

Attachment

Industry Position on the Use of Qualitative Factors to Support Imposition of SAMGs¹

In the pre-decisional draft regulatory analysis for the proposed rulemaking to address mitigation of beyond-design-basis events ("MBDBE rulemaking"), the staff suggests using qualitative factors to justify imposition of a requirement for licensees to develop and maintain Severe Accident Management Guidelines (SAMGs).² The staff discusses the benefits associated with imposing a SAMG requirement in terms of recent quantitative risk analyses, qualitative factors, and comparisons to the Fukushima experience.

Based on the results of the available quantitative risk information, the staff concluded that:

[Q]uantifiable risk information is not sufficient to justify the imposition of SAMGs requirements. The estimated benefit to safety showed no benefit for acute fatalities and small benefits for latent cancer fatalities (an estimated reduction of 10^{-9} or 10^{-10} for latent cancer fatalities). . . . The quantitative health objective (QHO) provides a risk criterion for regulatory decision-making, and in this case the results are 1,000 to 10,000 times below the QHO. Even the high-level conservative estimate (i.e., this can be considered a bounding level that equates to a maximum possible safety benefit) is well below the QHO. This quantitative result indicates that the use of SAMGs would result in minimal benefits to the public health and safety.³

In describing the available risk information, the staff reviewed the history of the Commission's consideration of severe accident risk and SAMGs.⁴ After providing this history, which resulted in the voluntary SAMG initiative implemented by industry in the 1990s, the Draft Regulatory Analysis examines how more current events and analyses may affect the Commission's previous treatment of severe accident risk. The staff reaches several important conclusions. First, the Draft Regulatory Analysis states that "there are sound reasons to conclude that the current risk of severe accidents is much less than existed in 1985, when the Commission concluded that severe accident risk did not warrant immediate regulatory action."⁵ The staff cites 30 additional years of regulations that have

¹ This attachment is intended to supplement some of the more general concerns expressed in the associated cover letter. Thus, it focuses on the use of qualitative information and is not necessarily a complete representation of industry's views on the Draft Regulatory Analysis document supporting the MBDBE rulemaking. Industry will provide our complete comments on the rulemaking package, including the Draft Regulatory Analysis and associated backfitting analysis, when those documents are published for public comment.

² *Draft Regulatory Analysis: Proposed Rulemaking to Address Mitigation Beyond-Design-Basis Events*, February 24, 2015 (pre-decisional ML15068A284)("Draft Regulatory Analysis"). The NRC made a pre-decisional version of the draft regulatory analysis publicly available in preparation for briefings with the Advisory Committee on Reactor Safety.

³ Draft Regulatory Analysis, at 42.

⁴ *Id.* at 62-65.

⁵ *Id.* at 68.

substantially lowered severe accident risk, including the Station Blackout Rule (10 C.F.R. 50.63) and the requirements of Order EA-12-049. The staff concludes “[t]he result of just these two regulatory actions alone has substantially reduced risk to well below the levels that existed in 1985.”⁶

Next, the staff examined the extensive quantitative risk information recently developed to support the Containment Protection Release Reduction (CPRR) rulemaking. That work estimates the potential benefits of strategies deployed after the onset of core damage and includes consideration of recent post-Fukushima regulatory efforts. While acknowledging that the CPRR work “does not provide a complete quantitative measure” of the benefits of SAMGs, the staff explained:

The CPRR risk work shows that under a bounding set of assumptions the maximum benefits that could be obtained through the post-core damage strategies at Mark I and Mark II facilities would be a full order of magnitude below the quantitative health objective (i.e., a level of risk that equates to 1/10 of 1 percent of the individual latent cancer fatality risk). More refined risk estimates, from the same work, push this benefit significantly lower. *In fact, the key risk insight obtained from this work and applicable to the proposed SAMG requirements in this rulemaking for any power reactor design is that it does not appear reasonable to expect that post-core damage strategies, including guidelines that implement those strategies (i.e., the SAMGs) would result in a safety benefit that could be justified under the Commission’s backfitting requirements.* This result, as expected, demonstrates the benefits of the Commission’s regulations to both effectively keep the frequency of core damage very low, and to ensure that through emergency preparedness requirements the surrounding population is less likely to experience health effects from the effluents.⁷

But, in the next paragraph, the staff concludes: “*Despite the available risk information*, the NRC proposes that SAMGs should be requirements based on qualitative reasons described in greater detail below.”⁸ Earlier, the Draft Regulatory Analysis explains that imposing a requirement mandating SAMGs would:

[L]ead to indirect benefits by maintaining containment integrity (i.e., this contributes to the mitigation of releases which manifest as reduced doses) and by supporting the ERO with regard to making more informed protective action recommendations (i.e., this can support efforts to protect onsite personnel, and possibly to move people out of the path of effluents and therefore could result in reduced doses).⁹

⁶ *Id.*

⁷ *Id.* at 68-69 (emphasis added).

⁸ *Id.* at 69 (emphasis added).

⁹ *Id.* at 43.

