



**Return to Service of the Wylfa Secondary Fuel Route
Agreement to Load Irradiated Fuel into Wylfa Secondary Dry Store Cell 5**

Project Assessment Report ONR-DFW-PAR-15-016
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EXECUTIVE SUMMARY

Title

This report presents the arguments that support my opinion that ONR should give its agreement to the loading of irradiated fuel into Dry Store Cell 5, so that the secondary fuel discharge route will be available to support efficient defuelling of Wylfa power station when it stops generating electricity at the end of 2015.

Permission Requested

ONR has previously placed a requirement on Wylfa that irradiated fuel may not be reintroduced into Secondary Dry Store Cell 5 without the regulator's agreement. The licensee has now requested agreement to load fuel into this cell so that the Wylfa secondary discharge route may be returned to limited operation.

Background

Dry Store Cell 5, and the secondary fuel route, have both been used previously at Wylfa but their use ceased due to safety and security concerns. Following extensive refurbishment of the route, Magnox Ltd would like to use it again as it would support an ambitious programme delivery target that allows Sellafield to cease magnox reprocessing in line with international commitments. Safety and security considerations result in only Dry Store Cell 5, but not Dry Store Cell 4, being proposed for use as part of the secondary discharge route.

Assessment and inspection work carried out by ONR in consideration of this request

ONR assessments of the modified and restricted secondary fuel route proposal have found it to be acceptable; restrictions have been implemented via design modifications, operator instructions and staff training. There is an ALARP case for use of Dry Store Cell 5 and the flask handling facility that now makes up the secondary route.

Matters arising from ONR's work

During the ONR assessment, no significant safety or security issues have arisen or remain outstanding. Consequently, there are no issues that prevent either Dry Store Cell 5 or the other parts of the secondary fuel route, excluding Dry Store Cell 4, from being returned to service.

Conclusions

Other than Dry Store Cell 4, ONR supports the use of the Wylfa secondary discharge route. Therefore, agreement to loading irradiated fuel into Dry Store Cell 5 should be given as requested by the licensee.

Recommendation

This project assessment report recommends that a letter is sent to Wylfa that indicates that ONR has no objection to irradiated fuel being reintroduced into Dry Store Cell 5 provided that the limits and conditions specified in the safety case are applied.

LIST OF ABBREVIATIONS

| | |
|--------|--|
| ALARP | As low as reasonably practicable |
| BSL | Basic Safety level (in SAPs) |
| BSO | Basic Safety Objective (in SAPs) |
| CNS | Civil Nuclear Security (ONR) |
| HOW2 | (Office for Nuclear Regulation) Business Management System |
| HSE | The Health and Safety Executive |
| IAEA | The International Atomic Energy Agency |
| NDA | Nuclear Decommissioning Authority |
| ONR | Office for Nuclear Regulation |
| PCER | Pre-construction Environment Report |
| PCSR | Pre-construction Safety Report |
| PSA | Probabilistic Safety Assessment |
| PSR | Preliminary Safety Report |
| RGP | Relevant Good Practice |
| SAP | Safety Assessment Principle(s) |
| SFAIRP | So far as is reasonably practicable |
| SSC | Structure, System and Component |
| TAG | Technical Assessment Guide (ONR) |

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1 PERMISSION REQUESTED

1. ONR have previously placed a requirement on Wylfa (Ref 8) that irradiated fuel may not be reintroduced into Secondary Dry Store Cell 5 without the regulator's agreement. The licensee has now requested agreement to load fuel into this cell so that the Wylfa secondary discharge route may be returned to limited operation (Ref 21).

