Office for Nuclear Regulation

ONR Report

Proof of Evidence

Protection of Workers and the Public

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Appeal Details	
Application Reference No.	22/00244/FULEXT
Appeal Reference No.	APP/W0340/W/22/3312261
Local Planning Authority	West Berkshire Council
Location	Land to the rear of the Hollies, Burghfield
Proposal	The erection of 32 dwellings including affordable housing, parking and landscaping. Access via Regis Manor Road.

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List of Abbreviations

ACoP	Approved Code of Practice
AWE(B)	Atomic Weapons Establishment Burghfield
DEPZ	Detailed Emergency Planning Zone
EP&R`	Emergency Planning and Response
ENSREG	European Nuclear Safety Regulators
HECA	Hazard Evaluation and Conseqences Assessment
IAEA	International Atomic Energy Agency
NIA	Nuclear Installations Act 1965 (as amended)
NPPF	National Planning Policy Framework
ONR	Office for Nuclear Regulation
OSEP	Off-Site Emergency Plan
REPPIR01	Radiation (Emergency Preparedness and Public Information) Regulations 2001
REPPIR19	Radiation (Emergency Preparedness and Public Information) Regulations 2019
The Act	Energy Act 2013
The Appellant	T A Fisher and Sons Ltd
The Application	22/00244/FULEXT
WBDC	West Berkshire District Council

Contents

1. Introduction

1.1. Biography

1. I am a Principal Inspector for ONR and the Nominated Site Inspector for the AWE A and B sites and have been in this role since September 2022. I am responsible for the day to day regulation of nuclear and conventional safety on these sites.

2. I have worked for ONR since 2015, primarily in the inspection of operational sites. Prior to Joining ONR, I worked at AWE for 12 years in roles including as Head of Engineering, Head of Internal Regulation & Audit, Head of Chemical Science and Head of Criticality Safety, and Corporate Criticality Safety Authority, giving me a wide knowledge of operations on the A and B sites.

3. My earlier career was in the Royal Navy where I served for 17 years in the submarine service as an engineering officer, including a role as the Chief Engineer of a Vanguard Class Submarine. I have degrees in Engineering Mathematics, Systems Engineering and Nuclear Engineering with a post graduate qualification in Reactor Engineering.

1.2. Purpose

4. This proof provides an outline of the role ONR has in protecting workers and the public from the hazards of the nuclear industry and how this is applied to AWE. It also outlines how the requirements of different legislation contribute to the totality of protection against the hazards posed by a nuclear site, and stresses the importance of each of those individual components.

5. My evidence contextualizes the role of off-site emergency planning as a key component of the holistic protection of workers and the public.

1.3. Overview

6. The safety of the public and workers from the hazards posed by nuclear installations is achieved via a broad suite of legislative requirements which have evolved since the industry began in the 1950's. The two principal pieces of legislation are the Nuclear Installations Act 1965 [1] (as amended) and the Energy Act 2013 [2].

7. The relevant legislation aligns with international obligations and commitments made by the UK Government. While my evidence cannot provide an exhaustive description of the legislative framework for nuclear sites, it seeks to provide the relevant context for this appeal.

8. Protection against potential nuclear hazards is primarily afforded via a robust licensing scheme as required by the NIA which ensures that nuclear sites are well managed. It seeks to ensure that activities are only undertaken once adequate

justification has been provided and agreed by the regulator(s) – which include ONR. In addition, there are requirements for control of activities and development local to the nuclear site as well as a need to have plans for the protection of the public should an event occur which results in the release of harmful nuclear material beyond the site boundary. This suite of requirements together forms the hierarchy of protection afforded to workers and the public at large.

9. As AWE(B) is an atomic weapons facility, there is an overlap of regulation undertaken by the ONR and by the Defence Nuclear safety Regulator ("DNSR"). AWE(B) is subject to the requirements of the Nuclear Installations Act 1965 by virtue of the Atomic Weapons Establishment Act 1991 and Amendment Order 1396/1997 [3]. However, the licence conditions attached to AWE(B)'s Nuclear Site Licence issued under the NIA do not apply to the extent that such conditions affect the design of a nuclear device, or any other device (other than a nuclear reactor) intended to simulate the properties of a nuclear device.

10. In practice, ONR and DNSR work closely to ensure that there is seamless regulation on AWE(B). Similarly, the Environment Agency has a role in regulating AWE(B), however as this is primarily around discharges it does not merit further assessment.

2. Off Site Planning and Protection of the Public

11. AWE(B) is a Nuclear Licensed site and nuclear safety on the site and the off-site plan are regulated primarily by ONR.

