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Deferral of Reactor 2 Statutory Outage to 25 July 2016

EDF Energy Nuclear Generation Limited (NGL) request for an extension to the operating period of Hartlepool Reactor 2 by 101 days until the next Statutory Outage in July 2016

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EXECUTIVE SUMMARY

Title

EDF Energy Nuclear Generation Limited (NGL) request for an extension to the operating period of Hartlepool Reactor 2 by 101 days until the next Statutory Outage in July 2016.

Permission Requested

EDF Energy Nuclear Generation Limited (NGL), the operator (known as the licensee) of Hartlepool power station, has requested agreement from the Office for Nuclear Regulation (ONR) to extend the operating period of Reactor 2 from 16 April 2016 up to 25 July 2016. NGL has identified a target date of 25 June 2016 to commence Reactor 2 shutdown, but has added a contingency to account for any unforeseen circumstances.

This agreement is required by Licence Condition 30(2) of its nuclear site licence.

Background

The periodic shutdown of nuclear reactors operated by NGL is a requirement of Licence Condition 30. At Hartlepool, statutory outages are undertaken at 3-year intervals in accordance with the approved maintenance schedule preface. A key element of these shutdowns is to inspect and maintain systems, structures and components; particularly when these activities cannot be carried out when the reactor is at power.

ONR's consent for Reactor 2 start-up following its last statutory outage was given on 16 April 2013 (Licence Instrument 545). NGL has submitted a request to ONR to permission an extension of the operating period of Reactor 2 until 25 July 2016. The basis for this request being the conflict of availability of essential contract staff and resources with other statutory outages, and the challenges this would bring to maintaining the high standard of nuclear safety in light of these resources.

Assessment and inspection work carried out by ONR in consideration of this request

ONR specialist inspectors in Structural Integrity, Civil Engineering, Mechanical Systems, Graphite, Electrical Systems, Control & Instrumentation Systems, Internal Hazards, Radiation Protection and Management Systems assessed the safety justification, written by the licensee, to confirm that there were no issues that would prevent agreement by ONR to the requested operating period extension.

Matters arising from ONR's work

No matters preventing issue of this Licence Instrument arose from the assessment of the licensee's safety justification by ONR inspectors.

Conclusions

ONR's assessment of the licensee's safety justification together with work by an ONR project inspector, provide confidence that it is safe to operate Hartlepool Reactor 2 until 25 July 2016.

Recommendation

I recommend that a Licence Instrument is issued to agree to EDF Energy Nuclear Generation Limited extending the operation of Hartlepool Reactor 2 until 25 July 2016.

LIST OF ABBREVIATIONS

ALARP	As low as reasonably practicable
APEX	Appointed Examiner
BSL	Basic Safety level (in SAPs)
BSO	Basic Safety Objective (in SAPs)
CLA	Component Life Assessment
CNS	Civil Nuclear Security (ONR)
EA	Environment Agency
EC	Engineering Change
HOW2	(Office for Nuclear Regulation) Business Management System
HRA/HAR	Hartlepool Power Station
HSE	The Health and Safety Executive
IAEA	The International Atomic Energy Agency
INSA	Independent Nuclear Safety Assessment
LC	Licence Condition
LI	Licence Instrument
NGL	EdF Energy Nuclear Generation Limited
ONR	Office for Nuclear Regulation
PCER	Pre-construction Environment Report
PCPV	Pre-stressed Concrete Pressure Vessel
PSSR	Pressure System Safety Regulations
PSA	Probabilistic Safety Analysis
RGP	Relevant Good Practice
RPV	Reactor Pressure Vessel
SAP	Safety Assessment Principle(s)
SFAIRP	So far as is reasonably practicable
SSC	Structure, System and Component
TAG	Technical Assessment Guide (ONR)

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1 PERMISSION REQUESTED

1. EdF Energy Nuclear Generation Limited (NGL), the operator and Licensee of Hartlepool nuclear power station, has written to the Office for Nuclear Regulation (ONR) requesting an Agreement for an extension of the Reactor 2 operating period up to 25th July 2016. NGL has identified a target date of 25th June 2016 to commence Reactor 2 shutdown, but has added a contingency to account for any unforeseen circumstances.
2. This permission is requested under licence condition 30(2) of Hartlepool power station's nuclear site licence.

