

BWR OWNERS' GROUP

K. S. Putnam, Chairman
Tel: (319) 851-7238
Fax: (319) 851-7364
Ken.putnam@nmcco.com

Nuclear Management Company • Duane Arnold Energy Center • 3277 DAEC Road • Palo, IA, 52324

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ADJUDICATIONS STAFF

SUBJECT: BWROG COMMENTS ON RISK-INFORMED CATEGORIZATION AND TREATMENT OF STRUCTURES, SYSTEMS, AND COMPONENTS FOR NUCLEAR POWER REACTORS (RIN 3150-AG42)

The BWR Owners' Group (BWROG) appreciates the opportunity to comment on the subject report. The comments in this letter were approved by a vote of the Risk Informed Part 50 Option 2 Committee, and the BWROG Primary Representatives.

At the outset, we want to recognize the substantial work applied to develop the proposed alternative approach for establishing the requirements for treatment of structures, systems, and components (SSC's). This work can provide for more realistic identification of the significance of SSC's and consequent categorization and treatment.

The BWROG has commented on both the NRC understanding of the rule as expressed in the Notice of Proposed Rulemaking, as well as the proposed rule text itself. The comments are physically organized into two categories. First is a comment on "Additional Requirements Imposed by the NOPR", followed by "General Comments" on both the NOPR and the rule. The comments are in the Attachment to this letter.

Of particular interest to the BWROG is the need for a license amendment. The requirement to prepare, submit, and then receive approval of a license amendment in order to implement 50.69 is seen as a particular disincentive to voluntary use of the new rule. In light of the desire to move to a more performance-based regulatory regime, voluntary implementation of 50.69 should be developed by licensees using the requirements in the rule and any attendant regulatory guidance, with routine NRC inspection serving to verify compliance.

If you have any questions regarding these comments, please contact Eric Jebson (Exelon Nuclear), BWROG Risk Informed Part 50 Option 2 Committee Chairman at (309) 227-3327; or Rick Hill (GE) Project Manager at (408) 925-5388.

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Regards,

A handwritten signature in black ink, appearing to read "K. S. Putnam". The signature is fluid and cursive, with a prominent initial "K" and a long, sweeping underline.

K. S. Putnam

BWR Owners' Group Chairman

Attachment: BWROG Specific Comments

cc: J. E. Conen, BWROG Vice Chairman
BWROG Primary Representatives
BWROG IRIR Committee Chairman
BWROG Risk Informed Part 50 Option 2 Committee Chairman
B. Bradley, NEI
T. G. Hurst, GE
R. A. Hill, GE
A. Wang, NRC

BWROG Specific Comments on Notice of Proposed Rule for Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors

Additional Requirements Imposed by the NOPR

Section II, page 26513, top of right column states: “As part of this process, those SSC’s found to be of risk significance would be brought under a greater degree of regulatory control through the requirements being added to the rule designed to maintain consistency between actual performance and the performance considered in the assessment process that determines their significance.”

Section III.3.1, page 26517, left column. Paragraph 3 states: “Additional requirements are being added to these SSC’s to ensure that their performance remains consistent with the assumed performance in the categorization process (including the PRA) for beyond design basis conditions.” “Further, the conditions under which those functions are assumed to be performed may exceed the design-basis conditions for the applicable SSC’s.” “...licensees might need to enhance the treatment applied to RISC-1 and RISC-2 SSC’s to support the credit taken in the categorization process, or conversely adjust the categorization assumptions to reflect actual treatment practices.”

Section III.7.2, page 26530, left column, middle of paragraph 2 states: “...and additionally requires sufficient treatment be applied to support the credit taken for these SSC’s for beyond design basis events.”

Section III.7.3, page 26530, center column, paragraph 2, states: “...and ensuring that credit taken for these SSC’s in the PRA for beyond design basis events is maintained, provides assurance that the safety-significant SSC’s continue to perform as assumed in the categorization process.”

