

**POLICY ISSUE**  
**Notation Vote**

December 18, 2015

SECY-15-0168

FOR: The Commissioners

FROM: Victor M. McCree  
Executive Director for Operations

SUBJECT: RECOMMENDATIONS ON ISSUES RELATED TO IMPLEMENTATION OF A  
RISK MANAGEMENT REGULATORY FRAMEWORK

PURPOSE:

The purpose of this paper is to seek Commission direction on two issues related to the U.S. Nuclear Regulatory Commission (NRC) staff's evaluation of NUREG-2150, "A Proposed Risk Management Regulatory Framework" (RMRF) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12109A277) dated April 2012. The paper also informs the Commission of planned actions related to two improvement activities that the staff re-evaluated and provides the Commission with a "description of any interrelationships of ongoing risk-informed initiatives" as requested in the staff requirements memorandum (SRM) for SECY-13-0132, "U.S. Nuclear Regulatory Commission Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report" (ADAMS Accession No. ML14139A104), dated May 19, 2014.

SUMMARY:

This paper has four sections. In Section I and Section III, the NRC staff requests Commission direction on two issues related to an RMRF. In Section II, the staff provides its plans for two "improvement activities" from Fukushima Near-Term Task Force (NTTF) Recommendation 1. In Section IV, the NRC staff presents the interrelationships of ongoing risk-informed initiatives.

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These sections are summarized as follows:

- I. *Path forward for enhancing the risk management approach used to ensure nuclear power reactor safety.* The staff recommends that the Commission use its existing regulatory framework to continue to make risk-informed regulatory improvements in an incremental manner. This framework has been effective and is well understood. It is based on the NRC's long-held commitment to the defense-in-depth concept; to the regulation of nuclear reactor issues beyond the traditional design-basis events, where appropriate; and to the inclusion of the defense-in-depth concept as an essential component of risk-informed regulation.
- II. *Re-evaluation of nuclear power reactor safety Improvement Activities 1 and 2 from Fukushima NTTF Recommendation 1.* The staff does not plan to establish a formal design basis extension category of requirements or to develop a definition of, and criteria for, determining adequacy of defense in depth.
- III. *Consideration of an overarching, agencywide policy statement on using the risk management approach.* The staff recommends that the Commission not develop and issue an agencywide risk management policy statement. Ongoing staff activities to implement risk-informed approaches within NRC program areas will continue to move forward and are not impacted by the staff's recommendation against developing an agencywide risk management policy statement.
- IV. *Description of the interrelationships between ongoing risk-informed nuclear power reactor safety initiatives.* The staff provides the Commission with a description of the interrelationships of ongoing risk-informed nuclear power reactor safety initiatives to ensure that the activities are well coordinated, and effectively planned and implemented.

### Non-concurrence

Two members of the staff non-concurred on the recommendations in Sections I, II, and III of this paper. A synopsis of the issues associated with the non-concurrence is provided after the discussion in Section IV.

### I. PATH FORWARD FOR ENHANCING THE RISK MANAGEMENT APPROACH USED TO ENSURE NUCLEAR POWER REACTOR SAFETY

#### Background

In early 2011, the NRC formed a Risk Management Task Force (RMTF) to evaluate how the agency should be regulating 10 to 15 years in the future. The task force report, NUREG-2150, was published in April 2012. The report provides findings and recommendations in two categories. The first category addresses strategic, agencywide issues, and recommends that "[t]he NRC should formally adopt the proposed Risk Management Regulatory Framework through a Commission Policy Statement." The second category addresses what changes could be made in specific regulatory program areas (e.g., power reactors, nuclear materials) in the next several years to support implementation of the risk management regulatory framework.

On June 14, 2012, the NRC Chairman issued a tasking memorandum, "Evaluating Options Proposed for a More Holistic Risk-Informed, Performance-Based Regulatory Approach" (ADAMS Accession No. ML121660102). In it the Chairman directs the NRC staff to "... review NUREG-2150 and provide a paper to the Commission that would identify options and make recommendations, including the potential development of a Commission policy statement."

### NRC Staff Evaluation and Recommendation

The NRC staff determined that the existing Policy Statements on "Safety Goals for the Operation of Nuclear Power Plants" (51 FR 30028; August 21, 1986), and "Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities" (60 FR 42622; August 16, 1995), in concert with regulatory guidance and increasing experience with risk-informed regulation and integrated risk-informed decision-making processes, have established most of the key aspects of an RMRF<sup>1,2</sup> for the nuclear power reactor safety program area. The staff then considered whether the NRC should continue to improve its risk-informed approach to nuclear power reactor safety in an incremental manner under the present framework or undertake a larger effort to make more sweeping changes. The staff recommends that the NRC maintain its existing regulatory framework for nuclear power reactor safety and continue to make risk-informed regulatory improvements on an incremental basis.

Regulatory improvements in response to the Fukushima Dai-ichi accident are being successfully implemented under the existing regulatory framework. Maintaining the existing regulatory framework and processes would maintain the approach to regulation that has been successful and is well-understood. Although there would be no wholesale or programmatic changes to existing NRC policies or processes, the NRC would continue to make regulatory improvements as needed on a case-by-case basis, whenever identified by existing regulatory processes and programs. Emergent issues with potential safety impact, such as the actions stemming from the Fukushima accident, would continue to be handled by existing regulatory processes. All

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<sup>1</sup> NUREG-2150 identifies four elements as being the components of an RMRF. The existing nuclear power reactor safety regulatory framework includes similar elements as indicated below:

1. Mission – Public health and safety; common defense and security; protect the environment
2. Objective – Manage the risks via current regulations, guidance, and oversight (including defense in depth, safety margins, single failure criterion, fail-safe design, reactor oversight program, etc.)
3. Goal – Provide sufficient risk-informed and performance-based protections to ensure risks are acceptably low (using the Commission's Safety Goal Policy Statement and subsidiary risk metrics)
4. Decision-making Process (that includes monitoring and feedback) – LIC-504, "Integrated Risk-Informed Decision-Making Process for Emergent Issues;" Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis;" Generic Issues Program; Operating Experience Program; Accident Sequence Precursor Program; Industry Trends Program, etc.

<sup>2</sup> The NRC's existing regulatory framework for power reactor safety is similar to RMRF Alternative 1: NRC Identifies Design Enhancement Events, as described in Section H.2.1 of Appendix H to NUREG-2150. NUREG-2150, however, did not recommend Alternative 1 because this approach does not systematically use plant-specific risk information to identify and mitigate possible vulnerabilities that are not identified by a generic regulatory framework.

ongoing and planned risk-informed initiatives would continue. The existing framework and regulatory processes would continue to evolve and improve in response to new operating experience and new information.

