

NEI Comments on Draft SECY on New Plant Risk Framework

Background

In late June, 2013, the NRC released a draft SECY¹ presenting a proposed staff response to Commission direction provided in SRM-SECY-12-0081². The SRM directed the staff to:

“[P]rovide the Commission with a notation vote paper that provides:

1. A technical basis for the staff’s proposal for the use of deterministic backstops, including examples;
2. A technical evaluation of the use of relative risk measures, including a reexamination of the pros and cons listed in the staff’s 2009 white paper;
3. A discussion of the appropriateness of the existing performance indicators and the related thresholds for new reactors.”

The June 2013 draft SECY addresses item 1 (Technical Basis for Backstops) in Enclosure 2. Commissioners’ Item 2 is addressed in draft SECY Enclosure 3 (Technical Evaluation of Relative Risk). Commissioners’ Item 3 is addressed in draft SECY Enclosure 4 (Appropriateness of Existing Performance Indicators).

The draft SECY was discussed at a July 22, 2013, meeting of the Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on Reliability and Probabilistic Risk Assessment (PRA). Industry representatives spoke at this meeting. Mr. Jeff Gasser, Executive Vice President, Southern Nuclear Operating Company (Southern), gave a presentation and answered questions from the subcommittee regarding the relative risk approach.

Industry and staff discussed the draft SECY again at an August 5, 2013, public meeting. NEI and industry representatives presented oral comments on the document. Most of the comments were focused on Enclosure 2. At that meeting, the staff requested that NEI provide additional and more detailed comments in a follow-up letter. This attachment provides those additional and detailed comments.

Our comments follow below, addressing the body of the draft SECY and Enclosures 1 through 4, in order.

Cover Letter (Body of the draft SECY)

- **BACKSTOPS** – Page 4: The substitution of the term “qualitative measures” for the prior term “deterministic backstops” suggests a great shift from the original connotation that backstops are limits. In the draft SECY, qualitative measures appear to be soft and arguable factors rather than a clear, positive threshold that triggers regulatory action (our notion of a “backstop”). We are concerned that the subjectivity of grading the factors that are presented in the draft SECY will simply compound the problem the present SDP process presents in judging things quantitatively. In the meantime, we would suggest the staff use a term that more clearly connotes a threshold for regulatory action, if that is the purpose of the non-quantitative portion of the evaluation the staff is proposing.
- **BASIS** – Page 5: The first paragraph says, “*The technical bases for using qualitative measures is [sic] already part of an integrated risk-informed approach with its tenets taken from several sources...*” This statement does not appear to provide a technical basis (e.g., for the factors chosen in Enclosure 2) but simply points to references that articulate principles related to the topic. We would suggest the SECY specify the key principles and points that would guide the development of a proposal for addressing non-quantitative information in the significance determination process. We would suggest the SECY also cite references from which each of those principles is taken.

¹ Draft memo from R. W. Borchardt to The Commissioners, “Recommendations for Risk-Informing the Reactor Oversight Process for New Reactors”, ADAMS Accession Number ML13169A372.

² Staff Requirements Memo SECY-12-0081, “Risk-Informed Regulatory Framework for New Reactors”, October 22, 2012, ADAMS Accession Number ML12296A158.

