

December 21, 2012

MEMORANDUM TO: Thomas H. Boyce, Chief  
Regulatory Guide Development Branch  
Division of Engineering  
Office of Nuclear Regulatory Research

FROM: Carol E. Moyer, Senior Project Manager **/RA/**  
Regulatory Guide Development Branch  
Division of Engineering  
Office of Nuclear Regulatory Research

SUBJECT: SUMMARY OF MEETING TO DISCUSS POTENTIAL  
DEVELOPMENT OF CONSENSUS STANDARDS BASED ON  
NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS  
RELATED TO THE FUKUSHIMA DAI-ICHI NUCLEAR POWER  
PLANT ACCIDENT

On November 30, 2012, U.S. Nuclear Regulatory Commission (NRC) staff held a Category 3 public meeting at the NRC headquarters in Rockville, Maryland. The purpose of the meeting was to discuss processes and priorities for development of voluntary consensus standards. Specifically, the American Nuclear Society (ANS) presented a proposal to develop consensus standards based on Tier 3 Near-Term Task Force (NTTF) recommendations related to the Fukushima Dai-Ichi nuclear power plant accident. Details about the recommendations can be found in the *Near-Term Task Force (NTTF) Recommendations for Enhancing Reactor Safety in the 21st Century* report, issued July 12, 2011, (NRC's Agency wide Documents Access and Management System (ADAMS) Accession No. ML111861807). The NRC staff, the Nuclear Energy Institute (NEI) and the American Society of Mechanical Engineers (ASME) also presented their views on this topic. The meeting agenda and a list of attendees are enclosed.

ANS had expressed concern that NRC was using NEI documents in its regulatory guidance, rather than encouraging the development of voluntary consensus standards by ANS, ASME, and other standards developing organizations (SDOs). NRC staff prepared short summaries of several of the NTTF Tier 3 recommendations, with an assessment of each issue's potential for consensus standards development. The issue summaries are enclosed.

The notice and agenda for the meeting can be found in ADAMS under Accession No. ML12311A413. The NRC, ANS, ASME, and NEI presentations are available in ADAMS under Accession Number No.: ML12356A086.

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### NRC Staff Presentation

Opening remarks were provided by Carol Moyer, Thomas Boyce, and Michael Case, of the NRC Office of Nuclear Regulatory Research. Mr. Case serves as the agency Standards Executive.

Mr. William Reckley, of the Japan Lessons Learned Directorate (JLD) in the Office of Nuclear Reactor Regulation, presented an overview of the NTTF recommendations, their categorization, and the status of the NRC's actions to implement them.

### NEI Presentation

Mr. Jim Riley presented NEI's perspective on whether standards should be developed for implementation of NTTF recommendations. He stated that the focus was appropriately on Tier 1 recommendations at this time, and that work on standards related to Tier 3 issues was premature.

### ANS Presentation

Dr. N. Prasad Kadambi and Dr. Donald Spellman gave a detailed presentation on behalf of the American Nuclear Society (ANS). After an overview of the ANS standards development process, they described several specific issues that may be a good fit for consensus standards.

### ASME Presentation

Mr. Bryan Erler gave a summary of ASME's activities addressing the Fukushima incident.

### Summary

There was discussion on the Tier 3 Issues and their potential for consensus standards development. Only the issue related to enhanced reactor and containment instrumentation was found to be a good fit to the capabilities and timeframe for consensus standards development. The NRC staff expects to continue an open dialog with ANS and other SDOs, as well as with NEI and other stakeholders, as they continue to respond to the Fukushima Dai-Ichi incident and implement related recommendations.

### Enclosures:

1. Agenda
2. Attendees List
3. Tier 3 Issue Summaries
4. Presentations

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**ADAMS Accession No:** ML12356A086

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NAME	C. Moyer
DATE	12/21/12

**OFFICIAL RECORD COPY**

AGENDA

PUBLIC MEETING ON POTENTIAL DEVELOPMENT OF CONSENSUS STANDARDS BASED  
ON NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE  
FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT

NOVEMBER 30, 2012

<b>Time:</b>	<b>Topic:</b>
8:00 AM – 8:15 AM	Welcome/Introductions/Logistics  Meeting Objectives and Purpose <i>Carol Moyer, NRC/RES</i>
8:15 AM – 8:30 AM	Overview of the Approach to Tier 3 Recommendations <i>William Reckley, NRC/NRR/JLD</i>
8:30 AM – 9:00 AM	Nuclear Energy Institute: Fukushima Response <i>James Riley, NEI</i>
9:00 AM – 10:00 AM	American Nuclear Society: National Standards Response to Fukushima Lessons Learned <i>Donald Spellman and Prasad Kadambi, ANS</i>
10:00 AM – 10:10 AM	Break
10:10 AM – 10:30 AM	American Society of Mechanical Engineers: ASME Post- Fukushima Efforts <i>Bryan Erler, ASME</i>
10:30 AM – 12:00 PM	Discussion and wrap-up

PUBLIC MEETING ON POTENTIAL DEVELOPMENT OF CONSENSUS STANDARDS BASED  
ON NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE  
FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT

NOVEMBER 30, 2012

LIST OF ATTENDEES

Name	Organization	Contact
<i>In Person:</i>		
N. Prasad Kadambi	ANS	npkadambi@verizon.net
Donald Spellman	ANS	spellmandj@ornl.gov
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<i>By Telephone:</i>		
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James Parello	IEEE	parellj@westinghouse.com

NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE FUKUSHIMA  
DAI-ICHI NUCLEAR POWER PLANT ACCIDENT:  
POTENTIAL FOR DEVELOPMENT OF CONSENSUS STANDARDS

**Tier 3 Recommendation:** 2.2 – Ten year seismic and flooding update  
**Key Staff Lead:** Jenise Thompson  
**SES Lead:** Niles Chokshi

**Description of the issue, including technical and regulatory gaps:**

Recommendation 2.2 is a rulemaking activity to require licensees to update the flooding and seismic hazards at each operating reactor site every 10 years based on any new and significant information identified since the most recent hazard reevaluation. This is a longer-term action related to Recommendation 2.1 which requires licensees to reevaluate the seismic and flooding hazards using present-day guidance and methodologies. The scope of Recommendation 2.2 is still under consideration by the staff as the Consolidated Appropriations Act of 2012 includes other external hazards as part of Recommendation 2.1 (this was categorized as a Tier 2 activity) and the staff is considering whether other man-related external hazards should also be included within the scope of the rulemaking. The main technical challenges include defining what constitutes new and significant information. The staff will also need to determine how the new and significant information should be addressed and disposed as well as the scope of the evaluations required to address the information. Finally, the staff would like to leverage the lessons learned from the R2.1 activities to inform R2.2, particularly with respect to the threshold for regulatory actions taken by the staff in response to the reevaluated hazards and any subsequent risk-informed analyses.

**Discussion of NRC plans to address the issues.**

The NRC is currently tracking any discussion or decisions made with respect to Recommendations 2.1 and 2.3 which may be useful in forming the technical basis for the R2.2 rulemaking. The staff plans to use contractor support starting in FY 2013 for pre-rulemaking activities if resources become available.

**Potential for consensus standards development:**

The staff will collect and review background information and similar international experiences to develop the technical bases for this rulemaking. The staff will also record any decisions made or guidance developed for Recommendation 2.1 that may be applicable to Recommendation 2.2. After the development of the technical basis the staff will be able to develop complete plans for the rulemaking and guidance needed to implement the rulemaking. This will be the time to decide about the need for a standard.

NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE FUKUSHIMA  
DAI-ICHI NUCLEAR POWER PLANT ACCIDENT:  
POTENTIAL FOR DEVELOPMENT OF CONSENSUS STANDARDS

**Tier 3 Recommendation:** 3 – Seismically Induced Fires and Floods  
**Key Staff Lead:** Selim Sancaktar  
**SES Lead:** Richard Correia

**Description of the issue, including technical and regulatory gaps:**

Seismically induced fires or floods have the potential to cause multiple failures of safety-related SSCs and induce failures in multiple locations at the site. Although these issues have been examined to a limited degree in the Generic Issues Program (e.g., Generic Safety Issue (GSI)-172, “Multiple Systems Responses Program”) and responses to GL 88-20, Supplement 5, “Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities,” the NTTF concluded that the staff should reevaluate the potential for common mode failures of plant safety-related SSCs as the result of seismically induced fires and floods. The NTTF identified this issue as Recommendation 3, “Evaluate Potential Enhancements to the Capability To Prevent or Mitigate Seismically Induced Fires and Floods.” In the Staff Requirements Memorandum to SECY 11-0137, the Commission directed the staff to initiate development of a probabilistic risk assessment (PRA) methodology to evaluate potential enhancements to the capability to prevent or mitigate seismically induced fires and floods as part of Tier 1 activities. Therefore, Commission indicated that the prerequisite activity to initiate development of an appropriate PRA methodology to support this issue should be started without unnecessary delay, while other aspects of this activity remained prioritized as Tier 3.