Numerous initiatives are underway that advance risk-informed decision-making by using existing agency processes under the existing regulatory framework. For example, research activities are being conducted on probabilistic flood hazards analysis. The staff is also applying lessons learned from the NFPA-805 [Risk-Informed Fire Protection] experience that will facilitate more efficient and effective risk-informed licensing reviews in the future. Multiple risk-informed technical specification initiatives are being pursued. In the area of oversight, the staff is looking at options for risk-informing the response to operability issues of low safety significance. Examples include risk-informed consideration of tornado missile impacts and allowing credit for beyond design-basis mitigating strategies and equipment and procedures. In rulemaking, during the annual prioritization process, the staff will use risk insights whenever available along with other factors obtained through consultation with subject matter experts. Both industry's and NRC's Risk-Informed Steering Committees are working to expand and leverage the use of risk-informed processes and tools to support timely and effective licensing and oversight decisions. The staff will continue to use risk insights to evaluate existing processes to ensure that they maintain safety in an efficient and effective manner.

During its evaluation of the RMRF, the NRC staff requested public comments on numerous issues. These comments are summarized in "Summary of Public Comments on NRC Staff White Paper" (Enclosure 1). As shown in Enclosure 1, public comments were highly supportive of maintaining the existing regulatory framework.

### Consideration of Alternatives

The staff considered several different alternatives in its evaluation. One alternative was to implement an RMRF approach derived from NUREG-2150<sup>3</sup> under which the NRC would develop a plant-specific regulatory framework for nuclear power reactors. Under this approach, the NRC would develop a regulation requiring all licensees to have plant-specific Probabilistic Risk Assessments (PRAs) meeting NRC-specified criteria. The NRC would specify criteria to create a "design enhancement category" of events that complement design-basis accidents and transients to provide additional safety and facilitate future plant-specific changes to existing design basis requirements. A formal risk-informed decision-making process would be implemented similar to the process described in Chapter 3 of NUREG-2150.

Public comments received on this alternative (see Enclosure 1) were not supportive, noting that the substantial resource burden<sup>4</sup> it would impose on current operating reactor licensees is not

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<sup>3</sup> NUREG-2150 described how the suggested approach could enable cost-effective changes in the handling of design-basis events if pursued in a planned and deliberate manner. Such a long term approach would, however, require coordinated programs within the NRC and with the nuclear industry and other stakeholders. Internal discussions and the NRC staff's interactions with external stakeholders have not identified the agreements and commitments needed to support the long-term approach envisioned by the RMRF.

<sup>4</sup> This burden is mostly related to the high cost of upgrading and maintaining licensee PRAs to a level that would be suitable for making substantive changes to a facility's current licensing basis. The staff's estimate of the cost to upgrade and maintain PRAs for the existing operating reactor fleet is provided in Attachment 1 to Enclosure 1 of SECY-13-0132.

likely to be justified by its benefits. The staff agrees with public commenters that this approach should not be implemented for currently operating nuclear power reactors.

The NRC staff also evaluated an “in-between” approach that would allow licensees to voluntarily choose to implement a risk-informed alternative licensing basis. Under this alternative, licensees and applicants of plants with suitable PRA models would be able to risk inform how they address certain accidents and transients included in their licensing basis without the need for submitting an exemption request under Title 10 of the Federal Regulations (10 CFR) Part 50.10. Licensees and applicants would also be required to mitigate any identified risk-significant events and accident sequences in accordance with criteria to be developed by the NRC. The NRC staff held a public meeting on July 29, 2015, to discuss this approach with stakeholders<sup>5</sup>. As a result of this meeting, the NRC re-opened the public comment period to ensure that stakeholders could provide their views on the “in-between” alternative.

After reviewing public comments, the staff decided not to recommend this approach. As previously discussed, a number of licensing initiatives and rulemakings that would allow for greater risk-informed decision-making are already underway. These initiatives will result in risk-informed changes to the licensing basis that will allow both the NRC staff and licensees to focus resources on issues of greatest safety significance. Also, based on the stakeholder comments received, there does not appear to be widespread stakeholder support for the “in-between” approach. Furthermore, many of the NRC and licensee resources needed to implement this option are currently assigned to other risk-informed initiatives.

### Consideration of Advanced Reactor Designs

The staff believes that the adoption of a risk-informed regulatory framework, similar in concept to an RMRF, would provide the greatest benefits for new reactor designs that employ non-traditional technologies (e.g., Generation IV designs). The staff will continue to engage stakeholders interested in pursuing such a risk-informed framework.

## II. RE-EVALUATION OF NUCLEAR POWER REACTOR SAFETY IMPROVEMENT ACTIVITIES 1 AND 2 FROM FUKUSHIMA NTTF RECOMMENDATION 1

### Background

Recommendation 1 of the Fukushima NTTF report, “Recommendations for Enhancing Reactor Safety in the 21<sup>st</sup> Century” (ADAMS Accession No. ML111861807), dated July 12, 2011, was to establish a “logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations.” The Chairman’s June 14, 2012, tasking memorandum on the RMTF report (NUREG-2150) directed the NRC staff to

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<sup>5</sup> Stakeholder feedback from industry representatives during the July 29, 2015, meeting indicated that the draft final 10 CFR 50.46a Risk-Informed Emergency Core Cooling System rule in SECY-10-0161, “Final Rule: Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements (10 CFR 50.46a),” was unlikely to be implemented by licensees because of high implementation costs. The staff believes that further stakeholder interaction is needed to determine the appropriate next steps for this potential rule. Eight months after receiving the Commission’s SRM on this SECY paper, the staff will prepare a COMSECY to inform the Commission of the results of this stakeholder interaction and the staff’s associated plans and schedule for addressing 10 CFR 50.46a.

consider, when developing options for the disposition of NTTF Recommendation 1, the regulatory framework recommendations for nuclear power reactors in the RMTF report. The staff provided its evaluation of NTTF Recommendation 1 and the RMTF report recommendations related to nuclear power reactor safety on December 6, 2013, in SECY-13-0132.

In the SRM on SECY-13-0132, the Commission closed NTTF Recommendation 1. The Commission directed the staff to re-evaluate the objectives of the staff's proposed Improvement Activity 1 (establish a new design-basis extension category) and Improvement Activity 2 (establish Commission expectations for defense in depth) "in the context of the Commission direction on a long-term Risk Management Regulatory Framework (RMRF), more specifically, the proposed policy statement." However, because these nuclear power reactor safety improvement activities are closely related to the staff's evaluation of NUREG-2150, the staff is providing its re-evaluations of Improvement Activities 1 and 2 in conjunction with its evaluation of the NUREG-2150 RMRF.

#### II.A. SECY-13-0132 Improvement Activity 1 - Establish Design-Basis Extension Category

Improvement Activity 1 in SECY-13-0132 recommended that the NRC adopt a new term -- "design-basis extension" -- to define and describe the events and requirements for nuclear power plants that have typically been characterized as "beyond-design-basis" events and accidents, even though they are within the "design bases" as defined in 10 CFR Section 50.2, "Definitions." The staff also proposed developing a standard set of "attributes"<sup>6</sup> and a standard set of treatment guidelines for each of the attributes that must be addressed for future requirements in the design-basis extension category.

