



**Approval of Issue 12 of the Wylfa Emergency Plan**

**Proposed Changes to Wylfa Site Emergency Arrangements during Defuelling Phase**

Project Assessment Report ONR-SDFW-PAR-16-001  
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## EXECUTIVE SUMMARY

### Proposed Changes to Wylfa Site Emergency Arrangements During Defuelling Phase

This report presents the findings of the Office for Nuclear Regulation's (ONR) consideration of the Magnox Ltd.'s request for Approval of an amendment to the Wylfa Emergency Plan resulting from proposed changes to the emergency response capability on the site that is aligned to the reduction in risk and hazard on the site during the defuelling period of operation.

### Permission Requested

The Wylfa nuclear site licence holder Magnox Ltd has proposed to amend the station Emergency Plan. Magnox Ltd has requested ONR's 'Approval' to these amendments under Licence Condition (LC) 11(3) attached to nuclear site licence number 58A

### Background

In view of the ongoing radiological hazard reduction and the associated reduction in risks Magnox Ltd.'s emergency planning strategy supports a reduction in emergency manning capability and changes to emergency response arrangements. This strategy has been incorporated into a Magnox Ltd Company Standard, which outlines the generic emergency scheme arrangements for all post-generation Magnox Ltd licensed sites up to the disapplication of REPPIR regulations 7 and 9.

In summary the main changes from the generation emergency arrangements are:

- Urgent damage repair has a reduced emphasis as any potential faults during defuelling are unlikely to require prompt intervention to prevent escalation.
- Resource for an immediate response from shift personnel is reduced but supplemented by increased staff on standby.
- Shift assignments reduce from 19 to 10 personnel.
- The Command & Control structure reduces from 3 to 2 nodes
- Shift Response Team (incorporating health physics monitoring, first aid, rescue & fire response capability) replaces Shift Incident Response Team
- Non-shift assignments reduce from 18 to 14 personnel.
- Damage Repair team of 10 personnel to Response Team of 6
- There is no longer a requirement for an Emergency Reactor Physicist and is replaced by an Emergency Technical Advisor.

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

ONR has carried out a programme of work that includes assessment of various elements of the proposed arrangements, inspection of training exercises and witnessing a Level 1 demonstration exercise.

### Matters arising from ONR's work

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

### Conclusions

To conclude, I am satisfied with the claims, arguments and evidence laid down within the Wylfa Emergency Plan and supporting documentation such that the proposed amendment is adequate to satisfy the requirements of Licence Condition 11.

### Recommendation

The Project Assessment Report recommends that;

- The Deputy Chief Nuclear Inspector for the Decommissioning, Fuel and Waste Programme accepts the technical and regulatory judgements in this report;
- The Deputy Chief Nuclear Inspector for the Decommissioning, Fuel and Waste Programme approve this report for publication after redaction as appropriate; and

- the Deputy Chief Nuclear Inspector for the Decommissioning, Fuel and Waste Programme issues Licence Instrument 567, Approval, to the Licensee to alter or amend the Wylfa Emergency Plan.

## LIST OF ABBREVIATIONS

MoC	Management of change
ONR	Office for Nuclear Regulation
REPPIR	Radiation (Emergency Preparedness and Public Information) Regulations

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## 1 PERMISSION REQUESTED

1. The Wylfa nuclear site licence holder Magnox Ltd (the Licensee) has proposed to amend the station emergency plan (Reference 1 and 20). The proposal aims to provide an emergency response capability on the site that is aligned to the change in risk and hazard on the site for the defuelling period of operation.
2. Licence Condition (LC) 11 requires the licensee to make and implement adequate arrangement for dealing with any accident or emergency arising on the site and their effects. Under LC 11(3) the Licensee requires the Office for Nuclear Regulation's (ONR) Approval of alterations or amendments of the approved arrangements. The Licensee requested ONR's 'Approval' under LC 11(3) to the alteration or amendment of the Wylfa emergency plan. (Reference 2).

