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Special Treatment For Important To Safety Structures, Systems And Components (SSCs) In The Licensing Of Light Water Reactors

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Abstract – *In the interest of developing an efficient and effective licensing process for light water reactors, there is a need to understand and better define the term "special treatment" and how it should be applied to new reactor applications. New passive reactors are particularly impacted by special treatment due to the large number of Structures, Systems and Components (SSCs) that do not perform any safety-related function, but may be important to safety. This paper addresses the evolution of the term special treatment, its relation to other similar terminology applicable to ensuring quality for improving the reliability and availability of risk-significant and important to safety SSCs and how it should be applied to the design of new reactors. To encourage development of readily endorsable industry consensus standards that capture NRC requirements and guidance concerning special treatment, this paper identifies types of non-specificity in design information, the need for clarity in definitions and regulatory basis for acceptance in the review of new reactor applications. This paper is part of a continuing effort by the NRC staff regarding the application of special treatment requirements for SSCs that have an importance to safety.*

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I. INTRODUCTION

This paper addresses the evolution of the term "special treatment", its relation to other similar terminology applicable to ensuring quality and how it should be applied to the design of new reactors. Special treatment requirements are typically defined as those requirements that exceed normal commercial and industrial practices to provide a greater degree of confidence in the capability of structures, systems and components (SSCs) to perform their safety functions under the design-basis conditions throughout their service life. Special treatment requirements encompass such aspects as quality assurance (QA), environmental and seismic qualification, inspection and testing and performance monitoring. Application of special treatment requirements may be especially critical in the design of non-metallic piping systems that are being proposed for risk significant cooling water systems in new passive plants.

II. EVOLUTION AND APPLICATION OF SPECIAL TREATMENT

The term "special treatment" evolved over many years in the application of general design criteria (GDC) Criterion 1 and Criterion 2 and to resolve issues relative to use of the terms "important to safety" and "safety-related". The NRC broadly defines the term important to safety in the introduction to 10 CFR 50 Appendix A as structures, systems and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. The NRC also identifies safety-related SSCs in Part 50.2 as those structures, systems and components that are relied upon to remain functional during and following design basis events to assure any of three specific functions. The determination of whether an SSC is safety related or important to safety has been based largely on deterministic analyses that included engineering judgment. In a memorandum dated November 20, 1981, NRR defined differences in these standard definitions for the terms important to safety and safety-related. The industry concern over the application of these terms was identified in early NRC correspondence in a memorandum from the Director Division of Licensing dated September 3, 1983. In a paper attached to this memo, the Utility Safety Classification Group identified an issue of major importance regarding treatment of SSCs relative to the terms important to safety and safety related.

This issue eventually evolved into the application of the terms special treatment, graded QA, regulatory treatment of non-safety systems (RTNSS) and the 50.69 rule making concerning risk-informed categorization and treatment of SSCs. Although various definition options were considered to resolve this issue, defining the term, important to safety, relative to special treatment requirements was not chosen, as explained in SECY-04-109. Rather it was agreed that SECY-98-300 option 2 be pursued relative to Part 50 in developing risk-informed definitions. This option provided for licensees to establish special treatment requirements for SSCs based on their safety significance in combination with the historic design Basis Accident (DBA) considerations. Safety significance is to be determined in part based upon the PRA results.

Industry Standards

Industry consensus documents, such as ANS 58.14, recognize that supplemental requirements may apply to certain "supplemented grade" non-safety related components. However, those supplemental requirements are not defined, RTNSS or the PRA is not addressed and this document is not currently endorsed by the NRC. This standard does recognize a potential difference in the use of the terms safety-related and important to safety.

International safety classification standards that are defined as technology neutral are concurrently being developed coincident with ANS standard. Technology neutral standards can apply to any type of power reactor. Draft IAEA Guide NS-G-1.14 includes a description of the technology neutral process by which safety functional groups can be classified for any type of reactor and a set of general safety functions is included within the guide for light water reactors. As identified in the guide, the safety classification process is an iterative process that ultimately establishes design requirements for all SSCs to achieve appropriate reliability. The draft guide identifies a possible combination approach during system level design where the design is based on a combination of deterministic safety analysis and probabilistic safety assessment. A graded approach is applied where special treatment is applied commensurate with the safety function or reliability requirements. Although the guide does not specify ways in which plant specific safety functions or SSC requirements are defined, expert judgement (through the range of techniques where the consequences of the SSC failures are assessed) is identified as one approach.