There are significant challenges associated with this effort including, but not limited to the following:

- hazard definition and characterization
  - quantification of seismically induced fire ignition
  - quantification of site-specific seismically induced flooding frequencies
  - treatment of uncertainties
- modeling concurrent and subsequent initiating events
- treatment of systems interactions
- human reliability analysis applicability to seismically induced hazards
- multiunit risk considerations

**Discussion of NRC plans to address the issues.**

There are a number of activities being conducted over the near-term that would provide valuable information for the ultimate resolution of Recommendation #3. For example, ongoing efforts to address seismic and flood hazard and mitigation strategies are expected to provide a more complete understanding of plant-specific hazards, vulnerabilities, and mitigation capabilities. The staff plans to monitor the progress of these Tier 1 areas before substantial

resources are dedicated to the evaluation of seismically induced fires and floods. Therefore, staff plans to engage in the following activities to address NTTF Recommendation 3 as augmented by Commission direction:

1. Initiate the development of a PRA methodology for addressing seismically induced fires and floods. As initially described in SECY-12-0025, the staff has completed a detailed plan for developing this method (Agencywide Documents Access and Management System Accession No. ML121450222). The staff plans to focus method development activities in two areas:
  - Coordination with standards development organizations (e.g., American Society of Mechanical Engineers and American Nuclear Society) and developing more generalized approaches for assessing concurrent hazards. This will help identify the technical elements and associated high-level and supporting requirements for a suitable PRA method, and will suggest specific areas where detailed guidance is needed.
  - Performance of a feasibility scoping study to identify issues associated with the risk assessment of multiple concurrent hazards and evaluation of available PRA methods within this context. This study would provide information regarding the capabilities of traditional and advanced risk assessment methods (e.g., linked event tree and fault tree, dynamic simulation-based approaches) for accident scenarios where issues such as event timing, dependencies, and concurrency can influence risk significance. This study would also include an evaluation of the current state of the art for addressing seismically induced fires and floods and, more generally, concurrent hazards.
2. Once the staff has obtained sufficient information from the Tier 1 activities related to seismic and flooding hazard evaluations and mitigation strategies for beyond-design-basis external events (e.g., Recommendation 2.1, 2.3, and 4.2 activities), the staff will re-evaluate NTTF Recommendation 3. This evaluation will be based on experience gained in developing a PRA methodology for seismically induced fires and floods and insights derived from other NTTF activities.

**Potential for consensus standards development:**

As discussed above, the staff desires coordination with standards development organizations (e.g., American Society of Mechanical Engineers and American Nuclear Society) to developing more generalized approaches for assessing concurrent hazards. This will help identify the technical elements and associated high-level and supporting requirements for a suitable PRA method, and will suggest specific areas where detailed guidance is needed. This issue presents a unique opportunity for early engagement with SDOs in formulating a technical approach for addressing future PRA needs.



NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE FUKUSHIMA  
DAI-ICHI NUCLEAR POWER PLANT ACCIDENT:  
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**Tier 3 Recommendation:** 6 - Hydrogen control and mitigation inside containment or in other buildings  
**Key Staff Lead:** Brett Titus  
**SES Lead:** William Ruland

**Description of the issue, including technical and regulatory gaps:**

The purpose of the project plan for Recommendation 6 is to assess the current state of knowledge regarding hydrogen generation, transport, distribution, and combustion in light of the Fukushima Dai-ichi accident, and then to determine whether any new safety issues arise that result in the need for additional regulatory action (e.g., rulemaking, orders).

This Recommendation is potentially affected by the outcome of Recommendations 5.1 and 5.2 regarding containment venting.

