Office for
Nuclear Regulation

Enforcement action Sellafield Site
Basis for ONR's enforcement decision following a confined spaces event at Magnox Reprocessing in September 2015

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EXECUTIVE SUMMARY

This report summarises my judgment and enforcement recommendations regarding a confined space related event at Magnox Reprocessing on Sellafield Limited's (SL's) Sellafield site in September 2015.

Background

The Office for Nuclear Regulation (ONR) regulates nuclear and conventional health and safety on the Sellafield site. SL identified and then notified ONR that a planned personnel entry by a contractor into a chemical process tank on its uranium finishing/medium active evaporation (UF/MAE) plant had been undertaken without the appropriate confined space control measures in place. Though there was no harm or injury to any of the personnel involved in the event and nuclear safety was not threatened, ONR followed up this event in view of the potential for the individual making the entry to be harmed.

The Confined Spaces Regulations (CSR) 1997 and its associated Approved Code of Practice (ACoP) define the legal responsibilities and provide guidance for those who work or control work in confined spaces. A confined space can be any space of an enclosed nature where there is a risk of death or serious injury from hazardous substances or dangerous conditions, for example asphyxiation. The law requires the dutyholder (in this instance, SL) to carry out a suitable and sufficient assessment of the risks for all work activities to decide what measures are necessary for safety. For work in confined spaces this means identifying the hazards present, assessing the risks and determining what precautions to take.

Work carried out by ONR in consideration of this event

The ONR inspector for Magnox Reprocessing met with the head of the operating unit a few days after the event occurred. Based on the information presented, the inspector judged that the event had been caused by SL not adequately controlling and supervising its contractor, and so was an apparent breach of Licence Condition (LC) 26 (control and supervision of operations). As such, the event was followed up as part of a planned LC 26 compliance inspection on the UF/MAE plant later that year. That inspection found that SL had inadequate control and supervision of contractors on the plant and a Regulatory Issue was raised to track SL's subsequent resolution activities.

In addition, ONR considered that the CSR aspects of the event were significant enough to warrant specific regulatory follow-up. Consequentially, supported by an ONR human factors specialist inspector, I began examining the CSR aspects of the event. My intervention was conducted in two parts. Firstly I reviewed SL's investigation report and sampled its CSR arrangements. Secondly I undertook an information-gathering site inspection, comprising a number of meetings with SL staff and also the contractor involved in the event.

Based on the information obtained, I concluded that:

- SL did not comply with its CSR arrangements for confined spaces entries in this instance.
- The actions taken by UF/MAE plant management immediately after the event were sufficient to bring the facility back into compliance with the site's CSR arrangements (and hence the CS Regulations) before any intervention by ONR.
- SL's investigation did not fully address the root cause of the event, specifically the reasons behind the shortfalls in human performance and control and supervision of work activities under consideration.
- The event was caused by SL not adequately controlling and supervising the work being undertaken by its staff and contractors.

In considering how to take forward these matters I took account of the Improvement Notice ONR served on SL in June 2015. This Notice, which is still in force, was for apparent breaches of Licence Condition 24 (operating instructions), within Magnox Reprocessing. When this Notice was served, ONR considered that it was highly likely that there would be further conduct of operation-related events in Magnox Reprocessing, until such time as SL had completed its (approximately 18 month) programme of identified improvements. The present event took place three months after this Notice was served. In my opinion, the control and supervision shortfalls associated with this event fall within the context of breaches that were anticipated by ONR as part of the due process in serving that Notice and in consequence no further regulatory action is merited in regard to this aspect of the event.

I have nevertheless applied ONR's Enforcement Management Model (EMM) to CSR aspects of this event. Based on these considerations I judge that the appropriate enforcement action is for ONR to issue SL with a regulatory letter for apparent breaches of CSR.

Conclusions

In my opinion:

- SL did not comply with the Confined Spaces Regulations 1997 and the associated ACoP when a contractor entered a chemical process tank during the Magnox Reprocessing 2015 periodic shutdown.
- SL took immediate actions that were sufficient to bring it back into compliance with CSR prior to ONR intervening. There is therefore no continuing offence and no-one was harmed in the event.
- Though there were control and supervision shortfalls associated with this event, the remedial actions required to address them are covered by ONR's existing Improvement Notice, relating to compliance with Operating Instructions.
- It would not be proportionate for ONR to take regulatory action against the contractor involved in this event.
- ONR should however take enforcement action in regard to apparent breaches of CSR.

