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**ONR Approval under LC23(5) – Approval of an Alteration to Table 1 of the Wylfa  
Operating Rules**

**Secondary Dry Store Cell 4 - Proposal for the alteration of Operating Rule 4.5 and  
associated operating instructions and maintenance schedule**

Project Assessment Report ONR-DFW-PAR-15-015

9 November 2015

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Published 02/16

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### EXECUTIVE SUMMARY

#### **Secondary Dry Store Cell 4 - Proposal for the alteration of Operating Rule 4.5 and associated operating instructions and maintenance schedule**

This project assessment report presents the findings of ONR's assessment of Magnox Ltd's request for Approval of an alteration to the Wylfa station Operating Rules.

#### **Permission Requested**

Magnox Limited, the Licensee for the Wylfa nuclear site, has proposed to make an alteration to the station Operating Rules by revision of Operating Rule 4.5 (OR4.5) for Secondary Dry Store Cell 4 (DSC4). Magnox Ltd has requested ONR's 'Approval' for this alteration under Licence Condition (LC) 23(5) of the nuclear site licence number 58A.

#### **Background**

DSC4 was designed for the bulk storage of nearly 29000 irradiated fuel elements in an actively controlled air environment. The operational requirements for maintaining the environment are provided in Operating Rule 4.5 (OR4.5) and associated reference Station Operating Instructions. The Licensee has declared DSC4 to be fuel free and it now contains only a small inventory of ILW. The Licensee considers that in this state the stringent conditions and limits specified in OR4.5 are no longer required to maintain nuclear safety and can be removed, and replaced with appropriate alternative arrangements based on routine station operating instructions.

The Licensee's submission presents arguments and evidence that OR4.5 can be revised with no detriment to nuclear safety and that the risk of radiological release from DSC4 is adequately minimised.

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

ONR has carried out a programme of work that includes the assessment of the Licensee's submission by chemistry, radiological protection and fault analysis specialists, engagement with the Licensee and inspection of proposed changes to ensure they are consistent with the Licensee's arrangements and regulatory standards and expectations.

For this assessment, the focus was on gaining assurance on the veracity of the declaration that DSC4 is fuel free which underpins the proposal, and on the adequacy of the proposed conditions for storage of the remaining ILW.

#### **Matters arising from ONR's work**

No unresolved issues remain from ONR's assessment and inspection work.

#### **Conclusions**

ONR is satisfied with the claims, arguments and evidence provided in the Nuclear Safety Committee (NSC) paper "Proposals for the deletion of operating rule 4.5, associated reference station operating instructions (RSOIs) and maintenance schedule (MS) activities for secondary dry store cell (SDSC) 4" and other evidence provided through engagement with the Licensee.

#### **Recommendation**

The project assessment report recommends that:

- The Superintending Inspector for the Magnox and Restoration sites sub-programme accepts the technical and regulatory judgements in the report;
- The Superintending Inspector for the Magnox and Restoration sites sub-programme approve the report for publication after redaction as appropriate; and

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- The Chief Nuclear Inspector grants the Approval to amend the Wylfa Station Operating Rules by alteration of Operating Rule 4.5 and revision of related documentation as indicated.

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### LIST OF ABBREVIATIONS

ALARP	As low as reasonably practicable
DSC4	Secondary Dry Store Cell 4
EPR2010	Environmental Permitting Regulations, 2010
HOW2	(Office for Nuclear Regulation) Business Management System
INSA	Independent Nuclear Safety Assessment
LC	Licence Condition
LI	Licence Instrument
NMS	Nuclear Maintenance Schedule
NSC	Nuclear Safety Committee
ONR	Office for Nuclear Regulation
OR	Operating Rule
PGDSC	Post-Generation Defueling Safety Case
PSR	Periodic Safety Review
RSOI	Reference Station Operating Instruction
SAP	Safety Assessment Principle(s)
SOI	Station Operating Instruction
TAG	Technical Assessment Guide (ONR)

