October 3, 2013

Mr. Joseph E. Pollock, Vice President
Nuclear Operations
Nuclear Energy Institute
1201 F Street NW, Suite 1100
Washington, DC 20004

Dear Joe Pollock:

The U.S. Nuclear Regulatory Commission (NRC) staff has considered your request to endorse the Nuclear Energy Institute (NEI) position paper dated June 2013, entitled "Use of Modular Accident Analysis Program (MAAP) in Support of Post-Fukushima Applications" (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML13190A201).

The purpose of the position paper is to provide information on the MAAP computer code which is used by some licensees to establish a timeline and develop strategies to satisfy Order EA-12-049, "Order Modifying Licenses With Regard To Requirements for Mitigation Strategies for beyond Design Basis External Events," (ADAMS Accession No. ML12054A735). The NRC staff has interacted with your staff and external stakeholders during the development of this position paper.

The NRC staff has reviewed the information submitted to date on the MAAP4 computer code. The NRC staff has not identified any concerns regarding the use of MAAP4 in performing containment analyses for both BWRs and PWRs in satisfying the intent of the NRC Order EA-12-049. However, for establishing a timeline which meets the intent of the order, the NRC staff has not received sufficient information to conclude that it is acceptable to use MAAP4 computer code in simulating the primary system during an ELAP event for a PWR. Therefore, those PWR licensees who choose to use MAAP4 for simulating the primary system need to provide the technical basis for its use.

The NRC staff finds that the use of the MAAP4 computer code in simulating the Extended Loss of AC Power (ELAP) event for Boiling Water Reactors (BWR) is an acceptable method for establishing a timeline which meets the intent of NRC Order EA-12-049, with the following limitations:

(1) From the June 2013 position paper, benchmarks must be identified and discussed which demonstrate that MAAP4 is an appropriate code for the simulation of an ELAP event at your facility.

(2) The collapsed level must remain above Top of Active Fuel (TAF) and the cool down rate must be within technical specification limits.

(3) MAAP4 must be used in accordance with Sections 4.1, 4.2, 4.3, 4.4, and 4.5 of the June 2013 position paper.

(4) In using MAAP4, the licensee must identify and justify the subset of key modeling parameters cited from Tables 4-1 through 4-6 of the "MAAP4 Application Guidance, Desktop Reference for Using MAAP4 Software, Revision 2" (Electric Power Research Institute Report 1020236). This should include response at a plant-specific level regarding specific modeling options and parameter choices for key models that would be expected to substantially affect the ELAP analysis performed for that licensee's plant. Although some suggested key phenomena are identified below, other parameters considered important in the simulation of the ELAP event by the vendor / licensee should also be included.
    a. Nodalization
    b. General two-phase flow modeling
    c. Modeling of heat transfer and losses
    d. Choked flow
    e. Vent line pressure losses
    f. Decay heat (fission products / actinides / etc.)

(5) The specific MAAP4 analysis case that was used to validate the timing of mitigating strategies in the integrated plan must be identified and should be available on the ePortal for NRC staff to view. Alternately, a comparable level of information may be included in the supplemental response. In either case, the analysis should include a plot of the collapsed vessel level to confirm that TAF is not reached (the elevation of the TAF should be provided) and a plot of the temperature cool down to confirm that the cool down is within tech spec limits.

The NRC staff will evaluate a licensee's application of the guidance in its development of the final safety evaluation documenting compliance with NRC Order EA-12-049. Individual licensees need to inform the NRC of their plans to abide by this generic resolution and their plans to address potential plant specific issues associated with implementing this resolution that are identified during the audit process. Licensees are strongly encouraged to follow this resolution in order to improve efficiency of the NRC's review and to avoid further requests for information.

If a licensee deviates from the guidance, the licensee must justify the deviations and provide information that demonstrates that MAAP computer code is being appropriately used.

Sincerely,

/RA/

Jack R. Davis, Director
Mitigating Strategies Directorate
Office of Nuclear Reactor Regulation

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Jack R. Davis, Director
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Office of Nuclear Reactor Regulation

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