Recommendation

I recommend that ONR should issue SL with a regulatory letter noting the apparent breaches of the Confined Spaces Regulations in this event, the shortfalls in the control and supervision of work activities, and the shortfall in its investigation to adequately identify the root causes of the event.

LIST OF ABBREVIATIONS

ACoP	Approved Code of Practice
CSR	Confined Spaces Regulations 1997
CST	Concentrate stock tank
EMI&T	Examination, maintenance, inspection and testing
EMM	Enforcement Management Model
HOMR	Head of Operations, Magnox Reprocessing
HOW2	(Office for Nuclear Regulation) Business Management System
HSE	Health and Safety Executive
IN	Improvement Notice
LC	Licence Condition
ONR	Office for Nuclear Regulation
OPEX	Operational experience
PAR	Project assessment report
PMS	Plant maintenance schedule
PPE	Personal protective equipment
PTW	Permit to work
SCIE	Sellafield Compliance, Intelligence and Enforcement
SL	Sellafield Limited
UF/MAE	Uranium finishing/medium active evaporation plant

TABLE OF CONTENTS

1 MATTER UNDER CONSIDERATION ... 7
2 BACKGROUND ... 7
3 WORK CARRIED OUT BY ONR IN CONSIDERATION OF THIS EVENT ... 8
4 MATTERS ARISING FROM ONR’S WORK ... 10
5 CONCLUSIONS ... 11
6 RECOMMENDATIONS ... 11
7 REFERENCES ... 12

1 MATTER UNDER CONSIDERATION

1. This project assessment report (PAR) records my recommendation of the appropriate enforcement action for the Office for Nuclear Regulation (ONR) to take in relation to an apparent breach in the Confined Spaces Regulations 1997 that took place on Sellafield Site during the Magnox Reprocessing operating unit's 2015 periodic shutdown.

2. ONR regulates nuclear and conventional health and safety on the Sellafield site. Sellafield Limited (SL), the site licensee, identified and then notified ONR that planned personnel entries into one of two chemical process tanks had been undertaken without the appropriate confined space control measures in place. This event took place at SL's uranium finishing/medium active evaporation plant (UF/MAE) in September during the 2015 periodic shutdown. SL states that there was no harm or injury to any of the personnel involved in the event and that nuclear safety was not threatened

3. The Confined Spaces Regulations (CSR) 1997 and its associated Approved Code of Practice (ACoP) (Ref.1) give the legal responsibilities and guidance for those who work or control work in confined spaces. A confined space can be any space of an enclosed nature where there is a risk of death or serious injury from hazardous substances or dangerous conditions, for example asphyxiation. The law requires the dutyholder (in this instance, SL) to carry out a suitable and sufficient assessment of the risks for all work activities to decide what measures are necessary for safety. For work in confined spaces this means identifying the hazards present, assessing the risks and determining what precautions to take.

2 BACKGROUND

4. In mid-2015 Magnox Reprocessing at Sellafield was shut down as planned for its triennial periodic shutdown, as required by the site's Licence Condition (LC) 30 (periodic shutdown) arrangements. During the shutdown SL undertook a programme of planned work in compliance with its LC 28 arrangements. LC 28 requires the licensee to make and implement adequate arrangements for the regular and systematic examination, inspection, maintenance and testing (EMI&T) of all plant which may affect safety. These activities included a programme of maintenance, external and internal inspection, and possible repairs to concentrate stock tanks (CST) 2 and 3 on the UF/MAE plant.

5. On 16 September 2015 a contractor undertook an internal inspection of CST3. The internal inspection was classified by the licensee as a confined spaces entry and therefore needed to comply with the requirements of its suitable and sufficient assessment performed under CSR. Towards the end of the inspection, SL personnel realised that the contractor had entered CST3, which had not been prepared for confined spaces entry, rather than the adjacent CST2, which had been prepared for entry. The contractor immediately exited CST3 and later entered CST2 to undertake the internal inspection. Throughout the internal inspections the contractor wore personal protective equipment (PPE) that SL considered was suitable for the task. He also wore a safety harness and lifeline that was attached to a manned winch, which provided a means of removing him from the tanks in an emergency.

