



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

Report for period 1 January to 31 March 2018

## 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/lrc/>).

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

ONR inspectors undertook inspections at Dungeness B Power Station, on the following dates during the quarter:

- 15-18 January
- 5-8 February
- 5-8 March
- 13 March

In addition to these compliance inspections, ONR security inspectors observed a Security Counter Terrorist Exercise in January.

## 2 ROUTINE MATTERS

### 2.1 Inspections

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 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.

In this period, routine inspections at Dungeness B covered the following:

- examination, maintenance, inspection and testing;
- management of operations including control and supervision;
- quality management;
- emergency preparedness;
- incidents on the site;
- staff training, qualifications and experience; and,
- conventional health and safety.

In general, ONR judged the arrangements made and implemented by the site in response to safety requirements to be adequate in the areas inspected. Where improvements were considered necessary, the licensee made satisfactory commitments to address the issues, and the site inspector will monitor progress during future visits. Where necessary, ONR will take formal regulatory enforcement action to ensure that appropriate remedial measures are implemented to reasonably practicable timescales.

In addition to our compliance inspections based on the conditions attached to the nuclear site licence, ONR inspectors also inspect 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 twenty-five 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 believes that this will provide more robust assurances of the site's safe operation and how the safety case is being implemented.

Within this period ONR conducted two systems based inspections: Reactor safety systems and Decay store systems. In both cases the ONR inspection team confirmed that the systems were being maintained and operated in accordance with the requirements of the safety case. Minor observations were raised during the Decay store system based inspection, relating to training and operating limits and conditions. The station has initiated action to address the shortfalls.

During this quarter, ONR also conducted a themed inspection on engineering governance. ONR inspection team judged that Dungeness B Power Station's engineering governance processes provide sufficient oversight and the arrangements ensure suitable training is provided to engineering personnel.

The inspection examined the effectiveness of Dungeness B's Engineering Department self-governance (internal checks and referencing to required standards) as well as any involvement of NGL's Central Technical Organisation in providing oversight of Station's engineering delivery processes and adherence to standards. ONR considered that compliance with central fleet engineering processes such as system walk-downs and equipment reliability reviews was adequate. Company technical standards are used as intended; however, compliance with company standards could be further enhanced by the use of systematic reviews or gap analysis of plant systems against technical guidance notes.

In February, the site inspector conducted a LC11 compliance inspection, examining Dungeness B's arrangements for dealing with any accident or emergency arising on the site. The inspection focussed on emergency scheme roles, training and sampled the emergency response facilities to confirm condition and availability.

In summary, the station is effectively capturing and utilising learning from exercises, assurance activities and through workshops. In the main the facilities visited were functional but a number of improvements are still required associated with equipment storage and layout. Succession planning is in place for emergency scheme role holders, but improvement is required in training compliance. The minor deficiencies found have been actioned through a regulatory issue and adequate progress was witnessed during the March inspection.

In addition to the LC11 compliance inspection, ONR security observed Dungeness B's planned Counter Terrorist Exercise. The scenario was considered to be challenging and a successful demonstration of the station capability was observed. Observations were fed back to the station for incorporation into their learning action plan and further interventions by ONR have confirmed satisfactory close out of actions.

## **2.2 Other work**

### **2.2.1 Pressure Systems Safety Regulations**

In March, ONR conducted a follow up inspection on Dungeness B's Pressure Systems Safety Regulations (PSSR) compliance arrangements. During an ONR inspection in November 2016 a number of significant shortfalls were identified, notably that the licensee was not able to demonstrate a robust process of acting upon non-imminent danger defects and recommendations contained within the competent person examination report. ONR wrote to the station requesting improvement in this area and resolution of the actions raised during the initial inspection. This follow up inspection was to confirm appropriate action had been taken to address these shortfalls.

From the evidence sampled during the inspection in March, ONR confirmed that enhancements had been made in the governance and oversight arrangements, system engineers are reviewing the examinations reports in a timely manner and the general awareness across the station of PSSR requirements has increased. ONR judged that the station has addressed the shortfalls identified within ONR's letter and no formal regulatory action is required.

### **2.2.2 Periodic Safety Review**

ONR has completed its assessment of EDF NGL's third Periodic Safety Review (PSR3) submission of the Dungeness B; which was formally submitted to ONR 31 January 2017. The EDF NGL PSR3 submission provides substantiation for a further ten year period of operation, subject to completion of EDF NGL's PSR3 action plan and resolution of ONR's findings.

ONR along with EDF NGL are aware of the challenges faced with Dungeness B station in relation to graphite weight loss, boiler tube integrity and general plant condition. In response to these challenges ONR acknowledges that NGL is delivering significant investments at Dungeness B, such as the updated nitrogen storage and injection system, the boiler modifications and other general plant condition improvements. ONR will continue to monitor timely delivery of these essential improvements which will be needed to support safe operation of the plant through to the end of electrical generation.

### **2.2.3 Safety improvement permissioning activities**

#### ***Nitrogen Plant***

Dungeness B are in the process of replacing a proportion of their Nitrogen Injection System (NIS) (the secondary safety hold-down system required for specific fault scenarios in the event of the control rods not inserting for reactor shutdown). The existing plant for the supply of the nitrogen is aging and is a challenge to maintain. A new nitrogen storage and vaporisation plant and nitrogen supply pipelines are being installed to modern standards. The new plant is similar to that fitted at Hinkley Point B and Hunterston B and should improve the reliability and safety performance of the NIS.

