



# Office for Nuclear Regulation (ONR) Quarterly Site Report for Heysham Power Stations

Report for period 1 October 2017 – 31 December 2017

## Foreword

This report is issued as part of ONR's commitment to make information about inspection and regulatory activities relating to the above site available to the public. Reports are distributed quarterly to members of the Local Community Liaison Committee and are also available on the ONR website (<http://www.onr.org.uk/lc/>).

Site inspectors from ONR usually attend the Heysham 1 and 2 Local Community Liaison Committee meetings and will respond to any questions raised there. Any person wishing to enquire about matters covered by this report should contact ONR.

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## 1 INSPECTIONS

### 1.1 Dates of inspection

1. The ONR nominated site inspectors made inspections on the following dates during the quarter:

#### Heysham 1

- 3 October 2017
- 7 – 9 November 2017
- 14 November 2017
- 6 - 8 December 2017

#### Heysham 2

- 3 - 5 October 2017
- 25 October 2017
- 21 - 22 November 2017
- 6 December 2017

2. In addition, technical specialists were involved in inspections on the following dates during the quarter:

#### Heysham 1

- 3 October 2017
- 24 – 25 October 2017
- 8 November 2017
- 7 - 8 December 2017
- 12 - 13 December 2017

#### Heysham 2

- 3 - 5 October 2017
- 21 - 22 November 2017
- 6 December 2017

3. The ONR Superintending Inspector visited the Stations on the following dates during the quarter:

#### Heysham 1

- 8 November 2017
- 6 December 2017

#### Heysham 2

N/A

## 2 ROUTINE MATTERS

### 2.1 Inspections

4. Inspections are undertaken as part of the process for monitoring compliance with:
  - the conditions attached by ONR to the nuclear site licence granted under the Nuclear Installations Act 1965 (NIA65) (as amended);
  - the Energy Act 2013;

- the Health and Safety at Work Act 1974 (HSWA74); and regulations made under HSWA74, for example the Ionising Radiations Regulations 1999 (IRR99) and the Management of Health and Safety at Work Regulations 1999 (MHSWR99).
  - the Regulatory Reform (Fire Safety) Order 2005
  - the Nuclear Industries Security Regulations 2003
5. The inspections entail monitoring the licensee's actions on the site in relation to incidents, operations, maintenance, projects, modifications, safety case changes and any other matters that may affect safety. The licensee is required to make and implement adequate arrangements under the conditions attached to the licence in order to ensure legal compliance. Inspections seek to judge both the adequacy of these arrangements and their implementation.
6. In this period, the following routine inspections were undertaken:

#### Heysham 1

- Licence condition 4 – Restrictions on nuclear matter
  - Licence condition 6 – Documents, records, authorities and certificates
  - Licence condition 11 – Emergency arrangements
  - Licence condition 25 – Operational records
  - Licence condition 28 – Examination, inspection, maintenance and testing
7. Licence condition 4 – A compliance inspection was undertaken against restrictions on nuclear matter on the site. This included an inspection of the arrangements in place to control and maintain accurate records of nuclear matter on-site, including observation of new fuel receipt, emplacement in store, recording and utilisation of inventory information on the Nuclear Material Accountancy System and dispatch of empty fuel boxes from the Additional New Fuel Store. A minor shortfall was noted in the key retrieval process for authorised source handlers. While the process met the expectations for compliance, the logistics of identifying approved handlers was unnecessarily onerous on security personal. The licensee agreed and is looking at improving this system.
8. Licence condition 6 - A LC 6 compliance intervention found that a recent audit of records management and an associated improvement plan provided a sound basis for identifying process non-conformities and identifying suitable areas for improvement. From a sample inspection of the Station's processes, records, equipment and facilities the compliance arrangements and their implementation were found to meet the expected standard and no regulatory issues were raised.
9. Licence condition 11 - A team of ONR inspectors observed a level 1 demonstration exercise of the Heysham 1 emergency arrangements for dealing with an accident on the site. The scenario was agreed with ONR before the exercise and provided a sound basis to test the site's emergency arrangements. The exercise objectives were met and the postulated incident was brought under control in an acceptable timescale. ONR observed a number of areas of good practice and also some opportunities where further improvement could be made. These observations have been communicated in writing to the Station Director and will be monitored for progress by the ONR site inspector during routine inspection. ONR judged the emergency exercise to be an adequate demonstration of the Heysham 1 emergency arrangements.
10. Licence condition 25 - During this period an unannounced inspection was undertaken of the Station's operational records, made in compliance with LC 25. The sample of records reviewed was judged to meet the expected standard. On