#### Staff Re-evaluation of Improvement Activity 1 – Design-Basis Extension Category

The primary purpose of establishing a design-basis extension category would be to ensure that all new beyond design-basis regulatory requirements properly consider each of the appropriate regulatory attributes identified in SECY-13-0132. Formal development of this new category is unnecessary if the staff develops and implements clear internal rulemaking guidance (through office instructions, etc.) to ensure consistency in specifying all necessary regulatory attributes (performance goals, treatment requirements, documentation requirements, change processes, and reporting requirements) whenever new regulations are developed. Accordingly, the NRC staff intends to use existing resources (< 0.5 full time equivalent (FTE)) to develop internal rulemaking guidance to ensure completeness and consistency in specifying necessary regulatory attributes for all new regulations.

The NRC requested public comments on its re-evaluation of the NTTF Recommendation 1 improvement activities. Three commenters provided comments on establishing the

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<sup>6</sup> Attributes identified in SECY-13-0132 that should be addressed when specifying beyond-design-basis regulatory requirements include performance goals, treatment requirements, documentation requirements, change processes, and reporting requirements.

design-basis extension category (see Enclosure 1). All three commenters agreed with the NRC staff's determination that it is not necessary to establish a new category of events and associated requirements.

### NRC Staff Conclusion

The NRC staff determined that a new category of events should not be established. The Commission should note that the staff intends to use existing resources to develop and implement internal rulemaking guidance to ensure that all future nuclear power reactor regulations (especially those imposing beyond-design-basis requirements) include consistent and comprehensive rule language addressing all necessary regulatory attributes. This guidance will provide most of the benefits identified by the staff when Improvement Activity 1 was originally recommended to the Commission.

### II.B. SECY-13-0132 Improvement Activity 2 – Establish Commission Expectations for Defense in Depth

Improvement Activity 2 in SECY-13-0132 recommended that the NRC:

*Establish Commission expectations for defense in depth through the development of a policy statement that includes: the definition, objectives, and principles of defense in depth; associated implementation guidance containing decision criteria for ensuring adequacy of defense in depth; and conforming guidance to ensure integration of defense in depth with risk.*

The conforming guidance associated with this improvement activity would include revisions to the regulatory analysis guidelines and conforming changes to existing regulatory guides.<sup>7</sup>

### Staff Re-evaluation of Improvement Activity 2 - Establish Expectations for Defense in Depth

Key aspects of the NRC's existing regulatory guidance on defense in depth for power reactor safety are provided in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." A detailed history of agencywide applications of defense in depth was provided to the Commission in Enclosure 3 to SECY-13-0132. This history and associated general observations on defense in depth are being consolidated in a NUREG report for knowledge management purposes. The NRC staff is also interacting with the Committee on Nuclear Regulatory Activities Senior-level Task Group on Defense in Depth. That task group is currently drafting a "green book" on defense in depth, which will provide insights into the implementation of defense in depth following the accident at Fukushima, and may ultimately provide guidance on defense in depth in order to offer a consistent international approach. The NRC staff will remain involved in this work as it progresses.

The NRC staff's re-evaluation of the defense in depth improvement activity concluded that developing a policy statement on defense in depth for power reactor safety was unnecessary, and that further efforts to develop a definition of, and criteria for, determining adequacy of

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<sup>7</sup> A search of all power reactor regulatory guidance would be conducted to identify guidance documents that would need to be updated.

defense in depth should not be pursued in light of resource constraints and uncertainty of expected benefits. Instead of a policy statement, definition, and decision criteria, the staff intends to update the existing defense in depth guidance in Regulatory Guide 1.174 as directed by the Commission in the SRM to SECY-11-0014, "Use of Containment Accident Pressure in Analyzing Emergency Core Cooling System and Containment Heat Removal System Pump Performance in Postulated Accidents" (ADAMS Accession No. ML110740254), dated March 15, 2011. This SRM directs the staff to revise Regulatory Guide 1.174 "using precise language to assure that the defense-in-depth philosophy is interpreted and implemented consistently. To the extent that other regulatory guidance refers to defense in depth, the relevant documents should be updated also, as appropriate." This revision was largely completed in 2011, but the activity was deferred to ensure compatibility with anticipated further direction from the Commission on the staff's recommendation in SECY-13-0132 to establish Commission expectations for defense in depth. While this regulatory guide update would not result in a formal definition and criteria for adequacy of defense in depth, advances would be made by providing improved staff guidance for evaluating defense-in-depth issues. The staff believes that improved language in Regulatory Guide 1.174 on defense in depth will enhance risk-informed decision-making. Defense in depth is one of five "key principles of risk-informed regulation" set forth in Regulatory Guide 1.174, and must be discussed by licensees and applicants desiring to make risk-informed changes to their licensing basis.

Three public comments were received on Improvement Activity 2 (see Enclosure 1). Each of the commenters supported<sup>8</sup> the development of criteria and guidance for determining the adequacy of defense in depth for nuclear power reactor safety.

The basis for the staff's determination on Improvement Activity 2 is as follows. Regarding the need for a policy statement on defense in depth for nuclear power reactor safety, the staff judged that the benefits of a policy statement (compared to issuing or updating regulatory guidance) would not justify the additional resource expenditures. Because a policy statement would also require preparation of implementing regulatory guidance, resource expenditures to develop the policy statement could be avoided by issuing enhanced regulatory guidance alone.

As for defining defense in depth and developing criteria for determining its adequacy, the staff's re-evaluation determined that although this initiative could potentially succeed in establishing more predictable, objective criteria for determining the adequacy of defense in depth, the estimated resource requirements (6.3 FTE over a period of 3 to 4 years<sup>9,10</sup>) are significant. This resource estimate is for defense-in-depth efforts applicable to the power reactor safety program area only. If the activity were conducted on an agencywide basis (*i.e.*, included defense in depth for all other NRC program areas), resource needs would be considerably higher. The

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<sup>8</sup> Support from two commenters was conditioned with the provision that when developed, the guidance would meaningfully integrate defense in depth with risk information (instead of treating the two approaches as separate decision criteria).

<sup>9</sup> See page 27 of Enclosure 1 to SECY-13-0132 on Fukushima NTF Recommendation 1. This resource estimate includes 1.5 FTE (5 people working for 2 years at 15% of their time) to develop the power reactor safety policy statement and 4.8 FTE to develop the nuclear power reactor implementation guidance (6 people working for 2 years at 40% of their time).

<sup>10</sup> The initiator of the non-concurrence disagrees with these estimates. The non-concurring individual believes that work on defense in depth completed after SECY-13-0132 can be utilized and that the resources needed to develop and implement an agencywide definition and criteria for determining adequacy of defense in depth for all NRC program areas would be between 1.0 and 1.5 FTE.

NRC staff is aware of the current challenging resource environment. In light of this challenge, and after considering the uncertain benefits of developing a defense-in-depth definition and criteria, the staff does not recommend committing additional resources for their development. In lieu of developing the definition and criteria, the staff will pursue the Regulatory Guide 1.174 update as previously described.

