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

### Report for period 1 April 2021 – 30 June 2021

**Foreword**

This report is issued as part of our 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 our website (http://www.onr.org.uk/llc/).

Our site inspectors 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. Our nominated site inspectors made inspections on the following dates during the quarter:

### Heysham 1

- 19 – 22 April (Onsite)
- 17 – 20 May (Onsite)
- 21 – 24 June (Onsite)

In addition, our specialist inspectors were involved in interventions on the following dates during the quarter:

- 19 – 21 April (Onsite)
- 10 – 13 May (Remote)
- 18 – 19 May (Onsite)
- 22 – 24 June (Onsite)

### Heysham 2

- March 2021 – Continuing into April (Remote)
- 21 – 22 April (Onsite)
- 18 – 21 May (Onsite)
- 28 June (Onsite)

In addition, our specialist inspectors were involved in interventions on the following dates during the quarter:

- 18 – 21 May (Onsite)
- 7 June (Onsite) – R7 Outage - Graphite
- 11 June (Onsite) - R7 Outage - Conventional Health & Safety / Internal Hazards
- 22 June (Onsite) – R7 Outage – Electrical

# 2 ROUTINE MATTERS

## 2.1 Inspections

2. 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 2017 (IRR17) and the Management of Health and Safety at Work Regulations 1999 (MHSWR99).

3. 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.

4. Due to the Covid-19 pandemic, access to site has been more restricted than pre-pandemic, but more routine regulatory activity was carried out than during the previous quarter. More details can be found in the News from ONR section at the back of this report and on our website. We have however maintained regulatory oversight of both stations by:-

- Initiating increased dialogue with site management, the licensee's independent nuclear safety assurance function, and trade union safety representatives to develop a consistent picture of the measures put in place to manage the safety of both the workforce and the plant.

- Observing regular station meetings and special working groups the licensee established to assess the coronavirus pandemic and manage the response. This includes the pandemic lead team meeting (which co-ordinated the site's response) and maintenance requirements review group (which managed the impact of potential or actual staff and supply chain shortfalls on safety-significant maintenance activities).

- Monitoring the minimum staffing levels required to deliver an adequate response in the event of an accident or emergency on the site.

5. Consequently, we consider that the site has managed its response to the pandemic during the period in a manner that, so far as is reasonably practicable, protected its own staff and ensured that there was no degradation in nuclear safety.

6. In this period, the following site and remote routine inspections were undertaken:

## Heysham 1

### Control and instrumentation themed inspection

7. The primary purpose of this intervention was to establish whether the licensee had made adequate progress towards addressing a number of maintenance record keeping arrangement shortfalls. The shortfalls were identified during the Reactor 1 statutory outage control and instrumentation (C&I) inspection, which was undertaken in November 2020.

8. The inspection sampled evidence to determine compliance against:

- Licence condition 10 (LC10) – Training;

- Licence condition 26 (LC26) – Control and supervision of operations; and
- Licence condition 28 (LC28) – Examination, inspection, maintenance and testing.

9. The purpose of LC10 is to ensure that the licensee makes and implements adequate arrangements for suitable training for all those on site who have responsibility for any operations which may affect safety.

10. The purpose of LC26 is to ensure that no operations are carried out which may affect safety except under the control and supervision of suitably qualified and experienced persons appointed for that purpose by the licensee.

11. The purpose of LC28 is to ensure the licensee make and implement adequate arrangements for the regular and systematic examination, inspection, maintenance and testing of all plant which may affect safety.

12. The intervention involved holding discussions with relevant maintenance, engineering, and training department stakeholders (in accordance ONR's and EDF NGL's COVID-19 secure arrangements), review of a sample of maintenance related documents, and observation of routine maintenance of a nuclear safety protection system.

13. Based on the information provided during the intervention, we considered that the licensee had made adequate progress towards addressing a number of maintenance record keeping arrangement shortfalls and assigned an inspection ratings of Green in relation to LC 10, LC26 and LC28.

