May 21, 2014

Steven P. Kraft
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1201 F Street NW, Suite 1100
Washington, DC 20004

SUBJECT: REQUEST FOR INFORMATION RELATED TO THE FILTERING STRATEGIES AND SEVERE ACCIDENT MANAGEMENT OF BOILING WATER REACTORS WITH MARK I AND MARK II CONTAINMENTS RULEMAKING

Dear Mr. Kraft:

The purpose of this letter is to request that the Nuclear Energy Institute (NEI) provide the U.S. Nuclear Regulatory Commission (NRC) information related to the filtering strategies and severe accident management of boiling water reactors (BWR) with Mark I and Mark II containments for the NRC filtering strategies rulemaking. This letter is based on the information discussed during the April 30, 2014, public meeting (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14101A442) on the filtering strategies rulemaking. The requested information will assist the NRC in assuring the quality of the work undertaken by the staff satisfies the Commission direction in SRM-SEC-12-0157, "Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II containments," dated March 19, 2013 (ADAMS Accession No. ML13078A017).

The NRC is requesting information on three topics related to the filtering strategies rulemaking: (1) detailed cost estimates by May 31, 2014; (2) major assumptions from the BWR Owners Group (BWROG) Emergency Procedure Guidelines/Severe Accident Guidelines (EPG/SAG) or other relevant proprietary industry documents that, as discussed, need to be on the record to support the rulemaking, by July 31, 2014; and (3) plant-specific information for BWR Mark I and Mark II containments, as requested at prior public meetings by July 31, 2014. This information will be used to assess how closely the set of important assumptions in the generic MELCOR computational analysis compares to actual plant values, and thereby obtain confidence that the modeling adequately represents the range of plants. The level of detail in the enclosure responds to the industry request for the NRC to provide a more detailed information request.

The NRC would use the information described above in Items (1) and (2) to verify and improve the quality of the NRC's regulatory analysis and backfit analysis supporting the NRC's decision on the filtering strategies rulemaking. The NRC prefers to receive the Items (1) and (2) information in a form which can be made available to the public. If some of that information cannot be made publicly-available, then the NRC requests that the NRC be afforded the opportunity to review the information, for example, through an external e-portal site. If the non-public information is in documents, the NRC requests that the documents be submitted to the NRC in accordance with 10 CFR § 2.390 (e.g., under affidavit with an explanation why the information may be withheld from public disclosure) and that a publicly-available summary or description of the documents containing non-public information be submitted to the NRC.

The staff believes that the majority of the information for Item (3), plant-specific information, can be found in a plant's EPG/SAG or may have been used in the Individual Plant Examination (IPE) Program analysis. If the information is publicly available, a citation to the document would facilitate the staff's review. Plants may be assigned numbers rather than use names for this item. The plant-specific information should focus on BWR with Mark II containments before BWR with Mark I containments.

If you have any questions regarding this letter, please contact me at 301-415-1272 or the rulemaking project manager for the filtering strategies and severe accident management of BWR with Mark I and Mark II containments rulemaking, Aaron Szabo, at 301-415-1985.

Sincerely,

/RA/

Jennifer Uhle, Deputy Director
Office of Nuclear Reactor Regulation

Enclosed:
As stated

cc: Lesa P. Hill, BWROG

Request #1: Detailed Cost Estimates

Industry initially provided high-level cost estimates at a public meeting in Fall 2013. During that public meeting, industry indicated that detailed cost information would be provided by the end of 2013. During the April 30, 2014, public meeting, industry provided more detailed cost estimates for the filters alternative and the external injection alternatives (ADAMS Accession No. ML14121A563). To note, the costs provided by industry were not life cycle costs (i.e., did not include the costs for operation or decommissioning) and were only the implementation costs assuming that no additional pumps or electrical equipment was necessary. Industry indicated that they would provide a formal letter with the information by May 31, 2014.

The U.S. Nuclear Regulatory Commission (NRC) requests that the industry provide the following detailed cost information. Unless stated otherwise, the detailed cost information request is for all alternatives, including drywell venting, external water injection (into the reactor pressure vessel and drywell), and external filters (small and large). The NRC is also requesting access via an external e-portal site to the Microsoft Excel spreadsheets and other relevant proprietary documents that the NRC could consider when developing the basis for the cost estimates that will be used in the regulatory analysis for the rulemaking:

1) Provide an explanation of the assumptions of the equipment and effort required to implement the alternative for the detailed cost estimate.
2) What are the significant cost drivers and variability among sites?
3) Do the costs associated with the implementation of the alternative consider shared equipment savings? If not, how would this affect the cost estimates?
4) How many licensees have incurred costs related to the implementation of the alternative that are considered sunk (e.g., extra pipes, valves, or implementation based on previous Orders or voluntarily) and what are those costs?
5) What are the costs for operation of the alternative (i.e., costs during life)?
6) What are the costs for validation and testing for the alternative relative to the validation and testing in the status quo?
7) What are the costs for decommissioning of the alternative assuming no accident (i.e., end of life cycle costs)?
8) What are the costs for decommissioning of the alternative assuming an accident (i.e., end of life cycle costs)?
9) Any additional equipment outside of the external water injection that would be required (e.g., additional pumps)?
10) What are the costs for modifying guidance (both the BWROG EPG/SAG and plant-specific guidance) if the alternative is implemented? Are these costs considered sunk (i.e., already implemented)?

The NRC understands that some of this information would be considered proprietary. The NRC is requesting a non-proprietary version of the document and access to review any information that the NEI considers to be proprietary information to be provided via an external e-portal site.

