

## **POLICY ISSUE INFORMATION**

November 2, 2011

SECY-11-0156

FOR: The Commissioners

FROM: Michael R. Johnson, Director  
Office of New Reactors

SUBJECT: FEASIBILITY OF INCLUDING RISK INFORMATION IN CATEGORIZING  
STRUCTURES, SYSTEMS, AND COMPONENTS AS  
SAFETY-RELATED OR NONSAFETY-RELATED

PURPOSE:

The purpose of this paper is to inform the Commission of the staff's assessment of the feasibility of including risk information in categorizing structures, systems, and components (SSCs) as safety-related or nonsafety-related for the design-specific small modular reactor (SMR) reviews either in the short term or the longer term. This paper does not address any new commitments.

SUMMARY:

The staff requirements memorandum (SRM) on SECY-11-0024, "Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews," dated May 11, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111320551), directed the U.S. Nuclear Regulatory Commission (NRC) staff to complete a feasibility study for using risk information in categorizing SSCs. The staff reviewed previous Commission policies that addressed "safety-related" or "nonsafety-related" SSC classification. This review went beyond issues related to new and advanced reactors, considering the spectrum of Commission policies, regulations, and guidance addressing this topic.

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Based on this review and engagement with the Office of the General Counsel (OGC) and external stakeholders, the staff concludes that in the short term the most appropriate use of risk information is to continue with the current plans to apply it in the SMR reviews. It is not feasible to make more substantive changes regarding the use of risk information in categorizing SSCs without significant modifications to the current regulations and associated guidance.

In the longer term the staff will develop recommendations to the Commission that address a new risk-informed and performance-based regulatory structure. The staff has devised an approach for the development of this regulatory structure that includes a pilot study, as described in SECY-11-0024, dated February 18, 2011. The pilot would test the concepts of a new, risk-informed regulatory framework, such as that described in NUREG-1860, "Feasibility Study for a Risk-Informed and Performance-Based Regulatory Structure for Future Plant Licensing," Volumes 1 and 2, issued December 2007.

With respect to resources, the staff is budgeted to conduct the short-term efforts. The staff has some resources to begin the longer-term efforts but would need additional resources to complete them.

#### BACKGROUND:

SRM-SECY-11-0024, "Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews," directed the staff to complete a feasibility study for using risk information in categorizing SSCs.

Specifically, SRM-SECY-11-0024 directed that:

- The staff should provide the Commission with a paper that explores the feasibility (e.g., regulatory infrastructure changes, resource requirements, and timing for implementation) of including risk information in categorizing SSCs as safety-related and nonsafety-related for the design-specific SMR review plans in both the short and longer term. Stakeholder input should be considered, as appropriate.
- The staff should consult with OGC on the Commission paper to determine if there are legal obstacles to this approach, namely to determine if this can be done without a rule change.
- The Commission paper should address its potential application to the overall regulatory framework and not be limited to SMRs.
- The Commission paper should include a review of previous Commission policies on the spectrum of new/advanced reactor policy issues that may have used "safety-related" or "non safety-related" SSC classification as part of the policy resolution.

#### DISCUSSION:

The staff reviewed key documents, including applicable Commission policy statements, regulations, and guidance related to a risk-informed approach to categorize SSCs. Enclosure 1 is a chronological list of those NRC documents. For most of these documents, the staff provides comments summarizing the salient points, especially as they relate to the use of risk information in SSC classification.

These documents describe an extensive history of NRC efforts to risk-inform SSC categorization and to develop a new risk-informed regulatory framework. In reviewing the past experience, the staff also explored options and tested current assumptions regarding what is needed to successfully implement risk-informed approaches to categorizing SSCs. The staff reaffirmed the current plans for developing a more risk-informed regulatory framework. These plans are described later in this paper. The staff then evaluated what changes are feasible in both the short term (prior to the receipt of an SMR design certification or license application) and in the longer term as they relate to the application of risk insights in the licensing of SMRs.