### Level 1 Security Exercise "Cosworth"

14. We observed Exercise COSWORTH, which was the first annual demonstration exercise conducted jointly by Heysham 1 and 2 since the start of the pandemic. This exercise had a security theme with a challenging and novel scenario, which we reviewed and approved prior to the demonstration. We judged the exercise to have been an adequate demonstration of Heysham's arrangements made under Nuclear Industries Security Regulations 2003 and Licence Condition 11 - Emergency Arrangements.

## Transport Inspection - Carriage of Class 7 (Radioactive Materials) Dangerous Goods

15. This intervention was carried out to assess the licensee's compliance with requirements of Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG 2009) and the legislation these regulations introduce into Great Britain's (GB) legal system. The intervention addressed the requirements for civil transport of class 7 dangerous goods (radioactive materials).

16. Due to the COVID19 pandemic, this intervention was conducted remotely. This involved requesting information on training and consigning class 7 materials from Heysham 1 Power Station together with structured

discussions by video-conference with Station staff involved in consigning class 7 materials. The intervention also examined class 7 transport emergency arrangements and transport security.

17. Following inspection of sampled evidence and from discussions with staff, we judged that the licensee was compliant with transport legislation required for the carriage of class 7 dangerous goods (radioactive materials).

## Chemistry themed inspection

18. A chemistry themed inspection was conducted to examine the implementation of chemistry derived limits and conditions and the governance arrangements necessary for the adequate production and subsequent implementation of the station safety case.

19. We noted that within the fleet chemistry function, technical governance documents are known as British Energy Operating Manuals (BEOMs). In addition a number of other Company Technical Standards (CTS) technical governance documents are also of relevance to chemistry.

20. We noted that the production of technical governance is driven by the Central Technical Oversight (CTO) function at Barnwood. However, technical governance revision requires station input and station implementation. The input of station to technical governance revision and subsequent implementation formed the focus of this intervention. The inspection was therefore rated against LC14 and LC23. The inspection was targeted towards primary coolant chemistry and chemistry control beyond the end of generation.

21. The inspection sampled evidence to determine compliance against:

- Licence condition 14 (LC14) – Safety documentation;
- Licence condition 23 (LC23) – Operating rules.

22. The purpose of LC14 is to ensure the licensee makes and implements adequate arrangements for the production and assessment of safety cases consisting of documentation to justify safety during the design, construction, manufacture, commissioning, operation and decommissioning phases of the installation.

23. The purpose of LC23 is to ensure the licensee, in respect of any operation that may affect safety, produces an adequate safety case to demonstrate the safety of that operation and to identify the conditions and limits necessary in the interests of safety. Such conditions and limits are referred to as operating rules and operations at all times shall comply with such operating rules.

24. While not rated, to gain intelligence, the intervention also sampled station processes for event reporting and application of new guidance produced by CTO within the chemistry function.

25. As part of the inspection, we also undertook a plant walkdown of the various systems which included:

- Gas Bypass Plant;
- Pond sampling points;
- Hypochlorite tanks, dosing plant and sampling points;
- Chemistry monitoring laboratory.

26. In general the plant was observed to be in good, clean condition with few defect tags. Visible progress of chemistry monitoring equipment was evident. No matters of significant safety concern were observed during the plant walkdown.

27. The inspection examined the implementation of chemistry derived limits and conditions and the governance arrangements necessary for the adequate production and subsequent implementation of the station safety case. Overall, from the evidence of sampled documentation, a plant walkdown and interviews with station chemistry staff, we judged that the licensee had adequately demonstrated compliance with LC14 and LC23.

## Heysham 2

### Licence Condition 28 - Maintenance Inspection

28. During March 2021 we started a Licence Condition 28 maintenance inspection. This was a themed inspection looking at the following specific aspects of the stations maintenance management system:

- Work Planning;
- Work Prioritisation;
- Defect resolution and backlog.

