September 27, 2001

MEMORANDUM TO: Michael T. Lesar, Chief
Rules Review and Directives Branch
Division of Freedom of Information
and Publications Services
Office of Administration

FROM: Cynthia A. Carpenter, Chief**/RA/**
Risk Informed Initiatives, Environmental, Decommissioning
and Rulemaking Branch
Division of Regulatory Improvement Programs, NRR

SUBJECT: RIP50 OPTION 2 RULE CONCEPTS

The staff has been working toward issuance of a proposed rule for RIP50 Option 2 to the Commission in April 2002. As part of efforts to engage public and stakeholders early in the rulemaking process, the staff intends to hold a workshop on this subject on October 15, 2001. The workshop is intended to facilitate discussions and to inform public and stakeholders of our current approach to the rule in the areas of categorization and level of review required, and to present the objectives for the treatment portion of the requirements for RISC-3 treatment and alternatives under consideration.

Please post the technical information and workshop agenda as provided in attachment 1, on NRC web page at http://techconf.llnl.gov/cgi-bin/topics. Public questions or comments received through this web page should be forwarded to Tim Reed at TAR@nrc.gov or David Diec at DTD@nrc.gov

A notice of public meeting and workshop is being issued which will refer interested parties to this web page for further information.

Attachment as stated.

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DISTRIBUTION:

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NAME	DDiec:nyc	EMcKenna	CCarpenter
DATE	09/27/01	09/27/01	09/27/01

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NOTE: The following information is attached to the meeting notice announcing the public workshop on this issue. Participants are invited to provide comment on agenda topics to the listed contact person so that suitable adjustment can be made to agenda content if necessary.

BACKGROUND MATERIAL FOR NRC WORKSHOP ON "OPTION 2" - RISK-INFORMING SPECIAL TREATMENT REQUIREMENTS IN 10 CFR PART 50

INTRODUCTION:

The NRC staff is conducting a public workshop on October 15, 2001, from 8 a.m. to 3 p.m. in the Auditorium at the NRC headquarters office in Rockville, Maryland, as part of its preparation of a proposed rule that would revise special treatment requirements applied to systems, structures and components (SSCs) used in commercial nuclear power plants based on a risk-informed categorization process. The staff is conducting this workshop to obtain input from the various stakeholders (e.g., members of the public, industry and special interest groups, and individual utilities) regarding the application of risk insights in the revision of special treatment requirements for SSCs early in the development of a rulemaking package. The NRC staff is working toward issuance of a proposed rule for public comment in the spring of 2002.

BACKGROUND:

As discussed in several Commission papers (e.g., SECY-99-256 and SECY-00-0194), Option 2 of the Risk-Informing Part 50 (RIP50) project involves the ranking of plant SSCs into one of four risk categories based on their safety significance. In particular, these categories are Risk-Informed Safety Class (RISC) 1 that includes high-risk safety-related SSCs, RISC-2 that includes high-risk nonsafety-related SSCs, RISC-3 that includes low-risk safety-related SSCs, and RISC-4 that includes low-risk nonsafety-related SSCs. In lieu of the special treatment requirements for safety-related and certain nonsafety-related SSCs required by the current NRC regulations, the proposed rule would specify the treatment applicable to SSCs to provide an appropriate level of confidence in their capability to perform their design functions.

The staff is developing a proposed rule to implement Option 2 of the RIP50 project in accordance with the Commission papers. At this time, the staff has determined that discussion of the boundary conditions for the rule under Option 2 of the RIP50 project and various approaches for preliminary rule language with its stakeholders would be beneficial in preparing the proposed rule for public comment.

DISCUSSION ON TREATMENT REQUIREMENTS:

A significant issue related to Option 2 of the RIP-50 project is the determination of the appropriate level of treatment requirements to apply to the RISC-3 SSCs, that are safety-related, but determined to be of low risk significance through the categorization process. The staff has established the boundary conditions for rulemaking under Option 2 and is considering a range of alternatives for the treatment requirements that might (or could) meet those boundary conditions. The alternatives differ by the degree of detail that would be included in the rule for the treatment of RISC-3 SSCs. For purposes of the workshop, three alternatives for rule language will be presented for discussion as follows: (1) reliance on commercial practice as proposed by the industry; (2) indication of high-level treatment objectives , and (3) specification of minimum treatment attributes .

The materials provided below discuss the boundary conditions and three rule alternatives, including what the rule language would likely involve for each alternative, the technical basis that would need to be provided for that alternative, and other issues or implications of the alternative. For this workshop, the actual rule language for the various alternatives has not been fully developed and, therefore, the preliminary rule text is intended to stimulate discussion of possible alternatives at the workshop.

WORKSHOP DETAILS:

The purpose of the workshop is :(1) to inform stakeholders of our current approach to the rule, such as in the areas of categorization and level of review required, (2) to present the objectives for the requirements for RISC-3 treatment and alternatives under consideration; and (3) to collect information from stakeholders that can be used to select the most appropriate alternative and formulate the proposed rule. While the focus of this workshop is on treatment for RISC-3, comments on other aspects of the rule can be made based upon stakeholder interest (as requested in the meeting notice). The times shown on the agenda are intended as a rough guide for planning but are subject to change.

This workshop is being transcribed so that comments and information provided by stakeholders will be available for staff use in preparing the rule package. Following the workshop, the staff intends to determine the appropriate proposed rule language for RISC-3 SSC treatment, and then place the draft proposed rule text on the NRC Ruleforum, consistent with the SRM direction of August 2, 2001. All of the information and comments obtained from these steps will be generally considered by the staff in preparing the proposed rule package; however, it should be noted that these steps do not replace the formal notice and comment process for a proposed rule.

