UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

January 28, 2013

MEMORANDUM TO: Members, ACRS Plant Operations and Fire Protection Subcommittee

FROM: Mark L. Banks, Senior Staff Engineer /RA/
Technical Support Branch, ACRS

SUBJECT: TRANSMITTAL OF STATUS REPORT AND PROPOSED AGENDA FOR THE ACRS SUBCOMMITTEE MEETING ON FEBRUARY 6, 2013, RELATED TO THE NEAR-TERM TASK FORCE RECOMMENDATION 8 RULEMAKING

The Plant Operations and Fire Protection Subcommittee will meet at 1:00 PM on February 6, 2013 to be briefed by the NRC staff regarding the Near-Term Task Force Recommendation 8 Rulemaking. The subcommittee meeting will be an information briefing. To prepare for this meeting, a proposed agenda and a status report are attached.

If you have any additional questions, please contact me at (301) 415-3718 or mark.banks@nrc.gov.

Attachments:

Proposed Agenda
Status Report

cc: ACRS Plant Operations and Fire Protection Subcommittee Members
C. Santos

PROPOSED AGENDA
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
PLANT OPERATIONS AND FIRE PROTECTION SUBCOMMITTEE MEETING

Rulemaking
Near-Term Task Force Recommendation 8:
Onsite Emergency Response Capabilities

ROCKVILLE, MARYLAND
February 6, 2013

Cognizant Staff Engineer/DFO: Mark L. Banks
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Topics	Presenters	Time
Opening Remarks	Dick Skillman, ACRS	1:00 pm – 1:05 pm
Introduction	Sher Bahadur, NRR	1:05 pm – 1:10 pm
Recommendation 8 Rulemaking Overview	Robert Beall, NRR	1:10 pm – 2:00 pm
Draft Regulatory Basis Overview	Chris Cowdrey, NRR	2:00 pm – 2:50 pm
Subcommittee Discussion	Dick Skillman, ACRS	2:50 pm – 3:30 pm
Adjourn	Dick Skillman, ACRS	3:30 pm

NOTE:

- During the meeting, 301-415-7360 should be used to contact anyone in the ACRS Office.
- Presentation time should not exceed 50 percent of the total time allocated for a given item. The remaining 50 percent of the time is reserved for discussion.
- Fifty (50) hard copies of each presentation or handout should be provided to the Designated Federal Official 30 minutes before the meeting.
- One (1) electronic copy of each presentation should be emailed to the Designated Federal Official 1 day before the meeting. If an electronic copy cannot be provided within this timeframe, presenters should provide the Designated Federal Official with a CD containing each presentation at least 30 minutes before the meeting.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
PLANT OPERATIONS AND FIRE PROTECTION SUBCOMMITTEE

Review of Rulemaking
Near-Term Task Force Recommendation 8: Onsite Emergency Response Capabilities

ROCKVILLE, MARYLAND
February 6, 2013

STATUS REPORT

PURPOSE

The purpose of this Subcommittee meeting is to discuss the staff's preliminary rulemaking efforts related to Fukushima Near-Term Task Force (NTTF) Recommendation 8: *Onsite Emergency Response Capabilities*. The Subcommittee will hear presentations by and hold discussions with representatives of the staff regarding its NTTF Recommendation 8 rulemaking plans and specifically, the draft regulatory basis prepared by the staff to support rulemaking to strengthen and integrate onsite emergency response capabilities. The staff plans to again brief the Subcommittee later in the rulemaking process prior to briefing the Full Committee.

BACKGROUND

In order to understand the Fukushima accident, the NRC established the NTTF to review the accident and develop lessons learned and initiate a review of NRC regulations to determine if additional measures needed to be taken in the near-term to ensure the safety of U.S. nuclear power plants. The NTTF issued its report (reference 1) on July 12, 2011, concluding that there was no imminent risk from continued operation and licensing activities at U.S. facilities. The NTTF further concluded, however, that enhancements to safety and emergency preparedness were warranted and included 12 recommendations for Commission consideration in their report. Recommendation 8 proposed strengthening and integrating existing onsite emergency response capabilities by enhancing and integrating the existing Emergency Operating Procedures (EOPs), Severe Accident Management Guidelines (SAMGs), and Extensive Damage Mitigating Guidelines (EDMGs).

Fukushima Near-Term Task Force Report

In Section 4.2.5, "Onsite Emergency Actions," of its report (reference 1, page 46), the NTTF reviewed the current nuclear power plant onsite emergency response framework and associated EOPs, SAMGs and EDMGs. Overall, the NTTF concluded that all U.S. nuclear power plants had addressed all elements of onsite emergency actions. However, the NTTF

stated that "the overall effectiveness of those programs could be substantially enhanced through further integration, including clarification of transition points, command and control, decisionmaking [*sic*], and through rigorous training that includes conditions that are as close to real accident conditions as feasible."