29. Due to holiday commitments around Easter the inspection continued into April.

30. Work Planning:- We examined how work identified on the maintenance schedule is translated into specific work packages and how the delivery is planned weeks in advance to ensure it is executed within the required periodicities. We examined how defects, emergent work and maintenance backlog tasks are incorporated into the work week management plans. I sampled data on schedule adherence and associated causes when work was not delivered when scheduled. The process appeared to be fit for purpose and was effective in delivering compliance. We noted some occasions, during the planning process, where the expected level of plan maturity did not meet the expectations of the week in question. Overall, these observations were minor, and we were satisfied that the planning process is adequate.

31. Work Prioritisation:- We examined how the station prioritises the delivery of Maintenance Schedule tasks, emergent work, defects, and statutory compliance inspections, associated with Lifting Operations and Lifting Equipment Regulations (LOLER) and Pressure Systems Safety

Regulations (PSSR). We were satisfied that the station is appropriately prioritising maintenance activities and defects rather than simply focusing on the activities to simply reduce backlog numbers.

32. Defect Resolution and Backlog:- We sampled the data collected by the station to assess the performance of work delivery, compliance and defect rectification. We sought to understand how this data is used to determine performance and used to inform decision making. The was good evidence that the station makes use of the data to provide situational awareness, aid planning and identify improvements. Although the work planning process seems comprehensive and is used effectively, the outcomes reflected in the data made available during the inspection, don't seem to match the planning process and the station has targets for reducing backlog. The business plan combined with the defect recovery workdown curves seem to be appropriate and the targets are challenging.

33. Overall, we identified minor areas for improvement regarding provision of appropriate resource for specification and strategy for reducing the backlog of defects. The licensee was already aware of these issues and has action plans in place to address.

**Close-out of Improvement Notice ONR-IN-20-003**

34. During quarter two inspections were conducted to gain evidence to close out Improvement Notice ONR-IN-20-003 issued against EDF Energy Nuclear Generation Ltd on 14th August 2020 following the flux detector event in April 2020.

35. The first inspection during April found that although substantial work and significant progress has been made towards meeting the requirements of the improvement notice, the inspection prompted the station to consider additional procedures that should have been included in the scope or withdrawn from use. An extension to 31 July 2021 was therefore granted to the station.

36. A follow-up inspection was undertaken towards the end of June which found that previous gaps identified had been closed. Therefore the improvement notice was closed.

37. All the procedures and check-sheets associated with safety mechanisms have been updated with specific requirements. This includes detailing the personnel requirements to enact various steps of the procedures, and additional hold points, to confirm that important parameters are checked and that equipment has been returned to service. The role of the Nominated Test Engineer (NTE) has been clarified to minimise the risk of the NTEs being drawn into the work thus preventing them from carrying out independent checks. The training of various other roles, in relation to safety mechanisms, have also been improved.

38. The Station with help from the human factors team at Barnwood are reviewing and updating all the safety mechanism procedures, check sheets and pre-job briefs to minimise human performance error traps. This improvement is over and above the requirements of the improvement notice. This work should be finished by the end of 2021.

## Procedural quality use and adherence and configuration control themed inspection.

39. This was a theme-based inspection structured around configuration control. It used nuclear site licence conditions (LC) 24 operating instructions, and LC26 control and supervision, to form a judgement. It was supported by a human factors nuclear associate.

40. For LC24 we sampled operating and maintenance instructions and the arrangements to ensure that they remain accurate and up to date. For LC26 we sampled the supervision arrangements for contractors and the setting to work process for all maintenance staff. The inspection included interviews with key staff, review of relevant documents and a walk-down of work being carried out. This included work being undertaken as part of Reactor 7 statutory outage.

41. We found that the procedures sampled were accurate. Staff were being encouraged to report any issues with the procedures. Additional resource has been secured to help with any document amendments. Awareness of what good looks like is being raised through Human Performance (HU) training; an observation programme, a procedure quality use and adherence (PQU&A) working group and a configuration control working group have all been established.

42. For LC26 we observed that maintainers are being set to work with an understanding of the key hazards and control measures. When interviewed, the maintenance manager and a field supervisor were both able to explain the fundamental principles behind the field supervision programme and gave confidence that it was being used effectively. Unfortunately, the opportunities to verify this were more limited than anticipated due to delays in starting tasks on plant.

