

NRC STAFF WORKING GROUP EVALUATION OF ALTERNATIVES FOR THE DISPOSITION
OF RECOMMENDATION 1 OF THE FUKUSHIMA NEAR-TERM TASK FORCE REPORT

NOTE: *Public availability of this draft document is intended to inform stakeholders of the current status of the NRC staff working group's evaluation of possible activities in response to Fukushima Near-Term Task Force (NTTF) Recommendation 1. In particular, the NRC staff wants to inform stakeholders of the staff's evolving views on how respond to NTTF Recommendation 1. Earlier staff views were made public on November 2, 2012 (ADAMS Accession no. ML12296A096) and on February 26, 2013 (ADAMS Accession no. ML13053A108).*

Please note that this draft document may be incomplete or in error in one or more respects and will be subject to management review and further revision before the NRC staff presents its recommendations for dispositioning NTTF Recommendation 1 to the Commission in a SECY paper expected early in December of 2013.

Presently, the NRC is not accepting public comments on the information below. However, the NRC staff does plan to offer another opportunity for public comments on approaches to disposition NTTF Recommendation 1 in the near future (late May/early June 2013), through the federal rulemaking web site, www.regulations.gov. The opportunity for public comment will be announced on www.regulations.gov under Docket NRC-2012-0173.

PURPOSE:

This paper provides the current status of the U.S. Nuclear Regulatory Commission (NRC) staff's evaluation of Recommendation 1 in the Near-Term Task Force (NTTF) Report, "Recommendations for Enhancing Reactor Safety in the 21st Century," July 12, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11861807), taking into consideration the power reactor recommendations presented in the Risk Management Task Force (RMTF) Report, NUREG-2150, "A Proposed Risk Management Regulatory Framework," April 2012 (ADAMS Accession No. ML12109A277).

SUMMARY:

The staff working group developed three potential regulatory improvement activities to disposition NTTF Recommendation 1. These potential improvement activities were developed after evaluation of the considerations underlying the NTTF's recommendation and consideration of the RMTF's power reactor recommendations. The potential improvement activities are:

1. Establish a Design Extension Category of Events and Associated Regulatory Requirements
2. Establish Commission Expectations for Defense-In-Depth

3. Clarify the Role of Voluntary Industry Initiatives in the NRC Regulatory Process

The staff is identifying key regulatory products to be developed and key issues which need to be resolved in order to implement each improvement activity along with cost estimates and estimated time to completion. The staff is also identifying the pros and cons for implementing each activity. Although the staff believes that implementation of these improvement activities would increase the efficiency and effectiveness of NRC regulatory programs, the staff also believes that it is acceptable, from the standpoint of safety, to maintain the existing regulatory processes, policy, and framework.

BACKGROUND:

Following the accident at the Fukushima Dai-ichi nuclear power plant in March 2011, the Commission established a task force of senior NRC managers to conduct a systematic and methodical review of NRC processes and regulations to determine whether the agency should make additional improvements to our regulatory system and make recommendations to the Commission for its policy direction, as set forth in Tasking Memorandum COMGBJ-11-0002 and SRM-COMGBJ-11-0002 (ADAMS Accession Nos. ML110800456 and ML 110820875, respectively). The NTTF issued its report on July 12, 2011 (ADAMS Accession No. ML111861807), as an enclosure to SECY-11-0093 (ADAMS Accession No. ML11186A959).

The NTTF developed 12 overarching recommendations, limited to radiological health and safety considerations for nuclear power reactors (common defense and security concerns were not directly addressed in the NTTF Report). Recommendation 1 consists of an overall recommendation and four sub-recommendations. The overall recommendation is for the establishment of a "logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations" (NTTF Report, p. 22). The four sub-recommendations are:

- 1.1 Draft a Commission policy statement that articulates a risk-informed defense-in-depth framework that includes extended design-basis requirements in the NRC's regulations as essential elements for ensuring adequate protection.
- 1.2 Initiate rulemaking to implement a risk-informed, defense-in-depth framework consistent with the above recommended Commission policy statement.
- 1.3 Modify the Regulatory Analysis Guidelines to more effectively implement the defense-in-depth philosophy in balance with the current emphasis on risk-based guidelines.
- 1.4 Evaluate the insights from the IPE and IPEEE efforts as summarized in NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," issued December 1997, and NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program," issued April 2002, to identify potential generic regulations or plant-specific regulatory requirements.

In an August 19, 2011, staff requirements memorandum (SRM) for SECY-11-0093 (ADAMS Accession No. ML112310021), the Commission set forth its direction to the staff with respect to the recommendations in the NTTF Report. For Recommendation 1, the Commission stated:

Recommendation 1 should be pursued independent of any activities associated with the review of the other Task Force recommendations. Therefore, the staff should provide the Commission with a separate notation vote paper within 18 months of the issuance of this SRM. This notation vote paper should provide options and a staff recommendation to disposition this Task Force recommendation.

Also, on June 14, 2012, Chairman Jaczko issued a tasking memorandum (ADAMS Accession No. ML121660102) directing the NRC staff to consider, when developing options for the disposition of Recommendation 1, the regulatory framework recommendations for power reactors in Commissioner Apostolakis' Risk Management Task Force (RMTF) report, NUREG-2150 (April 2012). The NRC staff did consider the RMTF recommendations regarding power reactors and believes that Commission approval of the three improvement activities discussed below would be consistent with the intent of the RMTF recommendations regarding defense-in-depth and a new category for beyond design-basis events. Implementation of the agency-wide RMTF recommendations, including those for power reactors, is being addressed by an inter-office working group led by the Office of Nuclear Regulatory Research. The RMTF working group is coordinating closely with staff working on NTTF Recommendation 1. The RMTF's proposed implementation plan for the agency-wide recommendations, including those for power reactors, will build upon the work from the NTTF Recommendation 1 effort, as guided by the Commission SRM associated with Recommendation 1. Disposition of the RMTF power reactor recommendations will be based on and consistent with the decisions made by the Commission on NTTF Recommendation 1, except for issues that were not fully evaluated or require additional Commission consideration. The outcome from that RMTF working group will be a Commission paper with a preliminary draft policy statement and an integrated plan on the implementation of the RMTF and NTTF recommendations.

DISCUSSION:

Staff Approach for Developing its Recommendation on NTTF Recommendation 1 and the Risk Management Task Force (RMTF) Recommendations for Power Reactors

The staff formed a working group consisting of senior staff members from the Office of Nuclear Reactor Regulation, Office of New Reactors, Office of Nuclear Material Safety and Safeguards, Office of Nuclear Security and Incident Response, Office of Federal and State Materials and Environmental Management Programs, Office of Nuclear Regulatory Research, and the Office of the General Counsel. The working group included one staff individual who was a member of the RMTF, as well as the OGC individual who was assigned to support the RMTF, to ensure coordination with, and better understanding of, the RMTF efforts and the RMTF Report.

The Japan Lesson Learned Directorate (JLD) Steering Committee was informed of the working group's activities, and provided direction to the working group throughout the development of this paper. In addition, at the request of the JLD Steering Committee, a Division Director Steering Committee was established to facilitate working group development and selection of regulatory framework improvement activities.