2 BACKGROUND

3. Under the nuclear site licence, the licensee has the ability to request an extension to an operating period by submitting a request to ONR. ONR can assess this submission (which includes justification for extending the operating period) and can provide the licensee with an agreement to the extension of the operating period.
4. On 1st April, NGL submitted this request (Ref 1) requesting permission to extend their shutdown until 25th July 2016. NGL's intention is to begin their outage on 25th June 2016. This is an extension by a period of 101 days with included suitable contingency.
5. NGL has requested this extension of the operating period in order to avoid clashes with the statutory outages of other reactors. They state that this will enable the effective management of station resources and thereby ensure the optimum availability of outage personnel.
6. NGL have included in their submission a Category 2 Engineering Change (EC) justifying the extension to Reactor 2's operating period. This has been undergone an independent nuclear safety assessment (INSA) and the approval statement was provided along with the request letter (Ref 2). Outstanding commitments excluded from the INSA statement have been satisfactorily closed out.

3 ASSESSMENT AND INSPECTION WORK CARRIED OUT BY ONR IN CONSIDERATION OF THIS REQUEST

7. I have considered NGL's request for ONR agreement to the extension of the Hartlepool Reactor 2 operating period. I have:
 - Utilised the services of ONR specialist inspectors, whom the Delivery Management Group (DMG) leads and nominated site inspector identified and which they considered covered the disciplines necessary to make an informed, proportionate judgement
 - Determined the views of the ONR nominated site inspector
 - Reviewed supporting information
 - Reviewed the Project Assessment Reports relating to the deferral of Reactor 2 in 2013 and the return to service of Reactor 2 in 2013 following its periodic shutdown.
8. Requests for extensions to reactor operating periods are not novel and similar requests have been submitted to ONR for agreement in the past using similar arguments.

9. ONR has undertaken a high level review of NGL's EC (Ref 3) to identify any significant change to the assessed nuclear safety risk. The review identified that the following areas should be subject to a limited assessment:
 - Electrical Engineering
 - Control and Instrumentation (C&I)
 - Structural integrity
 - Civil engineering
 - Graphite
 - Site inspection (including conventional safety aspects)
10. The decision to proceed using a scoping ONR assessment was agreed within the programme on the basis that it had been used in the past for similar requests and was in line with guidance provided in HOW2.
11. In addition to the nuclear safety assessments, I sought the opinion from ONR's Civil Nuclear Security site inspector to ascertain whether there were any aspects of the extension to the Reactor 2 operating period that may have an impact on ONR's decision. The CNS site inspector had no objections to the extension of the operating period of Reactor 2 (Ref 4).
12. I have also taken note of the INSA statement, which states that two commitments would be required to support the request for a licence instrument. The first was to review the Component Life Assessment (CLA). The CLA is a programme of work to determine the remaining structural life of their components through the use of modelling programmes and routine inspection. The second was to obtain formal third party acceptance of the proposal to postpone written scheme of examination inspections.
13. I am content that these commitments have been addressed (see section 3.7).
14. The principle safety claims within the EC were:
 - With the proposed deferral, the Hartlepool R2 period of operation at power since its last statutory outage will be less than 3 years.
 - Deferring the statutory outage has minimal impact on known degradation mechanisms and does not create a significant increase in risk;
 - There are no time dependant issues in committed inspection programmes of current safety cases which are significantly affected by this proposal (including previous return to service ECs);
 - The nuclear safety risk associated with this proposed deferral is As Low As Reasonably Practicable (ALARP);
15. I have provided a summary of the findings from each of the technical specialists identified below.

3.1 ELECTRICAL ENGINEERING

16. The electrical engineering specialist inspector has reviewed (Ref 5) the proposal for deferral and carried out assessment of EC355394 and EC 355782. Based on the specialist's review of the ECs, the proposed deferral of the R2 2016 Statutory Outage should not significantly impact on electrical systems and equipment and does not in their judgement have a significant effect on nuclear safety.