Furthermore, the NTTF concluded "that action is warranted to confirm, augment, consolidate, simplify, and strengthen current regulatory and industry programs in a manner that produces a single, comprehensive framework for accident mitigation, built around NRC-approved licensee technical specifications. These modified technical specifications would consolidate EOPs, SAMGs, EDMGs, and other important elements of emergency procedures, guidance, and tools in a manner that would clarify command and control and decisionmaking [*sic*] during accidents."

The NTTF summarized its views regarding onsite emergency actions in Recommendation 8:

> ***NTTF Recommendation 8:*** *The Task Force recommends strengthening and integrating onsite emergency response capabilities such as EOPs, SAMGs, and EDMGs.*
>
> ***8.1*** *Order licensees to modify the EOP technical guidelines (required by Supplement 1, "Requirements for Emergency Response Capability," to NUREG-0737, issued January 1983 (GL 82-33, to (1) include EOPs, SAMGs, and EDMGs in an integrated manner, (2) specify clear command and control strategies for their implementation, and (3) stipulate appropriate qualification and training for those who make decisions during emergencies.*
>
> The Task Force strongly advises that the NRC encourage plant owners groups to undertake this activity rather than have each licensee develop its own approach. In addition, the Task Force encourages the use of the established NRC practices of publishing RG [regulatory guides] (rather than NUREGs, supplements to NUREGs, or GLs [generic letters]) for endorsing any acceptable approaches submitted by the industry.
>
> ***8.2*** *Modify Section 5.0, "Administrative Controls," of the Standard Technical Specifications for each operating reactor design to reference the approved EOP technical guidelines for that plant design.*
>
> ***8.3*** *Order licenses to modify each plant's technical specifications to conform to the above changes.*
>
> ***8.4*** *Initiate rulemaking to require more realistic, hands-on training and exercises on SAMGs and EDMGs for all staff expected to implement the strategies and those licensee staff expected to make decisions during emergencies, including emergency coordinators and emergency directors.*

NRC Staff Efforts Regarding Recommendation 8 since the NTTF Report

Commission SECY Papers

The staff prepared the following notational vote SECY papers for Commission consideration regarding the NTTF Report and its recommendations:

- SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan, July 12, 2011 (reference 2).

  SECY-11-0093 transmitted the NTTF report to the Commission for its consideration without staff analysis or recommendations.

  SRM-SECY-11-0093 (reference 3) directed the staff to identify and make recommendations regarding any NTTF recommendations that can, and in the staff's judgment, should be implemented, in part or in whole, without unnecessary delay.

- SECY-11-0124, "Recommended Action to be taken without Delay from the Near-Term Task Force Report," September 9, 2011 (reference 4).

  The staff, in SECY-11-0124, identified a subset of the NTTF recommendations that the staff concluded had the greatest potential for safety improvement in the near-term. The near-term subset included Recommendation 8. The staff recommended that the NRC undertake regulatory action to resolve Recommendation 8. Specifically, the staff recommended issuing an Advanced Notice of Proposed Rulemaking to early on engage stakeholders for the purpose of modifying the EOP generic technical guidance to include guidance for SAMGs and EDMGs in an integrated manner and to clarify command and control issues as appropriate (reference 4, page 12).

  In SRM-SECY-11-0124 (reference 5), the Commission approved the staff's proposed actions to implement without delay the NTTF recommendations as described in SECY-11-0124, subject to Commission stipulations; the Commission stipulations did not explicitly affect Recommendation 8.

- SECY-11-0137, "Prioritization of Recommended Actions to be taken in Response to Fukushima Lessons Learned," October 3, 2011 (reference 6).

  The staff, in SECY-11-0137, proposed a prioritization of the NTTF recommendations; the recommendations were prioritized into three tiers:

  - Tier 1 – NTTF recommendations which the staff determined should be started without unnecessary delay and for which sufficient agency resources existed. Tier 1 included Recommendation 8.

- Tier 2 – NTTF recommendations that could not be initiated in the near-term due to factors that include the need for further technical assessment and alignment, dependence on Tier 1 issues, or availability of critical skill sets.

- Tier 3 – NTTF recommendations that required further staff study to support a regulatory action, have an associated shorter-term action that must be completed to inform the longer-term action, are dependent on the availability of critical skill sets, or are dependent on the resolution of NTTF Recommendation 1 [Enhanced Regulatory Framework].

With regard to Recommendation 8, the staff concluded that since procedures and guidelines already exist and are available for operator use and no imminent hazard was identified, Recommendation 8 should follow the standard rulemaking process.