The staff working group, with JLD Steering Committee approval, decided to limit its consideration of regulatory framework improvements to light-water nuclear power reactors only, and to exclude consideration of the NRC's regulatory framework for non-power reactors, nuclear materials (e.g., power reactor fuel, including spent fuel) at nuclear power plants. In addition, the staff decided to exclude consideration of regulatory framework issues for nuclear materials

regulated by the NRC, including non-reactor materials (such as materials used in medicine and in industrial uses such as well logging). These scope limitations are consistent with both the scope of the NTTF Report and the Chairman's Tasking Memorandum directing the staff to consider the power reactor recommendations of the RMTF.

The working group reviewed both the NTTF Report and the RMTF Report and considered different approaches in developing the improvement activities. During this period, the working group held 3 public meetings, met on many different occasions with the JLD Steering Committee, met 5 times with the ACRS, and, during late calendar year 2012 and early 2013, the staff provided several rounds of briefings to individual Commissioners on the status of the Recommendation 1 effort.

Identifying the problem that NTTF Recommendation 1 is attempting to resolve

To help the staff identify and assess options for the disposition of NTTF Recommendation 1, the staff developed a problem statement describing the issue that Recommendation 1 is directed at resolving. Many stakeholders, including the ACRS, suggested that the staff develop such a problem statement to assist stakeholders in understanding the bases for the staff's ultimate recommendations for the disposition of Recommendation 1. The staff's problem statement is:

The existing regulatory framework for power reactors effectively addresses design-basis events, including design-basis accidents. However, for non design-basis accidents, the existing framework could be improved to facilitate more consistent, efficient, timely, and transparent Commission decisions to address new issues and information. These improvements would allow the NRC's regulatory framework to provide:

- An improved structure and set of criteria for identifying and categorizing unanticipated hazards and events that may require regulatory action (e.g., extended station blackout). (addressed by Improvement Activity 1)
- A structure and criteria for consistently and predictably evaluating how defense-in-depth should be addressed for an effective NRC regulatory response to new information or unforeseen events or accidents (e.g., evaluation of a possible requirement for filtered vents). (addressed by Improvement Activity 2)
- A regulatory process that ensures licensee implementation and consistent long-term maintenance of voluntary industry initiatives (e.g., SAMGs). (addressed by Improvement Activity 3)

Options for the Disposition of NTTF Recommendation 1

The staff developed three improvement activities for the disposition of Recommendation 1. These three improvement activities are summarized below. These activities are not mutually exclusive and may be combined together in various ways to provide integrated regulatory framework improvements. *[Note: When completed, the SECY paper will include these enclosures -- Enclosure 1 provides the staff's detailed discussion of each improvement activity. Enclosure 2 provides an estimate of the costs of each improvement activity.]* The staff's estimates of costs do *not* reflect possible savings attributable to these improvement activities, either as benefits or averted costs. This decision was predicated on the staff's determination that estimates of such savings are difficult to quantify and that exclusion of such savings would be conservative from the standpoint of selecting cost-effective options.

A viable and acceptable alternative to implementing any or all of these improvement activities would be to maintain the existing regulatory processes and framework. If the Commission decides not to pursue any of these improvement activities, there would be no changes to existing NRC policies or processes initiated by the Commission in response to NTTF Recommendation 1. Instead, the NRC would continue under its current process to make improvements as needed on a case-by-case basis, when identified in the course of existing regulatory processes, e.g., inspections, audits, new research, generic issues program, communications with international nuclear regulatory bodies. Emergent issues with potential safety impact would continue to be handled as they currently are, as is the case for the actions now underway as a result of the Fukushima accident. In addition, the staff notes that new reactor certification and licensing processes have a PRA requirement which will lead to greater risk-informed regulation.

The staff emphasizes that a decision not to implement any of these improvement activities is *not* a “do nothing” approach. Under the existing regulatory processes and framework, the NRC would continue to improve portions of its processes and framework in response to operating experience, new information, or emergent issues, just as it has done in the past. For example, the NRC began to update its Regulatory Analysis Guidelines prior to the Fukushima Dai-ichi event. As another example, post-Fukushima Orders and other related regulatory actions will ensure NRC oversight of SAMGs, enhanced ability of licensees to mitigate severe accidents, improved emergency planning, and other safety improvements. These activities are being accomplished under the current NRC regulatory framework.

Maintaining the existing regulatory processes, policy, and framework would cause no additional incremental costs to be incurred by either the NRC or the nuclear power industry. However, the NRC and industry would incur costs when the agency decides to undertake future framework improvement activities on an *ad hoc* basis, and may forego possible minor reductions in costs resulting from efficiencies that might be realized if regulatory process and framework improvement activities were accomplished in an integrated fashion.

The major benefit of maintaining the existing regulatory processes and framework is that it would maintain nuclear safety while preserving an approach to regulation that has been successfully implemented by the NRC and industry for many years and is well understood by both. The existing framework allows for incremental improvements of the regulatory approach with full stakeholder engagement. However, it does not clearly address the apparent “patchwork” remarked upon by the NTTF and therefore does not aid in improving the understanding of NRC's regulatory structure. It may not be as efficient at effecting identified improvements as a framework that has been augmented by the 3 Improvement Activities described below. Detailed pros and cons are presented in *[Enclosure 1 -- placeholder for the SECY paper, when written.]*

Potential Improvement Activities for the Disposition of NTTF Recommendation 1

Improvement Activity 1: Establish a Design Extension Category of Events and Associated Regulatory Requirements

Improvement Activity 1 is intended to address the recommendations of the NTTF and RMTF with respect to establishing a category of beyond design-basis events/accidents. In the staff's view, the common concern underlying the NTTF and RMTF recommendations is with the NRC's inconsistent approach for dealing with hazards and events which are typically characterized as

“beyond design-basis accidents.” The staff believes that neither the NTTF Recommendation 1 approach nor the RMTF approach is a cost-effective approach for addressing the common concerns of the NTTF and RMTF. Therefore, the staff is proposing a simpler way to address the common concern which appears to underlie the categorization recommendations of the NTTF and RMTF.

The staff proposes that the NRC adopt a new term – “design basis extension” -- to define and describe the events and requirements which have typically been characterized as “beyond design-basis:”

“Design basis extension” are those conditions (including hazards and events) posing a potential significant safety concern at nuclear power plants for which accident prevention and/or mitigation capability must be provided, but are neither postulated accidents (anticipated operational occurrences or design basis accidents) evaluated in a nuclear power plant’s final safety analysis report, or the external hazards for which a nuclear power plant was designed and licensed.

The proposed definition should help to clear up the common confusion between a plant’s design basis, as defined in 10 CFR 50.2, and the various events, accidents, occurrences, hazards, and conditions that comprise the plant’s design and licensing basis. It makes it clear that there are regulations regarding hazards and events that are not included in the set of design-basis accidents (but may still be part of the plant’s design bases) and for which, therefore, the regulatory treatment of associated SSCs may be different than that prescribed for safety related SSCs.

