



Risk Prioritization Initiative

Summary of the NRC Staff Observations on the Nuclear Energy Institute Demonstration Pilots for Prioritizing and Scheduling Implementation

October 2014

Executive Summary

The Nuclear Regulatory Commission (NRC) Staff participated in the industry demonstration pilots of the Nuclear Energy Institute's (NEI) draft guidance for scheduling and implementation. The purpose of the demonstration pilots of NEI's draft prioritization and scheduling implementation guidance was to evaluate how an industry process can be used by licensees to prioritize regulatory issues on a generic and plant-specific basis. This is in support of the Risk Prioritization Initiative (RPI) in response to the Staff Requirements Memorandum (SRM) on COMGEA-12-0001/COMWDM-12-0002, "Proposed Initiative to Improve Nuclear Safety and Regulatory Efficiency," dated February 6, 2013.

Six licensees participated in the demonstration pilots: Palisades, H. B. Robinson, E. I. Hatch, Davis-Besse, Prairie Island, and V. C. Summer. The demonstration pilots were conducted between May and September of 2014 and the licensees exercised the draft guidance in the areas of generic assessment expert team evaluation, integrated decision-making panel (IDP) evaluation, and aggregation. The NRC Staff observed all the activities at Palisades and H. B. Robinson and participated in a sample of issues from the remaining licensees. In addition, the NRC Staff observed the aggregation meetings piloted at the six licensees. Lastly, a public meeting in September 2014 was held to further exercise the process in the areas of security, emergency preparedness, and radiation protection.

The draft of the NEI guidance used during the demonstration pilots was submitted to the NRC via a letter on April 15, 2014. The NEI guidance describes a process which can be used to prioritize and assess issues and consists of three main sections: a generic assessment performed by a Generic Assessment Expert Team (GAET), a plant-specific assessment performed by an Integrated Decision-making Panel (IDP), and an aggregation of the overall issues performed by the IDP.

Overall, the demonstration pilots illustrated that the process developed by NEI was effective in applying objective decision-making attributes to prioritize both regulatory and plant initiatives on a generic and plant-specific basis. The IDP was methodical and the observed demonstration pilots simulated how an actual panel would work in a plant environment. The IDP engaged in asking challenging questions and considered both the positive and adverse effects of the proposed issues, which included regulatory activities and licensee initiatives, in their deliberations. The use of available risk information such as insights from the site-specific Probabilistic Risk Assessment (PRA) models, when included in the IDP discussion, facilitated the process.

However, many of the issues that were prioritized fell within the "Low" or "Very Low" importance category. Therefore, licensees were challenged with prioritizing and scheduling a large number of issues. In addition, the NRC Staff observed the prioritization of compliance and inspection issues. Compliance issues are the purview of the NRC and the NRC Staff noted that fulfilling those requirements should not fall under a prioritization process that could result in continual deferral or delay of issues. Furthermore, the prioritization of inspection findings, which already

fall under the Reactor Oversight Process, may be considered redundant. The NEI draft guidance, if used in its current form for inspection findings, may undermine existing well-established programs and processes potentially resulting in regulatory instability. The NRC Staff also noted that additional effort is needed from NEI to refine its draft guidance to determine the relative importance of regulatory actions and licensee activities involving Radiation Protection, Security, and Emergency Preparedness. Furthermore, the observed prioritization process did not appear to incentivize the use of PRA. Only a few regulatory issues observed were quantitatively evaluated using the available PRA at the site. The NRC Staff also noted that licensees prioritized issues using the Reliability attribute (the rating category that determines the importance of reliability of structures, systems, and components used to generate electricity) for issues that did not have a clear nexus to plant safety within the NEI prioritization process and in some cases resulting in a higher priority than regulatory issues.

Purpose

The purpose of the demonstration pilots of NEI's draft prioritization and scheduling implementation guidance was to evaluate how an industry process can be used by licensees to prioritize regulatory issues on a generic and plant-specific basis. This is in support of the Risk Prioritization Initiative (RPI) in response to the Staff Requirements Memorandum (SRM) on COMGEA-12-0001/COMWDM-12-0002, "Proposed Initiative to Improve Nuclear Safety and Regulatory Efficiency," dated February 6, 2013 [Reference 1]. In addition, COMSECY-2014-0014 [Reference 2] and the follow on SRM [Reference 3] informed the Commission on the NRC Staff's planned participation in the demonstration pilots and provided additional direction to the NRC Staff. Specifically, details on 1) the pilot objectives and scope; 2) the number and names of pilot plants for NRC participation; 3) the approach to prioritization; and 4) the regulatory methods used to disposition changes identified during the prioritization. Items 1 and 2 are discussed in the following section on "Scope of Participation." The NRC Staff's plan to participate in the demonstration pilots [Reference 4] addressed items 3 and 4 of the COMSECY-2014-0014 with the following high level objectives (HLO):

