Office for Nuclear Regulation (ONR)
Site Report for
Dungeness B

Report for period - 1 July to 30 September 2020

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 to members of the Dungeness Site Stakeholder Group and are also available on the ONR website (http://www.onr.org.uk/llc/).

Site inspectors from ONR usually attend Dungeness Site Stakeholder Group meetings where these reports are presented 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. ONR inspectors undertook inspections at Dungeness B Power Station, on the following dates during the quarter:

   - 2, 21-23, July 2020
   - 29 July – 10 August 2020
   - 26 June – 6 July 2020
   - 2, 14-17 September 2020

   Some of the interventions that were undertaken in this period were conducted either remotely or on site by ONR.

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 station's arrangements facilitated some physical site-based inspections during this reporting period. However, due to the COVID-19 pandemic, other inspections were undertaken remotely using Skype, video conferencing and the use of independent site-based personnel where appropriate. The licensee is still required to make and implement adequate arrangements under the licence conditions attached to the licence in order to ensure legal compliance. Inspections seek to judge both the adequacy of these arrangements and their implementation.

Compliance Inspections

4. Due to the relaxation of the COVID -19 restrictions, some limited onsite inspections were carried out by ONR specialist inspectors and the by the ONR nominated site inspector for Dungeness B. During this reporting period, the site inspector has also continued to engage with the station remotely to monitor the station's performance of the site by:
   - Continuing open 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 station meetings, working groups and the licensees established management of the corona virus pandemic impact on the station.

5. Consequently, the site inspector considers 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, routine inspections at Dungeness B covered the following topics:

- Licence condition 6 – Documents records, authorities and certificates
- Licence condition 10 – Training
- Licence condition 28 – Examination, Maintenance, Inspection and Testing (EMIT)
- Licence Condition 34 - Leakage and escape of radioactive material and radioactive waste

Licence Condition 6 - Documents, records, authorities and certificates

7. The nominated site inspector undertook a site based planned compliance inspection of the station's arrangements for LC6. In addition, a reactive unplanned LC 10 (Training) compliance inspection and intelligence gathering was also undertaken at the site.

8. This LC6 compliance inspection was Part 2 of a previous remote LC6 compliance inspection that was undertaken between June and July 2020. The purpose of this inspection was to undertake a physical examination of the data store and the sampling of the station's work in its rationalisation of records and comparing the station's reported progress against an existing regulatory issue associated with it. The inspector noted that key milestones which are routinely reported to ONR identified that the station was either on track, nearing completion or had completed the areas it routinely reports upon to ONR.

9. For this planned LC 6 compliance inspection the station provided evidence that satisfied the site inspector that the station was complying with its arrangements in the areas he sampled. In light of his observations he rated this inspection as GREEN. This is a positive outcome given the historic challenges the station has had in this area, however, there still remains a significant task for the station in continuing the work in meeting its objectives.

Licence condition 10 - Training

10. This compliance inspection was a reactive unplanned LC10 inspection of Simulator Training that was taking place during the time of the site inspector's visit. The site inspector observed the simulator instructors providing the training and met with the candidates who were undertaking the training to discuss the aspects of their training and the use of the dual Reactor 21 and 22 simulators.

11. On completion of the scenario, the feedback to the candidates was constructive and positive, the instructors also elected to delve into the candidates understanding regarding key plant items and their expectations given the scenario presented to them and possible alternative actions. The site inspector's overall rating of this reactive LC10 compliance inspection was that a GREEN rating was appropriate.

Licence condition 28- Examination, inspection, maintenance and testing (EMIT)

12. Two unplanned LC28 compliance inspections were undertaken, on 2 July and 2 September 2020, focused in the following areas:

- 2 July 2020 station visit inspection
    - Newly discovered corrosion-under-insulation on concealed systems and newly discovered corrosion of recently mitigated corroded pipework, associated with nuclear related plant
    - An inspection of the on-going work to improve the maintenance and reliability of the extant Emergency Nitrogen Injection Plant, in readiness for return to front line service, when the reactors at back at power.

- An inspection of the installation of the new Automatic Boiler Emergency Depressurisation (ABED) system, which supports the station's new boiler tube leak safety case.

13. With regard to the newly found corrosion, the inspector noted that the plant inspections to understand the extent of condition and the remediation in progress were thorough and systematic. However, these findings suggest the station's preventative arrangements are not effective. The station's investigations into the root causes, extent of condition and appropriate corrective actions were on-going at the time of his inspection but it was judged that improvement in the station's arrangements for the management of concealed safety related systems was needed and this element of the inspection was rated as Amber. Given that there is currently a regulatory issue associated with corrosion at the station, ONR will review the outcome of the station's own investigations into this newly found corrosion of concealed safety systems before considering any further amendments to the existing regulatory issue.