The staff notes that the philosophy of defense in depth for nuclear power reactor safety has been implemented in the regulations, policy statements, guidance documents, and nuclear power plant designs even without a formal definition or objective criteria for determining the adequacy of defense in depth. Under the existing regulatory framework concerning defense in depth, the staff and the Commission have been able to make regulatory decisions on the various requirements in response to the Fukushima accident that involve major defense in depth considerations. The NRC continues to maintain its long-held commitment to the defense-in-depth concept; to the regulation of nuclear reactor issues beyond the traditional design-basis events, where appropriate; and to the inclusion of the defense-in-depth concept as an essential component of risk-informed regulation. Furthermore, in response to the Commission's SRM on SECY-11-0014, the staff will modify the Regulatory Guide 1.174 guidance on defense in depth to: (1) remove ambiguity, (2) re-structure the seven elements of defense in depth to more appropriately demonstrate their interrelationships, and (3) add examples to provide further clarification.

#### NRC Staff Conclusion

After re-evaluating Improvement Activity 2, the NRC staff does not recommend developing a definition of and criteria for determining adequacy of defense in depth. Therefore, the associated implementation guidance and policy statement described in Improvement Activity 2 are also unnecessary and not recommended.

### III. CONSIDERATION OF AN OVERARCHING, AGENCYWIDE POLICY STATEMENT ON USING THE RISK MANAGEMENT APPROACH

#### Background

NUREG-2150 recommends that an agencywide RMRF be adopted by the NRC by issuing a Commission Policy Statement. If an agencywide risk management policy statement were to be developed and implemented, it could potentially enhance and make more consistent the risk-informed, defense-in-depth regulatory approaches used for all program areas including reactors; industrial and medical uses of radioactive material; nuclear waste storage and disposal; fuel cycle facilities; and radioactive material transportation for both radiological safety and common defense and security.

The NRC staff drafted an initial white paper describing a conceptual example of an RMRF policy statement (ADAMS Accession No. ML13273A517) and published a notice in the *Federal Register* on November 25, 2013 (78 FR 70354), seeking public comments on the white paper. The staff held public meetings on June 5, 2013 (ADAMS Accession No. ML13197A216), and January 30, 2014 (ADAMS Accession No. ML14064A550). Public comments were accepted through the Federal Rulemaking Web site (<http://www.regulations.gov>). The public comments received in early 2014 on the draft conceptual agencywide policy statement varied greatly. The NRC staff's overall assessment was that the comments indicated a need for some revision to

the staff's approach. A summary showing the range and variability of these public comments is available in ADAMS (see Accession No. ML15104A718).

After reviewing public comments on the initial white paper, the staff developed a revised example of an overarching risk management policy statement. This revised example policy statement was one of three issues discussed by the NRC staff in a second RMRF white paper released for public comment on May 6, 2015 (ADAMS Accession No. ML15107A402). Public comments received on the second white paper are summarized in Enclosure 1. Only one commenter supported developing an agencywide risk management policy statement. The other commenters cited concerns with certain aspects of the policy statement and its implementation across different program areas and the amount of resources that would be required for this effort (which they viewed as being more effectively applied to other activities). Most commenters also believed that appropriate risk-informing actions could be taken under the existing regulatory framework without waiting for an agencywide policy statement to be developed. The commenter who supported the policy statement also expressed concern that the terms "defense in depth" and "risk-informed" would need to be well defined because they are not commonly understood in the materials licensee program area.

#### NRC Staff Recommendation

The NRC staff does not recommend pursuing an agencywide risk management policy statement. This decision is based on an analysis of the expected benefit of a policy statement compared to the resource expenditure to create the statement, and is informed by public feedback. These expected benefits could include enhanced consistency within and among the program areas and a regulatory framework that is more efficient and clearly communicates its policy to stakeholders, leading to a more stable and predictable process. Compared to the resource expenditure to create and implement a policy statement across the program offices, the NRC resources are not justified and are better focused on issues of greater safety significance. Ongoing staff activities to implement risk-informed approaches within NRC program areas will continue to move forward and are not impacted by the staff's recommendation against developing an agencywide risk management policy statement.

#### IV. DESCRIPTION OF THE INTERRELATIONSHIPS BETWEEN ONGOING RISK-INFORMED NUCLEAR POWER REACTOR SAFETY INITIATIVES

Enclosure 2, "Interrelationships Between Ongoing Risk-informed Power Reactor Safety Initiatives," is provided for information in response to the Commission's direction in the SRM on SECY-13-0132.

#### NON-CONCURRENCE

Two staff members non-concurred on this paper (see Enclosure 3). The two main issues in the non-concurrence are:

- As written, the draft SECY paper does not recommend that the NRC promptly initiate activities to develop an agencywide definition of defense in depth and associated implementation guidance for determining the adequacy of defense in depth.
- As written, the draft SECY paper does not recommend that the NRC develop an agencywide risk management policy statement.

The initiator of the non-concurrence shared her written views with the Advisory Committee on Reactor Safeguards during the November 5, 2015, full committee meeting. The non-concurrence process approver and coordinator met with the non-concurrence initiator (NCI) to discuss her views. After the discussion with the NCI, the staff added additional details associated with the resource estimates for conducting various defense-in-depth activities. With respect to the agencywide risk management policy statement, the NCI states “this policy statement would be keeping with the Agency’s strategic plan in managing risks and would ensure that NRC activities can evolve into a risk management framework which would lead to significant resource savings by being more consistent, efficient, effective, timely, clear, etc. in keeping with the Agency’s Principles of Good Regulation.” However, although these benefits may be possible, there is also uncertainty associated with the activity. Because the effort is not a mission-critical activity, the staff continues to believe that the NRC’s current resource limitations preclude undertaking the initiative. After the non-concurrence process was concluded, the initiator of the non-concurrence continued to non-concur, but the other non-concurring individual withdrew his non-concurrence.

#### COMMITMENTS:

1. The staff will use existing resources to develop and implement internal rulemaking guidance to ensure that all new nuclear power reactor regulations (especially those imposing beyond design-basis requirements) include consistent and comprehensive rule language addressing all necessary regulatory attributes (i.e., performance goals, treatment requirements, documentation requirements, change processes, and reporting requirements).
2. The staff will meet with interested stakeholders to discuss how to proceed with the draft final 10 CFR 50.46a Risk-Informed Emergency Core Cooling System rule. Eight months after receiving the Commission’s SRM on this SECY paper, the staff will prepare a COMSECY to inform the Commission of the resulting plans and schedule for addressing 10 CFR 50.46a. (See Footnote 5 on page 5.)

#### SUMMARY OF RECOMMENDATIONS:

The NRC staff recommends that the Commission direct the staff to:

1. Maintain the existing regulatory framework for the nuclear power reactor safety program area.
2. Refrain from developing an overarching, agencywide risk management policy statement.

With respect to these recommendations, the staff notes that the NRC will continue its long-held commitment to the defense-in-depth concept; to the regulation of nuclear reactor issues beyond the traditional design-basis events, where appropriate; and to the inclusion of the defense-in-depth concept as an essential component of risk-informed regulation. Ongoing staff activities to implement risk-informed approaches within NRC program areas will continue to move forward and are not impacted by the staff’s recommendation against developing an agencywide risk management policy statement.