43. There were a number of observations made in relation to the procedures and processes, which although they do not amount to regulatory shortfalls, they do, in my opinion make the likelihood of personnel making errors more likely. Notably, for even fairly routine tasks, there is a large volume of paperwork required, much of which is independently checked and verified. Complexity and bureaucracy could be reduced in many instances without compromising safety, allowing more targeting of those tasks where additional verification and oversight would add real value.

## Other outage related inspections and activities

44. Heysham 2 Reactor 7 statutory outage commenced on 14 May 2021. Our specialist inspectors carried out the inspections detailed in section 1 above and other assessment activities to establish that:

- requirements set out in the Station's Plant Maintenance Schedule (PMS) have been complied with;
- work has been carried out in accordance with arrangements for identified Structures, Systems and Components to the required quality by competent persons;

- safety issues identified during the reactor outage have been adequately addressed with suitable and sufficient justification provided to allow a regulatory judgement to be made that start-up of the reactor is safe.

45. A keyway root crack has been found during the station's inspections of the graphite core. Heysham 2 and Torness have a different graphite brick design to other AGR stations which gives a theoretical possibility of debris forming in channels that have a keyway root crack. A revised safety case covering this issue is being written by EDF and we will assess and permission before consideration is given to the restart of Reactor 7.

46. Inspections and assessments will continue during Period 3 of 2021 (July – September).

47. The reactor will not restart without a Consent from us. It is anticipated that this will be during period 3 of 2021 assuming that the safety case is adequate. Further details can be found within our project assessment report for the Reactor 7 outage will be published on our website.

## System Based (SBI)

48. In addition to the programme of site licence compliance inspections, we also inspect 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. We consider that this will provide additional assurance that operations on the Heysham site are safe. Each of these system inspections considers the relevant licence conditions (where relevant) 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.

### Heysham 1

### Emergency boiler feed systems

49. We performed an SBI to determine the adequacy of implementation of the safety case claims made in respect of the Emergency Boiler Feed (EBF) and High Pressure Back-up Cooling Systems (HPBUCS).

50. The purpose of the EBF system is to provide sufficient water flow to the boilers of a tripped reactor to affect the removal of the decay heat from the

reactors and prevent unduly high boiler gas outlet temperatures. In addition, the EBF system can be utilised for reactor shutdown cooling and can thus be claimed as a second feed system during shutdown.

51. The purpose of the HPBUCS is to provide a totally diverse supply of feedwater to the boilers for post-trip reactor cooling if the EBF system is unavailable. The HPBUCS can also be used for shutdown cooling and can be claimed as a second feed system during the shutdown.

52. An ONR SBI normally covers 6 key LCs, but in this case LC34 (Leakage and escape of radioactive material and radioactive waste) did not form part of this inspection as the inspection plan did not cover any area where the emergency boiler feed systems could lead to an escape of radioactive material or radioactive waste.

53. A plant walk down of the systems was also carried out which confirmed that the plant items were being maintained, with few recorded defects and good housekeeping standards.

54. During the inspection we identified that the Equipment Reliability Review (ERR) for the EBF system had not being completed in accordance with the licensee's own arrangements every three years. I was satisfied however, that other routine activities are conducted by the system engineers to monitor system health and reliability and nuclear safety is adequately maintained. However, in response to this ERR completion shortfall a regulatory issue has been raised in order to identify the extent of condition before determining whether further enforcement action may be proportionate.

55. Overall we judged that, from the evidence sampled and discussions with plant operators and plant/procedures inspected that the safety cases for the Emergency Boiler Feed Systems had been adequately implemented to fulfil their required safety functions.

### Heysham 2

56. There were no system Based Inspections at Heysham 2 during this period.

## 3 NON-ROUTINE MATTERS

57. Licensees are required to have arrangements to respond to non-routine matters and events. Our inspectors judge the adequacy of the licensee's response, including actions taken to implement any necessary improvements.

