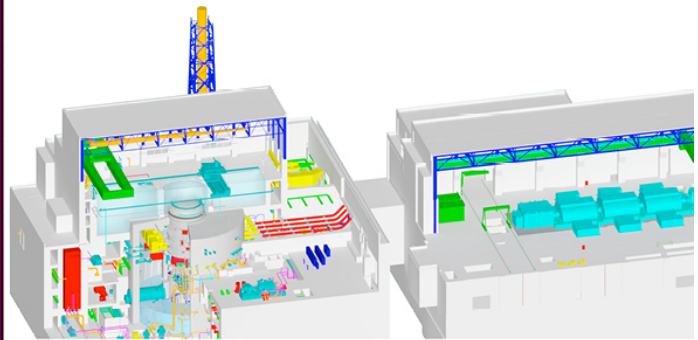


Generic design assessment of nuclear power stations

Summary report on initial assessment of Hitachi-GE Nuclear Energy, Ltd's UK Advanced Boiling Water Reactor



August 2014

LIT 10000

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1. Introduction

The Environment Agency is the principal environmental regulator of nuclear power stations in England. Our role as environmental regulator is to ensure that people and the environment are properly protected during normal operation of a nuclear power station and during construction, commissioning and decommissioning. Our work includes regulating discharges and disposals of radioactive and other wastes and we are responsible for carrying out Generic Design Assessment (GDA) for environmental aspects of potential new reactor designs. We work closely throughout GDA, and in the subsequent regulation of any new nuclear power stations, with our colleagues in the Office for Nuclear Regulation (ONR). ONR's responsibilities include regulating safety, security, and nuclear material safeguards at nuclear sites in the UK.

Natural Resources Wales (NRW) is also working closely with the Environment Agency on GDA to ensure that the outcome of the GDA for each reactor design, including any Statement of Design Acceptability (SoDA) or interim Statement of Design Acceptability (iSoDA) that may be issued, is applicable in both England and Wales.

GDA enables ONR and the Environment Agency to begin assessing the acceptability of safety, security and environmental aspects of a nuclear power station design, at a generic level, before site-specific applications are made.

This report summarises our initial findings from the first assessment stage of GDA for the UK Advanced Boiling Water Reactor (ABWR) nuclear power station design. This design was submitted by Hitachi-GE Nuclear Energy, Ltd (Hitachi-GE). This report is a summary of the full report of the initial assessment for the UK ABWR (Environment Agency 2014).

Hitachi-GE has published its GDA submission so that the public can view it and comment. The regulators have considered relevant comments received up to 31 May 2014 together with Hitachi-GE's responses to those comments during their initial assessments. They will consider comments received after 31 May 2014 during the next detailed assessment stage.

In our initial assessment we examine Hitachi-GE's submission at an outline level. The aim is to identify whether we require further information, if there are any matters that are obviously unacceptable, and if any significant design modifications are likely to be required.

2. Main findings

We assessed a range of areas and this is a summary of our main findings:

- **Quality management systems:** Hitachi-GE has a quality management system (QMS) which is certificated to ISO 9001:2008 and has developed specific management system arrangements for the GDA project. We are satisfied that Hitachi-GE has developed and implemented a suitable management system for this stage of the GDA project.
- **Generic site description:** The generic site described by Hitachi-GE includes details of assumed meteorological and hydrographical measures that would affect dispersion of discharges, and places where people live and food is produced, that are used in the radiological assessment.
- **Impact of radiological discharges:** The radiological impacts of the UK ABWR are below the source dose constraint of 300 $\mu\text{Sv}/\text{y}$ for humans, and below the dose criteria for wildlife of 10 $\mu\text{Gy}/\text{h}$. The dose calculations are based on estimated gaseous and liquid discharges and associated proposed discharge limits provided by Hitachi-GE. Based on the information we have at present, it is likely that radioactive discharges would not exceed those of comparable power stations.
- **Management of radioactive waste:** All likely sources of radioactive waste and feasible management and disposal plans have been identified for each waste stream. We are content

that estimates of solid radioactive waste from the UK ABWR are realistic, but we require more information on some waste for its detailed assessment.