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### 1 PERMISSION REQUESTED

1. The Wylfa nuclear site licence holder Magnox Ltd (MxL) has proposed to make an alteration to the station Operating Rules by substitution of the current Operating Rule 4.5 (OR4.5) for secondary dry store cell 4 (DSC4) with a null entry, labelled “No entry” (referred to as “deletion of the operating rule” in the Licensee’s submission and further in this report for consistency with this terminology used throughout the submitted documentation) (Ref.1). The proposal follows from declaration that DSC4 is now fuel free and therefore the conditions and limits specified by OR4.5 to maintain nuclear fuel are no longer required to maintain nuclear safety.
2. The Licensee has requested ONR’s ‘Approval’ for this alteration under Licence Condition (LC) 23(5) of the nuclear site licence number 58A (Ref. 1).

### 2 BACKGROUND

3. DSC4 was designed for the bulk storage of up to 28992 irradiated fuel elements in an actively controlled air environment. The fuel elements were stored individually in open-ended, vertically aligned, mild steel tubes, organised into 6 rows of 25 skips, each skip containing a matrix of 16 by 12 tubes. A trolley mechanism within DSC4 allowed movement of skips for activities such as discharge and inspection (Ref. 2).
4. DSC4 has not been in operational use since 2007 (Ref. 3). The Licensee has recently verified DSC4 to be empty of irradiated fuel elements and declared it fuel free (Ref. 4). This leaves DSC4 containing only a small volume of ILW which arose from historical water-induced corrosion of a number of fuel elements (Ref. 2, 12).
5. The ILW is contained within 37 skip tubes. One tube (Skip 131, tube D11) contains around half of a fuel element, present as corroded uranium and cladding material. The material in the other tubes is debris from corrosion of the Magnox cladding or miscellaneous items, such as thermocouple wire (Ref. 2, 3, 7). This corrosion debris is designated as retained waste, rather than nuclear fuel, by Euratom (for Safeguards purposes) and this designation has been accepted by ONR (Ref. 5, 6). The removal of the corroded fuel elements created some alpha-containing contamination in DSC4, designating it as R4:C4 for personnel access (Ref. 10, 11). A Wylfa project is underway to retrieve this ILW and remove it from DSC4 for interim storage over the next 2-3 years (Ref. 2, 12, 17).
6. This report presents ONR’s consideration of the Licensee’s proposal to alter Wylfa OR4.5, which is in place to actively control the environmental conditions in DSC4 to conditions appropriate for the storage of irradiated fuel elements. The proposal is supported by a Category 1 plant modification proposal (Ref. 1) – further referred to as “the Safety Case” - and by referenced documents.
7. OR4.5 sets conditions and limits to ensure adequate cooling, to maintain humidity to within a defined level, and to set some conditions and limits to be met for transfer of fuel elements into the store (Appendix B in Ref. 1). DSC4 also provides primary containment, being maintained at below atmospheric pressure, with HEPA filters and radioactivity monitoring capability integrated into the ventilation system. The conditions and limits of OR4.5 are implemented through a Reference Station Operating Instruction (RSOI; Appendix C of Ref. 1). The required plant to maintain these conditions is included in the nuclear maintenance schedule (Appendix E in Ref. 1).
8. The Licensee proposes to alter the station operating rules by deletion of OR4.5. The basis of this proposal is that the stringent conditions and limits specified in OR4.5 are no longer required to maintain nuclear safety now that DSC4 is fuel-free and contains

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only a small inventory of ILW (Ref. 1, 2). The Licensee intends to implement alternative arrangements (based on station operating instructions (SOI) not linked to an Operating Rule fulfilling requirements specified in the reference Safety Case) to maintain DSC4 to the same conditions as those currently established, for asset preservation purposes, with required plant covered by routine maintenance arrangements.

