

September 26, 2000

Mr. Stephen D. Floyd, Senior Director
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

SUBJECT: INITIAL OBSERVATIONS ON PROPOSED RISK-INFORMED PART 50
OPTION 2 CATEGORIZATION GUIDELINE (TAC NO. MA8584)

Dear Mr. Floyd:

This letter provides some of our initial observations on the categorization portion of your draft guideline, *Risk-Informed Categorization and Treatment of Structures, Systems and Components*. These observations are based upon our initial review of the draft categorization guidance submitted at a public meeting on March 30, 2000. Staff comments on the treatment portion of this draft guidance will be forthcoming. It is our understanding that you propose to exercise the draft guidelines as part of a pilot program to gain insights applicable to the risk-informed Part 50 Option 2 rulemaking effort.

Our detailed observations are provided in the enclosures. Enclosure 1 describes the classification of our observations. Enclosure 2 provides our detailed observations. These observations are generally consistent with topics discussed in public meetings on April 20 and June 27, 2000.

Summary of Significant Issues

Your categorization guideline is generally consistent with the technical standard given by the draft 10 CFR 50 Appendix T. The process to categorize structures, systems, and components (SSCs) is highly dependent on the integrated decisionmaking panel (IDP). This panel is expected to combine risk insights from the PRA and other risk analyses with other traditional engineering analyses to determine the safety significance of plant SSCs. There is minimal discussion of the requirements for the IDP in the current version of your guideline. Similarly, the guideline is also silent regarding the change control process for risk-informed SSCs and the associated implementing programs. We will require more information on the IDP and change control processes before we can complete our review.

Future Activities

We have discussed these issues with your staff in public meetings, and expect to continue discussions in future meetings. We anticipate three comment and response cycles over the next several months as we come to agreement on the categorization guideline content. We also anticipate gaining additional insights as the Option 2 pilot program proceeds.

Mr. Stephen D. Floyd

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We have briefed members of your staff on the significant issues and on our overall plans as discussed above. Your staff has agreed to provide a schedule for your response to us by October 3, 2000. Your timely response to the issues raised in this letter will be of great value to our Option 2 rulemaking effort. The NRC project manager for this review is Joe Williams, who can be reached at (301) 415-1470.

Sincerely,

/RA/ Signed by C. Ader for

David B. Matthews, Director
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosures: As stated

Mr. Stephen D. Floyd

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Mr. Stephen D. Floyd

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Enclosure 1

CLASSIFICATION OF NRC OBSERVATIONS

Observations are classified in one of three categories. A “comment” is an issue which must be resolved in order for the NRC staff to endorse the guideline. If the issue is not resolved, it is expected the comment will be the basis for a regulatory position taking exception to the guideline. You should feel free to propose alternative solutions to our comments if you feel they adequately resolve the issue.

“Suggestions” are changes we believe can improve or clarify the guideline. Incorporation of these suggestions is not necessary for endorsement of the guideline. However, in some cases, we may conclude that our regulatory guidance address these items if we believe clarification is necessary. These clarifications will not be considered as “exceptions” to the guidance. Again, you should feel free to propose alternatives to address our suggestions.

“Editorial changes” are changes proposed to improve the readability of the guidance, and can be adopted or not as you see fit. We have not proposed any editorial changes at this time. We expect to propose editorial changes when the guidelines are closer to their final form.

Enclosure 2

NRC STAFF OBSERVATIONS

CATEGORIZATION

Comments

1. Integrated Decisionmaking Panel (IDP) Guidance

The process to categorize SSCs is highly dependent on the IDP. This panel is expected to combine risk insights from the PRA and other risk analyses with other traditional engineering analyses to determine the safety significance of plant SSCs. There is minimal discussion of the requirements for the IDP in the current version of NEI's guidelines. It is essential that the guidelines discuss, as a minimum, the panel member qualifications, the decision-making process, the technical information bases, incorporation of non-PRA modeled items, identification of limitations, and the required documentation.

2. Change control process

In the last paragraph of Section 1.3, it is stated that the regulatory change process (10 CFR 50.59) applies only to activities that are encompassed by the 10 CFR 50.2 definition of design bases or described in the final safety analysis report. It is further stated that 10 CFR 50.69 includes a risk-informed change process for risk-informed SSCs and activities. It is currently our position that 10 CFR 50.59 will be applied in the same way as it is applied today, except that the treatment changes resulting from the Appendix T categorization will not be subject to 10 CFR 50.59. We also expect that 10 CFR 50.69 will include provisions to control facility changes to ensure safety significant performance characteristics are not compromised. The guideline needs to be clarified to ensure that it is clear with respect to the way 10 CFR 50.59 will be applied after moving to risk-informed special treatment regime.