Graded QA

The appropriate degree of QA applied to certain non-safety related SSCs has been a discussion topic for a period of time. Several NRC historical documents address the term “graded QA” or “graded requirements”. This guidance was developed for operating plants, prior to development of RTNSS. Early in 1993, the NRC recognized that guidance was needed for graded QA. SECY-95-059 addresses the development of graded QA methodology and outlines a process to establish the safety significance of SSCs, including an expert panel and PRA. This SECY paper also considers additional QA requirements for non-safety related SSCs. The process to select and evaluate risk significant SSCs eventually became the methodology behind 10 CFR 50.69 for operating plants in a voluntary graded quality assurance alternative to 10 CFR part 50, Appendix B. Pilot programs have been initiated by industry to apply this methodology to risk informed classifications defined in recent regulatory guidance to at least one operating plant, but the cost-benefit has been questioned by industry.

Historically, the NRC has determined that certain categories of non-safety related SSCs warrant some QA program treatment. Several NRC guidance documents address the issue of special treatment and RTNSS. Regulatory Guide 1.176 identifies an approach for graded quality assurance including augmented QA practices for SSCs currently categorized as non-safety related. RG 1.201, issued for trial use, defines a process related to categorizing SSCs according to their safety significance such that SSCs of low safety significance are removed from the scope of special treatment requirements.

Stakeholders recognize that eliminating special treatment requirements for low safety significant SSCs will have little adverse effect on safety while reducing unnecessary regulatory burden. However, determining the scope of risk-significant SSCs that require special treatment must be reviewed carefully to ensure reliability and availability of those SSCs used to respond to design basis accidents and to enhance defense in depth. For example, in passive reactor designs, certain active systems, such as the AP1000 startup (backup) feedwater system and AC standby or ancillary diesel generators and their supporting systems, are used as a first or second line of defense in response to certain DBAs. Although RTNSS systems are not normally credited in the Chapter 15 accident analyses, availability of these types of systems minimizes the challenges to safety-related systems, improves overall safety and protects the utilities investment in the plant.

The application of special treatment to RTNSS SSCs and level of rigor provided by commercial codes and standards has been evaluated by the NRC in various documents. NUREG/CR-6752 concluded that commercial codes and standards were not judged to provide a level of rigor equivalent to that provided by the nuclear special treatment rules. NRC positions on operating reactors regarding RTNSS are addressed relative to the review of the South Texas Project (STP) exemption, including SECY-98-300 and SECY-99-256 that developed alternative risk-informing special treatment requirements. Other earlier NRC documents such as SECY-93-087, SECY 94-084, SECY-95-172 and SECY-96-128 specifically address the issue of RTNSS for new evolutionary and passive reactors. SECY-93-087 limited RTNSS to passive designs and, as a result, RTNSS is not addressed for the Advanced Boiling Water Reactor (ABWR).

Reliability and Availability

Reliability and availability are important considerations to ensure that SSCs will be functional when required. Several NRC SECY documents address the issue of the reliability and availability of non-safety related components in responding to an accident including post-72-hour monitoring and cooling functions. In a paper dated 7/24/95 that is a consolidation of SECY-94-084 and SECY-95-132, the issue of selecting important non-safety systems and non-safety-grade electrical distribution systems was identified as a good candidate for resolution by the RTNSS process. SECY-95-172 also addresses the issue of post-72-hour actions in regard to RTNSS. SECY-96-128 states that, on the basis of GDC 2, equipment required after 72 hours must be readily available for connection and be protected from natural phenomena including seismic events. Therefore, the design of such RTNSS equipment must consider seismic events and be available after an SSE.

The basis for ensuring the reliability of SSCs included in the PRA is the Design Reliability Assurance Program (D-RAP). SECY-89-013 identified design requirements related to the evolutionary ALWR including the reliability assurance program. As explained in the consolidation of SECY-94-084 and SECY-95-132, each licensee that references an advanced reactor design must implement the design reliability assurance program approved by the NRC and the COL applicant would

augment the design certification D-RAP and would implement the balance of the D-RAP. All design certification applications include a description of their D-RAP for risk-significant SSCs.

