



MINISTRY OF DEFENCE

# DEFENCE NUCLEAR SAFETY REGULATOR

PRINCIPAL INSPECTOR CLYDE AND DEVONPORT

DNSR/ 15/4/

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Date : 8 December, 2009

Dear Sirs,

## **DNSR-NII-SEPA JOINT FOLLOW-UP INSPECTION OF HMNB CLYDE'S ARRANGEMENTS FOR RADIOACTIVE WASTE MANAGEMENT, 27<sup>th</sup> OCTOBER 2009**

References:

- A. DNSR/15/4 dated 12 Nov 08.
- B. DNSR/15/4(R) dated 7 Sep 09.

1. Further to the References, a joint DNSR-NII-SEPA team conducted a follow-up inspection of HMNB Clyde's arrangements for the management of radioactive waste on 27th Oct 09.
2. The outcome of the inspection was discussed with HMNB Clyde representatives on conclusion of the inspection. A detailed report is at Annex A. The key conclusions are:
  - a. Very significant progress has been made in resolving a number of previously identified shortfalls in the radioactive waste management arrangements, although the need remains to drive further improvements into the arrangements on a routine basis.
  - b. The arrangements do now reflect Best Practicable Means, albeit predicated on the limited design life of the existing facilities, i.e. until 2014. As has been advised previously, any proposed life extension for the existing facilities and arrangements beyond then will be very difficult to justify as BPM. The regulators are concerned at the increasingly challenging timescale for replacing existing facilities within their design life, and will maintain close engagement on this issue.
  - d. Two new Findings have been placed concerning the need for a decommissioning strategy and plan for the Portable Effluent Barge and for the liquid effluent pipework, ducts, sumps and tanks.
3. The inspection team is grateful for the very thorough preparation for the inspection which had clearly been made by HMNB Clyde personnel, and for their very full co-operation and openness throughout
5. The contents of this letter have been agreed with NII and SEPA.

*Signed on Original*

Principal Inspector (Clyde and Devonport)  
Defence Nuclear Safety Regulator

**RESTRICTED**

Distribution:  
DNSR-ICDb  
NII ND  
SEPA Ms I Watson  
DSTL  
file

**DNSR-NII-SEPA JOINT FOLLOW-UP INSPECTION OF HMNB CLYDE'S ARRANGEMENTS FOR RADIOACTIVE WASTE MANAGEMENT**

References:

- A. JSP 518.
- B. Health And Safety At Work etc Act, 1974.
- C. Ionising Radiations Regulations, 1999.
- D. Radioactive Substances Act, 1993.
- E. High Activity Sealed Source Regulations, 2005.

1. **VISITING OFFICERS** *Name(s)* **ITEM**  
All
2. **DATE (S) OF VISIT** 27 October 2009
3. **SITE AND LOCATION OF VISIT** Clyde Naval Base (Faslane)

4. PURPOSE OF VISIT -					
SIR Para graph	Inspection details (including operating unit / building)	<u>Plan Name.</u>		LC / Topic	Outcome Rating
8.1	Planned Inspection				
8.1.1	Joint NII/DNSR/SEPA Inspection of Radioactive Waste Management Arrangements at Faslane. See 8.1 for expansion of objectives.	Faslane		AC33, IRR99	See text
8.2	Reactive inspections				
8.3	Authorise project work				
8.4	Other Site Related Work				
9.0	Recommendations and actions				

## RESTRICTED

### 5. PRINCIPAL STAFF SEEN:

<i>Topic</i>	<i>Point of contact in organisation</i>
8.1.1	Head of Safety Assurance Head of Nuclear Activities Babcock Nuclear Activities Director Base Radiological Protection Advisor Base Radiological Safety Officer REDF/APF Facility Manager Radiation Safety Officer REDF Refurbishment Manager REDF Requirements Manager NII Principal Inspector for Faslane DSTL SME SEPA Faslane site inspector

### 6. POINTS OF INTEREST TO OTHER SITES/ SITE INSPECTORS

See Summary

### 7. SUMMARY

A follow-up inspection of HMNB Clyde's arrangements for radioactive waste management was carried out by a joint team from NII, DNSR and SEPA.

### 8. REPORT

8.1.1. A joint DNSR-NII-SEPA team conducted a follow-up inspection of HMNB Clyde's arrangements for the management of radioactive waste on 27 Oct 09 in accordance with the References. The objectives of the inspection were:

- a. To seek assurance that HMNB Clyde's radioactive waste management activities are compliant with JSP 518 (in particular, but not limited to, ACs 32, 33 and 34), the Ionising Radiations Regulations 1999 (IRR 99), the Radioactive Substances Act 1993 (RSA 93), including associated Letters of Agreement and the High Activity Sealed Source Regulations 2005 (HASS 05).
- b. To verify the recommendations in the Best Practical Means Assessment Report are all complete. In particular, the inspection considered progress with 15 recommendations from SEPA following an event with the Portable Effluent Barge (PEB) and with 27 recommendations from the site's own Best Practicable Means (BPM) study.
- c. To gain further assurance that the operation of the REDF in support of Nuclear Powered Warship (NPW) operations and its concurrent refurbishment continue to be managed safely and in an environmentally responsible manner.
- d. To gain further assurance that lessons from past incidents and anomalous events regarding radioactive waste management and the previous waste management inspection have been learned and corrective actions have been appropriately implemented accordingly.