17. The specialist inspector was satisfied that NGL had presented due diligence in identifying the implications of the deferral and consulted the appropriate SQEP resources within the station and wider NGL technical support organisation.
18. The specialist noted the commitment for NGL to assess where maintenance schedule activities may be exceeded at subsequent outages and was satisfied with the argument constructed for the gas circulator jacking oil pump motors to remain in service beyond the 3 year period already justified (EC337656). The specialist was satisfied that the deferral would not impact on the jacking oil pump motors in question.
19. The specialist concluded that from an electrical engineering perspective, was satisfied with the claims, arguments and evidence presented in the submission and did not have any objections to the extension of the operating period to the date requested, that is no later than 25th July 2016.

3.2 C&I

20. The C&I specialist inspector reviewed (Ref 6) the proposal for deferral and considers that the impact of the deferral on any increase of known degradation mechanisms will be minimal.
21. The inspector therefore concluded that he had no objection to the deferral of the HAR R2 periodic shutdown.

3.3 STRUCTURAL INTEGRITY

22. The Structural Integrity inspector has reviewed (Ref 7) the proposal and concentrated on items that have the highest safety significance using knowledge of structural integrity issues at Hartlepool based on the structural integrity assessment of the previous outage.
23. The specialist inspector reviewed the CLA and given that the CLA would be re-assessed prior to the deferral, was satisfied that no further assessment of this would be required.
24. The specialist inspector reviewed the impact of the delayed outage on the maintenance schedule activities. Most of the deferred inspections he considered were weld inspections, Boiler Closure Unit inspections and flow assisted corrosion inspections. Based on the evidence presented, the inspector did not expect the proposed deferral would significantly increase the risk of failure of these items.
25. Finally, the inspector examined the creep life programme. The creep life review identified a number of welds which required inspection at the 2016 outage. Assessment of the operating hours has indicated that due to forced outages, deferral until July 2016 would not invalidate the assessment and therefore the inspector did not expect that the proposed deferral would significantly increase the risk of failure of these welds.
26. The inspector concluded that he was satisfied with the claims, argument and evidence laid down within the licensee's safety case and has not identified any structural integrity issue which would make the outage deferral unacceptable.

3.4 CIVIL ENGINEERING

27. The Civil Engineering Specialist has reviewed (Ref 8) the request for deferral of the HRA R2 outage and confined his review to the Pre-stressed Concrete Pressure Vessel (PCPV) and its associated Maintenance Schedule (MS) activities (Schedule No. 3.1).
28. NGL has designated an Appointed Examiner (APEX) as the company officer to undertake duties and independent analysis of maintenance schedule activities associated with the PCPV. The specialist is content that the APEX's opinions have been included in the EC.
29. The specialist considered the effect of the deferral on PCPV tendon replacement, noting that a number of tendons are due for replacement during the periodic shutdown. The specialist considered the history of the tendon corrosion for this reactor and was content that an increase in risk of wire breakages will not significantly impact on nuclear safety due noting the significant margins in the design.
30. The specialist therefore considered that NGL has given adequate consideration to the potential safety implications (if inadequately conceived or executed) of the proposed deferral and has no objections to the extension of the operating period of Reactor 2 for a maximum of 101 days.

3.5 GRAPHITE

31. The graphite specialist inspector has reviewed (Ref 9) the graphite core aspects of the proposal to defer the Hartlepool Reactor 2 outage by 101 days. The specialist inspector judged that there is sufficiently large margin on the proposed limit of core irradiation that this deferral will not significantly impact on the nuclear safety requirements of the Reactor 2 core.

