NOTE OF SITE VISIT TO WYLFA POWER STATION BY CORWM'S WELSH WORKING GROUP

12 January 2015

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PRESENT

CoRWM: Gregg Butler, Helen Peters, Lynda Warren

Magnox Wylfa: Mark Thornton (Waste Manager), Adele Brooksbank (Lead Waste Engineer) and Mike Hughes-Roberts (Project Manager for uranic corrosion debris recovery and packaging). Stuart Law (Wylfa Site Director) was present at the beginning and end of the visit and at lunch.

BACKGROUND

1. CoRWM visited Wylfa Power Station on September 4 2014 and was given an overview of HAW waste management practices and issues on the site followed by tour of the site in small groups. Members felt that the visit had not provided sufficient opportunity for them to gain a clear understanding of how the various waste streams were managed and it was decided that the Welsh Working Group should return to the site for a further visit.
2. The Working Group advised Wylfa that it would like to visit the storage facilities for HAW and have a further briefing on the following:
    - the management of HAW and spent fuel;
    - plans for the retrieval of waste from current storage locations;
    - longer term plans for HAW at Wylfa;
    - implications of new build on the work at Wylfa including staffing issues; and
    - Wylfa's role in the overall Magnox operating plan and an update on its potential role as a buffer for spent fuel management in the event of problems at Sellafield.

SUMMARY

3. The Working Group was fully briefed on the management practices for HAW at Wylfa and had opportunities to discuss issues that have arisen in relation to management and the decisions that have been made for addressing these. It was accompanied on its visit to the waste management facilities by the lead persons with responsibilities for waste management who went to some length to explain the issues in detail. The Site Director was able to update the Working Group on the impact of Cavendish Fluor Partnership taking over as the parent body organisation in September 2014.

INTRODUCTORY BRIEFING

4. The Site Director confirmed that there was no intention to continue electricity generation operations beyond 2015 although it would not be technically impossible to go on to April 2016. As the overall reactivity of the fuel stock declines, so the rate of fuel inter-reactor

transfer (IRX) has had to increase, and the end of 2015 represents a prudent time for a controlled end of life.

5. The potential role of Wylfa as buffer store for spent fuel if there are problems with reprocessing at Sellafield was discussed. It was explained that fuel is transferred to flasks; the contents being limited by the wet stock limit under the control of MOP (despite the fact that Wylfa does not store its spent fuel in ponds). Sellafield then seeks delivery of flasks as required. It is expected that about 450-500 tons will be sent this year. This amount is in complete alignment with what Sellafield is achieving in its MOP. The Director stated that ending operations in 2015 would not challenge Sellafield. There is a 12 month contingency in the Sellafield plans and, if necessary, Wylfa could store the spent fuel in situ in the reactor.

6. There was a short presentation on the revisions to the Magnox Strategy following the change of PBO to the Cavendish Fluor Partnership. The main change is that there is a more flexible approach with the reopening of more options for waste management, especially in relation to packaging. Under the previous PBO, the strategy had been to use ductile cast iron containers (DCICs - Ministores or Yellow Boxes) and this had been supported by a BPEO exercise. There was one Yellow Box on site, containing desiccant. However, the new parent body has provided Magnox with the opportunity to review current waste strategies; the review took account of progress to date with the existing strategy, developments of new waste management routes, and proposals put forward by the new PBO in the contract bid produced as part of the process of selecting them as PBO. ILW packaging and interim storage strategy was one of the key areas under review, covering new containers, different storage requirements, consolidation between sites.

7. The review of ILW packaging covered both shielded and unshielded packages; with the exception of the yellow box, these all require encapsulation. Ten preferred options had been identified; these did not exclude DCICs but it was noted that whereas a DCIC cost in the region of £130k, a cement box was £20k. It was estimated that there would be a need for approximately 18 or fewer 6m3 reinforced concrete boxes (RCBs).

8. Under the previous strategy it was envisioned that there would be an interim storage facility and there was provision for this is in the work plan with moneys scheduled for it. However, this plan had only been included to provide consistency between Magnox sites and was never a realistic prospect given the comparatively small amount of waste to be managed. The view is now heading towards two alternatives: a location on site within the main reactor buildings, or consignment to the Trawsfynydd ILW store. At the moment there is no defined strategy for storage locations on site. The gas circulator rooms are a possibility but the floor loading will have to be tested before this can be given serious consideration. Transfer to Trawsfynydd is a possibility but as yet there has been no consideration of transport issues and no stakeholder engagement.

9. Following the briefing session, the Working Group was escorted on a site visit to various waste management facilities as described below.

SOLID ILW DRUM STORE

10. Approximately 120 drums including 3 drums of hoover bags are stored in a small unshielded room. 93 of the drums contain desiccant with tritium and chlorine 36 as the main radionuclides. The drums are all bar coded and the inventory is recorded on a spreadsheet. The original strategy was to follow a 'delay and decay' policy, especially in relation to the tritium; the intention being for the desiccants to go to the store in DCICs and to leave them there until they had reduced to LLW before consignment to disposal in Final Site Clearance(FSC)

11. In contrast, the current strategy is based on a 'wash and burn' policy with material to be sent to Winfrith for washing and incineration in a facility near to Southampton. The wash is then discharged into the marine environment with a small amount of aerial emissions, with the ash disposed of to landfill at permitted disposal sites. Winfrith have a big store and drums could go quite soon if accelerated funding became available. At the time of the visit however, there is no justification for doing this.

LLW SORTING AREA

12. Waste is segregated in a waste sorting cabinet. Each waste stream is dealt with separately. Segregation is done by hand into metallic, combustible, non-combustible waste. The facility is about 20 years old and is not optimised for as much segregation as would be liked – e.g. into ferrous and non-ferrous metal.