- HLO-1) Evaluate the extent to which the prioritization process is reliable, repeatable, and transparent, and
- HLO-2) Assess the level of incentive to develop enhanced probabilistic risk assessment (PRA) tools and models as included in the process and whether additional options or considerations should be eventually considered as part of the communications with ACRS and the Commission.
- HLO-3) Critically evaluate the licensee's use of deferral and elimination processes for regulatory activities of low risk and safety significance for appropriateness (e.g., as supported by the use of PRA and a clear regulatory vehicle) and its impact on regulatory stability.
- HLO-4) Consider how the process informs (or not) an eventual discussion on how corrective actions for findings, violations, and degraded or nonconforming conditions adverse to quality will be treated as part of the risk prioritization initiative.
- HLO-5) Evaluate how regulatory and non-regulatory activities are treated and the implications of the integrated assessment of priority of all items in the aggregation process. Since the demonstration pilots will (by necessity) include a limited set of initiatives, consider how an expanded scope could impact the understanding of the observed process
- HLO-6) Obtain the most recent NEI guidance on the Risk Prioritization Initiative and comparing during the demonstration pilot observations how (a) clear the guidance is followed in the exercises, (b) consistency applications across issues/licensees influence the outcomes, and (c) the extent to which the demonstration pilots indicate a needed clarification or gap that needs to be communicated to NEI by the end of the demonstration pilot activities.

HLO-7) Assess the ability of the RPI under review to appropriately prioritize initiatives from multiple disciplines (e.g., Radiation Protection, Security, and Emergency Planning).

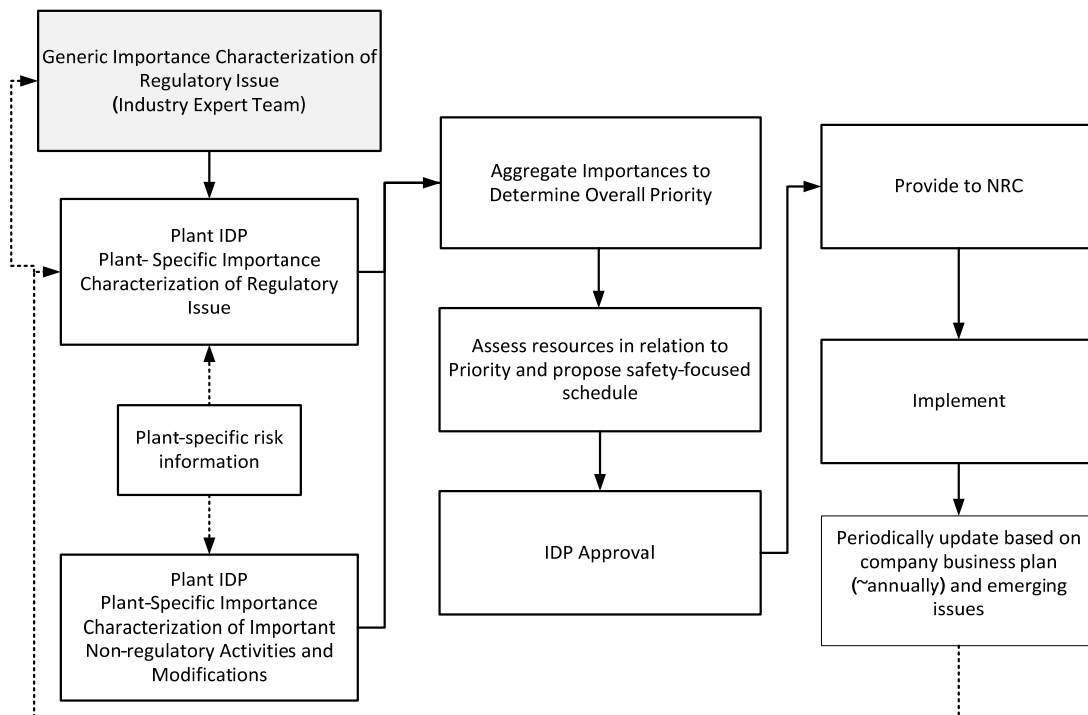
HLO-8) Observe, note, and collect any items of importance for communication in an eventual full briefing to the ACRS in advance of the transmission of the March 2015 paper to the Commission.