PRELIMINARY AGENDA

8:00 a.m.	Introduction - Purpose - Agenda	NRC NRC/DRIP
8:15 a.m.	Overview of draft rule (10 CFR 50.69)	NRC - (NRC/DRIP)
8:30 a.m.	Option 2 Treatment Boundary Conditions	NRC - T. Scarbrough
9:15 a.m.	RISC-3 Treatment Alternatives - NRC -	Presenter (Scarbrough)
10:15 a.m.	Break	
10:30 a.m.	Discussion of boundary conditions and treatment alternatives	All
12 noon	Lunch	
12:45 p.m.	Feedback from pilots (If desired and can be supported)	
1:30 p.m.	Discussion on other rule topics (As suggested by participants -)	NRC/DRIP
2:00 p.m.	Break	
2:15 p.m.	Continuation of discussion on any of above topics as needed	
2:45 p.m.	Summary of discussion, wrap up	
3:00 p.m.	Adjourn	

Attachment 1 : Representative rule text
Attachment 2 : Discussion of boundary conditions
Attachment 3 : Discussion of alternatives for treatment of RISC-3

Attachment 1: Rule Concepts with example rule language

(NRC OGC has not reviewed this example language in detail and the staff expects that the actual language will change. The language is provided to illustrate the conceptual approach)

§50.69 Risk-Informed Special Treatment Requirements

§50.69(a) Definitions

RISC-1 functions are functions performed by safety-related SSCs that are risk-significant as determined by a categorization process that meets the requirements of paragraph (c) of this section.
RISC-2 functions are functions performed by nonsafety-related SSCs that are risk-significant as determined by a categorization process that meets the requirements of paragraph (c) of this section.
RISC-3 functions are functions performed by safety-related SSCs that are low risk-significant as determined by a categorization process that meets the requirements of paragraph (c) of this section.
RISC-4 functions are functions performed by nonsafety-related SSCs that are low risk-significant as determined by a categorization process that meets the requirements of paragraph (c) of this section.

For the purpose of this rule, SSCs performing RISC-1, -2, -3, and -4 functions shall be considered RISC-1, -2, -3, and -4 SSCs, respectively.

§50.69(b) Applicability. The requirements of this section are applicable to (1) applicants for, or holders of, a license to operate a nuclear power plant under §50.21(b) or 50.22; (2) applicants for, or holders of a combined license for a nuclear power reactor issued under part 52 of this chapter; and (3) applicants for, or holders of renewed licenses under Part 54 of this chapter, who elect to adopt these requirements in lieu of other requirements (as specified below).

§50.69(c) Categorization Process Requirements. An applicant or licensee who elects to implement the alternative requirements of this section shall categorize SSC functions into one of the four RISC categories as defined in section 50.69(a) using a categorization process which has been approved by the NRC. As an alternative, an applicant or licensee may implement the requirements of Appendix T. The categorization process shall:

(1) Use a plant-specific Probabilistic Risk Assessment (PRA) to determine the relative importance of modeled SSC functions in terms of core damage prevention and mitigation and large early release prevention and mitigation. This calculation must be performed with an acceptable evaluation model which includes internal initiating events at full power operations. External initiating events and low power and shutdown modes of operation must also be considered, either as part of this PRA or as part of the integrated decision-making process described in §50.69(c)(2).

(2) Use an integrated decision-making process to determine the safety significance of functions performed by the SSCs. The categorization of these functions as either safety significant or low safety significant must consider :

(i) Results and insights from the PRA, including those from importance evaluations.

(ii). Determination of SSC function importance using an acceptable process for addressing initiating events and plant operating modes not modeled in the PRA.
(iii). Consistency with the defense-in-depth philosophy.
(iv). Maintenance of sufficient safety margins.

SSC functions determined to be of low safety significance must include sufficient supporting justification in terms of items (i) to (iv) above.

(3) Assure that the potential change in core damage frequency and large early release frequency is small. This must include a calculation of the change in risk resulting from re-categorizing SSCs. The calculation must consider the effect of the change in treatment applied to the SSCs as a result of re-categorization.

(4) Be approved as suitable for this application, if pressure boundary integrity functions are being categorized.

(5) Be updated at periodic intervals not to exceed 36 months. This update shall consist of:

(i) A review and update of the PRA to reflect current plant configuration and operational data.

(ii) A review and update of credit taken as part of the integrated decision-making process to justify low safety significance of SSC functions and a determination whether changes to risk-informed SSC categorization are necessary.

§50.69(d) Treatment Requirements.

(1) For SSCs that perform RISC-1 and RISC-2 functions:

(i) Existing regulatory requirements continue to apply to RISC-1 and RISC-2 SSCs.

(ii) The licensee shall evaluate the treatment being applied to these SSCs and implement any processes necessary to achieve and maintain the capability, reliability and availability of these SSCs consistent with the categorization assumptions.

(iii) The licensee shall monitor the performance or condition of these SSCs and take actions as necessary such that the reliability, capability, and availability assumptions in the categorization process continue to be satisfied.

(2) For SSCs that perform RISC-3 functions:

(i) Existing regulatory requirements continue to apply to RISC-3 SSCs, except as allowed by §50.69(e).

(ii) [There are three alternative ways under consideration to address the treatment requirements for RISC 3–they are discussed in a separate document and examples of the three approaches appear at the end of this attachment].

(iii) If a RISC-3 function is credited in the categorization process, the licensee shall monitor the performance or condition of the SSC and take actions as necessary to assure that the categorization assumptions continue to be satisfied.

(3) For SSCs that perform RISC-4 functions, [In conjunction with the three alternatives for RISC-3, there are companion approaches to RISC-4: For Alternative 1 : No new requirements would be applied to RISC-4 SSCs and any special treatment requirements that exist would be removed by 50.69(e) below. For Alternatives 2 and 3 (same approach for both): Only the requirements of 50.65 (a)(1), a(2), and a(3) are removed from RISC-4 SSCs. Any other requirements that exist continue to apply. Additionally, the rule would add a requirement: " If a RISC-4 SSC function is credited in the categorization process, the licensee shall monitor the performance or condition of the SSC and take actions as necessary to assure that the categorization assumptions continue to be satisfied."]

§50.69(e) Requirements Removed from RISC-3 [and for alternative 1 -- RISC-4]. RISC-3 [and for alternative 1 -- RISC-4] SSCs need not meet:

(1) 10 CFR Part 21

(2) The requirements that high point vents must conform to Appendix B in §50.44c(3)(iii), the requirements to justify the hydrogen control system with a suitable program of experiment and analysis in §50.44c(3)(iv)(A); §50.44c(3)(iv)(B); §50.44c(3)(iv)(C); §50.44c(3)(iv)(D)(1); §50.44c(3)(iv)(D)(2); §50.44c(3)(iv)(D)(3); the requirements to qualify for the environment caused by inerting, systems and components required to establish and maintain safe shutdown and containment integrity in §50.44c(3)(iv)(E).

