May 8, 2014

Dr. José N. Reyes, Jr.
Vice President, Regulatory Affairs (Acting)
NuScale Power, LLC
1100 NE Circle Blvd., Suite 200
Corvallis, Oregon 97330

SUBJECT: INFORMATION REQUEST FOR THE PURPOSE OF UPDATING THE MELCOR MODELS FOR SIMULATION OF ACCIDENTS IN THE NUSCALE DESIGN AND ASSESSMENT OF NUSCALE INTEGRAL EFFECTS TEST FACILITY.

Dear Dr. Reyes:

In 2013, the U.S. Nuclear Regulatory Commission (NRC) received two design data sets from NuScale Power, LLC (NuScale) related to MELCOR model development. Having an accurate MELCOR model of the NuScale design supports the agency's evaluation of prevention and mitigation design features during preparation of the Design Specific Review Standard for the NuScale design. Due to the nature of the MELCOR model development, additional design data are needed to replace some of the placeholder parameters in the latest version of the NuScale model.

The NuScale testing program includes separate effect tests and integral effects tests (IETs). The data from these tests can be used to assess the applicability of the MELCOR computer codes to the NuScale design. Results from the MELCOR input model representing the Oregon State University (OSU) IET facility for the Multi-Application Small Light Water Reactor (MASLWR), developed by an NRC contractor, have been compared against the experimental data for the NuScale IET facility. Some differences are reflected between the contractor-developed MASLWR and the NuScale design. Therefore, the MELCOR model for the OSU MASLWR facility needs to be updated to represent the final design of the NuScale IET facility.

Please provide responses to the questions below so that we can update the NuScale plant design MELCOR model:

1. Please provide the axial and radial power profiles at the beginning of cycle and the middle of cycle for an equilibrium cycle.

2. Is the region between the core and the core barrel (i.e., core bypass region) filled with perforated solid materials? If yes, please provide the number of holes that are present and their associated diameters and locations. In addition, please provide the detailed geometry and the total mass of the structures in this region.

3. For the decay heat removal system (DHRS), please provide the:
   - maximum heat capacity of one DHRS under design conditions,
   - capacity of one DHRS as a function of the pressure inside the tubes in DHRS,
   - capacity of one DHRS as a function of non-condensable mole fraction in the DHRS at reactor bay pool temperature of 323 K, and
   - capacity of one DHRS as a function of non-condensable mole fraction in the DHRS at reactor bay pool temperature of 373 K.

4. Please provide the inner and outer diameters of the control rod guide tubes (CRGT).

5. Please provide the thickness of the upper core plate.

6. Please provide the detailed geometry information for the:
   - upper head (e.g., shape), and
   - lower head.

7. Please provide the diameter and number of support columns in the region between the core and the riser section.

8. Please provide the outside diameter of the CRGT.

9. Please provide the elevation of the bottom of the CRGT relative to the top of the lower core plate.

10. Please provide the elevation of the top of the CRGT relative to the bottom of the upper core plate.

11. Please provide the number of control rod drive mechanisms.

12. Please provide the form loss coefficient:
   - at the exit of the core bypass region,
   - in the region between the core and the hot leg riser,
   - in the core in the horizontal direction,
   - in the hot leg riser, and
   - at the exit of the hot leg riser.

13. Please provide the emissivity for the outside surface of the:
   - reactor pressure vessel wall based on the design conditions, and
   - reactor pressure vessel upper and lower head under design conditions.

14. Please provide the wall thickness of the steam generator steam header.

15. Please provide the material and density of the grid spacers.

16. Please provide the density of the B_4C absorber material.

17. Please provide the elevation corresponding to the top of the reactor bay pool relative to the bottom of the reactor bay pool.

18. Please provide the design temperature of the reactor bay pool.

19. Regarding the design data for the NuScale IET facility, please provide the:
    - engineering design of each component of the IET facility,
    - design of instrumentation (i.e., location and type of measurements),
    - testing procedure,
    - detailed test parameters, and
    - details of the measured parameters, including the initial test conditions.

If any part of your response is proprietary, both a proprietary and non-proprietary version of the full response should be sent with an associated affidavit describing the reason for being made proprietary.

Should you have any questions regarding this correspondence, I may be reached at (301) 415-1560.

Sincerely,

/RA/

Anna Bradford, Chief
Small Modular Reactor Licensing Branch 2
Division of Advanced Reactors and Rulemaking
Office of New Reactors

Project No.: PROJ0769

19. Regarding the design data for the NuScale IET facility, please provide the:
    - engineering design of each component of the IET facility,
    - design of instrumentation (i.e., location and type of measurements),
    - testing procedure,
    - detailed test parameters, and
    - details of the measured parameters, including the initial test conditions.

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cc: NuScale Power LLC Listserv

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NAME	NDevaser	GCranston	SGonzalez*
DATE	4/16/2014	4/16/2014	4/17/2014
OFFICE	BC:NRO/DARR/SMRLB2		
NAME	ABradford		
DATE	5/08/2014		

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