



Sizewell B Dry Fuel Store

Office for Nuclear Regulation Justification for Granting Agreement
to Allow Sizewell B Dry Fuel Store Processing
to Move from Commissioning Controls to Normal Operations

Project Assessment Report ONR-OPF-PAR-19-001
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EXECUTIVE SUMMARY

This report justifies ONR's decision to grant agreement for implementation of the Sizewell B Dry Fuel Store operational safety case.

Permission Requested

Following completion of Sizewell B Dry Fuel Store (DFS) active commissioning with 7 Multi-Purpose Canisters loaded with irradiated Pressurised Water Reactor fuel (campaign 1), EDF Energy Nuclear Generation Limited (NGL) have requested that ONR release the regulatory hold-point, on implementation of the DFS operational safety case, allowing this facility to move from commissioning to normal operations.

Background

The requirement for NGL to seek ONR's agreement for the implementation of the DFS operational safety case was established under Regulatory Hold Point Schedule for the Sizewell B DFS project. This Hold Point is to ensure learning from DFS active commissioning has been acted on and any necessary changes made to the DFS Safety Case.

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

ONR undertook a readiness inspection to determine whether NGL had acted on learning from DFS active commissioning and updated the DFS safety case. Specifically, the inspection considered whether:

- Findings from active commissioning had been satisfactorily closed out; and
- Requirements from the Dry Fuel Store safety case Stage Submission 1 Revision 2 had been implemented, covering:
 - ◆ Review of changes made between Stage Submission 1 Rev 1 and Rev 2
 - ◆ Maintenance requirements for Dry Fuel Storage equipment when not in use and preparations for mobilisation,
 - ◆ Monitoring of dry stored fuel integrity,
 - ◆ Station's organisational capability and resilience for future Dry Fuel Store campaigns.

ONR also evaluated NGL's own Independent Nuclear Assurance (INA) requirements for release of INA Hold Point 9 prior to commencement of DFS campaign 2 scheduled to take place during the first quarter of 2020.

Matters arising from ONR's work

ONR's readiness inspection confirmed that learning from DFS active commissioning had been implemented, with improvements to operating processes justified by appropriate safety justification. The inspection also found that NGL had undertaken a suitable review of the DFS safety case and had made substantial preparations in readiness to implement the safety case. The inspection found that NGL had effective arrangements to manage the remaining work, including plant modifications, DFS procedures and issuing maintenance requirements for DFS equipment mobilisation. This remaining work is being effectively monitored by INA via hold point 9 to ensure completion before commencement of further fuel transfers into the store.

Conclusions

In consideration of ONR's findings, satisfactory progress was considered to have been made to allow ONR to issue agreement for implementation of the Sizewell B DFS operational safety case. INA Hold-Point 9 ensures outstanding work will be completed before commencement of DFS campaign 2.

Recommendation

It is recommended that ONR issues Licence Instrument 556 under LC 22, giving ONR's agreement to the implementation of Sizewell B DFS Safety Case 7575 Stage Submission 1 Revision 2 allowing this process to move from commissioning to normal operations.

LIST OF ABBREVIATIONS

DAP	Duly Appointed Person
DFS	Dry Fuel Store
MPC	Multi-Purpose Canisters
MOC	Management of Change
NGL	EDF Energy Nuclear Generation Limited
ONR	Office for Nuclear Regulation
PAR	Project Assessment Report
TQs	Technical Queries

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1 PERMISSION REQUESTED

1. This Office for Nuclear Regulation (ONR) Project Assessment Report (PAR) sets out regulatory views and judgments in consideration of EDF Energy Nuclear Generation Limited's (NGL's) request for ONR's agreement to allow Sizewell B Dry Fuel Store (DFS) to move from commissioning to normal operations.

