

U.S. NUCLEAR REGULATORY COMMISSION SUMMARY OF THE AUGUST 31, 2022,
PREAPPLICATION PUBLIC MEETING
WITH SMR, LLC (A HOLTEC INTERNATIONAL COMPANY)
TO DISCUSS QUESTIONS REGARDING LOSS-OF-COOLANT ANALYSIS
TO SUPPORT THE CONSTRUCTION PERMIT APPLICATION OF THE SMR-160 DESIGN

Meeting Summary

The U.S. Nuclear Regulatory Commission (NRC) held a preapplication public meeting on August 31, 2022, with SMR, LLC (SMR), a Holtec International company, to discuss questions regarding the loss-of-coolant analysis (LOCA) to support the construction permit application of the SMR-160 design. Specifically, SMR (applicant) requested to discuss with the staff the applicable large break LOCA regulations, definitions, guidance, and information on its previously submitted and subsequently withdrawn topical report.¹

This hybrid preapplication meeting had in-person and virtual attendees from SMR, LLC, Holtec International, LLC, and the NRC. There were no members of the public observing the meeting.

The following summarizes the discussion during the open session of the meeting.

- With respect to the applicant's Questions #1 and #2 related to the definitions of design-basis accident (DBA) and beyond design-basis accident (BDBA), the NRC staff responded that Standard Review Plan (SRP) Section 15.0 defines postulated accidents associated with DBAs discussed in the regulations with examples. These accidents are different from BDBAs which are typically characterized as severe accidents within the regulations. The NRC staff is working to update this SRP section to simplify the acceptance criteria for design-basis events and to incorporate generic passive reactor policy positions.²
- In discussing the applicant's Questions #3 and #4 regarding the definition of a LOCA as a "postulated accident" or "hypothetical accident," the applicant requested whether the threshold for the postulated LOCA is associated with a frequency; e.g., 10^{-10} or 10^{-12} . The NRC staff stated that to comply with the regulations, the DBA analysis is independent of the frequency. Similarly, other DBAs are called out by the regulations and are not associated with a frequency. Additionally, General Design Criterion 4 is specific to protection against dynamic effects and is a separate regulation from the hypothetical breaks required to be analyzed per 10 CFR 50.46.
- For the applicant's Question #5, the NRC staff noted that if an applicant cannot demonstrate compliance with 10 CFR 50.46, an applicant must seek an exemption and would need to demonstrate special circumstances; in part, this would require

¹ SMR, LLC, "Preapplication Meeting Materials for August 31, 2022 (Project No. 99902049)," dated August 24, 2022. Agencywide Document Access and Management System (ADAMS) Accession No. ML22236A529.

² U.S. NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 15.0, "Transient and Accident Analysis," dated March 2007, ADAMS Accession No. ML070710376.

demonstration that a LOCA has a sufficiently low likelihood of occurrence through analyses of its design. In addressing “low consequence,” the applicant should consider a holistic approach of its plant design that includes prevention based on its design and mitigation based on the plant’s response to an accident. In evaluating its design, the applicant should consider the acceptance criteria assigned to the category of the events.

- In response to the applicant’s Question #6, the NRC staff stated that it is not aware of any exemption requests related to postulated LOCA break sizes or loss-of-coolant rates. The NRC staff noted that a topical report cannot grant an exemption, but its review of a topical report could evaluate the methodology and acceptance criteria a future applicant would use to justify an exemption when a license application is submitted. The NRC staff would review an exemption request in the context of the design details in a license application to determine whether the applicable regulations are met or an exemption is justified. There is a spectrum of preapplication engagements that includes submission of White Papers for assessment and topical reports for evaluation. The NRC staff noted that more engagement and submission of information for review better prepares the NRC staff for review of the application.
- For the applicant’s Question #7, the NRC staff noted that the requests for additional information (RAIs) issued for the previously submitted topical report are part of the NRC staff’s review and is historical information for future submissions. The NRC staff encouraged the applicant to review the requested information identified during a previous audit because it provides information on what is needed to support its review and that these previous interactions have value in informing future engagements or submissions. The NRC staff noted that a topical report would provide the criteria against which a future exemption would be evaluated and the exemption would be part of a license application.
- The NRC staff noted that the applicant should consider the design specific details in regard to materials, environment, weld design, fabrication, fracture analysis, inspection, and design and loading of the components when considering the LOCA location selection as discussed in the previously issued RAIs. Consideration of this information in the design of the plant would support the NRC staff review of the systems analyses.

The following summarizes the discussion during the closed session of the meeting.

- The applicant described its DBAs for its passive emergency core cooling system for surrogate LOCA acceptance criteria where the core is not uncovered and a guillotine reactor coolant system break where the core is uncovered. The NRC staff noted that the applicant should consider the structural, mechanical, and fracture analysis for the full spectrum of break sizes. Reliance on the robustness of the design will require more design specific details and analyses of the methodology and acceptance criteria for the staff to evaluate these components.
- In discussing a potential exemption to the LOCA requirements, the NRC staff noted additional information may be needed to support an exemption request to have confidence in the results justifying the exemption.
- In response to whether an owner can engage in a future potential exemption in a manner different from a vendor and before a construction permit is issued, the NRC staff

noted that an owner (applicant for a construction permit) could get early feedback on the exemption through the NRC staff evaluation of its application; however, the exemption is not final until the construction permit is issued.