14. With regard to the extant Emergency Nitrogen Injection Plant, the inspector found that maintenance and testing of the plant had commenced in February this year and has gradually improved the condition and reliability of the plant. He found the application of the station's Technical Fault-Finding process to be focused, systematic and particularly effective. The required plant performance for front line emergency duty had almost been achieved at the time of the inspection. Assurance was obtained that the extant nitrogen plant would continue to be maintained and regularly tested to ensure consistent and sustained reliability. In light of his inspection findings he rated this element of the inspection as Green.

15. With regard to the newly installed ABEDs system, the pre-inspection review of the documentation associated with the new installation indicated it to be comprehensive; however, the inspector found that not all required entries had been completed. On the station, his inspections were carried out from the Boiler Emergency Depressurisation valves in the boiler annexe to the Main Control Room (MCR). However, due to the limited access, mainly due to Confined Space access, only a small part of the route could be inspected with regard to separation and segregation of the cabling from extant plant systems. The cable junctions in the associated switch room and the new cabinets in the Instrument Room adjacent to the MCR were examined and found to be in good order.

16. In conclusion the inspector rated the reactive LC28 compliance inspection as AMBER given the newly found corrosion of concealed safety related systems.

- <u>2 September 2020 station visit inspection</u>

  - DNB's corrosion management process implemented as part of its ongoing event recovery

17. During the inspector's visit he noted that all the areas he inspected displayed good housekeeping practices. It was also evident that further significant remediation work had taken place over the last 6 months. He observed that the plant was in good condition and where any degradation was noted, the DNB team was able to provide a verbal description of plans for its remediation.

18. For defects already remediated, he was impressed with the level of oversight and control demonstrated by the Quality Assurance Engineer and the quality of the document pack sampled. The inspector was satisfied that the corrosion project has demonstrated they hold suitable records of remediation work completed during the event recovery.

19. The inspector was also satisfied that the Remediation Lead and Corrosion co-ordinator were able to present and describe a reasonable remediation plan in the short term. However, a large amount of remediation remains and currently all remediation is taking place with both reactors' shutdown.

20. He outlined his expectation that the corrosion team would continue to receive appropriate support from the Corrosion Oversight Review Board and station management, so that they are able to maintain control of the corrosion challenge at DNB and address the commitments made in response to ONR's 2018 corrosion Direction.

21. In the inspector's opinion, the DNB corrosion recovery phase 2 inspection program represents an area of good practice. It was clear that lessons had been learnt from the beginning of the project and that improvements implemented should result in a suitable record of the condition of the concealed systems inspected as part of phase 2.

22. The overall conclusion of this corrosion-focussed LC28 inspection at DNB was that a GREEN rating was appropriate given the significant plant and process improvements witnessed.

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

23. This inspection was undertaken remotely due to constraints imposed by the then ongoing Covid-19 pandemic station arrangements. The specialist inspector focused on the fuel pond; to confirm, on a sampling basis, the licensee was implementing its compliance arrangements for LC34.

24. The specialist inspector examined how the licensee implemented its arrangements to identify barriers to leakage and escape of radioactive material, how it assured itself of the integrity of these barriers, and how leakage and escape would be detected. The scope of the inspection included the fuel pond structure and excluded the in-pond mechanical handling equipment and pond water treatment plant (PWTP). No plant walk-down of the fuel pond was conducted as this inspection was undertaken remotely.

25. The inspector was satisfied that the licensee was complying with its LC34 arrangements which require barriers to leakage and escape to be identified and their integrity assessed, based on sampling inspection. She was also satisfied that the level detectors which play an important role in detecting failure of these barriers are in place and in working order, based on sampling a range of inspection and maintenance records.

26. Based on her inspection, it was her opinion that the licensee met its legal requirements under LC34 and therefore assigned a rating of GREEN (no formal action) in accordance with the ONR inspection rating guide. Two regulatory issues were raised to address minor compliance shortfalls.