In SRM-SECY-11-0137 (reference 7), the Commission approved the staff's prioritization of the NTTF recommendations and supported action on the Tier 1 and Tier 2 recommendations.

Advance Notice of Proposed Rulemaking (ANPR)

The staff published an ANPR (reference 8), "Onsite Emergency Response Capabilities," in the *Federal Register* on April 18, 2012, to initiate the process of potentially amending its regulations to strengthen and integrate onsite emergency response capabilities. The ANPR solicited public comments on specific questions and issues related to possible revision of NRC requirements for onsite emergency response capabilities to support development of a regulatory basis. Submitted comments were due June 18, 2012. Comments were received from 18 individuals or groups (reference 9).

The most significant ANPR comment was submitted by NEI, which was endorsed by several of the other commenters. NEI proposed "that the NRC develop a high-level rule specifying necessary attributes of onsite emergency preparedness, and the industry would concurrently develop guidance for NRC consideration under the Regulatory Guide accompanying the rule." NEI provided their proposed language for a high-level rule in Attachment 5 of their submitted document.

Public Meetings

The staff conducted three Recommendation 8-related public meetings to date: February 15, May 23, and November 7, 2012 (references 10, 11, and 12). The public meetings included presentations by the staff and industry (NEI, EPRI, PWROG, BWROG), and stakeholders were given the opportunity to ask questions and/or make comments.

Draft Regulatory Basis

The NRC noticed the Recommendation 8 rulemaking draft regulatory basis (reference 13) in the *Federal Register* on January 8, 2013, soliciting public comments. The draft regulatory basis recommended developing a proposed rule that would require integrated accident mitigating procedures and associated severe accident exercises, identify requirements for a severe accident command and control organization, and amend current rules for training to include requirements related to severe accidents. Preliminary rule language was provided with the intent that it be further developed through the proposed rule phase of the rulemaking process.

ACRS Letters Regarding NTTF Recommendation 8

During the 587th Meeting (October 6-8, 2011), the Committee reviewed the NTTF Report and the staff's recommended actions to be taken without delay (SECY-11-0024, "Recommended Actions to be Taken without Delay from the Near-Term Task Force Report"). The Committee issued a letter (reference 14) to the NRC Chairman on October 13, 2011. In general, the Committee agreed with the NTTF Report and SECY-11-0124; however, the Committee offered several recommendations beyond those proposed by the staff.

In regards to Recommendation 8, the Committee found that the emergency response capabilities discussion in the NTTF Report appropriately focused on the need to clarify transition points, command and control, decision making, and training requirements for the various emergency response capabilities. The Committee suggested that experience with actual nuclear power plant fire events had shown that parallel execution of plant fire procedures, abnormal operating procedures, and EOPs can be difficult and can introduce operational complexity. Therefore, the Committee recommended that plant fire response procedures also be included in the comprehensive efforts to better coordinate and integrate operator responses during challenging plant conditions.

The EDO response (reference 15) indicated that the staff had reviewed the ACRS recommendations and had entered them into the NRC's process for screening additional recommendations, and had conducted a briefing to the Steering Committee regarding the ACRS recommendations that could be directly tied to Tier 1 recommendations. In the staff's Onsite Emergency Response Capabilities ANPR, stakeholders were asked their opinions on a more integrated approach to onsite emergency response including a specific reference and question pertaining to the ACRS recommendation that the staff include plant fire response procedures in the Recommendation 8 rulemaking.

The Recommendation 8 draft regulatory basis does not mention the ACRS's recommendation that plant fire response procedures be included in the coordination and integration of onsite emergency response capabilities.

DISCUSSION

The NTTF recognized from the Fukushima accident the need for plant operators to be well trained and supported by technically sound and useable procedures, guidelines, and strategies. The NTTF emergency response capability evaluation focused on operator training, procedures and guidelines, and command and control; and the necessity of integrating those three aspects to improve existing onsite emergency response capabilities.

Current nuclear power plant onsite emergency response capabilities following a transient or event resulting in a reactor trip, a design basis accident, or a beyond design basis accident are implemented through plant-specific EOPs, SAMGs, and EDMGs, depending on the type and severity of the event.

EOPs

Symptom-based EOPs have long been required by NRC regulations and are designed to place the reactor in a safe shutdown condition. Plant licensed operators receive substantial training (classroom and simulator) on EOPs, both during initial license training and in recurrent requalification training. Operators are examined on EOP concepts and evaluated exercising EOPs in the simulator. Operators enter the EOPs whenever the reactor trips, regardless of the initiating event. EOPs are intended for use by control room operators. See Appendix A for additional information regarding EOPs.

