Office for Nuclear Regulation

Generic Design Assessment

Step 2 Statement

for the BWRX-300

The Office for Nuclear Regulation (ONR), in accordance with the document 'New Nuclear Power Plants: Generic Design Assessment Guidance to Requesting Parties', ONR-GDA-GD-006 Issue 1, August 2024, hereby gives GE Vernova Hitachi Nuclear Energy International LLC, UK Branch a Generic Design Assessment (GDA) Step 2 Statement for the generic BWRX-300 design.

Based upon assessment to date ONR has not identified any significant issues that: may prevent ONR from issuing a Design Assessment Confirmation (DAC), might prevent ONR granting permission for the construction of a nuclear power plant based upon that design, or which might be in conflict with relevant government policy.

This judgement:

1. is given based upon the assessment described in the Annex. The regulatory findings made during Step 2 are based on the scope and design maturity described in the Annex;
2. does not guarantee that ONR will grant permission for the construction of a power station based on the BWRX-300 design at a particular site in Great Britain. Any organisation intending to build and operate a BWRX-300 in Great Britain must first obtain from ONR a nuclear site licence, as required under the Nuclear Installations Act 1965; and
3. is valid for a period of ten years beginning on the date on which it is issued.

This conclusion will be taken into account by ONR in any subsequent work as part of a GDA or to grant a future permission. Wherever possible, ONR will not look to reassess those aspects considered adequate in the GDA Statement. However, given the nature of the Step 2 assessment, the likelihood of continuing design development, and the broader and more detailed scope of any subsequent assessments, some aspects may need to be re-examined to ensure the conclusion remains valid.

Signed	**Date of Issue**
Paul Dicks Director of Regulation – New Nuclear Reactors	11 December 2025

Annex

Introduction

The BWRX-300 is a single unit, direct-cycle, natural circulation, boiling water reactor with generating capacity of ~ 300 MW (electrical) and is designed to have an operational life of 60 years. GE Vernova Hitachi Nuclear Energy International LLC, UK Branch is the Requesting Party (RP) for GDA. The designer of the BWRX-300 is GE Vernova Hitachi Nuclear Energy Americas LLC (GVHA), an established provider of reactor technologies, fuel and nuclear services.

The objective of Step 2 was to undertake an assessment of the generic design against regulatory expectations to identify any fundamental safety, security or safeguards shortfalls that could prevent ONR granting permission for the construction of a power station based on the design (ref. [1]). Our assessment of the BWRX-300 design against our 21 topic areas is summarised in a Step 2 summary report (ref. [2]).

Submissions

The submissions which formed the basis for ONR's assessment are recorded in the Master Document Submission list (MDSL) (ref. [3]). The regulatory judgements reached in Step 2 apply to the final versions of the RP's Safety, Security, Safeguards and Environment cases (SSSE) provided to ONR in July 2025. These summarise the information that has been submitted to ONR for assessment.

Design maturity

The BWRX-300 design assessed in GDA is defined within the Design Reference report (DRR) (ref. [4]). It is predominantly based on the 'standard' BWRX-300 design being developed by GVHA as it was in March 2024. Whilst the design has been fixed for the purposes of GDA, GVHA has continued to develop the design in support of its other international projects.

The RP states the design submitted for GDA is at an advanced concept stage of development. The structures, systems and components (SSCs) in the power block (comprised of the reactor building, turbine building, control building, radwaste building, and the turbine maintenance building) are stated to be at Baseline (BL) 1. This is where system interfaces have been established, system descriptions have been developed for the primary systems and deterministic and probabilistic analysis has been undertaken.

The balance of plant remains at BL0 for which only plant requirements have been established, and SSC design remains at a high concept level.

Scope

The SSCs included in Step 2, along with the depth and breadth of the supporting SSSE, are set out in the Scope of Generic Design Assessment report (ref. [5]), DRR (ref. [4]), and MDSL (ref. [3]).

The RP has chosen to stop GDA at the end of Step 2, with any future regulatory assessment of the BWRX-300 design assumed to be undertaken as part of a site-specific project.