3. Updated PRA

Throughout the guideline, the requirement for an up-to-date PRA to be used in the categorization process is de-emphasized. For example, guideline Section 2.3 states that "These analyses or programs may represent current plant design and operation, but even if they have not been kept up to date, they provide insights..." Similarly, in Section 2.4.1.2, "If the PRA or other analysis has not been updated to reflect all current design and operating conditions, it can still be used..."

Risk importance measures are relative, and if the PRA is inaccurate in one or more places, the relative importance of all the other SSCs is affected. Except for very simple cases, it is difficult to expect the IDP to account for and to adjust the PRA results when the basis for their decisionmaking is incorrect to begin with. Regulatory Guide 1.174 and the draft Appendix T call for the PRA to reflect the as-built and as-operated plant.

Therefore, the guideline should be revised to require usage of a PRA reflecting the as-built, as-operated facility.

4. Categorization and treatment of nonsafety-related SSCs

In the first paragraph of Section 1.1, the statement that nonsafety-related SSCs are not subject to special regulatory treatment is not accurate. For example, these SSCs may have requirements under 10 CFR 50.48 (fire protection), 10 CFR 50.49 (environmental qualification), 10 CFR 50.65 (maintenance rule), etc. The discussion in the last paragraph of Section 1.2 suggests that nonsafety-related and low safety significant SSCs that are currently within the scope of special treatment requirements could be categorized as RISC-4 and can be removed from regulatory control. This is inconsistent with the NRC's intent, which was to ensure that even after categorization those nonsafety-related SSCs within the current scope of special treatment requirements would remain functional in the same manner as RISC-3 SSCs. Finally, it should be recognized that SSCs in all RISC categories are within regulatory scope with respect to the categorization process in 10 CFR 50.69. Other regulatory requirements, such as 10 CFR 50.59 continue to apply, as well. It is, therefore, incorrect to suggest that RISC-4 SSCs are completely out of regulatory scope.

In SECY-00-0194, the staff has proposed clarifications to the "4-box" diagram defining the RISC categories. Please review your guideline and make the revisions necessary to conform to the revised RISC definitions.

5. Selective implementation

In Section 1.3, it is stated that the categorization approach may be applied to selected systems. Selective implementation could result only in applications requesting reduced treatment requirements rather than in applications that would combine the reduction as well as in the increase in requirements where necessary. Although the NRC agrees that selective implementation should be allowed for rules (provided that no exemptions would be required), we disagree that there should be unlimited flexibility with respect to selective implementation for systems. As discussed in SECY-00-0194, we believe that licensees should, at a minimum, address all RISC-1 and RISC-2 SSCs.

6. Prior NRC review and approval

Guideline Section 1.1 states that "The process and criteria are intended to be sufficiently clear... that there is not a need for prior NRC review and approval of the plant specific program." On the other hand, guideline Section 4 includes a brief description of a submittal to NRC, including some provisions for NRC approval of the transition to the Option 2 regulatory regime. In public meetings, NEI representatives have proposed an option where 10 CFR 50.69 and Appendix T would be less prescriptive, and that there would be some manner of review by the NRC.

What is the current NEI position on the prescriptiveness of the requirements and the need for prior NRC review and approval of the categorization process used and the PRA used as a basis for the categorization? If prior NRC review is found to be necessary, what regulatory mechanism, such as a license amendment, does NEI expect to be used as the means for NRC approval?

7. Guidelines for monitoring of SSCs and corrective action process

In guideline Section 1.1, it is stated that “This approach uses performance monitoring, rather than special treatment to ensure equipment reliability.” This sentence implies that performance monitoring is something other than special treatment. Does this statement contradict the effort to target 10 CFR 50.65 as a special treatment rule? Also, monitoring should ensure more than just equipment reliability, since equipment availability should also be considered. In addition, plant level indicators or condition monitoring should be taken into account. In the table labeled “Treatment of SSCs” on page 1-4, the RISC-2 box specifies the monitoring of risk-significant attributes and controlling of risk-significant attributes not addressable by monitoring. We believe the control of attributes not addressable by monitoring would be a good approach for all RISC classes.

The guideline provides limited information on how monitoring results will be addressed. The guideline needs to provide a thorough discussion of the role of licensee monitoring and corrective actions, and how those results are fed back into the categorization process. Monitoring, feedback, and corrective actions should be an integral part of the overall approach and should be incorporated into the guidance (e.g., into Figure 2.3-1 and associated text).