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- **APPROACH** – Page 5: The second paragraph says, *“The staff conceived an approach that would use both quantitative methods...and qualitative...methods in an integrated risk-informed fashion.”* From the discussion of this approach at the August 5, 2013 public meeting, we understand that the staff did not intend for the methodology presented in Enclosure 2 to be interpreted as a proposal. Rather, the staff meant it to illustrate the concept of combining qualitative and quantitative assessments. We would suggest the wording in the body of the draft SECY, in addition to the wording in the enclosures, be revised to reflect the hypothetical and illustrative nature of the technique and examples presented in Enclosure 2. As currently presented in Enclosure 2, the proposed approach appears to go far beyond the Commission’s direction to provide a technical basis and illustrations for deterministic backstops.
- **NTTF RECOMMENDATION 1** – Page 5: The closing paragraph of this page refers to consistency with the Near-Term Task Force (NTTF) Recommendation 1. This judgment about consistency appears premature and irrelevant. We would suggest that in lieu of this discussion, the body of the draft SECY simply indicate that if the Commission approves the staff’s Recommendation 1 in this SECY, the staff will monitor the work on NTTF Recommendation 1 and ensure that efforts to modify the ROP for new plants are aligned with the outcome of NTTF Recommendation 1.
- **CONSISTENCY** – Page 6, Second paragraph: *“This approach can also be considered for the current fleet of operating reactors...”* This sentence appears to skirt a key point, rather than hit it head on. As a practical and public confidence matter, changes to the ROP developed for application to new plants should be designed to be compatible with existing plants as well. If potential applicability to existing plants is a design consideration for the integrated approach, it should be clearly articulated as a principle guiding the staff’s thinking in Enclosure 2. If this is the staff’s intent, we would suggest the SECY say this plainly, rather than imply that applicability to existing plants is merely a possibility.
- **OBJECTIVITY** – Page 6, Second paragraph: The integrated risk approach would introduce additional subjectivity, since inspectors will be responsible for making judgment calls on qualitative criteria. We would suggest that the staff recommendations acknowledge that deterministic backstops will need to be developed for each qualitative criterion to ensure that an integrated risk-informed approach is as objective as practical.
- **RELATIVE RISK** - Page 7, closing paragraph: The list of bullets is lengthy and comprehensive, but as a result the weakest of them invites argument. In addition, some of the bullets refer to complexity or difficulty, sounding as if the staff shies away from a challenge. In our view, the real issue is that these challenges make it harder to communicate with the public and other stakeholders about the basis for, and application of, this thinking to new plants. We would suggest shortening the list of bullets, presenting the bullets in order of declining significance, and framing them in terms of the burdens relative risk implementation presents to: (a) allocating NRC and licensee resources, (b) operating and maintaining new plants, (c) maintaining consistency of response with existing plants, and (d) communicating with stakeholders. Both NRC and licensee resources can be better used in other areas than in developing a relative risk framework at this time.
- **PRO AND CON** – Page 8: *“...the staff concludes that although the relative risk approach may potentially have merit, the cons...outweigh the pros.”* The draft SECY implies the staff used some systematic method for weighing pros and cons equally. Evidence of such a systematic method is missing from the draft SECY. Furthermore, the use of the word “may” implies skepticism about the benefits. We would suggest that the body of the draft SECY simply and honestly acknowledge the advantages and chief arguments for the relative risk approach as put forward by the ACRS and others. We would suggest the draft SECY then clearly articulate the challenges of the relative risk approach, and, if possible, the criteria the staff used to judge that cons outweigh the pros.