## 2 BACKGROUND

3. Both reactors at Wylfa are now in a depressurised, cold shutdown condition in air. The reactors have been modified to prevent re-criticality and to ensure that a shutdown margin can be maintained during normal defuelling operation and fault conditions. Reactor 2 has been steadily defuelled in support of Reactor 1, which ceased operation at the end of December 2015, and is now being cooled through natural circulation. Reactor 1 is currently being actively cooled and will change to passive cooling during the post generation defuelling period of operation. Both reactors present a lower nuclear safety risk and hazard compared with the generation phase of operation, and these risks and hazards will continue to reduce as the reactors are defuelled.
4. Since Reactor 1 ceased generating no further defuelling has been undertaken. Reactor 1 is 100% fuelled and Reactor 2 is 65.5% fuelled. The total number of fuel elements at the end of April 2016 was 86163, this will have reduced slightly since then as a result of flask exports to Sellafield. The current site proposals for defuelling indicate that the site will be fuel-free by the end of December 2018.
5. This report presents ONR's consideration of the Licensee's proposal to amend the Wylfa emergency plan. The proposal is supported by a Category 1 safety submission (Reference 1), a Management of Change (MoC) (Reference 3) and by referenced documents.
6. In view of the ongoing radiological hazard reduction and the associated reduction in risks, Magnox Ltd emergency planning strategy (Reference 4) supports a reduction in emergency manning capability and changes to emergency response arrangements. This strategy has been incorporated into a Magnox Ltd Company Standard (Reference 5) which outlines the generic emergency scheme arrangements for all post-generation Magnox Ltd licensed sites up to the disapplication of REPPiR regulations 7 and 9.
7. In summary the main changes from the generation emergency arrangements are:
  - Urgent damage repair has a reduced emphasis as any potential faults during defueling are unlikely to require prompt intervention to prevent escalation.
  - Resource for an immediate response from shift is reduced but supplemented by increased staff on standby.
  - Shift assignments reduce from 19 to 10 personnel.
  - The Command & Control structure reduces from 3 to 2 nodes
  - Shift Response Team (incorporating health physics monitoring, first aid, rescue & fire response capability) replaces Shift Incident Response Team
  - Non-shift assignments reduce from 18 to 14 personnel.
  - Damage Repair team of 10 changes to Response Team of 6
  - There is no longer a requirement for an Emergency Reactor Physicist and is replaced by an Emergency Technical Advisor.

8. The development of the defuelling arrangements has been supported by significant interaction with the external emergency services including their involvement in a number of familiarisation and training exercises (Reference 19). An external consultancy, Berwicks, has provided focussed training and exercise support in command and control aspects of the new arrangements (Reference 19).

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

9. ONR has carried out a programme of work that includes assessment of various elements of the proposed arrangements, inspection of training exercises and witnessing a Level 1 demonstration exercise.
10. Wylfa Reactor 1 and 2 ceased generation in December 2015 and April 2012 respectively. After final shutdown both reactors were modified to prevent recriticality and to ensure that a shutdown margin can be maintained during normal defuelling operation and fault conditions. The reactors were also depressurised, operate at temperatures significantly below generation conditions and had the carbon dioxide coolant gas replaced with air. The reactors therefore present a significantly reduced nuclear safety hazard, compared with the generation phase of operations.

#### **3.1 ASSESSMENT**

##### **3.1.1 MANAGEMENT OF CHANGE**

11. In advance of its formal submission Magnox Ltd provided a copy of the MoC describing the proposed structure of the emergency response organisation for the defuelling phase of operations and the reasons for making the change (Reference 3). The MoC was reviewed by ONR Inspectors from Fire Safety, Leadership and Management for Safety, Radiological Protection and Site Inspection specialisms. A number of queries and observations were provided to Magnox Ltd from these reviews and suitable responses provided (Reference 6).
12. Following submission of its formal application, Magnox Ltd provided a presentation to ONR at a meeting held in early January 2016 (Reference 7). This meeting was attended by inspectors from the specialisms involved in assessing the MoC. The meeting provided an opportunity to be updated on changes arising in response to regulatory interventions and further development within Magnox Ltd and ensured a common understanding of proposed arrangements prior to inspection of their implementation. The meeting confirmed that a number of observations from earlier engagements between ONR and Magnox Ltd had been satisfactorily addressed.
13. In my opinion, the Licensee's proposed structure of its emergency response organisation for the defuelling phase of operations at Wylfa and its MoC to this new organisation are adequate.