2 BACKGROUND

2. Unlike the pond based discharge routes employed at all other magnox power stations, irradiated fuel is stored dry at Wylfa in Dry Store Cells (DSCs). When the station was built there were three dry store cells (DSC1 to DSC 3, also referred to as the primary DSCs). In the 1970s additional storage capacity was provided in the form of secondary DSCs, namely DSC 4 and 5. DSC 4 and 5 could each hold just less than [REDACTED] fuel elements. These secondary DSCs also included a second fuel element flasking route, thus in theory doubling the site's flask despatch rate for irradiated fuel; fuel that must go to Sellafield for reprocessing.
3. The route was used successfully during the 70s and 80s. During the late 80s and early 90s the secondary DSCs were gradually emptying as transport and reprocessing issues at Sellafield were resolved. Following international security events, a decision was made to empty DSC 4 and 5 in the early 2000s. Both DSC 4 and 5 are currently empty. The Licensee has over recent years spent many millions of pounds refurbishing these cells and the secondary discharge route so that it could be used as a buffer store and flask despatch route following end of electricity generation at Wylfa in 2015.
4. A paper of principle was produced for the return to service of the secondary fuel route in late 2010 (Ref 1) and ONR agreement or acknowledgement to the proposal was requested (Ref 2). The intention being to use only DSC 5 and not DSC4; and to limit the buffer stock of irradiated fuel in DSC 5 to no more than [REDACTED] elements. An ONR assessment of the proposal was initiated but problems arose as many reports and letters covered sensitive information and some were classified as 'restricted'. One of the assessment reports clearly indicates that meetings between ONR and Magnox were taking place and discussions involved areas where technical and security matters interfaced (Ref 3). ONR wrote to Magnox to confirm that regulatory assessment was progressing and to clarify that ONR require two hold points (Ref 4); the first was the requested agreement with a second requirement that ONR agreement was given before irradiated fuel was introduced into DSC 5.
5. Between 2011 and 2015 there was occasional exchange of correspondence (for example, Refs 5 to 9) on this proposal as a series of plant modifications were completed and a licence instrument (No 551) was issued giving ONR agreement to the proposals set out in the paper of principle (Ref 1). Once the secondary fuel route modification process was complete a final report on the return to service of the Wylfa secondary fuel route (Ref 10) was presented to the NSC for agreement. The paper had received support from an INSA Officer (Ref 11) and NSC agreement was also received (Ref 12) in July 2015.
6. A Level 4 meeting was arranged at Wylfa power station on 2nd July 2015 so that the ONR Project Inspector dealing with this request could be updated on the project, tour the facilities and see how they are to be operated, discuss the proposals in detail and agree the way forward (Ref 13). ONR was content that the discharge route was refurbished and fit to use, operating instructions appeared adequate, operator training had commenced but the licensee had still not provided ONR with an adequate 'ALARP' argument that dealt with its return to service as previously requested by ONR (for example, Ref 5 and 8). It was agreed that the letter that requested ONR agreement to the return to service of the route would include an ALARP statement that

justified reintroducing irradiated fuel into what is currently a 'clean' facility. Consequently, the licensee's letter requesting ONR agreement to the use of DSC 5 (Ref 14) had an ALARP statement attached.

3 ASSESSMENT AND INSPECTION WORK CARRIED OUT BY ONR IN CONSIDERATION OF THIS REQUEST

7. ONR has carried out a programme of work that started in 2010 and continued throughout the refurbishment and commissioning of DSC5 and the secondary discharge route. Following the receipt of the original proposal (Ref 1), ONR carried out a technical assessment as described in Reference 15 and this resulted in a licence instrument being issued (LI 551) that gave ONR's agreement to the proposal (Ref 8). The technical assessment had included consideration by ONR specialists that looked at fault studies, mechanical engineering, control and instrumentation, civil engineering and security. The Environment Agency had also been consulted and they confirmed that they had no issue with the proposal (Ref 16). The only issue that was outstanding at the end of the assessment (Ref 15) related to the need for the licensee to establish that it was ALARP to use the secondary fuel route prior to ONR giving agreement to the introduction of irradiated fuel into the refurbished DSC5.
8. Following receipt of the final report (Ref 10); ONR assessment regarding fault studies was repeated (Ref 19), and additionally, assessments have been carried out by the fuel behaviour assessor and the civil nuclear security site inspector (Refs 17 and 18). None raised any concerns that need to be taken forward, indeed, they found the proposal acceptable.
9. The ALARP case is weak as the underlying optioneering exercise was recorded in classified reports that the licensee is reluctant to release. After extensive negotiation, a report has been made available [REDACTED] and having read this and the ALARP statement (Ref 14), I am content that the ALARP process has been followed and the decision to use the secondary discharge route is both justified and acceptable.