the basis that proposed improvements are to be made to the processes by the Central Technical Organisation, no regulatory issues were raised.

11. Licence condition 28 - A follow up inspection was made by ONR specialist inspectors to review the progress made by the Station in response to a number of regulatory actions placed by ONR to remedy shortfalls in the corrosion management programme for plant important for safety. The Station was found to have made significant progress with improving their understanding of plant material condition and has a structured, well-managed process in place for identifying those systems most at risk from corrosion, based on their safety significance. ONR is satisfied that the licensee has a robust set of management tools and procedures in place to address the shortfalls previously identified and judges that the regulatory actions have been satisfactorily addressed.

## Heysham 2

- Licence condition 4 – Restrictions on nuclear matter
  - Licence condition 12 – Duly authorised and other suitably qualified and experienced persons
12. Licence condition 4 –The LC4 compliance inspection included an inspection of the arrangements in place to maintain accurate records of nuclear matter control onsite, the station’s nuclear material system and an inspection of the station’s fuel stores. I observed good practice in the licensee’s accountancy arrangements which covered the full fuel cycle for a single fuel element. I also observed good housekeeping for the fuel stores. I was also able to observe the opening of a fuel box and discussed the process with competent person in charge. A minor shortfall was noted with regards to the absence of a role profile for the Operational Planning Engineer. The licensee has agreed to ensure the role profile is completed. No regulatory issues were raised.
  13. Licence condition 12 - A compliance inspection was undertaken against duly authorised and other suitably qualified and experienced persons on site. This inspection sampled several areas, including operations technicians, shift managers, reactor desk engineers and fuel route engineers. We saw evidence of good training programme planning and tracking of training, informed by the Curriculum Review Committee. A minor shortfall was noted for a particular training requirement affecting shift managers. The licensee agreed to ensure that this gap is addressed. From our inspection we were content that the station was meeting the requirements of LC12. In accordance with the ONR inspection rating guide a GREEN rating was awarded, with no formal regulatory action being required.
  14. In addition to the program of site licence compliance inspections, ONR also inspects operating reactors based on safety related systems. Each site has a safety case, which identifies the important aspects of operation and management required for maintaining safety. For both stations at Heysham, the key systems important to nuclear safety will be inspected against the requirements of the safety case over a five-year period. ONR considers that this will provide additional assurance that operations on the Heysham site are safe. Each of these system inspections considers the relevant licence conditions below:
    - Licence condition 10: Training
    - Licence condition 23: Operating rules
    - Licence condition 24: Operating instructions
    - Licence condition 27: Safety mechanisms
    - Licence condition 28: Examination, inspection, maintenance and testing

- Licence condition 34: Leakage and escape of radioactive material and radioactive waste