The staff proposes that the NRC revise its internal policies, guidance and procedures to ensure that future design basis extension requirements (both rules and orders) are written in a consistent, logical, and complete manner. Matters to be addressed would include (but are not limited to):

- Performance goals, including analysis methods and acceptance criteria
- Treatment requirements, such as design criteria, level of quality assurance needed, and environmental qualification
- Documentation requirements for information which the NRC has determined needs to be developed and maintained with respect to demonstrating compliance with the design basis extension requirements
- Change processes for licensee-initiated facility changes related to compliance with design basis extension rules
- Reporting requirements
- Characterization of each future design basis extension requirement as a matter of adequate protection or safety enhancement, even if the requirement is not backfitting or inconsistent with Part 52 issue finality provisions

The staff’s simplified approach for implementing Improvement Activity 1 would use existing NRC programs (e.g., operating experience, generic safety issues, etc.) for the identification of new regulatory issues and would use existing guidelines (e.g., regulatory analysis guidelines, safety goals, etc.) for determining which regulatory requirements would be imposed to address matters of design basis extension. The staff may, however, change the criteria for both identification and promulgation of new regulations as a result of other activities now underway. Thus, the

significant costs associated with both the NTTF and RMTF categorization approaches would be avoided under the staff's recommended approach.

The staff believes the initial population of requirements in this category would be drawn from the existing regulatory requirements addressing what are currently referred to as beyond design-basis events. These existing regulations include station blackout (10 CFR 50.63); anticipated transients without scram (ATWS – 10 CFR 50.62); combustible gas control (10 CFR 50.44); loss of large plant areas, (10 CFR 50.54(hh)); and aircraft impact assessment (10 CFR 50.150). In process rulemakings which may be characterized as design basis extension are the risk-informed emergency core cooling system rule (proposed 10 CFR 50.46a) and the station blackout mitigating strategies rulemaking.

Both the NTTF and the RMTF reports discuss options for creating a single new event category but offer differing insights as to what this new category may look like and how it would be populated with events and associated requirements. The extent to which the implementation of Improvement Activity 1 conforms with either NTTF or RMTF recommendations depends upon how five key issues are resolved. These key issues and how they are resolved by the staff's proposed approach are discussed below.

- Would the approach be specified on a generic or a plant-specific basis, or by both methods? The NRC staff believes that the regulatory requirements for design basis extension conditions should be applied on a generic basis, meaning that NRC would determine when orders or regulations would be promulgated and licensees would be required to comply with the generic requirements applicable to classes or groups of licensees.
- Would the category be for adequate protection, safety enhancement, or both? The staff believes that regulatory requirements for beyond design basis events could be for either adequate protection (e.g., recent Order EA-12-049 on mitigating strategies) or for cost-justified safety enhancement (e.g., SBO). Regulations developed under either rationale would still define the performance goals, treatment requirements, documentation and reporting requirements, and change processes; although the specific requirements might be more stringent for regulations deemed necessary to provide reasonable assurance of adequate protection of public health and safety.
- Would a site-specific PRA be required? PRAs are useful tools for maintaining and operating plants safely and may also be used to assess the site-specific risk-significance of emergent issues. All operating reactors have PRA's of varying quality and have used these PRAs to search for site-specific vulnerabilities (i.e., GL 88-20), to support risk-informed regulatory activities (e.g., 10 CFR 50.65 risk assessments and the Significance Determination Process of the Reactor Oversight Program and alternatives), and to support risk-informed alternatives to regulatory requirements (e.g., changes to Technical Specifications and Inspection programs). However, the NRC staff believes that a regulatory requirement for a site-specific PRA for currently operating reactors, for the sole purpose of searching for as yet unrealized cost-beneficial risk-reduction activities, would not provide benefits commensurate with the substantial costs¹ of developing such regulatory compliant PRA models. Nuclear power plants licensed under Part 52 are

¹ Industry costs to upgrade and maintain PRAs at current operating plants were estimated to range from \$200 to \$380 million by the PWR Owners Group and from \$48 to \$202 million by the NRC staff.

already required to have plant-specific PRA models and these new reactor designs have also already benefited from risk insights.

- Would the new category be applicable to new reactors, or also to operating plants? The staff believes that the regulations developed for design basis extension events should be applicable to all nuclear power reactors affected by the hazard or event that a new requirement is intended to address unless found unnecessary due to plant-specific design features as demonstrated by a request for exemption.
- Would the category be forward-fit or retrospective? A retrospective approach would generally reassess currently operating plants to determine whether there are additional risk-reduction measures that should be imposed to address design basis extension conditions. A forward-fit approach would not involve a new assessment of currently operating plants unless new information arose that indicated a reassessment would lead to new requirements. The NRC staff believes that the forward-fit is the more effective approach especially given that, under the staff's proposed approach, the processes for identifying and making decisions on regulatory requirements are unchanged.

After reviewing the current NRC regulations that address beyond design-basis events (SBO, ATWS, § 50.44, § 50.54(hh), etc.), the NRC staff determined that NRC regulations already include a de-facto "category" of requirements to address what would be termed "design basis extension events" if this improvement activity is implemented. Thus, it is unnecessary for the NRC to undertake rulemaking to establish such a category². The category could be established by internal staff guidance (i.e., Management Directive or Office Instruction). This guidance would address the best regulatory practices identified by the staff (i.e., inclusion of requirements for performance goals, documentation, reporting, change control, and special treatment) for regulatory requirements (both rules and orders) in the design basis extension category.

Expected products resulting from this activity would include revisions to existing guidance documents to describe the regulation of design basis extension events. The Commission could also direct rulemaking to establish a "definition" of the new category (along with consistent definitions for other regulatory accident category concepts not currently defined in Part 50).

The staff estimates no additional costs to the industry for the approach described above. If this approach is implemented through guidance alone, estimated costs for the NRC are expected to be minimal in that the changes could be incorporated into routine updates of the internal guidance documents. Conforming changes could also be incorporated into the regulatory analysis guidelines as part of the update to that document that is being pursued as a result of Commission direction from SECY-12-0110 on Economic Consequences. (Further modifications to the regulatory analysis guidelines to ensure that they reflect the Commission's expectations on ensuring the adequacy of defense-in-depth are a possible as an outcome of Improvement Activity 2, below, on defense-in-depth). Completion of the categorization improvement activity is expected to take 2 to 4 years.

To provide an example of the possible outcome of implementing Improvement Activity 1, the staff believes that portions of 10 CFR 50.54(hh) on loss of large areas of the plant would have been designated as a design basis extension rule, which would provide a clearer basis for specifying a reduced set of treatment requirements for SSCs required to meet §50.54(hh).

² However, there may be value to including a "definition" of this new category in Part 50 for clarity.

One benefit of implementing Improvement Activity 1 as described above is that it could provide clarity and a common terminology for describing these events (now characterized inconsistently in various ways including “beyond design basis”). Another benefit is a consistent, clear, and efficient approach to developing future requirements for addressing design basis extension events. The NRC staff believes that this approach represents a cost-effective way to improve NRC’s regulatory system related to evaluating and establishing regulatory requirements for these events. It also could aid in the public’s understanding of NRC’s regulations that address these events, including the regulatory controls over the SSCs that mitigate them. However, this generic approach is not expected to be able to provide site-specific safety benefits by indentifying risk outliers.