As a general matter, regulatory and policy changes, other than for minor interpretations and guidance, require notice and comment rulemaking. Also, substantive changes in guidance or interpretations are considered equivalent to a rule change requiring notice and comment under certain circumstances. Past experience suggests that the NRC would need to expend substantial resources, and substantially engage in stakeholder interactions, to complete rulemaking. It is not feasible to complete notice and comment rulemaking to make substantive changes to regulations and guidance to include risk information in the categorization of SSCs prior to receipt of a SMR application, based on current anticipated SMR design certification (DC) or construction permit application dates. The staff notes that once an application is received, the Commission can, on a case-by-case basis, allow the use of risk information in the categorization of SSCs by issuing exemptions and imposing application-specific requirements by order.

NRC's current regulations and policies, as well as associated guidance and interpretations, have a long historical practice of using deterministic concepts. A shift to a risk-informed interpretation, with its associated substantive changes to guidance and interpretations would effectively constitute a change in the NRC interpretation of the regulation and would likely require notice and comment. The staff notes that one of the reasons the NRC chose to implement Title 10 of the *Code of Federal Regulations* (10 CFR) 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," as a rulemaking, rather than as a change in interpretation of existing regulations, was because implementation of the risk-informed SSC classification concept represented a change in regulatory practice and would have a broad impact on other regulations. Based on historical practice, any other approach to using risk information in categorizing SSCs would likely require either some form of notice and comment rulemaking or the issuance of exemptions to existing regulations.

With this information in hand, the staff reached out to external stakeholders. Stakeholder input was obtained from public meetings that included a public meeting with the Nuclear Energy Institute and potential SMR vendors and applicants on June 15, 2011; the 10 CFR 50.69 Tabletop Exercise for New Plants public meeting on August 9, 2011; and a publicly-noticed teleconference on SRM-SECY-11-0024. Applicants for new, large light water reactors (LWRs) indicated they are focusing their resources on receiving a combined license (COL), however, some new reactor applicants have indicated a desire to pursue the flexibility in categorizing SSCs afforded by 10 CFR 50.69 after COL issuance. Similarly, SMR vendors and applicants are focusing their resources on preparing their design certification or license applications. No applicant indicated they plan to pursue the possible benefits that might be achieved through the

use of 10 CFR 50.69 prior to receiving a COL. In addition, no applicant indicated they plan to submit an exemption to the regulations related to the use of risk information in classifying their SSCs.

### Next Steps

In the short term, the staff plans to continue its efforts to risk-inform the SMR reviews. These include the activities discussed in SECY-11-0024, which consist of the preparation and application of Design-Specific Review Plans (DSRPs) in the review of SMR design applications. The DSRPs use risk insights to enhance the safety focus and efficiency of the SMR reviews.

In addition, the staff is prepared to review any application referencing existing regulations, such as 10 CFR 50.69, to apply risk insights and 10 CFR 50.12, "Specific Exemptions" to request exemptions as stated above. The staff believes that the current provisions of 10 CFR 50.12 would permit the Commission to approve regulatory exemptions that allow for implementation of risk-informed changes to operational and qualification requirements.

In the longer term the staff has devised an approach as described in SECY-11-0024, for the development of a new risk-informed and performance-based regulatory structure. This would involve development of a risk-informed framework for both LWRs and non-LWRs and would not be limited to SMRs. The staff's approach is a multistep process that will extend over several years and is expected to include several pilot studies in which the principles of a technology-neutral regulatory framework are considered for an integral pressurized water reactor (iPWR) design application and preapplication activities for non-LWRs to the extent those activities are practical and are supported by Commission budget decisions. In pursuing this approach, the staff will remain cognizant of efforts and Commission direction pursuant to SRM SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated August 19, 2011. The staff also will use, as appropriate, the results from the Task Force for Assessment of Options for More Holistic Risk-Informed, Performance-Based Regulatory Approach chartered by the Chairman's tasking memorandum to the Executive Director for Operations and the General Counsel, dated February 11, 2011.

