

AWE plc
Regulatory Interface Control Centre
(RICC) [REDACTED]
Atomic Weapons Establishment
Aldermaston
Reading RG7 4PR

[REDACTED]
HM Principal Inspector
(Nuclear Installations)
Nuclear Safety Directorate
B3.2 Redgrave Court
Merton Road
Bootle
Merseyside L20 7HS

Tel: 0151 [REDACTED]
Fax: 0151 [REDACTED]
[REDACTED]@nise.gsi.gov.uk

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Your Ref:
Unique No:

FAO: [REDACTED] AWE Burghfield [REDACTED]

Dear [REDACTED]

Burghfield Assembly Facility – Issues arising from meeting between AWE(B) and NII Inspectors on 24/25th April 2007

Thank you for the opportunity to meet with a number of AWE staff at the meeting referenced above. One of the objectives of the meeting was for individual NII inspectors to gain an understanding of progress of the shortfalls highlighted in the PRS. We felt that a number of useful discussions had been undertaken to achieve this objective. Additionally, we note the summary of issues produced by [REDACTED] which helps clarify your position on progress of these issues. We are now in a position to advise you of those areas that we consider further evidence is required in order to demonstrate that risks are ALARP.

Full details of the issues raised are presented in Annex 1. However, we believe that a number of common concerns have been raised by individual inspectors. In particular, the following issues were noted by a number of individuals:

- The visibility of the tracking of shortfalls from identification in the PRS to completion via the 804 Change Control process is not clear. The Design Control Plan does not instil confidence that AWE's own procedures are being followed.

- Further assurance is needed that proposed modifications would resolve the original issue and produce the necessary safety benefits;
- Further assurance is needed that shortfalls that have been declared as closed have indeed been closed-out to an appropriate standard;
- The categorisation of the modification work is unclear against the consequences of inadequate design/ implementation.

NII is also concerned that the key role in ensuring that design specifications are subjected to appropriate ALARP reviews, FMRA's etc. is the responsibility of a single individual.

We consider that it will be necessary to focus our attention in these areas to enable us to be in a position to make a positive decision on the Burghfield PRS. We will therefore use the forthcoming inspection weeks to gain evidence that the points highlighted above, and those details contained in the lead inspectors' reports in Annex 1, are being appropriately addressed.

Please arrange for copies of this letter to be provided to the AWE safety representatives. I will be sending a copy to [REDACTED] of DNSR at Abbeywood.

Yours sincerely,

[REDACTED]
HM Principal Inspector (Nuclear Installations)

Distribution:

[REDACTED]

[REDACTED] DNSR, Abbeywood

Annex 1: Details of NII Concerns Regarding Closure of PRS Shortfalls:

Safety Case Issues – NII Lead, [REDACTED]

NII sought evidence of closure of shortfalls, and sampled shortfall 6.5.4.1 "glovebox operations should be subject to a HAZOP2 study in order to investigate cause and effect". The evidence presented was Hazop report DMP/GG/LL/17214183. However, the report was for a HAZOP1 not a HAZOP2. The shortfall therefore did not appear to be closed. NII also sampled shortfall 6.5.3.1 and 6.5.2.1 regarding new lifting and tooling FMEAs. It was noted that the tooling FMEA did not have a 'failure mode', column, and hence did not appear to be consistent with AWE procedure CSP 855 s4, nor consistent with the lifting FMEA.

NII spoke to [REDACTED] a member of the Remedial Works team. NII emphasised the importance of doing a proper risk assessment for modifications, to ensure that risk is in fact reduced and not increased by being inadequately conceived or implemented

Engineering Issues – NII Lead, [REDACTED]

Manufacturing Authority

[REDACTED] briefly spoke to [REDACTED] of the Manufacturing Authority. He provided a summary of all the shortfalls listed against the MA.

There were 18 shortfalls ranging from Cat 1 to Cat 4 and he had provided an outline of the proposed actions that are proposed. Three items were completed and the outline engineering details of a number of modifications were listed. Eight items indicated that a challenge would be made against the original shortfall. That is the original SFRs were considered too onerous, unrealistic or there was new evidence/test etc. One action related to electrical issues.

[REDACTED] is generally satisfied that the MA are progressing the shortfalls appropriately and will arrange further discussions with [REDACTED] to discuss them. The modifications will be controlled and implemented by the MA itself.

Remedial Works Team, 24 April 2007

[REDACTED] provided a summary of the activities of the remedial works team. He explained that there were 338 shortfalls assigned to them amounting to around 80 planned fixes. The differences in the number of fixes arising out of the fact that a number of shortfalls may have a common theme and may be addressed by a single fix. The situation is further complicated by the fact that a similar fix would be implemented in a number of areas at different times.

Given the apparent complexity of the task AWE were asked to explain how the technical issues raised against a specific DAR would be rectified in practice. There were two main issues, the traceability of the process and the technical reassurance that the proposed modification would both resolve the original issue and produce the perceived overall safety benefit to the final safety case.