Comment: The wording in these sections is not consistent. Section III.3.1 and III.7.3 seem to imply that the same level of treatment (quality, testing, etc) needs to apply for design basis and beyond design basis conditions. Section III.7.2 uses the modifier “sufficient” to temper the requirement. The modifier should be added to all sections, and sufficient treatment needs to be described for beyond DBA conditions, including the types of restrictions, conservatisms, and margins expected.

General Comments on NOPR and 50.69 Rule Text

General – throughout this document the phrase “the Commission expects.....” is used. Utility implementation should allow for interpretation by the individual utility of the implementation processes to avoid undue disruption of their established practices.

Section III.2.0, page 26516, left column states that both a peer review and a NRC review of the PRA is required.

Comment: This seems redundant.

Section III.2.0, page 26516, center column, last paragraph states: “Section 50.69 contains requirements for maintaining the design basis of the facility. These requirements, considered in conjunction with the requirements to maintain the potential change in risk as small (as discussed above), ensure that safety margins are maintained. The performance of candidate RISC-3 SSC’s should not be significantly degraded by the removal of special treatment. This is because the licensee is required to implement processes that provide **reasonable confidence** that SSC’s remain functional, that is, remain capable of performing their function with a reliability that is not significantly degraded to such an extent that there will be a significant number of failures that can lead to unacceptable increases in CDF or LERF.”

Comment: These NOPR requirements for maintaining the design basis, in order to provide reasonable confidence that SSC’s remain functional, are appropriately specified in this section. However, the requirements stated later (in the Federal Register page 26541 Last Paragraph Right Column) in the V.5.2.1 Section for 50.69(d)(2)(i) Design Control Process have the potential to be more restrictive rather than these more general requirements. It is the opinion of the BWROG that the discussion of Section III.2.0 and focus on “reasonable confidence” be considered the appropriate guidance for establishment of licensee processes, and that any further guidance for establishing licensee processes for RISC-3 SSCs in Section V.5.2.1 be understood in this context. (See related comments: III.4.0 and V.5.2.1.).

Section III.2.0, Page 26517, left column states: “...the rule would require that implementation be done for an entire system or structure and not for selected components within a system or structure.”

Comment: The methodology for determining system boundaries is unclear. System boundaries should be determined by the licensee. Often, the PRA uses different system boundaries than the plant master data list. Some examples: the Diesel Generator Fuel Oil Transfer system can be considered separately from the Diesel Generator system, and both can be considered separately from the plant Electrical System. The HPCI room cooler can be considered separately from the HPCI system (if it only cools HPCI).

Section III.3.1 page 26517, center column. There is the implication that treatment of RISC-3 SSC's is substantially the same as RISC-1 treatment.

Comment: It is possible that safety-related equipment is assumed to perform following severe accidents or other events modeled in the PRA because of operating conditions different from the design basis requirements. For example in severe accident analyses ECCS pumps can assume full containment overpressure (prior to containment failure) for operability, while the design basis requires no credit for overpressure. These additional performance conditions added to address PRA performance assumptions should not be subject to the Appendix B requirements that remain for RISC-1 SSC's. Furthermore, the design control documentation necessary to capture the assumptions made in the categorization process will place a large implementation cost on plants.

Section III.4.0, page 26518 center column, paragraph 1 states: "Instead of the special treatment requirements, the Commission has set forth more general requirements by which a licensee is to maintain functionality. These requirements give the licensee more latitude in applying its treatment processes to achieve performance objectives. The more general requirements that the Commission is specifying for the RISC-3 SSC's include steps to procure SSC's suitable for the conditions under which they are to perform, to conduct performance and/or condition monitoring and to take corrective action, as a means of maintaining functionality."

Comment: These general requirements by which a licensee is to maintain functionality are appropriately stated in this section. However, the requirements provided later starting on page 26541, right column, last paragraph in Section V.5.2.1 Section 50.69(d)(2)(i) Design Control Process have the potential to be more restrictive rather than more general. Recommend section V.5.2.1 be revised to be consistent with this section, which states the licensee is required to implement processes that provide more general requirements that SSC's remain functional. (See related comments on Sections III.2.0 and V.5.2.1.)