Improvement Activity 2: Establish Commission Expectations for Defense-In-Depth

Improvement Activity 2 would establish the Commission’s expectations for defense-in-depth as applied to nuclear power reactor safety. A Commission policy statement would be developed that would include the definition, objectives, and principles of defense-in-depth. The policy would set forth the defense-in-depth approach as a hierarchy that includes specified levels of defense for reactor safety. This improvement activity would also develop decision criteria to support regulatory decisions regarding whether the Commission’s expectations for defense-in-depth have been addressed in the design and operation of a nuclear power plant. Development of the decision criteria will also include development of associated implementing guidance.

Improvement Activity 2 directly supports NTTF Recommendation 1, which states: “The Task Force recommends establishing a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.” It does this by defining defense-in-depth for nuclear power reactors and developing decision criteria for assessing when defense-in-depth has been adequately addressed in the design of a nuclear power plant. These are necessary steps in implementing the NTTF’s recommendation. Improvement Activity 2 also supports the RMTF overall recommendations (R2.1-2.4) and those for power reactors (PR-R-5, OR-R-5, and NR-R-5).

If the Commission directs the NRC staff to proceed with Implementation Activity 2, the staff would develop the policy statement as described below. This policy statement would be developed as part of the draft policy statement that is being prepared for Commission consideration in addressing the recommendation in NUREG-2150 for a Risk Management Regulatory Framework (RMRF) policy statement. Developing the reactor safety policy on defense-in-depth as part of the Risk Management Regulatory Framework policy statement will ensure that it is consistent with the overall agency policy. The staff envisions six major parts to the Commission Policy Statement on Defense-in-Depth for Nuclear Power Reactor Safety:

- Statement of Commission Expectations
- Definition of Defense-in-Depth
- Objective of Defense-in-Depth
- Defense-in-Depth Principles
- Levels of Defense for Nuclear Power Reactor Safety
- Decision Criteria

Example Commission Expectations: A defense-in-depth approach is used to provide reasonable assurance of public health and safety from the operation of the reactor of a nuclear power plant.

Example Definition: Defense-in-depth is a strategy that employs successive levels of defense and safety measures in the design, construction and operation of the nuclear power plant to ensure appropriate barriers, controls, and personnel are in place to prevent, contain, and mitigate exposure to radioactive material.

Example Objectives: The purpose of employing a defense-in-depth strategy is to keep the risk to the environment from the operation of the reactor of a nuclear power plant acceptably low by:

- Compensating for uncertainties, including events and event sequences which are unexpected
- Making the nuclear power plant more tolerant of failures and external challenges; for example, by:
 - compensating for potential adverse equipment performance, as well as human actions of commission (intentional adverse acts are part of this) as well as omission
 - maintaining the effectiveness of barriers and protective systems by ensuring multiple, generally independent and separate, means of accomplishing their functions
- Protecting the public even assuming a severe accident and radiological release

Example Principles: The objectives of defense-in-depth are achieved by implementing the following **example** principles:

- Key safety functions are not dependent upon a single element of design, construction, maintenance or operation
- Uncertainties in SSCs and human performance are accounted for in the safety analysis and appropriate safety margins are provided
- Application of conservative codes and standards
- High quality in the design, construction, and operation of the nuclear power plant
- System redundancy, independence, and diversity are part of the design and operation
- Defenses against potential common-cause failures are part of the design and operation

Example Levels of Defense: For ensuring nuclear power reactor safety, defense-in-depth is comprised of four successive levels of defense where each level's defense measures are applied if the previous level fails:

- Event preclusion – safety measures that preclude events that could challenge safety
- Accident prevention – safety measures that prevent events from progressing to core damage
- Source term containment– safety measures that prevent radioactive release from the containment

- Release mitigation – safety measures that protect the public from the effects of radioactive releases

Example Decision Criteria: Decision criteria would be developed to determine whether a given plant design had sufficient depth, that is, an appropriate number of each of the four levels of defense, as well as to judge whether the defenses within a level had an appropriate reliability and availability in view of uncertainties. Such decision criteria could involve:

- Extent to which the objectives of defense-in-depth are met
- Extent to which the principles of defense-in-depth are employed
- How well each level of defense provides protections from a given hazard or scenario
- Amount of safety margin available
- Effectiveness of performance measurement or monitoring strategies
- Significance of uncertainties
- Comparison to quantitative acceptance guidelines (e.g., CDF, LERF)

The policy statement would reinforce the Commission's expectation that all regulatory decisions be made with appropriate consideration of uncertainties. The strategy and approach in the policy statement for defense-in-depth would likely include both deterministic and probabilistic decision criteria. The policy statement would clearly state that the deterministic criteria for defense-in-depth must, at the most fundamental level, compensate for uncertainties, including those in the PRA models or other risk assessments.

There are several issues which the Commission should address as part of this improvement activity:

1. To which licensed entities will the policy (and any rules) apply? The staff believes that the new policy should be applicable to all nuclear power reactors.
2. Will the policy be forward-fit or retrospective? A retrospective approach would assess currently operating plants to determine whether the Commission's expectations regarding defense-in-depth were met. A forward-fit approach would not assess currently operating plants, but would apply the Commission's expectations for defense-in-depth to issues as they arise. The NRC staff believes that the forward-fit approach would be more consistent with the NRC's principles of good regulation.
3. Should a PRA be required? The NRC staff believes that a requirement for a site-specific PRA for currently operating reactors, for the sole purpose of informing the defense-in-depth policy, would not provide benefits commensurate with the cost of developing such PRA models. Nuclear power plants licensed under Part 52 are required to have plant-specific PRA models.

If Activity 2 is approved by the Commission, the staff would develop the Commission policy statement, possible revisions to the Regulatory Analysis Guidelines, and substantial conforming changes to several existing regulatory guides. The development of this policy statement would be part of the draft RMRF policy statement being developed in the staff response to NUREG-2150. The draft RMRF policy statement would take into account the Commission SRM in

response to the staff recommendation to develop a policy statement on defense-in-depth for reactor safety. Estimated costs for implementing Activity 2 are \$1.1 million for the NRC and no incremental cost for industry, assuming that no PRA requirement is imposed on currently operating reactors. Completion of this effort will be in accordance with the schedule that is being developed under the RMRF activity.

To provide an example of the possible outcome of implementing Improvement Activity 2, the staff describes how the NRC's recent deliberations on filtered vents in Mark I and II containments might have proceeded if this activity had been implemented and in effect during those deliberations. The containment designs would have been evaluated for defense-in-depth considerations. If the NRC had well-defined criteria for evaluating the adequacy of defense-in-depth, the NRC may have been able to more efficiently come to a decision on this issue. Such decision criteria would improve the transparency and predictability of the NRC's regulatory process.

The major benefit of improvement activity 2 is that it provides a uniform, technically-justified, documented basis for the defense-in-depth principle of risk-informed decision-making. Improvement activity 2 also directly supports the Commission's PRA Policy Statement. However, it will be challenging for the staff to develop decision criteria with sufficient detail to achieve consistency.