**Discussion of NRC plans to address the issues.**

The staff plans to evaluate the Fukushima Dai-ichi accident sequences with particular emphasis on hydrogen generation from all sources and timing. Compare the accident timing and amount of hydrogen generated both in-vessel and ex-vessel, to that predicted in comparable severe accident scenarios for U.S. nuclear power plants.

Furthermore, the staff intends to follow the efforts to assess the potential containment release pathways (e.g., upper drywell head, equipment/personnel hatches, instrument penetrations, bellows, seals) for hydrogen ingress into the reactor building. The staff also plans to consider the hydrogen combustion assessments on the reactor building and the safety related equipment.

The project plan for Recommendation 6 also includes an assessment of additional hydrogen control measures and potential hydrogen ingress into adjacent buildings— including the feasibility, safety significance, and risk implications of providing additional hydrogen control measures for the primary containment and connected structures.

Finally, the staff plans to assess the technical basis for NRC's existing hydrogen generation and control requirements in 10 CFR 50.44 against the results of the other tasks above. The focus of the assessment is to confirm the validity of the existing technical basis or identify gaps, and characterize the safety and risk significance of any identified gaps. Based on all of the above information, the staff plans to integrate the results of the above tasks into a final report that will be used to determine whether any additional regulatory action is needed to address Recommendation 6.

**Potential for consensus standards development:**

Because longer term staff evaluation is required to support a decision on the need for regulatory action, it would seem premature to engage upon a consensus standard associated with Recommendation 6. Perhaps, in the future, after the assessments have been completed and the need (or the absence of the need) for regulatory action has been decided upon, a consensus standard may be more appropriate.

NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE FUKUSHIMA  
DAI-ICHI NUCLEAR POWER PLANT ACCIDENT:  
POTENTIAL FOR DEVELOPMENT OF CONSENSUS STANDARDS

**Tier 3 Recommendation:** 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, 11.1, 11.2, 11.3, and 11.4  
**Key Staff Lead:** Kevin Williams  
**SES Lead:** Robert Lewis

**Description of the issue, including technical and regulatory gaps:**

In Recommendations 9, 10, and 11, the Task Force recommended that the NRC:

- 9.1 Initiate rulemaking to require EP enhancements for multiunit events in the following areas:
- personnel and staffing
  - dose assessment capability
  - training and exercises
  - equipment and facilities
- 9.2 Initiate rulemaking to require EP enhancements for a prolonged Station Blackout (SBO) in the following areas:
- communications
  - Emergency Response Data System (ERDS) capability
  - training and exercises
  - equipment and facilities
- 9.3 Order licensees to do the following until rulemaking is complete in the following areas:
- Maintain ERDS capability throughout the accident.
- 10.1 Analyze current protective equipment requirement for emergency responders and guidance based upon insights from the accident at Fukushima.
- 10.2 Evaluate the command and control structure and the qualifications of decisionmakers to ensure that the proper level of authority and oversight exists in the correct facility for a long-term SBO or multiunit accident or both. The evaluation should consider concepts such as whether decisionmaking authority is in the correct location (i.e., at the facility), whether currently licensed operators need to be integral to the ERO outside of the control room (i.e., in the TSC), and whether licensee emergency directors should have a formal “license” qualification for severe accident management.

10.3 Evaluate ERDS to do the following:

- Determine an alternate method (e.g., via satellite) to transmit ERDS data that does not rely on hardwired infrastructure that could be unavailable during a severe natural disaster.
- Determine whether the data set currently being received from each site is sufficient for modern assessment needs.
- Determine whether ERDS should be required to transmit continuously so that no operator action is needed during an emergency.

11.1 Study whether enhanced onsite emergency response resources are necessary to support the effective implementation of the licensees' emergency plans, including the ability to deliver the equipment to the site under conditions involving significant natural events where degradation of offsite infrastructure or competing priorities for response resources could delay or prevent the arrival of offsite aid.

11.2 Work with FEMA, States, and other external stakeholders to evaluate insights from the implementation of EP at Fukushima to identify potential enhancements to the U.S. decisionmaking framework, including the concepts of recovery and reentry.

11.3 Study the efficacy of real-time radiation monitoring onsite and within the EPZs (including consideration of AC independence and real-time availability on the internet).

