**Generic Design Assessment**

**Step 2 Statement**

**for the Rolls-Royce SMR**

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 Revision 0, October 2019, hereby gives Rolls-Royce SMR Limited a Generic Design Assessment (GDA) Step 2 Statement for the generic Rolls-Royce SMR 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 permissioning 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 Rolls-Royce SMR design at a particular site in Great Britain. Any organisation intending to build and operate a Rolls-Royce SMR 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**

 30 July 2024

**Jane Bowie**

Director of Regulation – New Nuclear Reactors

**Annex**

**Introduction**

The Rolls-Royce SMR is a 470 MWe pressurised water reactor. Rolls-Royce SMR Limited is the Requesting Party (RP) for GDA.

The objective of Step 2 was to undertake an assessment of the generic design against regulatory expectations to identify any fundamental safety, security or safeguard shortfalls that could prevent ONR permissioning the construction of a power station based on the design (ref. [1]). Our assessment 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 (ref. [3]). The RP’s Environment, Safety, Security and Safeguards (E3S) case is at Version 2 and summarises the information that has been submitted to ONR to date.

**Design maturity**

The Rolls-Royce SMR design is defined within the Design Reference report (ref. [4]). The majority of Systems, Structures and Components (SSCs) have reached sufficient maturity to define the baseline design for inclusion in the design reference. Further E3S submissions will need to include a completed list of functional and non-functional requirements and demonstrate they are met by the design.

**Scope**

The assessment was against the GDA scope (ref. [5]) which has been agreed between the RP and ONR.

The RP intends to complete a three-step GDA, with the objective of receiving a DAC from ONR and has aligned its GDA scope with this objective. The GDA scope defines the generic plant and layout and includes all SSCs that are identified as being important to safety, security and safeguards, all modes of operation, and all stages of the plant lifecycle.

Some areas of future regulatory interest to ONR are declared as out of scope for GDA. These are largely operator or site-specific matters that are not expected to be included in any GDA. In addition, specific to the Rolls-Royce SMR design, the off-site factories used to produce modular components, the transport of such modules to site, and construction of modules on the site are out of scope of this GDA.

We have assessed submissions made across 21 topics, covering all of our statutory purposes relevant to GDA.

Give the step-wise assessment during GDA, information was not available for all aspects within the GDA scope. Important aspects where the Step 2 E3S case has limitations include:

* A full scope safety analysis, covering deterministic and probabilistic analysis and the assessment of hazards is not yet available.
* Design and requirements information is at differing levels of maturity for SSCs included in the GDA Scope and design reference.
* Operational matters, which provide specific details on how the Rolls-Royce SMR will be operated are not yet available.
* Radiological analysis for normal operations and faults require more design details than are currently available.

**Assessment outcomes**

Overall, based on our assessment to date, and subject to the provision and assessment of suitable and sufficient supporting evidence, we have not identified any fundamental safety, security or safeguards shortfalls that could prevent ONR permissioning the construction of a power station based on the generic Rolls-Royce SMR design.

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

We raised two Regulatory Observations (ROs) during Step 2. These were areas where we identified a potential regulatory shortfall which requires action and new work by the RP for it to be resolved. Resolution plans for both ROs have been agreed and good progress towards resolution continues.

A number of technical aspects have been identified where we would expect to seek further information during future regulatory interactions. These are reported in the summary report (ref. [2]).

**Readiness for Step 3**

Our readiness review concluded that both the RP and ONR are ready to begin Step 3.

**References**

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| [1]  | ONR, New Nuclear Power Plants: Generic Design Assessment Guidance to Requesting Parties, ONR-GDA-GD-006 Revision 0, October 2019. www.onr.org.uk/media/pylbvfnz/onr-gda-gd-006.pdf.  |
| [2]  | ONR, Generic Design Assessment of the Rolls-Royce SMR - Step 2 summary, ONRW-2019369590-8980, Issue No. 1, July 2024. (Record ref. ONRW-2019369590-8980).  |
| [3]  | Rolls-Royce SMR Limited, Master Document Submission List and Document List, SMR0001724, Issue 13, May 2024. (Record ref. ONRW-2019369590-9824).  |
| [4]  | Rolls-Royce SMR Limited, Rolls-Royce SMR – GDA Design Reference Report, SMR0009043, Issue 2, April 2023. (Record ref. ONRW-2019369590-8872).  |
| [5]  | Rolls-Royce SMR Limited, Rolls-Royce SMR Generic Design Assessment Scope, SMR0002183, Issue 2, January 2023. (Record ref. ONRW-2019369590-7694).  |