8.1.2. The inspection team comprised (SEPA) and (DSTL), (DNSR), (NII), Ms I Watson

8.1.3. The inspection included:

- a. Opening presentations from \_\_\_\_\_ (Head of Nuclear Activities),  
(Base Radiation Safety Officer), and \_\_\_\_\_ (REDF/APF Facility Manager),  
supported by \_\_\_\_\_ (Base Radiation Protection Adviser), \_\_\_\_\_ (Radiation  
Safety Officer (Faslane), Cdr \_\_\_\_\_ (Head of Safety Assurance) and \_\_\_\_\_.
- b. A visit to the REDF and E berth.
- c. A visit to the APF.
- d. A detailed review of progress on recommendations from the BPM study and on compliance failures against the SEPA Letter of Agreement.

8.1.4. The context of the inspection was to follow-up a similar inspection conducted in Nov 08, the main conclusion of which was to endorse the Naval Base's own conclusion that their radioactive waste management arrangements at that time did not represent Best Practicable Means (BPM) as required, and to endorse the corrective actions which were then underway. From this inspection it was evident that very significant progress has been made in resolving a number of longstanding legacy issues which underlay the previously identified shortfalls.

#### Radioactive Effluent Disposal Facility (REDF)

8.1.5. Refurbishment is virtually complete and the facility is now in the final stages of active commissioning. The discharge pipeline from the facility has also been replaced. The reflection of functional safety requirements into the design and ultimately into operating documentation was noted. Final conditioning work on the building structure is still on-going. First indications are that cobalt-60 liquid discharges have been much reduced. The arrangements represent a vast improvement and now appear to be fully fit-for-purpose.

8.1.6. The Regulators welcomed the traceability of safety functional requirements through the design into operating and maintenance documentation. Terms of Reference have been amended to reflect SEPA requirements. It was recognized that measures are in hand to protect against tritium contamination at the barrier, where it cannot be detected.

8.1.7. Plans are in hand (and funded) for the removal of redundant plant, including post-operational clean-out (POCO) of the receipt tank sludges and ion exchange column from the old REDF process, scheduled to commence Feb 2010, completing April 2010. Experience elsewhere in the industry has clearly shown that POCO should be carried out straight after operations cease rather than being left as part of decommissioning. It is a regulatory expectation that this work will be satisfactorily completed.

**Observation (CLY/O/0089): It is a regulatory expectation that the removal of redundant plant in REDF, including POCO, will be completed by April 2010.**

#### Portable Effluent Barge (PEB)

8.1.8. This has been taken out of service and transferred ashore for surveying and consideration of breakdown options. This work is not yet funded. The site is liaising with Barrow to share learning in disposal.

**Finding (CLY/F/0090): A decommissioning strategy and plan should be developed for the portable effluent barge.**

## Liquid waste handling

8.1.9. All of the pipework and underground tanks between the Active Processing Facility (APF), Nuclear Repair and the Radiochemistry Laboratory and REDF have been taken out of service. All liquid waste is now transferred from these facilities to REDF manually using carboys. Both waste volumes and activity concentrations are very low, and on this basis the regulators accept that these arrangements are satisfactory but on an interim basis only, ie within the context of the limited design life of the current arrangements and facilities which expires in 2014.

8.1.10. Plans are in hand (and funded) to cap the now redundant pipework and to provide an engineered inlet from the carboys to REDF, to complete Feb 2010. It is a regulatory expectation that this work will be satisfactorily completed.

**Observation (CLY/O/0091): It is a regulatory expectation that work to cap the now redundant liquid effluent transfer pipework and to provide an engineered inlet from the carboys to REDF will be completed by Feb 2010.**

8.1.11. The pipework, ducts, sumps and tanks have been surveyed, revealing some trace contamination. There is currently no decommissioning strategy or plan (or funding) for dealing with these. Any water ingress is monitored and sentenced accordingly, normally as non-radioactive. SEPA stressed the need to minimize water ingress in waste handling, noting that if no contamination can be demonstrated then it can go straight to the drains.