6. On 17 September plant personnel raised a Condition Report for the event. SL's plant management immediately suspended all work on CST 2 and 3, all confined spaces activities on UF/MAE and all work on site being undertaken by the contractor. The plant management subsequently put in measures that it considered were sufficient to bring it back into compliance with SL's CSR arrangements and implemented enhanced supervision of contractors. The outstanding work on CST 2 and 3 was later completed without incident.

7. Soon after the event the licensee convened a team to investigate the root causes of the event as part of its due process. Its root cause investigation report (Ref.2) was issued in January 2016 and peer reviewed (within SL) in March 2016. The report identified eleven root causes and ten corrective actions to be taken to address the condition/causes of the event.

3 WORK CARRIED OUT BY ONR IN CONSIDERATION OF THIS EVENT

8. ONR's site inspector for Magnox Reprocessing was made aware of the event from reviewing the weekly Incident Event Report list sent to ONR by the licensee on 18 September. The ONR inspector contacted SL's Head of Operations, Magnox Reprocessing (HOMR), to express her concerns about the event, which in her opinion had potential for serious harm. As part of a planned site visit between 21-24 September, the ONR inspector met with the HOMR to follow up on the event (Ref. 3). Based on the information presented, the ONR inspector deemed that the event had been caused by SL not adequately controlling and supervising the contractor undertaking EMI&T, as necessary to comply with LC 26 (control and supervision of operations). The inspector also notified ONR's conventional safety inspectors about the confined spaces aspects of the event (Ref.4). The event was discussed further at the periodic shutdown start-up meeting (Ref. 5) and shutdown progress meeting (Ref. 6).

9. In November 2015, ONR inspectors undertook an LC 26 inspection (Ref.7) of UF/MAE. One of the conclusions from the inspection was that there was a shortfall in SL's control and supervision of contractors. An inspection rating of 4, below standard, was awarded against LC26 requirements. In accordance with ONR's guidelines an issue was raised on the ONR Regulatory Issues Database against the shortfall to track SL's resolution activities.

10. In early 2016, ONR sampled SL's root cause investigation report into the event (Ref.2) and considered that there was a shortfall in the report as to why the event occurred. ONR Sellafield Programme management considered that the CSR aspects of the event were significant enough to warrant regulatory follow up (Ref. 8).

11. In consequence, an ONR human factors specialist inspector and I undertook an intervention looking at the CSR aspects of the event. The intervention was conducted in two parts. Firstly we reviewed SL's investigation report and sampled its CSR arrangements (Ref. 9). Secondly we undertook an information-gathering site inspection (Ref. 10) between 15-16 March, comprising a number of meetings with SL staff and the contractor involved in the event. The salient points arising from that inspection were:

   - The contractor had entered a designated confined space: without the atmosphere within CST 3 being tested; without monitoring the tank's atmosphere during the inspection; and without implementing fully SL's arrangements for emergencies and rescue. In addition there were shortfalls with SL's control and supervision of the work being undertaken by its staff and contractors during this event.
   - Once SL had identified there had been a potential breach of CSR it immediately took action to bring itself back into full compliance. The actions included suspending all similar work being undertaken in the operating unit, introducing enhanced arrangements for control and supervision of contractors, retraining key personnel, reinforcing management expectations for control and supervision of work and compliance with arrangements, and increasing the number of its "manager in the field" inspections.

- Prior to the event, and in response to enforcement action from ONR, SL had already instigated a separate improvement programme aimed at addressing shortfalls in human performance and safety culture.
- SL undertook a review of its CSR arrangements in response to the event, which concluded that they were fit for purpose.
- We challenged SL that its investigation had not, in our opinion, addressed in sufficient detail why the event occurred, i.e. the root cause. The report author responded that the human performance aspects of the investigation were covered by the human performance and safety culture improvement programme SL had already introduced.
- I sampled the permit to work (PTW) documentation for the confined spaces work on CST 2 and 3. I made an observation that the work activities associated with CST 2 and 3 were covered by two PTW; one each for work in August and September respectively. I would have expected a PTW for each discrete work activity to help focus control and supervision of operations. However, in my opinion the structure of the PTW did not significantly contribute to the event.

