



INTERVENTION RECORD			
Unique Document ID and Revision No:	ONR-SZB-IR-15-112 Revision 0	TRIM Ref:	2015/418260
Location and purpose of Intervention:	Sizewell B Power Station ONR readiness/ compliance inspection in support of permissioning Dry Fuel Store Safety Case Stage Submission 1 Rev 1 covering radioactive waste and decommissioning		
Inspector(s) taking part in Intervention:	[REDACTED]		
Date(s) of Intervention:	3 <sup>rd</sup> to 4 <sup>th</sup> November 2015		

**PRINCIPAL STAFF SEEN**

Record Section	Organisation	Role	Name
	EDF Energy Nuclear Generation Ltd. (NGL)	[REDACTED]	[REDACTED]

(A) SYSTEM / STRUCTURES BASED INSPECTION RATINGS					
Complete this section only where a System / Structures Based Inspection takes place. If Licence Condition not applicable, enter "n/a"					
Record Section	System / Structures Based Inspection Details	Plan Name	Licence Condition (LC)	Rating	P/RUP*
	N/A				
Overall judgement that the System / Structure adequately fulfils the requirements of the safety case. Please delete "Yes" or "No" in the box provided as applicable.					

\* P = planned, RUP = reactive unplanned

**(B) INTERVENTION RATINGS**

Complete this section only where applicable, e.g. for a compliance inspection or assessment where the duty holder's arrangements are being rated. If not applicable, enter "n/a". Complete Part A in respect of System / Structures Based Inspection

Record Section	Intervention Details	Plan Name	LC/ Series Code	Rating	P / RUP*
2.1	Dry Fuel Store Project	Sizewell B IP	6	3	P
2.2	Dry Fuel Store Project	Sizewell B IP	25	3	P
2.3	Dry Fuel Store Project	Sizewell B IP	32	3	P
2.4	Dry Fuel Store Project	Sizewell B IP	34	3	P
2.5	Dry Fuel Store Project	Sizewell B IP	35	3	P

\* P = planned, RUP = reactive unplanned

**(C) INTERVENTION RATINGS - (FOR USE ONLY BY CNS & CROSS ONR PROGRAMMES)**

Complete this section only where applicable for a Security/Transport/Safeguards/Conventional Safety/Fire Inspection. If not applicable, enter "n/a". Complete Part A in respect of System / Structures Based Inspection, if applicable.

Record Section	Intervention Details	Plan Name	Series Code	Rating	P / RUP*
	N/A				

\* P = planned, RUP = reactive unplanned

## TABLE OF CONTENTS

1	EXECUTIVE SUMMARY .....	4
2	RECORD .....	5
3	ISSUES .....	9

## **1 EXECUTIVE SUMMARY**

### **1.1 Purpose of Intervention**

1. This joint Office for Nuclear Regulation (ONR) and Environment Agency (EA) inspection was carried out to support ONR's permissioning of the Sizewell B Dry Fuel Store Safety Case NP/SC 7575, SS1 Rev 1, EC 338509.

### **1.2 Interventions Carried Out by ONR**

2. This inspection targeted EDF Energy's radioactive waste and decommissioning arrangements for dry storage of fuel and was focussed on the selection of records and their management throughout the life of the dry fuel store.

3. The inspection built on ONR's assessment work undertaken on SS1, Rev 1 and addressed the following Licence Conditions (LC):

- LC6: Documents, records, authorities and certificates
- LC25: Operational records
- LC32: Accumulation of radioactive waste
- LC34: Leakage and escape of radioactive material and radioactive waste
- LC35: Decommissioning

### **1.3 Explanation of Judgement if Safety System Not Judged to be Adequate**

4. This was not a planned Safety System Inspection and so no judgement was made.

### **1.4 Key Findings, Inspector's Opinions and Reasons for Judgements Made**

5. The inspection had a positive outcome with NGL clearly demonstrating a structured and methodical approach to recording and retaining data and information for dry fuel store activities. The evidence provided and confidence given, through explanation of the radioactive waste and decommissioning arrangements, met the expectations set out in ONR guidance.

6. Data and Information recording specification for the dry fuel store has not been finalised and the system to manage dry fuel store records is still developing. These arrangements are expected to be in place for active commissioning, with the draft document and planned systems considered adequate.

7. All of the five LCs inspected against were rated as 'adequate' given that the evidence presented by EDF Energy was judged to be suitable and sufficient based on Station's arrangements and ONR's guidance.