8. Miscellaneous Comments

a. Mapping of plant SSCs to the PRA

The document does a good job for SSCs directly modeled in the PRA. However, there is little guidance for SSCs implicitly modeled or implicitly taken credit for. For example, additional guidance is required to address the role of SSCs in the screening out of scenarios or initiating events, inherently reliable SSCs not modeled (e.g., piping and tanks) but assumed to function, SSCs not explicitly modeled (e.g., some room cooling, instrumentation and control systems), SSCs needed to support operator recovery actions, and SSCs failed through spatial interactions.

b. Risk indices outside the scope of the PRA

The guidance must address the role of SSCs in emergency preparedness (such as emergency operating procedures and severe accident management guidelines), the role of SSCs in fission product barrier integrity, and role of SSCs in mitigating the consequences of accidents.

c. Consideration of defense-in-depth

The figure in Section 2.4.2.1 used to assess defense-in-depth is consistent with staff guidance in that the level of defense-in-depth should be commensurate with frequency of occurrence of initiating events. However, staff guidance in the draft Appendix T also calls for defense-in-depth to be commensurate with consequences of events, and with the uncertainty of the analysis. Therefore, events like steam generator tube ruptures should be treated separately, because of more severe consequences resulting from a potential bypass of the containment. Also, events like RCP seal LOCAs and events where there are small success criteria margins should be afforded more defense-in-

depth to address modeling uncertainty. The guideline figure and discussion should be expanded to include these factors.

Some clarification of the defense-in-depth is also needed. For example, the figure appears to apply only to design basis accident initiators. The figure should address initiators including the beyond design basis events identified by the PRAs. It is also not clear if the intent of the table is to ensure that the SSCs being affected (SSCs where treatment requirements are reduced) are not the only line of defense, even for a low frequency initiator and that there is at least one more line of defense for more frequent initiators. Finally, it is not clear if the evaluation should assume that all trains of the system containing the RISC-3 components are unavailable.

d. Sensitivity studies

Sensitivity studies for common cause failure probabilities and for human error probabilities should be performed such that the probabilities are increased as well as decreased. In addition, findings from the PRA peer review process should be factored into the sensitivity studies. The categorization guidelines should be more specific as to what the IDP does with the results of the sensitivity studies, i.e., how will the sensitivity results factor into the decision-making.

e. Risk importance assessment process

In Section 2.4.2.1, a complicated initiating event is defined as an event which trips the plant and causes an impact of a key safety function. It is not clear what threshold applies for this definition.

Also, in Figure 2.4-3 (in the flow path where “Importance measures do not include initiating event contribution”), it is not clear how the SSC function to mitigate an accident is accounted for. It appears that the SSC role in causing an initiating event is the primary reason for an SSC being classified as safety significant.

f. Internal fire and flood assessment

How are SSCs responsible for the definition of the “independent” fire zones and flood zones treated? For example, fire dampers or back-flow check valves in drain lines are credited in the definition of fire and flood zones. How will these SSCs be classified?

The sixth paragraph of Section 2.4.2.2 deals with situations where LERF cannot be quantitatively linked into the fire model and talks about linking insights to the internal events PRA model. How are impacts on other aspects of the PRA model which could affect LERF (e.g., operator/human response no longer valid due to the environmental conditions resulting from the fire) addressed? This comment also applies to the flooding and seismic initiators.

g. Importance rankings for external events and low power and shutdown modes

Appendix T states that, because the PRA analyses for these events may be overly conservative or not as well developed when compared to the internal event analysis, importance rankings should be determined both integrally and individually (to prevent masking effects). Only when an SSC is low safety significant for each of these analyses will it be assigned to the low safety significant category. It is not apparent from Section 2.4.2.6 in how the NEI guidance treats this issue. What criteria are used by the IDP to determine the safety significance of an SSC? Will all SSCs that have an individual (i.e., for one analysis, e.g., low power or seismic) Fussell-Vesely or risk achievement worth (RAW) value equal to or exceeding screening criteria be identified as important? How would an SSC be classified if its integral (i.e., integrated) Fussell-Vesely or RAW were less than the screening criteria?

The discussion in Section 2.4.2 on flooding suggests a reevaluation of the importance of SSCs with the dominant contributor removed. Why restrict this type of analysis to flooding, and why to the “dominant contributor?”

h. External events and plant operating modes not modeled in the PRA

When PRAs are not available, and screening methodologies are relied upon to determine safety significance, the NEI guidance states that SSCs credited in the safe shutdown path should be categorized as high safety significant. How are failure probabilities of SSCs in this path accounted for? In addition, how will defense-in-depth be treated in these cases?