13. It had been intended to continue the incineration of LLW on site and a new flue gas stack was installed. However, the regulator (Environment Agency, acting as agents for NRW) required expensive abatement equipment to be fitted to meet the requirements of the EU Industrial Emissions Directive and it was decided that it would be less future commercial and regulatory risk to send the waste into the supply chain for incineration despite the increased cost.

14. Each drum is analysed using a gamma spectrometer but this facility is not accurate enough to detect the low levels of some of the waste so a lot of it comes out as MDAs. The new unit in the incinerator building is much more sensitive and it is intended to use this to activity assess VLLW.

15. Segregated LLW is bagged and stored in the Low Level Solid Waste Store, a secure small room adjacent to the sorting area.

16. Occasionally ILW is detected in a drum. The management strategy for this waste is to store it in a location in accordance with the safety case pending determination of the disposition route.

ILW MINI-STORE

17. Wylfa was the first generating nuclear site to package waste in its final (DCIC) disposal package; early investigations involved treating the waste but laboratory scale experiments could not be up-scaled to working conditions. The decision to use such expensive packaging for such small volumes of waste is difficult to justify today but made sense at the time due to

advantages to having a consistent safety case across all sites. Despite the fact that the DCIC is designed to provide all the shielding necessary. The DCIC is not currently licensed for the transport of High Active Waste.

GAS TURBINE HOUSE

18. The Gas Circulator Rooms are being considered as a store for DCICs and/or RCBs; it is thought that it might contain about 6 of these subject to the floor being strong enough. As it has supported a very large motor it is likely that it might be suitable. It is in any event a requirement of the safety case that the building stays safe for the duration – i.e. until final site clearance.

WASTE TRANSIT STORE

19. This room houses a number of removed Burst Can Detector (BCD) cooling heat exchangers from the reactor gas fuel integrity monitoring system which may be disposed of as LLW. However, they are contaminated with tritium and chlorine 36. The contamination is not evenly distributed along the units with higher activity associated with the bend at one end. Work is underway to obtain a clearer picture of changes along tubes and to find a way to cut off the less contaminated (LLW) bits – the difficulty being the danger of releasing radioactivity into the air if heating is used. Therefore cold cutting techniques will be used to ensure sample integrity as well as worker safety.

DRY STORE CELLS

20. The void is a large concrete-lined box between the reactors; it currently contains approximately 850 m^3 of irradiated waste. The intention is to continue to use this facility to store irradiated operational waste. The formal inventory of the contents of the void is calculated using total volumes derived from camera surveys and irradiation data. Additionally there are posting records which are not part of the formal inventory. There are no plans to remove waste from the void; the plan is to leave this until final site clearance.

21. Spent fuel is stored in one of two dry store cells. DSC 4 is currently in use and it is intended to use DSC 5 for defueling. There are 29000 skip tubes; 6 rows of 25 skips each with 192 tubes and each tube containing 1 fuel element. DSC 4 still contains 6 fuel elements. It had been thought that these had gone off site long ago but there had been a serious issue with commissioning of DDR cells in the 70s and they had been missed. These elements will be recovered.

22. Some years ago there was a water leakage into some of the fuel pipes caused by a faulty joint that could not be detected because it was behind the facing at the point where the store adjoined the reactor building.

23. 19 out of approximately 21,000 fuel elements became corroded after being exposed to moisture arising from the leak. It has taken many years to devise a plan for removing the damaged fuel elements but project work commenced in March 2010. It was possible to get most of the elements out cleanly with no sign of any corrosion of the uranium (anti-ratcheting grooves being clearly visible) but one is very badly corroded; only a half was

recovered and this was heavily corroded at one end. It is assumed that the rest has corroded away into debris. This particular element, nicknamed 'Stumpy' was found to have a significantly higher burnup that usual, and it was more porous, allowing it to absorb water and hasten the corrosion process.

24. The original plan was to remove the material from tubes but the plan now is to remove the whole skip. The main difficulty in doing this is the height of the store within the building. There is now a plan in place to safely package the damaged elements in concrete boxes which have been hauled by hoist to the 60' level. Members had the opportunity to go up to the sprocket room and get an overview of how this plan will be put into effect and the Working Group was then shown a model of the facility.

WRAP UP DISCUSSION

25. There was a short discussion of the implications of the change in PBO and the prospect of Wylfa Newydd for ongoing HAW management on the site. The fact that the new PBO has such a strong focus on cost could have implications for staffing levels and this is unsettling for staff. It is unfortunate that decommissioning of the site is not aligned with the beginning of construction work on Wylfa Newydd and there is a danger that skilled staff will be lost as they seek other jobs outside of Anglesey.

26. One further comment was that methods used for recording the waste inventory were not standardised across all SLCs.

CONCLUSION

27. The Working Group drew the following conclusions from its visit:
    - Plans for end of electricity generation seem robust, with fuel arisings planned within the Magnox Operating Plan envelope.
    - The amount of drummed ILW is modest and the alternatives are to store at a location within the reactor building or to transport to the Trawsfynydd ILW store.
    - LLW had been planned for incineration on site, but the imposed change to the environmental permit will see this waste transported to off-site facilities for incineration.
    - There is a considerable amount of largely metallic ILW in the dry store cells. These facilities will continue to be used, and the assay, removal, treatment and disposal of this waste will need to be dealt with at final site clearance.
    - Keep watching brief over (1) the management of staff once generation ceases, (2) selection of packaging, (3) development of the plans for interim storage of HAW; and (4) the uranic corrosion debris removal project.