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- MSPI** – Page 8: The sentence “...the case studies developed for the Mitigating System Performance Index (MSPI)...showed that the existing MSPI is not adequate and would be...” This sentence could be misconstrued as saying that MSPI is not adequate for any reactors, existing or new. We suggest deleting the phrase “is not adequate and”, as it adds no value to the point being made about determining regulatory response. We understand that MSPI is unique among the existing performance indicators and will need deeper examination than undertaken to date.
- EXISTING THRESHOLDS** – Page 8: “The staff noted that the existing performance limit approach, which is effectively a backstop, potentially could be modified and emphasized...” The performance limit in MSPI is not effectively a backstop, it is a backstop. We suggest deleting the word “effectively.”
- EXISTING THRESHOLDS** – Page 9: We believe it is important to strive for keeping thresholds aligned for new and existing plants, as much as possible. In addition, we heard remarks at the August 5 meeting that made it unclear whether the staff intended all references to existing thresholds in the draft SECY to mean thresholds of performance indicators (our understanding), or something in the significance determination process. We would urge the staff to review all mentions of thresholds in the draft SECY and ensure they properly refer to performance indicators.
- CONCEPTUAL** – Page 9, Conclusions: “...staff concludes that the conceptual integrated risk-informed approach...is an appropriate means to identify the potentially significant performance issues...” This sentence, like others in the body of the draft SECY, gives the impression the integrated approach would be defined or bounded by what is presented in Enclosure 2. If the staff intends the SECY to convey the intent staff expressed orally at the August 5 meeting, i.e., that Enclosure 2 illustrates a concept rather than defines or bounds the approach, we would suggest all mentions of the integrated approach be made with indefinite articles (“an approach”) rather than definite articles (“the approach”).
- NEED** - Page 9, Conclusions: “Additionally, if the staff were to develop and implement a relative risk approach, the structured integrated risk-informed approach would likely still be needed to address shortcomings that the relative risk approach would not solve, such as considering defense-in-depth (particularly barrier integrity) and degradation of passive components.” What is the basis for the above statement? If relative risk were implemented, Inspection Manual Chapter 0609, Appendix M³ could still be used, which would consider qualitative criteria. We suggest that the above statement be technically validated or removed.
- PHILOSOPHY** – Page 9: In the present regulatory scheme, owners of existing plants are incentivized to continuously improve the safety margins of their facilities for their own benefit. When they do, immediate neighbors and broader society benefit from the enhanced safety of the plant. The relative risk approach would have the regulator recapture every increment of safety margin added by the plant owner. This would lead to tighter and tighter regulation of the safest plants. Such an approach would misallocate NRC resources to the safest plants. The greatest overall benefit to society from nuclear safety regulation occurs when that oversight helps to maintain high levels of safety at the 100-plus existing plants, not when focusing excessively on the handful of new units that are inherently safest.
- RECOMMENDATIONS vs. OPTIONS** – Page 9: In SRM-SECY-12-0081, the Commission directed the staff to provide a notation vote paper. However, the draft SECY lists two specific Recommendations, not Options for the Commission to consider and vote for. This furthers the impression that the staff’s proposed integrated approach is not an illustrative concept but the only option deemed wor-

³ NRC Inspection Manual Chapter 0609, Significance Determination Process, Appendix M, Significance Determination Process Using Qualitative Criteria.

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thy of Commission consideration. We recommend that options be included in the draft SECY before a final recommendation is given, along with pros and cons for each option. The following two comments are our recommendation for what such options could include, along with justifications for including or revising each option.

- **OPTION 1** – Proposed Addition: The existing ROP significance determination process (SDP) was developed using many years of operating experience with active industry participation. A significant change to the SDP should be developed in a similar manner. There is no evidence in the existing fleet, which have different risk profiles, that the safest plants allow performance to decline because they have greater margin. Additionally, new plants are required by regulation to have full-scope PRAs, which include external hazards such as seismic and flooding. It may turn out that the full scope PRA results will reveal CDF values that are comparable to those of existing plants on which the ROP is based. If so, then continuing to spend resources to modify the ROP specifically for new plants will yield little or no benefit. Also, there has been a significant drop in industry interest in building new reactors since the discussions on risk-informing the ROP for new plants began. Only two plants are scheduled to put units online before 2020, and those four units will likely be operational for five years or more before another new plant loads fuel. This affords the NRC ample time to collect operational data and capture lessons learned to apply them to enhance the ROP, if they determine such a change is actually needed.

To ensure appropriate oversight/regulatory response for the few new plants that are operational, the NRC could utilize an existing mechanism, Action Matrix Deviation. In addition, the NRC could use the existing guidance in IMC 0609, Appendix M, to supplement the significance determination of a finding with qualitative criteria.