(3) The environmental qualification requirements related to documentation and margins in 10 CFR 50.49(e)(8) and (j) [or §50.49]

(4) [Omit 10 CFR 50.55a from the list and rely on ASME code risk-informed code case(s) which would be implemented through either code relief or by revising 10 CFR 50.55a in the future]. [Or: (4) The inservice testing requirements for pumps and valves in 10 CFR 50.55a(f); ~~the repair and replacement requirements for ASME Class 2 and 3 SSCs in 10 CFR 50.55a(g);~~ the inservice inspection requirements, other than for containment structures, in 10 CFR 50.55a(g); the electrical component quality and qualification requirements of Sections 4.3 and 4.4 of IEEE 279 in 10 CFR 50.55a(h)(2). Also under consideration is adding rule words (in 50.69 (d)) about use of national standards other than ASME for repair/replacement of Class 2 and 3 SSC so that the code requirements could be removed from scope for RISC-3]

(5) §50.55e

(6) §50.65(a)(1), §50.65(a)(2), and §50.65(a)(3)

(7) §50.72

(8) §50.73

(9) Appendix B to 10 CFR Part 50

(10) The Type B and Type C leakage testing requirements of Appendix J to 10 CFR Part 50 for both Options A and B for RISC-3 SSCs meeting the following criteria:

(i) For containment isolation valves that meet one or more of the following criteria:

(A) The valve is required to be open under accident conditions to prevent or mitigate core damage events;

(B) Tthe valve is normally closed and in a physically closed, water-filled system;

(C) The valve is in a physically closed system whose piping pressure rating exceeds the containment design pressure rating and that is not connected to the reactor coolant pressure boundary;

(D) The valve is in a closed system whose piping pressure rating exceeds the containment design pressure rating and is connected to the reactor coolant pressure boundary; and

(E) The valve size is 1 inch nominal pipe size or less.

(ii) For containment penetrations that meet one or more of the following criteria:

(A) The penetration is 1 inch nominal size or less

(B) The penetration is continuously pressurized

(11) The earthquake engineering criteria in Sections VI(a)(1) and (2) of Appendix A to 10 CFR Part 100 to the extent the criteria requires qualification testing to demonstrate capability of structures, systems and components to withstand the vibratory motion associated with the Operating Basis Earthquake and the Safe Shutdown Earthquake. This may include a conforming change to

§50.69(f) Submittal. (1) Unless a licensee is implementing the requirements of Appendix T, a licensee proposing to implement the §50.69 shall submit a license amendment request that contains the following information:

(i) A list of the regulations identified in §50.69 (e) for which the requirements of §50.69 are being substituted.

(ii) A description of the categorization process and decision criteria used that meets the requirements of §50.69(c).

(iii) A description of the scope, level of detail, and technical acceptability of the PRA used in the categorization process including the measures taken to provide an adequate level of PRA quality.

(iv) A schedule for implementation of §50.69.

(v) A discussion of the scope of SSCs to which the requirements of §50.69 will be applied.

(vi) A description of the PRA and IDP update process that is being applied as part of implementation of requirements of §50.69.

(vii) A description and supporting basis for any exceptions taken to an approved method used to implement §50.69.

(2) Until the staff approves the license amendment request, the licensee shall not implement the requirements of §50.69 and shall continue to follow existing requirements in other sections of the regulations.

(3) Licensees who implement the requirements of Appendix T, may implement the requirements of §50.69 without prior NRC approval and need only to notify the NRC, by letter to the Director of Nuclear Reactor regulation, of their intent to implement the requirements of §50.69. This letter shall include a discussion of §50.69(f)(1)(v) and §50.69(f)(1)(vi).

§50.69(g) Change Control

(1) In lieu of the requirements of §50.59, when making changes to the procedures and processes for implementing §50.69(c) and §50.69(d), the licensee (or applicant) shall provide a written basis, and maintain it onsite, that the requirements of §50.69 continue to be met.

(2) In addition to the requirements of §50.59, when making changes to the facility that affect safety significant functions (as determined by the categorization process pursuant to §50.69(c)), the licensee shall take such actions necessary to provide reasonable assurance that these functions continue to be satisfied consistent with the assumptions in the categorization process following the facility change or shall determine that the risk associated with not crediting these functions is not significantly increased.

§50.69(h) Program Description, Documentation, and Reporting .

(1) Licensees adopting the requirements of this section shall include in their FSAR in accordance with the provisions of §50.71(e), a summary description of processes and activities applied to SSCs that are the means of implementing the requirements of §50.69.

(2) Changes to the final safety analysis report to implement 10 CFR 50.69 do not need a supporting §50.59 evaluation.

(3) The licensee shall document, and maintain for the duration that an SSC is installed, the basis for categorization and treatment of SSCs made pursuant to the requirements of this section.

(4) A report should be submitted to the NRC consistent with the requirements of 50.73(b) for any event or condition that alone could have prevented the satisfaction of a RISC-1 or RISC-2 function unless the event or condition has been reported under the provisions of §50.72 and §50.73.

(5) Records required by this section shall be maintained until the license is terminated.

Alternative 1 RISC-3 Approach: Commercial

(ii) Reasonable confidence in the capability of RISC-3 SSCs to perform their design functions at the conditions under which the intended functions are required to be performed shall be provided.

Alternative 2 RISC-3 Approach: Minimal Rule Attributes

(ii) Reasonable confidence in the capability of RISC-3 SSCs to perform their safety-related functions under design-basis conditions throughout their service life shall be provided through the implementation of treatment processes for design; procurement; installation; maintenance; inspection, test, and surveillance; corrective action; oversight; and configuration control.

(A) Design Process.

Design inputs shall be maintained and applied to ensure that RISC-3 SSCs are capable of performing their safety-related functions under design-basis conditions throughout their service life.

(B) Procurement Process.

SSCs shall satisfy the design inputs to support the determination that RISC-3 SSCs remain capable of performing safety-related functions under design-basis conditions throughout their service life . Suitable methods shall be used to support a documented determination that procured SSCs will be capable of performing their safety-related function under design-basis conditions, including appropriate environmental conditions and combinations of normal and accident conditions with earthquake motions.

(C) Installation Process.