System Based Inspections (SBI)

27. In addition to our compliance inspections based on the conditions attached to the nuclear site licence, ONR also inspects operating reactors against safety-related systems. Each site has a safety case that demonstrates how it operates safely. For Advanced Gas-cooled Reactors, each of the key systems will be inspected against the claims made upon them by the safety case. The aim is to systematically inspect all the significant safety related systems within a five-year cycle. ONR considers that this will provide additional assurance that operations on the Dungeness 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

28. One remote SBI was undertaken during this period which examined the station's Fuelling Machine (FM) & Plug Unit Maintenance Facility (PUMF). The purpose of the FM is to transfer fuel assemblies, control rod assemblies and other non-fuel assemblies including interstitial plug assemblies between the reactor channels of both reactors and other facilities. The purpose of the PUMF is to allow operators to test, maintain, refurbish, replace and store plug units while minimising their exposure to radiation as far as practicable.

29. The inspection was undertaken by a multi-disciplinary team of ONR inspectors, including Control Electrical & Instrumentation, fault studies, internal hazards and mechanical engineering specialist inspectors. Given the restrictions in place due to the coronavirus pandemic, this inspection was carried out remotely using teleconferencing facilities.

30. Based on this inspection, ONR rated the following Licence conditions LC20, 23, 24, 27 as Green, however due to time constraints we were unable to obtain enough evidence to provide a rating for LC34. In regard to LC28, this was rated as Amber (seek improvement) as it was considered that the safety case for the PUMF had not been adequately implemented at Dungeness B Power Station. Because of this rating, ONR's enforcement management model (EMM) was applied to determine the appropriate enforcement action that was necessary to bring the station back into compliance.

31. The EMM indicated an enforcement letter was a proportionate response to the shortfalls identified. The station is to be issued with an enforcement letter which will identify several regulatory issues for the station to address regarding the PUMF area specifically concerning the gloveboxes/partial enclosures and hoists. ONR is content that the regulatory issues raised will resolve the shortfalls prior to the next use of the gloveboxes/partial enclosures and hoists.

2.2 Other work

Dungeness B Performance Improvement Plan (PIP)

32. ONR currently regards Dungeness B as being in 'enhanced attention' and has allocated extra resources to the station as it works to get back into safe generation of electricity, and beyond that to improve its performance further. This includes engagement with the station's performance improvement plan, which aims to improve performance further in the following areas:

    - Equipment reliability;
    - Leadership and Behaviours;
    - Systematic approach to training;
    - Management of Work;
    - Organisational learning

33. ONR is interacting frequently with the team organising this improvement plan, giving advice and feedback and monitoring progress. The programme is expected to run for at least eighteen months more. It is ONR's current view that this is a well-conceived and well-

targeted plan that, if it achieves its aims, should help to enable Dungeness B's return to normal attention level.

3 NON-ROUTINE MATTERS

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

35. Dungeness B reported to ONR on 18 May 2020 that two routine inspections, associated with Reactor 21 Pre-stressed Concrete Pressure Vessel (PCPV) penetrations, had not been completed within the intervals specified in the associated Written Scheme of Examination under the Pressure Systems Safety Regulations 2000 (PSSR).

36. There was no significant nuclear safety impact as Reactor 21 was shut down at the time and had not operated at power beyond the due date. However, given that this is a breach of PSSR regulations, and these penetrations are nuclear safety significant items of plant, an enforcement letter (DNB71334R) was issued to the station on the 7 July 2020 to ensure the contraventions were remedied. The station has since responded to ONR's letter outlining its plan to address the actions identified.

Return to Service Update

37. Both reactors are safely shutdown due to the ongoing repair of widespread steel corrosion across the station, cracking found in the main steam lines of the boilers and potential degradation issues associated with boiler tubes. The reactors will only be permitted to return to service when ONR is satisfied that the issues identified have been resolved.

38. The corrosion event recovery has progressed to the point where inspections required to support return to service are now complete, the necessary defect remediation required for return to service has been completed and is in progress. Risk-informed defect rectification work is also planned for several years after the return to service of the reactors. ONR has received a safety case produced by EDF to demonstrate a suitable return to service position with regards to corrosion. ONR will review this and supporting evidence to establish the adequacy of the submission. A corrosion focussed site inspection was carried out by ONR in early September. This resulted in a number of positive findings and areas of good practice noted. The station continues to address remaining ONR corrosion actions prior to return to service.

39. Boiler steam main line inspections are complete, and some repairs have been carried out. A number of plant enhancements have been made. The safety case for return to service has been assessed and agreed by ONR.

40. Potential issues related to a previously known in-service degradation mechanism that could affect specific sections of the boilers are being addressed by the station. Any justification for continued operation will be supported by a robust safety justification, which ONR will assess prior to return to service of either reactor.

41. Due to the prolonged shutdown of Reactor 21, the station has proposed deferral of the Reactor 21 2020 Outage, which was due to start in September, to January 2022. ONR are assessing the associated safety case.