##### **3.1.2 EMERGENCY PLAN AND HANDBOOK**

14. I have reviewed the proposed Emergency Plan and in my opinion it is consistent with the Magnox Ltd corporate standards, with the exception of retention of the on-site fire team. Magnox Ltd corporate standard does not require the presence of a site fire-fighting capability during defuelling. However, the site considers this necessary at this time and consequently is maintaining a fire fighting capability within its response team. The justification for this is reasonable and aligns with the understanding that the North Wales Fire and Rescue Services have a number of resource challenges that are currently being addressed. In my judgment the retention of this capability on site during the initial stages of defuelling is appropriate.

15. ONR reviewed the Emergency Plan and the supporting Emergency Handbook with the aim of confirming that arrangements demonstrated in the training exercises were consistent with the written procedures. The review highlighted some aspects regarding the role of the Shift Charge Engineer that were not accurately described and also the function and number of Command and Control nodes. These matters and some additional areas that required clarification were presented to Magnox Ltd (Reference 12 and 13). Adequate responses were presented (Reference 14) that resulted in some further revision to the Emergency Plan and a consequent re-issue (Reference 15 and 16). The revised emergency plan is considered adequate and the changes have been presented to the Nuclear Safety Committee for its endorsement as a matter arising (Reference 17).
16. In my opinion, the Licensee's proposed Emergency Plan for Wylfa is fit for purpose and adequately addresses the requirements of LC 11.

### 3.2 INSPECTION

17. During the preparation for transition to the new emergency arrangements Magnox Ltd undertook a programme of 5 shift training exercises culminating in a Level 1 demonstration exercise. ONR inspected two of the training exercises before witnessing the Level 1 exercise (References 8 and 9). The purpose of inspecting these exercises was to gather evidence of the robustness of the training being provided and seek opportunities to identify any potential weaknesses exposed that may result in revision to the emergency response during defuelling. Inspection of these exercises highlighted some of the difficulties in changing mind-set in shift charge engineers with regard to their being more flexible in how they respond to accidents or emergencies, given the reduced risks and hazards associated with the defuelling operations in comparison to generation.
18. Inspection of the Level 1 demonstration, which also included a security element, demonstrated that learning from the training exercises, and other aspects of Magnox Ltd.'s implementation activities, had been captured and incorporated (Reference 10). Despite some of the observations of opportunities for improvement ONR concluded that the exercise provided an adequate demonstration of the Wylfa emergency arrangements and valuable learning was captured to take forward into defuelling. Notwithstanding the conclusion that the demonstration was judged adequate, ONR recommended that a re-demonstration is undertaken in the near future to address these identified opportunities for improvement. These included:

- First aid and casualty handling
- An opportunity to assess the performance of the Response Team Leader
- An opportunity to see the Response Team perform with six team members.
- The setting up of command centres as per the described changes to the emergency arrangements
- The control and command discipline within the Advanced Control Point
- Casualty decontamination, management and recovery

Magnox Ltd has confirmed that it will undertake a programme of consolidation training exercises that will provide an opportunity to demonstrate that the aspects highlighted can be demonstrated (Reference 11).

19. Throughout the implementation period Magnox Ltd has maintained excellent engagement with the external emergency services that has proven beneficial to all organisations (Reference 19). ONR Site Inspector and Fire Safety specialist Inspector met separately with the North Wales Fire and Rescue Service and Ambulance Service to discuss their observations on Magnox Ltd.'s capability and proposed arrangements. Both of the external organisations were positive in their response to experience of

revitalised engagement with the Licensee. In my opinion this increased regulatory engagement has facilitated the implementation of relevant integrated training that has been absent during the past few years'. This has resulted in increased regulatory confidence in the ability of the licensee to deliver an appropriate response in the event of an incident on site.

20. In my opinion the Licensee has adequately demonstrated that it can implement effectively its proposed Emergency Plan.

#### **4 MATTERS ARISING FROM ONR'S WORK**

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

#### **5 CONCLUSIONS**

22. This report presents the findings of ONR's consideration of Magnox Ltd.'s request for 'Approval' of an amendment to the Wylfa Emergency Plan from proposed changes to the emergency response organisation.
23. To conclude, I am broadly satisfied with the claims, arguments and evidence laid down within the Wylfa Emergency Plan and supporting documentation such that the proposed amendment is adequate to satisfy the requirements of Licence Condition 11.