Reliability and dependability are important factors addressed in IAEA Draft Guide NS-G-1.14. Although RTNSS is not addressed in this guide, the quality of the item is linked to the safety function and the QA provisions for SSCs should be commensurate with the safety classification or reliability requirements.

III. CURRENT INDUSTRY APPROACH FOR NEW REACTORS

The application of recent guidance such as NEI 00-04, RG 1.176, and RG 1.201 to the 10 CFR 50.69 risk-informed categorization process is limited to voluntary application by the licensees and is not applicable to new reactors (Ref. SECY-04-109). As such, the risk-informed categorization approach does not apply to new reactors and applicants are basically applying a deterministic approach. As identified in NRC RG 1.206 Subsection C.IV.9, the RTNSS process is considered on a case by case basis for new reactors and, for COL applicants that reference a certified design, the certification will have addressed the implementation of the RTNSS process. The categorization process is actually a combination of deterministic and risk-informed methodology. Application of special treatment for RTNSS SSCs relative to each new reactor technology is discussed below.

ABWR

In Chapter 3 of the Standard Safety Analysis Report (SSAR) for ABWR, ANS 52.1-1983 is identified as a basis for the definitions of safety classifications. The SSAR states that, because of specific design considerations, these general definitions are subject to interpretation and exceptions. As identified in the Final Safety Evaluation report (FSER), the staff has not endorsed ANSI/ANS 52.1-1983 and it cannot rely on those safety classifications for determining the acceptability of non-pressure retaining SSCs.

For the evolutionary ABWR design, RTNSS is not addressed in the DCD or SER completed in 1996 and the NRC staff currently applies a recent white paper dated 10/17/07 that includes risk insights in support of new reactor application reviews, including ABWR COL applications. This NRC document identifies ABWR SSCs that have a risk-significant function, but this document does not identify special treatment requirements for non-safety related SSCs. Since the ABWR is considered an evolutionary design rather than a passive design, RTNSS does not apply, but the D-RAP is applicable to risk-significant SSCs.

Application of special treatment requirements to ABWR requires consideration of a number of factors. For example, non-safety related structures that contain seismic category I SSCs such as the ABWR turbine building are identified in the white paper as risk significant. In the DCD, the ABWR turbine building is considered non-safety related and is not identified as Seismic Category I, but it is evaluated for seismic loads by applying the Uniform Building Code (UBC). Since the ABWR is not considered a passive design, special treatment requirements such as seismic or QA are not addressed for the turbine building relative to RTNSS, but special treatment could apply relative to RG 1.29, the PRA and the D-RAP. Although seismic classification is not specifically identified in the DCD, the ABWR claims consistency with RG 1.29 for seismic classification and the seismic design to the UBC has been accepted in the NRC (FSER).

AP 1000

In Chapter 3 of the DCD Revision 16 for AP1000, ANS 58.14-1993 and ANS 51.1 are identified as a reference for the definitions and guidelines for safety classifications. The DCD identifies that the specific classifications of various SSCs included in RG 1.26, ANSI 18.2 and ANS 51.1 are based on a nuclear power plant with active safety systems and are not necessarily appropriate for the passive safety systems of the AP1000. Similar to the ANS classification standard referenced for the ABWR, this outdated ANS standard is not endorsed by the NRC and has been withdrawn. Until these ANS standards are updated and endorsed by the NRC, these documents are not used as references in the design certification review by the NRC. As a minimum, the ANS standards should be updated to include new methodology and reactor systems for passive reactors and address the RTNSS process.

The passive AP 1000 includes design considerations for RTNSS. In Chapter 22 of the AP 1000 FSER, the staff references the guidance in SECY-93-087, SECY-94-084 and SECY-96-128 applied to the evaluation of the applicant's RTNSS process described in WCAP-15985. In regard to seismic considerations, WCAP-15985 Revision 2

identifies that the AP1000 seismic evaluation does not credit nonsafety-related components and no nonsafety-related SSCSs are identified as important. In The FSER, the staff concurred that, the seismic margins analysis used to perform the AP1000 seismic evaluation does not credit non-safety-related SSCs. Therefore, no non-safety-related SSC is identified as RTNSS important. The FSER states that since the SSCs relied upon to address design-basis events are designed in accordance with the AP1000 seismic design criteria provided in DCD Tier 2, Section 3.7, the staff has determined that they are acceptable. In regard to post-72-hour actions and equipment, the NRC staff, in part, concluded that, since all equipment required for post-72-hour actions is onsite, the equipment meets the requirements of Appendix A to 10 CFR Part 50, GDC 2 with respect to protection against natural phenomenon (including seismic events).