4 REGULATORY ACTIVITY

42. 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.

43. ONR issued an enforcement letter on the 8 January 2020 which was in response to a number of conventional health and safety incidents that occurred at the station involving contractors between October and November 2019. During this period, the station responded to ONR's letter and has provided an action plan to address the findings. The site inspector is content with the station's plan and will monitor the implementation of it.

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

Date	Type	Ref No	Description
07 July 2020	Letter	2020/185660 - DNB71334R	Enforcement letter - Dungeness B PSSR Compliance Issue
04 September 2020	LI 565	2020/252339 - DNB71336N	LI 565 - Agreement to NPSC 7798 Under LC22(1)
08 September	Letter	2020/264904 - DNB71337N	Review and consideration of np/sc 7256 addendum 1, rev 000: addendum to: a revised depressurisation safety case for an 'at power' reactor

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)

ONR is 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.

As COVID-19 restrictions change, our focus is on the preparedness for the weeks and months ahead and maintaining safe and secure operations in the face of any further escalation in COVID-19 transmission.

ONR staff continue to work at home, primarily. We are increasing our on-site regulatory work in accordance with public health advice. We'll also continue to inspect, assess and permission remotely where necessary to protect staff, workers on site, and the public around sites.

Enforcement Action

In July we publicised the serving of an Improvement Notice on Rolls-Royce Submarines Ltd (RRSL) for procedural safety breaches at its Derby site. The notice was served after shortfalls were identified against the safety case requirements at a nuclear fuel production facility on the site.

In September we announced that an Improvement Notice had been served on EDF Energy Nuclear Generation Ltd (EDF NGL) for shortfalls in safety procedures at its Heysham 2 Power Station in Lancashire. The notice was served after some of the equipment which is used to measure reactor power was incorrectly configured during the reactor's restart process following a planned outage in April 2020.

In September we announced that an Improvement Notice had also been served on Devonport Royal Dockyard Ltd for shortfalls in maintenance procedures at its Plymouth site. The notice was served after Devonport Royal Dockyard failed to carry out scheduled maintenance tests on an effluent extraction system which is used to support maintenance and repair activities within the licensed site.

In September we publicised our intention to prosecute AWE plc under Section 3 of the Health and Safety at Work etc. Act (1974). The charge relates to an incident on 20 June, 2019, at the AWE Aldermaston site which resulted in a contractor narrowly avoiding injury when a flash over of electricity occurred from a 415V electrical source. The incident was a conventional health and safety matter and took place in a 'non-nuclear' building, so there was no radiological risk to workers or the public.

Regulatory updates

In July the Government published its response to the International Atomic Energy Agency's final report on the Integrated Regulatory Review Service (IRRS) mission to the UK. The IRRS mission took place between 14 – 25 October 2019 was hosted by ONR, and saw a team of 18 independent experts from across the globe scrutinising the regulation of nuclear and radiological safety.

In August we provided EDF NGL with permission for Reactor 3 at its Hunterston B site to return to service for a limited period of operation (16.425 Terawatt days, approximately six months' operation). In September we also gave permission for Reactor 4 at the same site to return to service for a limited period of operation (16.25 terawatt days, which is approximately six months operation). The decision to permission the restart of these reactors was given after extensive and detailed assessments of the respective safety cases by specialist ONR inspectors.

Corporate updates

In July we published our new 2020-25 Strategy, which sets out our direction and priorities for the next five years. It builds on our strengths and continues to focus on protecting society, and addressing the changing demands we will face as the UK's nuclear regulator.

In late September we published our Annual Report and Accounts highlighting our performance and key achievements for 2019/20.

The report notes that we continued to deliver our mission of protecting society by securing safe nuclear operations and that the majority of dutyholders have continued to meet the high standards of safety and security required. Where dutyholders have fallen short of such standards, we are satisfied that their facilities remain safe and that our regulatory focus has had a positive impact on their performance.

During the year, we completed more than 800 compliance inspections across 36 licensed sites during 2019/20, granting permission for 30 nuclear-related activities, serving three improvement notices and instigating one prosecution.

ONR Chair Mark McAllister said: “I am pleased to report that we have again delivered our mission and achieved our 2020 vision. As we look ahead, I have every confidence in our senior leadership team to see through the strategic improvement projects already underway that will enhance the organisation’s information and knowledge management system, and successfully deliver the aspirations of our new strategy.”

In September we announced that Jean Llewellyn OBE had been appointed to the ONR Board as the new Security Non-Executive member. Jean will take up her appointment on 1 October 2020 for a three year term and will Chair ONR’s Security Committee.

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