### **1.5 Conclusion of Intervention**

8. Overall, this inspection provided the ONR specialist inspector with evidence to support ONR's assessment of dry fuel store radioactive waste and decommissioning arrangements as being implemented to the required standard.

### **1.6 Recommendations**

9. No recommendations were identified from this inspection.

## 2 RECORD

10. This is one of a series of inspections undertaken to support ONR's assessment and permissioning activities of the Sizewell B Dry Fuel Store project. NGL has presented its safety arguments and justifications in the Sizewell B Category 1 Safety Case Dry Fuel Store Operations, NS/NP 7575, EC 338898, Stage Submission 1 Revision 1 (SS1 Rev 1).

11. An ONR Inspection Commentary Document (TRIM 2015/388205) was agreed between the Environment Agency and ONR, and issued to NGL before this inspection to allow the Dry Fuel Store Project team to prepare for the intervention. The inspection was carried out in line with ONR's published Technical Inspection Guides.

12. The inspection was structured as follows:

- Overview of the dry fuel store project
- Presentation on information management arrangements to describe what is being recorded and how that is to be accomplished
- Presentation giving an overview of Sizewell B Dry Fuel Store operational radioactive waste management and environmental monitoring
- Familiarisation tour of the Fuel Building and Dry Fuel Store.
- Follow up detailed information on how the data and information recording system process and procedures are implemented.

13. Before the inspection, NGL provided relevant documents in preparation:

- Corporate arrangements for LC6, 25, 32, 34 and 35
- Current version of Dry Fuel Store Data and Information Recording Specification
- Sizewell B Power Station Lifetime records procedure SZB/MCP/005V

14. The dry fuel store project overview provided an update on progress with safety case and site documentation, and progress with dry fuel store construction. Inactive commissioning will take place before the outage in April 2016; active commissioning will take place afterwards.

15. NGL gave an explanation of the 10 year safety case revalidation, which is a separate task to the Periodic Review of Safety. The review is intended to capture developments in fuel disposability, international OPEX and UK policy. This will be further informed by a review before each dry fuel campaign.

16. No failed fuel will be loaded into the dry store. The fuel clad and cask wall provide barriers to radiation escape, and the conditions in the dry store will maintain both barriers. This is confirmed with tests before sealing the cask, in store temperature differential monitoring and corrosion monitoring. Maintaining the fuel in such a way to avoid degradation means no option for future treatment will be foreclosed.

17. Additionally, an ONR inspector attended the site PSRG, to be updated on recent safety events. This is presented in section 2.6.

### 2.1 LC6: Documents, records, authorities and certificates - IIS Rating 3

18. The inspection looked at the how records whether records held by NGL were being maintained for a suitable period to ensure that the safety case for operation is available at all times, that design and construction information is available for decommissioning, that operational records are available to assist investigations in the event of an accident. This included:

- How an accurate record of the dry fuel store inventory will be kept

- How the store is planned to be operated, maintained and managed (particularly records) following the cessation of generating options at Sizewell B
- How the condition of the stored fuel and its containers will be assured throughout the lifetime of the store.

19. In addition to compliance with LC25 (see section 2.2), the licensee provided an explanation of the SZB lifetime records arrangements, which includes retention durations for all document types.

20. The dry fuel store records are classified as Higher Activity Waste records (series 0279), and as such have a retention schedule of 150 years. The records are reviewed at the end of the retention period. The NDA record retention schedule for HAW records is indefinite. Assuming a lifetime of the dry store of 100 years and the 150 year review this is an adequate retention period. Therefore I have given an inspection rate of 3 (Adequate) for LC6.

## **2.2 LC25: Operational records - IIS Rating 3**

21. The inspection looked for compliance with NGL corporate data and information management processes, and how adequate records are kept regarding operation, inspection and maintenance of any safety-related plant. This included:

- Compliance with NGL corporate data and information management processes
- How NGL Operational Commitments from the Dry Store safety case sections 11 and 19 are being managed
- Compliance with Dry Store specific Data and Information Recording Specification along with accuracy of dry fuel store inventory.

22. NGL gave an explanation of how the corporate, site specific and project specific record management arrangements were connected. Current arrangements for irradiated fuel records have been extended to include Higher Activity Waste Arrangements i.e. additional information on the fuel assemblies is being recorded to meet HAW records arrangements. A flow chart of the records created at each stage of the dry fuel storage process was provided.