While there is still additional discussion and details that will be necessary in support of items 3 and 4 of the COMSECY, this summary highlights the observations that support the HLOs thus far. The insights gained from the demonstration pilot activities will be used in the development of a Commission paper describing potential options for using a risk-informed process to prioritize regulatory activities.

Overview of NEI Guidance

The draft of the NEI guidance used during the demonstration pilots was submitted to the NRC via a letter on April 15, 2014 [Reference 5]. The NEI guidance describes a process which can be used to prioritize and assess issues and consists of three main sections: a generic assessment performed by a Generic Assessment Expert Team (GAET), a plant-specific assessment performed by an Integrated Decision-making Panel (IDP), and an aggregation of the overall issues performed by the IDP. Figure 1-1 of the NEI draft guidance describes the overall process.

**Figure 1-1
Plant Process for Schedule Prioritization**



1. Generic Assessment Expert Team

The GAET is composed of industry and subject-matter experts assembled to evaluate issues on a generic basis. The purpose of the GAET is to characterize the important attributes of an issue to support various regulatory and industry functions. The GAET can potentially provide information during the early phase of an issue to support the assessment of the issue, the issue resolution, and potentially the cost-benefit analysis. In addition, it can evaluate the issue resolution and closure of an approved regulatory issue and provide feedback in the final evaluation and implementation of the issue. Lastly, it can be used to evaluate the overall significance of an issue and can provide those key attributes in support of the IDP conducted at the plant-specific level.

2. Integrated Decision-making Panel

The IDP is composed of licensee managers and licensee subject-matter experts assembled to evaluate issues on a plant-specific basis. The purpose of the IDP is to determine the significance of an issue and the potential impact of the proposed resolution to address the issue. In its deliberations, the IDP considers both the positive and adverse effects of the resolution to determine the overall importance characterization.

An issue is evaluated using a series of questions to assess its impact against the Safety, Security, Radiation Protection (RP), Emergency Preparedness (EP), and Reliability categories of the process. The Reliability category captures the importance of the reliability of systems, structures, and components (SSCs) used to generate electricity and the stewardship of the plant site. The evaluation is qualitative in nature and has the option for a quantitative analysis under the Safety characterization.

For Safety, the guidance borrows risk-informed criteria from Regulatory Guide 1.174 [Reference 6] and other well established processes to determine the safety significance of an issue. An issue is evaluated using a 2 step screening process and can assess the issue as “High”, “Medium”, “Low”, and “Very Low” importance. An issue can also be screened as having “no impact” for safety if it screens out in step 1 of the NEI draft process. For the other categories of Security, EP, RP, and Reliability, the NEI draft guidance determines the significance of the issues using a series of flowcharts and then determines the effectiveness of the resolution of the issue using a decision matrix.

3. Aggregation

The aggregation meeting is conducted by the IDP to determine the overall priority of an issue and to evaluate the relative priority by comparing the issues against each other. All the issues are evaluated using the results of the importance characterization to determine its overall priority from 1 to 5 and schedule of implementation. For example, issues with priority 1 would be those designated as “Adequate Protection” by the NRC or those having a “High” Safety importance. According to the NEI draft guidance, issues assigned with a priority 5 may not be scheduled or implemented.

Scope of NRC Participation

The NRC Staff observed all the activities at Palisades and H. B. Robinson and participated in a sample of issues from E. I. Hatch, Davis-Besse, Prairie Island, and V. C. Summer. In addition, the NRC Staff observed the aggregation meetings for all the demonstration pilots. Lastly, a public meeting in September 2014 was held to further exercise the process in the areas of security, emergency preparedness, and radiation protection.

In addition to the NRC Staff from Region III, NRC Staff from the following Divisions and Offices participated in the demonstration pilots activities:

Office of Nuclear Reactor Regulation (NRR) - Division of Safety Systems (DSS), Division of Engineering (DE), Division of Risk Assessment (DRA), Division of Operating Reactor Licensing (DORL), Division of Inspection and Regional Support (DIRS), Japan Lessons Learned Division (JLD), and Division of Policy and Rulemaking (DPR); and

Office of Nuclear Security and Incident Response (NSIR) – Division of Security Policy (DSP), and Division of Preparedness and Response (DPR).

