<b>1069</b>
<b>% Defective of Inspected</b>	<b>0</b>	<b>16.42</b>	<b>11.11</b>	<b>4.42</b>	<b>10.67</b>	<b>8.81</b>	<b>3.23</b>	<b>0</b>	<b>18.92</b>	<b>0</b>	<b>0</b>	<b>4.35</b>	<b>13.38</b>	<b>7.87</b>	<b>10.68</b>



Inspections/Audits of Local Aids to Navigation and Offshore Structures – 2017 Report

**Annex 4 - Offshore Renewable Energy Aids to Navigation inspection analysis**

OFFSHORE RENEWABLE ENERGY AIDS TO NAVIGATION INSPECTION ANALYSIS

Aid Type	Condition Codes																														Defect Totals			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		50	60	99
Lighted Substation	2																																	0
Unlighted Substation	15																																1	1
Lighted Meteorological Mast	9		1	3											1																			5
Unlighted Meteorological Mast	2																																	0
Lighted Buoy	79				1		2																								1			4
Lighted Wind Turbine	163		5	3		1									3			1	7														6	26
Unlighted Wind Turbine	24																																	0
Condition Total	294	0	6	6	1	1	2	0	0	0	0	0	0	4	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7	36

SUMMARY TOTALS		
No.CORRECT	No.DEFECTIVE	% DEFECTIVE
294	36	10.91%