



**Consideration of enforcement action against Magnox Ltd - Wylfa Power Station**

**Basis of enforcement decision following an ONR intervention prompted by discrepancies with fuse protection on Lighting and Small Power fuseboards**

Project Assessment Report ONR-SDFW-PAR-16-029

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### EXECUTIVE SUMMARY

- 1 This Project Assessment Report (PAR) outlines the circumstances that prompted ONR to consider enforcement action against Magnox Ltd in relation to fuse anomalies in Lighting and Small Power (L&SP) fuseboards across the Wylfa power station site.
- 2 It also sets out recommendations arising out of that consideration of enforcement action, including the original recommendation to issue an Improvement Notice (IN) and the rationale for subsequently amending that recommendation to an enforcement letter supported by a Regulatory Issue.

### Background

- 3 The discovery of an incorrectly rated fuse in a L&SP fuseboard prompted Magnox Ltd to survey a sample of 415 Volt-rated fuseboards to ascertain whether such anomalies were widespread. This survey subsequently identified a significant number of fuse anomalies in L&SP fuseboards.
- 4 In one instance a fuse was found to be rated in excess of the current-rating of the cable that it was intended to protect, thus presenting a potential fire risk if an electrical fault and/or overload were to develop in that circuit. A further hazard associated with overrated fuses is that they could also potentially increase the risk of electric shock under certain fault conditions and work scenarios.
- 5 Based on these findings, Magnox Ltd committed to undertake inspections of all L&SP fuseboards around the Wylfa power station site, for which a completion date of 31 October 2016 was proposed and discussed with ONR. However, Magnox Ltd did not complete the inspections within this timescale.

### Assessment and inspection work carried out by ONR

- 6 ONR met with Magnox Ltd at Wylfa power station on 29-30 March 2016 to discuss the licensee's internal investigation into incorrectly rated fuses in L&SP fuseboards, including the resulting actions to prevent future occurrences and to identify and remediate existing occurrences.
- 7 Magnox Ltd informed ONR that it intended to inspect all L&SP fuseboards on the Wylfa power station site in order to identify and remediate further foreseeable fuse anomalies. ONR agreed with Magnox Ltd that this action was proportionate, given the number of fuse anomalies identified in the initial sample survey and the associated risk.
- 8 Magnox Ltd subsequently provided ONR with a copy of its Event Investigation Report (EIR) on 4 May 2016, which was then discussed during a meeting at Wylfa power station on 25 May 2016. At this meeting, Magnox Ltd confirmed that its inspections of L&SP fuseboards were adequately resourced and were progressing to schedule, that measures were being implemented to reduce the possibility of fuse anomalies being introduced in future, and that it was reviewing shortfalls in its arrangements for periodically inspecting L&SP fuseboards in particular areas of the Wylfa site. These shortfalls in inspections are believed to have prolonged the existence of some fuse anomalies.

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- 9 Magnox Ltd also confirmed that targeted checks of fuses in Minimum Safety Related Plant (MSRP) had confirmed that there were no significant fuse anomalies in that equipment.
- 10 Magnox Ltd also reported that since commencing the inspections of all L&SP fuseboards, it had discovered a further fuse anomaly that presented a potential fire risk, which in this case was caused by a piece of wire connected across a blown fuse. Recognising this second instance of a potential fire risk, Magnox Ltd reaffirmed its commitment to complete inspections of all L&SP fuseboards and to remediate any anomalies no later than 31 October 2016. However, while noting this timescale, ONR requested that Magnox Ltd should notify it of any significant emergent issues or changes to the work schedule.
- 11 On 27 October 2016 Magnox Ltd informed ONR that its inspections of L&SP fuseboards had fallen behind schedule, with approximately 70% of fuseboards completed. It also informed ONR that two further instances of fuses linked out by pieces of wire had been discovered.
- 12 Following this development, I consulted the Enforcement Management Model (EMM) to determine whether stronger enforcement action would be appropriate, while the ONR nominated site inspector for Wylfa engaged with Magnox Ltd to seek its justification for keeping the unchecked 30% of L&SP fuseboards energised, given that at least one further instance of a fuse anomaly presenting a fire risk was likely to occur in the unchecked fuseboards. The nominated site inspector also requested Magnox Ltd to consider implementing mitigation measures for the duration of the remaining inspections.
- 13 In response to the nominated site inspector's enquiries, Magnox Ltd presented arguments that the associated risk of harm did not justify taking uninspected L&SP fuseboards out of service, nor the implementation of additional mitigation measures. Magnox Ltd therefore indicated that its efforts would be better directed at progressing inspections of the remaining 30% of fuseboards, for which it proposed a revised completion date of 16 December 2016 with weekly monitoring of progress.