SSCs shall be properly installed and tested to support the determination that RISC-3 SSCs are capable of performing their safety-related functions under design-basis conditions throughout their service life. SSCs that are pressure boundary components shall be installed to the requirements of the procurement Code, or the construction Code of the SSC to be replaced.

(D) Maintenance Process.

The scope, frequency, and detail of predictive, preventive, and corrective maintenance activities (including post-maintenance testing) shall be established to support the determination that RISC-3 SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout their service life.

(E) Inspection, Test, and Surveillance Process.

Data or information shall be obtained to support the determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout their service life. The data or information for pumps, valves,

and snubbers shall allow evaluation of operating characteristics of these RISC-3 SSCs.

(F) Corrective Action Process.

Measures shall be established to ensure conditions that could preclude a RISC-3 SSC from performing its safety-related function under design-basis conditions throughout their service life are promptly identified with a determination of cause, corrected to preclude repetition of significant conditions adverse to quality, documented and reported to management.

(G) Oversight Process.

The implementation of the treatment processes for RISC-3 SSCs, and the assessment of the effectiveness of those processes, shall be controlled and accomplished through documented procedures and guidelines (including the qualification, training, and certification of personnel) to support the determination that SSCs are capable of performing safety-related functions under design basis conditions throughout their service life.

(H) Configuration Control Process.

The configuration of RISC-3 SSCs and applicable plant documents shall be controlled to reflect current plant status and design changes.

Alternative 3 RISC-3 Approach: Detailed Rule Requirements

(ii) Reasonable confidence in the capability of RISC-3 SSCs to perform their safety-related functions under design-basis conditions throughout their service life shall be provided through the implementation of treatment processes for design control; procurement; installation; maintenance; inspection, test, and surveillance; corrective action; management and oversight; and configuration control.

(iii) The treatment applied to RISC-3 SSCs shall satisfy the minimum attributes of the individual processes provided below:

(A) Design Control Process.

The design control process for RISC-3 SSCs shall comply with 10 CFR Part 50, Appendix B. Changes in the design functions of RISC-3 SSCs or the conditions under which the intended functions are required to be performed, as described in the FSAR, shall be controlled by following a design control process satisfying 10 CFR Part 50, Appendix B, and other regulatory requirements that may be applicable, such as 10 CFR 50.59.

(B) Procurement Process.

RISC-3 SSCs shall satisfy the design inputs such that these SSCs will be capable of performing their safety-related functions under design-basis conditions. Technical requirements (including applicable design-basis environmental and seismic conditions) for items to be procured shall include the design inputs for the item. One or more of the following methods shall be used to determine that the procured item can perform its safety-related function under design-basis conditions, including applicable design-basis environmental (temperature and pressure, humidity, chemical effects, radiation, aging, submergence, and synergistic effects) and seismic (earthquake motion, as described in the design bases, including seismic inputs and design load combinations) conditions:

- Vendor Documentation - Vendor documentation may be used when the performance characteristics for the item, as specified in vendor documentation (e.g., catalog information, certificate of conformance), satisfy the SSC's design requirements. If the vendor documentation does not contain this level of detail, then the design requirements may be provided in the procurement specifications. The vendor's acceptance of the stated design specifications may provide sufficient confidence that the replacement RISC-3 SSC would be capable of performing its safety-related functions under design-basis conditions. Differences constituting a design change shall be documented and processed under the design control process.

- Equivalency Evaluation - An equivalency evaluation may be used when it is sufficient to determine that the procured item is a like-for-like replacement.

- Technical Evaluation - For minor differences, a technical evaluation may be performed to compare the differences between the procured item and the design requirements of the item being replaced and determine that differences in areas such as material, size, shape, stressors, aging mechanisms, and functional capabilities would not adversely affect the ability to perform the safety-related functions of the SSC under design-basis conditions. Differences constituting a design change shall be documented and processed under the design control process.

- Technical Analysis - In cases involving substantial differences between the procured item and the design requirements of the item being replaced, a technical analysis may be performed to determine that the procured item can perform its safety-related function under design-basis conditions. The technical analysis shall be based on one or more engineering methods that include, as necessary, calculations, analyses and evaluations by multiple disciplines, test data, or operating experience to support functionality of the SSC over its expected life. Where the differences are determined to require a design change, the design control process for safety-related SSCs shall be followed.

- Testing - Testing under simulated design-basis conditions may be performed on the component.

Documentation of the implementation of these methods shall be maintained. Additionally, documentation shall be maintained to identify the preventive maintenance needed to preserve the capability of the procured item to perform its safety-related function under applicable design-basis environmental and seismic conditions for its expected life. In the procurement process, standards required by the applicable state and national consensus commercial standards shall be used for the procurement of SSCs consistent with commercial practices.

The procurement process shall provide for the identification and implementation of special handling and storage requirements to ensure that the item is not damaged or degraded during shipment to the site or during storage on site. These handling and storage requirements shall consider available recommendations from the vendor. The licensee may use an alternative to these recommendations if there is a technical basis that supports the functionality of the RISC-3 SSCs. At the time of receipt, the received item shall be inspected to ensure that the item was not damaged in the process of shipping, and that the item received is the item ordered.

(C) Installation Process.

Installation and testing of RISC-3 SSCs shall be performed such that these SSCs will be capable of performing their safety-related functions under design-basis conditions. Standards required by the applicable state and national consensus commercial standards shall be used for the installation of SSCs consistent with commercial practices. Post-installation testing shall be performed to the extent necessary to provide reasonable confidence that the installed SSC will perform its safety function. The test shall verify that the SSC is operating within expected parameters and is functional.

(D) Maintenance Process.

The scope, frequency, and detail of maintenance activities shall be established such that RISC-3 SSCs will remain capable of performing their safety-related functions under design-basis conditions. Preventive maintenance tasks shall be developed for active structures, systems, or components factoring in vendor recommendations. The licensee may use an alternative to these recommendations if there is a technical basis that supports the functionality of the RISC-3 SSCs. For an SSC in service beyond its designed life, the licensee shall have a technical basis to determine that the SSC will remain capable of performing its safety-related functions. The frequency and scope of predictive maintenance actions shall be established and documented considering vendor recommendations, environmental operating conditions, safety significance, and operating performance history. The licensee may deviate from vendor recommendations where a technical basis supports the functionality of the RISC-3 SSCs. When an SSC deficiency is identified, it shall be documented and tracked through the corrective action process. The deficiency shall be evaluated to determine the corrective maintenance to be performed. Following maintenance activities that affect the capability of a component to perform its safety-related function,

post-maintenance testing shall be performed to the extent necessary to provide reasonable confidence that the SSC is performing within expected parameters. In the maintenance process, standards required by the applicable state and national consensus commercial standards shall be used for the maintenance of SSCs consistent with commercial practices.