23. NGL talked through a live example of how the documents from the first dry fuel store campaign will be captured and maintained in the site management system AMS. The example complied with the management arrangements.

24. The HAW record arrangements have been assessed by RWM as part of the ILW ion exchange resins project and found to meet their requirements.

25. There are five operational commitments relating to radioactive waste and decommissioning in SS1. The Operational Commitments database is well established on the site, and has a nominated person responsible for actions. It ensures any commitments made in the safety case are complied with, and embedded in site arrangements where appropriate. The Operational Commitments database was demonstrated, and one of the SS1 commitments was shown.

26. The record arrangements capture all information that will be required for eventual disposal in a UK GDF, which will also be sufficient information should the fuel be reprocessed instead of disposed of. The AMS system is a companywide system which is regularly maintained. Any updates to the system include a check that records are accessible following the upgrade. Therefore I have given an inspection rate of 3 (Adequate) for LC25.

## **2.3 LC32: Accumulation of radioactive waste - IIS Rating 3**

27. The inspection looked for evidence that the existing Sizewell B radioactive waste accumulation arrangements and management of operational radioactive waste have been embedded in dry fuel store operations. This included:

- Brief overview of operational radioactive and non-radioactive wastes (solid, liquid and gaseous), their characterisation, monitoring and disposal routes.
- How current station procedures for the management of operational radioactive waste have been imbedded in DFS operational procedures.

28. There is no expected radioactive waste arising from operation of the dry fuel store.

29. During the plant walkdown to the Fuel Building current waste management arrangements were explained, including decontamination routine for fuel transport was also explained. In the walkdown of the Dry Fuel Store, the licensee pointed out how those waste management arrangements would be implemented. There were specific areas for Radiation Controlled Area access, accepting that the store is not expected to be a classified area.

30. The arrangements for waste management already in place in the fuel building are adequate, and their implementation in the dry fuel store was evident. Therefore I have given an inspection rate of 3 (Adequate) for LC32.

#### **2.4 LC34: Leakage and escape of radioactive material and radioactive waste - IIS Rating 3**

31. The inspection looked for evidence of environmental monitoring and safe storage arrangements to support compliance with GDF WAC (once available). This included:

- Overview of environmental monitoring within the Dry Store
- How the MCP arising from commissioning will be used for corrosion monitoring.

32. The licensee gave an explanation of Surveillance Programme 14, which ensures that the fuel remains in physical state where it can be repacked for transport following the storage period. Any deviations from the expected store conditions will be recorded. All records produced from the surveillance programme will form part of the HAW records, although it is still to be decided if they will form part of series 0279, or a new series will be created.

33. The Temperature Differential Monitoring System detects advance warning of leaks by measuring the difference in temperature between the top and the bottom of the casks. This feeds into the engineering LAN which is monitored 24 hours a day.

34. The cask used for in-active commissioning, which will have been in the fuel pond, is going to be loaded into a bespoke overpack which will replicate storage conditions, but allow full access to the cask for inspection.

35. Any cask which loses integrity (by leak or corrosion) and therefore could release radioactivity or allow fuel to degrade will be identified by the surveillance programme, in line with SS1. Therefore I have given an inspection rate of 3 (Adequate) for LC34.

#### **2.5 LC35: Decommissioning - IIS Rating 3**

36. The inspection looked for evidence that documents and records that may be required for decommissioning have or are in stages of being produced, and there are arrangements for retaining and updating this information so that it will be available when needed. This included:

- How records and documents for decommissioning are being managed

37. NGL gave an explanation of how the site specific and project specific lifetime records arrangements worked. A hard copy of the information requirements for the dry fuel store was provided.

38. The record arrangements capture all information that will be required for eventual decommissioning of the dry fuel store. The AMS system is a companywide system which is regularly maintained. Therefore I have given an inspection rate of 3 (Adequate) for LC35.

## 2.6 Dry Fuel Store Event Follow Up

39. During this Site Intervention the ONR Dry Fuel Store Project Inspector followed up on recent Dry Fuel Store project events:

- Fuel Building Crane Trip 6 October 2015
- Force Helium De-Hydration (FHD) Bursting Disc Rupture 11 October 2015
- Damage to HI-TRAC Transportation Frame 19 October 2015

40. I spoke with the NGL Dry Fuel Store Project Manager and attended the Dry Fuel Store Project Safety Review Group (PSRG) where the above events were discussed.