15. During the reporting period, the following safety related systems were inspected:

### **Heysham 1**

#### Seawater systems

16. This System Based Inspection (SBI) targeted the seawater cooling systems on site consisting predominantly of the Main Cooling Water (MCW) and the Essential Cooling Water (ECW) systems. Both of these systems provide a nuclear safety function; however the ECW was chosen for further sampling during this intervention due to its importance for cooling several nuclear safety significant systems. In brief the ECW system comprises of two segregated mains circuits with an additional circuit available, which is stored dry to enable sections of either main to be bypassed for maintenance or safety purposes. Each circuit contains two pumps which take seawater from the clean side of the drum screens, passes them through strainers to feed plate heat exchangers that interface with the associated safety related cooling circuits. After the heat exchangers, the ECW discharges into a surge chamber, which eventually feeds into the MCW discharge route and outfall. The system is dosed with sodium hypochlorite to reduce marine fouling, which can affect fluid flow across the strainers and impair heat transfer across the heat exchangers.
17. After considering the totality of evidence examined during the inspection against the relevant licence conditions listed above (LCs 10, 23, 24, 27, 28 and 34), the ONR specialist inspector judged that the ECW system met the requirements of the associated safety case. The arrangements in place were suitable overall and were being implemented in a satisfactory manner. In accordance with the ONR inspection rating guide a GREEN rating was awarded, with no formal regulatory action being required.

#### Electrical short break supplies

18. This SBI targeted the short break electrical supplies system which is a function of the site's electrical distribution system. The short break system provides a reliable power supply for all necessary electrical loads during normal operation and a reliable on-demand power supply for all essential post trip operations. In brief this system provides electrical power supplies to a number of nuclear safety significant systems that have the ability to tolerate a short interruption to their electrical power supplies. The short interruption, a matter of seconds, is to allow the site's emergency generation system to run up, to allow the switching 'off' of non-essential electrical loads and switching 'on' of all essential electrical loads to occur. All switching operations are undertaken automatically by a short break logic system.
19. After considering the totality of evidence examined during the inspection against the relevant licence conditions listed above (LCs 10, 23, 24, 27 and 28), the ONR specialist inspector judged that the short break electrical supplies system met the requirements of the associated safety case. The arrangements in place were suitable overall and were being implemented in a satisfactory manner. In accordance with the ONR inspection rating guide a GREEN rating was awarded, with no formal regulatory action being required.

### **Heysham 2**

#### Control Rod System

20. This SBI targeted the licensee's control rod reactor shutdown system. The control rod system is the principal element of the nuclear reactor control and primary shutdown (PSD) system. The purpose of the shutdown system is to shut down and maintain the nuclear reactor in a sub-critical condition when required.
21. The intervention included a plant walk-down of the maintenance, inspection and test workshop. During the inspection we noted that the maintenance, inspection and test areas were laid out a logical way flowing from control rod receipt to dispatch. One minor observation was raised during the inspection which related to the testing procedure for the control rod drop test. The licensee has recently informed ONR's that it has amended its testing procedures in light of ONR's inspection findings.
22. After considering the totality of evidence examined during the inspection against the relevant licence conditions listed above (LCs 10, 23, 24, 27 and 28), the ONR specialist Inspector judged that the control rod reactor shutdown system meet the requirements of the safety case. The arrangements in place were suitable overall and were being implemented in a satisfactory manner. In accordance with the ONR inspection rating guide a GREEN rating was awarded, with no formal regulatory action being required

#### Secondary Shutdown System (SSD)

23. This SBI targeted the licensee's SSD system, which is intended to minimise the risk of release of radioactivity as a result of a failure of the primary shutdown system. This system does this by shutting down the reactor in a diverse manner. The system consists of equipment which automatically injects nitrogen gas into the reactor core to provide rapid shutdown (1<sup>st</sup> stage) and hold down (2<sup>nd</sup> stage), and manually initiated equipment which injects boron beads in to the core providing long term hold down with the reactor depressurised.
24. After considering the totality of evidence examined during the inspection against the relevant licence conditions listed above (LCs 10, 23, 24, 27 and 28), the ONR specialist Inspector judged that the control rod reactor shutdown system meet the requirements of the safety case. The arrangements in place were suitable overall and were being implemented in a satisfactory manner. In accordance with the ONR inspection rating guide a GREEN rating was awarded, with no formal regulatory action being required

