U.S. NUCLEAR REGULATORY COMMISSION SUMMARY OF THE MAY 17, 2023, OBSERVATION PREAPPLICATION PUBLIC MEETING WITH SMR, LLC (A HOLTEC INTERNATIONAL COMPANY) TO DISCUSS THE SMR 160 PROBABILISTIC SAFETY ANALYSIS OVERVIEW

Meeting Summary

The U.S. Nuclear Regulatory Commission (NRC) held an observation public meeting on May 17, 2023, with SMR, LLC (SMR), a Holtec International Company (Holtec), to discuss preapplication information related to the SMR-160 design. Specifically, SMR (Holtec) requested the meeting to provide a high-level overview of the SMR probabilistic safety analysis (PSA) modeling methodology to respond to a question the NRC asked at the May 5, 2023, design overview meeting related to the SMR-160 PSA. SMR provided the presentation slides, a gap assessment and a proprietary white paper to discuss at this public meeting.[2] This meeting satisfies the SMR (Holtec) request for review and feedback on its preapplication meeting materials.

This virtual observation preapplication meeting had attendees from SMR (Holtec), NRC staff, and members of the public. The NRC staff and SMR (Holtec) discussed proprietary information during the closed session.

Preapplication engagements, including this meeting, provide an opportunity for the NRC staff to engage in early discussions with a prospective applicant to identify potential licensing issues early in the licensing process and to obtain feedback from the NRC staff on the high-level overview and specific topics that the NRC would like to discuss further in future meetings. No decisions or commitments were made during the preapplication meeting.

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

- SMR (Holtec) provided an overview of the PSA Quality Control Process and their approach for compliance with Regulatory Guide (RG) 1.200, “Acceptability of Probabilistic Risk Assessment Results for Risk-Informed Activities,” RG 1.201, ”Guidelines for categorizing structures, systems, and components in nuclear power plants according to their safety significance,” RG 1.174, “An approach for using probabilistic risk assessment in risk-informed decisions on plant-specific changes to the licensing basis,” NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,” and applicable American Nuclear Society/American Society of Mechanical Engineers Standards. SMR (Holtec) discussed several aspects of their PSA development including initiating event analysis, accident sequence analysis, and human reliability analysis.

- SMR (Holtec) discussed initiating events for their PSA accident sequence analysis regarding considerations for preventing core damage. For these analyses, SMR (Holtec) used RELAP-3D regarding event tree development to evaluate plant response to each

[1] Letter from J. Hawkins, “SMR, LLC Preapplication Meeting Materials for May 17, 2023,” dated May 11, 2023, Agencywide Documents and Access Management System (ADAMS) Accession No. ML23131A045, part of ML23131A044.

[2] SMR, LLC, “Enclosure 1 - SMR, LLC Meeting Presentation Materials for May 17, 2023,” dated May 17, 2023, ML23131A047 (Public), ML23131A046 (Proprietary), part of ML23131A044.

initiating event and used MELCOR to analyze the accident sequence analysis associated with their PSA regarding core damage sequences.

- NRC staff asked how failure probability is assigned for first-of-a-kind (FoaK) structures, systems and components (SSCs). SMR (Holtec) stated that its design is expected to have limited FoaK SSCs and provided information on how their failure probabilities are going to be determined.

- NRC staff asked at what point SMR (Holtec) plans to start incorporating plant-specific data, specifically in relation to FoaK components. SMR (Holtec) responded plant-specific data will not be available until the plant is operating.

- NRC staff asked if there are any differentiations in assigning failure probabilities to safety-related versus non-safety-related components. SMR (Holtec) said that the failure probability database is used to determine if there is differentiation.

- SMR (Holtec) discussed their thresholds for determination of risk significant SSCs from the PSA. The thresholds discussed by SMR (Holtec) referenced a staff approved licensing topical report (LTR) on risk significance for a different advanced light-water reactor SMR-160 design. As stated in the limitations and conditions section in the LTR safety evaluation report, any use in whole or in part for other designs would require additional applicability review by the staff.

- NRC staff asked whether SMR (Holtec) plans to submit a LTR or include the justification for these thresholds in the licensing application. SMR indicated that a decision has not been made.

- NRC staff asked how key PRA assumptions are identified and addressed during PSA development. SMR (Holtec) responded that although NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making," is not directly used in its PSA development, the concepts and steps are being implemented to identify key assumptions and sources of uncertainty.

There was one question from a member of the public that was addressed.

The open session ended and was followed by a closed session to discuss propriety topics.

The following provides a high-level, non-proprietary summary of the discussion during the closed session of the meeting:

- Whether and how the spent fuel pool is being considered in the PSA regarding development of initiating events due to the unique design. The staff provided examples where consideration appeared warranted.

- Building design for beyond-design-basis severe and extreme winds, including tornados and hurricanes.

- SMR (Holtec) discussed some preliminary results of their risk analysis and stated that they are evaluating potential design changes.

- SMR (Holtec) discussed core damage frequency and the associated risk significance thresholds and the basis for those thresholds. The staff requested a comparison of percent of SSCs identified as risk significant from SMR (Holtec)'s risk significance thresholds compared to those in RG 1.200.

The meeting adjourned.