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Unit 3b Division 3 PROJECT ASSESSMENT REPORT No:40/2006

HEALTH AND SAFETY EXECUTIVE

HM NUCLEAR INSTALLATIONS INSPECTORATE

**PROJECT:** Report to justify the Agreement to the implementation of the Trident modified disassembly process, Burghfield.

**SITE:** AWE Burghfield

**CONSENT/APPROVAL NO:** N/A

**LICENCE INSTRUMENT No:** [REDACTED]

**LICENCE and CONDITION Nos:** 78, LC 22(1)

**AUTHOR:** [REDACTED]

**SIGNED:** .....Date.....

**APPROVED:** [REDACTED]

**SIGNED:** .....Date.....

**Distribution:**

[REDACTED]  
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SUMMARY

In 2002 AWE submitted the Trident Modified Disassembly<sup>1</sup> Safety Case (TMDSC). NII had concerns over the methodology and asked for a revised risk assessment (RA) to be carried out. Licence Instrument [REDACTED] was issued to allow limited [REDACTED] the meantime and with the restriction of [REDACTED] in Gravel Gerties. In mid 2003 a further LI [REDACTED] was granted allowing further limited [REDACTED] with the same constraint. At this time NII understood that the RA was continuing to be developed. In March 2004 NII reiterated in writing that a new RA was necessary and that further LIs would only be granted when adequate progress had been demonstrated. AWE programmed the RA for completion in April 2006, however, it was not completed and forecasts at the time indicated that it would not be completed until April 2007. On the basis that sufficient progress had not been made toward completion of the RA, and the ongoing PRS had indicated a number of shortfalls to the facility and plant, LI [REDACTED] was issued in August 2006 to allow AWE to [REDACTED] specified units, already held at AWE(B), but only following written confirmation from DNSR that the [REDACTED] were necessary in support of the UK Strategic Deterrent. The AWE(B) letter requesting LI [REDACTED] was annexed by a Schedule of Deliverables (SD)(reference 1), which was agreed by NII prior to the granting of the LI. This schedule required AWE(B) to introduce some risk-reducing measures in the short term, including the development of that part of the TMDSC which included the significant contributors to the overall risk of disassembly operations, before any further LIs would be granted.

In November AWE(B) sought agreement to [REDACTED] but not [REDACTED] a number of units. DNSR confirmed by letter that an [REDACTED] of a minimum of [REDACTED] was necessary in support of the UK Strategic Nuclear Deterrent. Following site visits and examination of an "evidence" file supplied by AWE, NII granted [REDACTED] to permit the [REDACTED] of [REDACTED] on [REDACTED]

AWE has now applied for permission to [REDACTED] a further [REDACTED] based upon a need to support the UK Strategic Deterrent and on progress so far in achieving completion of the deliverables offered in reference 1.

AWE has made good progress against these requirements, with respect to the RA and in making and implementing inspection and testing regimes for the civil and mechanical structures associated with nuclear operations. A Human Factors assessor has also considered the process used in completion of the RA and has concluded that there is no evidence to withhold Agreement to the current request. Issues do remain though in respect of the [REDACTED] used in the GGs and [REDACTED] which need to be resolved before their further use can be sanctioned and there is a requirement that civil facilities be inspected before next use. AWE has provided assurance in its request letter (reference

<sup>1</sup> Whilst AWE(B) carries out both assembly and disassembly of Trident Warheads it is generally accepted that [REDACTED]

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2) that these aspects will be undertaken prior to next use of the facilities and on that basis I judge that a Licence Instrument be granted for the [REDACTED] of the [REDACTED]

### INTRODUCTION

The continuing use of Trident as the deterrent beyond the initial design lifetime is underwritten by the ability to maintain the serviceability of the existing stockpile. To achieve this, AWE needs to carry out [REDACTED] and examination of units to maintain stockpile confidence and capability. Units need to be [REDACTED] for stockpile surveillance and other related reasons and to maintain Government commitments on warhead numbers.

A modified process for Trident disassembly at AWE(B) has been developed, which has incorporated a number of improvements compared to the original Trident disassembly process.

AWE has been using the Trident Modified Disassembly Process (TMDP) under the previous [REDACTED] limited agreements LI Nos. [REDACTED] and [REDACTED]

AWE has now requested that NII agrees to the disassembly of a further [REDACTED] [REDACTED] This PAR provides a record of the basis upon which the regulatory decision has been reached. Rather than restate in any detail the arguments presented in the 4 previous Project Assessment Reports PAR 02/05 (dated 15 February 2002), PAR 74/2003 (dated 28 August 2003), PAR 25/2006 (dated 21 August 2006) and PAR 33/2006 (dated 17 November 2006) it focuses on the AWE progress made against the deliverables identified in reference 1.