A holistic consideration of all the processes available to the NRC to monitor plant performance, such as the Corrective Action Program and Maintenance Rule, indicates that such programs and processes are adequate to address any inadvertent loss in safety margin. The Corrective Action Program is a powerful tool that could be enhanced to provide the NRC more oversight. For instance, voluntary reporting of repetitive failures and common cause failures, or other voluntary actions during the first five years of operations, would allow the NRC staff to have leading indication of performance problems. There is great value in learning from experience by evaluating actual new plant performance deficiencies before locking in modifications to the ROP to address a hypothetical problem. It is not prudent to rush into a change that 1) may have a noticeable impact on the public perception of the safety of new reactors and 2) may have an inappropriate impact on the limited NRC and utility resources that are needed to ensure reliable operation of our plants.

Option 1 would minimize the resources spent pursuing ROP modifications tailored to new plants and make any future modifications more technically sound. Potential wording could be, “In light of the cumulative impacts on NRC and industry resources, the Commission approves the option to suspend development of additional qualitative factors for the significance determination process to be applied in future performance deficiencies arising at new plants. Staff should rely primarily on lessons learned in the Action Matrix Deviation process and other experience evaluating performance deficiencies that arise at new plants to determine whether and how to modify the ROP to address the postulated lower risk levels for new plants.”

- **OPTION 2** – Proposed Revision, Page 9: Recommendation 1 says, “*Commission approves the staff’s plans to further develop the qualitative measures used to supplement the risk evaluations and the integrated risk-informed approach...*” We cannot find in the draft SECY a clear plan for developing the qualitative measures (i.e., a scope of work, task list, resources, and

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schedule leading to a specified outcome). We view this as a “con” for Option 2. In addition, the phrasing of Recommendation 1 implies the measures have already been determined, rather than are illustrative of a concept. We would suggest Recommendation 1 be included as Option 2 and be rephrased along the lines, “Commission approves the staff’s plans to ~~further~~ develop qualitative measures used to supplement the risk evaluations ~~and the integrated risk-informed approach~~ for evaluating the safety significance of inspection findings to ensure an appropriate regulatory response to performance issues for new reactor designs.”

- RECOMMENDATION 1** – Proposed Revision, Page 9: A significant change to the ROP should be developed with active industry participation and supplemented by insights gained from several years of determining the significance of findings for new plants. Evidence revealing a need for augmenting the ROP is presumptive, and more information will be available to the industry as PRA models are fully developed. Interest in building and operating new reactors has declined with changes in the electricity market since the ROP revision efforts began. This makes it more feasible for the NRC to use existing or voluntarily enhanced processes/programs (e.g., Action Matrix Deviations, PRA and CAP), rather than imposing a methodology that is not fully vetted by experience, which could be applied to the entire fleet, for the sake of two plants now under construction. Therefore, we recommend the following as Recommendation 1: “The staff recommends Option 1. The staff would work with internal and external stakeholders to determine whether and how to modify the reactor oversight process for new plants based on at least two years of operating experience. If a change to the ROP is warranted based on this experience, the staff would work with internal and external stakeholders to develop ROP guidance changes to provide to the Commission. If a change is not warranted, the staff will provide evidence in a paper to the Commission.”

Enclosure 1 – Background and History of Correspondence

No comments.

Enclosure 2 – Technical Basis and Examples of Integrated Risk-Informed Approach

General Comments

- CONCEPTUAL OR BOUNDING** - The introduction to Enclosure 2 clearly states this is conceptual in nature and “one possible way” in which to develop a combined qualitative-quantitative approach to SDPs. However, most of the text of Enclosure 2 actually reads as if what is presented is intended to be a firm proposal rather than an illustration. As such, Enclosure 2 appears to go far beyond what was called for in SRM-SECY-12-0081.

In the August 5 public meeting, the staff indicated the intent of Enclosure 2 was merely to show how qualitative and quantitative results can be combined, not how they should or will be combined. Our comments presented below presume that the staff’s original intent was to prescribe a methodology in Enclosure 2, rather than the intent we heard at the August 5 meeting.