SAMGs

SAMGs, on the other hand, resulted from an industry voluntary initiative related to the Individual Plant Evaluation (IPE) program. Essentially, SAMGs were developed to mitigate severe accidents that progressed beyond the EOPs, i.e., loss of core cooling. SAMGs are not currently required by NRC regulations, nor are there SAMG inspection requirements. Currently, SAMGs are intended to be utilized by both control room operators and the Technical Support Center staff. Generally, training on SAMGs is minimal in comparison to EOPs. See Appendix A for additional information regarding SAMGs.

EDMGs

EDMGs were developed to comply with new regulatory requirements promulgated after the September 11, 2001 terrorist attacks. EDMGs are intended to mitigate the loss of large areas of the plant due to explosions or fires from a beyond design basis event (e.g., aircraft impact). EDMGs are regulatory requirements and are inspectable. EDMGs are intended to be utilized by both control room operators and the Technical Support Center staff. See Appendix A for additional information regarding EDMGs.

NTTF Onsite Emergency Response Capability Evaluation

The NTTF reviewed the purpose and implementation of the EOPs, SAMGs, and EDMGs individually and collectively, concluding the following:

> Each of the onsite emergency action programs (the abnormal operating procedures, alarm response procedures, EOPs, SAMGs, and EDMGs) contributes to overall emergency response capability of plant and operators to mitigate accidents. It is clear that the SAMGs and EDMGs complement the EOPs in an important way. The NRC and industry have established the command and control responsibilities for each of these programs, although not necessarily in a consistent manner. Each of these programs was developed at a different time to serve a different purpose, and each of these programs is treated differently in the NRC's regulations, inspection program, and licensing process, as well as in licensee programs and organizations.
>
> The Task Force concludes that all U.S. plants have addressed all of the elements of onsite emergency actions that need to be accomplished by reactor operators. However, the overall effectiveness of those programs could be substantially enhanced through further integration, including clarification of transition points, command and control, decisionmaking [*sic*], and through rigorous training that includes conditions that are as close to real accident conditions as feasible.
>
> The Task Force also concludes that action is warranted to confirm, augment, consolidate, simplify, and strengthen current regulatory and industry programs in a manner that produces a single, comprehensive framework for accident mitigation, built around NRC-approved licensee technical specifications. These modified technical specifications would consolidate EOPs, SAMGs, EDMGs, and other important elements of emergency procedures, guidance, and tools in a manner that would clarify command and control and decisionmaking [*sic*] during accidents.

Rulemaking

<u>Draft Regulatory Basis</u>

The draft regulatory basis identified the following five regulatory deficiencies (see reference 13 for additional details):

1. *Accident mitigating procedures (EOPs, SAMGs, EDMGs, and additional supporting guidelines) were developed via separate initiatives. There is no regulatory requirement for a comprehensive strategy that ensures that these procedures work together as an integrated approach for responding to an event that progresses past design basis assumptions.*

Essential to this objective is the elimination of any gaps in the guidance that is intended to protect public health and safety during a beyond design basis event. Currently, no regulatory requirement ensures that procedures are developed in an integrated manner with clear transitions between the various guidelines and procedures.

2. *SAMGs and additional supporting guidelines are not required by NRC regulations. SAMGs exist as an industry commitment and the supporting guidelines are in the development process.*

   The lack of a regulatory requirement for these guidelines allows for potential inconsistencies in the way licensees develop, maintain, and implement their procedures. Further, any deficiencies noted in the content or procedural control of these guidance documents are not currently subject to enforcement. Without a regulatory requirement, the NRC would not be able to ensure that all licensees' SAMGs are written, maintained, and implemented in accordance with these standards.

3. *Licensees are not required to clearly identify a command and control structure for beyond design basis events.*

   An important aspect of a licensee's ability to respond to a large scale event is the existence of a strategy in place that clearly defines the command and control function and how it evolves as the severity of an event increases beyond a licensee's design basis. The extent of the coordination necessary to implement EOPs, SAMGs, EDMGs, and additional guidelines in response to a severe accident or large scale event would require a robust and clearly defined command and control structure. No regulatory requirement exists for licensees to establish a command and control strategy and clearly identify the decision making authority for severe accidents.

4. *The NRC's regulations do not identify the training and qualifications necessary for key personnel relied upon to implement severe accident mitigating strategies.*

   The NRC has no regulatory requirements for training and qualifying personnel who would be responsible for implementing SAMGs, EDMGs, and supporting guidelines. The extent of the training and qualification programs would best be determined through a systems approach to training in accordance with 10 CFR 50.120. A training plan for severe accidents would need to identify the training and qualification requirements for all personnel relied upon to implement the integrated response to severe accidents.