9. The Safety Case presents arguments and evidence that the requested alteration can be made with no detriment to nuclear safety and that the risk of radiological release from DSC4 is adequately minimised.

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

10. ONR has carried out a programme of work that includes the assessment of the Licensee's submission by chemistry, radiological protection and fault analysis specialists (Ref. 7, 8, 9), engagement with the Licensee and inspection of proposed changes to ensure they are consistent with the Licensee's arrangements and regulatory standards and expectations (Ref. 10, 11, 12).

#### **3.1 INSPECTION**

11. The Licensee's arrangements requires an Independent Nuclear Safety Assessment (INSA) to be undertaken for changes to Approved Operating Rules followed by presentation to the Nuclear Safety Committee (NSC) for Endorsement (Ref. 13).
12. The record of the INSA has been reviewed and provides assurance that the Licensee has complied with its arrangements. The INSA officer provided agreement to the proposed amendments as described in the submission (Ref. 1).
13. The minutes of the Magnox Ltd NSC meeting held on 2/7/15 have been reviewed and considered to provide assurance of further independent challenge to the submission (Ref. 1). The NSC advised the Chairman to endorse the proposed alteration of the Operating Rules.
14. The Licensee submission is consistent with the site arrangements for amendments to Operating Rules (Ref. 13).
15. The Licensee has declared DSC4 to be fuel free (Ref. 4). The fuel free verification process has been reviewed by ONR, including sampling of the associated records, and is considered to be robust, giving assurance that no irradiated fuel elements remain in DSC4 (Ref. 11). ONR confirmed that physical and administrative measures are in place to prevent further fuel transfers into DSC4 (Ref. 10, 14).
16. ONR is satisfied that the Licensee has delivered against the commitments identified in the submission (Ref. 1), including:
  - Station Operating Instruction (SOI) to set conditions and limits to maintain humidity and reduced pressure ventilation in DSC4 for asset preservation purposes developed to replace the existing RSOI associated with OR4.5 (Ref. 10, 15)
  - Inclusion of key plant and equipment into Wylfa's routine maintenance schedule (Ref. 1, 10, 11)
  - Inclusion of HEPA filters on the DSC4 exhausts in the Environmental Maintenance Schedule (Ref. 1, 10, 11)

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### 3.1.1 ASSESSMENT

17. For this assessment, effort has been concentrated on assessing the requirements for continued safe storage of the remaining inventory of ILW in DSC4. The Safety Case proposes to maintain DSC4 to the same humidity and reduced pressure, as under OR4.5, through an SOI.
18. The assessment considers the relatively low risk involved in the proposed alteration to the operating rule, the expected chemical behaviour and evolution of the ILW under the proposed conditions and the potential for any radiological release from DSC4.
19. The ONR assessment is undertaken in line with the relevant ONR SAPs and TAG requirements and identifies satisfactory conformance of the chemistry-related parts of the submission with ONR's guidance.
20. The Chemistry Specialist inspector sampled the Safety Case and related documents on the characterisation of the ILW and concluded that from the Chemistry point of view, the presented claims, arguments and evidence provided sufficient support to the proposed alterations to OR4.5, as well as a reasonable ALARP justification, provided that the environmental conditions are maintained as proposed (Ref. 7). Brief reviews of the Licensee's proposal by ONR fault analysis and radiological protection Specialist Inspectors did not highlight any issues in these specialist areas that warranted detailed assessment (Ref. 8, 9).
21. The ONR specialist assessments have not identified any issues or observations that could preclude the Licensee implementing the proposed alteration of the station Operating Rules. The Environment Agency have independently assessed the proposal and have no objections from their perspective (Ref. 16).