ENCLOSURE

Request #2: Major Assumptions related to the BWR Owners Group's Guidance Documents and other proprietary documents

The NRC requested Revision 3 of the BWR Owners Group's (BWROG) Emergency Procedure Guidelines/ Severe Accident Guidelines (EPG/SAG Rev 3) in a letter dated November 26, 2013 (ADAMS Accession No. ML13325B094).
Industry responded to the letter on December 17, 2013, stating that due to the proprietary nature of the document, the industry will provide the BWROG EPG/SAG Rev 3 via e-portal to the NRC and will hold a closed meeting (ADAMS Accession No. ML13352A355). The NRC received access and held a closed public meeting in March 2014.

Based on the closed meeting and the NRC's review of the BWROG EPG/SAG Rev 3 and other relevant proprietary industry documents, the NRC believes the following information is contained within the BWROG EPG/SAG Rev 3 or other relevant proprietary industry documents and is important for human reliability analysis in the regulatory basis in relation to an extended loss of AC power (ELAP) and ELAP with loss of normal direct current (DC) power scenarios:

1) What pressures and temperatures would anticipatory venting occur?
   a. What pressures would the vents open and close?
   b. What circumstances (e.g., failure of RCIC) would anticipatory venting not occur?
2) What role does the technical support center serve during a severe accident?
3) For your analyses of cases where a severe accident capable drywell vent and external filter are included as mitigation systems, please identify any changes to strategies and operator actions that are assumed (i.e., changes relative to cases that do not include a severe accident capable vent and external filter).
4) For both an ELAP and ELAP and loss of normal DC power scenarios, provide the following information for drywell venting, wetwell venting, water management strategies (if there are different water management strategies that differ in the following areas, address each water management strategy separately), FLEX portable pumps, and FLEX portable generators, unless specified differently.
   a. What are the conditions that use of the equipment will be commenced?
   b. If venting is controllable, how is venting controlled (e.g., closed at a certain threshold and reopened at a certain threshold)? If different pre and post core damage, specify for each. – drywell venting and wetwell venting only
   c. Is the action performed automatically (no human actions needed), by the main control room (MCR) or onsite?
   d. If the action is performed by the MCR or onsite, are special tools required? If yes, specify the tool needed.
   e. If the action is performed onsite, is the action location and travel path in a high radiation area (i.e., greater than 10 rem/hour)? If the answer differs pre and post core damage, indicate separately.
   f. Are the actions taken discrete (e.g., turn a few switches or align a few valves) or require monitor and control?
   g. How long do the actions take, including travel tie and time required to complete the actions?
   h. How many people are needed to perform the action?

Request #3: Plant-specific Information

During the April 30, 2014, public meeting and at previous public meetings, the NRC requested information about plant-specific variation in relation to the filtering strategies rulemaking. Below is a list of information that should be provided for all BWR with Mark I and Mark II containments except where noted (plants may be numbered instead of named). Categories 1 through 6 are in order of priority, and in all cases the Mark II information is of higher priority than the Mark I information.

1) Drywell Head Seal Details
   a. Gasket material
   b. Gasket cross section
   c. Flange cross section
   d. Number of bolts/studs
   e. Bolt effective length
   f. Bolt material
   g. Bolt diameter
   h. Head flange diameter
   i. Weight of head
   j. OEM warranted maximum temperature

2) Pedestal/Drywell Geometry
   a. Pedestal inner radius
   b. Pedestal outer radius
   c. Drywell floor radius
   d. Radius to closest drywell to wetwell vent pipe floor penetration outside pedestal for Mark II only
   e. Drywell to wetwell vent pipe inside pedestal: Yes/No (if yes, location with respect to center of reactor vessel bottom head)
   f. Sump location with respect to center of reactor vessel bottom head
   g. Sump width
   h. Sump length
   i. Sump depth
   j. Sump drain line penetration size/location for Mark II only
   k. Floor drain line penetration size/location inside pedestal and nearest outside pedestal for Mark II only

3) Wetwell and Drywell (Reference from a Wetwell Bottom = 0 ft.)
   a. Normal wetwell water level
   b. Normal wetwell water volume in gallons
   c. Normal wetwell air volume in ft^3
   d. Normal wetwell vent flood-out elevation
   e. Hardened Containment Venting System wetwell vent flood-out elevation
   f. Wetwell vent line volume outside wetwell up to drywell lip elevation for Mark I only
   g. Wetwell to drywell vacuum breaker location (inside or outside torus)
   h. Vacuum breakers (number and size)
   i. Wetwell to drywell vacuum breaker flood-out elevation and corresponding wetwell volume
   j. Drywell vent elevation
   k. Drywell vent hardened: Yes/No

l. Drywell floor elevation
m. Drywell to wetwell vent elevation (bottom and top at connection to drywell for Mark I, top for Mark II)
n. Drywell to wetwell vent elevation (bottom and top at connection to wetwell for Mark I, bottom for Mark II)
o. Drywell vents (number and size)
p. Drywell spray header(s) elevation(s)
q. Drywell head seal elevation

4) Reactor Core Isolation Cooling Pump Specifications
   a. Operator equipment manufacturer (OEM) warranted maximum water temperature
   b. Extended maximum water temperature if different from 1
   c. Pump required net positive suction head (NPSHr)
   d. Pump suction height relative to suppression pool bottom

5) Safety Valves
   a. Number of valves
   b. Capacity of each valve
   c. Set to open pressure each valve
   d. Discharge elevation if directly to drywell

6) Main Steam Relief or Safety Relief Valves
   a. Relief valve set pressure, each valve
   b. Safety valve set pressure, each valve
   c. Electric power required for manual operation: Yes/No