### Heysham 1

58. There were no such matters or events of significance during this period.

### Heysham 2

#### Make-up Shield (INF1 2020/693) & (INF1 2021/191)

59. The technical investigation has continued. A revised safety case will be required before the MUS can be operated at pressure. We have placed a regulatory hold point and will permission the revised safety case. Indications are that the safety case and associated modifications will not be complete until 2022.

## 4 REGULATORY ACTIVITY

60. We may issue formal documents to ensure compliance with regulatory requirements. Under nuclear site licence conditions, we issue 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**

### Heysham 1

61. None

### Heysham 2

| Date | Type | Ref No | Description |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

While no reports detailing regulatory decisions were issued during the period, previous decisions can be found on our website at http://www.onr.org.uk/pars/.

## 5 NEWS FROM ONR

Below are summaries of key activities over the last three months. Further detail is available on our website.

### Covid-19 (Coronavirus) (ONR position)

We are continuing to obtain assurance that nuclear site licensees and other dutyholders are adequately resourced to continue to safely and securely carry out their activities. We remain satisfied with industry's response at this time and there has been no significant change to dutyholders' safety and security resilience.

All licensed sites are required to determine minimum staffing levels necessary to ensure safe and secure operations and contingency arrangements in the event that these levels are not met. This condition is specifically designed to ensure that industry can adequately manage and control activities that could impact on nuclear safety and security under all foreseeable circumstances, including pandemics.

Although ONR staff continue to work primarily at home, (carrying out as much of our work as possible via videoconference, phone and email), we are carefully and progressively increasing our site footprint. We continue to assess our on-site presence in line with government guidelines and our business needs, ensuring we have a balanced portfolio of on-site inspections and interventions, that are important to support effective regulation across our purposes.

Our latest position can be found on our website.

### Enforcement Action

- In April, we announced that EDF complied with a Direction we served on 14 December 2020, under the Pressure Systems Safety Regulations (2000). This followed an inspection, at which found a number of pressure system components at Heysham 1 Power Station were overdue their scheduled examination.

- In May, we agreed to extend an improvement notice served on EDF in September 2020, recognising the progress made so far. The notice was served after some of the equipment used to measure reactor power at Heysham 2 was incorrectly configured. We judged that Heysham 2 is able to operate safely, and that additional time to demonstrate the required improvements will not pose a risk to safety. EDF must now comply with the improvement notice by 31 July 2021.

- In June, we announced that Rolls-Royce Submarines Ltd (RRSL) had complied with an improvement notice served on 29 May 2020. The notice was served after RRSL operators brought 21 units of fissile material into the facility – which exceeding the limit defined within the safety case and set out in the Criticality Control Certificate for the facility.

### Stakeholder Engagement

- In April, we published an article introducing our newest board member, Jean Llewellyn, who joined us in October 2020, as security lead. Jean brings with her a wealth of experience, including serving as a non-executive director on the board of the World Institute for Nuclear Security since 2018 – which has given her a good understating of the global security challenges facing the nuclear industry.
- In May, we issued our e-bulletin 'ONR News' to subscribers. This issue included farewell reflections from our outgoing chief executive, a leadership update, further information on our COVID -19 response, and the results of our latest stakeholder survey. You can sign up for our e-bulletin here
- On 1 June, we announced the full implementation of our new leadership structure. Mark Foy is now our combined Chief Executive and Chief Nuclear Inspector. He is supported by Sarah High as Deputy Chief Executive, and Donald Urquhart as Executive Director of Operations.
- In June, we published our new Corporate Plan for 2021/22, which sets out our key priorities to protect the public by securing safe nuclear operations.
- In June, our State System of Accounting for and Control of Nuclear Material (SSAC) project - which saw ONR become the UK's national nuclear safeguards regulator from 31 December 2020, was shortlisted for a national award in the Project Management Institute's UK National Project Awards in the 'Project of the Year (Public Sector)' category.
  Nuclear safeguards are measures to verify that countries comply with international obligations not to use nuclear materials from civil nuclear programmes for non-peaceful purposes.

## 6 CONTACTS

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Published 11/21