(E) Inspection, Test, and Surveillance Process.

Inspections, tests, and surveillances shall be performed to obtain data or information that allows evaluation of operating characteristics such that RISC-3 SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout the service life of the SSC. When measuring and test equipment is found to be in error or defective, a determination shall be made of the functionality of the safety-related SSCs that were checked using that equipment. The licensee may use an alternative to vendor recommendations if there is a technical basis that supports the functionality of the RISC-3 SSCs. In the inspection, test, and surveillance process, standards required by the applicable state and national consensus commercial standards shall be used for the inspection and testing of SSCs consistent with commercial practices.

(F) Corrective Action Process.

The corrective action process for RISC-3 SSCs shall comply with 10 CFR Part 50, Appendix B.

(G) Management and Oversight Process.

The management and oversight process shall be established to control the implementation, and to assess the effectiveness, of treatment such that RISC-3 SSCs will remain capable of performing their safety-related functions under design-basis conditions. The management and oversight process shall be accomplished through approved procedures and guidelines. Procedures shall provide for the qualification, training, and certification of personnel. Vendor recommendations shall be considered in the training, qualification, and certification of personnel. The licensee may use an alternative to these recommendations if there is a basis for continued effective training of personnel. For qualification, training, and certification of personnel, standards required by the applicable state and national consensus commercial standards shall be used consistent with commercial practices. Documentation, reviews, and record retention requirements for completed work activities shall be governed by plant procedures. Planned changes to, or elimination of, commitments described in the safety analysis report or other licensing bases documentation that address issues identified in NRC generic communications (including but not limited to generic letters or bulletins), NRC orders, notices of violation, or other documents related to RISC-3 SSCs shall be evaluated in accordance with an NRC-endorsed commitment change process.

(H) Configuration Control Process.

The configuration of the facility shall be controlled through approved procedures and policies. The design control process shall ensure that the plant configuration is properly reflected in design documents and drawings.

Note that Paragraph (iii) shown on p. 6 is renumbered as (iv) (below)

(iv) If the function of a RISC-3 SSC is credited in the categorization process, the licensee shall monitor the performance or condition of the SSC and take actions as necessary to assure that the categorization assumptions continue to be satisfied.

Attachment 2: DISCUSSION OF BOUNDARY CONDITIONS AS THEY RELATE TO TREATMENT APPROACHES FOR RISC-3 STRUCTURES, SYSTEMS, AND COMPONENTS

BOUNDARY CONDITIONS

1. **Licensees are required to maintain the design functions of safety-related structures, systems, and components (SSCs) with functions of low safety significance (categorized as RISC-3 SSCs) at the conditions under which the intended functions are required to be performed as described in the updated FSAR. RISC-3 SSCs must meet their existing functional requirements, including capabilities (e.g., pressure, flow) and design conditions (e.g., loads imposed by a seismic event, harsh environment).**

Basis: In SECY-98-300, the NRC staff stated that Option 2 "does not address changing the design of the plant or design-basis accidents." The staff also indicated that, while Option 2 allows the "grading" of special treatment requirements applied to SSCs based upon risk importance, RISC-3 SSCs are required to remain in the plant, and are expected to be capable of performing their design function, but without the additional margin, assurance, or documentation associated with high safety-significant SSCs. In SECY-99-256, the staff noted the expectation that "criteria for preservation of functional capability (at a reduced level of assurance) will be developed and incorporated into 10 CFR 50.69." In SECY-00-0194, the staff indicated that "no design changes could occur under Option 2 that would not also be acceptable under the current regulatory framework." The staff also stated that licensees would be required to maintain the design functions of RISC-3 SSCs at the conditions under which the intended functions are required to be performed as described in the updated FSAR. The staff further noted that "when licensees replace an existing safety-related, fully qualified RISC-3 SSC, the replacement must meet existing requirements for the SSC, including capabilities (e.g., pressure, flow) and design conditions (e.g., loads imposed by a seismic event, harsh environment)." For environmental conditions, the staff considers that licensees must address the capability of the RISC-3 SSCs to function including such applicable factors as temperature and pressure, humidity, chemical effects, radiation, aging, submergence, and synergistic effects. For seismic conditions, the staff considers that licensees must address the capability of the RISC-3 SSCs to function including such applicable factors as earthquake motion, as described in the design bases, including seismic inputs and design load combinations. However, the staff has interpreted the SECY papers to allow the use of national standards other than the ASME Code of record for a facility with regard to repair and replacement activities for low-risk ASME Code Class 2 and 3 safety-related SSCs with certain conditions (e.g., continued requirements to obtain fracture toughness data). The staff applied this interpretation during its review of the request by the licensee of the South Texas Project (proof-of-concept plant for Option 2) for exemption from the special treatment requirements (including the ASME Code requirements incorporated by reference into 10 CFR 50.55a) of the NRC regulations.

The issue of functionality of RISC-3 SSCs is important because categorization processes are significantly affected by redundancy in plant equipment and the probability of initiating events, and the level of treatment can have a significant impact on functionality. Based on staff review of the South Texas Project exemption request, RISC-3 SSCs perform a wide range of required safety functions. For example, the South Texas licensee categorized the diesel generator air start valves and the spent fuel pool system pumps and valves as RISC-3. Technical bases for changing the design basis and removing specific safety functions have not been developed under Option 2, but is included under the Option 3 effort.