5. *Current regulations governing exercises do not require licensees to demonstrate implementation of all the procedures groups designed to address beyond design basis events.*

Current exercise requirements of 10 CFR Part 50, Appendix E, do not require licensees to conduct drills or exercises that would necessitate the implementation of all accident mitigating procedures in an integrated manner. In order to validate the adequacy of procedures, evaluate key personnel in their accident mitigation roles, and determine the overall effectiveness of a licensee's onsite emergency response capabilities, the NRC needs to develop additional exercise requirements to test these capabilities on a periodic basis.

The draft regulatory basis formulated the following four rulemaking options (see reference 13 for additional details):

- *Option 1: New Accident Mitigating Procedures Rulemaking with Amendments to Training and Exercise Requirements.*

  Option 1 would develop new regulatory requirements to address the current procedure deficiencies and amend the current regulatory framework covering training and exercises.

- *Option 2: Comprehensive Onsite Emergency Capabilities Rule.*

  Option 2 would write a new, all-encompassing onsite emergency response capability rule that includes all requirements for procedures, training, and exercises.

- *Option 3: Expanded Industry Commitments with NRC Guidance Documents.*

  Option 3 would rely on regulatory guidance documents and generic communications with corresponding industry commitments. This option would not be a change from the current regulatory approach, with the exception that supporting guidelines would be added to the industry's commitments.

- *Option 4: New Accident Mitigating Procedures Rulemaking with Expanded Industry Commitments for Training and Exercises.*

  Option 4 would use any combination of the first and third options.

<u>Relationship to Other NTTF Recommendations</u>

Draft regulatory basis, Section 6.1, "Relationship to Other NTTF Recommendations," briefly discusses Recommendation 8's relationship to other related NTTF recommendations. Specifically, this draft regulatory basis section lists NTTF Recommendation 10.2, "Command and Control and Qualifications for Beyond Design Basis Events," and states that "[t]he NRC anticipates that the guidance contained in NTTF Recommendation 10.2 would be addressed in its entirety within the rulemaking process associated with NTTF Recommendation 8."

In Recommendation 10.2 (reference 1, page 57), the NTTF recommended that the NRC "[e]valuate the command and control structure and the qualifications of decisionmakers [*sic*] 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 NTTF further stated, "[c]oncepts such as whether decisionmakers [*sic*] authority is in the correct location (i.e., at the facility), whether currently licensed operators need to be integral to the ERO [emergency response organization] outside of the control room (i.e., in the TSC [technical support center], and whether licensee emergency directors should have a formal "license" qualification for severe accident management." Along these same lines, the NTTF also noted in its report the following:

> Ensuring that the response framework contains the correct level of authority, knowledge, and experience is paramount to successful response. In light of the Fukushima accident, the staff should explore concepts such as whether decisionmaking [*sic*] 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 in addition to their existing qualification requirements, and different than a reactor operator license.

Including Recommendation 10.2 in the Recommendation 8 rulemaking would appear to be an appropriate goal since both Recommendation 8 and 10.2 fall within emergency preparedness and involve plants' emergency response organizations, including decision makers. However, the focus of the four draft regulatory basis options concentrates on EOPs, SAMGs, and EDMGs and does not address the Recommendation 10.2 issues.

Additionally, all of NTTF Recommendation 10 was relegated to Tier 3 by SECY-11-0137 (reference 6). The SECY describes Tier 3 as follows:

> The third tier consists of those NTTF recommendations that require further staff study to support a regulatory action, have an associated shorter term action that needs to be completed to inform the longer term action, are dependent on the availability of critical skill sets, or are dependent on the resolution of NTTF Recommendation 1. The staff has focused its initial efforts on developing the schedules, milestones, and resources associated with Tier 1 and Tier 2 activities. Hence, information regarding the Tier 3 recommendations is not included in this enclosure. Once the staff has completed its evaluation of the resource impacts of the Tier 1 and Tier 2 recommendations, it will be able to more accurately address the Tier 3 recommendations.

In other words, the staff will devote minimal resources to Tier 3 activities, until Tier 1 and 2 activities have been addressed. Therefore, if Recommendation 10.2 is not included in the Recommendation 8 rulemaking, Recommendation 10.2 may not be addressed by the staff in the foreseeable future.

Rulemaking Schedule

Recommendation 8 rulemaking will follow the typical rulemaking schedule.

- Final Regulatory Basis 1st quarter of 2013
- Proposed Rule 3rd quarter of 2014
- Final Rule 2nd quarter of 2016

Any new or revised guidance documents will be provided with the proposed and final rules.