Improvement Activity 3: Clarify the Role of Industry Initiatives in the NRC Regulatory Process

Improvement Activity 3 would clarify the role of certain industry initiatives in NRC's regulatory processes by (1) re-affirming the Commission's expectation that initiatives relied upon for adequate protection be incorporated into regulatory requirements; (2) specifying when these initiatives may be credited in the base-case for regulatory analyses; and (3) providing guidance regarding what level of NRC oversight is appropriate. By "industry initiative," the staff is referring to proposals made by the entire nuclear power industry, e.g., commitments made by the Nuclear Energy Institute (NEI), or proposals made by discrete groups of licensees and applicants, e.g., the BWR Owners Group.

Industry initiatives can generally be classified as one of the following 3 types³.

Type 1: A Type 1 initiative is developed in response to an issue of potential safety concern that would complement regulatory actions within existing regulatory requirements. However, when it is determined that the safety concern involves the assurance of adequate protection, or other criteria described in Title 10, Section 50.109, of the *Code of Federal Regulations* (10 CFR 50.109), the NRC shall pursue rulemaking. In such a case, the Type 1 industry initiative may form the basis for an acceptable method of meeting the new regulation through endorsement in a regulatory guide.

Type 2: A Type 2 initiative is developed in response to a potential safety concern that is a potential cost-beneficial safety enhancement outside existing regulatory requirements. Such industry initiatives may be used to provide safety enhancements without the need for regulatory action. However, where it is determined that the proposed industry initiative is not effective in addressing the safety concern, the NRC may pursue rulemaking in accordance with the criteria described in 10 CFR 50.109.

³ The descriptions of the three types of initiatives are from SECY-01-0121, "Industry Initiatives in the Regulatory Process," July 5, 2001 (ADAMS Accession No. ML011630126).

Type 3: A Type 3 initiative is developed as an information-gathering mechanism, or a means to address issues of concern to the applicable industry group that are not potential safety concerns, do not involve adequate protection issues, are outside existing regulatory requirements, and are not likely to yield cost-beneficial safety enhancements. These voluntary industry initiatives may be used by the applicable industry group to address economic or efficiency issues.

Improvement Activity 3 focuses *only* on how Type 2 industry initiatives should be considered in the NRC regulatory process. It does not address Type 1⁴ or Type 3⁵ initiatives. Some examples of current Type 2 industry initiatives include:

- Low power/shutdown risk
- Severe accident management guidelines
- Heavy load lifts
- Hydrogen igniter backup power for BWR Mark III and ice condenser containments

Improvement Activity 3 would affect the decisionmaking process in a situation where the NRC is considering taking generic regulatory action (rulemaking or issuance of generic orders⁶) to address a safety issue of generic applicability and the industry proposes an initiative to address the issue that could obviate the need for regulatory action. Such an initiative would be a Type 2 issue if the NRC did not issue a legally-binding requirement to address the safety issue. (The scope of this proposed improvement activity does not include plant-specific orders or plant-specific voluntary commitments because these activities are developed using different processes and the impact of these activities is limited to individual plants and are therefore not a generic regulatory framework concern.

In general, this activity would involve either the development of a Commission Policy Statement (and any necessary implementing guidance) or revisions to existing guidance. The Policy Statement or revised guidance would reiterate the current Commission policy that industry initiatives may not be used to avoid NRC regulatory action on adequate protection issues (May 27, 1999, Commission SRM (ADAMS Accession No. ML003752062), approving the staff's recommendations in SECY-99-063, "The Use by Industry of Voluntary Initiatives in the Regulatory Process," March 2, 1999 (ADAMS Accession No. ML992810068)). The Policy Statement would also direct that industry initiatives may not be credited in the base case as defined in the Regulatory Analysis Guidelines (NUREG/BR 0058, Rev. 4) when evaluating potential backfits unless there is a high likelihood that the industry will effectively implement and maintain the initiative over time.

⁴ Activity 3 does not address Type 1 industry initiatives even though some of those initiatives address NRC requirements involving adequate protection. Additional NRC action on Type 1 industry initiatives is unnecessary, because the NRC already has the regulatory tools to address a licensee's failure to comply with the underlying NRC regulatory requirement (regulation, license condition, order, technical specification) to which the Type 1 industry initiative is directed. The NRC may inspect/audit a licensee to determine if the licensee is complying with the underlying NRC requirement and may take enforcement action if the NRC determines that the licensee is not complying with the underlying NRC requirement.

⁵ Activity 3 does not address Type 3 industry initiatives because those initiatives address issues that are not potential safety concerns.

⁶ "Generic" orders are substantially identical in content and are issued to several licensees.

The staff will also develop and implement a formal program for NRC staff oversight of those initiatives (existing as well as future) which the NRC believes are important from both safety and regulatory perspectives, but do not themselves constitute matters of adequate protection. The program will use risk insights to focus oversight; i.e., be risk-informed. Such a program would include criteria for determining what industry activities are worthy of oversight, the nature of the oversight (i.e., NRC inspection/audit, or imposition of mandatory information collections with NRC review of the collected data), and the periodicity of the oversight activity.

The staff will also re-evaluate whether certain existing industry initiatives are being consistently maintained, which is within the staff's authority and does not require Commission approval. As part of this effort, the staff will review licensee commitments made as a result of the IPE/IPEEE programs and will verify that those with the highest safety significance were implemented and have been maintained. These licensee commitments on IPE/IPEEE are not, strictly speaking, Type 2 industry initiatives. Nonetheless, the staff believes that these commitments were implemented as a result of NRC "generic action" requesting the performance of the IPE and IPEEE and are similar to the kind of "voluntary industry initiatives" which were the subject of NTTF Recommendation 1. Moreover, review of the status of these commitments would also address, to a limited extent, the NTTF recommendation that the NRC evaluate the insights from the IPE and IPEEE for the purpose of identifying potential generic or plant-specific requirements. Finally, as part of this effort, the staff will consider modifying inspection procedures to provide more oversight of significant Type 1 initiatives.

The staff estimates that this activity would involve up to \$1.0 million in costs to the NRC and up to \$1.6 million in industry costs. The staff estimates that Improvement Activity 3 would take 2 years to implement.

To provide an example of the possible outcome of implementing this option, the staff has reviewed the history of its efforts in 2004–2005 to promulgate a rule requiring Mark III and ice condenser containments to provide backup power to hydrogen igniters. As the staff was performing the backfit analysis and regulatory analysis, industry representatives voluntarily proposed to install a rudimentary backup power system that relied substantially on operator manual actions. As a result of crediting this proposed initiative in the base case of the value-impact analysis, the benefits of the staff's proposed rule for ice condensers were reduced and the staff could not find that there was a "substantial increase" in protection to public health and safety, or that the proposed rule was cost-effective under the regulatory analysis. The staff believes that, had Improvement Activity 3 been implemented at the time of the proposed rulemaking, the industry initiative would have been credited only if verification activities (e.g., NRC inspections, reporting requirements, etc.) had been put in place.

The major benefit of Improvement Activity 3 is that it ensures that the safety benefits from industry initiatives would be consistently maintained over time by providing risk-informed regulatory oversight. Possible adverse effects are that licensees may be less likely to interact with the NRC on safety issues and may be less likely to develop industry initiatives for Type 2 issues.

For further information on existing industry initiatives of Types 1, 2, and 3, the staff has attached a partial list in Attachment 1.