#### ***Boiler Lifetime Modifications***

A number of modifications were identified during the Dungeness B plant life extension (PLEX) work to mitigate against the effects of graphite weight loss and the increased likelihood of boiler tube failure as the Dungeness B plant ages. These modifications should reduce the likelihood of boiler tube failure and reduce the consequences should a failure occur. Both ONR and EDF recognise that these are important modifications to support the Dungeness B plant through the 2020's to end of generation. Therefore ONR are looking for timely completion of the modifications to ensure that the maximum safety benefit is gained. The work should be completed by 2021.

### **2.2.4 Boiler tube leak safety case anomaly**

Late in December, Dungeness B reported a safety case anomaly related to the Boiler tube leak safety case. This safety case anomaly was identified as part of the on-going development of the boiler lifetime modifications. The production of a 3D model provided NGL with an improved understanding of the general arrangements for the gas circulator duct region.

As a result, it has been identified that contrary to what NGL has assumed previously in the safety case, water could potentially collect in the inlet region of the gas circulators and challenge safety case claims for forced and natural circulation in the event of a boiler tube failure and subsequent water ingress. Dungeness B has written an interim justification for continued operations and has made changes to operator actions in response to a boiler tube leak event. ONR are engaging on the development of the safety case and are intending to assess the modified safety case and its implementation.

### 3 NON-ROUTINE MATTERS

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.

During this period, the site inspector reviewed a number of incidents that met the criteria for routine reporting to the 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. Matters and events of particular note during the period were:

Late in December, ONR was informed of an automatic trip on Unit 21. The Unit tripped whilst changing over Unit Supplies (electrical), as part of the unit load raise. Initial indications identify a fault with a relay switch in the unit electrical switchboard, this was later confirmed to be a defected spring within the relay switch. All post trip interlocks operated without any failures and the unit was shut down safely. An investigation has been completed and corrective action taken to prevent re-occurrence. ONR Electrical specialist inspector judged that appropriate action had been taken and no further regulatory action is required.

In January, during a load reduction and transfer from main feed to low load feed, superheat was observed to fall. The superheat continued to fall, therefore the decision to manually shutdown the unit was taken. All post trip interlocks worked correctly and the unit was shut down safely. The superheat can be difficult to monitor and manage if the boiler gas outlet and feed water trim valves are set to auto as required by the operating instruction. The operating instruction is being reviewed as a result of the investigation. ONR intend to follow up on whether there is any additional learning from recent events relating to operational practices.

In February, a reactor zone control channel gas outlet thermocouple reading was rejected from the channel zone average. Following a refuel outage a number of gas valve moves are required; and in this instance two were deferred during load raising. These were averaging zone rod channels, therefore the deferral resulted in a thermocouple reading being rejected. The rejection resulted in initiation of safety protection measures. Throughout the event, operations remained within the safety case with sufficient defence in depth and an investigation has been completed. Amendments are being made to the operating instructions and training material. ONR intend to follow up on whether there is any additional learning from recent events relating to operational practices.

In February, investigations into the failure of Gas Circulator 22 Lubrication Oil Pump 'A' identified that a maintenance schedule requirements for the 6 yearly overhaul of 415v Normal Supplies Switchgear had not been completed during the 2017 Statutory Outage. Extent of condition was considered and action taken to address other missed maintenance on impacted switchgear. The overhaul of the switchgear on both gas circulators was undertaken. Sufficient defence in depth remained through additional lubrication oil pumps and on discovery the lube oil system was switch to stationary seal in line with safety case requirements to enable disclaiming of the faulty pump. ONR has followed up at the station and action taken to date is deemed appropriate. The station is reviewing plant maintenance schedule arrangements and the effective implementation.

### 4 REGULATORY ACTIVITY

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.

No LIs or Enforcement Notices were issued during the period.

## **5 NEWS FROM ONR**

In January, ONR received the results of its first external stakeholder survey which was undertaken by YouGov on behalf of ONR. A broad range of stakeholders were invited to participate in an online survey, with 351 responses received. In addition to the online survey, a number of in depth interviews were also completed with stakeholders. While overall the results demonstrate ONR is seen as a high performing organisation with good levels of stakeholder confidence, there are areas where improvements can be made and we will be working with our divisions on those in the coming months. Further details about the survey results can be found in our March 2018 newsletter which is available on [ONR's website](#).

In February, ONR held its first webinar following the publication of the 'Guide to enabling regulation in practice.' Chief Nuclear Inspector, Mark Foy and Deputy Chief Inspector, Mike Finnerty, were on hand to answer questions about the guide which has been designed to illustrate working examples of enabling regulation in practice. This is a new channel of communication for ONR and we'll be holding further webinars on different topics over the coming months. If you would like to join future webinars then please get in touch with the ONR Communications team via [contact@onr.gov.uk](mailto:contact@onr.gov.uk)

In March, ONR held the first of two meetings this year with representatives from across the NGO community. Held in Birmingham, the meeting was attended by 15 NGO representatives from 11 different organisations. Topics discussed included: Domestic Safeguards pending the withdrawal of the UK from Euratom; Emergency Planning Arrangements; and the ONR Stakeholder Survey results. The next meeting is scheduled to take place in October 2018. We are keen to increase the number of people engaging with ONR on nuclear safety and security issues and would like to invite members of SSGs, and LCCs to join our engagement programme. For more details please get in touch via [contact@onr.gov.uk](mailto:contact@onr.gov.uk)

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>).

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