From the discussions it became apparent that there were a number of unique numbering systems using apparently similar numbering sequences in different areas. AWE explained that you needed access to the DOORS data base to follow the numbering system through from a unique shortfall to a planned improvement.

AWE provided a demonstration of how the system operated. From the demonstration it became apparent that the data base had limited search capability and is essentially a document record and retrieval system. That is given a unique shortfall reference AWE could retrieve the supporting documentation to the shortfall and it was then possible from reading the records to understand the history of it.

AWE indicated that against each shortfall reference there would eventually be a number of further documents as follows;

- a. Scoping document
- b. Engineering specification
- c. Basis of implementation pack
- d. Change Control 804 document
- e. Safety Justification.

Following a number of attempts to interrogate the system and track the progress of a specific design modification through the system AWE agreed to find a simple modification that was either at an advanced stage, or possibly at completion when the meeting resumed the following day.

Remedial Works Team, 25 April 2007

AWE provided the agreed example Unique Reference No DMP/LL24415970. The example related to an X ray door interlock system where the integrity of the original interlock categorisation was considered to be inadequate. Details of NII's findings for this modification can be found under the CI & E Issues below.

An early discussion with [REDACTED] would appear essential to ensure that we have clear visibility of how safety requirements (i.e. shortfalls in the existing equipment) are incorporated into the remedial works engineering process and appropriate CSPs are used in the development of new designs.

The facility remedial works design control plan for these projects needs to be finalised urgently if these projects are to be completed to a September 2007 deadline.

CI & E Issues – Nil lead, [REDACTED]

The Remedial works programme (which consists of ~80 shortfalls) is being managed by [REDACTED] who has responsibility for 6 engineers. AWE attempted to demonstrate the DOORS database role in the Remedial works process. This process appears to take the output from the 'PRS handover report & close out report' (DMP/GG/LL18029095) forward into an engineering scope of works document and then a technical specification as basis for contract of works.

In order to gain some confidence in the process AWE were asked to take Nil through a PRS shortfall from its identification to completion (closeout). This demonstration proved quite difficult for AWE and revealed a number of potential areas for concern. AWE said that the process was difficult to demonstrate as it required input from other groups (PRS, safety case) and the majority of the improvements are still at the early stage of scoping.

We asked AWE to put together the best example to demonstrate the process for the meeting on the next day. At this second break out session AWE put forward an example shortfall to demonstrate the process. This shortfall involved the [REDACTED] in building *F**. AWE started by producing a copy of a signed off proposed scope of works document (DMP/LL24415970). This proposed modification was to provide a Castell key interlock system to control access.

AWE said that the scoping document process looked back to the PRS including the output of the DAR's and ALARP meetings (optioneering process). However it was difficult to establish how the engineered solution, that was proposed in the scoping report, had been derived and how it related to and satisfied the original shortfall against the SFR. This was further highlighted by a statement in the document that the basis for the design integrity was not yet known (not known but could exceed SIL 2).

AWE said that the due process was not yet completed at this stage and the document had to be processed by the safety case department [REDACTED] and go through facility modification risk assessment (FMRA) and modification arrangements (804) before being completed. AWE then presented a Design Control Plan in order to explain the process. However this project specific DCP failed to show a visible link and raised concerns that the project may not necessarily be complying with the corporate CSP's.

AWE accepted that the visibility and traceability of the link between the shortfall, ALARP and scoping process could be improved and suggested that this could be incorporated in the scoping document. However it is only the visibility issue that raises concerns; it was worrying to see that the proposal in this instance had been developed through to an electrical specification stage report. This report (DMP/GGEC/LL24819731) is intended for issue to a contractor for works. A chief concern is that the categorisation of the entire process may not reflect the consequences of inadequate conception of design or implementation. AWE admitted that this modification may now attract a category B status however this contradicted what had previously been noted that only category A and C modifications existed.

In conclusion AWE failed to adequately demonstrate that the process would deliver engineering fixes that address the PRS shortfalls in terms of the safety case requirements. There is a risk that AWE could implement modifications that subsequently can not be demonstrated to satisfy the safety case.

The inspection raised the following observations / concerns:-

- i) The process to address PRS shortfalls is complex and has many overlaps in responsibility. It needs robust arrangements to manage it with the DOORS database playing a significant role.
- ii) The categorisation of the modification work is unclear against the consequences of inadequate design/ implementation.
- iii) The process to demonstrate that the improvements satisfy the safety case requirements lacks visibility.
- iv) The project (design control plan) may not be following AWE's own corporate CSP requirements.
- v) The work is being driven by the delivery date of September 07, which raises a question on AWE's capability to resource and complete the task.