Thus, the staff concludes that "SAMGs directly support two key, defense-in-depth foundational elements of the NRC's regulatory framework: Containment and Emergency Preparedness."¹⁰

There are several problems with the staff's use of qualitative information. First, other than pointing out that the referenced quantitative work was not specifically designed to assess the benefits of SAMGs, the staff does not explain exactly how the quantitative information is inadequate for the purposes of regulatory decision-making. This explanation is necessary in order to determine, in the first instance, whether there is a limitation in the quantitative information that substantially undermines its utility to the decision-maker and, if so, whether quantification to fill any identified gaps is "possible or practical."¹¹ Without such explanation, it is difficult (if not impossible) to determine whether use of qualitative information is appropriate and, if so, how that information should be used to inform the agency's decision. This lack of specificity and context to inform the use of qualitative information gives rise to hazy evaluations that tie the favored regulatory action to high-level goals, such as furtherance of broad aspects of the defense-in-depth philosophy. As former-Commissioner Magwood observed in his vote on SECY-12-0157, this imprecise use of qualitative information to overcome conclusions based on quantitative analysis results in a methodology that can be used "to justify essentially any regulatory change" and "renders the Backfit Rule essentially meaningless."¹²

Second, the staff's evaluation of benefits assumes that, absent the proposed requirement, SAMGs would not exist or, at a minimum, would not be effective. The staff seems to rely on the results of TI 2515/184 to support this assumption. For example, the Draft Regulatory Analysis states:

[B]y not requiring licensees to develop, implement, and maintain site-specific SAMGs, the NRC would not address one of the key objectives of the proposed rulemaking. Following the events at Fukushima Dai-ichi, the NRC inspected the implementation, ongoing training, and maintenance of licensees' SAMGs at all power reactor sites, except those that had permanently ceased operation, through performance of TI-2515/184. The NRC found that some licensees had not maintained the SAMGs in accordance with the latest revisions of the applicable industry owners group's generic technical guidelines nor conducted training in a consistent and systematic approach.¹³

Thus, the staff is assessing the qualitative benefits of imposing SAMGs against "a presumed state of voluntary SAMGs that are not up to date and may not reflect the current plant configuration."¹⁴

¹⁰ *Id.* at 44.

¹¹ Staff Requirements – SECY-14-0087 – Qualitative Consideration of Factors in the Development of Regulatory Analyses and Backfit Analyses, March 4, 2015.

¹² Commissioner Magwood's Comments on SECY-12-0157, "Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments," at 2-3.

¹³ Draft Regulatory Basis, at 13.

¹⁴ *Id.* at 69.

But the staff's assessment fails to recognize the significant efforts to update and improve the generic industry SAMGs to reflect lessons learned after completion of TI 2515/184.¹⁵ As the Advisory Committee on Reactor Safeguards recognized in its April 22, 2015 letter to Chairman Burns, "the industry through their Owners Groups has invested resources to revise and update the generic SAMGs to reflect lessons learned through significant NRC and industry efforts. This major work was completed and documented in October 2014. The next steps for implementation are in progress."¹⁶ Thus, while acknowledging the importance of SAMGs, the ACRS concluded that voluntary industry action could accomplish the agency's goals without the need for an additional regulatory requirement.¹⁷ And, as explained in industry's presentation to the ACRS on April 9, 2015, the industry supports submittal of a docketed commitment by each site that would ensure: (1) maintenance of SAMG strategies, (2) integration with EOPs and other guideline sets, (3) timely incorporation of Owners Group revisions, and (4) establishment of configuration controls. The industry has successfully implemented voluntary initiatives in the past and there is no reason to believe that the industry could not do so successfully with respect to SAMGs.¹⁸ Failure to meaningfully consider this viable alternative to the imposition of a regulatory requirement is a fundamental flaw in the Draft Regulatory Analysis.

¹⁵ TI 2515/184, *Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)*, was issued on April 29, 2011. See *Summary of Results for Temporary Instruction (TI) 2515/183, "Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event and TI 2515/184, Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"*, Nov. 28, 2011. Inspections conducted pursuant to TI 2515/184 were completed by the end of May 2011.

¹⁶ Draft SECY Paper, "Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49)," April 22, 2015, at 5 ("ACRS Letter").

¹⁷ *Id.* at 5.

¹⁸ The Summary of Observations on TI 2515/184 stated:

While individually, none of these observations posed a significant safety issue, they indicate that while the SAMG procedures are available at every site, there appears to be an inconsistent implementation of some aspects of this voluntary SAMG program.

SAMGs are typically available in plant locations critical to combating a potentially severe accident. However in some cases the procedures were either not available in all expected areas or not properly controlled. In addition, while SAMGs appear to be updated to reflect design changes at a facility, there does not appear to be a consistent approach to conducting periodic reviews. Finally, while personnel do appear to be properly trained and knowledgeable on SAMGs, exercises on SAMGs do not appear to be periodically conducted at all sites.

Summary of Observations Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)." Although this summary describes issues associated with implementation of SAMGs, it does not indicate that those issues were so severe that they could not be resolved via an improved voluntary initiative addressing this issue.

Industry developed SAMGs nearly two decades ago to assist in the management of remote, yet potentially serious severe accidents and we agree that optimizing SAMGs through improvements in maintenance, integration, and configuration control is a worthwhile effort from the standpoint of enhancing industry's preexisting investment in the development of these guidelines. However, it is clear that the available quantitative risk insights described in the Draft Regulatory Analysis reveal that the proposed requirement will not result in a cost-justified, substantial increase in the protection of public health and safety. Thus, this requirement cannot be justified pursuant to the agency's backfitting rule.