CONCLUSION:

The staff proposes to address NTTF Recommendation 1 and the related RMTF recommendations for power reactors by implementing the 3 improvement activities described above. These improvement activities are intended to address the underlying intent of the recommendations, as understood by the staff, but do not fully implement every aspect of each of the recommendations. The discussion and tables in Attachment 2 summarize how the 3 improvement activities relate to and address NTTF Recommendation 1 and the RMTF recommendations for nuclear power reactors. They also explain the NRC staff's rationale for not recommending full implementation of the NTTF or RMTF recommendations.

Attachments:

1. Partial List of Voluntary Industry Initiatives
2. Comparison of Improvement Activities to NTTF Recommendation 1 and RMTF Power Reactor Recommendations

Partial List of Industry Initiatives

Types of industry initiatives:

1. A Type 1 initiative is developed in response to an issue of potential safety concern that would complement regulatory actions within existing regulatory requirements. However, where it is determined that the safety concern involves the assurance of adequate protection, or other criteria described in Title 10, Section 50.109, of the Code of Federal Regulations (10 CFR 50.109), the NRC shall pursue rulemaking. In such a case, the Type 1 industry initiative may form the basis for an acceptable method of meeting the new regulation through endorsement in a regulatory guide.
2. A Type 2 initiative is developed in response to a potential safety concern that is a potential cost-beneficial safety enhancement outside existing regulatory requirements. Such industry initiatives may be used to provide safety enhancements without the need for regulatory action. However, where it is determined that the proposed industry initiative is not effective in addressing the safety concern, the NRC may pursue rulemaking in accordance with the criteria described in 10 CFR 50.109.
3. A Type 3 initiative is developed as an information-gathering mechanism, or a means to address issues of concern to the applicable industry group that are not potential safety concerns, do not involve adequate protection issues, are outside existing regulatory requirements, and are not likely to yield cost-beneficial safety enhancements. These voluntary industry initiatives may be used by the applicable industry group to address economic or efficiency issues.

The descriptions of the three types of initiatives are from SECY-01-0121, "Industry Initiatives in the Regulatory Process," July 5, 2001 (ADAMS Accession No. ML011630126).

Partial List of Industry Initiatives

Description	Type*
<p>Boron Corrosion</p> <ul style="list-style-type: none"> NRC issued a 10 CFR 50.54(f) request for information (GL 88-05), which stated: The principal concern is whether the affected plants continue to meet the requirements of General Design Criteria 14, 30, and 31 of Appendix A to Title 10 of the <i>Code of Federal Regulations</i> (CFR) Part 50 when the concentrated boric acid solution or boric acid crystals, formed by evaporation of water from the leaking reactor coolant, corrode the reactor coolant pressure boundary. Industry developed boric acid corrosion prevention programs to ensure compliance... 	1
<p>Guidelines for the management of materials issues</p> <ul style="list-style-type: none"> ML101050337 	1
<p>Guidelines for 10 CFR 50.59 Implementation</p> <ul style="list-style-type: none"> NEI 96-07 Endorsed in Regulatory Guide 1.187 	1
<p>Steam generator program</p> <ul style="list-style-type: none"> NEI 97-06 SECY-00-0116: <i>As for the new NEI-97-06 steam generator industry initiative, it will result in voluntary and enforceable changes to plant technical specifications.</i> SECY-00-0116: <i>This industry initiative will involve license amendments by all pressurized water reactor (PWR) licensees to change from deterministic to performance-based technical specifications. In response to the staff's ongoing regulatory development effort, the PWR industry focused its efforts on improving existing SG inspection guidance and developing additional guidelines on other programmatic elements related to SG tube integrity. The industry's efforts to improve industry guidance culminated in the NEI 97-06 industry initiative, developed through the NEI Nuclear Strategic Issues Advisory Committee, which establishes a framework for structuring and strengthening existing SG programs. This industry initiative discusses regulatory interfaces, licensee responsibilities, and a protocol for revising referenced guidelines. It also defines the performance criteria that licensees shall use to measure tube integrity. It should be noted that the final staff review of NEI-97-06 is still in progress.</i> 	1

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
<p>Boiling Water Reactor Vessel Internals Project</p> <ul style="list-style-type: none"> • SECY-01-0121: A Type 1 example of an existing program that complements existing regulatory requirements via an industry initiative is the Boiling Water Reactor Vessel and Internals Project (BWRVIP). This program, in which all U.S. BWR licensees participate, was instituted in 1994, initially to address the potential consequences of intergranular stress corrosion cracking (IGSCC) in the BWR core shroud. The project subsequently expanded in scope to address all BWR safety-related austenitic stainless steel and Alloy 600 components, the reactor vessel, and safety-related piping. This industry-led program developed, in safety-significance priority, approximately 50 generic industry guidelines for inspection scope and frequency, flaw evaluation, and mitigation and repair. All BWR owners committed to adhere to the program or inform the staff of any plant-specific deviations. Further, since the BWRVIP representatives agreed on which components are safety-related, actions taken to inspect, evaluate, and repair these components are covered by the individual licensees' quality assurance (QA) programs, as governed by Appendix B to 10 CFR Part 50. 	1
<p>Station Blackout</p> <ul style="list-style-type: none"> • NUMARC 87-00 • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. 	1
<p>Dedication of Commercial Grade Items</p> <ul style="list-style-type: none"> • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. 	1
<p>Monitoring the Effectiveness of Maintenance</p> <ul style="list-style-type: none"> • NUMARC 93-01 • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. 	1

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
Vehicle Barrier Systems <ul style="list-style-type: none"> • NEI 96-01 • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. 	1
Containment Testing (App. J, Option B) <ul style="list-style-type: none"> • NEI 94-01 • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. 	1
FSAR Updated <ul style="list-style-type: none"> • NEI 98-03 • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. 	1

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
<p>Low power/shutdown risk (or “Shutdown issues”)</p> <ul style="list-style-type: none"> • NUMARC 91-06 • Has not been endorsed by the NRC but has been recognized by the NRC as providing an acceptable means of addressing an NRC issue or concern. • SECY-00-0116: <i>In the case of shutdown risk, the staff had completed an analysis indicating that industry actions could be justified as a cost-beneficial safety enhancement; however, the Commission concluded that rulemaking should not proceed given the initiatives taken by the industry to maintain an acceptable level of risk during shutdown conditions. Licensee implementation of commitments in this area is not enforceable, but NRC monitoring provides a basis for determining if future regulatory action becomes necessary.</i> • SRM-SECY-00-0116: <i>This risk-significant issue is not explicitly required by existing regulations. The staff, using an older version of NUREG/BR-0058 which did not allow any credit for industry initiatives, found this issue to be valid for backfitting as a safety enhancement pursuant to 10 CFR 50.109. The rulemaking was discontinued since the Commission concluded that existing industry practices provide an adequate level of safety. The Commission also directed that NUREG/BR-0058 be updated to permit appropriate credit for industry initiatives. No enforcement would presently be appropriate.</i> • See also presentations about shutdown risk from Operating Experience Gateway internal web site: http://nrr10.nrc.gov/ope-info-gateway/shutdown-risk.html 	2
<p>Severe Accident Management Guidelines</p> <ul style="list-style-type: none"> • Has not been endorsed by the NRC but has been recognized by the NRC as providing an acceptable means of addressing an NRC issue or concern. • See also: Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants (August 8, 1985; 50 FR 32138). 	2