**Finding (CLY/F/0092): A decommissioning strategy and plan should be developed for the redundant liquid waste pipework, ducts, sumps, tanks etc.**

## Active Processing Facility (APF)

8.1.12. Again a substantial refurbishment has been undertaken, coupled with the review and update of processing documentation and of training for personnel. A key enhancement has been the commissioning of a sorting table, leading to substantial reductions in solid waste disposals. Other enhancements include: CCTV replaced, EOT crane refurbished and sink drain modifications. In view of the major changes in the APF arrangements the regulators will wish to inspect this area again in the context of the IRR 99 inspection in Spring 2010. Storage at height was much improved since last inspection. However, barrier protection measures are not appropriate for the long term, and carboys seen in the APF do not represent best practice and, consistent with previous statements, will not be supported by the Regulators beyond the current agreement. Operating experience will be reviewed in the 2010 IRRS inspection.

**Observation (CLY/O/0093): In view of the major changes in APF arrangements the regulators will wish to inspect this facility in the context of the IRR 99 inspection in Spring 2010.**

## Progress of corrective actions

8.1.13. A detailed review was carried out of progress on the recommendations from the BPM study and on compliance failures against the SEPA Letter of Agreement. Very good progress was evident. Also the presentation of the necessary supporting evidence was outstanding (both comprehensive and systematic), thereby substantially simplifying the inspection process. Specific actions arising from these earlier reviews are now very largely complete although a number of associated detailed follow-on activities will continue. It is intended that these will now be regulated as normal business, and that all actions arising from these previous reviews, inspections etc will now be considered overtaken by the Findings and Observations set out in this report.

8.1.14. Particular initiatives include the documentation of a radioactive waste management strategy, to be sponsored by BRSO and maintained as a living document subject to annual review. Also evidence was presented of the on-going commitment to maintaining momentum in driving further improvements in the arrangements via enhanced training and awareness, maintaining pressure on minimizing waste generation, raising the profile of environmental protection requirements generally etc. As an example, a detailed review of the working level arrangements and procedures in REDF from a human factors viewpoint is planned to look at the correlation between the documented arrangements and the activities actually carried out, to be rolled out in other areas in due course.

8.1.15. A contract has been let to conduct a radioactive waste management capability options study covering both liquid and solid waste, due to complete in Mar 2010. This is intended to provide a basis for identifying the long-term waste management arrangements which are required given the limited design life of the existing facilities (approved only until 2014). As advised previously, any proposed life extension for the existing facilities and arrangements beyond their already extended design life, ie beyond 2014, will be very difficult to justify as BPM.

**Observation (CLY/O/0094): The regulators remain concerned at the increasingly challenging timescale for identifying the requirements in relation to the new waste management arrangements, and then funding and building to allow operation of these arrangements within the existing design life (ie by 2014), and will maintain close engagement as this moves forward.**

#### Summary and conclusions

8.1.16. Very significant progress has been made in resolving a number of previously identified shortfalls in the radioactive waste management arrangements. These include:

- a. Refurbishment of REDF and APF, in both cases leading to significant reductions in waste disposals.
- b. Withdrawal from use of the underground liquid effluent pipework and tanks.
- c. Very good progress on the recommendations from the BPM study and on compliance failures against the SEPA Letter of Agreement : demonstration of compliance was well thought through and presented.
- d. Clear recognition of the need to maintain momentum and drive further improvements in the arrangements.
- e. Good progress in commencing post operational cleanup activities early, which should be extended to the lap tanks.

8.1.17. As a result it is concluded that the arrangements do now reflect Best Practicable Means, albeit this is predicated specifically on the limited design life of the existing facilities, i.e. until 2014. As advised previously, any proposed life extension for the existing facilities and arrangements beyond their already extended design life, i.e. beyond 2014, will be very difficult to justify as BPM.

8.1.18. The regulators remain concerned at the increasingly challenging timescale for replacing existing facilities within their design life (i.e. by 2014), and will maintain close engagement as this moves forward.

8.1.19. The closure of outstanding actions exposed ongoing process issues such as refresher training.

8.1.20. Two new Findings have been placed concerning the need for a decommissioning strategy and plan for the Portable Effluent Barge and for the liquid effluent pipework, ducts, sumps and tanks.

8.1.21. In addition, the regulators expect the currently planned work on the removal of redundant plant (including POCO) in REDF and in relation to the redundant liquid effluent pipework to be taken to a conclusion.

**8.2            Reactive Inspection**

Not relevant to this inspection.

**8.3            Authorisee's Project Work**

Not relevant to this inspection.

**8.4            Other Site Related Work**

Not relevant to this inspection.

**9.            Actions this Visit**

**Finding (CLY/F/0090): A decommissioning strategy and plan should be developed for the portable effluent barge.**

**Finding (CLY/F/0092): A decommissioning strategy and plan should be developed for the redundant liquid waste pipework, ducts, sumps, tanks etc.**

**10.          Actions from Previous visits**

Previous DNSR findings (Reference B) are agreed to have been closed out during this inspection.

Signed... ..

**Date: 23 November 2009**