2 BACKGROUND

2. The requirement for NGL to seek ONR's agreement to move from commissioning to normal operations is established through Regulatory Hold Point Schedule (Ref 1) for the Sizewell B DFS project. This Hold Point is to ensure learning from DFS active commissioning has been acted on and any necessary changes made to the DFS Safety Case.
3. The ONR DFS Regulatory Hold Point Schedule was developed in line with NGL's Independent Nuclear Assurance (INA) Assessment Programme Scope document (Ref 2).
4. NGL completed DFS active commissioning on 17 June 2017, with the loading of 7 Multi-Purpose Canisters (MPC), each containing 24 irradiated Pressurised Water Reactor fuel elements. Following this NGL issued its DFS Post Active Commissioning Report (Ref 3) in January 2018 confirming that all DFS equipment and operations had been successfully tested and commissioned during active commissioning with only a few minor areas for improvement identified. NGL undertook a review of the DFS Pre-Operational Safety Case, Stage Submission 1 Revision 1 (Ref 4) with an updated version issued under the title DFS Operational Safety Case, Stage Submission 1 Revision 2 (Ref 5). This is a Category 1 safety submission given potential safety consequences should the safety case be inadequately conceived or executed.
5. NGL submitted its DFS Operational Safety Case (Ref 5) to ONR under covering letter (Ref 6) dated 12 October 2018. This requested ONR's agreement to the DFS Operational safety case, allowing the DFS to move from commissioning to normal operations. This agreement is under Licence Condition (LC): 22 Modification or Experiment on Existing Plant under NGL's arrangements, Company Specification GEG/SPEC/DAO/020 Revision 006, Titled Modification Process (Ref 7).
6. NGL supported the application by confirming DFS Operational Safety Case had been assessed by NGL's INA Department and an Independent Nuclear Safety Assessment Certificate (Ref 8) issued confirming the case complied with regulatory requirements and company standards. The DFS Operational Safety Case was also submitted to NGL's Nuclear Safety Committee for review and endorsed at meeting 08/18, held on 2 August 2018, (Ref 9).

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

7. ONR undertook a readiness inspection to determine whether NGL had acted on learning from DFS active commissioning and updated the DFS safety case. Specifically, the inspection considered whether:
 - Findings from active commissioning had been satisfactorily closed out; and
 - Requirements from the Dry Fuel Store safety case Stage Submission 1 Revision 2 had been implemented, covering:
 - ◆ Review of changes made between Stage Submission 1 Rev 1 and Rev 2
 - ◆ Maintenance requirements for Dry Fuel Storage equipment when not in use and preparations for mobilisation,
 - ◆ Monitoring of dry stored fuel integrity,
 - ◆ Station's organisational capability and resilience for future Dry Fuel Store campaigns.

8. Consideration was also given to requirements INA had imposed on the Sizewell B DFS project with INA Hold Point 9 to allow commencement of DFS campaign 2, which is scheduled to take place in the first quarter of 2020.

4 MATTERS ARISING FROM ONR'S WORK

9. ONR Intervention Record (Ref 10) sets out the regulatory approach and findings from the readiness review, with these summarised below.

4.1 Close Out of Dry Fuel Store Active Commissioning Findings

10. ONR's intervention findings confirmed that lessons learnt from DFS active commissioning had been identified and acted on, with changes made to processing parameters for trace elements when flushing MPCs in preparation for fuel drying. These were justified by modification proposals reviewed by NGL's INA department.
11. Samples of Technical Queries (TQ) raised during active commissioning were reviewed by ONR. Inspectors found that TQs had been evaluated with suitable justification produced and solutions submitted to the Testing and Commissioning Panel for consideration and approval.
12. A review of progress of DFS modification proposals and updates to instructions found that good progress was being made but there was some outstanding work which was being managed through tracking sheets linked to requirements in INA's Assessment Programme Scope (Ref 2) for release of hold point 9 required for commencement of DFS campaign 2.

4.2 Review of Changes made between Stage Submission 1 Rev 1 and Rev 2

13. ONR's evaluated changes made to DFS safety case through review of Reference 5 and structured discussions with the DFS SS1 Rev 2 Safety Case Officer and Sizewell B Responsible Engineer. The Safety Case Officer confirmed each section of the DFS Pre-Operational Safety Case had been reviewed based on findings from active commissioning and input from NGL's Central Technical Organisation's (CTO) Subject Matter Experts. (Ref 11) gives a summary of the updates to the DFS SS1 Rev 1 Safety Case).
14. I have reviewed these changes and am satisfied that none of the changes made effect the fundamental basis of the safety case. Furthermore, I am satisfied that these changes do not have a material effect on ONR's assessment of the DFS SS1 Rev 1 Safety Case undertaken in 2016 (Ref 14) and judge that detailed assessment of DFS SS1 Rev 2 is not necessary.

4.3 Dry Fuel Store Equipment Maintenance Requirements

15. ONR's inspection of maintenance requirements for DFS confirmed good progress in developing equipment maintenance instructions based on original equipment manufacturer and NGL requirements had been made. All maintenance requirements for nuclear related equipment were in place, although requirements for campaign mobilisation need to be completed. This was an identified deliverable in the INA Assessment Programme Scope (Ref 2) for releasing hold point to commence DFS campaign 2.

4.4 Monitoring of Fuel Placed into Dry Store

16. ONR's readiness inspection confirmed monitoring of fuel placed into dry storage was in place, with Surveillance Programme 14 in operation and Thermal and Corrosion Expert Panels meeting on a regular basis. A review of meeting minutes found monitoring data was being reviewed and acted on. It was noted that NGL had good correlation between thermal data gathered from DFS Thermal Differential Monitoring System and NGL thermal hydraulics computer model CONCORD for external top and bottom MPC temperatures.