The first step in the staff's longer-term approach would include a pilot study in which the principles of a technology-neutral regulatory framework are considered for an iPWR design application. The staff would conduct a pilot study of an iPWR design application by applying the principles of a technology-neutral regulatory framework (e.g., NUREG-1860) for review of the application. This pilot study is distinct from the licensing review, although the staff would seek to conduct the pilot study in parallel with review of the iPWR design application. The staff would determine the scope and depth of the pilot study during the iPWR preapplication activities (using preliminary results from probabilistic risk assessments) and would begin the pilot study following the submittal of the application. The staff intends to conduct this study in cooperation with the applicant and in a manner to minimize burden on the applicant. The staff may need to make assumptions or otherwise compensate for limitations on interactions with designers and the possible lack of information beyond that needed for the actual licensing review. The staff would develop and document insights that it acquires from the pilot study.

The resource estimates for the pilot study are provided in the Resource section below but will need to be refined during detailed project planning wherein the scope, methodology and schedule are determined.

In pursuing the longer term approach, the staff may identify possible changes to the regulations that would result in a risk-informed framework that would address, among other things, the categorization of SSCs. While it is possible that a change to the regulations stemming solely from the longer term approach could be proposed, the staff thinks it more likely that an integration of concepts from pursuing SRM SECY-11-0093 and the activities being conducted in response to the Chairman's tasking memorandum would provide the basis for substantive risk-informed changes to the regulations (i.e., 10 CFR Part 5X).

In response to SRM SECY-11-0024, the staff has provided resource estimates for a rulemaking that might follow from the longer-term activities. However, these estimates do not reflect any integrated activity that might be proposed.

#### RESOURCES:

As described above there are essentially no short term additional funding requirements.

Cost estimates for longer-term activities are provided below.

The resource estimate for the pilot study is approximately 1 Office of New Reactors (NRO) full-time equivalent (FTE) staff member and 1 Office of Nuclear Regulatory Research (RES) FTE and \$1 million over 1 year.

The resource estimate for developing a new 10 CFR Part 5X based on results from the longer-term activities described in this paper is 25 to 50 NRO FTE over 4 to 8 years and 2 to 3 RES FTE for 2 to 3 years and \$750K.

NRO has budgeted 4 FTE in the FY 2012 Budget Request and the FY 2013 Performance Budget under Business Line: New Reactors, Product Line: Licensing; Product: Licensing Support. However, the majority of the longer-term activities would require additional funding. RES has no budgeted resources in FY 2012 or FY 2013 to conduct pilot studies. Longer-term activities will require additional funding. The additional funding will be requested as part of the NRC's FY 2014 budget process.

It should be noted that staff with the appropriate skill sets to support the pilot study will also be supporting the review of upcoming SMR DC and license applications expected to begin in 2013. This may create limitations on resource skill set availability for both the staff and industry that could affect the schedules discussed above as priority will be given to the certification and licensing reviews.

The Commissioners

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COORDINATION:

OGC has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

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Michael R. Johnson, Director  
Office of New Reactors

Enclosure:

1. Key References and Documents Reviewed  
Including Applicable Previous Commission Policies

COORDINATION:

OGC has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

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**SECY-012**

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**Key References and Documents Reviewed, Including Applicable Previous Commission Policies**

Below is a chronological listing of references and documents reviewed, including previous Commission policies, related to a risk-informed approach to categorizing structures, systems and components (SSCs). Dates for references in Title 10 of the *Code of Federal Regulations* (10 CFR) references are based on the latest revision.

