U.S. NUCLEAR REGULATORY COMMISSION SUMMARY OF THE DECEMBER 5, 2022, OBSERVATION PREAPPLICATION PUBLIC MEETING WITH SMR, LLC (A HOLTEC INTERNATIONAL COMPANY) TO DISCUSS QUESTIONS RELATED TO QUESTIONS RELATED TO THE SMR-160 DESIGN OF THE PASSIVE CORE COOLING SYSTEM FOR NON-LOCA EVENTS

Meeting Summary

The U.S. Nuclear Regulatory Commission (NRC) held an observation public meeting on December 5, 2022, with SMR, LLC (SMR), a Holtec International Company, to discuss preapplication items for the SMR-160 passive core cooling system design for non-loss-of-coolant accident (non-LOCA) analyses and the safe shutdown criteria discussed in SECY-94-084.[1] Specifically, SMR requested the meeting to obtain NRC staff feedback on how the criteria in SECY-94-084 applies to their SMR-160 design.[2]

This virtual preapplication observation public meeting had attendees from SMR, LLC, Holtec International, LLC, the NRC staff, and members of the public.

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

- The applicant provided an overview of the SMR-160 Passive Core Cooling System (PCCS) that is comprised of the Primary Decay Heat Removal System (PDHR), Secondary Decay Heat Removal System (SDHR), Automatic Depressurization System (ADS), and Passive Core Makeup Water System (PCMWS). The ADS and PCMWS are used only during a LOCA. The applicant noted that the PDHR and SDHR are the focus of today's discussion.

- The applicant described the PDHR and SDHR and clarified for the staff that the text describing Loop 1 is correct and not accurately depicted in the graphic on Slide #6.

- The applicant discussed the PCCS performance following a LOCA noting that following non-LOCAs (except for Main Steam Line Break and Feedwater Line Break), the SMR-160 design satisfies the safe shutdown requirement using the PDHR and SDHR. In response to the NRC staff's question, the applicant confirmed that the PDHR and SDHR are designed such that these systems continue to perform the intended functions assuming a single failure.

- In response to the applicant's question on Slide #10 regarding safe shutdown criteria in SECY-94-084, the NRC staff noted the following:

    - The 420°F Reactor Coolant System (RCS) temperature referred to is the RCS Average Temperature (T_{avg}).

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1 U.S. NRC, SECY-94-084, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plants," dated March 28, 1994. (Agencywide Documents and Access Management System (ADAMS) Accession No. ML003708068).

2 SMR, LLC, "NRC Meeting: SECY-94-084 Safe Shutdown Criteria," dated December 5, 2022. (ML22320A004, Package ML22320A002).

    - The safety-related decay heat removal system only needs to be designed to get the plant to safe shutdown (less than 420°F) which correlates to the MODE definition in its technical specifications.

    - As noted in the SECY, General Design Criterion (GDC) 34 requires heat removed from the reactor core so that specified acceptable fuel design limits (SAFDLs) and the design conditions of the reactor coolant pressure boundary are not exceeded.

- The applicant described that it is evaluating the capability of the design to reach safe shutdown. Based on the discussion, the NRC staff noted that while the temperature in the steam generator tubes may remain high (approximately 550 °F), if the core T_{avg} is less than 420°F in 36 hours then the SECY criteria is met. The NRC staff further noted that GDC 34 covers both SAFDLs and the reactor coolant pressure boundary. Therefore, the potential for thermal stratification and stresses in the reactor coolant system generated from this condition must be demonstrated to not exceed design conditions.

- There were no questions or comments from members of the public. The open session of the meeting was adjourned at 1:52 pm.

The closed session of the meeting started immediately after the closing of the open session and focused on proprietary details of the SMR-160 passive core cooling system design summarized below:

- In response to the applicant's question on the basis for the 36-hour requirement, the NRC staff referred to the earliest reference found in Standard Review Plan Section 5.4.7, Revision 1, 1979, which served, in part, as the resolution of Generic Safety Issue Item A-31, "RHR Shutdown Requirements."

- The NRC staff noted the feedback provided during the meeting is based on the general information provided to support the meeting and that an evaluation of the system will be completed upon acceptance of an application for NRC review.

- The NRC staff encouraged the applicant to consider further engagements on its analysis codes and methods to support its construction permit application timeline.

The closed session of the meeting was adjourned at 2:10 pm.