2. **The treatment process must maintain the functionality of RISC-3 SSCs consistent with the reliability and availability assumptions in the categorization process.**

Basis: The categorization process under Option 2 places SSCs at the nuclear plant in one of four risk-significance categories based on a probabilistic risk assessment (PRA) and consideration by an expert panel of plant personnel. The four SSC categories are RISC-1 (high-risk safety-related SSCs), RISC-2 (high-risk nonsafety-related SSCs), RISC-3 (low-risk safety-related SSCs), and RISC-4 (low-risk nonsafety-related SSCs). The categorization process assumes a certain level of reliability of the SSCs in placing them in one of the four categories, and does not estimate the effects of reduced treatment on SSC reliability. Draft Appendix T uses a sensitivity study (i.e., varying the unavailability of the RISC-3 SSCs by a factor of 3 to 5) to assess the potential change in risk associated with the reduction in treatment applied to RISC-3 SSCs. For the sensitivity study to bound the potential increase in risk associated with the reduced treatment for RISC-3 SSCs and to ensure that the categorization process remains valid, the treatment must provide reasonable confidence that RISC-3 SSCs will remain functional at the reliability and availability levels assumed in the PRA. In addition, the treatment applied to the RISC-3 SSCs must provide reasonable confidence that common-cause failures not modeled in the PRA (e.g., inter-system common cause failures) are not inadvertently introduced by reductions in treatment. A challenge in preparing 10 CFR 50.69 is that the data and evaluations necessary to quantify changes in reliability associated with modified treatment do not exist and are not practical to develop. With respect to consideration of treatment alternatives, the staff has considered the categorization process to be fixed in its approach to categorizing SSCs based on their safety significance. Therefore, the focus in treatment of RISC-3 SSCs should be on the reduction in the current treatment requirements while maintaining reasonable confidence in SSC capability, availability, and reliability consistent with the assumptions in the categorization process.

3. **The NRC must maintain a level of regulatory assurance regarding the continued functionality of RISC-3 SSCs consistent with its mission to ensure adequate protection of the public health and safety.**

Basis: In SECY-99-256, the NRC staff stated that “RISC-3 SSCs will need to receive sufficient regulatory treatment such that these SSCs are still expected to meet functional requirements, albeit at a reduced level of assurance.” The staff also noted that the purpose of the rulemaking is to develop an alternative regulatory framework that enables licensees, using a risk-informed process for categorizing SSCs according to their safety significance (i.e., a decision that considers both traditional deterministic insights and risk insights), to reduce unnecessary regulatory burden for SSCs of low safety significance by removing these SSCs from the scope of special treatment requirements. This boundary condition encompasses consideration of the NRC staff’s performance goals including the most important goal of maintaining safety, and also reducing unnecessary regulatory burden; increasing public confidence; and making NRC activities more effective and efficient.

TABLE SUMMARY OF BOUNDARY CONDITIONS

Boundary Conditions	Basis
1. Licensees are required to maintain the design functions of safety-related SSCs with functions of low safety significance (RISC-3 SSCs) at the conditions under which the intended functions are required to be performed as described in the updated FSAR.	As discussed in SECY-98-300, safety-related SSCs categorized as low safety significance under Option 2 are expected to be capable of performing their design function. As noted in SECY-99-256, it is expected that criteria for preservation of functional capability (at a reduced level of assurance) will be developed and incorporated into 10 CFR 50.69. Design changes should not be made as part of Option 2. Any design changes should be made under the existing regulatory process (i.e., 10 CFR 50.59). As specified in SECY-00-0194, replacements for RISC-3 SSCs must meet existing design bases as specified in FSAR for the replaced SSC, including capabilities (e.g., pressure, flow) and design conditions (e.g., loads imposed by a seismic event, harsh environment). Based on staff review of the proof-of-concept plant, RISC-3 SSCs perform a wide range of required safety functions. Technical bases for changing the design basis and removing specific safety functions have not been developed under Option 2, but should be included under the Option 3 effort.
2. Treatment must maintain functionality of RISC-3 SSCs consistent with reliability and availability assumptions in categorization process	The categorization process assumes a certain level of reliability and availability of RISC-3 SSCs. The modified treatment may not introduce common-cause failures not addressed by the categorization process. Data or evaluations are necessary to quantify changes in reliability and availability of RISC-3 SSCs, or treatment must be consistent with the assumptions regarding maintaining SSC functionality.
3. Level of regulatory assurance for the treatment of RISC-3 SSCs needs to be consistent with NRC's mission.	SECY 99-256 requires sufficient regulatory treatment such that RISC-3 SSCs are still expected to meet their functional requirements, albeit at a reduced level of assurance.

Attachment 3: Discussion of Alternatives for RISC-3 Treatment

1. Commercial Practice

A. Description

1. Rule: The rule would state that licensees must provide reasonable confidence that safety-related SSCs with functions of low safety significance (RISC-3 SSCs) are capable of performing their safety functions under design-basis conditions (including environmental and seismic conditions) throughout their service life. Licensees may use commercial practices to accomplish this.

2. Statement of Considerations (SOC): The SOC would specify the NRC's expectations regarding commercial practice as implemented for RISC-3 SSCs. If commercial practice is adequately defined, the SOC could state that reliance on a general reference to commercial practice provides sufficient regulatory treatment for RISC-3 SSCs with respect to the importance of their safety functions and the minimum level of treatment that meets the definition of commercial practice. The SOC would provide a technical basis for reliance on commercial practice where the industry demonstrates that a defined commercial practice would provide the reliability consistent with the categorization process. The technical basis would require development of actual data or evaluations to support RISC-3 reliability and availability consistent with the assumptions in the categorization process, particularly with respect to performance of RISC-3 SSCs under design-basis environmental and seismic conditions. The use of plant operating data under normal conditions would not be sufficient to demonstrate the reliability of RISC-3 SSCs under design-basis conditions. Further, the data or evaluations necessary to quantify changes in SSC reliability associated with application of a defined commercial practice must be established. The focus in treatment of RISC-3 SSCs is therefore on the reduction in the current treatment requirements while maintaining reasonable confidence in functionality.

3. Regulatory Guide: The regulatory guide would reference NEI 00-04 for the implementation of commercial practice for RISC-3 SSCs.