12. The findings of the information-gathering inspection are reported in detail in reference 10. An inspection rating of three, adequate, was awarded against CSR. I drew two conclusions from the inspection, namely:

- SL did not comply with its CSR arrangements for the confined spaces entries into CST 2/3 during the event.
- The actions taken by UF/MAE plant management immediately after the event were sufficient to bring the facility back in compliance with the site's CSR arrangements (and hence CSR) before any intervention by ONR. There is, therefore, no enduring offence.

13. Based on the evidence I have sampled in response to this event, I consider that the event was caused by SL not adequately controlling and supervising the work being undertaken by its staff and contractors.

14. The event is therefore linked to other shortfalls in control and supervision of operations within Magnox Reprocessing. In response to these ONR issued SL with an Improvement Notice (IN) I/2015/ONR/PSJ/001 (Ref. 11) in June 2015 for apparent breaches in its duty under LC 24 (operating instructions).

15. The PAR (Ref.12) that recommended that ONR serve the LC 24 IN included a section on the strategy for and intended outcome of the enforcement action. The PAR is explicit in noting that delivering the necessary improvements on the operating unit in a sustainable manner could not be a "quick fix". The likely timescales for delivery of the IN schedule were anticipated to be approximately 18 months. During this period the PAR notes that "*it is highly likely that there will be further conduct of operation-related events and operating instruction breaches at the plant. Any such occurrence will need to be considered by ONR on a case-by-case basis. However, consideration of enforcement action following such occurrences should be tempered by the existence of the Notice".*

16. In my opinion, the control and supervision shortfalls associated with this event fall within the context of breaches that were anticipated by ONR as part of its due process in serving Notice I/2015/ONR/PSJ/001. The event being considered here occurred approximately three months after the IN was served and so well inside the likely timescale of 18 months for delivery of the required improvements.

17. In my opinion, SL's investigation did not fully address the root cause of the event, specifically the reasons behind the shortfalls in human performance and control and supervision of work activities under consideration. I have therefore included this shortfall in my recommendation concerning the content of the enforcement action letter. However, I am confident that SL's more general programme to address shortfalls in the human performance of its staff is sufficient to address the problems identified through this event. ONR is actively engaged with SL in tracking its resolution activities.

3.1 APPLICATION OF THE ENFORCEMENT MANAGEMENT MODEL (EMM)

18. I have applied the EMM (Refs 13, 14, 15) to this event in view of the apparent non-compliance with CSR 1997 and its associated ACoP. In my opinion SL did not adequately implement the risk assessment for the confined spaces activities undertaken by its contractor on CST 3 on 16 September 2015. In particular there were shortfalls with supervision, testing and monitoring the confined spaces atmosphere, and emergencies and rescue. These are precautions to be included in the safe system of work set out in the CSR, Regulation 4 ACoP.

19. I judged that these shortfalls amount to a substantial risk gap against a defined standard, giving an initial enforcement action of an IN. I then applied EMM dutyholder factors to derive the indicated enforcement action, which was a regulatory letter.

20. In my opinion SL's actions taken immediately after the confined spaces entry event were sufficient to bring Magnox Reprocessing back into full compliance with its CSR arrangements. I judged that there was no continuing non-compliance with the CSR. I consider, therefore, that the appropriate enforcement action in this instance, after taking dutyholder factors into account, is for ONR to issue a regulatory letter to SL.

21. In my opinion, the contractor shared some responsibility for the apparent breach of CSR because I would have expected a person competent for confined spaces working to be aware of the associated hazards and what precautions to take. However, in this instance I consider that the balance of responsibility for ensuring compliance with CSR lay with SL and therefore it would not be proportionate to take regulatory action against the contractor. In reaching this conclusion I have taken into account that the contractor used a harness and attached lifeline, and adequate PPE during his entry into the tank.