Demonstration Pilots Activities (May - September 2014)		
	Generic Assessment and Characterization [Reference 7]	
	<i>NRC Participants</i>	
NEI Headquarters	NRR (DRA, DPR) NSIR	
	Integrated Decision-Making Panel	Aggregation
	<i>NRC Participants</i>	
Palisades	NRR (DRA, DE, DORL, DIRS) NSIR (DSP) Region III	NRR (DRA, DORL) Region III
H. B. Robinson	NRR (DRA, DE, DSS)	NRR (DRA, DPR)
E. I. Hatch	NRR (DRA)	NRR (DRA)
Davis-Besse	NRR (DRA) NSIR (DSP)	NRR (DRA)
Prairie Island	NRR (DRA, JLD) Region III	NRR (DRA, DPR)
V. C. Summer	NRR (DRA, DPR) NSIR (DPR)	NRR (DRA, DPR) NSIR (DPR)
	Integrated Decision-Making Panel	Aggregation
	Security, EP, and RP [Reference 8]	
	<i>NRC Participants</i>	
NRC Headquarters	NRR (DRA, DPR), NSIR (DSP, DPR), Region III	

Observations from Demonstration Pilots

The NRC Staff observations are divided into two categories: generic and topic-specific. The generic observations are NRC Staff comments that encompass the whole prioritization process documented in the NEI draft guidance. The topic-specific observations delineate the NRC Staff comments in some of the regulatory activities and plant initiatives that were exercised using the prioritization process.

1. Generic Observations:

HLO-1) Evaluate the extent to which the prioritization process is reliable, repeatable, and transparent.

Overall, the demonstration pilots illustrated that the process developed by NEI was effective in applying objective decision-making attributes to prioritize both regulatory and plant-initiated initiatives on a generic and plant-specific basis. The IDP was methodical and the observed demonstration pilots simulated how an actual panel would work in a plant environment. The IDP engaged in asking challenging questions and considered both the positive and adverse effects of the proposed issues, which included regulatory activities and licensee initiatives, in their deliberations. The use of available risk information such as insights from the site-specific Probabilistic Risk Assessment (PRA) models, when included in the IDP discussion, facilitated the process.

However, several NRC Staff identified potential issues with the NEI guidance as written. The NRC Staff observed that the use of qualitative information increased the subjectivity of the evaluation and could result in inconsistencies in the prioritization of issues. In addition, some NRC Staff recognized that licensees had their own prioritization methods which have worked for many years that have some discussion of qualitative risk insights. It is unclear how much improved prioritization of activities would be due to the new NEI draft process. However, the NRC Staff has not routinely audited existing licensee methods to prioritize work and was not familiar with their use or effectiveness. In addition, the IDP evaluations must be made available to the NRC Staff for their review in order to support transparent decision-making. Lastly, in several examples, the licensee stated that actions required to support regulatory decision-making as a result of an IDP evaluation would require additional information and would be submitted to the NRC Staff and made publically available.

HLO-2) Assess the level of incentive to develop enhanced probabilistic risk assessment (PRA) tools and models as included in the process and whether additional options or considerations should be eventually considered as part of the communications with ACRS and the Commission.

Some licensees acknowledged that the use of available plant PRA information would reduce subjectivity and help focus resources on the most safety significant items (i.e., where enhanced PRA modeling is available, better decision-making is possible with higher confidence). The pilot activities appear to provide additional visibility of the benefits of PRA to a wider number of the

decision-making staff within their organizations, which could eventually lead to a greater reliance on risk insights in decision-making.

The observed prioritization process as written did not appear to incentivize the use of PRA. Only a few regulatory issues observed were quantitatively evaluated using available PRA at the site. Most of the plant initiatives were evaluated using the qualitative method in the NEI draft guidance. The NRC Staff also noted that, for some topics, the licensee had relied on the Individual Plant Examination of External Events (IPEEE) or other potentially outdated information; hence, it is unclear whether RPI will provide significant incentive by itself for additional PRA enhancements without a separate process or a more refined, quantitatively-based decision table

HLO-3) Critically evaluate the licensee’s use of deferral and elimination processes for regulatory activities of low risk and safety significance for appropriateness (e.g., as supported by the use of PRA and a clear regulatory vehicle) and its impact on regulatory stability.

