Office for Nuclear Regulation

Written evidence submitted by the Office for Nuclear Regulation (ONR)

Welsh Affairs Committee – ONR Submission on the Future of Nuclear Power in Wales

Introduction

1. The Office for Nuclear Regulation is an independent regulator established as a public corporation on 1 April 2014. Our mission is to provide efficient and effective regulation of the nuclear industry, holding it to account on behalf of the public. ONR is responsible for fulfilling the statutory purpose of regulating the nuclear industry within Great Britain in the areas of nuclear safety, nuclear security, conventional health and safety on nuclear sites, nuclear safeguards, and transport of radioactive materials. We ensure that nuclear site licence holders have made and are implementing adequate arrangements for complying with relevant legislation during construction, operation and decommissioning phases across all nuclear licensed sites.

2. As an independent regulator we are unable to provide a view on what types of reactors should be built in the UK. With regard to any commercial aspects, we are committed to the principles of the regulators code: avoiding unnecessary regulatory burden; enabling growth for compliant businesses; and ensuring that our actions are targeted and proportionate in their impacts on the regulated community.

Executive Summary

3. Within our regulatory scope we are able to provide responses to the following specific points that the Committee has expressed an interest in:

    - How the decommissioning of Wylfa and Trawsfynydd is being carried out; and
    - What potential there is for small modular reactors to be built at Trawsfynydd and how that will impact decommissioning and future planning; as well as
    - A limited discussion on the scheduling of Wylfa Newydd (not covering the commercial aspects of this decision).

In addition following a request from the Committee, we have provided an overview of how the Generic Design Assessment (GDA) process works in general.

How the decommissioning of Wylfa and Trawsfynydd is being carried out

4. Licensees and regulator have agreed to a three stage process for the decommissioning of the former Magnox power reactor sites that comprises:

    - care and maintenance preparations;
    - quiescent care and maintenance, and
    - final site clearance.

5. Wylfa ceased electricity generation at the end of 2015. The current licensee plans indicate that defueling operations will be complete by the end of 2018. They also indicate that decommissioning will commence in 2019 or perhaps earlier, as the site already has detailed decommissioning plans in place.

6. Trawsfynydd ceased electricity generation in 1993 and was fully defueled in 1995. The site has been undergoing decommissioning and preparing for a move to care and maintenance since the end of generation. Many redundant buildings have been demolished and radioactive wastes processed and either removed off the site or passively stored on site in a purpose built secure store. Preparations for entry into care and maintenance are almost complete and this is anticipated to occur within the next few years. Care and maintenance utilises the benefits from radioactive decay to further reduce the site hazard. Currently, the licensee plans are for final site clearance to commence in approximately 70 years.

7. On completion of defuelling and export from Magnox reactor sites the hazard is reduced by several orders of magnitude in comparison with at-power operation. However, some decommissioning activities (for example, waste retrieval) will increase site risk for short periods. During decommissioning, nuclear safety and security legislation remains the same as when the site is operational. Adopting a proportionate approach, commensurate with the risks and hazards on site, ONR inspectors (nuclear safety, security and conventional health and safety) continue to seek compliance with the nuclear site licence (and the conditions attached to it), the Nuclear Industries Security Regulations, the Ionising Radiation Regulations and other relevant legislation. We will apply appropriate hold points - continuing to permission the more significant activities, regulating to ensure that appropriate high standards are maintained, and requiring proportionate periodic safety reviews to confirm the adequacy of the site's safety case.

8. Throughout decommissioning, we will engage with the licensee to clarify expectations during this phase of the lifecycle, to understand decommissioning scope and risks and to ensure appropriate management of radioactive wastes. We will also regulate any non-compliance

through appropriate regulatory action - holding industry to account in line with ONR's enforcement policy statement and enforcement management model.

9. ONR's routine, planned site visits will reduce from approximately monthly to quarterly as decommissioning progresses towards establishment of a quiescent care and maintenance decommissioning stage. ONR's arrangements are sufficiently flexible to allow reactive interventions with a site should the need arise.

10. In summary, ONR's powers remain unchanged and we will continue to regulate in a proportionate, consistent, transparent and targeted manner through all stages of the decommissioning process.