The Nuclear Weapon Regulator (NWR) has informed NII that the [REDACTED] which AWE has requested permission to [REDACTED] are necessary in support of the UK Strategic Defence. This note is reference 3.

Since the granting of LI [REDACTED] NII inspectors have monitored progress toward completion of the requirements of the deliverables in reference 1, with particular attention being paid to the development of the RA and the application of civil and mechanical engineering inspection and testing regimes and Human Factors issues.

### PERMISSIONING STRATEGY FOR AWE BURGHFIELD

In order to secure ongoing improvements to the safety case, the processes and plant at AWE Burghfield, a strategy of permissioning has been adopted by NII, under which AWE is permitted only to undertake limited defined operational activities. Following such activities and prior to Agreement of the next phase of operations, reviews take place to determine that progress has been made against identified issues. It is planned that a number of licence instruments will be used to monitor progress with the PRS remedial works and continuing development of the safety case through until at least the end of September 2007. Briefly the licence instruments will cover:

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LI number	Proposed activity	Main deliverable
LI [REDACTED]	Permissioning of [REDACTED]	Progress against identified deliverables including civil inspections, mechanical inspections and the risk assessment
LI x	Permissioning of further [REDACTED]	Progress against identified deliverables including civil inspections, mechanical inspections and the risk assessment
LI y	Permissioning of the use of [REDACTED]	Agreement of a programme for the replacement of the [REDACTED] and progress against PRS remedial works
LI z	Permissioning of further [REDACTED]	Progress against PRS remedial works

**BASIS FOR DECISION**

**Regulatory Background**

AWE acknowledged that the operator risk associated with the original disassembly process was only acceptable for a limited throughput associated with surveillance and assembly rectification. A review of the original disassembly process was undertaken in 2002 to take account of experience with the disassembly of units of a different design, in tooling and handling and to make improvements to procedures. These changes were used by AWE to justify claims of reduced operator and public risk from disassembly operations. The resulting Pre-Operational Safety Report, categorised as Cat A under the licensee's arrangements went through due process including endorsement by the NSC within AWE for that category of change.

NII's initial assessment of the POSR raised a number of issues which encompassed concerns about human error probabilities, fault study issues like the Lines of Defence screening methodology and uncertainty in [REDACTED] probabilities. The initial NII assessment of the revised POSR resulted in the granting of LI [REDACTED] which gave agreement to process [REDACTED] and restricted operations to allow for [REDACTED] in the Gravel Gerties. These assessment concerns were revisited prior to the granting of LI [REDACTED] and, although there were some remaining reservations, none were considered sufficient to prevent NII agreeing to continued adoption of the TMDP whilst awaiting the new RA. In addition this would allow AWE time to develop a comprehensive risk assessment for the TMDP and over the same time period become more informed regarding the condition of the plant and facilities through the PRS process.

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In March 2004 NII confirmed that a new risk assessment was required and that 'further agreements would be dependent on demonstrating adequate progress'. (AWE letter ref NII 2246R dated 13 April 2005 and NII letter BUR 77156N dated 15 July 2005 both linked the completion of the RA with the issue of the next LI). A new RA was started but progress has been unacceptably slow. AWE had initially programmed completion of the RA for April 2006 which would have provided sufficient time for NII to fully assess the information and be in a position to make a judgement on its adequacy and its level of development for the granting of [REDACTED]. When this date was not met the completion date was revised to November 2006. However, in August 2006 AWE declared (telecon [REDACTED] 09/08/07) that the fully completed RA would not now be available until April 2007. LI [REDACTED] was granted in [REDACTED] which permissioned the [REDACTED] of [REDACTED] [REDACTED] which were already held on at AWE(B). This LI was issued on the basis that DNSR confirmed that the work was necessary in support of the UK Strategic Nuclear Deterrent. LI [REDACTED] also committed AWE to complete a Schedule of Deliverables which included the production of that part of the new RA, which AWE currently believes to be the main risk contributors, in such a form and with suitable evidence to demonstrate that the risk is below the BSL. NII was satisfied that the significant contributors to the risk relating to [REDACTED] have been identified in support of the application for LI [REDACTED]. Following pressure from NII, AWE also issued a detailed RA programme, which has recently been amended to include the provision of a deterministic element to the RA. As a result of this NII granted LI [REDACTED] to permission the [REDACTED] of [REDACTED] on [REDACTED].

The ongoing PRS process has identified a significant number of shortfalls that have been categorised. Work has recently started to remediate these shortfalls. NII specialist inspectors have closely monitored the PRS process and have identified and informed the licensee of practical risk reduction methods that could quickly be applied in advance of any proposed engineering modifications. The deliverables in reference 1 linked to LI [REDACTED] required AWE(B) to consider and adopt such measures and, although the work is not yet fully completed with respect to written schedules of inspection and testing, good progress has been made in this area.