- **Best available techniques (BAT):** Hitachi-GE is making progress in demonstrating that its UK ABWR design will use the best available techniques to protect the environment. However, the assessment is at an early stage and further evidence is required for detailed assessment.
- **Combustible waste:** There is not enough information on quantities and characteristics for both radioactive and non-radioactive combustible waste. We have requested more information for our detailed assessment.
- **Monitoring of discharges and disposals:** There is not enough information for us to conclude whether Hitachi-GE's proposals for measuring and assessing discharges and disposals of radioactive waste are acceptable. We require more information for our detailed assessment.
- **Other environmental regulations:** The UK ABWR will use direct seawater cooling. More information is needed on arrangements, including fish deterrent systems, to make sure that marine life is adequately protected. There is not enough information provided in the submission on proposed non-radioactive discharges to surface waters, including thermal discharges. More information has been requested on this, and on the proposed combustion plant. The submission states that there will be no discharges to groundwater. The submission also states that no on-site incinerator is planned. No information has been provided on the quantities of any dangerous substances that will be stored on site. This information is needed for the detailed assessment.

For all of the areas where we require further information, Hitachi-GE has committed to providing this during our detailed assessment stage.

3. Conclusions

In this initial assessment of GDA we examined the management systems used for producing the submission and the impact of the proposed radioactive discharges.

Our assessment also considered whether Hitachi-GE's submission for the UK ABWR contained any matters that are obviously unacceptable and so whether any significant design modifications might be needed. We also assessed whether there was enough information to carry out the detailed assessment stage.

The overall conclusions of our initial assessment for the UK ABWR nuclear power station design are:

- The submission does not adequately address all of our information requirements (as set out in our process and information document (P&ID) (Environment Agency, 2013)). Hitachi-GE has committed to providing the required information on a timescale that, subject to the information being of adequate quality, should enable us to maintain our indicative target of four years for completing a meaningful GDA.
- We have not at this stage identified any matters addressed by the submission that are obviously unacceptable.
- We have not at this stage identified any significant design modifications that are likely to be required.
- Hitachi-GE has an appropriate management system in place to control the content and accuracy of the information it provides for GDA.
- The annual radiation impact of the UK ABWR design on people would be below the UK constraint for any single new source.
- Based on the information we have at present, it is likely that radioactive discharges would not exceed those of comparable power stations.
- The generic site description is broadly consistent with the potentially suitable coastal sites identified in the nuclear national policy statement (UK Parliament, 2011).

These conclusions are based on our initial assessment. Further or modified conclusions may be developed once Hitachi-GE has provided all the required information and we have carried out our detailed assessment.

We will only proceed to detailed assessment of the UK ABWR and subsequent consultation once we are satisfied that the regulators and Hitachi-GE are ready to do so. This detailed assessment is expected to commence in September 2014 and take approximately 18 months.

At the regulators' request, Hitachi-GE has implemented a 'comments process' that enables people to view and comment on the GDA submission it has made (http://www.hitachi-hgne-uk-abwr.co.uk/make_a_comment.html).

References

Reference	Author / Publication / Website
Environment Agency, 2014	Environment Agency, 2014. Generic design assessment of nuclear power stations. Report on initial assessment of Hitachi-GE Nuclear Energy, Ltd's UK Advanced Boiling Water Reactor. https://www.gov.uk/government/publications/new-nuclear-power-stations-assessment-of-hitachi-ges-uk-abwr-design
Environment Agency, 2013	Environment Agency, 2013. Process and information document for generic assessment of candidate nuclear power plant designs (version 2). Bristol: Environment Agency. https://www.gov.uk/government/publications/assessment-of-candidate-nuclear-power-plant-designs
UK Parliament, 2011	United Kingdom. Parliament. House of Commons. Department of Energy and Climate Change, 2011. National Policy Statement for Nuclear Power Generation (EN-6). London: The Stationery Office. https://www.gov.uk/consents-and-planning-applications-for-national-energy-infrastructure-projects

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