B. Issues

1. Commercial practice is not sufficiently defined within the nuclear industry to provide uniform implementation of a minimum level of treatment that would provide reasonable confidence that RISC-3 SSCs are capable of performing their safety functions under design-basis conditions throughout their service life consistent with the assumptions in the categorization process. In particular, an NRC-sponsored study by Idaho National Engineering and Environmental Laboratory described in NUREG/CR-XXXX determined that commercial practice at nuclear power plants vary widely between plants and apply different levels of attention to various balance-of-plant SSCs. For example, commercial practice as currently implemented within the industry might allow a balance-of-plant SSC to be purchased without specific design control, received without inspection, installed without specific procedures, assumed to function without monitoring, and maintained only after the SSC is found to have failed. Further, some commercial practice allows design inputs for seismic

analysis to be modified as part of their application (e.g., use of general building code inputs rather than component-specific location inputs as specified in the FSAR). This type of change in design-basis conditions as specified in the FSAR would need to be changed under 10 CFR 50.59, if appropriate; not as part of the 10 CFR 50.69 treatment process. Therefore, Alternative 1 does not meet Boundary Condition 1 for the treatment of RISC-3 SSCs under Option 2.

2. Sufficient data or evaluations do not exist to support functionality and reliability of SSCs under design-basis conditions relying only on commercial practice. Available operational data on the reliability of SSCs maintained under commercial practice do not include consideration of operation under design-basis conditions. While a study referenced by the South Texas licensee suggested that the reliability of SSCs procured and maintained using commercial practice is similar to the reliability of SSCs subject to special treatment requirements, the study did not consider performance under design-basis conditions nor collect the data using quality controls. Therefore, Alternative 1 does not meet Boundary Condition 2 for the treatment of RISC-3 SSCs under Option 2. The data or evaluation necessary to satisfy Boundary Condition 2 would need to demonstrate commercial practice would provide reasonable confidence that the SSCs will have reliability and availability consistent with the assumptions in the PRA (e.g., the reduction in treatment to an undefined commercial level would not cause the failure rate of the equipment to increase above the PRA assumptions and that common-cause interactions would not exceed assumptions regarding their potential to cross system boundaries). As a separate approach, Boundary Condition 2 might be satisfied by defining the level of commercial practice sufficient to maintain a level of treatment that is consistent with the assumptions regarding maintaining functionality.

3. Reliance on commercial treatment in which no means are employed to detect degradation and/or failure of SSCs with safety functions prior to these SSCs being called upon to function for a design basis event would not maintain safety as specified by the NRC performance goals and is inconsistent with the NRC's mission of ensuring the protection of the public health and safety. Without an acceptable definition of commercial practice, it is questionable whether Alternative 1 would satisfy the NRC staff's other performance goals. Therefore, Alternative 1 does not meet Boundary Condition 3 for the treatment of RISC-3 SSCs under Option 2.

4. The current industry guidance in NEI-00-04 does not provide an adequate level of treatment for RISC-3 SSCs. For example, the industry guidance would allow implementation of a commercial practice that might not maintain seismic design conditions as specified in the FSAR. Further, the industry guidance might allow licensee commitments related to the functionality of RISC-3 SSCs to be changed without an adequate technical basis. Therefore, the industry guidance in NEI-00-04 would need to be revised to satisfy the boundary conditions for RISC-3 SSCs under Option 2.

C. Potential Impact

A significant delay of the rulemaking package could occur as a result of an effort to define commercial practice, and to develop data and evaluations to support reliance on commercial practice.

D. Examples

The description above provides examples of the rule language, statement of considerations, and regulatory guidance if the above technical issues are resolved.

2. High-Level Treatment Objectives

A. Description

1. Rule: The rule would state that licensees shall provide reasonable confidence in the capability of RISC-3 SSCs to perform their safety functions under design-basis conditions throughout their service life, and that this reasonable confidence shall be provided through the implementation of treatment processes for design control; procurement; installation; maintenance; inspection, test, and surveillance; corrective action; management and oversight; and configuration control. The rule would then specify high-level objectives for each of these treatment processes for RISC-3 SSCs.

2. Statement of Considerations: The SOC would discuss the bases for each performance objective (i.e., why each objective is necessary to meet the boundary conditions). The SOC would also discuss the NRC's expectations regarding implementation of the rule.

3. Regulatory Guidance: The regulatory guidance would provide expectations and general methods for implementing the rule in an effective manner. The staff could reference industry guidance, such as an acceptably revised NEI 00-04.

B. Issues

1. This alternative would satisfy Boundary Condition 1 by specifying in the rule that licensees are required to provide reasonable confidence that RISC-3 SSCs are capable of performing their safety functions under design-basis conditions throughout their service life through implementation of the treatment processes specified in the rule. As part of this requirement, the treatment applied to RISC-3 SSCs would not alter their design inputs (including environmental and seismic conditions). This alternative would satisfy Boundary Condition 2 by specifying high-level treatment objectives in the rule to provide reasonable confidence in maintaining the functionality of RISC-3 SSCs consistent with the reliability and availability assumptions in the categorization process. This alternative would satisfy Boundary Condition 3 by maintaining a level of regulatory assurance regarding the continued functionality of RISC-3 SSCs consistent with the NRC's mission to ensure adequate protection of the public health and safety. This alternative would also meet the NRC staff's performance goals of (1) maintaining safety by allowing licensees to focus their resources on the most safety significant SSCs without allowing the treatment of

less significant SSCs to degrade to a level that confidence would not exist in their ability to perform their safety functions; (2) reducing unnecessary regulatory burden by removing the special treatment requirements from RISC-3 SSCs and allowing licensees to apply commercial practices that meet minimum treatment objectives; (3) increasing public confidence by demonstrating that the NRC can modify its regulations to focus on the most significant SSCs but retain adequate regulatory control over SSCs with less significant but important safety functions; and (4) making NRC activities more effective and efficient by allowing regulatory review and oversight to be focused on the most significant SSCs at a facility. A potential issue with Alternative 2 is that specification in the rule of high-level treatment objectives might provide less flexibility than simply referencing commercial practice.

2. The industry needs guidance that provides an acceptable approach to meeting the high-level objectives for the treatment of RISC-3 SSCs. For example, the current industry guidance would allow implementation of a commercial practice that might not maintain seismic inputs. Further, the industry guidance might allow licensee commitments related to the functionality of RISC-3 SSCs to be changed without an adequate technical basis. Therefore, NEI would need to revise its guidance to provide an acceptable approach for satisfying the high-level treatment objectives specified in the rule.

C. Potential Impact

NEI would need to revise its guidance to satisfy the rule for the staff to endorse the guidance. If not, the staff would develop separate guidance for implementation of the rule.

D. Examples

1. RULE: Design Control Process: Design inputs shall be maintained and applied to ensure that RISC-3 SSCs are capable of performing their safety-related functions under design-basis conditions.