ACRS Staff Engineer Comments

In the draft regulatory basis, the staff concluded that a complete overhaul of the accident mitigation procedures (EOPs, SAMGs and EDMGs) was not the "optimal solution." The staff appropriately determined that the primary focus of a plant's onsite emergency response capability should remain focused on the current EOPs. The staff noted that the more than 25-year history of training, exercises, operating experience, and actual events associated with the current EOPs and their validation should not be abandoned. More importantly, the staff recognized the importance of ensuring that any Recommendation 8-related regulatory changes not adversely affect a plant's ability to implement the EOPs.

SUBCOMMITTEE ACTION

This is essentially a preliminary meeting designed to engage the Subcommittee early in the rulemaking process to inform the Subcommittee of the staff's rulemaking plans and provide the staff with the Subcommittee's insights and suggestions. The staff will again brief the Subcommittee at a future date in the rulemaking process, prior to briefing the Full Committee.

REFERENCES

1. U.S. NRC, Near-Term Task Force (NTTF) Report, May 21, 2011 (ML111861807)
2. U.S. NRC, SECY-11-0093, "Near-Term Report and Recommendation for Agency Action Following the Events in Japan," July 12, 2011 (ML11186A959)
3. U.S. NRC, SRM-SECY-11-0093, "Staff Requirements – SECY-11-0093 – Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," August 19, 2011 (ML112310021)
4. U.S. NRC, SECY-11-0124, "Recommended Actions to be taken without Delay from the Near-Term Task Force Report," September 9, 2011 (ML11245A127)
5. U.S. NRC, SRM-SECY-11-0124, "Staff Requirements – SECY-11-0124 – Recommended Actions to be Taken without Delay from the Near-Term Task Force Report," October 18, 2011 (ML112911571)

6. U.S. NRC, SECY-11-0137, “Prioritization of Recommended Action to be taken in Response to Fukushima Lessons Learned,” October 3, 2011 (ML11269A204)
7. U.S. NRC, SRM-SECY-11-0137, “Staff Requirements – SECY-11-0137 – Prioritization of Recommended Action to be taken in Response to Fukushima Lessons Learned,” December 15, 2011 (ML113490055)
8. Federal Register, “Onsite Emergency Response Capabilities: Advanced Notice of Proposed Rulemaking,” April 18, 2012 (77 FR 23161) (ML12058A062)
9. Onsite Emergency Response Capabilities: Advanced Notice of Proposed Rulemaking, Public Comments 1-18
10. U.S. NRC Memorandum, “Summary of the February 15, 2012 Public Meeting to Discuss Implementation of Near-Term Task Force Recommendation 8, Strengthening and Integration of Onsite Emergency Response Capabilities Such as EOPs, SAMGs, and EDMGs, Related to the Fukushima Dai-ichi Nuclear Power Plant Accident,” March 13, 2012 (ML12073A283)
11. U.S. NRC Memorandum, “Summary of the May 23, 2012 Public Meeting to Discuss the Advanced Notice of Proposed Rulemaking Implementing Near-Term Task Force Recommendation 8, Strengthening and Integration of Onsite Emergency Response Capabilities Such as EOPs, SAMGs, and EDMGs, Related to the Fukushima Dai-ichi Nuclear Power Plant Accident,” June 14, 2012 (ML12165A627)
12. U.S. NRC Memorandum, “Summary of the November 7, 2012 Public Meeting to Discuss Near-Term Task Force Recommendation 8, Strengthening and Integration of Onsite Emergency Response Capabilities Such as EOPs, SAMGs, and EDMGs, Related to the Fukushima Dai-ichi Nuclear Power Plant Accident,” December 5, 2012 (ML12339A110)
13. Federal Register, “Onsite Emergency Response Capabilities: Regulatory Basis to Address Nuclear Regulatory Commission Near-Term Task Force Recommendation 8,” January 4, 2013 (78 FR 1154) (ML12332A328)
14. ACRS Letter, “Initial ACRS Review of: (1) the NRC Near-Term Task Force Report on Fukushima and (2) Staff’s Recommended Actions to be Taken Without Delay,” October 13, 2011 (ML11284A136)
15. U.S. NRC Letter, “Initial ACRS Review of: (1) the NRC Near-Term Task Force Report on Fukushima and (2) Staff’s Recommended Actions to be Taken Without Delay (SECY-11-0124), and (3) Staff’s Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned (SECY-11-0137),” December 8, 2011 (ML11321A203)
16. U.S. NRC, “Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants, August 8, 1985 (50 FR 32138) (ML003711521)
17. U.S. NRC Generic Letter 88-20, “Individual Plant Examination for Severe Vulnerabilities – 10 CFR 50.54(f),” November 23, 1988 (ML031150465)
18. U.S. NRC Generic Letter 88-20, Supplement No. 2, “Accident Management Strategies for Consideration in the Individual Plant Examination Process,” April 4, 1990 (ML031200551)