<b><u>Date</u></b>	<b><u>Document and Comments</u></b>
1956	10 CFR 50.2, "Definitions" (specifically for SSCs)
1984	Generic Letter 84-01, "NRC Use of the Terms, "Important to Safety" and "Safety-Related," dated January 5, 1984. <ul style="list-style-type: none"> <li>• The staff clarified the staff's use of the terms "safety-related" and "important to safety."</li> </ul>
1991	10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," latest revision 2007. <ul style="list-style-type: none"> <li>• The term "risk significance" first appeared in Regulatory Guide (RG) 1.160, January, 1995, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," which endorsed NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," as one acceptable method to satisfy 10 CFR 50.65 requirements.</li> </ul>
1985	10 CFR 50.12, "Specific Exemptions." <ul style="list-style-type: none"> <li>• Current NRC regulations allow applicants and licensees to request the application of risk insights in the design, construction, and operation of nuclear power plants through the exemption provisions in 10 CFR 50.12.</li> </ul>
1995	SECY-95-132, "Policy and Technical Issues Associated with regulatory treatment of nonsafety systems (RTNSS) in Passive Plant Designs," dated May 22, 1995." <ul style="list-style-type: none"> <li>• The paper discussed the new NRC process for the RTNSS in passive plants.</li> <li>• It established the Reliability Assurance Program.</li> </ul>
1997	Direction-Setting Issue-12 (Draft), "Risk-Informed, Performance-Based Regulation" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML051610706), dated April 15, 1997. <ul style="list-style-type: none"> <li>• The Commission stressed the use of probabilistic risk assessment (PRA) concepts that allow a risk-graded approach for determining high- and low-risk activities. Risk insights could be used to reduce unnecessary regulatory burdens, as well as to identify areas where requirements should be increased.</li> </ul>



1998	<p>SECY-98-300, "Options for Risk-Informed Revisions to 10 CFR Part 50—'Domestic Licensing of Production and Utilization Facilities,'" (ML992870048), dated December 23, 1998.</p> <ul style="list-style-type: none"> <li>• This SECY presented three options for risk-informed modifications to 10 CFR Part 50: (1) continue ongoing rulemaking activities and risk-informed approaches, making no changes to the current 10 CFR Part 50, (2) modify the scope of special treatment rules in 10 CFR Part 50 to be risk informed, and (3) make changes to specific requirements in the body of regulations, including Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," to 10 CFR Part 50.</li> <li>• Proposed that safety related SSCs that are low safety significance would move from special treatment to normal industrial (sometimes called commercial grade) treatment. They would, however, remain in the plant and be expected to perform their design function, although without the additional margin, assurance, or documentation required for current safety-related SSCs. Conversely, SSCs that are currently not safety-related but that are determined to be safety significant would move from normal industrial to regulatory treatment.</li> <li>• The staff recommended developing risk-informed approaches to the application of special treatment requirements. This option only addressed implementing changes to the regulatory scope for SSCs needing special treatment in terms of providing assurance that the SSCs will perform their functions. It did not address changing the design of the plant or the design-basis accidents, which establish the physical complement of plant systems included in the design.</li> <li>• This paper recognizes that current provisions of 10 CFR 50.12 would permit the Commission to approve regulatory exemptions that allow for early implementation of risk-informed reductions to operational and qualification requirements. The NRC could grant an exemption to operational requirements that involve, in total, no change or a decrease in risk, pursuant to 10 CFR 50.12(a)(2)(iv). The NRC could grant an exemption under 10 CFR 50.12(a)(2)(vi) that involves an increase in risk, if the Commission were able to find that quantitative risk information had not been considered in establishing the regulatory requirement that is the subject of the exemption. The rationale for granting an exemption under 10 CFR 50.12(a)(2)(vi) would be that quantitative risk information constitutes a "material circumstance" not considered when the regulation was adopted.</li> </ul> <p>Granting limited exemptions to a limited number of plants for purposes of pilot testing does not pose any special problems, but the repeated issuance of a large number of exemptions that, considered together, represent a fundamental alteration of the conceptual nature of the licensing basis, to more than a limited number of plants, essentially constitutes a generic change to the regulatory requirements in 10 CFR Part 50. Such generic changes should be adopted through rulemaking, rather than case by case, which is inherent in the regulatory approach embodied in the issuance of exemptions. Similarly, the granting of a large number of exemptions to a single plant should not be so extensive that the validity of the original license is called into question (e.g., granting wholesale exemptions to all GDC and regulations for an extensive subset of SSCs).</p>
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1999	<p>Staff Requirements Memorandum (SRM) for SECY-98-300, dated June 8, 1999.</p> <ul style="list-style-type: none"> <li>• The Commission approved the following: <ul style="list-style-type: none"> <li>• Implement Option 2 and incorporate the Maintenance Rule.</li> <li>• Allow voluntary implementation of the risk-informed alternative requirements. The Commission deferred judgment on the issue of selective implementation.</li> <li>• Use industry pilot studies.</li> </ul> </li> </ul>
1999	<p>SECY-99-256, "Rulemaking Plan for Risk-Informing Special Treatment Requirements," dated October 29, 1999.</p> <ul style="list-style-type: none"> <li>• This resulted in the staff issuing 10 CFR 50.69 in 2004.</li> <li>• The staff proposed creating an Appendix T, "Categorization of SSCs Into Risk-Informed Safety Classes," to 10 CFR Part 50.</li> <li>• The staff decided not to define or redefine the existing terms (i.e., "safety related" or "important to safety"), primarily because it judged this approach to be relatively inefficient and ineffective from a regulatory standpoint. The staff concluded that the use of the same terms having two different meanings would unnecessarily complicate and confuse the existing regulations governing power reactors. The potential level of confusion could be significant, considering the potential for licensees to elect to implement the risk-informed alternative for only a subset of revised rules, resulting in the use of similar language with different meanings in the licensee's licensing-basis documents and in the associated plant-implementation documents. In fact, this type of confusion would be unavoidable when licensees are phasing in the new approach at their facilities as they recategorize the SSCs in various plant systems. Both the terms "safety related" and "important to safety" have a long regulatory history that has established their meaning and interpretation in both a technical and regulatory sense. The staff concludes that it is better to avoid the potential for reopening previous debates concerning these terms (and the associated resource drain for both the staff and industry).</li> <li>• Introduced the explicit 4-box risk-informed safety class (RISC) category boxes for SSCs.</li> </ul>