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

- 14 The appropriate standard for the control of risks associated with electrical systems is specified by the Electricity at Work Regulations 1999, for which Regulations 4(1), 4(2) and 11 are particularly relevant to the circumstances of this intervention. Regulation 4(2) requires maintenance of electrical systems to prevent danger, so far as is reasonably practicable, while Regulations 4(1) and 11 are concerned with avoiding deficiencies that can present danger in electrical systems, such as fuse anomalies.
- 15 Guidance on these matters is provided in the HSE publication '*The Electricity at Work Regulations 1989 – Guidance on Regulations*', while supplementary guidance can also be found in in *BS7671 Requirements for Electrical Installations* (formerly referred to as the *IEE Wiring Regulations*).
- 16 On applying the EMM to the circumstances of this intervention, I originally determined that an IN would be justified to address the immediate risk gap arising out of the potential for further latent fuse anomalies. My intention was for Magnox Ltd to achieve prompt compliance by completing its maintenance inspections of all L&SP fuseboards, thus enabling it to identify and remediate any further fuse anomalies.

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- 17 For the purpose of this proposed IN, I considered the most appropriate legislation to be the Electricity at Work Regulations 1989, Regulation 4(2), which states that:
- “as may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger”.*
- 18 Although Magnox Ltd provided a commitment to inspect the remaining 30% of L&SP fuseboards within revised timescales, I still considered the serving of an IN to be a justified and proportionate action as it would provide ONR with confidence that Magnox Ltd was adequately prioritising and resourcing the remaining inspection work.
- 19 After I had presented my enforcement recommendation to the nominated site inspector, ONR met with Magnox Ltd at Wylfa power station on 15 November 2016 to consult on its enforcement intentions. At this meeting, Magnox Ltd informed ONR that it had now completed visual inspections of all L&SP fuseboards and rectified any fuse anomalies, thus addressing the most significant shortfalls that created the immediate risk gap.
- 20 In light of this progress, I considered that Magnox Ltd had closed the immediate risk gap associated with the potential for latent fuse anomalies to present risks of fire and electric shock. Magnox Ltd had therefore achieved compliance with the Electricity at Work Regulations 1999 in so far as ensuring adequate protection against excess current on L&SP fuseboard circuits is concerned.
- 21 However, in relation to Magnox Ltd's remaining work activities associated with compliance and administrative aspects of the Electricity at Work Regulations 1999, including the need to implement revised maintenance arrangements, I determined that an enforcement letter was now a proportionate enforcement response to ensure that Magnox Ltd achieves sustained compliance with the law in respect of its ongoing maintenance of L&SP fuseboards.

### Conclusions

- 22 Delays in Magnox Ltd's inspections of L&SP fuseboards prolonged the existence of a risk gap associated with the potential for latent fuse anomalies, which presented potential risks of fire and electric shock.
- 23 Application of the EMM to determine whether stronger enforcement action was justified directed the serving of an IN to encourage prompt completion of maintenance inspections of all L&SP fuseboards. This would facilitate the identification and remediation of any further fuse anomalies, thus closing the associated risk gap.
- 24 Prior to this IN being served, Magnox Ltd closed the risk gap by completing visual inspections of all L&SP fuseboards. This enabled Magnox Ltd to ensure that all L&SP fuses were correctly rated, which therefore achieved compliance with those requirements of the Electricity at Work Regulations 1999 concerned with providing protection from excess current, i.e. Regulation 11 and also Regulation 4(1).
- 25 A combination of shortfalls contributed to incorrectly rated fuses being installed in L&SP fuseboards in the first instance and then remaining undetected. In particular, shortfalls in Magnox Ltd's arrangements for periodic inspections of L&SP fuseboards in some areas of the Wylfa site had prevented timely identification and remediation of deficiencies such as fuse anomalies.