In Chapter 3 of the DCD, Equipment Class D is identified as nonsafety-related with some additional requirements on procurement, inspection and monitoring. The RTNSS process determines the scope of risk-significant SSCs that need augmented requirements. The selection of RTNSS candidates and their treatment depends on deterministic criteria, the quality of the PRA, and engineering judgment from the expert panel. In Chapter 17 of the FSER, the staff explained that SSCs identified by the RTNSS process are within scope of the DCD Tier 2, Table 17-1, “Risk-Significant Components”. Because the classification process is iterative and the PRA evolves during the detailed design, supplemental requirements, including seismic considerations for AP1000 RTNSS candidates, may be added or changed in design certification licensing amendments and Combined Operating License (COL) applications. The DCD identifies various risk-significant systems and components as non-seismic and equipment class D. DCD Chapter 3 identifies that the buildings containing Class D SSCs are designed to the Uniform Building Code, similar to the ABWR, and the systems are not designed for seismic loads. Therefore, not all risk-significant RTNSS SSCs are classified as Category I or II and these SSCs may not be seismically analyzed or qualified, other than in regard to consideration of seismic anchorage for a limited number of post-72-hour components. As identified in DCD Chapter 3, standard industrial quality assurance standards are applied to Equipment Class D nonsafety-related SSCs and 10 CFR 50, Appendix B does not apply.

Much of the RTNSS guidance relative to seismic issues is applicable to AP600 which is also a passive design. In a NRC memorandum dated July 18, 1994, the staff proposed a review approach for RTNSS relative to the AP600. This memo identifies that the staff should consider if non-safety-related systems identified as important by the RTNSS process (IRP) and their support systems can withstand the effects of natural phenomenon, including earthquakes and that a dynamic analysis or a qualification test should be performed. This memo also indicates that these systems and components should not be required to be classified as seismic Category I and that qualification by experience may be approved by the staff on a case-by-case basis. In regard to structures that house IRP systems and components, this memo identifies that, if these SSCs are not already classified as seismic category I, then they should be classified as seismic Category II. Further, in a NRC memo dated 6/23/97 regarding SECY-96-128, the staff clarified that the post-72 hour SSCs are not required to be safety-related but, to ensure that post-72 hour SSCs can withstand the effects of SSE, without the loss of capability to perform required functions, the SSCs should be analyzed, designed and constructed using the method and criteria for seismic Category II building structures. This memo identified that no dynamic qualification of active equipment is necessary, but the design of equipment anchorages must be consistent with the SSE design of equipment anchorages of Seismic Category I items. Based on the AP1000 Amendment 16 currently under review, it is not evident that all risk-significant SSCs, including those that perform post-72-hour functions (such as the ancillary diesels), are classified or analyzed to NRC staff expectations.

Equipment Class D SSCs are those SSCs that are not considered safety-related and, therefore, are not constructed to the ASME Section III Code. Equipment Class D SSCs that are considered Seismic Category II are not included in the 10 CFR 50 Appendix B QA program, although NRC guidance (RG 1.29 Position C.4) identifies that pertinent quality assurance requirements should be applied to all activities affecting safety-related functions of SSCs. In terms of quality standards for nonsafety-related SSCs that are risk-significant, the staff recognizes that industrial standards, such as ANSI B31.1, may be appropriate, provided sufficient supplemental requirements are imposed to ensure their reliability and availability, as assumed in the PRA. Inclusion in the reliability assurance program and maintenance program will help to ensure reliability, but these programs may not be sufficient without supplemental requirements, such as seismic design, NDE, testing and a quality assurance program similar to 10 CFR 50 Appendix B.

ESBWR

In Chapter 3 of the DCD Revision 4 for ESBWR, ANS 58.14-1993, previously identified as a reference for the application of safety classifications, has now been deleted, since this ANS standard is not endorsed by the NRC and is withdrawn. Until ANS 58.14 is updated and endorsed by the NRC, this document is not used as a reference in the design certification review by the NRC. As a minimum, the ANS standard should be updated to include new methodology and reactor systems for passive reactors and address the RTNSS process.