The SSSE was produced with the intention of providing sufficient information to support the objectives of Step 2. Therefore, it had some limitations in terms of the design details, analysis and substantiation that would be required for a DAC, or to allow activities on a nuclear licensed site to commence. Whilst awareness is shown of likely country-specific requirements and ONR regulatory expectations, the submitted SSSE generally postpones the demonstration of these requirements to a future site-specific project.

Given this, detailed information was not available for all aspects within the GDA scope. Important aspects where the Step 2 SSSE has limitations include:

- Deterministic safety analyses are predominately for accident sequences associated with the reactor at power, analyses for all operating modes and events away from the reactor were not available;
- Design and requirements information is at differing levels of maturity for SSCs included in the GDA Scope and design reference; and
- Application of the RP's proposed approach to categorisation safety functions and classification of SSCs is partial.

Assessment outcomes

Our Step 2 assessment has not identified any fundamental safety, security or safeguards shortfalls that could prevent ONR issuing a DAC (if the RP was to return to complete Step 3) or granting permission for the construction of a power station based on the generic BWRX-300 design. This is based on our assessment of the submissions provided in Step 2 and is subject to the provision and assessment of suitable and sufficient supporting evidence as part of any future GDA or site-specific BWRX-300 regulatory interactions.

We have not identified any potential conflicts with relevant government policy at this time.

The SSSE submitted for GDA was of a high quality and provided a sound basis for us to reach our regulatory conclusions on the generic BWRX-300 design including its passive safety features. The RP's adherence to International Atomic Energy Agency (IAEA) standards has aided our ability to form a view on how safety, security and safeguards outcomes are being achieved. The RP's integration of its arrangements

for GDA with the established processes and procedures of GVHA for controlling the BWRX-300 design and future SSSE commitments was found to be robust.

There remain three open Regulatory Observations (ROs) from our Step 2 assessment of the BWRX-300 for which we have credible resolution plans agreed with the RP. These are described in our Step 2 Summary Report (ref. [2]) and are listed on our website (ref. [6]). ROs are areas where we have identified a potential regulatory shortfall which requires action and new work by the RP for it to be resolved. If the RP undertakes the work it has identified in its resolution plans and incorporates it into a future design and SSSE, the gaps identified in the GDA submissions that prompted the ROs should not be a barrier to ONR granting permission for the construction of a BWRX-300.

We have identified in our Step 2 summary report (ref. [2]) a number of areas where additional substantiation, analysis or modelling will be required in a future SSSE if a UK project is initiated. These are aspects that could be addressed through ongoing development of the design or regulatory interactions in other countries.

If the RP wants to maximise the value of GDA to achieve its goal of a widely accepted standard design supported by common documentation where possible, it should take into the account the matters arising from our assessment, as identified in our Step 2 summary report (ref. [2]) as it takes forward other projects elsewhere.

References

[1] ONR, New Nuclear Power Plants: Generic Design Assessment Guidance to Requesting Parties, ONR-GDA-GD-006, Issue 1, August 2024, https://www.onr.org.uk/media/iexmextu/onr-gda-gd-006.docx.

[2] ONR, Generic Design Assessment of the BWRX-300 Step 2 Summary Report, Revision 1, December 2025, ONRW-2019369590-21328.

[3] GE-Hitachi, NEDO-34089, BWRX-300 UK Generic Design Assessment Master Document Submission List (MDSL), Revision 19, November 2025, ONRW-2019369590-25137.

[4] GE-Hitachi, NEDC-34154P BWRX-300 UK GDA Design Reference Report, Revision 3, April 2025, ONRW-2019369590-20194.

[5] GE-Hitachi, NEDC-34148P, Scope of Generic Design Assessment, Revision 2, September 2024, ONRW-2019369590-13525.

[6] ONR, GE-Hitachi BWRX-300 - Regulatory observations and resolution plans, November 2025, https://www.onr.org.uk/publications/regulatory-reports/generic-design-assessment/ge-hitachi-bwrx-300-regulatory-observations-and-resolution-plans.