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- 26 To ensure sustained compliance with the maintenance requirements of Regulation 4(2) of the Electricity at Work Regulations 1999, which will facilitate the identification and remediation of deficiencies such as incorrectly rated fuses, I consider an enforcement letter to be an appropriate enforcement action. I also consider it appropriate for ONR to raise a Regulatory Issue to assist with monitoring Magnox Ltd's progress in resolving these matters.

### Recommendations

- 27 I recommend that ONR sends an enforcement letter to Magnox Ltd (Site Director, Wylfa Power Station). This should request details of how Magnox Ltd proposes to ensure sustained compliance with Regulation 4(2) of the Electricity at Work Regulations 1989 in so far as maintenance of L&SP fuseboards on the Wylfa site is concerned.
- 28 This letter should also request that Magnox Ltd identifies whether similar compliance shortfalls exist in relation to maintenance of other electrical systems on the Wylfa site and provide details of how it proposes to resolve these.
- 29 I also recommend that ONR should raise a Regulatory Issue to facilitate monitoring of Magnox Ltd's progress with resolving these matters.

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### LIST OF ABBREVIATIONS

EIR	Event Investigation Report
EMM	Enforcement Management Model
HSE	Health and Safety Executive
IN	Improvement Notice
INF1	Incident Notification Form 1
L&SP	Lighting and Small Power
MSRP	Minimum Safety Related Plant
ONR	Office for Nuclear Regulation
PAR	Project Assessment Report
PGD	Post Generation and Defueling
RD	Recorded Discussion

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### 1 ENFORCEMENT CONTEXT

1. The purpose of this Project Assessment Report (PAR) is to record the basis of ONR's original and revised enforcement decision arising out of an intervention that was prompted by Magnox Ltd's discovery of fuse anomalies in Lighting and Small Power (L&SP) fuseboards across the Wylfa power station site.
2. A decision to consider enforcement action was taken after Magnox Ltd reported unsatisfactory progress in its ongoing inspection of all L&SP fuseboards; a maintenance task that was deemed necessary to identify and remediate further instances of incorrectly rated and by-passed fuses, which were considered likely given the number of previous occurrences discovered.

### 2 BACKGROUND

3. Wylfa power station is now in a Post Generation and Defueling (PGD) phase of operation following the shutdown of Reactor 2 in April 2012 and Reactor 1 in December 2015.
4. Magnox Ltd previously reported that an investigation into a lighting circuit fault in early 2016 led to the incidental discovery of an incorrectly rated fuse, which prompted it to survey a sample of 415 Volt-rated fuseboards around the site to ascertain whether such issues were widespread. As this survey identified a significant number of fuse anomalies in L&SP fuseboards, a comprehensive survey of these fuseboards was deemed necessary.
5. Although the site is currently in a PGD phase of operation, the L&SP fuseboards are general purpose plant items that are anticipated to remain in use for the foreseeable future.

### 3 ASSESSMENT AND INSPECTION WORK CARRIED OUT

6. ONR received an INF1 (Incident ID 2016/133) **[ref.1]** that provided notification of an event (WYL-001256 – Significant 415V fuseboard anomalies) recorded on 22 March 2016. This related to discrepancies between the ratings of installed fuses and the ratings specified on ledger sheets for a number of 415 Volt-rated fuseboards. A resulting action raised by Magnox Ltd to conduct a sample survey to ascertain the extent of fuse anomalies was formally recorded as ONR Regulatory Issue 4337.
7. ONR discussed this matter during a site visit on 29-30 March 2016 (TRIM 2016/146457) **[ref.2]**, at which Magnox Ltd explained that it had now completed a sample survey of its 415 Volt-rated fuseboards. Magnox Ltd advised ONR that although its investigation report was still in preparation, the significant number of fuse anomalies identified in L&SP fuseboards had already prompted an action to inspect all L&SP fuseboards in order to identify and remediate any further fuse anomalies. ONR agreed with Magnox Ltd that this action was appropriate given the number of anomalies identified in the sample survey.
8. ONR also placed a related action on Magnox Ltd to provide a copy of its final Event Investigation Report (EIR), which was formally recorded as ONR Regulatory Issue 4347.