We suggest the staff make clearer that Enclosure 2 does not provide a specific proposal, but merely an illustration of the act of combining various considerations. The hypothetical and illustrative nature of Enclosure 2 would be even clearer, in our judgment, if it provided at least a conceptual plan for developing one or more integrated approaches following Commission approval. We would also suggest that the hypothetical nature of Enclosure 2 would be clearer if the methodology and examples presented were more general and less detailed. The high level of detail suggests a maturity and specificity of thought that contradicts the intent presented to us in the staff’s remarks at the August 5 meeting.

- TECHNICAL BASIS** - The SRM called for “A technical basis for the staff’s proposal for the use of deterministic backstops, including examples” (SRM-SECY-12-0081, October 22, 2012, page 1). The paragraph titled “Technical Basis” does not provide a specific basis for what follows. Instead, it provides

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general references to fundamental source documents (e.g., Regulatory Guide 1.174, SECY-99-007, etc.). We suggest the section should present a specific basis for the staff's proposed approach. This section could, for example, enumerate the principles on which an integrated approach should and will be based. That would be far more helpful in describing the "technical basis" requested by the Commission.

- **DEVELOPMENTAL PROCESS:** Given that Enclosure 2 and the body of the draft SECY do not specify a plan (i.e., tasks, milestones and deliverables) for development of an integrated approach, we cannot discern from the document when stakeholders will have opportunities to work with the staff to flesh out the proposed approach, if the Commission approves the staff recommendation. We would like to know what those opportunities will be.
- **BALANCE OF CREDITS AND DEMERITS** - In practical application, the proposal shown in Enclosure 2 appears unlikely to lead the Senior Reactor Analysts to give credit for a qualitative factor if doing so would reduce the significance of a performance deficiency. How would the staff ensure the integrated approach is more even-handed in the granting of credit for factors that are favorable to safety, not just assigning of demerits for factors unfavorable to safety?
- **DEFINITIONS** - The definitions of the qualitative factors are critical to the success of the proposed approach. For the approach to be practical to use, the definitions should be: (a) consistent with other NRC governing documents (e.g., Regulatory Guide 1.174, Inspection Manual Chapters on the ROP, etc.), (b) mutually exclusive, so there is no overlap between qualitative factors; and (c) free of overlap with elements included in the quantitative evaluation. What source documents would the staff use, and what stakeholder interactions would the staff use, to sharpen the definitions of factors to be considered in a future integrated approach?
- **USE OF THE TERM "DOUBLE COUNTING":** Though expedient, the use of the term "double counting" in the draft SECY could be confused with the use of "double counting" elsewhere in the ROP to refer to a performance indicator and an inspection finding that address the same problem area. We suggest the draft SECY use some other term to refer to the consideration of a factor that overlaps in the quantitative analysis and the qualitative analysis.

Specific Comments and Questions

- **UNCERTAINTY** - Top of page 2: *"Uncertainty is captured implicitly by the existence of multiple layers of defense-in-depth and safety margins that are defined below their absolute engineering limits."* What does this statement mean?
- **FOUR OUTCOMES** – Top of page 2: *"For an overall qualitative rating of "moderately degraded", the color-band thresholds will be identical to the ones currently employed in the ROP for the operating fleet."* Does this mean that the ROP for the current fleet assumes "moderately degraded" conditions apply to operating plants?
- **BASIS FOR COMBINATIONS** – Top of page 2: *"The combined aggregate of quantitative risk and the total qualitative rating will be applied to a table which will take both into account in determining the SDP finding's color band."* It is unclear how the severity of qualitative ratings compares to quantitative results. Can you say more about the basis for combining qualitative ratings?
- **ANALYST'S JUDGMENT** – Middle of page 2: *"...an individual impact rating will be assessed based on the analyst's judgment using the tables below as a guide."* This inserts additional subjectivity into the evaluation process. How will the analyst's judgment be made more transparent and consistent?
- **INCONGRUITY** – Middle of page 2: *"The criteria and definitions for individual impact ratings are as defined below and may not be identical to those of the overall qualitative ratings."* What does this statement mean?