[This condensed rule language results in RISC-3 SSCs continuing to be required to meet 10 CFR 50.55a, and allows licensees to apply the ASME risk-informed Code Cases for inservice inspection and testing, and repair and replacement, for relaxation of the requirements in 10 CFR 50.55a for RISC-3 SSCs.]

STATEMENT OF CONSIDERATIONS: Discussion of NRC expectations and bases for design control requirements.

REGULATORY GUIDANCE: Design control is one of the key processes for maintaining the functionality of RISC-3 SSCs, which is assumed as part of the categorization process. The manner in which design control is accomplished for RISC-3 SSCs is the responsibility of the licensees adopting of the rule.

2. RULE: Procurement Process RISC-3 SSCs shall be procured to satisfy the design inputs as required by 50.69(d)(2)(A). Suitable methods shall be used to support a documented determination that the procured SSCs will be capable of performing their safety-related functions under design-basis conditions, including

appropriate environmental conditions and combinations of normal and accident conditions with earthquake motions.

STATEMENT OF CONSIDERATIONS: The proposed rule would allow licensees to replace special treatment requirements for the procurement of RISC-3 SSCs with less prescriptive methods and documentation. Licensees may be able to meet these requirements through implementation of existing site procurement practices.

REGULATORY GUIDANCE: Discussion of acceptable procurement methods.

3. Minimum Treatment Attributes

A. Description

1. Rule: The rule would require reasonable confidence of functionality of RISC-3 SSCs under design-basis conditions throughout their service life. The rule would also specify minimum treatment attributes similar to provisions of updated FSAR for the South Texas exemption request.

2. Statement of Considerations: The SOC would discuss the bases for these minimum attributes and the NRC's expectations for their implementation.

3. Regulatory guidance: The regulatory guidance would provide a detailed discussion of the acceptable methods to effectively implement the minimum attributes specified in the rule that satisfied the NRC's expectations without the need for a reference to industry guidance.

B. Issues

1. This alternative would satisfy Boundary Condition 1 by specifying in the rule that licensees are required to provide reasonable confidence that safety-related RISC-3 SSCs are capable of performing their safety functions under design-basis conditions throughout their service life through implementation of the minimum treatment attributes specified in the rule. This alternative would satisfy Boundary Condition 2 by specifying minimum treatment attributes in the rule to provide reasonable confidence in maintaining the functionality of RISC-3 SSCs consistent with the reliability and availability assumptions in the categorization process. This alternative would satisfy Boundary Condition 3 by maintaining a level of regulatory assurance regarding the continued functionality of RISC-3 SSCs consistent with the NRC's mission to ensure adequate protection of the public health and safety. This alternative would also satisfy the NRC staff's performance goals of (1) maintaining safety by allowing licensees to focus their resources on the most safety significant SSCs without allowing the treatment of less significant SSCs to degrade to a level that confidence does not exist in their ability to perform their safety functions; (2) reducing unnecessary regulatory burden by removing the special treatment requirements from RISC-3 SSCs and allowing licensees to apply commercial practices that meet minimum treatment criteria; (3) increasing public confidence by demonstrating that the NRC can modify its regulations to focus on the most significant SSCs but retain adequate regulatory control over SSCs with less significant but important safety functions; and (4) making NRC activities more

effective and efficient by allowing regulatory review and oversight to be focused on the most significant SSCs at a facility. This alternative would provide less flexibility than Alternative 2 for licensees in implementing the rule and for NRC staff monitoring its implementation, because the minimum treatment criteria would be required as part of the regulations rather than only specifying high-level objectives with the methods suggested for implementation in regulatory guidance. A technical issue is that the staff would need to develop rule language and more detailed implementation guidance that might be perceived as reducing stakeholder input regarding format and details of rule and guidance.

C. Potential Impact

The rulemaking schedule might be delayed to develop rule language and more detailed regulatory guidance.

D. Examples

An example of the rule language for this alternative is the requirements specified in the updated FSAR submitted by the licensee in the South Texas exemption request. The discussion in the safety evaluation for the South Texas exemption request, including indication of ineffective methods of implementation, is an example of the regulatory guidance that would accompany this alternative.

SUMMARY TABLE OF TREATMENT ALTERNATIVES

Treatment Alternatives	Content of Rule	Content of Statement of Considerations and Guidance	Issues	Potential Impact
Commercial (industry proposal)	- Requires reasonable confidence of functionality of RISC-3 SSCs at design-basis conditions throughout service life by applying commercial practice	Reference industry guidelines in NEI 00-04	1. Commercial practice not sufficiently defined to establish an acceptable level of safety and to ensure uniform implementation consistent with categorization process assumptions. 2. Sufficient data or evaluations do not exist to support functionality and reliability of SSCs under design-basis conditions relying only on commercial practice. 3. Reliance on commercial treatment in which no means are employed to detect degradation or failure of safety-related SSCs prior to their being called upon to function for a design basis event does not maintain safety and is inconsistent with the NRC's mission. 4. NEI-00-04 does not satisfy the boundary conditions for RISC-3 SSCs under Option 2 (e.g., approach might not maintain seismic inputs, or might allow commitments to be changed without technical basis).	Significant delay of rulemaking to define commercial practice and develop data or evaluations to support reliance on commercial practice
High-Level Treatment Objectives	- Requires reasonable confidence of functionality of at design-basis conditions throughout service life - Specifies high-level objectives for 8 treatment processes	Provides NRC expectations and methods for effective implementation of rule to achieve high level objectives with possible reference to revised industry guidance	1. Rule specification of high-level treatment objectives might provide less flexibility than referencing commercial practice. 2. NEI-00-04 does not describe an acceptable approach to meeting the high-level treatment objectives.	NEI would need to revise its guidance to satisfy rule, or staff would develop separate guidance
Minimum Treatment Attributes	- Requires reasonable confidence of functionality at design-basis conditions throughout service life - Specifies minimum treatment attributes similar to provisions of South Texas updated FSAR	Provides more detailed expectations and guidelines specifying methods and acceptance criteria for satisfying treatment attributes without need for industry guidance	1. Staff would need to develop rule language and more detailed implementation guidance that might be perceived as reducing stakeholder input regarding format and details of rule and guidance.	Rulemaking schedule might be delayed to develop rule language and more detailed guidance