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- 9 Amongst the fuse anomalies discovered in the sample survey of L&SP fuseboards, Magnox Ltd explained that in one instance the fuse rating had exceeded the current rating of the cable that it was intended to protect. In this scenario, the affected cable may not have been adequately protected against the full range of potential fault and overload currents, with a consequential risk of fire. Magnox Ltd referred to the possibility of this occurrence during a Recorded Discussion (RD) on 22 March 2016 (TRIM 2016/191871) **[ref.3]**.
- 10 However, even if the fuse value does not exceed the current rating of the protected cable, the use of a fuse rating above the design intent could potentially increase the risk of electric shock under certain fault conditions and work scenarios; a significant number of fuse anomalies identified in the sample survey of L&SP fuseboards fell into this category.
- 11 Magnox Ltd provided ONR with a copy of its EIR on 4 May 2016 (TRIM 2016/437191 and 2016/216046) **[refs.4 & 5]**, which ONR discussed with Magnox Ltd during a meeting at Wylfa on 25 May 2016 (TRIM 2016/232588) **[ref.6]**. At this meeting, Magnox Ltd confirmed that:
- i) The inspections of all L&SP fuseboards were progressing to schedule, with sufficient resource allocated to complete the work by 31 October 2016.
  - ii) In addition to inspecting L&SP fuseboards and remediating any fuse anomalies, measures were being implemented to reduce the possibility of fuse anomalies being introduced in future.
  - iii) There were shortfalls in the arrangements for periodically inspecting and maintaining L&SP fuseboards in particular areas of the Wylfa site, which had probably prolonged the existence of some fuse anomalies, but these were now being reviewed.
  - iv) Targeted checks of fuses in Minimum Safety Related Plant (MSRP) did not identify any significant issues, which was attributed to the stricter access control and maintenance requirements associated with this plant when compared to L&SP fuseboards.
- 12 In addition to the discovery of one fuse that was rated in excess of its associated cable's current rating during the sample survey of L&SP fuseboards, Magnox Ltd also reported that it had since identified a further instance of a cable being inadequately protected against overcurrent. This related to a piece of wire connected across a blown fuse rather than installation of an incorrect fuse. Recognising this second instance of a potential fire risk, Magnox Ltd highlighted that it was committed to complete the inspection of all L&SP fuseboards and remediate any anomalies by 31 October 2016.
- 13 ONR subsequently closed Regulatory Issue 4347 on the basis that Magnox Ltd's investigation and the resulting actions were satisfactory, including the proposed timescale for completing the inspection of all L&SP fuseboards. This timing was balanced against other demands on Magnox Ltd's electrical engineering resource, such as electrical works associated with implementing the PGD phase of operations. However, while noting the proposed timescale for completing the inspections, ONR requested Magnox Ltd to provide it with notification of any significant emergent issues or changes to the work schedule (TRIM 2016/219292) **[ref.7]**.
- 14 However, on the 27 October 2016 Magnox Ltd informed ONR that the inspections of L&SP fuseboards had fallen behind schedule due to resource constraints, with checks on approximately 30% of fuseboards still outstanding (TRIM 2016/436705) **[ref.8]**. Magnox Ltd also reported that two further instances of fuses linked out by pieces of wire had been discovered in the previous week, for which a related INF1 (incident ID

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2016/492) [ref.9] was submitted to ONR on 28 October 2016. Magnox Ltd reaffirmed its commitment to complete the inspections at the earliest opportunity, citing revised best and worst case completion dates of 31 December 2016 and 31 January 2017. In light of this development, the effectiveness of Magnox Ltd's response to this incident was challenged.