4.5 Adequacy of Station's Organisational Capability and Resilience to Carry Out Future Dry Fuel Store Campaigns

17. The review of DFS organisational capability and resilience focused on arrangements set out in Section 16 of DFS Operational Safety Case (Ref 5) supported by Management of Change (MOC) (Ref 12).

18. The MOC established DFS campaign delivery as the responsibility of Station's Strategic Outage Manager, with the DFS Campaign Group Head (new Sizewell B Nuclear Base Line post) responsible for delivering each DFS campaign supported by NGL's Investment Delivery Group.
19. DFS campaign delivery was to be managed in the same manner as reactor refuelling outages, with a DFS Pre-Outage Milestone Programme developed 2 years before a DFS campaign takes place.
20. NGL confirmed a contract had been placed with Holtec to supply resources for DFS operations, with the Sizewell B Fuel Route Duly Appointed Person (DAP) responsible for maintaining safe control of operations. During active commissioning Fuel Route DAP resources had been limited and Station had increased the number of approved Fuel Route DAP from 4 to 7 to support DFS delivery.
21. Training of DFS operational staff for future campaigns would use the same approach as adopted for active commissioning, with all staff receiving classroom and field training followed by formal assessment. This would be reinforced through DFS mobilisation where equipment would be tested and operators made aware of operations.

4.6 Consultation within ONR and Other Regulatory Bodies

22. Internal consultation with ONR's Sizewell B Civil Nuclear Security Inspector confirmed that security arrangements for DFS process are adequate. The Security Inspector had no objection to ONR issuing agreement to allow Sizewell B Dry Fuel Store (DFS) move from commissioning to normal operations (Ref 13).

5 CONCLUSIONS

23. Based on discussions with NGL staff and evidence gathered during the DFS readiness inspection the following views have been reached:
 - In considering learning from DFS active commissioning:
 - ◆ The intervention confirmed learning from active commissioning had been acted on and implemented, with changes made to DFS operating parameters with suitable safety justification. TQs have been addressed with some updates to modifications and procedures still to be completed.
 - In the case of updating and implanting DFS Operational safety case requirements:
 - ◆ A suitable review of the DFS Pre-Operational safety case has been undertaken based on learning from active commissioning.
 - ◆ Maintenance requirements for DFS equipment are in place with requirements for campaign mobilisation still to be completed.
 - ◆ Requirements for dry fuel monitoring were in place and being followed with expert panels in place and monitoring equipment operational.
 - ◆ Station's organisational capability and resilience was found to be adequate, with increased Fuel Route DAPs and management of the delivery of DFS campaigns based on processes used for reactor refuelling outages. Training of staff for DFS operations was considered adequate based on the approach used during preparations for DFS campaign 1.
24. Given that Sizewell B has demonstrated the implementation of learning and the safety case requirements for DFS operation, it is considered ONR should give agreement the DFS Operational Safety Case, allowing the facility to move from commissioning to normal operations. This decision is based on identified shortfalls of some plant modifications still to be completed, further work to complete DFS procedures and issuing maintenance requirements for DFS equipment mobilisation. All of these requirements are identified in NGL's release of INA Hold Point 9 to allow commencement of DFS campaign 2, which I am confident is sufficient oversight to ensure these activities are completed without the need for further ONR oversight.

6 RECOMMENDATIONS

25. It is recommended that ONR issues Licence Instrument 556 under LC 22, giving ONR's agreement to the implementation of Sizewell B DFS Safety Case 7575 Stage Submission 1 Revision 2 allowing this process to move from commissioning to normal operations.