12. ONR outlines its expectations for licensees in a series of guidance documents, one of the most important of which is the Safety Assessment Principles ("SAPs"). [4]ONR's inspectors use SAPs, together with supporting Technical Assessment Guides ("TAGs"), to guide their regulatory judgements and recommendations when undertaking technical assessments of Licensees and other dutyholders. Underpinning these is the legal duty (from Health and Safety at Work Act 1974 (HASWA)) [5] on licensees to reduce risks so far as is reasonably practicable ("SFAIRP"), and this informs the use of SAPs. It should be noted that for all practical purposes SFAIRP is analogous to a risk assessment of As Low As Reasonably Practicable ("ALARP").

13. Demonstration that the risk from a nuclear facility is ALARP is achieved through a range of analyses of the risks, protection and mitigation. These are articulated in ONR guidance as Engineering key principles.

14. One of the key principles in nuclear safety is the use of a protection hierarchy, often termed "defence in depth". Nuclear facilities should be designed and operated so that defence in depth against potentially significant faults or failures is achieved by the provision of multiple independent barriers to fault progression. The methodology

should ensure that if one level fails, it will be compensated for, or corrected by, the subsequent level.

15. This approach accords with the approach recommended by both the European Nuclear Safety Regulators Group ("ENSREG") and the International Atomic Energy Agency ("IAEA"). The IAEA published its guide to "Defence in Depth" as INSAG-10 in 1996 [6] (Pub1013e_web.pdf (iaea.org)), and reinforced this approach with Safety Series No. 46 in 2005 (STI/PUB/1218 (iaea.org)) [7]

16. The basic principle as articulated by the IAEA is:

> *"To compensate for potential human and mechanical failures, a defence in depth concept is implemented, centred on several levels of protection including successive barriers preventing the release of radioactive material to the environment. The concept includes protection of the barriers by averting damage to the plant and to the barriers themselves. It includes further measures to protect the public and the environment from harm in case these barriers are not fully effective"*

17. Furthermore, it also states that:

> *"The existence of several levels of defence in depth is never justification for continued operation in the absence of one level. Severe accidents in the past have been the result of multiple failures, both human and equipment failures, due to deficiencies in several components of defence in depth that should not have been permitted"*

18. Table 1 below from ONR's SAPs is a summary of the levels of defence in depth which are consistent with the approach set out in the IAEA guidance.

Table 1 Objective of each level of protection and essential means of achieving them

Level	Objective	Defence/Barrier
Level 1	Prevention of abnormal operation and failures by design	Conservative design, construction, maintenance and operation in accordance with appropriate safety margins, engineering practices and quality levels
Level 2	Prevention and control of abnormal operation and detection of failures	Control, indication, alarm systems or other systems and operating procedures to prevent or minimise damage from failures
Level 3	Control of faults within the design basis to protect against escalation to an accident	Engineered safety features, multiple barriers and accident or fault control procedures
Level 4	Control of severe plant conditions in which the design basis may be exceeded, including protecting against further fault escalation and	Additional measures and procedures to protect against or mitigate fault progression and for accident management

Level	Objective	Defence/Barrier
	mitigation of the consequences of severe accidents	
Level 5	Mitigation of radiological consequences of significant releases of radioactive material	Emergency control and on- and off-site emergency response

19. Level 5 in Table 1 provides that the presence of an on-site and off-site emergency response (via REPPIR19 [8]) is essential to ensuring that the defence in depth measures are demonstrable and meet international safety standards.

20. REPPIR19 is one part the UK's response to international obligations. The IAEA publish a document (entitled "Preparedness and Response for a Nuclear or Radiological Emergency" P_1708_web.pdf (iaea.org)) [9]. Under requirement 1:

> *"The government shall ensure that an integrated and coordinated emergency management system for preparedness and response for a nuclear or radiological emergency is established and maintained "*

21. It follows that REPPIR 19 is a fundamental part of the defence in depth approach; reflects the UK's commitment to meeting requirement of the UK's international obligations; and that a lack of capability in this area cannot be compensated for through other lines of protection.

22. The UK is subject to reviews of the way in which its regulators ensure that these commitments are met by regular missions from the IAEA known as the Integrated Regulatory Review Service.

3. Regulation of AWE

23. ONR has a dedicated team of 20 inspectors responsible for the regulation of the AWE Aldermaston and Burghfield sites. ONR undertakes a suite of inspections to ensure compliance with the licence conditions and other relevant legislation as well as undertaking assessment of safety cases and permissioning of new or modified activities.