19. U.S. NRC, Temporary Instruction 2515/184, “Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs),” April 4, 2011 (ML 11115A053)

20. U.S. NRC Memorandum, “Summary of Results for Temporary Instruction (TI) 2515/183, ‘Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event’ and TI 2515/184, ‘Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs).’” November 28, 2011 (ML113220418)

21. U.S. NRC, Security Order EA-02-026, “Interim Compensatory Measures (ICM) Order,” March 4, 2002 (67 FR 9792) (ML020510635)

22. Federal Register, Final Rule: “Power Reactor Security Requirements,” March 27, 2009 (74 FR 13926) (ML083380546)

23. NEI 05-07, Revision 1, “Industry Mitigation Strategy Study Guideline,” December 2005 (ML061670250)

24. NEI 06-12, Revision 2, “B.5.b Phase 2 & 3 Submittal Guideline,” December 2006 (ML070090060)

25. U.S. NRC, Temporary Instruction 2515/171, “Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies,” February 6, 2008 (ML073120469)

26. U.S. NRC Inspection Procedure 71111.05T, “Fire Protection (Triennial),” January 1, 2012 (ML11201A170)

27. U.S. NRC, Temporary Instruction 2515/183, “Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event,” March 23, 2011 (ML 11077A007)

Appendix A
Accident Mitigating Procedures

Emergency Operating Procedures

EOPs are regulatory-required plant procedures that direct licensed operators' actions to mitigate the consequences of transients and accidents which have caused plant parameters to exceed reactor protection system set points, engineered safety feature set points, or other established safety limits. Current EOPs are symptom-based which focus on critical safety functions: reactivity level, core heat removal, reactor coolant inventory, containment isolation, and containment integrity. Preserving critical safety functions ensure that the integrity of barriers to radioactive release is maintained, regardless of the initiating event.

EOPs are required by 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and are included in the "Administrative Controls" section of plant technical specifications. Initial licensed operator training includes extensive training on EOPs, both in the classroom and in the simulator. The NRC examines a licensed operator candidate's knowledge of EOPs and their implementation prior to granting a license to operate a reactor. Licensed operators continue to receive EOP training and are further evaluated for EOP proficiency during required periodic requalification training.

Severe Accident Mitigation Guidelines

The origin of SAMGs could be said to have begun with the 1985 Commission policy statement on severe reactor accidents (reference 16). A fundamental objective of the Commission policy statement was "to take all reasonable steps to reduce the chances of occurrence of a severe accident involving substantial damage to the reactor core and to mitigate the consequences of such an accident should one occur." The policy statement indicated that the Commission planned to conduct a plant-specific "systematic safety examination of existing plants to determine whether particular accident vulnerabilities are present and what cost-effective changes are desirable to ensure that there is no undue risk to public health and safety."

In 1988, the Commission's plan to conduct a plant-specific "systematic safety examination" resulted in the issuance of Generic Letter 88-20, "Individual Plant Examination [IPE] for Severe Accident Vulnerabilities" (reference 17). The purpose of the IPE program was "for each utility to (1) develop an appreciation of severe accident behavior, (2) to understand the most likely severe accident sequences that could occur at its plant, (3) to gain a more quantitative understanding of the overall probabilities of core damage and fission product releases, and (4) if necessary by modifying, where appropriate, hardware and procedures that would help prevent or mitigate severe accidents." Generic Letter 88-20 requested that each licensee perform an IPE and submit the results to the NRC.

In 1990, Generic Letter 88-20, Supplement No. 2, “Accident Management Strategies for Consideration in the Individual Plant Examination Process” (reference 18) was issued. Based on numerous probabilistic risk assessments and severe accident studies, the NRC determined that it was possible to “implement certain actions, or accident management strategies, that have the potential for recovering from a wide variety of accident scenarios.” Supplement No. 2 included an NRC staff compiled list of such accident management strategies; licensees were expected to evaluate these or similar strategies as part of the ongoing IPE process. In Supplement No. 2, the NRC posited that an effective way of reducing the frequency of severe accidents or to mitigate their consequences might be “through the implementation of accident management procedures, that is, procedures that promote the most effective use of available plant equipment and staff in the event of an accident.”

In response to Generic Letter 88-20, Supplement 2, the nuclear industry voluntarily developed and implemented plant-specific SAMGs during the 1990s, based on generic guidance developed by the respective Owners Groups, and NEI or its predecessors. The SAMGs were designed to provide comprehensive technical direction during severe accidents. They are intended for use by control room operators and plant technical staff to manage accident scenarios that progress beyond the EOPs, i.e., loss of core cooling. Since SAMG development was not an NRC requirement there are currently no specific regulatory criteria or requirements for SAMGs, nor are SAMGs part of the Reactor Oversight Program, i.e., the NRC does not inspect plant-specific SAMGs or their implementation. For the same reason, there are no formal SAMG training requirements for control room operators or plant technical staff. Since the guidelines were implemented by individual licensees and the NRC did not develop a regulatory requirement for SAMGs, the training, evaluation, and procedure control requirements for SAMGs vary from plant to plant.