2002	<p>NUREG-1755, "Some Observations on Risk-Informing Appendices A and B to 10 CFR Part 50," prepared for the Advisory Committee on Reactor Safeguards, January 2002.</p> <ul style="list-style-type: none"> <li>• This discusses possible changes to the GDC of Appendix A to 10 CFR Part 50 to make them more consistent with a risk-informed regulatory structure. It considered (1) changing the scope of the GDC from "important to safety" to "important to risk," (2) modifying individual criteria to address risk more directly, and (3) replacing the GDC with safety goals and risk acceptance criteria. As written, the GDC apply to SSCs important to safety, which are defined as those SSCs that are required to provide reasonable assurance that there will be no undue risk to public health and safety. If the scope is changed to "important to risk," the GDC can be applied to those SSCs that will have the greatest impact on reducing risk, as measured by risk metrics such as core damage frequency or large early release frequency.</li> <li>• Such changes might involve replacing requirements for redundancy, diversity, and independence with an overall reliability goal for a system or function. The staff examines the applicability of the GDC to plants that are not light-water reactors (LWRs) and concludes that slightly more than half of the criteria could apply to non-LWRs, but the remainder should be modified or replaced to address phenomena important to the safety of other reactor types. Another brief discussion of the quality assurance requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 concludes that Appendix B has sufficient flexibility to permit less stringent requirements for SSCs that are less important to risk.</li> </ul>
2003	<p>SECY-03-0059, "NRC's Advanced Reactor Research Program," April 18, 2003.</p> <ul style="list-style-type: none"> <li>• This paper included a discussion of the staff's plan to develop a technology-neutral, risk-informed regulatory structure for new plant licensing.</li> </ul>
2004	<p>10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," November 22, 2004.</p> <ul style="list-style-type: none"> <li>• It established an alternative risk-informed approach for the treatment of nuclear power plant SSCs, based on their safety significance, as an alternative to the special treatment requirements for safety-related SSCs specified in the NRC regulations.</li> <li>• The determination of the safety significance of SSCs uses an integrated decisionmaking process incorporating both risk and traditional engineering insights. The safety functions of SSCs include both the design-basis functions (derived from the safety-related definition) and functions credited for preventing or mitigating severe accidents. Treatment requirements are then commensurately applied to the categorized SSCs to maintain their functionality. The 10 CFR 50.69 risk-informed SSC categorization scheme overlays the safety-related versus nonsafety-related SSC categories with the safety-significance categories. Risk insights can be used to identify SSCs as being either safety significant or low safety significant. (The NRC introduced the safety-significance categorization earlier as a part of the Reliability Assurance Program for new plants licensed under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." The NRC derived the criteria from those established under the Maintenance Rule.)</li> <li>• It incorporated the SECY-98-300 approach of combining the "safety-related" and "safety-significant" terminology and placing SSCs in one of four RISC category boxes.</li> </ul>

