

## 16 TECHNICAL SPECIFICATIONS

Chapter 16 of the preliminary safety analysis report (PSAR), for a one-unit BWRX-300 small modular reactor (referred to as CRN-1) designed by GE-Vernova Hitachi Nuclear Energy at the Clinch River Nuclear Site, provides an identification and justification for the selection of variables, conditions, and items determined as the result of the preliminary safety analysis and evaluation to be probable subjects of technical specifications (TS) for the facility, with special attention given to those items which may significantly influence the final design. The purpose of these preliminary TS is to ensure that, during the final design and licensing stages, the facility's operation will remain within safety limits and that the design and operation of safety-significant structures, systems, and components (SSCs) will be adequately controlled.

### 16.1 Regulatory Evaluation

The following regulations and guidance are applicable to this review:

- Title 10 of the *Code of Federal Regulations* (10 CFR) 50.34(a)(5) requires the construction permit (CP) applicant to provide “an identification and justification for the selection of those variables, conditions, or other items which are determined as the result of preliminary safety analysis and evaluation to be probable subjects of technical specifications for the facility, with special attention given to those items which may significantly influence the final design.”
- 10 CFR 50.36, “Technical specifications,” specifies the categories of items to be included in TS. These items include safety limits, limiting safety system settings, limiting conditions for operation (LCOs), surveillance requirements, design features, and administrative controls.
- SRP Section 16.0 provides acceptance criteria and review procedures for TS in CP applications. PSAR Table 1.9-16 states the design conforms to SRP 16.0
- DNRL-ISG-2022-01, “Safety Review of Light-Water Power Reactor Construction Permit Applications,” supplements the standard review plan (SRP) for CP reviews and clarifies the U.S. Nuclear Regulatory Commission’s (NRC’s or the Commission’s) expectations for the scope and detail of preliminary TS at the CP stage.

### 16.2 Technical Evaluation

PSAR Section 16.3.1 states that, to the extent appropriate for CRN-1, the preliminary TS content and format align with the guidance in TSTF-GG-05-01, “Writer’s Guide for Plant-Specific Improved Technical Specifications,” Revision 1, and reference NUREG-1433 and NUREG-1434, which are the standard TS for General Electric boiling water reactor (BWR)/4 and BWR/6 plants, respectively. The applicant indicates that the TS structure, definitions, and rules for use and application of CRN-1 are consistent with industry standards and recent NRC and industry harmonization efforts, to the extent appropriate for the BWRX-300 design.

#### 16.2.1 *Selection Methodology*

The applicant’s methodology for selecting preliminary TS content is described in PSAR Section 16.4 and is based on:

- Incorporation of relevant sections from BWR/4 and BWR/6 standard technical specifications (STS) and TS for the economic simplified boiling-water reactor (ESBWR) certified design, as applicable.

- Consistency with the approach of the BWRX-300 safety strategy, including the identification of defense lines and the use of TS and availability controls to ensure consistency with design and safety analysis assumptions.
- Use of the four selection criteria from 10 CFR 50.36(c)(2)(ii) for LCOs:
  1. Installed instrumentation for detecting, and indicating in the control room, degradation of the reactor coolant pressure boundary.
  2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
  3. SSCs that are part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
  4. SSCs shown by operating experience or probabilistic risk assessment (PRA) to be significant to public health and safety.
- Consideration of lessons learned from recent NRC reviews of new and passive plant designs.

PSAR Table 16.5-1 provides a preliminary table of contents for the CRN-1 TS, identifying each candidate specification, the applicable selection criterion, and the basis for inclusion. PSAR Section 16.4.2 states, in part, if CN-DSA (conservative deterministic safety analysis) results for an event sequence involving an AOO (anticipated operational occurrence) PIE (postulated initiating event) with an assumed CCF (common cause failure) of DL2 (defense line 2) functions conclude that fuel cladding failures would occur, the corresponding BL-DSA (baseline deterministic safety analysis) initial conditions and SSCs credited to mitigate that same AOO PIE will be subject to Technical Specification LCOs.

At the time of this safety evaluation report, the PSAR Chapter 16, PSAR Table 16.5-1 has not been updated to reflect the AOO PIEs with a failure of DL2 functions that may result in fuel failure (i.e., transients required by LCO Criteria 2 and 3 to the probable TS list); therefore, the NRC staff has not evaluated all the probable CRN-1 TS, which is not required at the CP stage under 10 CFR 50.34(a)(5). However, the staff concluded that finalization of this information in the TS can be reasonably deferred to a later licensing phase. The NRC staff will evaluate the finalized TSs during the operating license (OL) application review.

### **16.2.2 Scope and Level of Detail**

Consistent with the expectations for a CP application, as established by 10 CFR 50.34(a)(5) and 10 CFR 50.35(a)(2), the applicant has not provided final numerical values, completion times, or surveillance frequencies, noting that these will be developed and justified at the OL application stage when the design is complete. The PSAR includes high-level descriptions of the types of TS expected to be required, their bases, and references to sections of the PSAR or applicable regulations that support their selection.

Where applicable, the applicant identifies that surveillance frequencies will be controlled under a Surveillance Frequency Control Program consistent with current industry practice, and that initial values and their bases will be provided with the OL application. The staff concluded that the level of detail provided in the PSAR is consistent with the requirements of 10 CFR 50.34(a)(5) and associated guidance. Consistent with DNRL-ISG-2022-01, finalization of technical specifications can be reasonably deferred to the operating licensing stage.

### **16.2.3 Comparison with Reference Technical Specifications**

The staff compared the preliminary CRN-1 TS content and format with the reference BWR/4, BWR/6, and ESBWR STS. The CRN-1 preliminary TS are structured consistently with these references, including chapters on use and application, safety limits, LCOs and surveillance requirements, design features, and administrative controls. The applicant's approach for adapting the STS to the BWRX-300 design, and for identifying areas where deviations are necessary, is clearly described.

### **16.3 Conclusion**

The NRC staff has reviewed the available information provided in PSAR Chapter 16 and consistent with SRP 16.0 and DNRL-ISG-2022-01, concludes that, as required by 10 CFR 50.34(a)(5), the applicant justifies the selection of those variables, conditions, or other items determined from the preliminary safety analysis and evaluation to be probable TS subjects for the facility. Further, the addition of probable TS for transients (AOO PIEs) will need to be evaluated in the OL application. On this basis, the NRC staff concludes that the requirements of 10 CFR 50.34(a)(5), in accordance with 10 CFR 50.35(a)(2), have been met and, therefore, that the proposed preliminary TS items are acceptable and supports the issuance of a CP.