Following the Fukushima accident, the NRC inspected licensees’ SAMGs and their implementation using Temporary Instruction (TI) 2515/184, “Availability and Readiness Inspection of Severe Accident Mitigation Guidelines (SAMGs)” (reference 19). The objectives of TI 2515/184 were to (1) determine that the SAMGs were available and how they had been maintained and (2) determine the nature and extent of the licensees implementation of SAMG training and exercises. Once the SAMG inspection was completed, the NRC concluded the following regarding licensee implementation:

> The following are some general observations made during the performance of TI 2515/184. While individually, none of these observations posed a significant safety issue, they indicate that while the SAMG procedures are available at every site, there appears to be an inconsistent implementation of some aspects of this voluntary SAMG program.
>
> SAMGs are typically available in plant locations critical to combating a potentially severe accident. However in some cases the procedures were either not available in all expected areas or not properly controlled. In addition, while

> SAMGs appear to be updated to reflect design changes at a facility, there does not appear to be a consistent approach to conducting periodic reviews. Finally, while personnel do appear to be properly trained and knowledgeable on SAMGs, exercises on SAMGs do not appear to be periodically conducted at all sites (reference 20).

Extensive Damage Mitigation Guidelines

Following the events of September 11, 2001, the NRC issued an “Order for Interim Safeguards and Security Compensatory Measures” (reference 21), to licensees that included section B.5.b which required licensees to develop guidance and strategies for addressing the loss of large areas of the plant due to explosions or fires from a beyond design basis event (e.g., aircraft impact), as well as maintaining or restoring core cooling, containment integrity, and spent fuel pool cooling. Section B.5.b requirements were later codified in 10 CFR 50.54(hh) (reference 22).

In response, the nuclear industry, through NEI, developed guidance to comply with the Order and eventual license condition (e.g., NEI 05-07, “Industry Mitigation Strategy Study Guideline” and NEI 06-12, “B.5.b Phase 2 & 3 Submittal Guidance” [references 23 and 24]). The industry response included acquisition and staging of additional equipment, and development of mitigation guidance documents, EDMGs. EDMGs were developed to contain predetermined strategies for dealing with more extreme damage states than those previously considered in EOPs and SAMGs. It was recognized from their conception that EDMGs could also be beneficial in mitigating “traditional” severe accidents (e.g., prolonged station blackout). NEI 06-12 stated the following when describing the purpose of EDMGs:

> The term, "extensive damage," is used to connote the potential for spatial impacts that are quite broad. Such damage may not only affect equipment, but may affect the ability of plant operators to monitor plant conditions and gain access to equipment in portions of the plant. In addition, due to the nature of some beyond design basis threats, it is possible to envision combinations of failures which might be considered of negligible probability in traditional severe accident analysis. Thus, the boundary conditions applied for EDMGs are substantially different from those used in defining plant operating procedures and even severe accident management guidelines (SAMGs). EDMGs are not a replacement for normal emergency operating procedures (EOPs) or SAMGs. Rather, EDMGs are developed on a plant-specific basis to allow the site to define the kinds of responses that may be appropriate in the event such conditions occurred.

All licensees developed plant-specific EDMGs which are intended to be utilized by licensed operators and technical staff.

Unlike SAMGs, the guidelines and strategies contained in EDMGs are regulatory requirements (10 CFR 50.54(hh)(2) and subject to NRC inspection. The initial compliance of licensees with section B.5.b of the Order was inspected using TI 2515/171, “Verification of Site-Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies” (reference 25), during 2008. In regards to EDMGs, inspectors reviewed procedures and guidance documents developed to implement the B.5.b mitigating strategies, as well as related training provided to plant staff. Subsequently, the B.5.b (and later 10 CFR 50.54(hh)) inspection activities were added to Inspection Procedure 71111.05T, “Fire Protection (Triennial)” (reference 26), the NRC’s regular fire protection inspection procedure.

Following Fukushima, the NRC further inspected EDMG implementation using TI 2515/183, “Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event” (reference 27). The TI 2515/183 Summary of Observations stated that “While individually, none of these observations posed a significant safety issue, they indicate a potential industry trend of failure to maintain equipment and strategies required to mitigate some design and beyond design basis events.” According to the NTTF report, the “EDMGs do not play a large role in the formal training and licensing of plant operators” (reference 20). Additionally, the ANPR noted that EDMGs do not have a regulatory training requirement.