3.6 SITE INSPECTION

32. The site inspector has reviewed (Ref 10) the proposal for deferral and judged that NGL has applied a systematic process to identify the potential safe implications of the deferral. The site inspector was satisfied that the justification was supported by appropriate claims, arguments and evidence and that alignment of outage windows is necessary to ensure effective management by NGL of supply chain specialist resource.
33. The site inspector reviewed the station's Action Tracking Log used to monitor the availability of plant and equipment. The inspector was satisfied that the availability of systems that may affect safety is being managed in accordance with the station's limits and conditions of operation and has no objection to the deferral of the 2016 Reactor 2 periodic shutdown.

3.7 COMMITMENTS MADE WITHIN THE EC

34. I reviewed the proposal to defer the outage by 101 days and reviewed the commitments. Two commitments were made:
 - Review the Component Life Assessment programme prior to the original outage start date to ensure there are no components outside their tolerated predicted remaining life.
 - Obtain formal acceptance by the Third Party Independent Competent Persons to endorse postponement of the WSE inspections

35. I requested an update from station as to whether the first commitment had been completed and I received a response indicating that it had been performed and no components were shown to be above the tolerable predicted damage levels (Ref 11)
36. A letter was received from NGL (Ref 12) for the endorsement of postponement of the WSE inspections by the independent component person therefore I am satisfied that both of these commitments have been addressed appropriately.

3.8 OTHER GOVERNMENT DEPARTMENT LIAISON

37. The views of the nominated Environment Agency Site Inspector were sought over the proposed extension to the operating period of Reactor 2 and they did not have any objections. (Ref 13).

4 MATTERS ARISING FROM ONR'S WORK

38. No issues preventing issue of this LI arose from the assessment of the Licensee's safety justification by ONR inspectors, the EA inspector or me.

5 CONCLUSIONS

39. ONR's assessment of the Licensee's safety justification, together with the work of the ONR nominated site inspector, provides confidence that it is safe to operate Hartlepool Reactor 2 up to 25th July 2016.

6 RECOMMENDATIONS

40. I recommend that the Superintending Inspector:
- Signs this Project Assessment Report to confirm acceptance for the technical and regulatory arguments that justify issuing of Hartlepool Licence Instrument 558.
 - Signs Hartlepool Licence Instrument 558, an Agreement under Licence Condition 30(2) to extend the operating period of Reactor 2 from 16th April 2016 up to 25th July 2016.
 - Signs this Project Assessment Report approving its release for publication, after redaction where appropriate.

7 REFERENCES

1. Hartlepool – Proposal to Defer the 2016 R2 Periodic Shutdown – Request Letter – TRIM 2016/138736
2. INSA statement for the proposal to defer the 2016 statutory outage of Reactor 2 at Hartlepool – TRIM 2016/138736
3. Proposal to Defer the 2016 Statutory Outage of Reactor 2 at Hartlepool EC 355394 001 Proposal Version No. 03 – TRIM 2016/138736
4. NGL proposal for deferral of Reactor 2 at Hartlepool 2016 – CNS consultation – TRIM 2016/140955
5. Hartlepool R2 2016 Statutory Outage Deferral – Electrical Engineering Note NSL HRA 51103R EC355394 EC355782 – 6 April 2016 - TRIM 2016/145878
6. Hartlepool – Proposal to defer the 2016 R2 periodic shutdown – C&I assessment TRIM 2016/149202
7. File Note, Hartlepool Power Station, Reactor 2 Deferral of 2016 Outage, Structural Integrity Assessment TRIM 2016/146852
8. Hartlepool - Proposal to Defer the 2016 R2 Periodic Shutdown - Civil Engineering judgement – TRIM 2016/143690
9. Hartlepool R2 101 day deferral 2016 – Graphite review – TRIM 2016/145018
10. Hartlepool R2 Periodic Shutdown – Outage Deferral – E-mail from Site Inspector to Project Inspector – 8 March 2016 TRIM 2016/149322
11. Hartlepool R2 2016 Periodic Shutdown – Outage deferral EC – Response to question – Structural Integrity – Remnant Life TRIM 2016/144197
12. HRA R2 2016 Statutory Outage deferral LI request – postponement letter from PSSR CP TRIM 2016/150963
13. NGL proposal for deferral of Reactor 2 at Hartlepool – EA response – TRIM 2016/144943