- 15 I discussed this situation with the nominated site inspector, who agreed that I should consult the Enforcement Management Model (EMM) for guidance on applying stronger enforcement action to resolve this matter.
- 16 The nominated site inspector also engaged with Magnox Ltd to request its justification for keeping the as yet unchecked 30% of L&SP fuseboards energised (TRIM 2016/436794) [ref.10]. This challenge was based on the reasonable assumption that as four safety significant fuse anomalies presenting a fire risk (i.e. three fuses linked out by pieces of wire and one overrated fuse) had been discovered in the 70% of fuseboards inspected so far, at least one further occurrence was likely in the 30% of unchecked fuseboards.
- 17 In response to the nominated site inspector's enquiry, Magnox Ltd presented probabilistic arguments that the associated risk of harm was in the order of  $2 \times 10^{-7}$  per annum, driven primarily by the low probability claim for an electrical fault occurring in an affected circuit (i.e. in which overcurrent protection is compromised). Although the associated risk of harm occurring may be remote, the figures used in Magnox Ltd's calculation are subjective and unsubstantiated. Furthermore, the requirement to provide an efficient means for protecting electrical systems from an excess of current as may be necessary to prevent danger is an absolute requirement in legislation (see Section 4).
- 18 The nominated site inspector for Wylfa also requested that Magnox Ltd explore the possibility of implementing mitigation measures for the duration of the remaining inspections (TRIM 2016/436798) [ref.11]. Although Magnox Ltd's response evaluated the options of isolating unchecked fuseboards, imposing area access restrictions and prioritising certain fuseboards, it argued that such measures were disproportionate to the risk of harm and that its efforts would therefore be better directed at progressing inspections of the remaining 30% of fuseboards, which it now proposed to complete by 16 December 2016 and to monitor on a weekly basis.

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

- 19 The appropriate standard for the control of risks associated with electrical systems is specified by the Electricity at Work Regulations 1999. In particular, the following Regulations are relevant to the circumstances of this intervention:
- i) Regulation 4(1), which states that "*all systems shall at all times be of such construction as to prevent, so far as is reasonably practicable, danger*".
  - ii) Regulation 4(2), which states that "*as may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger*".
  - iii) Regulation 11, which states that an "*efficient means, suitably located, shall be provided for protecting from excess of current every part of a system as may be necessary to prevent danger*".

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- 20 Regulations 4(1) and 11 are concerned with avoiding deficiencies in the electrical system that can present danger, such as overrated fuses. In particular, Regulation 11 specifically deals with protection from excess current, which can be achieved by installing suitably rated fuses.
- 21 In addition to shortfalls in compliance with Regulations 4(1) and 11 arising out of fuse anomalies in L&SP fuseboards, a related shortfall is Magnox Ltd's arrangements for periodically inspecting L&SP fuseboards in particular areas of the Wylfa site, which challenges compliance with Regulation 4(2). One benefit of such maintenance is that it facilitates the identification and remediation of deficiencies in the electrical system, such as fuse anomalies. For the approximately 30% of L&SP fuseboards that had not been inspected at the time when the EMM was consulted, this maintenance shortfall prolonged the existence of the risk gap associated with fuse anomalies.
- 22 I applied the EMM to the circumstances of this intervention and recorded my decisions on form EMM1 (TRIM 2016/439471) [ref.12]. In following this process, I judged that (i) the potential consequences (e.g. fire, electric shock) of a fault on an electrical circuit that had inadequate overcurrent protection could be serious personal injury or death, (ii) the benchmark likelihood of harm achieved by compliance with the Electricity at Work Regulations 1989 is nil/negligible, and (iii) the actual likelihood of harm is remote (i.e. the lowest option on EMM Table 2.1). After entering these selections into the EMM Table 2.1 for a single or small number of casualties, I determined that the indicative risk gap was 'substantial'.
- 23 Guidance on the construction and maintenance of fixed electrical installations is provided in 'The Electricity at Work Regulations 1989 – Guidance on Regulations' [ref.13] published by the HSE. More specific guidance is also provided through that document's references to 'BS7671 Requirements for Electrical Installations' ('IEE Wiring Regulations') [ref.14]. Both documents are authoritative sources of guidance on the matters pertinent to this intervention and can be considered to form relevant good practice for the installation and use of 415Volt-rated electrical equipment and associated apparatus, such as L&SP fuseboards and fuses.
- 24 I judged that the existence of these documents meant that a 'defined' and/or 'established' standard of requirement was available, which with reference to EMM Table 5.1 directed an initial enforcement expectation of an Improvement Notice (IN) . My subsequent consideration of dutyholder factors did not vary this initial enforcement expectation, while consideration of strategic factors did not influence the resulting enforcement conclusion, i.e. the serving of an IN.
- 25 For the purpose of this IN, I considered the most appropriate legislation to be the Electricity at Work Regulations 1989, Regulation 4(2), which states that:
- “as may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger”.*
- 26 The following points illustrate the relevance of this particular Regulation to the risk gap that existed:
- (i) The relevant 'danger' includes the potential risk of injury resulting from a fire of electrical origin, in relation to which Magnox Ltd's EIR (TRIM 2016/437191) [ref.4] and Recorded Discussion (RD) (TRIM 2016/191871) [ref.3] both acknowledge that fuses rated in excess of the cable rating or that are replaced by pieces of wire present a potential fire risk.
  - (ii) The guidance on Regulation 4(2) in the 'The Electricity at Work Regulations 1989 – Guidance on Regulations' indicates that inspection is an essential part