RESOURCES:

Resource needs for the staff's planned activities are minimal (less than 1 FTE) and thus are not detailed in this paper.

COORDINATION:

The Office of the Chief Financial Officer reviewed this package and determined that it has no financial input. The Office of the General Counsel (OGC) has reviewed this paper and has no legal objection. However, with respect to the NTTF Recommendation 1 improvement activity on defense in depth, OGC offers the Commission the following additional information. The greater clarity that defense-in-depth criteria would bring to NRC decisionmaking would reduce the resources that OGC and other offices expend on developing and justifying regulatory documents, including cost-benefit analyses relying on defense in depth. OGC believes that developing a defense-in-depth definition and criteria (or decision rubric), beyond the enhancements that the staff plans for Regulatory Guide 1.174, may have the following benefits:

- Transparency and enhanced public confidence with respect to NRC decisions based in part on defense-in-depth considerations;
- Consistency in NRC regulatory decisions on defense in depth;
- More timely NRC regulatory decisions, resulting in more efficient use of NRC resources; and
- Harmonization of NRC's defense-in-depth concepts with international practices.

For these reasons, development of defense-in-depth criteria beyond the enhancements which the staff plans for Regulatory Guide 1.174 would enhance the NRC's legal posture in judicial tribunals. In addition, OGC believes that the discussion of defense in depth in this paper may overstate the difficulties and costs of the NTTF Recommendation 1 improvement activity. The SECY does not reference the substantial work already accomplished on defense in depth in SECY-13-0132, Enclosures 1 and 3, nor does it reflect the apparently large degree of commonality over the years and among various stakeholders with respect to the key elements of defense in depth. In addition, the staff is already committing to update Regulatory Guide 1.174 to address defense in depth, which incrementally reduces the resources needed to accomplish the NTTF improvement activity on defense in depth. Finally, the NRC's costs could be reduced from that reflected in the SECY paper if the Nuclear Energy Institute's commitment<sup>11</sup> to develop a paper addressing a structured, risk-informed approach to defense in depth resulted in a document which the NRC could approve for use (e.g., a regulatory guide).

The staff notes that it did consider the additional view provided by OGC in this section, and agrees that a defense-in-depth definition and criteria may be beneficial. Notwithstanding this view, given the current resource environment, the staff continues to recommend that a defense-in-depth definition and criteria not be pursued.

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<sup>11</sup> See Nuclear Energy Institute letter dated August 15, 2013 (ADAMS Accession No. ML13234A022).

Advisory Committee on Reactor Safeguards (ACRS) Conclusions and Recommendations

The staff met five times with the ACRS subcommittee, and once with the ACRS full committee to discuss the staff's recommendations for an RMRF. The ACRS prepared a letter dated November 13, 2015 (see ADAMS Accession No. ML15317A142), providing its recommendations and conclusions on the implementation of an RMRF. To summarize, the ACRS recommended and concluded that:

- The principles of a risk management regulatory framework should be established as a vision for how the agency will regulate 10- to 15- years in the future.
- The staff should work with licensees to develop a voluntary approach for a risk-informed alternative licensing basis.
- The ACRS agrees with the staff's conclusion to not establish a formal "design basis extension" category of events at this time.
- A Commission policy statement that includes the definition, objectives, and principles of defense in depth can be deferred until there is clear direction to move forward with a regulatory framework that encompasses an integrated risk-informed defense-in-depth concept.
- A new or revised Commission policy statement on agencywide adoption of the risk management regulatory framework is not needed.

With regard to the first two recommendations, the staff believes that, based on the internal and external objectives in the charter of the NRC's Risk-Informed Steering Committee (RISC), the RISC will oversee the incremental improvements to the current risk-informed regulatory framework and conduct further discussions with licensees regarding the use of PRA to support regulatory decisionmaking. The staff agrees with the remaining three recommendations and conclusions.

*/RA/*

Victor M. McCree  
Executive Director  
for Operations

Enclosures:

1. Summary of Public Comments  
on NRC Staff White Paper
2. Interrelationships Between Ongoing  
Risk-Informed Power Reactor  
Safety Initiatives
3. Non-concurrence (NCP-2015-11)

Advisory Committee on Reactor Safeguards (ACRS) Conclusions and Recommendations

The staff met five times with the ACRS subcommittee, and once with the ACRS full committee to discuss the staff’s recommendations for an RMRF. The ACRS prepared a letter dated November 13, 2015 (see ADAMS Accession No. ML15317A142), providing its recommendations and conclusions on the implementation of an RMRF. To summarize, the ACRS recommended and concluded that:

- The principles of a risk management regulatory framework should be established as a vision for how the agency will regulate 10- to 15- years in the future.
- The staff should work with licensees to develop a voluntary approach for a risk-informed alternative licensing basis.
- The ACRS agrees with the staff’s conclusion to not establish a formal “design basis extension” category of events at this time.
- A Commission policy statement that includes the definition, objectives, and principles of defense in depth can be deferred until there is clear direction to move forward with a regulatory framework that encompasses an integrated risk-informed defense-in-depth concept.
- A new or revised Commission policy statement on agencywide adoption of the risk management regulatory framework is not needed.

With regard to the first two recommendations, the staff believes that, based on the internal and external objectives in the charter of the NRC’s Risk-Informed Steering Committee (RISC), the RISC will oversee the incremental improvements to the current risk-informed regulatory framework and conduct further discussions with licensees regarding the use of PRA to support regulatory decisionmaking. The staff agrees with the remaining three recommendations and conclusions.

**/RA/**  
 Victor M. McCree  
 Executive Director  
 for Operations

Enclosures:

1. Summary of Public Comments on NRC Staff White Paper
2. Interrelationships Between Ongoing Risk-Informed Power Reactor Safety Initiatives
3. Non-concurrence (NCP-2015-11)

201200131 ADAMS Accession No.: Pkg.: ML15302A135; SECY: ML15265A488 \* via email

<b>OFFICE</b>	NRR/DPR/PRMB/PM	QTE*	NRR/DPR/PRMB/PM*	NRR/DPR/PRMB/RS*	NRR/DPR/PRMB/BC
<b>NAME</b>	RDudley	JDougherty	NJordan	GLappert	TInverso
<b>DATE</b>	10/01/2015	8/14/2015	10/06/2015	9/28/2015	10/06/2015
<b>OFFICE</b>	NRR/DPR/DD	NRR/DPR/D	NRR/DRA/D	RES/D*	OGC*
<b>NAME</b>	AMohseni	LKokajko	JGitter	BSheron (RCorrea for)	GMizuno
<b>DATE</b>	10/05/2015	10/07/2015	10/07/2015	10/20/2015	11/10/2015
<b>OFFICE</b>	NSIR/D*	NRO/D*	RES/DRA/PRB	RES/DRA/PRB/BC*	NRR/D
<b>NAME</b>	BHolian (MKohen for)	GTracy (GHolahan for)	MDrouin Non-concurred	JNakoski (withdrew non-concurrence)	WDean
<b>DATE</b>	10/21/2015	10/22/2015	11/12/2015	12/11/2015	12/15/2015
<b>OFFICE</b>	OCFO	EDO			
<b>NAME</b>	JGreen (RAllwein for)	VMcCree			
<b>DATE</b>	12/17/2015	12/18/2015			

## Summary of Public Comments on NRC Staff White Paper

The U.S. Nuclear Regulatory Commission (NRC) staff prepared a draft white paper, "NRC Staff White Paper on Options for Responding to the June 14, 2012, Chairman's Tasking Memorandum on 'Evaluating Options Proposed for a More Holistic Risk-Informed, Performance-Based Regulatory Approach'" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15107A402), dated April 20, 2015. On May 12, 2015, the NRC published a *Federal Register* notice of availability of the white paper (80 FR 27191) and provided an opportunity for public comments via the Federal rulemaking web site at <http://www.regulations.gov> under Docket ID NRC-2013-0254.