#### **6 RECOMMENDATIONS**

26. The Project Assessment Report recommends that;
- The Deputy Chief Nuclear Inspector for the Decommissioning, Fuel and Waste Programme accepts the technical and regulatory judgements in this report;
  - The Deputy Chief Nuclear Inspector for the Decommissioning, Fuel and Waste Programme approve this report for publication after redaction as appropriate; and
  - the Deputy Chief Nuclear Inspector for the Decommissioning, Fuel and Waste Programme grants Licence Instrument 567, Approval (Reference 18), to the Licensee to alter or amend the Wylfa Emergency Plan.

## 7 REFERENCES

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2. Letter WYF52460R, dated 22 December 2015, Licence Condition 11(3) – Emergency Arrangements, Request for Approval of Issue 11 of the Wylfa Emergency Plan, Document WAY/EMP/001 Under Licence Condition 11(3), TRIM 2015/490682.
3. WYL/DD/QPC/05.12 Issue 2 - Wylfa Site - Generation to Defuelling Transition Programme - MOC Outline Justification Document - 12 Emergency Scheme. TRIM 2016/167848.
4. NP/SC 5125 Revision 1, Paper for Information: Emergency Planning Transition on Cessation of Generation. TRIM 2012/372852.
5. Company Standard S-076 Issue 2. Generic Emergency Arrangements for Post Generation Sites. TRIM 2016/163276.
6. Consolidated ONR Comments on Wylfa Magnox Post Generation Emergency Arrangements MoC including Licensee responses. TRIM 2016/201355.
7. Wylfa - Post Generation Defuelling Safety Case (PGDSC) - LC11 - Defuelling Arrangements Presentation - 6 January 2016. TRIM 2016/6645.
8. Intervention Record ONR-DFW-IR-15-124 - Wylfa Power Station - Planned Intervention - 7 to 11 December 2015. TRIM 2015/482790
9. Intervention Record ONR-DFW-IR-15-135 - Magnox Ltd - Wylfa Power Station - Planned Intervention - 18 to 22 January 2016. TRIM 2016/41085.
10. Intervention Record ONR-DFW-IR-15-158 - Magnox Ltd – Wylfa Power Station – Planned Inspection - 22 to 23 March 2016 TRIM 2016/149434
11. Confirmation from Magnox Ltd of delivery of emergency arrangements consolidation training exercises during 2016/17 and in response to ONR Intervention ONR-DFW-IR-15-158
12. Email from ONR to Magnox Ltd Raising a number of queries relating to Wylfa Emergency Plan (Issue 11) and the supporting Emergency Handbook. TRIM 2016/167910.
13. Contact Record ONR-SDFW-CR-16-052 - Wylfa Amendments to Emergency Arrangements for Defuelling Operations -Telecon - 22 April 2016. TRIM 2016/168549.
14. Magnox Ltd, Wylfa - Response to Email from ONR to Magnox Ltd Raising a number of queries relating to Wylfa Emergency Plan (Issue 11) and the supporting Emergency Handbook. TRIM 2016/206207.
15. Wylfa - Nuclear Safety Committee - NPSC 5280 Revision 03 - Proposed Changes to Wylfa Site Emergency Arrangements During Defuelling Phase - 11 May 2016 Revised Emergency Plan. TRIM 2016/201390.
16. WYA/EMP/001 - Issue 12 - Wylfa Emergency Plan - 11 May 2016. TRIM 2016/201405
17. Wylfa Site - Statement Under Matters Arising from Previous Minutes - Minutes 125-136 refer - Revision 1 - 4 May 2016. TRIM 2016/201431
18. Wylfa - Licence Instrument - LI Number 567 - Approval of Issue 11 of Wylfa Emergency Plan – May 2016. TRIM 2016/117952.
19. Letter WYF52497R - Letter from Wylfa - Wylfa Power Station - Defuelling Emergency Arrangements Supporting Information - 30 March 2016TRIM 2016/139687

20. Letter WYF52501R - Letter from Wylfa - Request for Approval Under Licence Condition 11(3) of the Amendment to Wylfa Emergency Plan - 16 May 2016. TRIM 2016/201291