2006	<p>SECY-06-0007, "Staff Plan to Make a Risk-Informed and Performance-Based Revision to 10 CFR Part 50," January 9, 2006.</p> <ul style="list-style-type: none"> <li>This SECY requested Commission approval to issue an Advance Notice of Proposed Rulemaking (ANPR) soliciting stakeholder feedback on rulemaking approaches related to making technical requirements for power reactors risk informed and performance based and to allow the staff to supplement the ANPR with additional information, as needed, to solicit stakeholder input.</li> </ul>
2006	<p>SRM for SECY-06-0007, March 22, 2006.</p> <ul style="list-style-type: none"> <li>The SRM directed the staff to recommend whether to issue a rulemaking for risk-informed, performance-based technical requirements for future reactors and, if so, how to proceed.</li> <li>It approved issuance of an ANPR, addressed in SECY-07-0101 (see below).</li> </ul>
2006	<p>RG 1.201, "Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to Their Safety Significance," Revision 1, May 2006</p> <ul style="list-style-type: none"> <li>The staff accepted Nuclear Energy Institute (NEI) 00-04, "10 CFR 50.69 SSC Categorization Guideline," Revision 0, issued July 2005 as one means of categorizing nuclear power plant SSCs in support of the implementation of 10 CFR 50.69.</li> </ul>
2007	<p>SECY-07-0101, "Staff Recommendations Regarding a Risk-Informed and Performance-Based Revision to 10 CFR Part 50," June 14, 2007.</p> <ul style="list-style-type: none"> <li>The staff requested Commission approval of recommendations for a risk-informed and performance-based revision to 10 CFR Part 50 for the next generation nuclear non-LWRs, specifically the pebble bed modular reactor.</li> <li>The SECY also informed the Commission of the results of the staff's review of stakeholders' comments provided in response to an ANPR on the development of risk-informed and performance-based requirements applicable to nuclear power reactors.</li> <li>The staff recommended deferring rulemaking.</li> </ul>
2007	<p>SRM for SECY-07-0101, September 7, 2007 (ADAMS Accession No. ML072530501).</p> <ul style="list-style-type: none"> <li>The Commission indicated that the staff should publish its technology-neutral regulatory framework, discussed in SECY-07-0101.</li> <li>The Commission approved deferring the rulemaking.</li> </ul>
2007	<p>NUREG-1860, "Feasibility Study for a Risk-Informed and Performance-Based Regulatory Structure for Future Plant Licensing," December 2007.</p> <ul style="list-style-type: none"> <li>This NUREG established the feasibility of developing a risk-informed and performance-based regulatory structure for licensing future (advanced non-LWR) nuclear power plants.</li> <li>It documented a framework that provides an approach, scope, and criteria for developing a set of requirements that would serve as an alternative to 10 CFR Part 50 for licensing future non-LWRs.</li> <li>It incorporated a safety classification scheme in which all plant SSCs fall into two categories, safety significant or nonsafety significant, distinguished by whether the SSCs need special treatment or not. This differs from the scheme for current reactors, where a distinction is made among safety-related, safety-significant, nonsafety-related, and important-to-safety equipment.</li> <li>The concepts in NUREG-1860 can be used to develop a risk-informed and performance-based process for licensing future nuclear power plants.</li> </ul>