### 4 MATTERS ARISING FROM ONR'S WORK

22. There are no unresolved issues remaining from ONR's assessment and inspection work.

### 5 CONCLUSIONS

23. This report presents the findings of ONR's assessment of Magnox Ltd's request for Approval of an alteration to the Wylfa station Operating Rules by deletion of Operating Rule 4.5 for DSC4.
24. To conclude, I am satisfied with the claims, arguments and evidence provided in the Nuclear Safety Committee (NSC) paper "Proposals for the deletion of operating rule 4.5, associated reference station operating instructions (RSOIs) and maintenance schedule (MS) activities for secondary dry store cell (SDSC) 4" and other evidence provided through engagement with the Licensee. On the basis of this assessment, ONR Approval can be granted to the Licensee's proposal to delete OR4.5, associated RSOIs and nuclear maintenance activities, and replace them with the documentation and arrangements proposed.

### 6 RECOMMENDATIONS

25. The project assessment report recommends that:
  - The Superintending Inspector for the Magnox and Restoration sites sub-programme accepts the technical and regulatory judgements in the report;

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- The Superintending Inspector for the Magnox and Restoration sites sub-programme approve the report for publication after redaction as appropriate; and
- The Chief Nuclear Inspector grants the Approval to amend the Wylfa Station Operating Rules by deletion of Operating Rule 4.5 and revision of related documentation as indicated.

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### 7 REFERENCES

1. Request for an alteration to the operating rules under licence condition 23(5). Proposals for the deletion of operating rule 4.5, associated reference station operating instructions (RSOIs) and maintenance schedule (MS) activities for secondary dry store cell (SDSC) 4 (TRIM: 2015/280930).
2. Wylfa Dry Store Cell 4 (DSC4) Removal of corrosion debris (2015/369520).
3. Secondary dry store cell 4 internal camera inspection results (WYA/REP/9770; 24/10/13) (TRIM: 2015/360162).
4. Letter from Wylfa notifying ONR of the removal of the final six irradiated fuel elements from secondary dry store cell 4, 2 September 2015 (TRIM: 2015/331277).
5. Euratom confirmation to Wylfa that the debris in skip 131 tube D11, is retained waste (TRIM: 2015/422609).
6. Confirmation from ONR Safeguards that the debris in skip 131 tube D11 is retained waste (2014/214058; 2015/397937).
7. Chemistry assessment of the impact of the proposed withdrawal of Operating Rule 4.5 for secondary dry storage cell 4 (TRIM: 2015/454086).
8. ONR Specialist comment on fault studies aspects of the Wylfa proposal to delete operating rule 4.5 (TRIM: 2015/361362).
9. ONR Specialist comment on Radiological Protection aspects of the Wylfa proposal to delete operating rule 4.5 (TRIM: 2015/352473).
10. Wylfa reply to ONR questions on the deletion of DSC4 operating rule 4.5, 14 October 2015 (TRIM: 2015/383878)
11. Planned Systems Based Intervention, including liaison meeting on DSC4 (ONR-DFW-IR-15-085), 23-24 September 2015 (TRIM: 2015/371035).
12. Planned intervention (ONR-DFW-IR-15-099), meeting on DSC4, 22 October 2015 (TRIM: 2015/403060).
13. Magnox Ltd, Wylfa – Management Control Procedure No 021 Part 012, WYA/MCP/021/012 Issue 26. Control of amendment to or suspension of operating rules, RSOIs, amendment of operating instructions and special temporary instructions (TRIM: 2015/156763).
14. SOI D1 Appendix E (prohibiting transfer of further irradiated fuel elements to DSC4) (TRIM: 2015/397870).
15. SOI for DSC4 to be implemented following deletion of operating rule 4.5 (TRIM: 2015/421701).
16. Letter from the Environment Agency (██████████) indicating no objection to the deletion of operating rule 4.5 for DSC4 (TRIM: 2015/410971).
17. Letter from Wylfa seeking ONR acceptance of closure of LC35 milestone LC35.01 and notification of creation of two new LC35 milestones (35.08 and 35.09) for recovery of the remaining ILW in DSC4 (TRIM: 2015/405454).

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