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of any preventative maintenance programme, that maintenance should be sufficient to prevent danger so far as is reasonably practicable and that practical experience of use may indicate an adjustment to the frequency at which preventative maintenance needs to be carried out.

- 27 In relation to the frequency of maintenance (see (ii) above), Magnox Ltd identified the need to conduct a one-off inspection of all L&SP fuseboards on the basis that a significant quantity of fuse deficiencies had been identified in the sample survey, including one instance that presented a potential fire risk. However, as Magnox Ltd had made unsatisfactory progress – i.e. 30% of L&SP fuseboards not inspected – in completing this maintenance and hence in closing the related risk gap, in my opinion this justified the serving of an IN.
- 28 Although Magnox Ltd provided assurances that it would complete the outstanding inspections within revised timescales, ONR needed to gain further confidence that Magnox Ltd would now assign sufficient priority and resource to deliver on this commitment, which in my opinion was further justification for serving an IN.
- 29 In being prepared to accept Magnox Ltd's proposal to continue with its inspection programme, albeit enforced by an IN, I accepted Magnox Ltd's proposals not to implement further mitigation measures (see paragraphs 17 and 18) on account of the following factors:
- (i) No site history of electrical faults causing harm due to inadequate overcurrent protection, and
  - (ii) The likelihood that fire suppression measures would be effective before any harm could occur.
- 30 However, after I had presented my enforcement recommendation to the nominated site inspector, ONR met with Magnox Ltd at Wylfa power station on 15 November 2016 (TRIM 2016/463952) [ref.15] to consult on its enforcement intentions. At this meeting, ONR demonstrated to Magnox Ltd how application of the EMM process had directed the enforcement conclusion of an IN, while Magnox Ltd described how the slippage occurred in its L&SP fuseboard inspection programme. Magnox Ltd also explained that, following a recent reprioritisation of the L&SP fuseboard inspections, allocation of additional resource and working time had enabled it to complete visual inspections of all L&SP fuseboards and to rectify any fuse anomalies.
- 31 In light of this progress, I considered that Magnox Ltd had closed the immediate risk gap, although it clarified that it still had outstanding work to complete, including updates to labelling, ledgers, drawings, maintenance records and maintenance arrangements, as well as addressing minor material defects and installing locking devices on some L&SP fuseboards. Magnox Ltd subsequently confirmed this position in a letter to ONR (TRIM 2016/466038) [ref.16].
- 32 By closing the risk gap associated with the potential existence of latent fuse anomalies, which presented risks of fire and electric shock, Magnox Ltd had achieved compliance with the Electricity at Work Regulations 1999 in so far as ensuring adequate protection against excess current on L&SP fuseboard circuits is concerned.
- 33 However, in relation to Magnox Ltd's remaining work activities associated with compliance and administrative aspects of the Electricity at Work Regulations 1999, including the need to develop and implement revised maintenance arrangements, I determined that EMM Table 5.2 supported an enforcement letter as a proportionate enforcement response to ensure that Magnox Ltd achieves sustained compliance with the law in respect of its ongoing maintenance of L&SP fuseboards