2009	<p>SECY-09-0056, "Staff Approach Regarding a Risk-Informed and Performance-Based Revision to Part 50 of Title 10 of the <i>Code of Federal Regulations</i> and Developing a Policy Statement on Defense-in-Depth for Future Reactors," April 7, 2009.</p> <ul style="list-style-type: none"> <li>• This paper informed the Commission of the staff's planned approach about rulemaking for a risk-informed and performance-based revision to 10 CFR Part 50 for future reactors and the development of a defense-in-depth policy statement for future reactors.</li> <li>• The staff recommended deferring rulemaking.</li> <li>• The paper described current NRC activities related to developing a risk-informed regulatory structure and testing it in parallel with the review of the NGNP application.</li> </ul>
2009	<p>Memorandum, "Alternative Risk Metrics for New Light-Water Reactor Risk-Informed Applications," dated February 12, 2009, from R. W. Borchardt, NRC Executive Director for Operations, to the Commission, enclosing a "White Paper on Options for Risk Metrics for New Reactors." (ADAMS Accession No. ML090150636).</p>
2009	<p>NEI letter to Girija S. Shukla, NRC, "Transmission of Industry White Paper, 'Risk Metrics for Operating New Reactors,' for ACRS Review," March 27, 2009 (ADAMS Accession No. ML090900674).</p>
2010	<p>SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," March 28, 2010.</p> <ul style="list-style-type: none"> <li>• The staff identified potential policy, licensing, and technical issues that might require Commission consideration to support future design and license review applications for small modular reactors (SMRs).</li> </ul>
2010	<p>Commission COMGBJ-10-0004/COMGEA-10-0001, "Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor Reviews," July 9, 2010.</p> <p>The Commission requested the following (which led to the development of SECY-11-0024):</p> <ul style="list-style-type: none"> <li>• Develop a framework, implementation strategy, plans, and schedules to more fully integrate the use of risk insights into preapplication activities and the review of SMR applications, consistent with Commission policy statements. This effort should focus on the use of risk insights to identify risk-significant SSCs and aspects of the design that contribute most to safety.</li> <li>• Align review resources, consistent with regulatory requirements, to risk-significant SSCs to enhance the efficiency of the review process. The plan should address the staff's use of risk insights in determining which portions of existing review guidance (e.g., standard review plans) it should apply to SMRs.</li> <li>• Develop risk-informed licensing review plans for each of the SMR reviews, including the associated preapplication activities.</li> <li>• Develop a new risk-informed regulatory framework, with a longer-term objective to build on the SMR reviews, insights gained from future non-LWR review activities, and the earlier technology-neutral framework presented in NUREG-1860.</li> </ul>