## **2.2 Other work**

### **Heysham 1**

25. The ONR nominated site inspector, security inspector, and delivery lead for operating reactors, civil nuclear security and the Environment Agency inspector attended the Heysham 1 Annual Review of Safety and Security (ARoSS). At the ARoSS the Station management team provided a comprehensive review of safety over the past twelve months, the key challenges and safety/ security improvements implemented over this period. The station director also provided a forward look ahead and explained the two key focus areas of the station business plan for the next three years. ONR inspectors undertook a plant inspection covering areas of interest and acknowledged that a number of safety and security improvements had been implemented over the review period.
26. ONR attended the Station's Health and Safety Committee (HESAC) meeting with management representatives, safety representatives and contract partners to support their function of representing employees and receiving information on matters affecting their health, safety and welfare at work such as industrial, fire, environmental safety and well-being. The meeting was positive and demonstrated

that the Station management, employees and contract staff are actively engaged in good health and safety management practices.

## Heysham 2

27. The ONR nominated site inspector observed the first of several shift exercises at the Heysham 2, exercise “VOX”. This was in response to the licensee’s Level 1 demonstration exercise (“Kingfisher”) which took place on the 18 January 2017. This was a joint exercise between Heysham 1 and 2. ONR judged that both stations arrangements for compliance with LC 11 merited an intervention rating of Green. However, ONR considered that the Access Control Point (ACP) on Heysham 2 failed to meet the required standard and in light of this required Heysham 2 to re- demonstrate this specific area in the presence of the ONR nominated site inspector for Heysham 2 during one of the station’s shift exercises
28. The nominated site inspector considered that the shift exercise was challenging for the individuals involved and overall judged that the arrangements for compliance against LC10 and LC11 warranted a rating of “GREEN” (no formal action). However, in terms of addressing the shortfalls that were observed for exercise “Kingfisher” the licensee has some areas to address to meet the expected standard.
29. In addition, the site inspector held meetings with the Heysham 2 station director as part of his routine station engagement. Other routine engagements also include the licensee’s independent nuclear assurance inspector and ONR issues follow-up meetings.
30. A themed inspection was undertaken by a team of ONR inspectors examining the control and supervision of operations and maintenance in three areas: Plant Status Control and Monitoring, Work Planning and Safe Work Execution. In addition to this inspection, an international team of observers from the Organisation for Economic Cooperation and Development (OECD) Working Group on Inspection Practices (WGIP) observed ONR’s inspection methods. This is a normal practice of observations of OECD member states in order to improve nuclear regulatory inspection practices. Their findings will be shared with regulators from member states across the world.
31. The themed inspection examined compliance against LC12, LC23, LC24, LC25, LC26, LC27, LC28 and MHSW Reg 5. Overall, based on the evidence sampled, the ONR inspectors judged that legal requirements were met. We observed a number of work activities, examined management arrangements and sampled key documentation covering plant status control, work planning and work execution. In all cases the level of control and supervision was commensurate with the safety significance of the associated task. Two minor non compliances were identified for which two regulatory issues have been raised. In accordance with the ONR inspection rating guide a GREEN rating was awarded, with no formal regulatory action being required.

## 3 NON-ROUTINE MATTERS

### Heysham 1

32. During this period, the Heysham 1 nominated site inspector reviewed a number of incidents that met the criteria for routine reporting to ONR under the site’s Licence Condition 7 arrangements. The site inspector sampled the station’s follow up reports and corrective actions. From the evidence sampled, the inspector was satisfied that these incidents had been adequately investigated and appropriate event recovery actions identified. In addition the site inspector held meetings with



the Heysham 1 independent nuclear assurance inspector and ONR issues follow-up meetings.