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## 5 CONCLUSIONS

- 34 Delays in Magnox Ltd's inspections of L&SP fuseboards prolonged the existence of a risk gap associated with the potential for latent fuse anomalies, which presented potential risks of fire and electric shock.
- 35 Application of the EMM to determine whether stronger enforcement action was justified directed the serving of an IN to encourage prompt completion of maintenance inspections of all L&SP fuseboards. This would facilitate the identification and remediation of any further fuse anomalies, thus closing the associated risk gap.
- 36 Prior to this IN being served, Magnox Ltd closed the risk gap by completing visual inspections of all L&SP fuseboards. This enabled Magnox Ltd to ensure that all L&SP fuses were correctly rated, which therefore achieved compliance with those requirements of the Electricity at Work Regulations 1999 concerned with providing protection from excess current, i.e. Regulation 11 and also Regulation 4(1).
- 37 A combination of shortfalls contributed to incorrectly rated fuses being installed in L&SP fuseboards in the first instance and then remaining undetected. In particular, shortfalls in Magnox Ltd's arrangements for periodic inspections of L&SP fuseboards in some areas of the Wylfa site had prevented timely identification and remediation of deficiencies such as fuse anomalies.
- 38 To ensure sustained compliance with the maintenance requirements of Regulation 4(2) of the Electricity at Work Regulations 1989, which will facilitate the identification and remediation of deficiencies such as incorrectly rated fuses, I consider an enforcement letter to be an appropriate enforcement action. I also consider it appropriate for ONR to raise a regulatory issue to assist with monitoring Magnox Ltd's progress in resolving these matters.

## 6 RECOMMENDATIONS

- 39 I recommend that ONR sends an enforcement letter to Magnox Ltd (Site Director, Wylfa Power Station). This should request details of how Magnox Ltd proposes to ensure sustained compliance with Regulation 4(2) of the Electricity at Work Regulations 1989 in so far as maintenance of L&SP fuseboards on the Wylfa site is concerned.
- 40 This letter should also request that Magnox Ltd identifies whether similar compliance shortfalls exist in relation to maintenance of other electrical systems on the Wylfa site and provide details of how it proposes to resolve these.
- 41 I also recommend that ONR should raise a Regulatory Issue to facilitate monitoring of Magnox Ltd's progress with resolving these matters.

**7 REFERENCES**

1. INF1 2016/133
2. ONR-DFW-IR-15-149 - Wylfa Power Station – Inspection of Progress with Electrical, Control & Instrumentation Aspects of PGDSC Preparation Following Final Shutdown of Reactor 1 (TRIM 2016/146457).
3. Email from Magnox Ltd to ONR - Significant 415V Fuse Board Anomalies (TRIM 2016/191871).
4. Email from Magnox Ltd to ONR - Follow Up Report for Wylfa WYL-001256 Significant 415V Fuse Board Anomalies (TRIM 2016/437191).
5. Email from Magnox Ltd to ONR - Wylfa site visit relating to EC&I aspects of PGDSC (29-30 March 2016) (TRIM 2016/216046).
6. ONR-SDFW-CR-16-143 - Magnox - Wylfa Power Station - Review of progress with fuse survey and related remediation activities (TRIM 2016/232588).
7. Email from ONR to Magnox Ltd – Review of investigation into fuse anomalies and actions from EC&I PGDSC inspection - Wylfa - 25/05/16 (TRIM 2016/219292).
8. Email from Magnox Ltd to ONR – Review of investigation into fuse anomalies and actions from EC&I PGDSC inspection - Wylfa - 25/05/16 (TRIM 2016/436705)
9. INF1 2016/492
10. Email exchanges between ONR and Magnox Ltd - Progress in response to investigation into fuse anomalies (TRIM 2016/436794).
11. Email from Magnox Ltd to ONR - Fuse inspections - Mitigation (TRIM 2016/436798).
12. Form ONR EMM1 (TRIM 2016/439471)
13. HSE Publication HSR25 – The Electricity at Work Regulations 1989 – Guidance on Regulations - Third edition.
14. BS7671 - Requirements for Electrical Installations. IET Wiring Regulations. Seventeenth edition.
15. ONR-SDFW-IR-16-136 – Wylfa Site Inspection – 14 to 18 November 2016 (TRIM 2016/463952).
16. Letter from Magnox Ltd (Site Director) to ONR – Small Power and Lighting Distribution Fuse Boards – 28/11/16 (TRIM 2016/466038).