Section III.4.9, page 26526 and subsequent sub-paragraphs describe the rules that were proposed for applicability, but ultimately were rejected.

Comment: Several rules are excluded from the scope of 50.69 treatment changes because they have previously undergone risk informed changes. This introduces undue complexity into the regulations. There would be traditional/deterministic bases for treatment, risk-informed bases for treatment, and several special risk-informed bases for treatment. While a lot of excellent work has gone into these special risk-informed rules, consistency should be of greater importance. The only acceptable reasons for excluding sections should be that the risk-informed process is insufficient for the particular

application (which is not likely because it has been deemed sufficient for everything else) or that its conclusions have been determined to be overly conservative. That is, the 50.69 categorization process should be sufficient for all applications, on a voluntary basis.

Section III.4.9.2, page 26526.

Comment: SSC's categorized as RISC-3 should not require testing and reporting as required in technical specifications. 50.36 should be added back into the list of applicable regulations. While other actions are underway to risk inform the specifications, 50.69 should provide the process by which future changes can be made.

Section V.3.2, Section 50.69(b)(2), page 26535, left column, paragraph 4 states: "Regarding the categorization process description, the NRC expects that most licensees and applicants will commit to draft regulatory guide DG-1121 which endorses NEI 00-04, with some conditions and exceptions."

Comment: The BWROG recommends changes to incorporate BWROG industry exceptions to the proposed Regulatory Guide DG-1121, which endorses NEI 00-04.

Section V.4.1.2, page 26536, right column, last paragraph & page 26537 left column, first paragraph states: "(2) PRA's typically model recovery actions, especially for dominant accident sequences. Estimating the probability for the recovery actions involves a certain degree of subjectivity. The concerns in this cause stem from situations where very high success probabilities are assigned to a sequence, resulting in related components being ranked as low risk contributors. Furthermore, it is not desirable for the categorization of SSC's to be impacted by recovery actions that sometimes are only modeled for the dominant scenarios. Sensitivity analyses should be used to show how the SSC categorization would change if recovery actions were removed. The IDP should ensure that the categorization is not unduly impacted by the modeling of recovery actions."

Comment: It is agreed that recovery actions should not unduly influence the risk categorization of SSC's. However, when such recovery actions are justified by adequate equipment, procedures, and training, then these recovery actions are judged reasonable they should be considered acceptable. The consequential result is that the underlying equipment is of lower risk worth because its initial failure can be mitigated by timely action and this should be considered by the ICD. It is expected that recovery actions which replace equipment actuation, not equipment repair, will be important in the short term accident response. Such actions will have minimal impact on equipment "fail to run" type PRA data. In the long term accident response, actual equipment repair may be fully acceptable.

Section V.4.1.2 (3) page 26537 left column, paragraph 2 states: “CCF’s are modeled in PRA’s to account for dependent failures of redundant components within a system. CCF probabilities can impact PRA results by enhancing or obscuring the importance of components. A component may be ranked as a high risk contributor mainly because of its contribution to CCF’s, or a component may be ranked as a low risk contributor mainly because it has negligible or not contribution to CCF’s. The IDP should ensure that the categorization is not unduly impacted by the modeling of CCF’s. ”

Comment: It is agreed that the potential for CCF of SSC’s is an important concern in risk categorization. It is understood that the IDP is **not** expected to become expert in determination of CCF probability values which may appear in a PRA. The IDP scope is limited to consideration of SSC redundancy, diversity of SSC’s performing similar functions, existing treatments used to guard against CCF, and discerning if any suggested changes in treatment may significantly affect CCF. That is, the IDP performs a qualitative review of CCF impact.

Section V.4.2.2, page 26537 right column & page 26538 left column states: “In addition to being safety – significant in terms of their contribution to CDF or LERF, SSC’s can also be safety significant in terms of other risk metrics or conditions. Therefore, for SSC’s not modeled explicitly in the PRA, the IDP should verify low safety significance based on traditional engineering analyses and insights, operational experience, and information from licensing basis documents and design basis accident analyses. The IDP should assess the safety significance of these SSC’s by determining if:” (Eleven specific considerations are presented in the NOPR.)