33. In November the Station reported the automatic tripping of Reactor 2, as a result of a boiler quadrant protection operating on low steam temperature. Post trip cooling was established satisfactorily and the station's Emergency Control Centre was established in Operational Alert mode to provide assistance to the duty shift team in managing the consequences of an event associated with the partial loss of electrical supplies. Whilst the Reactor was shut down, the Station took the opportunity to perform refuelling and other maintenance activities. This work was completed and Reactor 2 was successfully returned to service in December. The Station is undertaking an investigation to determine the root causes of the Reactor automatic trip. ONR will review this reported incident as part of routine site inspection.

### Heysham 2

34. During this period, the Heysham 2 nominated site inspector reviewed an incident regarding the station's burst can detection (BCD) system which met the criteria for routine reporting to ONR under the site's Licence Condition 7 arrangements. The BCD is used to continuously monitor coolant gas activity on each reactor. The nominated site inspector was satisfied that this incident had been adequately investigated and appropriate event recovery actions identified.

## 4 REGULATORY ACTIVITY

35. ONR may issue formal documents to ensure compliance with regulatory requirements. Under nuclear site licence conditions, ONR issues regulatory documents which either permit an activity or require some form of action to be taken. These are usually collectively termed Licence Instruments (LIs), but can take other forms. In addition, inspectors may issue Enforcement Notices to secure improvements to safety.

**Table 1**  
**Licence Instruments and Enforcement Notices Issued by ONR during this period**

Date	Type	Ref No	Description
N/A			No Licence Instruments or Enforcement Notices were issued during the period

Reports detailing the above regulatory decisions can be found on the ONR website at <http://www.onr.org.uk/pars/>.

## 5 NEWS FROM ONR

### New Build:

#### New Nuclear Power Station Design Approved

36. The UK Advanced Boiling Water Reactor (UK ABWR), designed by Hitachi-GE, is suitable for construction in the UK, the regulators confirmed following completion of an in-depth assessment of the nuclear reactor design. The Office for Nuclear Regulation, the Environment Agency and Natural Resources Wales, the regulators who undertake the Generic Design Assessment of new reactor designs, are satisfied that this reactor meets regulatory expectations on safety, security and environmental protection at this stage of the regulatory process. ONR has issued

a Design Acceptance Confirmation and the environment agencies have issued a Statement of Design Acceptability to Hitachi-GE.

## **Step 2 of Nuclear Reactor Assessment**

37. We also announced in November 2017 that we are progressing to the next phase of our assessment of the General Nuclear System Limited (GNS) UK HPR1000 nuclear reactor technology. This means we will now begin the technical assessment phase. Additionally, all members of the public can give their views and find out more information about the design by going to UKHPR 1000 website at [www.ukhpr1000.com](http://www.ukhpr1000.com).

### **Other news:**

## **ONR Response to BEIS Impact Assessment**

38. The Department for Business, Energy and Industrial Strategy (BEIS) has recently published its Impact Assessment of the Nuclear Safeguards' Bill and that makes reference to ONR's regulation. We contacted BEIS to clarify two points within the document as part of our ongoing constructive engagement with them to develop a domestic safeguards regime as part of exiting Euratom. The first is that ONR regulates the nuclear industry; it does not provide services to it. Secondly, the Government's policy has developed since the assessment was undertaken and the intention is to put in place a regulatory framework which is as robust and as comprehensive as Euratom. This means that we are not in a position to identify potential efficiencies in our regulatory approach at this stage. As we support BEIS in its development of secondary legislation, we will provide advice to the Government to inform the anticipated impact assessment for nuclear safeguards regulation.
39. For the latest news and updates from ONR visit the website and sign up for our ebulletin (<http://www.onr.org.uk/ebulletin/index.htm>).

## 6 CONTACTS

Office for Nuclear Regulation  
Redgrave Court  
Merton Road  
Bootle  
Merseyside  
L20 7HS

website: [www.onr.org.uk](http://www.onr.org.uk)  
email: [ONREnquiries@onr.gov.uk](mailto:ONREnquiries@onr.gov.uk)

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