The passive ESBWR design, now under NRC review, does require consideration of RTNSS and subsection 5.1.10 of the NRC Reviewers Guide includes guidance for RTNSS. The term important to safety is defined by the applicant in the DCD Tier 1 Section 1.2 with elevated quality assurance requirements (special treatment) and RTNSS functions applicable to such important to safety SSCs. RTNSS is addressed in DCD Chapter 19 and the applicant applies both deterministic and PRA based methodology depending on the RTNSS criterion and only Criterion C for the PRA mitigating systems is assessed probabilistically. The deterministic methodology is not specifically defined in the application and there have been a number of Chapter 19 and Chapter 22 RAIs related to RTNSS SSCs and augmented requirements. Although there is no Chapter 22 SRP, the SER for RTNSS will follow a similar format to the AP1000 Chapter 22. Current guidance is that the applicant should establish graded safety classifications and graded requirements based on the importance to safety of their functional R/A missions. In the Chapter 3 review, the staff has also questioned the identification of supplemental requirements for non-safety related components with Quality Assurance E designation. For certain Systems required beyond 72-hours, Appendix 19A identifies augmented seismic design standards for certain RTNSS Seismic Category II SSCs classified as B1 and the IBC for systems classified as B2 for seismic considerations. The only RTNSS system designated for high regulatory oversight is the Diverse Protection System. Table 19A-2 classifies certain RTNSS systems, such as B1 or B2, and the degree of regulatory treatment (high, low, support), but there are no other design specific special treatment requirements identified for RTNSS SSCs. As a result of this non-specificity, there are a number of unresolved issues concerning such treatment. Examples of some of these unresolved special treatment issues are included below:

- An outstanding open issue regarding special treatment requirements for non-safety related SSCs is the risk-significant RTNSS support systems, such as the diesels and plant service water system, that are to withstand seismic loads require special treatment with regard to seismic design, appropriate QA and D-RAP considerations. As non-seismic, these RTNSS SSCs are proposed by the applicant to be qualified by the International Building Code (IBC), but the IBC is not considered to be appropriate for seismic qualification of SSCs that need to be functional after an earthquake.

- An unresolved issue related to special treatment and RTNSS is a Seismic II over I issue in regard to the ESBWR turbine building design. The turbine building initially considered Seismic Category II in the DCD is now revised as non-seismic in Rev. 4. This revised classification is contrary to RG 1.29 guidance and the application of special treatment requirements.

- An unresolved issue concerning special treatment involves the identification of special treatment requirements for various ESBWR availability controls relative to RTNSS SSCs. Although the categorization as high regulatory oversight or low regulatory oversight is identified, the specific treatment is not identified for each RTNSS SSCs, other than augmented seismic requirements applicable to B1 and B2 SSCs.

- An open issue regarding appropriate quality assurance applicable to non-safety related Quality Assurance E SSCs identified in Table 3.2-1 that have a safety significant function has not been resolved. Special treatment beyond commercial standards, such as augmented design or graded QA requirements to ensure reliability/availability assumed in the PRA, may be required. As identified in the DCD, the QA program does include nonsafety-related SSCs and all RTNSS systems are required to be in the scope of the D-RAP.

IV. DISCUSSION

To enable the licensing process to be effective and efficient going forward, there should be an agreed upon approach between the NRC and other stakeholders regarding special treatment. There are a number of points where there is common ground among the stakeholders and where both the NRC and industry agree. There are also a number of sub-issues where there is a difference of opinion and where additional effort is required for resolution. These are listed below:

General Agreement

- Although the exact definition relative to special treatment is not defined, there is agreement on the basic definition of important to safety SSCs included in 10 CFR 50 Appendix A
- The definition of functions for safety-related SSCs, as defined in 10 CFR 50
- Compliance with 10 CFR Part 50 Appendix A, GDC 1 and GDC 2
- A risk-informed categorization approach is not applicable to new reactors
- Understanding that the RTNSS process and PRA results will determine appropriate treatment of SSCs designated within RTNSS
- The need for a high quality PRA to determine RTNSS candidates
- With minimal exceptions, consistency with RG 1.26 , RG 1.29, SRP 3.2.1 and SRP 3.2.2
- 10 CFR Appendix B applies to safety-related SSCs
- There is a need for an endorsable industry consensus standard for quality and seismic classification