41. The event involving the Fuel Building Crane trip 6 October 2015 resulted in the Multi-Purpose Canister (MPC) transport vessel (HI-TRAC) being suspended 300 mm above the floor of the Fuel Pond Preparation (FPP) bay. NGL reported that there was no threat to nuclear safety of a drop load event impacting on loss of fuel pond cooling or pond integrity. This type of event is considered in the facility's safety case. The cause of the event was attributed to a switch in the crane's Nuclear Protection System 2 (NPS 2) not being correctly set due to an omission in Site Acceptance Testing (SAT). A review of SAT has been undertaken by the Dry Fuel Store Testing and Commissioning Panel (T&CP) with checks made on all limit switches for both control and protection circuits. No further faults were identified from this review.

42. In the case of FHD Bursting Disc Rupture and Damage to HI-TRAC Transportation Frame these two events are being evaluated through Sizewell B's Significant Adverse Condition Investigation (SACI) process. At the Dry Fuel Store PSRG the SACI Chair reported preliminary findings as follows.

43. NGL stated that the failure was with the bursting disc fitted to the Multi-Purpose Canister (MPC) simulator used in testing FHD system water removal and drying. Pressure relief equipment fitted to FHD was not involved. NGL reported that the MPC simulator was fitted with a bursting disc in compliance with Pressure System Equipment Supply requirements. Operational MPC are not fitted with bursting discs.

44. Failure of the bursting disc occurred when the FHD was operating at 5 bar(g) pressure and a temperature of 160°C which is below the normal operating temperature of 204°C. The root cause of the failure is attributed to HOLTEC incorrectly specifying the bursting disc for the MPC simulator, in that its maximum operating temperatures was identified as 79°C. NGL's investigation revealed that the FHD system had not been inspected by the Site's pressure systems third party assurance organisation, Lloyd's Register, before it was placed into service. The Lloyd's Register Inspector has indicated that they would have identified this shortfall.

45. The consequence of the event was that very fine insulating material spread in the fuel building, across fill bay and part of the cooling pond. Dispersed insulating material was recovered from the pond by pond skimmers. Analysis of cooling pond water and fuel has shown no increase in impurity levels of cooling pond water or debris on stored fuel elements. No potential significant contraventions of safety hazards resulted from the event with the bursting disc being captured. A potential respiratory hazard was created through insulation material dispersion which was identified as inert (non-hazardous).

46. In the case of the Damage to HI-TRAC Transportation Frame this was a result of using the HI-TRAC as a calibration weight following issues over accuracy of Fuel Building Crane loads weighing system. Before work commenced an accurate weight of the HI-TRAC was required. Three load cells were placed on the HI-TRAC transport frame and the HI-TRAC was



lowered onto them. Deflection of the frame was observed followed by a loud crack. Operations were stopped and the HI-TRAC placed in its safe laydown area. The cause of the damage has been attributed to overload of the transport frame sections due to point loads being applied through load cells. Although T&CP approval was given for the use of HI-TRAC as a calibration weight, the method by which this task was carried out does not appear to have gone through due process with the appropriate design and T&CP sign off. No serious danger could have resulted from this event.

47. In considering these three events I do not consider there is a case for formal regulatory action to be taken. The potential for serious danger was limited. There are clear trends due to lack of attention and loss of control in the process which would have identified shortfalls. I propose waiting until NGL has completed its SACI and review evidence before reaching my final decision.

### 3 ISSUES

48. No issues were raised or closed during this inspection.

#### 3.1 Issues Raised

*Where the intervention identifies a shortfall in regulatory compliance one or more issues should be raised to address the gap, and brought to the attention of the duty holder/licensee. In general, these will be Category 4 issues that can be easily followed up via subsequent interventions. These issues should be recorded on the ONR Issues Database after the intervention and subsequently tracked and managed. More significant issues should be categorised higher and progressed in the usual manner. Please refer to the Regulatory Issues Management process.*

No	Issue Title	Category	Issue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion / Review Date
	N/A					

#### 3.2 Issues Closed

No	Issue Title	Category	Issue Level	Licensee/Duty Holder Role	Owner (Inspector)	Completion / Review Date
	N/A					

### RECORD APPROVAL, SIGN-OFF AND ISSUE

#### RECORD APPROVAL AND SIGN-OFF

Note: Documents must be finalised on TRIM when signed-off / approved for issue.

Revision	Name	Responsibility	Executive Summary Approved	Date
0				10 <sup>th</sup> November 2015

### VERSION CONTROL