11.4 Conduct training, in coordination with the appropriate Federal partners, on radiation, radiation safety, and the appropriate use of KI in the local community around each nuclear power plant.

**Discussion of NRC plans to address the issues.**

The staff plans to use a single Advanced Notice of Proposed Rulemaking regarding NTTF Recommendations 9, 10, and 11. This will be a 4.25 year project.

**Potential for consensus standards development:**

The staff intends to initiate actions regarding this issue in FY 2014. However, given the level of uncertainty regarding this issue and the need to gain additional information, the staff does not see a need for any consensus standard development at this time.

NEAR-TERM TASK FORCE TIER 3 RECOMMENDATIONS RELATED TO THE FUKUSHIMA  
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**Tier 3 Recommendation:** 12.2 – Staff Training on Severe Accidents, Resident Inspector  
Training on Severe Accident Management Guidelines  
**Key Staff Lead:** Travis Tate  
**SES Lead:** Joseph Giitter

**Description of the issue, including technical and regulatory gaps:**

The Task Force recommended that the Commission direct the staff to enhance NRC staff training on severe accidents, including training resident inspectors on severe accident management guidelines (SAMGs). This recommendation is dependent upon Tier 1, Recommendation 8, which recommended the staff strengthen and integrate onsite emergency response capabilities such as emergency operating procedures (EOPs), SAMGs, and extensive damage mitigation guidelines (EDMGs).

SAMGs were implemented as a voluntary initiative and are not currently included in formal training and licensing of plant operators. Consequently, only limited NRC staff and inspector training courses on severe accidents and SAMGs were developed.

**Discussion of NRC plans to address the issues.**

While the scope of enhancements to NRC staff training on severe accidents including SAMGs is dependent on the resolution of Recommendation 8, the staff recommended several near-term actions that may be implemented to provide more opportunities for general training on severe accident progression in parallel with activities to resolve Recommendation 8.

**Potential for consensus standards development:**

None. This recommendation involves enhancements to NRC staff training programs.

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DAI-ICHI NUCLEAR POWER PLANT ACCIDENT:  
POTENTIAL FOR DEVELOPMENT OF CONSENSUS STANDARDS

**Tier 3 Recommendation:** ACRS 2(e), Enhanced Reactor and Containment Instrumentation  
**Key Staff Lead:** Russ Sydnor/David Rahn  
**SES Lead:** Michael Case

**Description of the issue, including technical and regulatory gaps:**

Fukushima Dai-ichi operators faced significant challenges in understanding the condition of the reactors, containments, and spent fuel pools because instrumentation was either lacking or giving erroneous readings. 10 CFR 50 GDC 13, 19 & 64, 10 CFR 50.34(f), 10 CFR 52.47(a)(23) and 52.79(a)(38) specify regulatory requirements for accident prevention and mitigation equipment. RG 1.97 Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants, endorses the use of IEEE Standard 497-2002, "IEEE Standard Criteria for Accident Monitoring Instrumentation for Nuclear Power Generating Stations" and describes a method the NRC staff considers acceptable for use in complying with the agency's regulations with respect to satisfying criteria for accident monitoring instrumentation in nuclear power plants. The selection and survivability of instruments for the beyond design basis and severe accident environmental conditions will require additional study to address:

1. Is the current instrumentation identified in RG 1.97 adequate to cover the full range of beyond design basis conditions suggested by the Fukushima event?
2. Will the instrumentation qualified to address the guidance of RG 1.97 survive with adequate capability to ensure monitoring of severe accident conditions?

Instrumentation needs and survivability should be considered as part of higher tier NTTF actions which could impact the identification of needs for enhanced reactor and containment instrumentation; 1) NTTF recommendation 2.3 actions to identify and address plant-specific vulnerabilities and verify the adequacy of monitoring and maintenance for protection features, 2) NTTF recommendation 8 will require strengthening and integrating onsite emergency response capabilities such as emergency operating procedures (EOPs), severe accident management guidelines (SAMGs), and extensive damage mitigation guidelines (EDMGs), 3) NTTF recommendation 4.1 will require strengthening station blackout (SBO) mitigation capability at all operating and new reactors for design-basis and beyond-design-basis external events, 4) Order EA-12-049, Mitigation Strategies, and 5) Order EA-12-051, Spent Fuel Pool Monitoring.