What potential there is for small modular reactors to be built at Trawsfynydd and how that will impact decommissioning and future planning

11. Under the Nuclear Installations Act 1965 a nuclear site licence must be granted by ONR to a corporate body before a site may be used for the purpose of installing or operating a nuclear power reactor.

12. The Government currently has a national policy statement for siting of large nuclear power stations. The statement lists locations in England and Wales that it has determined are strategically suitable for new nuclear power stations. ONR would only issue a licence in respect of a site that has been designated by the Government. Trawsfynydd is not currently an identified location and any such decision would require the Government to amend the national policy statement accordingly.

13. The suitability of specific sites, including Trawsfynydd, for SMR deployment will depend upon the technology being considered. In particular, before granting a site licence, we would need to be satisfied that the proposed design could be constructed and operated safely taking account of local external hazards, including seismic disturbances and extreme weather events such as flooding; and that an adequate emergency plan could be implemented if required. Vendors of certain SMR designs claim that the potential for accidents with off-site radiological consequences is small. However, it is a prospective licensee's responsibility to make adequate safety arguments, drawing on the safety case submitted as part of the Generic Design Assessment (GDA). We would test these arguments as part of the assessment to support licensing and we would also confirm that the requirements for cooling water and grid connections could be satisfied, although reliance on these may be less onerous for an SMR than for large reactor designs.

14. The more novel a small reactor design, the more challenging it will be for the developer to gather sufficient evidence, from research and development work, to demonstrate that all aspects of the design that affect its safety and security will meet regulatory requirements. For reactors which are smaller versions of established reactor types, it may be easier to draw on operational experience with existing power stations to support the safety of the proposed design. Consequently, a safety case for a small reactor will not necessarily be shorter or simpler than for a large reactor.

15. We would also need to consider safety and security concerns in relation to the transport of radioactive materials and the location of the site as part of its wider assessment. Our approach to licensing is set out in our guide to Licensing Nuclear installations.

16. ONR is currently reviewing its approach to the regulation of new build and how design assessment, licensing and construction activities can be developed to better support the Government's future intent for SMRs, recognising and addressing the unique nature of their construction and deployment.

17. In summary, construction and operation of an SMR at Trawsfynydd is feasible; however there are number of elements that would need to be considered over and above the detailed assessment of any proposed technology; including site specific elements and suitability of the organisation to hold a nuclear site licence. Furthermore, we would expect a new licensee to work closely with Magnox Ltd and NDA to ensure that existing decommissioning work is not adversely affected by work to install a new SMR, and to ensure that decommissioning activities did not compromise the safe operation of the reactor.

Scheduling of Wylfa Newydd

18. Horizon Nuclear Power Ltd (Horizon) is intending to apply for a nuclear site licence to construct and operate the Hitachi-GE Advanced Boiling Water Reactor (ABWR) power station at Wylfa on Anglesey. Horizon cannot commence nuclear safety related construction until it has been granted a licence by ONR, and has received permission to do so under a condition attached to the licence. Legal conditions placed by other government and regulatory bodies must also be met.

19. The schedule for Wylfa Newydd is a matter for Horizon. However, we are working with Horizon to provide advice and constructive challenge as it develops its organisational capability and application for a nuclear site licence. The aim is to enable Horizon to understand regulatory expectations and establish the infrastructure expected of a nuclear site licence holder.

20. We understand that Horizon intends to submit its nuclear site licence application in mid-2016, with a view to the licence being granted in 2018. When the site licence application is received we will commence formal assessment, which will culminate in a recommendation being made to the ONR Chief Nuclear Inspector as to whether a nuclear site licence should be granted. Upon granting of a nuclear site licence we will regulate the activities of Horizon in order to ensure that it maintains compliance with the conditions of the licence granted. Upon receipt and satisfactory completion of assessment of a site specific safety case we will issue permission for first nuclear construction on the Wylfa Newydd site, which is currently scheduled for 2019. In addition, we would permission against declared hold points during the construction period as well as prior to commissioning and operation of the reactors.