7 REFERENCES

1. ONR letter Amendment of ONR Regulatory Hold Point Schedule for Sizewell B Dry Fuel Store Project, ONR Document Reference 2014/402097.
2. NGL Independent Nuclear Assurance Sizewell B Dry Fuel Store Assessment Programme Scope NGL Document Reference SRD/REP/SUR/SZB/018, ONR Document Reference 2019/79188.
3. NGL Sizewell B Dry Fuel Store Post Active Commissioning Report, NGL Document Reference SZB/REP/PD/4A732G0/012 Rev 000, ONR Document Reference 2019/79187.
4. NGL Document NP/SC 7575 Stage Submission 1 Revision 1, Sizewell B Dry Fuel Store Pre-Operational Safety Case, Stage Submission 1 Revision 1, ONR Document Reference 2016/433295.
5. NGL Document NP/SC 7575 Stage Submission 1 Revision 1, Sizewell B Dry Fuel Store Operational Safety Case, Stage Submission 1 Revision 2, ONR Document Reference 2018/358880.
6. NGL letter NSL SZB 50863R dated 12 October 2018, Request for ONR Agreement for Sizewell B Dry Fuel Store processing to move from commissioning controls to normal operations.
7. NGL Company Specification GEG/SPEC/DAO/020 Revision 006, Titled Modification Process.
8. NGL Independent Nuclear Safety Assessment Certificate for EC 353982 Rev 002, ONR Document Reference 2018/358940.
9. NGL Nuclear Safety Committee minutes from meeting 08/18, held 2 August 2018, ONR Document Reference 2018/358939.
10. ONR Intervention Record, ONR-OFD-IR-18-226, Dry Fuel Store Readiness Inspection and System Based Inspection of Sizewell B Power Station, ONR Document Reference 2019/88988.
11. NGL Document setting out Review of Sizewell B Post Operational Dry Fuel Store Safety Case Stage Submission 1 Revision 1 to Development of Operational Dry Fuel Store Safety Case Stage Submission 1 Revision 2, ONR Document Reference 2019/105643.
12. NGL Sizewell B Management of Change Dry Fuel Store Operations SZB/MOC/402, ONR Document Reference 2019/111213.
13. Email from ONR Security Inspectors to confirm no objection to ONR issuing agreement to allow commissioning to normal operations for Sizewell B Dry Fuel Store (DFS) processes, ONR Document Reference 2019/111290.
14. ONR Project Assessment Report, Assessment of Sizewell B Dry Fuel Store Post Operational Safety Case, Stage Submission 1 Revision 1, NP/SC 7575, EC 338898-1, ONR-OPF-PAR-16-010, ONR Document Reference 2016/294694,

APPENDIX 1 Regulatory Hold Point Schedule and Permissioning Activities

Project Hold Point	NGL Safety Cases	ONR Permissioning Activity
	Paper of Principle NP/SC 7575 (Addendum 1). Sizewell B Dry Fuel Store, TRIM Ref 2012/24943.	Licence Instrument 531 Requiring NGL to seek ONR's Consent before commencing active commissioning <u>Specification</u> Issued against LC21(4) ONR Project Assessment Report (PAR) ONR-CNRP-SZB-PAR-12-047 TRIM Ref 2012/363755
1	NP/SC 7575 Stage Submission 1 Rev 0 Pre-Construction Safety Case EC 338898 TRIM Ref 2012/496728 Category 1 Safety Case	No Licence Instrument Requested ONR Assessed case issuing PAR ONR-SZB-PAR-13-020 TRIM Ref 2013/238321
1B	Stage Submission 2 Construction of Dry Fuel Store Building EC 338897 Rev 0 TRIM Ref 2014/60562 Category 2 Safety Case	Licence Instrument 533 <u>Agreement</u> to commence construction of Dry Fuel Building Issued against LC19(1) ONR PAR TRIM Ref 2014/188731
2B	Stage Submission 3 Modification of Fuel Building Crane EC 340194 rev 001 TRIM Ref 2014/216548 Category 2 Safety Case	Licence Instrument 542 <u>Agreement</u> to modify Fuel Building Crane Issued against LC22(1) ONR PAR TRIM Ref 2014/112914
7	Stage Submission 4 Commencement of Inactive Testing and Commissioning EC 338509 TRIM Ref 2014/472146 Category 2 Safety Case	No Licence Instrument Requested ONR carried out joint readiness reviewed with INA issuing Intervention Record ONR-SZB-IR-15-156 TRIM Ref 2016/57698
8	NP/SC 7575 SS 1 Rev 1 Pre Operational Safety EC 338898 TRIM Folder 4.4.2.16691. Category 1 Safety Case	No Licence Instrument Requested ONR assessed case to confirm compliance with LC23(1) issued PAR ONR-OPF-PAR-16-010 TRIM Ref 2016/294694
	Stage Submission 5 Inactive Testing and Commissioning safety report EC 353982 TRIM Ref 2016/416107 Category 1 Safety Submission	Licence Instrument 551 <u>Consent</u> to commence Active Commissioning Issued against LC21(4) ONR PAR TRIM Ref 2016/399380
9	NP/SC 7575 SS 1 Rev 2 Operational Safety EC 338898 TRIM Folder 4.4.2.22545. Category 1 Safety Case	Licence Instrument 556 Agreement of Dry Fuel Store Safety Case Issued against LC23(1) ONR PAR TRIM Ref 2019/95540
	Stage Submission 5 Active Testing and Commissioning report TRIM Ref 2019/79187	