The potential process for deferral and elimination of low risk regulatory activities was not exercised by any licensee during the demonstration pilots. However, there were examples of plant-initiated modifications or commitments that the licensee would reevaluate and in one instance cancel as a result of the demonstration pilots and the use of both qualitative and quantitative risk information. Therefore, the licensee experienced a direct benefit of utilizing the draft process and its participation in the demonstration pilot.

HLO-4) Consider how the process informs (or not) an eventual discussion on how corrective actions for findings, violations, and degraded or nonconforming conditions adverse to quality will be treated as part of the risk prioritization initiative.

The Reactor Oversight Process (ROP) already allows licensees to prioritize issues in a risk-informed approach, including findings of very low safety significance, through their respective corrective action programs; which are inspected by NRC using existing inspection procedures. It is not clear, therefore, from the very limited NEI guidance and examples, what the benefit would be in using RPI to further prioritize corrective actions resulting from inspection findings. It is possible that unintended consequences in further re-prioritizing corrective actions, for which the licensees already have scheduling flexibility, may create additional burden on the inspectors from the Region to determine the timeliness of those actions.

For example, prioritizing corrective actions based on inspection findings in accordance with NEI draft guidance could potentially conflict with established processes like the Corrective Action Program, which is required by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 Appendix B. As observed in the demonstration pilot, the issue behind a proposed modification may involve an operable but non-conforming condition. The NRC Staff noted that page 14 of Inspection Manual Chapter 0326, “Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety” states “If the licensee does not resolve the degraded or nonconforming condition at the first available opportunity or does not appropriately justify a longer completion schedule, the NRC Staff would conclude that corrective action has not been

timely and would consider taking enforcement action” [Reference 9]. The process in the NEI draft guidance could result in continual deferral or delay of corrective actions. Thus, if the NEI draft guidance is used in its current form for inspection findings, it may undermine existing well-established programs and processes and potentially result in regulatory instability. The NRC Staff will continue to consider how this NEI draft guidance may impact inspection activities as requested by the Commission in SRM to COMSECY-14-0014, “Cumulative Effects of Regulation and Risk Prioritization Initiative: Update on Recent Activities and Recommendations for Path Forward,” dated July 17, 2014 [Reference 2].

HLO-5) Evaluate how regulatory and non-regulatory activities are treated and the implications of the integrated assessment of priority of all items in the aggregation process. Since the demonstration pilots will (by necessity) include a limited set of initiatives, consider how an expanded scope could impact the understanding of the observed process

The NRC Staff observed that the IDP methodically and consistently reviewed each issue. The panel reviewed each individual final priority to ensure that there were no significant deviations from the panel’s consensus and any additional insights from follow-up discussions were captured. During the aggregation meeting, topics were compared to each other individually; within the same priority level; and across topics as a group such as NFWA 805-related or Mitigation Strategies Order-related. While this comparison was constructive, the current NEI draft guidance does not have any structured approach to support such a comparison.

In many of the demonstration pilots, there is at least one plant initiative that ranked higher than other regulatory activities due to a “High” rating in Reliability and “Very Low” rating in Safety. In such instances, a licensee may defer a regulatory activity due to the higher ranking of a reliability-related plant initiative. The NRC Staff recognized that some reliability-related plant initiatives, such as dry-cask storage, may warrant consideration in the process. While some licensees explained the rationale of the “High” rating in Reliability, the nexus between Reliability and Safety is not always apparent. Without such connection, the NRC Staff may find it unreasonable to accept schedule changes for regulatory activities. The NRC Staff believes that additional work by the industry is still needed to better understand the Reliability attribute as the draft guidance, in its current form, does not address the nexus between Reliability and Safety. Additionally, licensees have existing internal processes for assigning priorities and scheduling work. It was not clear how the new NEI process would interface with those existing processes.

During the demonstration pilot activities, only two licensees employed the NEI guidance and prioritization results for exercising the adjustment of their implementation schedules. In addition, the pilot activities did not demonstrate the NEI process for future periodic updates or the inclusion of additional or emerging issues. Thus, minimal insights were obtained in these areas.

HLO-6) Obtain the most recent NEI guidance on the Risk Prioritization Initiative and comparing during the demonstration pilot observations how (a) clear the guidance is followed in the exercises, (b) consistency applications across issues/licensees influence the outcomes, and (c) the extent to which the demonstration pilots indicate a needed clarification or gap that needs to be communicated to NEI by the end of the demonstration pilot activities.