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- **NEGLIGIBLY DEGRADED** – Middle of page 2: *“An impact rating of “negligibly degraded” would represent a condition that would result in little or no regulatory concern.”* As implemented in Table 2, it appears that “Negligibly Degraded” actually leads to an overall qualitative rating of “Moderately Degraded”. The effect is to raise the color by one band. Why does “Negligibly Degraded” defense-in-depth lead to a baseline rating of “Moderately Degraded”?
- **NTTF RECOMMENDATION 1** – Bottom of page 2: *“Definitions [of defense-in-depth] may be further...refined as part of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, Recommendation 1.”* NTTF Recommendation 1 refers to the regulatory framework for adequate protection. How does the proposed SDP framework apply to adequate protection? How would this framework be tied to NTTF Recommendation 1?
- **BARRIERS** – Bottom of page 2: *“...[defense-in-depth] philosophy is based on providing...levels of protection so that health and safety will not wholly depend on any single element of the design, construction, maintenance, or operation of the plant. These levels of protection can be viewed as barriers of potential accident mitigation.”* How are the elements of design, construction, maintenance and operations reflected in the evaluation of barriers and defense-in-depth in the proposed approach?
- **COMPREHENSIVE PRA** – Bottom of page 2: *“...when a comprehensive risk analysis is not done (or cannot be done), traditional defense-in-depth considerations should be used or maintained to account for uncertainties.”* How does this apply to new plants, which are required to have comprehensive PRAs?
- **BARRIERS** – Top of page 3: *“Some elements defined as being part of defense-in-depth include the barriers of the fuel cladding, reactor vessel, reactor coolant, and containment.”* What is the definition of barrier? How is the reactor coolant a barrier?
- **SHUTDOWN FINDINGS** – Top of page 3: *“For shutdown findings, defense-in-depth elements include the key safety functions of...”* How does the proposed approach account for the fraction of the 18-month or 24-month operating cycle in which the plant is shut down?
- **DEFENSE-IN-DEPTH BARRIERS LOST** – Page 3: *“Complete loss of only one barrier” equals “Degraded”. “A loss of more than one barrier” equals “Significantly degraded”. How does the “more than one barrier” category address combinations of partial and complete losses of barriers? What does “impact” mean? Does “impact” cover a wide range of effects?*
- **SAFETY MARGINS**
 - a) Bottom of page 3: *“In the context of this paper, the concentration is on this limit for licensing purposes as the maximum value for the consideration of safety margins.”* If the plant is still within its licensing basis, what is the regulatory or safety concern?
 - b) Bottom of page 3: *“...only safety margins for non-failed barriers of defense-in-depth will be evaluated for any additional impact.”* If margins are degraded on non-failed barriers, this would have to be part of the performance deficiency, not a separate consideration.
 - c) Bottom of page 3: *“For findings that erode safety margins to be at the limit of the defense-in-depth barrier’s licensed operability, an impact rating of SIGNIFICANTLY DEGRADED is applied.”* If the situation remained within the licensing basis, what is the regulatory concern?
 - d) Top of page 4: *“Some margin lost” equals “Degraded’.* It is not clear how the three categories are made mutually exclusive. Does “Some margin lost” span the range from zero-plus-one-iota all the way to licensed-threshold-minus-one-iota? The implications on the “zero-plus” end seem very different from the implications on the other.