AWE has developed programmes of work, based around the AWE(B) operations programme, to rectify the shortfalls. NII and AWE continue to discuss the details of the remedial work programmes and more detail of the engineering solutions is developing as work proceeds.

### **NII Assessment**

NII assessment has been directed at confirming the adequacy of AWE(B)'s completion of the requirements in reference 1 as these apply to the facilities for inload, assembly and disassembly. The work has been carried out by specialist inspectors in fault studies/PSA, mechanical engineering, civil engineering and human factors. Each has prepared an assessment report/note which are referenced in this report.

### **Fault Studies/PSA**

The fault studies assessor has produced a note (reference 4) which concludes that AWE has not yet completed the RA and, in his opinion, has not completed the first bullet point deliverable in reference 1. However I note that there is still some 4 months available before April 2007 (agreed by [REDACTED] as the revised delivery date) by which time AWE has undertaken to produce a full risk assessment.

Additionally the fault studies assessor has identified that [REDACTED] not currently considered in the RA. In response AWE has provided the following explanation of this omission which is reference 5.

*"The interim risk assessment assessed the dominant fault sequences. The screening process revealed these to be associated with [REDACTED]*

*[REDACTED] could provide a range of consequences. The magnitude of this response is not fully understood at this point in time and could not be quantified for the interim risk assessment. Work is being undertaken in this area and a position paper will be complete by the end of January. Consideration of [REDACTED] will be made, as appropriate, for the full safety case."*

I judge that there is no evidence that AWE will not be able to complete the full risk assessment by April 2007 but this will clearly need to be monitored closely.

A number of other issues have been raised by the assessor as a result of a site visit undertaken during week commencing 11 December 2006 that will need to be resolved. These can be addressed at appropriate stages of NII's permissioning strategy described on page 3 and therefore they do not in my opinion prevent NII from issuing [REDACTED]

### **Civil Engineering Assessment**

A civil engineering assessor has produced an assessment report (draft at reference 6)

The assessor concludes that:

*"The licensee has made good progress with developing a process for the examination, inspection and maintenance of civil engineering structures. The process is not yet complete, but it is my opinion that the approach is correct and the licensee is applying adequate SQEP resources to implementing the procedure. There are still some issues to be concluded and these relate to formalising the procedure into the AWE corporate process and to include the training scheme and training records in the process. The licensee has put*

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forward a programme for completing the formalisation of the process, training and implementation of the inspections on all the buildings relevant to nuclear safety. My assessment of this aspect is that the licensee has made satisfactory progress and this deliverable has been met."

"The licensee has gone some way to setting the basis for an operating procedure for [REDACTED]. My assessment is that he has adequately established a [REDACTED]. The procedure appears to be adequate though the technical basis and detail supporting the procedure requires further review and discussion with the licensee. My expectations for this are set out in reference 7."

"The licensee has carried out assessments on the corridors and other structures. I have not assessed the corridor structures. I expect to carry out this work during the assessment of the PRS. I have reviewed the information contained in the DAR for the store structure. I have identified some aspects of the assessment which require further enquiry and assessment. The base data for the seismic analysis appears to be out of date, the protection offered to units in store from impact due to collapsing steelwork and masonry is not clear and there may be a requirement to limit operations in the store during [REDACTED] due to the [REDACTED]. Other structures have identified shortfalls which require to be addressed. I have not assessed the licensee's proposals in these areas and expect to do so as part of the NII Assessment of the PRS."

"There are shortfalls associated with other concrete structures in the facility. These have not been assessed in detail at this stage. The licensee is developing remedial works proposals which I expect to assess for the PRS."

"The licensee has made good progress with implementing a programme of [REDACTED] in the Gravel Gerties. There are two outstanding issues which require resolution prior to issue of the LI:

the tension in the measuring filament needs to be checked and confirmed as acceptable.

the licensee needs to prepare a procedure for the training, maintenance and operation of the [REDACTED] arrangement.

The production of the descriptions of detailed work packages and a programme for their implementation is, in my opinion, adequate subject to minor improvement. Although the work has been substantially completed for the main buildings, the licensee has a programme for the completion of the information of the remainder of the buildings."

A summary of the required deliverables for this and subsequent licence instruments has been provided by the civil assessor and is reference 7. All these requirements have been met already or are detailed in the licensee's letter of application for this licence instrument reference 2.

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### Mechanical Engineering Assessment

A mechanical assessor has provided an assessment note which is reference 8.

He concludes that:

“At the time of writing this report AWE have been unable to complete the full range of work identified in Reference 1 in respect of testing and inspection of the lifting and handling equipment. They have undertaken considerable work on the [REDACTED] and plan to extend this work to cover the equipment within [REDACTED]. They have also taken steps to improve the general storage and control of lifting equipment but these measures are also incomplete. Continued operation therefore of the current processing facilities is based on their existing maintenance and inspection procedures. AWE expect to have completed this work by January 2007.”

