MEMORANDUM TO:	William D. Reckley, Chief Policy and Support Branch Japan Lessons-Learned Project Directorate Office of Nuclear Reactor Regulation
FROM:	Rajender Auluck, Senior Project Manager /RA/ Policy and Support Branch Japan Lessons-Learned Project Directorate Office of Nuclear Reactor Regulation
SUBJECT:	SUMMARY OF JUNE 13, 2013 MEETING TO DISCUSS ACTIVITIES ASSOCIATED WITH IMPLEMENTATION OF NEAR- TERM TASK FORCE RECOMMENDATION 5.1 RELATED TO CONTAINMENT VENTING SYSTEMS

July 25, 2013

On June 13, 2013, a Category 2 public meeting was held between the Nuclear Regulatory Commission (NRC) staff, representatives from the Nuclear Energy Institute (NEI) and the Boiling Water Owners group (BWROG) related to the Implementation of Recommendation 5.1 of the Near-Term Task Force (NTTF) Recommendations for Enhancing Reactor Safety in the 21st Century report, issued July 12, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111861807). The specific purpose of this meeting was to discuss (i) interim staff guidance (ISG) development in support of Order EA-13-109, which was issued on June 6, 2013 (ADAMS Accession Nos. ML13130A067), and (ii) initiate interactions on another activity directed in the Staff Requirements Memorandum, dated March 19, 2013, related to the development of technical bases for filtering strategies and accident management of Boiling Water Reactors Mark I and II containments (ADAMS Accession No. ML13078A017).

The NRC senior management opened the meeting and thanked everyone for initiating these discussions so soon after the issuance of Order EA-13-109, which was issued a week prior to the meeting. There are ongoing activities which are interrelated and it is important that we are aware of these relationships as we move forward. As we will discuss later, the schedules are very tight for these activities, it is important that we continue to make progress and highlight the areas of differences soon. In their opening remarks, the industry senior representative thanked the NRC staff for this opportunity and fully agreed that discussions must focus on the differences and how best to address these differences. The industry working group is looking forward to future public meetings and will support staff in meeting the schedules identified in the staff requirements memorandum (SRM).

In their presentation, the NRC staff provided an overview of activities directed in the SRM which included: (i) requiring the licensees to upgrade or replace the reliable hardened vents required by Order EA-12-050 with the containment venting system designed and installed to remain

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functional during severe accident conditions, (ii) develop technical bases for filtering strategies with drywell filtration and severe accident management of containments, (iii) develop a proposed and final rule, and, (iv) seek Commission guidance on use of qualitative factors in regulatory decisions. The revised Order EA-13-109 included a two phase approach to ensure implementation of adequate protection provisions and cost justified enhancements with minimal delays. It supersedes Order EA-12-050 and therefore, licensees are no longer expected to comply with the requirements of EA-12-050. The staff also reiterated the scope, as stated in the revised order under the two phases and their implementation timeline. The industry representatives recognized the tight schedule and the challenges and agreed to fully support to the extent possible.

In the first technical presentation, NRC management provided an overview of the rulemaking process and the need for the development of technical bases in support of the proposed and final rules. The NRC manager stated that a working group (WG) has been formed, representing several disciplines and NRC offices for the purpose of preparing a technical bases document which will support the development of proposed and final rules. The NRC manager further stressed that the schedule, as directed in the Commission SRM for developing the technical bases. The staff will engage the Advisory Committee on Reactor Safeguards, public, and the stakeholders in developing the technical bases.

In their technical presentation, the industry representative briefly provided an overview of what should be included in the technical basis discussions for the filtering strategies rulemaking effort. These include regulatory framework, rulemaking problem statement, and development of regulatory basis. It is important and critical to coordinate this activity with other post-Fukushima orders and rulemakings. The industry representative noted that the objectives, as derived from SRM-SECY-12-0157 are filtering strategies and severe accident management. In addition, the problem statement should be understood and agreed upon, the success criteria should be clear, measurable and aligned with the SRM. With respect to the development of a regulatory basis, the presentation noted that the base case should reflect implementation of EA-13-109 and that industry will support with realistic cost data. The industry believes that the base case would include Severe Accident Capable Vent + B.5.b + Emergency Plan Guidance (EPG) Rev 3 and filtering strategies, which includes procedural and hardware changes. Industry is also working with the licensees in compiling cost data for different options and requested that if possible, can the staff provide a template or a format for the cost information which could be easily used by the staff. They also suggested a separate meeting on EPG Rev 3 which can be combined with the industry's presentation on use of "early venting" in mitigating procedures. The industry also commented on the staff's ongoing work on economic consequences, which may have some implications on the technical basis document. The NRC staff stated that a policy paper on economic considerations is under preparation and a public meeting is planned for fall 2013.

