U.S. NUCLEAR REGULATORY COMMISSION SUMMARY OF THE OCTOBER 19, 2022, OBSERVATION PREAPPLICATION PUBLIC MEETING WITH SMR, LLC (A HOLTEC INTERNATIONAL COMPANY) TO DISCUSS LOSS-OF-COOLANT ACCIDENT ANALYSIS TO SUPPORT THE CONSTRUCTION PERMIT APPLICATION OF THE SMR-160 DESIGN

The U.S. Nuclear Regulatory Commission (NRC) held a preapplication public meeting on October 19, 2022, with SMR, LLC (SMR), a Holtec International Company, regarding their loss-of-coolant accident (LOCA) analysis and associated information regarding a potential exemption to the requirements.[1] The applicant requested NRC staff review and feedback on a document regarding the basis for a potential future LOCA exemption request to support the construction permit application for the SMR-160 design.[2] This meeting summary satisfies the applicant's request for review and feedback on these preapplication meeting materials. This virtual preapplication meeting had attendees from SMR, LLC, Holtec International, LLC, the NRC staff and a member of the public.

The purpose of the meeting was for the NRC staff to provide comments on a consolidated list of items titled, "Basis for Future LOCA Exemption Request," in a table of contents format that Holtec plans to use to formulate a potential SMR-160 LOCA exemption justification. This document, with NRC comments, is included as Enclosure (4) to this meeting summary.

Holtec stated that they anticipate providing a future exemption request relating to Title 10 *Code of Federal Regulations* (10 CFR) 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," as it relates to the SMR-160 design in support of a future licensing application under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

The NRC staff provided initial observations on the meeting materials that are included in this meeting summary. The applicant proceeded to discuss the initial observations by the NRC staff and the staff responded to additional questions associated with Enclosure (4) regarding the reasonableness of the SMR-160 exemption justification list, and identification of any major items that should also be considered.

With respect to the plans for a future report, the applicant described that the table of contents outline provided prior to the meeting is the first step to developing the proposed exemption request. The applicant stated that they plan to continue with the submittal of white papers to provide information related to a future exemption request as part of its construction permit application and is not currently considering the submission of a topical report on this topic. The NRC staff pointed out that the staff's assessment of an applicant's meeting materials is not binding and is not an evaluation of the applicant's approach. The applicant confirmed their understanding.

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1 SMR, LLC, "Preapplication Meeting Materials for October 19, 2022," dated October 3, 2022. Agencywide Documents and Access Management System (ADAMS) Accession No. ML22276A068.

2 SMR, LLC, "SMR, LLC Basis for Future LOCA Exemption Request for October 19, 2022," dated October 3, 2022, ML22276A070.

The following summarizes the discussion on the table of contents outline (Enclosure 4):

- With respect to Section 2.1 on the reactor coolant system (RCS) and subject locations, the applicant stated that its application will clarify the meaning of subject locations. The NRC staff noted that it had used that simple term in previous discussions and is acceptable as long as it is defined.

- In Section 2.3.2:

    - Regarding materials labels for the RCS and subject locations, the applicant responded to the NRC staff that it plans to include material specifications as well as labels and locations in its application.

    - The applicant stated that they will include a justification for the forging process.

    - The NRC staff clarified that the observation on the system structural layout lateral supports is applicable to the steam generator and reactor pressure vessel and not the pressure-injected footing (PIF). The staff's concern was stated to be that the height of the steam generator may create a bending moment on the vessel-to-vessel connection. The staff also noted that elevations should be included in any drawings provided.

    - With respect to nondestructive examination, the applicant stated that it will provide a diagram to show how it plans to conduct a 100 % ultrasonic inspection, and that the application will be clear on its commitment to the timing of the inspection during preconstruction and in-service inspections.

- In Section 2.3.3:

    - The NRC staff clarified that more detail would be needed on how the post weld heat treatment of welds meet the American Society of Mechanical Engineers (ASME) requirements. The applicant stated that its application will include a discussion of its procedures and Quality Assurance Program.

    - The NRC staff noted that from operating experience there can be thermal stratification in horizontal pipes, e.g., pressurizer surge line. The applicant stated that this is not a concern for the PIF because it is a short, horizontal pipe with constant flow. The applicant noted that it is currently designing the SMR-160 to be capable of load-following.

    - In response to the applicant's request for clarification on an evaluation of the weld stresses on the PIF, the NRC staff noted that modelling the stresses during the design stage would be part of the NRC staff's evaluation of any probabilistic approach that is used to inform the LOCA break spectrum.

    - With respect to thermal aging, the applicant stated that it plans to commit to industry guidelines and discuss existing processes and procedures. The NRC staff noted that an application detailing the ASME code versions referenced in the design will reduce the number of requests for additional information.

- In Section 2.3.4

    - The NRC staff noted that the section appears to blend probabilistic risk assessment (PRA) information with analysis for the break size and location. The applicant confirmed that the analysis for the break size and location should be separated from the PRA analysis.

    - The NRC staff encouraged the applicant to consider reviewing the work from the late 2000s to develop a transition break size by using risk information to determine the likelihood of pipe breaks of different sizes. The NRC staff recognizes that this work was later suspended and not applicable to the SMR 160 design; however, the NRC staff believes that valuable insights can be gained from reviewing this information, including how the staff has historically approached consideration of alternatives to requirements for evaluating the performance of the emergency core cooling system.

At the end of the meeting the public was given an opportunity to comment. A member of the public commented that a LOCA can cause high burnup uranium pellets to dissolve to powder (this phenomenon is referred to as fuel fragmentation, relocation, and dispersal) and asked why the consequences of a LOCA on the fuel was not discussed. The NRC responded that the NRC is engaged in preapplication activities, and the comment is beyond the scope of the specific discussion for today's meeting. The technical aspects of the comment will be part of the NRC staff's review of the application when received.

The meeting was adjourned.