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
<p>Industry Initiative on Underground Piping and Tanks Integrity</p> <ul style="list-style-type: none"> • NEI 09-14 • NEI letter describing initiative: ML093350032 • NEI revision to the initiative: ML13079A318 • NRC Buried Piping Action Plan, Revision 3: ML13099A380 • See http://www.nrc.gov/reactors/operating/ops-experience/buried-piping-activities.html 	2
<p>Hydrogen igniter backup power for BWRs and ice condensers</p> <ul style="list-style-type: none"> • GSI-189 • Regulatory Analysis: ML051450060. The decision rationale on page 55 of the regulatory analysis for the proposed action to address generic safety issue 189 (ADAMS Accession No. ML051450060) explains that the decision to take no further regulatory action was based on the assumption that voluntary licensee actions would be implemented as described and that the NRC would revisit rulemaking in the future, if necessary. 	2
<p>Heavy load lifts</p> <ul style="list-style-type: none"> • NEI 08-05 ML082180666 • NRC safety evaluation: ML082410532 • NRC endorsement: RIS 2008-28 (ML082460291) • See also 2007 operating experience brief on this topic: http://nrr10.nrc.gov/rorep/docs/HeavyLoadsBrief200702.pdf • See also inspection guidance FY2007-03, Rev. 2 	2
<p>Safety culture initiative</p> <ul style="list-style-type: none"> • NEI 09-07 	2
<p>Station Blackout (Diesel Reliability portion)</p> <ul style="list-style-type: none"> • Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
Motor Operated valves <ul style="list-style-type: none"> Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. Established to address Generic Letter 96-05 	2
Piping Erosion/Corrosion <ul style="list-style-type: none"> Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2
Comprehensive Procurement Initiative <ul style="list-style-type: none"> NUMARC 90-13 Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2
Oil Loss in Rosemount Transmitters <ul style="list-style-type: none"> NUMARC 91-02 Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. See resolution of generic safety issue 176: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0933/sec3/176r1.html 	2
Substandard Non-Safety-Related Molded Case Circuit Breakers <ul style="list-style-type: none"> NUMARC 90-14 Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2
Design Basis Programs <ul style="list-style-type: none"> NUMARC 90-12 Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2
Fraudulent Flanges <ul style="list-style-type: none"> NUMARC 88-01 Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
Managing Regulatory Commitments <ul style="list-style-type: none"> • NEI 99-04 • Endorsed by NRC as providing an acceptable means of addressing an NRC issue or concern. 	2
IPE/PEEE commitments <ul style="list-style-type: none"> • GL 88-20 	3
Groundwater Protection <ul style="list-style-type: none"> • Package: ML061910196 • Final: ML072610036 	3
Data gathering rule Proposed rule to gather data for PRA 1996	3
Access Authorization <ul style="list-style-type: none"> • NUMARC 89-01 • Endorsed by NRC in a regulatory guide as an acceptable means, in whole or in part, of meeting a new or existing regulation. • SECY-00-0116: <i>A Type 2 industry initiative addresses issues that are not related to a regulatory requirement and do not address a safety concern (e.g., productivity, balance of plant system performance, or resource management). An example is site access authorization, in which industry representatives determined that a common approach would be beneficial. In this case, the staff and stakeholders participants agreed that a commitment to the NRC regarding the industry initiative was unnecessary, and inspections and enforcement are not applicable.</i> 	3
Industry Consensus <ul style="list-style-type: none"> • Initiative taken to address industry, non-regulatory issue 	3
Shortage of Qualified personnel <ul style="list-style-type: none"> • Initiative taken to address industry, non-regulatory issue 	3

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

Partial List of Industry Initiatives

Description	Type*
Fitness for Duty Data Collection <ul style="list-style-type: none"> Initiative taken to address industry, non-regulatory issue 	3
Reducing Automatic trips <ul style="list-style-type: none"> Initiative taken to address industry, non-regulatory issue 	3
Radiation Exposure Control <ul style="list-style-type: none"> Initiative taken to address industry, non-regulatory issue 	3
Personnel Access Data System <ul style="list-style-type: none"> NEI-95-06 Guideline to address industry, non-regulatory issue 	3
ECCS Acceptance Criteria <ul style="list-style-type: none"> Voluntary industry collection of data to ensure safety of current plants regarding previously-unconsidered phenomena. This data was collected voluntarily to eliminate the need for an NRC generic letter seeking information on the underlying matter. See draft proposed rule: ML112520249. The data collection is discussed on page 15. 	3
Air Operated Valve Program <ul style="list-style-type: none"> See NEI letter dated 3/27/2001: ML010950310 	3

* The distinction between the various types of initiatives is not always clear. Some of the Type 2 initiatives listed (underground piping, MOVs, Rosemount transmitters, etc) do have an underlying regulatory requirement for the specific function served by the components.

COMPARISON OF IMPROVEMENT ACTIVITIES TO NTTF RECOMMENDATION 1 AND RMTF POWER REACTOR RECOMMENDATIONS

The NRC staff studied in detail Recommendation 1 of the NTTF and interviewed members of that task force to ensure understanding of what had been proposed. The staff also followed the efforts of the RMTF and included a member of that task force on its inter-office working group that was tasked with developing a notation vote paper with options and a staff recommendation to disposition NTTF Recommendation 1 (SRM-SECY-11-0093).

The NRC staff has developed three proposed improvement activities to address NTTF Recommendation 1 and the related RMTF recommendations for power reactors. These improvement activities are intended to address the underlying intent of the recommendations, as understood by the staff, but do not fully implement every aspect of each of the recommendations. The staff's recommendations differ from the NTTF and RMTF for the following reasons:

- The staff has had more time to consider the regulatory framework issues raised by the NTTF, as compared with the limited 90-day period afforded the NTTF to consider those same issues
- The NRC has taken a number of post-Fukushima actions to improve safety, including issuing three Orders and initiating two rulemaking activities to address the areas of greatest potential risk, consistent with the NTTF recommendations
- The staff has had the benefit of the views of internal staff, as well as the public (including the nuclear power plant industry), and is cognizant of the concerns on resources and prioritization of issues

The following tables summarize how the three proposed improvement activities relate to NTTF Recommendation 1 and the related RMTF recommendations for nuclear power reactors. They also explain the NRC staff's rationale for not recommending full implementation of the NTTF or RMTF proposals.

Table 1: Comparison Of Staff-Proposed Improvement Activities To NTTF Recommendation 1		
Recommendation	Relevant Improvement Activities	Remarks
1. Logical, consistent, coherent framework for adequate protection	1, 2, 3	<p>Each of the three proposed improvement activities provides additional regulatory clarity, predictability, reliability, and efficiency over the current framework as currently implemented.</p> <p>Activity 1 would result in rules and orders currently considered to be “beyond design basis” to clearly specify well-defined performance goals, treatment requirements, documentation and change control requirements, and reporting requirements.</p> <p>Activity 2 would formalize by Commission Policy Statement and implementing guidance the defense-in-depth philosophy, elements and decision criteria to support regulatory decisions.</p> <p>Activity 3 would re-affirm the existing Commission policy that adequate protection matters must be addressed by NRC requirements rather than industry initiatives, and provide graded oversight of high safety significance Type 2 industry initiatives.</p>
1.1 Policy statement for risk-informed defense-in-depth for extended design basis (adequate protection)	2	Activity 2 directly supports risk-informed decisions by developing decision criteria to assess defense-in-depth adequacy. The staff does not propose defining adequate protection, or to treat defense-in-depth as relevant only to adequate protection.