Civil Engineering Issues – NII Lead [REDACTED]

There are several items of work which will extend beyond the decision date. Some examples of these are as follows (also shown on the programme):

- 4.1.1.1 Structural modifications to [REDACTED] on [REDACTED] programme)
- 4.2.12.1 Repairs to Gunnite Cap (Part complete but some of implementation will extend beyond Sept 07)

There are also some items which are planned to finish before the decision date but which may extend beyond it for some reason. Some items are reliant on ongoing analysis work which may not resolve the issue. There is inspection work still being procured and which is slow in implementation which could push the resolution of the issue beyond the decision date. These relate to the trial for the investigation of buried structures concrete which was planned for January and has still not started due to difficulty in letting an appropriate contract. If the trial is successful it is not clear that the inspection in the facility will be complete by the decision date. If the trial is unsuccessful it is doubtful if there is time to look for an alternative. A similar situation could occur with the inspection of the masonry on the [REDACTED] Building. Examples of these are as follows:

- 4.4.10 Inspection of external concrete surfaces. Contract being let to APERIO but very slow. This will be for trial only. If successful needs to be implemented on facility structures – probably after Sept 2007. If unsuccessful, alternative position to be proposed and agreed.

4.10.1 [REDACTED] Seismic withstand of roof trusses. Justification expected, but if unacceptable further work will be required either in analysis or remedial works. Sept 07 unlikely to be met in this case.

4.10.2.1 [REDACTED] Masonry withstand. Inspection required (Contract let very slow). If Ok No further work. If not OK remedial work required probably after Sept 07.

There are some items which are being reviewed and which are being put to the ALARP Panel for approval of a reduced scope of work. If the ALARP Panel does not agree to the reduction, further work is required which may overrun the decision date. Examples of these concerns are as follows:

4.2.6.6. GG [REDACTED] inspection. GG [REDACTED] Complete and report received by NII. Expectation is that all GGs will be inspected. Submission to ALARP Panel to remove need to inspect other GGs on basis of first report.

Additional work is being undertaken to provide justification of robustness of GG [REDACTED] If unacceptable may lead to additional work and so overrun the decision date.

4.4.4.1 [REDACTED] roof capacity. Proposal to ALARP Panel to revise analysis method and reduce site work. ALARP Panel have requested further information. Unsuccessful result could extend solution definition beyond Sept 07.

Many of the civil engineering shortfalls will not actually end up with a physical fix. There may be further analysis or justification which goes some way towards demonstrating that the risk may be tolerable. There will undoubtedly be a degree of engineering judgement involved in the final decision as to whether the plant is safe to operate.

AWE need to provide a coherent justification as to why it is safe to continue operating with a structure which will not meet modern standards. The current work will contribute to that justification but it will not, in its own right, provide a modern standards fix for the shortfall. A Justification is also required that the 'fix' is ALARP. There are a number of 'do nothing' responses to shortfalls which need to be included in that justification.

We need also to bear in mind that for the civil engineering structure the only real fix is the new facility.

Human Factors Issues – NII Lead, [REDACTED]

Human factors in the PRS process has been limited to production of a report detailing a human factors and SMS review of extant assessments which identifies safety case shortfalls for human factors but no deficiencies in plant or processes except to reiterate shortfalls identified during human factors assessment undertaken in 2004, although these were not formally added to the PRS shortfalls database; it was indicated that they would be held in the AMS database. AWE indicated that for the PRS reliance was placed upon engineering specialists to identify ergonomic shortfalls as part of the DAR process and

formal human factors input was not sought. In addition it was stated that AWE modification process (804) requires human factors aspects to be addressed, however, AWE was not able to confirm that human factors advice had been sought in optioneering, design and implementation of PRS shortfalls. It is noted that a number of shortfalls have human factors implications for example, those focused on handling issues have the potential to include changes to operations and a number of shortfalls involve changes to the Human-Machine Interface.

The AMS database was interrogated, tracking a selection of shortfalls assigned to the facility to progress. The criteria for this decision process was not apparent looking through the list. There is some inconsistency; for example, the AMS database holds shortfalls that were explained as aimed at tooling, and challenges to the risk assessment. During discussion, AWE personnel indicated that these would not be resolved by the facility. Without clear ownership there is the potential for shortfalls to fall through the gaps. In addition, some shortfalls were ambiguously worded and the facility were unclear with regard to the issue to be addressed. The facility appear to be using AMS to manage the process rather than DOORS, there are practical reasons for this; production of work sheets for each individual shortfall owner integrates the PRS shortfalls into normal business. Details of the required actions and evidence of close out is not recorded. Progression of shortfalls through AMS needs to be reconciled with the overall remediation of the PRS shortfalls to ensure AWE has adequate oversight of the whole process. This is something that will be pursued in further inspections.

Some of the shortfalls carried over from the 2004 human factors assessment were also tracked. They appeared difficult to track and dates for resolution of some fell between 2008-9.

To conclude, the presentation and inspection activity has prompted identification of three areas for further inspection from a human factors perspective;

1. Further interrogation of the AMS for progress of the facility-led shortfalls encompassing resolution of management issues and earlier human factors assessment used as source material for the PRS.
2. Progress of the safety case shortfalls.
3. Treatment of human factors issues in the engineering substantiation and modification process.

It is intended that these will be pursued during May inspection week.