24. AWE(B) and the Council are both dutyholders under REPPIR 19. ONR is responsible for regulating both parties.

25. REPPIR19 came into force on 22 May 2019, updating and replacing the previous 2001 regulations. They contain new requirements for emergency planning in particular, defining a radiation emergency, establishing a different basis and responsibilities for determining emergency planning zones, including the addition of Outline Planning Zones, and defining an emergency worker. An approved Code of Practice (ACoP) [10] to provide guidance on how to satisfy the requirement of REPPIR19 has also been produced.

26. ONR provided assistance to operators during the one-year transition period following REPPIR 2019 coming into force by initiating a programme of

engagements with all nuclear site licence holders in order to monitor the implementation of the new regulations. This lasted until May 2020.

27. ONR also engaged with all operators prior to the coming into force of REPPIR19 whilst the Approved Code of Practice ("ACoP") was being developed to determine the practicality of the methodologies being proposed to calculate the minimum distance for protective actions. There were no significant issues flagged by operators to require the methodology to be changed at this time and the REPPIR 2019 ACoP and guidance was published in September 2019.

28. AWE recalculated the minimum distances for AWE(B) according to the new REPPIR19 methodologies on [DATE]. This gave rise to a significant increase in the minimum distance for protective actions that might be required in the event of a radiation emergency at AWE(B). As part of ONR's regulatory activity, ONR fault studies inspectors met with AWE to understand the approach to the production of the Hazard Evaluation and Conseqences Assessment ("HECA") and the sources of supporting information. Production of a HECA is a requirement of REPPIR19 which examines the nature of the hazards on the site and the liklihood and consequences or a radiation emergency in terms of potental dose to members of the public.

29. Following the meetings, the ONR fault studies inspector reviewed AWE's HECA and concluded that the methodology adopted by AWE to calculate the minimum distance (on which the DEPZ would be determined) was in accordance with REPPIR19 and its ACoP.

30. The HECA report submitted by AWE to the Council was also sampled by an ONR EP&R inspector. Although this sample review identified some minor shortfalls, they did not affect the overall judgement of the ONR inspector that AWE had complied with its REPPIR19 duties in respect of calculating the minimum distance for protective actions.

31. Once the Council received the HECA report from AWE, it initiated a process to re-determine the DEPZ around AWE(B) in line with the requirement of REPPIR19 . ONR EP&R inspectors provided oversight of this process to ensure that the recently revised regulations and ACoP were correctly implemented. This was done by attendance at AWE off-site planning group meetings; and further correspondence, both generally to explain ONR's regulatory role, and specifically to raise questions regarding the draft re-determination. Lastly, an internal ONR review was carried out of the Council's AWE(B) DEPZ Determination to assess compliance with REPPIR19. ONR's internal review found that the analysis and procedure applied by the Council was consistent with Regulation 8 of REPPIR19 and the associated guidance.

4. Conclusion

32. ONR's view that the requirements of REPPIR19 were met by both dutyholders, the Council and AWE(B).

33. ONR's assessment is that the DEPZ and OSEP demonstrably meet the requirements of REPPIR19; fulfils its principle part in the defence in depth protection hierarchy; and consequently plays its part in providing the demonstration that all potential risks arising from AWE(B) have been reduced to SFAIRP.

34. It follows that when the Council's emergency planning function was unable to provide the necessary assurance that the proposed development could be accommodated in the OSEP, that necessitated the ONR's objection and represented a good reason for the Council to refuse the Application.

References

1. Nuclear Installations Act 1965 (as amended) (Nuclear Installations Act 1965 (legislation.gov.uk))
2. The Energy Act 2013 (TEA 13) (Energy Act 2013 (legislation.gov.uk))
3. Atomic Weapons Establishment Act 1991 (Atomic Weapons Establishment Act 1991 (legislation.gov.uk))
4. Health and Safety at Work Act 1974
5. Safety assessment principles for nuclear facilities ONR 2014 (Revision 1) http://www.onr.org.uk/saps/saps2014.pdf
6. INSAG-10 “Defence in Depth in Nuclear Safety” (Pub1013e_web.pdf (iaea.org)) ,
7. IAEA Safety Report Series No.46 – “Assessment of Defence in Depth for Nuclear Power Plants”(STI/PUB/1218 (iaea.org))
8. The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (legislation.gov.uk))
9. IAEA Report Preparedness and Response for a Nuclear or Radiological Emergency GSR Part 7 P_1708_web.pdf (iaea.org)
10. REPPIR 19 ACoP (The Radiation (Emergency Preparedness and Public Information) Regulations 2019 Approved Code of Practice and guidance (onr.org.uk))