In their presentation, the NRC staff highlighted that the rule requirements will be performance based and will include performance goals, performance objectives, and performance measures. The staff highlighted that the goal, as stated in the SRM for SECY-12-0157, is to "prevent the release of significant amounts of radioactive material following the dominant severe accident sequences through filtering strategies with dry well filtration and severe accident management." The staff also noted that one of the performance objectives should be to reduce the containment failure probability for failure from liner melt-through, and for severe accident over-pressure/over-temperature conditions. For performance measures, the staff suggested that

some numerical values will be useful to be specified. The accident scenarios should be risk-significant and informed by Fukushima accident. The base-case assumed extended loss of ac power (ELAP) and included safety relief valve (SRV) failures, induced main steam line (MSL) creep rupture, vessel breach, and seal failures. The staff also provided an example of a typical event tree. The industry stated that at this time, they are not prepared to discuss the details provided by the staff but will be ready for the next meeting and will have specific comments and proposals. The staff also discussed potential mitigating actions as use of Reactor Core Isolation Coolant (RCIC), Severe Accident Management Guidelines and Emergency Operating Procedures, operator action for Reactor Pressure Vessel (RPV) depressurization, core and drywell spray, and containment venting. The important parameters to focus on will include timing of RCIC, size and timing of drywell spray, and timing of venting. The staff also provided potential alternatives with the base case to include ELAP + severe accident capable wetwell vent + severe accident capable drywell vent + some containment flood. Alternatives could include plant-specific filtering strategies, and use of an engineered filter. While evaluating these alternatives, uncertainties must be kept in mind. These may include human factors performance, suppression pool and drywell spray DFs, instrumentation, engineered filter performance, and drywell temperature variation and rise and potential impact on penetration and head flange leakages. Towards the end, the staff indicated that it will need some design information from licensees to use in developing the draft technical basis for the proposed rule. As highlighted in Slide 23, it may include drywell and wetwell spray header configuration and nozzle data, wetwell configurations, drywell floor configurations, etc. industry representative indicated that they will support to the extent possible.

The second half of the meeting was devoted to discussions regarding development of guidance document for Order EA-13-109, reliable severe accident capable hardened vent. The NRC staff stated that the focus should be on prevention of core damage as well as to vent under severe accident conditions, including those associated with core debris breach of RPV. The order describes the implementation in two phases. Phase 1 is for installation of wetwell vent, and Phase 2 is for installation of a drywell vent or development of reliable venting strategies that will obviate the need of a drywell vent. The staff also noted that industry has volunteered to develop a guidance document which the staff will review and endorse to the extent possible via the ISG process. The ISG and BWROG template for EA-12-050 is a good starting point for the development of severe accident capable vent system guidance. New and/or revised guidance needs to address radiological conditions including routing, shielding, and control panel locations. The staff highlighted some of the changes from the previous Order EA-12-050 new requirements in EA-13-109 including hydrogen flammability limits and potential dynamic loading resulting from hydrogen deflagration and detonation. The staff shared some information noted in licensee responses to EA-12-050 and EA-12-049 and stated that there were several cross references for pre-core melt conditions. These need to be assessed for severe accident conditions. The staff also stated that for venting configurations, including venting discharge layout, considerations should be given for dovetailing the vents for future potential changes resulting from Phase 2 of EA-13-109 and the rulemaking. These may include drywell vents, and filtering strategies which may require external filters.

In their presentation, the NEI representative stated that they have formed a working group to develop a guidance document NEI 13-02, "Guidance to Implement EA-13-109" and proposed a table of contents for the guidance document. The NEI representatives also highlighted that it is their understanding that all actions related to EA-12-050 and generic Letter 89-16 will be superseded by the new Order EA-13-109. They also provided a partial list of key items which

must be addressed in completing the document. These included the amount of hydrogen concentration, use of available equipment, pressure and temperature limits for design purposes, and availability of ultimate heat sink. With respect to hydrogen generation, a reference was made to a General Electric SIL report. Industry agreed to provide the cited reference report. The NRC staff agreed that these are important issues and must be discussed in future meetings.

Members of the public attended in person, through the bridgeline and via webcast. At designated points during the meeting, members of the public were invited to provide any comments on the presentations. Members of the public asked several clarifying questions, and there were some comments similar to previous comments received by the NRC. The NRC staff responded to all questions adequately.

A list of attendees is provided in ADAMS Accession No. ML13199A247. Presentation slides may be located through ADAMS Package No. ML13199A216.

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- 1. List of attendees
- 2. Presentation slides

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