2010	<p>SRM on COMBGJ-10-0004/COMGEA-10-0001, August 31, 2010 (ADAMS Accession No. ML102510405).</p> <p>The Commission requested the following (which led to the development of SECY-11-0024):</p> <ul style="list-style-type: none"> <li>• Describe how the staff intends to develop resolution strategies for—and engage the Commission on—the substantive policy considerations for SMR licensing laid forth in SECY-10-0034. Some of these policy issues include accident source terms that would be used to assess the effectiveness of the containment and plant mitigation features, site suitability, and emergency planning; requirements for operator staffing for small or multimodular facilities; and security and safeguards requirements for SMRs.</li> <li>• Include a discussion of how the staff would propose to align (or deconflict) NRC resources for licensing new reactors to support this development.</li> <li>• In the plans and schedules to be included in the staff’s paper, account for the existence of ongoing prelicensing activities with SMR vendors who have already discussed their licensing strategies with the staff. In developing this paper, the staff should seek input from SMR vendors and other relevant external stakeholders.</li> </ul>
2010	<p>SECY-10-0121, “Modifying the Risk-Informed Regulatory Guidance for New Reactors,” September 14, 2010.</p> <ul style="list-style-type: none"> <li>• The paper requested Commission approval of the staff’s recommendation to modify the risk-informed regulatory guidance to recognize the lower risk profiles of new reactors and to prevent a significant decrease in the enhanced levels of safety provided by new reactors.</li> </ul>
2011	<p>SRM for SECY-10-0121, March 2, 2011.</p> <ul style="list-style-type: none"> <li>• The Commission disapproved the staff’s recommendation to modify risk guidance for new reactors and approved a hybrid of options described in SECY-10-0121.</li> </ul>
2011	<p>SECY-11-0024, “Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews,” February 18, 2011.</p> <ul style="list-style-type: none"> <li>• The staff reviewed the history of the application of risk insights to nuclear power plant regulation and discussed its plans to apply such insights in licensing SMRs.</li> <li>• The staff responded to the Commission request to develop a policy paper, with near-term efforts focused on integral pressurized-water reactor designs that address the following: <ul style="list-style-type: none"> <li>○ Develop a framework, implementation strategy, plans, and schedules to more fully integrate the use of risk insights into preapplication activities and the review of SMR applications consistent with Commission policy statements.</li> <li>○ Align review focus and resources, consistent with regulatory requirements, to risk-significant SSCs and other aspects of the design that contribute most to safety to enhance the efficiency of the review process.</li> <li>○ Develop risk-informed licensing review plans for each of the SMR reviews, including the associated preapplication activities.</li> <li>○ Develop a new risk-informed regulatory framework and, as a longer-term objective, build on the SMR reviews, insights gained from the future NGNP review activities, and the earlier technology-neutral framework presented in NUREG-1860.</li> <li>○ In the plans and schedules to be included in the staff’s paper, account for the existence of ongoing prelicensing activities with SMR vendors who have already discussed their licensing strategies with the staff.</li> </ul> </li> <li>• As stated in SECY-11-0024, the staff has developed an approach for creating, over the longer term, a new risk-informed and performance-based regulatory structure for licensing advanced reactor designs (e.g., high-temperature gas reactors and liquid metal reactors) in response to paragraph d of SRM-COMBGJ-10-0004/COMGEA-10-0001.</li> </ul>

2011	<p>SRM on SECY-11-0024, May 11, 2011.</p> <ul style="list-style-type: none"> <li>• The Commission approved the staff's proposed plan as outlined in SECY-11-0024.</li> <li>• It directed the staff to explore the feasibility (e.g., regulatory infrastructure changes, resource requirements, and timing for implementation) of including risk information in categorizing SSCs as safety related and nonsafety related for the design-specific SMR review plans in both the short and longer term.</li> </ul>
2011	<p>RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 2, May 2011.</p> <ul style="list-style-type: none"> <li>• The RG describes an acceptable approach for assessing the nature and impact of changes to proposed plant licensing bases by considering engineering issues and applying risk insights.</li> </ul>
2011	<p>IAEA Draft Safety Guide DS 367, "Safety Classification of Structures, Systems and Components in Nuclear Power Plants," dated February 4, 2011.</p> <ul style="list-style-type: none"> <li>• The NRC has comments and has not yet endorsed this guide.</li> </ul>
2011	<p>SECY-11-0089, "Options for Proceeding with Future Level 3 Probabilistic Risk Assessment Activities," July 7, 2011.</p> <ul style="list-style-type: none"> <li>• This paper provides the basis for proceeding with a full-scope comprehensive site Level 3 PRA.</li> </ul>
2011	<p>SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," July 12, 2011.</p>
2011	<p>SRM for SECY-11-0093, August 19, 2011.</p>
2011	<p>Task Force for Assessment of Options for More Holistic Risk-Informed, Performance-Based Regulatory Approach, chartered by the Chairman's tasking memorandum to the Executive Director for Operations and the General Counsel, February 11, 2011.</p>