The NRC requested comments on the following topics:

- I. Three options for enhancing the risk management approach used to ensure nuclear power reactor safety.
- II. Re-evaluations of Fukushima Near Term Task Force Recommendation 1 Improvement Activity 1 – Establish a Design-Basis Extension Category of Events and Associated Regulatory Requirements and Improvement Activity 2 – Establish Commission Expectations for Defense in Depth.
- III. Consideration of an overarching, agencywide policy statement on using the risk management approach to ensure safety and security.

Comments were received from the following commenters:

- Commonwealth of Virginia (VA)
- Organization of Agreement States (OAS)
- Daniel Cronin (Cronin)
- Narasimha Prasad Kadambi (Kadambi)
- Nuclear Energy Institute (NEI) (2 letters)
- Connecticut Yankee Atomic Power Company (CY)
- Yankee Atomic Electric Power Company (YAEC)
- Maine Yankee Atomic Power Company (MY)
- FirstEnergy Nuclear Operating Company (FENOC)
- EnergySolutions (ES)

These comments are summarized by topic in the following discussion.

### I. Three Options for Enhancing the Risk Management Approach Used to Ensure Nuclear Power Reactor Safety

*Option 1 - Maintain the Current Regulatory Framework. All ongoing and planned risk-informed initiatives would continue.*

Four commenters (Kadambi, NEI, FENOC, and ES) provided comments on this option and all of them were in favor of maintaining the current framework.

*Option 2 - Implement a Risk-Informed Alternative Licensing Basis. The NRC would retain its existing generic regulatory structure but would promulgate a rule that allows licensees and applicants to comply with a risk-informed alternative licensing basis. The alternative licensing basis would utilize a suitable PRA model to provide plant-specific risk insights, which would be used along with the other elements of risk-informed regulation such as defense in depth, safety margins, and performance measurement strategies. Licensees/applicants of plants with a suitable PRA model would be able to risk inform how they address certain regulations and aspects of their licensing basis (e.g., which accidents and transients are to be included in their licensing basis). They would also be able to use the suitable PRA model to provide additional operational flexibility in responding to generic issues and informing NRC oversight activities. Licensees/applicants that choose to adopt the risk-informed alternative licensing basis would also be required to address vulnerabilities that might be identified by the plant-specific PRA. Criteria to define vulnerabilities would be developed. This option could result in eliminating or reducing requirements associated with some design-basis accidents included in a plant's licensing basis. If vulnerabilities were identified, a licensee might have to address some currently unregulated events.*

Three commenters (NEI, FENOC, and ES) provided comments on this option. All three expressed some level of interest in this approach but stated that the NRC had not yet developed sufficient implementation details regarding Option 2 to enable commenters to satisfactorily analyze its potential costs and benefits. None of these commenters recommended pursuing Option 2. One commenter (ES) stated that because of the insufficient analysis and level of detail associated with Option 2, the NRC staff should not include Option 2 in its SECY paper for the Commission.

*Option 3 - Implement the NUREG-2150 Plant-Specific Risk Management Regulatory Framework. The NRC would develop a plant-specific regulatory framework for nuclear power reactors derived from the approach recommended in NUREG-2150. A risk management goal would be established to provide protections to meet the higher level risk management objective. The NRC would issue a regulation requiring all licensees to have plant-specific PRAs meeting specified criteria. The NRC would create a "design enhancement category" of events that complement the design-basis accidents and transients to provide additional safety. A formal, risk-informed decision-making process would be implemented similar to the process described in Chapter 3 of NUREG-2150.*

Two commenters (NEI and ES) provided comments on this option. Neither commenter supported Option 3 for currently operating reactors. One commenter (NEI) stated that the approach was not viable. The other commenter (ES) stated that although insufficient implementation details had been provided by the NRC to allow an evaluation of its safety and cost benefits, Option 3 is unlikely to be justifiable for the current fleet of operating reactors. This commenter stated that Option 3 would be better applied to the next generation of power reactors.

## II. Staff Re-evaluation of Near-Term Task Force (NTTF) Recommendation 1 Improvement Activities 1 and 2

### *Improvement Activity 1 – Design Basis Extension Category*

Three commenters (NEI, FENOC, and ES) provided comments on establishing the design basis extension category. All three commenters agreed with the NRC staff's determination that it is not necessary to establish a new design basis extension category of events and associated requirements.

### *Improvement Activity 2 – Establish Commission Expectations for Defense in Depth*

Three commenters (NEI, FENOC, and ES) provided comments on establishing the Commission's expectations for defense in depth for power reactor safety. Two of these commenters (NEI and FENOC) supported the NRC staff's recommendation to develop additional criteria and guidance on the treatment of defense-in-depth as long as the guidance meaningfully integrates defense in depth with risk information (instead of treating the two approaches as separate decision criteria). The third commenter (ES) also stated that the NRC needs to better define how defense in depth will be applied.

## III. Consideration of an overarching, agencywide policy statement on using the risk management approach to ensure safety and security

All ten commenters provided comments on the agencywide policy statement. One commenter (OAS) supported an agencywide policy statement; but with respect to two key concepts that would be included in such a policy statement, stated:

“We cannot state or endorse the concept that there is a general understanding of the terms risk-informed and defense-in-depth ... As to defense-in-depth, this term seems to be used in multiple agencies, and we are not sure if the definition is consistent across all those agencies. If the intent is to use the same definition as that for nuclear power plants, we are not sure it transfers well to the material licensee realm.”

OAS and another commenter (VA) commented on the language regarding a risk management approach being used to ensure adequate protection of public health and safety, stating that the framework of the current regulatory system and processes already ensure adequate protection. Thus, they recommended that the policy statement be changed to explain that a risk management approach would review and identify potential enhancements to the current system and processes.

Seven other commenters (Kadambi, NEI, CY, YAEC, MY, FENOC, and ES) recommended against developing an agencywide policy statement. In general, these commenters believed that the NRC could appropriately risk-inform its regulatory programs without first preparing an agencywide policy statement.

One commenter (ES) said that a “risk management policy statement would require substantial industry resources to develop and implement without clear safety benefits.” This commenter cautioned the NRC “against adopting a single approach to risk management without defining

criteria and providing clear guidance on how to uniformly apply risk-informed decisions across the diverse NRC-regulated program areas” and noted that “the same regulatory approach [for defense in depth] may not apply uniformly to regulations of reactors, material, waste, fuel cycle, and security.”