Comment: The risk metrics of interest for SSC categorization are CDF and LERF, i.e. those which can be related to significant impact on public health and safety. While the 11 items listed form a good “checklist” for IDP consideration, this consideration must focus not only on consequences, but also on the probability of these consequences to gain a perspective on **risk**. It is understood that in considering each item, the IDP addresses, qualitatively or quantitatively, the contribution that each consideration may have on total plant risk, (e.g. the probability or frequency of occurrence, the relative contribution of each factor, etc.) It is not expected that detailed listings of all SSC’s not included explicitly in the PRA be developed for IDP consideration.

Section V.4.5, Section 50.69(c)(1)(v), page 26539, This Section indicates initial implementation may be for a subset of plant systems or structures, with “phased in implementation over a period of time”.

Comment: It should be understood that implementation may end with those SSC’s forming the initial implementation, even if they are a subset of all plant SSC’s, i.e. implementation may be for a single plant system.

Section V.4.5 Section 50.69(c)(1)(v), page 26539. This section states: “Section 50.69(c)(1)(v) specifies that the categorization be done at the system level”

Comment: The application of the special treatment requirements as well as the safety classification of components is normally made at the component level. Similarly, the categorization needs to be at the component level since Systems often have more than a single function and the safety significance is established by the function (for example containment isolation). This area needs more clarification.

Section V.5.2.1 Section 50.69(d)(2)(i), page 26542, left column, last paragraph states: “It is recognized that the level of confidence in the design capability of RISC-3 SSC’s may be less than the confidence provided in the capability of RISC-1 SSC’s to perform their safety functions. The proposed treatment requirements for the control of RISC-3 SSC’s are included, in part, to provide a basis for the assumption in the categorization process that these SSC’s will continue to be capable of performing their safety related functions under design basis conditions throughout their service life.”

Comment: However, the statements in the second paragraph following the above appear to be more prescriptive than the current regulation and have the potential to add unnecessary burden beyond that specified in 50.69(d)(2)(i). That is, the proposed 50.69(d)(2)(i) specifies in a summary statement that the Design functional requirements and bases for RISC-3 SSC’s must be maintained and controlled including the design requirements for environmental conditions, and aging and synergism effects, and seismic conditions. This general summary statement should be sufficient.

Section VI.2.1, page 26546 – this Section comments on requirements for full scope PRA.

Comment: Implementation of 10CFR50.69 should not be dependent on development of a full scope PRA. Such a scope is not required if other methods of determining risk impact are available, particularly maintenance of defense-in-depth and safety margins. The PRA should not be viewed in isolation. That is, if defense-in-depth and safety margins are in place, any PRA should result in very low calculated risk and thus the PRA serves merely to confirm the benefit of defense-in-depth and safety margins. Because of the uncertainty inherent in compliance with any new rule, flexibility of implementation should be maximized to promote increased use of the rule and development, over time, of a “preferred” method of compliance. Use of other methods of evaluating risk such as margins analysis and IDP judgment should also be allowed, if such analyses are capable of supporting risk categorization.

Section VI.2.2, page 26546 – This Section treats Review and Approval of Treatment for RISC-3 SSC’s.

Comment: Details of compliance with current special treatment requirements vary according to the particular individualities of each plant site. These particular individualities are expected to be present even after implementation of 50.69. As changes in risk-informed regulation and PRA continue, and especially during the initial implementation phase of 10CFR50.69, special treatments can be expected to evolve. Requiring that Licensees continually approach the NRC for approval of treatment changes is seen as a strong disincentive for both implementing 10CFR50.69 and for making evolutionary changes as desired. The requirement for Licensees to monitor performance and revise treatment as needed to maintain design basis performance is sufficient.

Section VI.2.3, page 26546 – This Section treats Inspections & Enforcement.