Table 1: Comparison Of Staff-Proposed Improvement Activities To NTTF Recommendation 1		
Recommendation	Relevant Improvement Activities	Remarks
1.2 Initiate rulemaking to implement a risk-informed defense-in-depth framework consistent with policy statement in 1.1	None	The staff is recommending a defense-in-depth Policy Statement and implementing guidance. A defense-in-depth regulation is not needed for transparency or consistent NRC decision-making if a Policy Statement and implementing guidance are adopted.
1.3 Modify Regulatory Analysis Guidelines to more effectively implement defense-in-depth in balance with risk-based guidelines	2, 3	The Regulatory Analysis Guidelines would be updated to include defense-in-depth criteria. The guidance may also be changed to strengthen the cost-benefit section regarding how Type 2 industry initiatives are credited.
1.4 Evaluate the insights IPE and IPEEE for generic or plant-specific requirements	3	The staff plans to determine the status of certain licensee IPE/IPEEE commitments.
Voluntary safety initiatives by licensees should not take the place of needed regulatory requirements. (NTTF Report, pp. 19, 21)	3	Activity 3 addresses this NTTF comment because the staff plans to determine the status of the most safety-significant licensee IPE/IPEEE commitments

Table 2: Comparison Of Staff-Proposed Improvement Activities To RMTF Power Reactor Recommendations		
Recommendation	Related Activities	Remarks
PR-R-1 OR-R-1 (portion) NR-R-1 <i>Design-basis events and accidents should be reviewed and revised to integrate insights from operating history and modern methods such as PRA</i>	None Staff would recommend not pursuing these RMTF recommendations.	The staff is proposing to retain the current approach for design-basis accidents because creating and implementing a new framework would generate additional regulatory complexity and costs but provide no clear safety benefit. Insights from operating history and PRA will be incorporated into Improvement Activity 1 as needed. Licensees may submit individual risk-informed license amendment or exemption requests that are processed in the current framework and

Table 2: Comparison Of Staff-Proposed Improvement Activities To RMTF Power Reactor Recommendations		
Recommendation	Related Activities	Remarks
		these requests may propose any new approaches that would be required for each request.
<p>OR-R-1 (portion) NR-R-1 GIV-R-1</p> <p><i>Promote adoption of risk-informed approaches for the selection of relevant scenarios (e.g., alternatives to the single failure criterion) for design-basis accidents</i></p>	<p>None</p> <p>Staff would recommend not pursuing these RMTF recommendations.</p>	<p>The staff does not propose re-visiting how design-basis accidents are selected. The staff believes that there is value in clarifying how NRC identifies and treats events and hazards outside of the design-basis accidents; this is the topic of Improvement Activity 1</p>
<p>PR-R-2 OR-R-2 NR-R-2 GIV-R-2</p> <p><i>Establish by rule a design-enhancement category of regulatory treatment for beyond-design-basis accidents. Category should use risk as a safety measure, be performance-based, provide for periodic updates, include consideration of costs, and be implemented on a site-specific basis</i></p>	<p>1</p> <p>Staff would recommend implementing the intent of these RMTF recommendations via Improvement Activity 1.</p>	<p>The staff is recommending a policy statement to formalize the <i>defacto</i> category of generic, events traditionally considered to be beyond design basis. NRC already uses risk as one element of determining safety significance. A site specific approach (including periodic updates) is not recommended because of cost and limited safety improvements for implementing the category on a site-specific basis.</p>
<p>PR-R-3 OR-R-3 NR-R-3 GIV-R-3</p> <p><i>Reassess methods for estimating frequency and magnitude of external hazards. Implement consistent process including deterministic and PRA methods. Risks from beyond-design-basis external hazards should be considered in the design-enhancement category</i></p>	<p>1 (partial)</p> <p>Improvement Activity 1 design basis extension category would support future rules on beyond design-basis external hazards.</p> <p>Recommendation 1 working group did not fully consider all aspects of these</p>	<p>Other NTTF recommendations are being implemented that address this recommendation for power reactors. For example, NTTF 2.1 is reassessing seismic and external flooding hazards. The mitigating strategies order and related station blackout mitigating strategies rulemaking provide additional defense-in-depth for preventing and mitigating unspecified external events. The 2012 Appropriations Bill also requires the NRC to reassess external hazards.</p> <p>The ASME/ANS PRA standards development activity for external hazards, which the NRC participates in and endorses, provides methods</p>

Table 2: Comparison Of Staff-Proposed Improvement Activities To RMTF Power Reactor Recommendations		
Recommendation	Related Activities	Remarks
	<p>RMTF recommendations. Decision would be deferred to NTTF Rec. 2.1 and 2012 Appropriations Bill activities.</p>	<p>for estimating frequency and magnitude of external hazards; an update of these standards is currently underway. Moreover, it is part of the ASME/ANS protocol to continually update their standards on a regular periodic basis.</p>
<p>PR-R-4 OR-R-4 NR-R-4 GIV-R-4 <i>Establish a systematic program for collection, evaluation, and communication of external hazard information</i></p>	<p>None</p> <p>Recommendation 1 working group did not consider these RMTF recommendations which are not directly related to regulatory framework. Decision would be deferred to NTTF Rec. 2.2 and 2012 Appropriations Bill activities.</p>	<p>NTTF recommendation 2.2 will consider this recommendation for seismic and external flooding. Other external hazards will also be included, consistent with the 2012 Appropriations Bill. In addition, this recommendation may be pursued regardless of the regulatory framework and could be integrated into Improvement Activity 1.</p> <p>The ASME/ANS PRA standards development activity for external hazards, which the NRC participates in and endorses, provides methods for collection and evaluation of external hazards (e.g., frequency, fragility analysis); an update of these standards is underway. Moreover, it is part of the ASME/ANS protocol to continually update their standards on a regular periodic basis.</p>
<p>PR-R-5 OR-R-5 NR-R-5 GIV-R-5 <i>Apply risk-informed and performance-based defense-in-depth concepts in a more quantitative manner</i></p>	<p>2</p> <p>Staff would recommend implementing these RMTF recommendations via Improvement Activity 2.</p>	<p>Activity 2 would directly address this recommendation by defining defense-in-depth and associated attributes and criteria to facilitate regulatory decision-making.</p>

Table 2: Comparison Of Staff-Proposed Improvement Activities To RMTF Power Reactor Recommendations		
Recommendation	Related Activities	Remarks
PR-R-6 OR-R-6 NR-R-6 GIV-R-6 <i>Develop and implement guidance for security regulatory activities using language in common with safety activities and harmonizes methods with risk assessment and the proposed risk-informed and performance-based defense-in-depth</i>	None These recommendations are being addressed separately by NSIR under RMRF.	The staff excluded security regulatory issues from the scope of the staff's activities for the disposition of NTTF Recommendation 1.