Another commenter (FENOC) stated that “a high-level risk management policy statement that would apply to all program areas ... would be difficult to develop and implement ... [and] the resources that would be required ... could be used more effectively in other areas.”

NEI reiterated a previous Pressurized Water Reactors Owners Group comment that:

“The development, testing, and implementation of such a regulatory framework would be a significant task for one area within the NRC. Accomplishing this across the entire agency in a coordinated, consistent manner would appear to be an extremely challenging task for the NRC that will require a long period of time, inter-agency coordination, and perhaps a dilution of methodological approaches to satisfy all of the agency’s desires.”

Another commenter (Cronin) said:

“To limit premature decommissioning of low-power NRC-licensed research reactor facilities, it is imperative that any proposed Risk Management or Defense-in-Depth policy should be carefully weighed against Section 104c of the Atomic Energy Act of 1954. ... Section 104c requires the Commission to impose the minimum amount of such regulation and terms of license that will permit the agency to fulfill its obligation under th[e] Act ... with the intent of permitting the conduct of widespread and diverse research and development.”

## **Interrelationships Between Ongoing Risk-Informed Power Reactor Safety Initiatives**

### Background

The Commission's staff requirements memorandum (SRM) on SECY-13-0132, "Staff Requirements – SECY-13-0132 – 'U.S. Nuclear Regulatory Commission Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report,'" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14139A104) dated May 19, 2014, directed the staff to provide in the Risk Management Regulatory Framework (RMRF) Commission paper "a description of any interrelationships of ongoing risk-informed initiatives to ensure the activities are well coordinated, and effectively planned and implemented." The Commission stated that this description should, as a minimum, include:

- a. The RMRF working group development of "a policy to establish a common risk management regulatory framework that has consistent implementation elements to be applied to all U.S. Nuclear Regulatory Commission (NRC) licensed uses of byproduct, source and special nuclear materials;
- b. The SECY paper being developed as directed in the SRM for COMGEA-12-001/COMWDM-12-0002, "Proposed Initiative to Improve Nuclear Safety and Regulatory Efficiency" (November 5, 2012; ADAMS Accession No. ML12314A262) to evaluate using a site specific, risk-informed approach for prioritizing regulatory actions;
- c. Efforts of the NRC's Risk-Informed Steering Committee (RISC) to address a number of policy and technical issues related to the use of Probabilistic Risk Assessment (PRA) in risk-informed regulatory decisionmaking;
- d. Industry related initiatives, such as the December 2011 EPRI Report 1022997, entitled, "Identification of External Hazards for Analysis in Probabilistic Risk Assessment," and tabletop exercises to explore regulatory prioritization; and
- e. Staff efforts to address the defense-in-depth direction in SRM-SECY-11-0014, "Use of Containment Accident Pressure in Analyzing Emergency Core Cooling System and Containment Heat Removal System Pump Performance in Postulated Accidents," which directed the staff to revise Regulatory Guide (RG) 1.174 to use precise language to assure that the defense-in-depth philosophy is interpreted and implemented consistently and to update other documents to the extent that they refer to defense in depth.

### Identification of Additional Risk-Informed Activities

The RMRF working group reviewed ongoing risk-informed activities being performed to support the power reactor safety program. In addition to the activities identified in the Commission SRM, the staff identified the following interrelated activities (some of which are being conducted by entities outside the Agency):

- a. Activities addressing the SRM-SECY-13-0132 to consider Near-Term Task Force (NTTF) Recommendation 1 Improvement Activity 1 (new design-basis extension category of events) and Activity 2 (definition of and criteria for adequacy of defense in depth).
- b. Activities addressing the SRM-SECY-13-0132 to “enshrine” the history and insights related to defense in depth.
- c. Activities within the agency, activities conducted by the Electric Power Research Institute (EPRI), and activities undertaken by the RISC working groups associated with addressing uncertainty in decisionmaking; including revisions and workshops on NUREG-1855, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making” and associated EPRI Reports (EPRI 1013491, “Guideline for the Treatment of Uncertainty in Risk-Informed Applications Guide,” October 2006; EPRI 1016737, “Treatment of Parameter and Model Uncertainty for Probabilistic Risk Assessments,” December 2008; and EPRI 1026511, “Practical Guidance on the Use of PRA in Risk-Informed Applications with a Focus on the Treatment of Uncertainty,” December 2012).
- d. Activities associated with addressing external hazards, such as EPRI Report 3002003116, “An Approach to Risk Aggregation for Risk-Informed Decision Making,” April 2015; as a companion to EPRI 1022977.
- e. Activities addressing the SRM-SECY-14-0002, “Plan for Updating the U.S. Nuclear Regulatory Commission's Cost-Benefit Guidance,” regarding economic consequences and associated updates to the Regulatory Analysis and Backfit Analysis guidance.
- f. Activities addressing COMSECY-14-0014, “Cumulative Effects of Regulation and Risk Prioritization Initiative: Update on Recent Activities and Recommendations for Path Forward,” and the SRM-SECY-12-0137, “Implementation of the Cumulative Effects of Regulation Process Changes.”
- g. Activities related to risk-informed rulemakings, such as those related to the risk-informed alternative to address the effects of debris on long term cooling in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.46c, “Performance-Based Emergency Core Cooling Systems Cladding Acceptance Criteria,” 10 CFR 50.46a, “Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements” and the potential rulemaking to decouple the assumption of loss of offsite power from analysis of loss-of-coolant accidents (LOOP-LOCA).
- h. Activities related to updating regulatory guidance documents, such as RG 1.174, “An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions on Plant Specific Changes to the Licensing Basis,” RG 1.177, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,” and RG 1.178, “An Approach for Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping.”

- i. Activities involving broad-scope risk-informed licensing actions, such as 10 CFR 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors,” Risk Managed Technical Specifications (Risk-informed Technical Specification Initiative 4B), and Risk-Informed Surveillance Frequencies (Risk-informed Technical Specification Initiative 5B).
- j. Activities of the RISC working group associated with the acceptance of new PRA methods and close-out of peer review findings.

### Overview of Interrelationships

To illustrate how these activities are interrelated, the staff developed the attached influence diagram (Figure 1) to show the relationships<sup>12</sup> between the activities within the power reactor safety reactor arena.<sup>13</sup> In developing the influence diagram, the staff identified two major types of activities, policy development activities and implementation activities. These two types of activities are being conducted under the oversight of the RISC. Some policy development activities will inform other policy development activities as represented by the downward arrow showing how development of objective criteria for defense in depth could potentially inform the regulatory and backfit analysis policy guidance. Policy development activities will also guide various implementation activities as shown by the horizontal and diagonal arrows from certain policy activities to the adjacent implementation activities.

Technical development activities are shown on the right side of the diagram. These activities provide technical input to the RISC working groups on PRA uncertainty and PRA methods. The RISC working groups update the risk-informed guidance documents that facilitate the various types of risk-informed licensing actions and other risk-informed regulations.