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- e) Page 4: The evaluation of safety margin only goes in one direction (toward elevating the outcome). What about the case in which tremendous margin exists? Would the process recognize this and produce a less severe outcome (i.e., a color reduction)?
- **CONDITION TIME** – Page 4:
 - a) When would the condition time used in the qualitative assessment be the same as the duration assumed in the risk evaluation? How would the proposed approach ensure that the condition time used in the qualitative analysis is not counting the time interval twice?
 - b) Condition Time appears to apply only to mitigating systems. Condition Time for mitigating systems is considered within the PRA.
 - c) A factor of two change in condition time yields a full color change. On the contrary, it takes a full decade change in delta CDF to yield a color change from the quantitative evaluation.
 - d) How would condition time be evaluated for situations in which a technical specification allowable outage time does not apply?
 - **QUALITATIVE CREDIT** – Page 5: “...qualitative credit...cannot be used as a substitute for a complete loss of more than one barrier to defense-in-depth.” This appears inconsistent with the depiction in Table 1 for cases with defense-in-depth Significantly Degraded. There are cases in which the entry for Qualitative Credit is shown as “Credit”.
 - **OVERALL RATING** – Page 5 and Table 1: The labels for the overall rating use the same terms as shown for the components of the rating (e.g., defense-in-depth rated as “Moderately Degraded” and overall rating is also “Moderately Degraded”). This is potentially confusing and implies some arithmetic by which the component ratings are added up to get the overall rating. It would be less confusing to give the overall rating a different set of labels. For example, an outcome that reduces the color by one rating might be labeled “Reduced Significance”; an outcome that leaves the color unchanged might be labeled as “Nominal Significance”; an outcome that raises the color by one rating might be labeled “Elevated Significance”.
 - **OVERALL RATING** – Page 5 and Table 1: An outcome that raises the color by two levels is equivalent to an increase in risk by a factor of 100. Qualitative factors should be used to justify such an elevation only to address specific limitations of the risk analysis, not to layer on separate considerations.
 - **APWR EXAMPLE: EXPOSURE TIME** – Page 6: The quantitative assessment accounted for the Turbine-Driven EFW Pump A being unavailable for three months. The defense-in-depth qualitative measure was given an impact rating of moderately degraded because of the pump’s impact on decay-heat removal. However, the pump failure’s impact on decay-heat removal is already accounted for in the PRA/SPAR model through its impact on core damage frequency. Also, the qualitative measure for condition time is given a rating of significantly degraded because it was more than twice the maximum allowable outage time in technical specifications. This, too, was accounted for quantitatively. Based on the way that Table 1 of Enclosure 2 is configured, the results of this example depend on whether or not qualitative credit is given. If credit is given, the finding will be white, which is consistent with the quantitative analysis results. However, if credit is not given, the finding would be escalated to yellow. Is it appropriate to escalate this finding if the licensee does not have an alternate source pump? Is it appropriate that two of the four qualitative measures are already accounted for in the quantitative assessment?
 - **APWR EXAMPLE: SSC** – Page 6: Does the defense-in-depth evaluation mean that the loss of any structure, system or component supporting a safety function is to be judged as comprising at least “Moderately Degraded”? This implies that the unavailability of any mitigating system would be con-

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sidered at least “Moderately Degraded”, no matter how many redundant trains are available in the new plant design.

- **APWR EXAMPLE: SM** – Page 6: *“For this example, a potential extent-of-condition degradation existed for the other pump, which would degrade safety margins...”* Does this mean that a potential degradation is to be treated the same as an actual degradation? Why is this part of Safety Margin rather than defense-in-depth? What about credit for the pump testing satisfactorily? Is there an example of a mitigating system performance deficiency that is not a degradation of defense-in-depth?
- **AP1000 EXAMPLE: PRHR DID** – Page 8: *“...the PRHR heat exchanger itself is a single barrier of defense-in-depth.”* What is the barrier in this case? What is the basis for concluding that the rating should be “Degraded”?
- **AP1000 EXAMPLE: PRHR SM** – Page 8: *“There is an impact to the safety margins of the remaining barriers to defense-in-depth, but it is less than the licensed safety margin.”* What does this mean? Why is it judged “Degraded”?
- **AP1000 EXAMPLE: CONCLUSION** – Page 8: *“This finding is driven by the 1-year condition time.”* The outcome seems to be driven as much by the Safety Margin determination as the Condition Time assessment. How is the Yellow outcome driven by condition time?
- **ABWR EXAMPLE: POTENTIAL** - Page 9: *“Despite no extent of condition being found, there still exists a potential for this performance deficiency to manifest itself in interactions with other components in both remaining trains of the high pressure core flood (HPCF) system.”* Does this mean that a potential impact is to be treated the same as an actual impact?
- **ABWR EXAMPLE: CONDITION TIME** – Page 9: Condition Time is accounted for in the PRA. Why is it treated separately as a qualitative factor here?