4 MATTERS ARISING FROM ONR'S WORK

10. ONR has given this proposal a considerable amount of effort over the last five years and it has never raised any issues that suggest that the proposed use of a refurbished secondary discharge route at Wylfa is unacceptable. The only concern was a lack of a visible ALARP argument. I am now satisfied that a case has been made.
11. While producing this project assessment report it was noted that LI 551 (Ref 8), that gave ONR agreement to the original proposal to refurbish and reuse the Wylfa secondary discharge route (Ref 1), had also contained a caveat that required the licensee to seek ONR agreement to the introduction of irradiated fuel into DSC 5. Setting aside the legality of this caveat, I now understand why the licensee has found it difficult to word a letter seeking ONR agreement to the use of DSC 5. At the time, ONR should have issued a specification under LC 22(4) so that the licensee could now be requesting a consent, under LC 22(4), to introduce irradiated fuel into DSC 5.
12. After a long discussion with the licensee it was agreed that a modified request for agreement would be made to ONR so that it referenced the correct licence condition, the correct technical report and sought agreement to load fuel into DSC 5. This has now been received (Ref 21).

5 CONCLUSIONS

13. This report presents the findings of detailed technical assessments that cover both safety and security issues associated with the use of the secondary discharge route at Wylfa. The proposal is to have [REDACTED] fuel within DSC 5 that can act as a

buffer and allow use of the secondary flasking route should the primary route suffer breakdown or any other form of delay. If necessary, both routes could be used in parallel. This will give confidence in achieving a site irradiated fuel dispatch rate that ultimately allows Sellafield to achieve end of magnox fuel reprocessing in line with international commitments.

14. Specialist ONR assessors are satisfied with the claims, arguments and evidence presented by the licensee. I am satisfied that the route is ready for use and the operators have the necessary operating instructions and training. An ALARP argument has been made that justifies the use of DSC 5.
15. I have also considered how to give the required agreement and I conclude that ONR should use flexible permissioning arrangements, consequently, I am suggesting that a letter is sent to Wylfa that indicates that ONR has no objection to irradiated fuel being reintroduced into DSC 5 provided that the limits and conditions specified in the safety case (Reference 10) are applied.

6 RECOMMENDATIONS

16. This project assessment report recommends that a letter is sent to Wylfa that indicates that ONR had no objection to irradiated fuel being reintroduced into DSC 5 provided that the limits and conditions specified in the safety case (Reference 10) are applied.

7 REFERENCES

1. NP/SC 5060; Wylfa Site – Paper of Principle for Return to service of the secondary Fuel Route; Nov 2010; TRIM Attachment to Ref 2 at 2011/50160
2. Magnox Letter to ONR with unique number WYF52215R, dated 20 January 2011; TRIM 2011/50160
3. ONR Internal Memo: “ Wylfa Dry Store Cell 5 – Permissioning Strategy”; 25 May 2011: TRIM 2011/421267
4. ONR Letter to Magnox with unique number WYF70974R, Dated 12 August 2011; TRIM 2011/381641
5. Magnox Letter to ONR with unique number WYF52274N, dated 11 November 2011; TRIM 2011/583834
6. Magnox Letter to ONR with unique number WYF52294R, dated 12 January 2012; TRIM 2012/29268
7. Magnox Letter to ONR with unique number WYF52320N, dated 12 April 2012; TRIM 2012/158632
8. ONR Letter to Magnox with unique number WYF70984R, LI 551, Dated 30 April 2012; TRIM 2012/139308
9. Magnox Letter to ONR with unique number WYF52454N, dated 21 April 2015; TRIM 2015/150800
10. NP/SC 5060 Addendum 1; Wylfa Site – Paper of Principle for Return to service of the secondary Fuel Route: Final Report; July 2015; TRIM 2015/270299
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19. ONR Assessment Report; ONR-DFW-AR-15-010; Wylfa; Return to Service of the Secondary Fuel Route 0 Assessment of the Fault Study Aspects; Issued November 2015; TRIM 2015/382470

20. Magnox Letter to ONR [REDACTED]
21. Magnox Letter to ONR with unique number WYF52481R, dated 27 October 2015;
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