Even though the draft NEI guidance benefited from the NRC Staff's and industry interaction during the generic and plant-specific tabletops [Reference 10, 11] additional insights were gained from exercising the process during the demonstration pilots. The licensees and the NRC Staff provided additional comments and inputs in clarification to the screening question, supporting information for the flow-charts used for the other categories, as well modification of the flow-charts for Security, RP, and EP.

Some licensees recognized that RPI, as a subset of Cumulative Effects of Regulation (CER), could potentially inform regulatory issues that are in the development stage. NRC Staff note that the potential benefits may vary widely depending on the maturity of the specific issue. For example, for new or emergent issues, sufficient risk information may not be available to inform regulatory decisions. However, early public interaction with external stakeholders can provide additional information early in the regulatory process when appropriate.

The licensees discussed several issues including the draft Tornado-missile regulatory issue summary (RIS), the Spent Fuel Pool Instrumentation Order, Open Phase Condition, Independent Spent Fuel Storage Installation (ISFSI) proposed rulemaking, and the Cybersecurity rule. However, some IDP members found it difficult to review these potential modifications, which are inherently less specific during the early stage of development. In some instances, the panel discussed the current plant design as well as the licensing basis in these areas and concluded that its plant design was adequate and further action was likely to have limited safety benefit. Further development in the NEI draft guidance may be needed to perform plant-specific prioritization and scheduling for emerging issues.

HLO-7) Assess the ability of the RPI under review to appropriately prioritize initiatives from multiple disciplines (e.g., Radiation Protection, Security, and Emergency Preparedness).

During the tabletop exercises of the EP, RP, and Security, it was clear that the qualitative risk information needed to navigate the assessments were more subjective and very dependent on how the situation was characterized. Thus, because Security, EP, and RP do not lend themselves to quantitative analysis, the assessments are not as reproducible as those based on quantitative risk estimates. For example, in one of the EP tabletop exercises, the impact on the risk of an early release of radioactivity from the loss of the Emergency Operating Facility (EOF) was qualitatively assessed, in lieu of a full level 3 PRA. The outcome was very dependent on how effective the compensatory actions (temporary EOF) were assumed to be during an actual core damaging event. Specific observations from Security, RP, and EP are discussed below:

Security

The industry has made some progress in the NEI draft guidance for Security and Cybersecurity between the public meetings in May and September 2014. However, the NRC Staff still expressed concern regarding the risk treatment of Security. Security was modelled using a safety approach, rather than the traditional security approach that looks at pathways that focus on detection, assessment, delay, and neutralization. Since compensatory measures are in place for most security weaknesses, the prioritization process does not adequately identify any deltas in risk. As an example, replacing outdated systems was concluded as appropriate without proper indication of increasing or decreasing risk.

During the public meeting in September 2014, the NRC Staff continued to raise concerns regarding the use of a safety risk model for Security. The NRC Staff noted that using the current NEI draft guidance, security issues would not rank high unless the specific activity was in close proximity to a target. The industry recognized the need to adjust their process to more closely reflect traditional security risk modeling. In addition, there seems to be a difference of opinion between the NRC Staff and industry regarding how cybersecurity issues factor into the Security importance. This will require further interaction with industry.

The NRC Staff has had further discussions with the NEI to discuss updated guidance relative to Security. The updated approach appears to be improved, but requires further development. In particular, the guidance must discuss how to use a security risk approach to assess possible impacts on plant safety.

Radiation Protection

In the NEI prioritization process, issues have to pass one of two gates that ask the question "Plant Specific Cost-Benefit Achieved?" in order to achieve a "High" importance rating via the RP flow chart in the draft guidance. It is not clear to the NRC Staff if this cost-benefit refers to an ALARA (dose reduction) assessment or not. Since the analysis for determining the cost-benefit was not included in the examples in the September 2014 public meeting, the results could be interpreted as somewhat arbitrary and counter intuitive. For example, in one of the evaluations, the proposal to remove and replace leaky fuel (an expensive action) was deemed cost-beneficial due to the reduction in public dose, which is typically very low. However, in another evaluation related to the upgrade of effluent release software (a much lower cost action) to comply with a revised 10 CFR 50 Appendix I, the licensee determined that the activity did not pass the cost-benefit test. The outcomes can be subjective depending on how the action or issue is characterized in the process.