### Detailed Description of Interrelationships

More specifically, updated cost-benefit guidance on the consideration of qualitative factors from Commission direction on the Qualitative Factors SECY paper would be used in regulatory and backfit analysis procedures to inform decisionmaking for ongoing and future risk-informed rulemakings such as the risk-informed alternative to address debris in 10 CFR 50.46c, 10 CFR 50.46a, and LOOP-LOCA. Similarly, regulatory framework recommendations from this RMRF SECY paper (i.e., internal rulemaking guidance) could also affect these future risk-informed rulemakings. Furthermore, it is possible that the NUREG on the history and insights on defense in depth could inform the development of criteria for determining the adequacy of defense in depth<sup>14</sup> and also the regulatory guidance on defense in depth in RG 1.174. The upward and downward arrows emanating from the implementation activity to

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<sup>12</sup> Arrows with solid lines represent actual influences and arrows with dotted lines represent potential influences that may result from ongoing but uncompleted activities.

<sup>13</sup> The influence diagram does not include all the ongoing or recently completed activities, but only some of the major activities. For example, activities related to risk-informing emergency preparedness have recently been completed and received an SRM from the Commission.

<sup>14</sup> Note, however, that this SECY paper recommends against applying resources to develop defense-in-depth criteria at the present time.

update RG 1.174 (and other risk-informed guidance) show how the periodically-updated risk-informed review guidance is used to inform both risk-informed rulemaking and risk-informed licensing action initiatives.

At the bottom left of the diagram, insights from the activities related to the Cumulative Effects of Regulation influenced the staff's recommendations<sup>15</sup> for the Risk Prioritization Initiative and associated Tabletop Exercises.

### Management Oversight

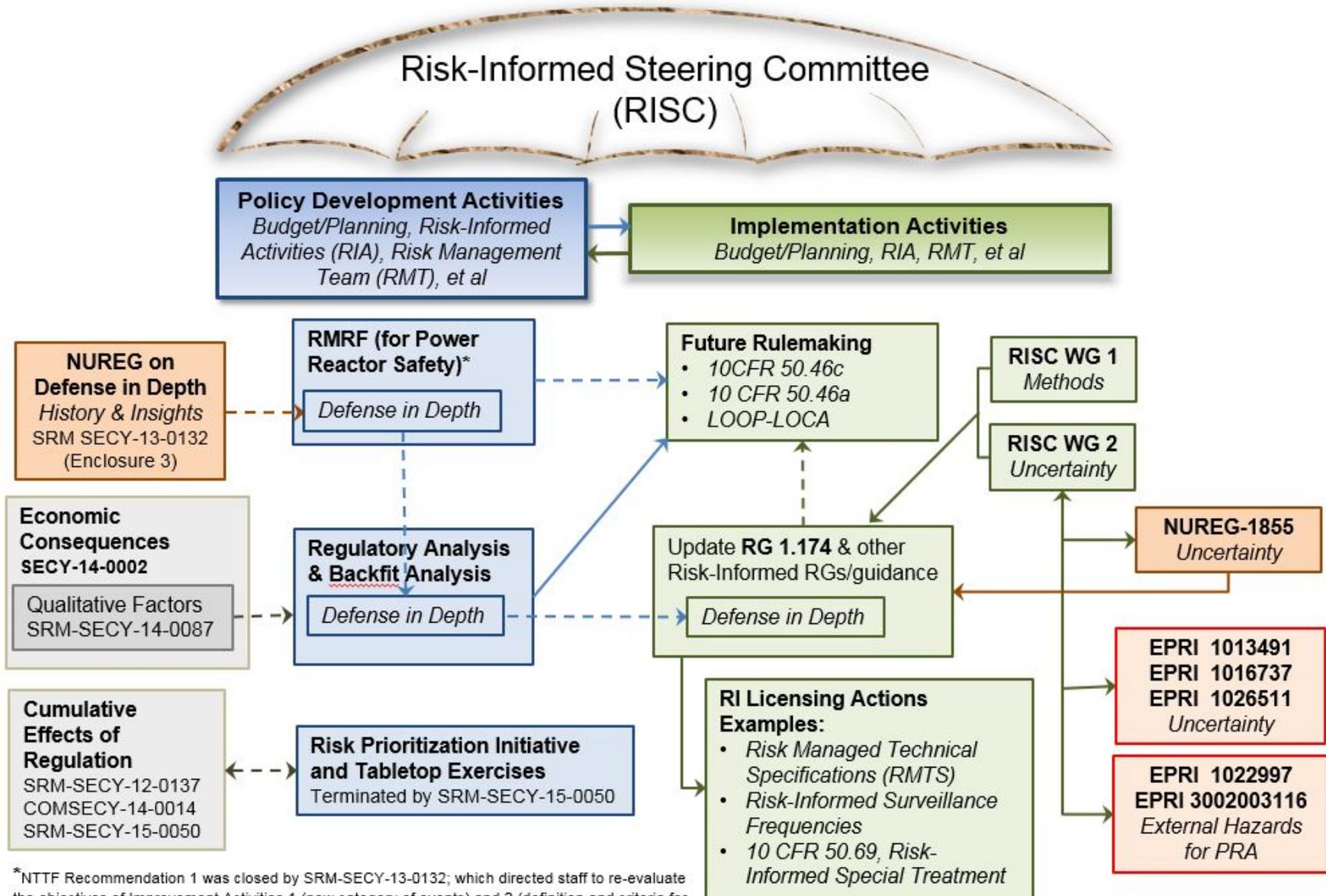
There are numerous management oversight processes and activities utilized by the staff to ensure that risk-informed activities are well planned and effectively coordinated and implemented. These include:

- a. Division and Office-level steering committees and interactions, such as the regular internal and external RISC meetings, weekly division-level coordination calls between the risk divisions in Office of Nuclear Regulatory Research (RES), Office of Nuclear Reactor Regulation (NRR), and Office of New Reactors (NRO), and the semi-annual User Need meetings between the RES risk division and the risk divisions of NRR and NRO.
- b. Staff level intra-office coordination and consistency activities, such as the Risk Management Team meetings, which meets the requirements of the NRR/NRO joint procedure on maintaining technical consistency.
- c. Budget/Planning and tracking activities (e.g., WITS items) also provide opportunities to ensure activities are properly resourced and scheduled reflecting inter-relationships between risk-informed activities and other NRC (and associated industry) activities.
- d. Risk-Informed Activities website, which provides the latest status on major risk-informed activities across the agency and currently includes an annual status SECY paper.

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<sup>15</sup> The staff's proposed actions related to the Risk Prioritization Initiative and Tabletop Exercises were rejected by the Commission in its SRM on SECY-15-0050 which terminated the effort.

# Figure 1. Interrelationships Between Ongoing Risk-informed Activities



\*NTTF Recommendation 1 was closed by SRM-SECY-13-0132; which directed staff to re-evaluate the objectives of Improvement Activities 1 (new category of events) and 2 (definition and criteria for defense-in-depth (DID)) as part of RMRF-related implementation activities.