Differences

- Based on industry correspondence, industry does not recognize differences between safety-related and important to safety
- Industry approach to categorize certain important to safety structures as non-seismic contradicts NRC guidance that structures important to safety be able to withstand the effects of an SSE based on a seismic analysis or approved qualification method
- Industry approach to qualify certain important to safety SSCs by the IBC is inconsistent with NRC accepted approach to dynamically analyze or alternatively qualify
- Industry does not recognize that special treatment requirements improve SSC quality and reliability
- Appendix B quality assurance program is not applied to certain important to safety SSCs

To be Resolved

- Agreement on difference between definition of safety-related and important to safety so that special treatment requirements are consistently applied to nonsafety-related SSCs that are important to safety
- Specific special treatment requirements based on the RTNSS process need to be better defined in the application
- Endorsable industry consensus standards (IAEA Guide NS-G-1.14 and ANS 58.14) updated for new reactors and the RTNSS process needed for classification
- Need industry consensus document for seismic classification and design standards for RTNSS SSCs

V. RESOLUTION

For the review of new reactor license applications, industry organizations, the applicants and the NRC staff must continue to work together to develop appropriate special treatment requirements for risk-significant SSCs that meet regulatory guidance and are necessary to achieve the reliability and availability assumed in the PRA. These special treatment requirements apply to both design and operations. Lessons learned during pilot programs for operating reactors may be used in developing guidance for new reactors.

To support the development of a consistent and efficient process to define special treatment requirements for new reactors, a consensus must be reached on the essential elements of a RTNSS process where there is a basic difference in opinion between industry and the regulator. Adoption of the following methodology is a suggested process to move forward in resolving outstanding issues regarding special treatment for new reactors.

- The terms safety-related and important to safety are not the same. Important to safety SSCs are those safety-related and non-safety related SSCs whose function is to

protect the health and safety of the public. Safety-related SSCs are those important to safety SSCs that perform one of three important safety functions.

- Nonsafety-related RTNSS SSCs that are risk-significant are to be considered important to safety, unless demonstrated otherwise.

- Risk-significant SSCs are to include those SSCs that are required to function post-72 hours. Risk-significant SSCs are also to include SSCs that accomplish defense in depth functions and limit challenges to safety-related systems.

- Consistent with GDC 2, important to safety SSCs should be designed to remain functional following a safe shutdown earthquake. The application of seismic qualification methods other than dynamic analysis or testing require technical justification and review by the NRC staff.

- Consistent with GDC 1, important to safety SSCs should be designed, constructed and tested to appropriate quality standards commensurate with their safety function. Industrial standards supplemented by augmented requirements such as rigorous analysis, NDE, testing and QA as determined by the reliability and availability controls.

- Structures that contain important to safety systems and components should be designed to preclude their failure from adversely affecting important to safety systems and components.

VI. CONCLUSION

For operating reactors there is a process in place to address a risk-significant categorization process as an alternative to 10 CFR 50 Appendix B. Where industry does not apply a risk-informed categorization process, an industry consensus standard that is endorsed by the NRC, when available, will provide a deterministic method to identify special treatment requirements for important to safety SSCs.

For new reactors that apply a deterministic approach, there is a need to better define and consider what special treatment requirements are applicable to important to safety SSCs that may not be considered safety-related and are included in the RTNSS process. One solution is to address special treatment requirements for RTNSS SSCs in an industry consensus standard such as ANS 58.14 or develop a new separate standard that specifically addresses the RTNSS process and/or seismic requirements for new reactors. In either case, a combination of deterministic and risk-informed approach with consideration of special treatment requirements, including seismic, to ensure reliability assumed in the PRA. Until there is an endorsable industry consensus standard, applications for new reactors will be reviewed for special treatment under RTNSS on a case by case basis. The identification and evaluation of RTNSS candidates to determine their risk-significance must not be solely based on a PRA, but must consider deterministic factors that affect reliability and availability assumed in the PRA. The design, procurement, installation, testing, quality control and maintenance requirements directly affect the reliability and availability of SSCs so that special treatment requirements, to supplement commercial grade quality, is appropriate. Applications must include the deterministic methodology, as supplemented by the PRA, to enable the NRC staff to adequately review special treatment applied to risk significant RTNSS SSCs. Consideration of special treatment requirements to ensure reliability and availability of RTNSS SSCs must be included in the application or adequately addressed by the applicant.

REFERENCES

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