

Evidence

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Scoping study: discharges from boiling water reactors

Project summary SC130018

The Environment Agency is required by the Department of Energy and Climate Change to conduct a Generic Design Assessment (GDA) for proposed new nuclear power plants in the UK. The design currently being proposed for Wylfa on Anglesey and Oldbury in Gloucestershire is the UK Advanced Boiling Water Reactor (UK ABWR) design of Hitachi-GE of Japan.

Part of the GDA process is to consider the potential discharges from the proposed Hitachi-GE UK ABWRs. There are no ABWRs operating in the UK at present, but there are many boiling water reactors (BWRs) operating around the world. BWRs are a predecessor reactor type to ABWRs. Reports of the discharges from such reactors are available in the public domain or on request from regulators or operators. The information on BWR discharges can be used to inform the GDA of the likely discharges from ABWRs and inform the approach to regulating ABWRs.

This project is a scoping study to inform a larger project on BWR discharge assessment. The aim of this project was to identify suitable BWR reactors for study, taking account of the type and age of reactor, location, regulatory regime and operational approaches. From an original list of 77 operational BWRs and ABWRs, a set of 23 suitable reactors was selected from across Europe, the USA, Mexico and Japan and an assessment was made of the availability of discharge information from open source, operators or regulators. Approaches were made to obtain as much of this data as was possible in the short project timescale, and potential gaps in the data sought were identified.

For European BWRs, discharge data was available for radioactive discharges to various levels of detail. Information on chemical discharges and solid waste was also generally available. Some contextual information on outage periods and fuel pin failures was obtained for some reactors, and this information can be assessed in greater detail in a proposed follow-up study. Limited information was available from operators or regulators in Japan in the timescale available for this preliminary project.

US data was available from the Nuclear Regulatory Commission effluent database, which provides annual data on the quantities of radionuclides released in liquid and gaseous effluents from each plant. No information was received from the Mexico plant during the project.

There is a proposed continuation study to obtain all identified data from this scoping project, define data gaps and source further information. This future study would collate the data and consider comparability (e.g. units, measurement types, time periods). An assessment of the likely range of discharges for the proposed new UK ABWRs can then be made based on the data from existing predecessor reactors. This data will be used as a baseline reference for the discharge data that Hitachi-GE will provide as part of their submission to the GDA. The evidence of existing discharges will also allow the Environment Agency to make realistic comparisons with proposed discharges from new ABWRs.

This summary relates to information from project SC130018, reported in detail in the following output(s):

Report: SC130018/R

Title: Scoping study: discharges from boiling water reactors

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