Emergency Preparedness

The practical use of the EP flow chart in the NEI draft guidance was discussed and several suggestions for additional modifications were provided by licensees to NEI. The prioritization process appears capable of assigning an appropriate priority for major EP issues. However, it may be difficult to find EP issues that would actually go through the process as opposed to simply getting resolved by the licensee. In any case, it would seem that the EP portion of the

process adds value outside of specific EP issues because of the impact of nuclear safety, RP and other areas upon the functioning of EP.

From the overall discussion, additional modifications of the EP guidance and further exercising this portion of the process will be needed to ascertain whether consistent application can be achieved across multiple areas. Subsequently, and given that consistency in application can be achieved, the NRC Staff will determine whether EP issues are being appropriately characterized using the draft process

HLO-8) Observe, note, and collect any items of importance for communication in an eventual full briefing to the ACRS in advance of the transmission of the March 2015 paper to the Commission.

The NRC will brief the ACRS in November 2014, February 2015, and March 2015. The information gathered from the demonstration pilots and previous and future interactions will be used to develop the notation vote paper to be presented to the Commission in March 2015.

2. Topic-specific Observations:

The observations below are from various Subject Matter Experts that were included as part of the NRC Staff's participation during the demonstration pilots.

Generic Safety Issue-191

Regarding Generic Safety Issue-191 (GSI-191) "Assessment of Debris Accumulation on PWR Sump Performance," the applicability of this issue to re-prioritization may be difficult to justify since licensees must confirm how they are in compliance with long-term core cooling regulations given known issues such as fiber in-vessel and chemical effects on debris. The activities that may be able to be prioritized using the NEI process would be limited to insulation replacement or modifications resulting from the licensee actions to address the generic issue.

National Fire Protection Association 805

One of the licensees evaluated three of the multiple modifications planned for the fire protection program transition to National Fire Protection Association 805 (NFPA 805). The IDP identified the importance of looking at the overall impact of reviewing all the NFPA 805 transition modification as a package. The NRC Staff noted that the fire PRA assumptions are usually based on all the modifications being completed. Sub-dividing the NFPA 805 modifications into pieces, the Safety importance for of each modification ranged from "Low" to "High". However, there are other modifications, which are not solely "NFPA 805 modifications," may also have impacts on the NFPA 805 licensee amendment request (e.g., Westinghouse Seal Package or Installing Communication Repeaters-in containment for fire scenarios, etc.) There are also "NFPA 805" modifications whose impact goes beyond just fire safety, for which the licensee should include when assessing the importance (e.g., a diesel-driven AFW pump added for NFPA 805 may benefit other risk scenarios in addition to fire safety).

It is possible that the timing of the "Risk Picture" may give a wrong impression of the risk because in the NEI process, risk is usually evaluated with programs currently in place such as

10 CFR Part 50 Appendix R. For NFPA 805 related activities, risk information is evaluated with future programs that are not yet in place. On the other hand, the IDP members noted that, utilizing the quantitative Fire PRA risk numbers made the review quicker, easier, and more accurate.

The NRC Staff noted that for some NFPA 805 modifications, a licensee performed qualitative evaluations for the Safety importance as oppose to quantitative evaluations even though Fire PRA information is readily available. Furthermore, when identifying the “current risk for the issue,” there were instances when a licensee used the total risk of the plant versus using the risk associated with the specific issue. This potential inconsistency may affect the ranking of the results. Another specific evaluation was complicated by the assumed starting conditions, namely upgrading from code-compliant to presumably more “enhanced” code-compliant detection systems (Very Early Warning Fire Detection), when in reality the upgrade to be evaluated was one from non-code-compliant to code-compliant detection systems, regardless of “enhancement.”

Open Phase Condition:

One observation for the Open Phase Condition issue, which was described in NRC Information Notice 2012-03 and NRC Bulletin 2012-01, was that the referenced PRA evaluation did not properly model the event. The model presented was a single failure of one-of-two trains of safety loads. The NRC Staff noted that the open phase event presents a common-cause failure threat to both trains of safety loads and therefore both trains should have been failed in the model. The ultimate significance of using the correct model would mean that the relative importance of this plant modification would be much higher than what was shared with the NRC Staff during the demonstration pilots. Thus, if the model is incorrect, the results will be incorrect. It was observed that the subject matter experts (SME) always deferred to the PRA staff when the issue of risk was under discussion. In the case above, the SME had an excellent knowledge of the open phase event but seemingly did not fully grasp the essence of the common-cause failure and how that would be modelled in a PRA evaluation. This is a possible disconnect that could bias the results of the overall prioritization effort. Additionally, if the NRC Staff disagreed with the quantitative risk evaluation performed by a licensee and thereby disagreeing with overall assigned priority, the NEI process did not address how such an issue would be resolved.