Enclosure 3 – Technical Evaluation of Relative Risk Measures Including Reexamination of Pros and Cons

- **PROS AND CONS** – Page 4: As explained by Mr. Jeff Gasser during his remarks to the ACRS Subcommittee on Reliability and PRA on July 22, the concern by ACRS and others that safety margins inherent in new reactor designs may be eroded unless “locked-in” by modifications of the ROP is misplaced. Inspection findings of any color get prompt and intensive attention of licensee management at today’s plants. The intensity of corrective action is not a function of the plant’s Core Damage Frequency. It is simply the norm across all 100-plus operating units and will continue to be the norm for the new units having lower CDF values. This high level of response to NRC inspection findings is recognized across the industry as necessary and prudent to maintain an effective regulatory relationship and a high level of public trust and confidence. Both are essential for success in today’s operating climate.
- **PRO AND CON** – Page 6: *“The relative risk approach may potentially have merit, but the cons...appear to outweigh the pros.”* The draft SECY implies the staff used some systematic method for weighing pros and cons equally. The use of the word “may” implies skepticism about the benefits of relative risk put forward by its proponents. We would suggest that the draft SECY simply acknowledge the advantages and chief arguments for the relative risk approach as put forward by the ACRS and others. We would suggest the draft SECY then clearly articulate the challenges of the relative risk approach.

The conclusion of Enclosure 3 would be more transparent and credible if the staff articulated the criteria used to judge that the cons outweigh the pros. It would be compelling, for example, if Enclosure 2 included an estimate of the dollars and man-hours of NRC and licensee time needed to develop the relative risk framework. It would be instructive to see estimates of the burden on NRC and li-

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censes from misdirecting resources to deal with new plant issues that are much less significant than existing plant issues. It is also important to note that Enclosure 3 does not offer evidence that CDF margin erosion has been observed among the existing plants with lower CDF values. Hence, the concerns about erosion of extra CDF margin in oncoming new plant designs is hypothetical, not predicted by the data available on the operating plants today. On the contrary, we believe that the availability of full-scope PRAs will provide added assurance that CDF margins will be prudently monitored and maintained in the new units, obviating the need for ROP modifications specifically aimed at preserving new plant CDF margins.

Enclosure 4 – Appropriateness of Existing Performance Indicators and Thresholds

- **IMPACT ON CDE:** Any change in the current performance indicators that requires a change in data reporting or calculations will necessitate a change in the Consolidated Data Entry (CDE) system at INPO. The CDE design is highly complex and necessary to maintain data integrity throughout the data collection and reporting process. A proposed change that appears to be a minor “tweak” to the data reporting requirements (e.g., the rules on rounding of calculated values) can require major expenditure of INPO and industry resources to modify CDE. We urge the staff to do everything possible to avoid requiring changes in the existing performance indicators that would require making changes in CDE. We further urge that any discussions about changes that could require modifications to CDE include knowledgeable INPO and industry representatives, and that ample time be allowed for INPO and industry to accomplish those changes in an orderly manner. In addition, the NRC should keep in mind that the resources for making those modifications will have to be added to the INPO budget during its annual business planning cycle. This must be considered in establishing the lead time necessary to implement any changes in the performance indicators that might emerge from discussions with the Commission, the staff and industry.