“I am satisfied that AWE have investigated the use of shock absorbing materials and there are no immediate measures that could be taken to significantly mitigate the hazards from these operations in the short term.”

“AWE has undertaken a range of measures to reduce the consequences of RA material dispersal in the event of an accident in these facilities and thereby protect sheltering workers. Whilst the changes to the service air system are still incomplete, they have taken steps to isolate this system and significantly reduce the potential offsite dose in the short term from one of the most likely fault sequences. The safety functional requirements for these systems should be reviewed within the remedial works programme and the benefits of providing redundant and diverse systems that are appropriately hardened against explosive events should be examined.

As indicated in my earlier assessment report, any decisions to agree to the continued use of these facilities should only be taken in the full knowledge of the existence of all of the shortfalls, the potential outcome and with the full agreement of the MoD regulator, who should confirm the requirement for and the importance of such operations in these facilities. The number of any such operations should be strictly limited. A judgement therefore regarding the tolerability of these operations and the MoD's necessity for such operations should be taken.”

“The above short term measures and those currently planned do not reduce the significance of the shortfalls in these systems or remove the urgency of the remedial works programme that should consider each shortfall in detail and develop appropriate ALARP improvements.”

In addition to this assessment report, the mechanical assessor has produced a summary document which is reference 9, which lists the immediate and future remedial works required to be undertaken by AWE. These have all been adopted and are incorporated in the licensee's request letter reference 2.

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### Human Factors Assessment

A HF assessor as provided an assessment report which is reference 10.

The assessor concludes that:

"With the proviso that my assessment has, of necessity been high-level and limited in scope, apart from some minor technical issues in quantification aspects I am content that AWE has adopted a pragmatic and logical approach, supported by a sufficient level of qualitative analysis. This provides assurance that AWE has an informed view of the human factors aspects of operations and this is likely to result in an accurate estimation of the dominant faults from a human factors perspective and enable substantiation of the derivation of HEPs to support the quantitative assessment. Consequently, I have found no reason to refuse the request for consent for the proposed activities on human factors grounds."

### Deliverable not addressed in the above Assessments

It was previously agreed that the deliverable for the [REDACTED] replacement would be agreement between NII and AWE of the programme associated with this work following a review by [REDACTED] to determine whether the current programme could be brought forward. This agreement was to have been made by 10 January 2007. The review has been undertaken but [REDACTED] been unable to realise our ambitions to bring the replacement forward. He has found a number of problems with the management and definition of the project and is unable even to confirm the current programme delivery dates. He will not be in a position to do this until the end of February 2007 – some 6 weeks after that date by which agreement with NII was supposed to have been achieved. This is disappointing but is not directly related to the issue of this LI. Nevertheless NII will need to develop its strategy for addressing the future permissioning of the [REDACTED]

### CONCLUSIONS

AWE continues to develop the interim Risk Assessment for the Assembly Facility nuclear operations. There is still clearly some way to go and NII will need to monitor progress through until April 2007.

Similarly work has been progressing on the civil and mechanical aspects supporting the safety case.

The only area where no progress has been made or is likely to be made is in respect of the replacement for the [REDACTED]. Whilst this is undesirable, it is not considered appropriate to withhold a licence instrument for [REDACTED] due to the unavailability of a satisfactory programme for this [REDACTED]. This matter will continue to be addressed through NII's permissioning strategy of holdpoints at AWE Burghfield.

RECOMMENDATIONS

It is recommended that:

NII should issue Licence Instrument [REDACTED] (reference 11 and checksheet reference 12) agreeing to the [REDACTED] of [REDACTED]

NII should not issue further Licence Instruments until AWE satisfactorily meets the requirements of the deliverables included reference 1 and those additional ones in the request letter for the licence instrument at reference 2.

NII should take action to attempt to expedite the replacement of the [REDACTED]  
[REDACTED]

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REFERENCES

Reference 1	EDMS1/800 DEA78/B/LS/SC0101 Issue 1 dated 18 August 2006
Reference 2	Request letter EDMS1/800F35E8/B/LS/N0400 DATED [REDACTED]
Reference 3	Email dated 15 December from [REDACTED] [REDACTED] NWR
Reference 4	Assessment note from fault studies assessor dated 13 December 2006
Reference 5	Email from AWE dated 15 December 2006 explaining the omission of Violent Reaction
Reference 6	Civil engineering assessor's draft assessment report PAR 36/2006
Reference 7	Civil engineering assessor's summary note of his expectations of AWE
Reference 8	Mechanical assessor's assessment report PAR 41/2006
Reference 9	Mechanical assessor's summary note of his expectations of AWE
Reference 10	HF assessor assessment note
Reference 11	[REDACTED]
Reference 12	[REDACTED] checksheet