The demonstration pilot also illustrated how the potential response the open phase condition could potentially introduce additional risk from an inadvertent loss of offsite power. In addition, through the deliberations of the IDP, the licensee qualitative evaluated the potential benefit of installing a monitoring system only versus including a monitoring system and an automatic isolation system. The monitoring system provided the majority of the safety benefit as compared to the latter modification without potentially introducing the adverse effects of the automatic system.

Auxiliary Feed Water pump room cooling

One of the issues evaluated was a proposed modification to the Auxiliary Feed Water (AFW) pump room cooling, which was screened as having no impact according to the NEI process.

However, the issue behind the proposed modification involved an operable but non-conforming condition related to the AFW pump. While there are compensatory measures in place, additional calculations or modifications are necessary to resolve the issue. The NRC does not view compensatory measures as equivalent to full qualification of structures, systems, and components. This is an important activity that needs to be completed in a timely manner consistent with the regulations and the licensee's Corrective Action Program (CAP). If a licensee prioritizes the issue via the NEI process and results in delay implementation because there is no perceived impact, the issue may ultimately be dropped. Such action could be in direct conflict with existing regulatory requirements.

Tornado-missile RIS

The generic evaluation of the Tornado-missile Regulatory Issue Summary (RIS) determined that existing level of risk for the operating fleet is plant-specific and would be better informed by plant-specific evaluations. However, it did illustrate using existing sources of tornado risk information, that the potential of a tornado missile impacting a SSC important to safety could be bounded from "Low" to "Very Low." In addition, it identified additional risk considerations that would benefit those evaluations such as: frequency of tornadoes, available missiles projectiles on the site, importance of vulnerable targets, and the degree of defense-in-depth.

One of the licensees screened the tornado missile RIS issue and the results indicated a "Very Low" rating because the licensee stated that they comply with their design and licensing basis. However, the basis of the RIS is that the NRC has determined that some facilities may be outside their licensing basis. The NRC Staff noted that, if the systems, structures, and components (SSCs) are declared inoperable, the licensee would enter a Limiting Condition of Operations requiring a plant shutdown. If these SSCs are indeed inoperable, the action to restore the SSCs to operable must be performed as soon as possible and would be outside the scope of this prioritization process. Furthermore, the NRC Staff noted that the licensee had relied on IPEEE or other potentially outdated information for the evaluation.

Mitigating Strategies Order

One of the licensees evaluated certain aspects the Mitigating Strategies Order through only one of the processes rather than through all of the processes, which prevented a consistent application of the ranking criteria that relied on multiple ratings. Additionally, there was not a clear understanding of the bases of the various post-Fukushima Orders; such an understanding would be necessary for an appropriate application of the criteria such as taking into account whether the item was required for ensuring "adequate protection."

ASME Code Case N-770

The licensee has committed to inspecting the primary coolant welds and is in the process of developing the necessary documentation to support those inspections. However, since this was the only inspection program to be addressed in the demonstration pilots, the licensee continued to perform the evaluation for the purpose of testing the prioritization process. The NRC Staff noted that the process did not recognize the adverse effect of a repair activity given a possible failure of the weld component during operations to assist the IDP in the decision-making

process. Finally, the NRC Staff also noted that there was already an established program for risk-informing this activity with the risk-informed in-service piping inspection program. While this new NEI prioritization process may add some value in other areas, significant resources may be required to establish the prioritization process for little additional benefit in the area of prioritizing in-service weld inspections.

Reactor Vessel Internal hold-down spring replacement

The licensee, through a qualitative argument, determined the hold-down spring replacement activity to be of “Very Low” Safety importance. The NRC Staff noted that the licensee is committed to perform periodic inspection in accordance with NRC Staff-endorsed guidance and the proposed replacement activity is in addition to that. Since performing periodic inspections provided assurance that the degradation due to the associated aging mechanism can be managed, it seems reasonable for the licensee to conclude, using a qualitative argument, that the replacement activity would have minimal impact on Safety. However, the NRC Staff also noted that a quantitative evaluation using available PRA information is difficult because the vessel internal components are not modeled in the PRA.

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