Comment: Additional training and guidance should be provided to NRC inspectors charged with oversight of 10CFR50.69 activities. In the past (e.g. for the new NRC oversight process) public workshops have proved useful. Guidance should also be added to NRC inspection modules for existing special treatment areas indicating that compliance with 50.69 is a valid alternative for RISC-3 SSC's. In essence, some "change management" process should be followed to allow inspection staff to understand the nature and use of the new rule.

Section VI.2.4, page 26547 – This Section treats Operating Experience

Comment: Any data collection program should be commensurate with the RISC significance of the SSC of interest. That is, data collection for RISC-3 components should not be any more laborious than under current special treatment regulations. Although data collection is seen as important for "proving" that RISC-3 SSC design basis capability is maintained, the risk categorization process recognizes that more uncertainty in this design basis capability is acceptable, and that "correction" of treatment to prevent any unacceptable reduction in RISC-3 SSC reliability or availability need not occur on a minute-by-minute basis because the risk categorization has already determined that the risk of SSC failure is small.

50.69(b)(2), page 26550 **Comment:** The requirement to prepare, submit, and then receive approval of a license amendment in order to implement 50.69 is seen as a particular disincentive to voluntary use of the new rule. In light of the desire to move to a more performance-based regulatory regime, voluntary implementation of 50.69 should be developed by Licensees using the requirements in the rule and any attendant regulatory guidance, with routine NRC inspection serving to verify acceptable compliance.

50.69(c)(1)(i), page 26550 **Comment:** The requirement for PRA peer review and assessment against NRC endorsed standards appears to delay application of 50.69 until existing draft guide DG-1122 is final, and then after Licensees have either completed peer reviews under the final guidance, or completed “delta” studies and resolved differences between existing industry peer reviews and the newly completed NRC guidance.

50.69(c)(1)(v), page 26550 **Comment:** The requirement to evaluate “entire systems” should be understood to exclude entire “support” systems. For example, if system A is evaluated as “RISC-3”, but components of system A are in turn dependent on system B operation, and the particular system B components of interest are categorized as RISC-1 or RISC-2, then system A is understood not to include these system B components and is not to be categorized as RISC-1 or RISC-2.

50.69(d)(2), page 26550 **Comment:** Analysis of this section of the rule in V.5.2 includes the verbiage “Licensees may decide to apply current practices at their facilities” It is recommended that this verbiage be added to the final rule for completeness.

50.69(e)(1), page 26550 **Comment:** It is understood that the risk analyses (PRA, margins, etc.) supporting 50.69 risk categorizations should reasonably reflect the as-built, as operated plant. However the need to update the supporting analyses should be maintained as part of the “quality” of these analyses embodied in compliance with NRC endorsed standards, already addressed in 50.69(c)(1)(i). The update frequency specified in 50.69 should be limited to that of the categorization itself. Thus, the verbiage in the NOPR “... the licensee shall review changes to the plant, operational practices, applicable industry operational experience, and, as appropriate, update the PRA and SSC categorization.” should be changed to “...the licensee shall update the SSC categorization”

50.69(e)(1), page 26550 **Comment:** Because updates of PRA applications typically follow updates of the PRA itself, and because Licensee implementation of 50.69 may fall on a schedule which does not correspond to existing Licensee PRA update processes, the 36 month update frequency in the NOPR should be specified to be “... no longer than every 36 months *after Licensee implementation of SSC categorization per 10CFR 50.69....*” (Italics added).

50.69(g), page 26551 **Comment:** Creating separate reporting requirements under 50.69 would be redundant and confusing when compared to 10 CFR 50.72/50.73. Existing reporting requirements are well defined and implemented. The proposed reporting requirements for RISC-1 and RISC-2 SSCs under 50.69 are vague. Lessons learned from the implementation of 50.72 and 50.73 were that vague reporting requirements created substantial burden and inconsistency for the industry. Any additional data that might be generated by the proposed reporting requirement of 50.69 for RISC-2 SSCs would be of very limited value. It is sufficient to state that reporting requirements for RISC-1 SSCs under 50.69 are unchanged from existing reporting requirements.