22. This PAR has been peer reviewed by a Health and Safety Executive conventional safety inspector, who is attached to ONR. I consider that this gives adequate oversight from an ONR conventional safety inspector of this conventional safety related event.

4 MATTERS ARISING FROM ONR'S WORK

23. I have formed a judgment on the appropriate enforcement action for ONR to take in relation to an apparent breach of CSR that took place at Sellafield during the Magnox Reprocessing 2015 periodic shutdown. In forming my judgment I have followed ONR's processes for delivering this PAR and applying the EMM (Ref.13) to the event.

24. I have taken note that ONR served IN I/2015/ONR/PSJ/001 on the licensee for apparent breaches against LC 24 within Magnox Reprocessing just prior to this event and that Notice is still in force. I am content that the control and supervision aspect associated with this confined spaces event are adequately covered by the IN.

25. In forming my judgment I took into account SL's actions subsequent to the event and other ONR regulatory interactions with SL. In my opinion SL's actions taken immediately after the confined spaces entry event were sufficient to bring Magnox Reprocessing back into compliance with CSR. It is my judgment therefore that the

appropriate enforcement action in this instance is for ONR to issue SL with a regulatory letter.

5 CONCLUSIONS

26. In my opinion:

- SL did not comply with the Confined Spaces Regulations 1997 and the associated ACoP when a contractor entered CST 3 during the Magnox Reprocessing 2015 periodic shutdown.
- SL took immediate actions that were sufficient to bring it back into compliance with CSR prior to ONR intervening. There is, therefore, no continuing offence and no-one was harmed in the event.
- Though there were control and supervision shortfalls associated with this event, the remedial actions required to address them are covered by ONR's existing IN I/2015/ONR/PSJ/001, which is related to compliance with operating instructions, supplemented by the Regulatory Issue raised in November 2015 focusing on SL's management of contractors.
- This event occurred shortly after IN I/2015/ONR/PSJ/001 was served and thus too soon for the improvements it requires to have become embedded.
- It would not be proportionate for ONR to take regulatory action against the contractor involved in this event.

27. I have applied the EMM to this event and it is my judgment that the appropriate enforcement action in this instance is for ONR issue SL with a regulatory letter.

6 RECOMMENDATIONS

28. I recommend that ONR should issue SL with a regulatory letter noting the apparent breaches of the Confined Spaces Regulations in this event, the shortfalls in the control and supervision of work activities, and the shortfall in its investigation to adequately identify the root causes of the event.

7 REFERENCES

1. Confined Spaces Regulations 1997 ACoP. http://www.hse.gov.uk/confinedspace/

2. SL Root Cause Investigation Report. TRIM Re. 2016/79204

3. ONR Contact Record, ONR-SEL-CR-15-322. TRIM Ref. 2015/364134.

4. Email from ONR nuclear safety inspector to ONR conventional safety inspector. TRIM Ref 2015/364105

5. ONR Contact Record ONR-SEL-CR-15-346. TRIM Ref. 2015/379825

6. ONR Contact Record ONR-SEL-CR-15-317. TRIM Ref. 2015/371171

7. ONR Intervention Record for LC 26 inspection ONR-SEL-IR-15-070. TRIM Ref. 2015/452940

8. Email from ONR conventional safety inspector to ONR nuclear safety inspectors. TRIM Ref. 2016/167693

9. Sellafield Limited Confined Spaces arrangements. TRIM Ref. 2016/167645

10. ONR Intervention report for information-gathering inspection. ONR-SEL-IR-15-100. TRIM Ref. 2016/126749

11. Improvement Notice I/2015/ONR/PSJ/001 served on SL (Magnox Reprocessing) in June 2015 following breaches of LC 24 (Operating Instructions). TRIM Ref. 2015/235869.

12. ONR PAR supporting Ref. 11, ONR-SEL-PAR-15-001. TRIM Ref. 2015/135045

13. *ONR HOW2 Guide – The use of the EMM in ONR - NS-ENF-GD-002 Revision 5*. October 2014.

14. Completed EMM1 form for September 2015 confined spaces event. TRIM Ref. 2016/167586

15. HSE Enforcement Management Model (EMM) http://www.hse.gov.uk/enforce/emm.pdf