RG 1.97 and, IEEE Standard 497 provides criteria for the design of instrumentation channels, supporting systems, and displays used for monitoring design basis accidents, including extended ranges of equipment that address a source term that considers a damaged core. It does not address the process needed to evaluate the possible progression paths of severe accidents and identify specific key parameters needed to be presented to the operators to enable them to take appropriate action to mitigate the effects of severe accidents. Rather, IEEE 497 limits itself to identifying the appropriate design characteristics of such instrumentation systems and channels, not the identification of key parameters.

## **Discussion of NRC plans to address the issues.**

NRC staff plans to 1) Coordinate with NTTF recommendations 2.3, 4.1, and 8, and Order EA-12-049 and EA-12-051 teams to ensure instrumentation needs are considered; 2) Obtain and review information and insights from previous and ongoing research and coordinate with international and domestic efforts to identify enhanced instrumentation needs; 3) Evaluate Tier 1 action information and information obtained from internal, domestic and international research to recommend regulatory framework changes, if any, for enhanced reactor and containment and instrumentation. Further, the NRC staff is supporting an IAEA effort to generate an IAEA TECDOC for Enhanced Reactor and Containment Instrumentation. One purpose for the IAEA TECDOC is to serve as a basis for the development of improved international consensus standards for severe accident instrumentation.

## **Potential for consensus standards development:**

Future updates of IEEE 497 to address design criteria for severe accident monitoring instrumentation channels would be beneficial to the Industry and the NRC. The ANS could support these activities for improved industry consensus standards by assisting in the development of consensus standards for severe accident analysis (including the use of best-estimate modeling techniques) to support identification of severe accident equipment needs including instrumentation as well as the analysis and identification of severe accident environment parameters and standardized methods for addressing severe accident equipment survivability analyses. ANS could also continue to monitor the progress of efforts to integrate Emergency Procedure Guidelines with Severe Accident Management and Extensive Damage Mitigation Guidelines, and from that effort identify any perceived gaps in reactor or containment instrumentation needed by plant operators to effectively transition among the procedures developed out of these guidelines. A development timeframe of 3-4 years would support the NRC's NTTF activity schedules.

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DAI-ICHI NUCLEAR POWER PLANT ACCIDENT:  
POTENTIAL FOR DEVELOPMENT OF CONSENSUS STANDARDS

**Tier 3 Recommendation:** Expedited Transfer of Fuel to Dry Cask Storage  
**Key Staff Lead:** Steven Jones  
**SES Lead:** Jack Davis

**Description of the issue, including technical and regulatory gaps:**

Following the event at Fukushima, several stakeholders submitted comments to the Commission and staff requesting that regulatory action be taken to require the expedited transfer of spent fuel to dry cask storage. Based on past studies, the NRC has concluded that both SFPs and dry casks provide adequate protection of public health and safety and the environment, and that the likelihood of an accident involving a radiological release from the spent fuel pool remains extremely small. While the staff has concluded that public health and safety is adequately protected, the staff has determined that it should confirm, using insights from Fukushima, whether any significant safety benefits (or detriments) would occur from expedited transfer of spent fuel to dry casks. For the purposes of this program plan, expedited transfer is defined as the movement of spent fuel (stored in SFPs for more than five years) into dry cask storage earlier than is currently being conducted.

Technical gaps include understanding the difference in safety between high and low density storage of fuel within pools, the negative effects associated with accelerated transfer of fuel to dry storage, and the assessment of cooling of exposed fuel in various configurations. Regulatory gaps involve establishment of suitable metrics to assess the difference in safety resulting from a transition to low density storage.

**Discussion of NRC plans to address the issues:**

The NRC staff has proposed a three phase approach. The first phase involves quantification of the maximum safety benefit that could result from a transition to low density storage and assessment of this safety benefit against appropriate metrics for regulatory decision making. The second phase involves quantifying the risks of accelerated fuel transfer. The final phase involves consideration of potential policy changes affecting regulatory decision making.

Technical evaluations supporting the first phase are expected to be complete in support of recommendations by mid- 2013.

**Potential for consensus standards development:**

Low potential for consensus standard development because regulatory guidelines for fuel storage are relatively well developed and the NRC staff plans to decide on the regulatory feasibility of the overall plan prior to implementation of each successive phase.