21. ONR publishes regular progress updates on our regulatory interactions with Horizon, and we intend to publish a position statement on receipt of the licence application for Wylfa Newydd. These can be found at http://www.onr.org.uk/civil-nuclear-reactors/wylfa-newydd.htm

The Generic Design Assessment (GDA) process

22. GDA is the start of the lifecycle for a new reactor; it is a comprehensive assessment of the safety, security and environmental aspects of the design in advance of any construction on site. GDA aims to de-risk construction by providing regulatory clarity on design changes required to address regulatory concerns and the safety analysis requirements ahead of financial decisions and major plant construction. It is a joint process undertaken by the ONR and the Environment Agency, where the regulators engage with nuclear reactor design companies - the Requesting Party (RP) - at the earliest stage when they can have the most influence.

23. It is not a mandatory process, but because of its advantages for both reactor vendors and developers, it is expected that it will normally be requested for new nuclear reactor technologies intended for construction in Great Britain. It provides a systematic assessment of the design of potential new reactors, ensuring the designs meet the safety and security expectations of the UK's regulatory framework. The GDA process focuses purely on the reactor design and does not consider site specific issues.

24. The regulators will only conduct GDA on a new reactor design following a formal request from the government. Regulators undertake a technical assessment of the submissions provided by the RP (design companies/reactor vendors), consulting with international regulators as appropriate, and providing advice on any issues they identify. This approach increases regulatory effectiveness and efficiency and helps developers reduce their commercial risks on

costs and timescales. The systematic, stepwise process gets increasingly detailed as the process develops:

Step 1 – Involves work undertaken by the RP in setting up its project management and technical teams and arrangements for GDA as well as preparation of safety and security submissions. There will be discussions between the RP and regulators to ensure a full understanding of the requirements and processes that will be applied and to arrive at formal agreements for cost recovery.

Step 2 – Regulators obtain an overview of the fundamental design and the basic safety and security claims in relation to the UK's regulatory requirements and standards. The aim of this step is to assess the key claims and identify any fundamental safety or security shortfalls that could prevent the proposed design from being licensed in Great Britain.

Step 3 – A review of the overall design, the safety case arguments and related security aspects is undertaken. The requirement is to move from the fundamentals of the previous step to an analysis of the design, primarily by examination at the system level and by analysis of the arguments submitted by the RP, which support the safety and security claims.

Step 4 – The final step involves an in-depth assessment of the safety case evidence, the generic site envelope and the related security aspects, it involves the largest amount of regulatory effort and the duration is dependent upon the quality of the submissions and engagement. The intention of this step is to move from the safety arguments and system level assessment of Step 3 to a fully detailed examination of the available evidence, on a sampling basis, given in the safety and security submissions. The aim of this step is to confirm that the higher level claims and arguments are properly justified, and to complete sufficient detailed assessment to allow ONR to come to a judgment of whether a Design Acceptance Confirmation (DAC) can be issued for the generic reactor design.

25. The whole process can take up to 5 years. Once ONR is fully content with the generic safety and security aspects, it would then provide the RP with a DAC, which marks the end of GDA for that generic design. Provision of a DAC will mean that a generic reactor design is capable of being built and operated, on a site bounded by the generic site envelope, in a way that is acceptably safe and secure (subject to site specific assessment and licensing). Similarly the EA would issue its Statement of Design Acceptance (SoDA) once it is satisfied regarding environmental matters.

26. Where the regulators judge that there are significant, unacceptable shortfalls in the design or the Requesting Party submissions, then no DAC or SoDA will be issued. It would be a matter for the Requesting Party to decide whether to propose additional work to address the shortfalls, which may allow the regulators to issue a DAC or SoDA at some future date.

27. If the regulators' assessments are largely complete and the generic design is found to be generally acceptable but some nuclear safety, security or environmental issues remain, or where shortfalls in information have been identified, then the outstanding issues may be identified as GDA Issues, for which the Requesting Party will be required to provide credible resolution plans. If the regulators are satisfied with the resolution plans then they may be able to issue an Interim Design Assessment Confirmation (iDAC) and an Interim Statement of Design Acceptability (iSoDA). A full DAC is only provided once the issues have been satisfactory resolved.

28. The regulators maintain GDA as an open and transparent process and the public can view and comment on detailed design information on the internet. ONR also gives regular feedback on assessment progress and publishes reports periodically.

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