NRC FORM 658
(9-1999)

U.S. NUCLEAR REGULATORY COMMISSION

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DATE OF MEETING
12/08/2000

The attached document(s), which was/were handed out in this meeting, is/are to be placed in the public domain as soon as possible. The minutes of the meeting will be issued in the near future. Following are administrative details regarding this meeting:

Docket Number(s)	**50-498 and 50-499**
Plant/Facility Name	**South Texas Project, Units 1 and 2**
TAC Number(s) (if available)	**MA6057 and MA6058**
Reference Meeting Notice	**11/22/00**
Purpose of Meeting (copy from meeting notice)	**To discuss the NRC's draft Safety Evaluation on the risk-informed multipart exemption request to special treatment requirements**

NAME OF PERSON WHO ISSUED MEETING NOTICE	TITLE
John Nakoski	**Sr Project Manager**

OFFICE
NRR

DIVISION
DLPM

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RISK-INFORMED EXEMPTION TO
SPECIAL TREATMENT REQUIREMENTS
MEETING BETWEEN STPNOC AND NRC ON DSE OPEN ITEMS

MEETING PURPOSE: To provide a forum for the exchange of information in support of the resolution of the Open Items identified in the November 15, 2000, Draft Safety Evaluation.

AGENDA:

WEDNESDAY, DECEMBER 6, 2000 - ROOM O-13B4

1:00pm to 2:30pm:	Broad discussion on Engineering Evaluation vs. Engineering Analysis - when does STPNOC use evaluations vs. when does STPNOC use analysis.
2:30pm to 2:45pm:	Break
2:45pm to 4:15pm:	Testing - baselining of replacement components, monitoring, and PMT.
4:15pm to 5:15pm:	Examples to provide PRA insights into how beyond design-basis conditions are considered for HSS/MSS SSCs

FRIDAY, DECEMBER 8, 2000 - ROOM O-13B4

8:00am to 8:30am:	Feedback from ACRS meeting
8:30am to 9:00am:	National Consensus Standards - What level of commitment is the staff looking for?
9:00am to 10:45am:	Change Control - level of detail in FSAR (Open item 5.1)
10:45am to 11:00am:	Break
11:00am to 12:00pm:	PRA issues (limitations on CDF/LERF and latent consequences, and Common Cause Failure issues)
12:00pm to 12:30pm:	Wrapup

RISK-INFORMED EXEMPTION TO
SPECIAL TREATMENT REQUIREMENTS
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(Revision 1)

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12:30pm to 1:00pm:	Wrapup

Below is a simplified example of an estimation of RAW contribution from common cause failures. This example depicts the RAW involving Component "X" from a 3-train system which has X, Y, Z components. Thus the Random failures include: X, Y, and Z and Common Cause failures include: [XY], [XZ], [YZ], and [XYZ]. Assume 0.1 to be the failure probability for each of these failures.

Case	Failure Type	Base Condition	Random Failure of X (Assumed failure of X)	Assumed failure of doublet common cause failures involving x: [xy] or [xz]	Assumed failure of triplet CCF	Assumed failure of all CCFs involving X	Assumed failure of X plus assumed failure of all CCFs involving X	Assumed failure of ccf [xy]	Assumed failure of ccf [xz]
1	XYZ	(.1)(.1)(.1) = 0.001	(1)(.1)(.1) = 0.01	(.1)(.1)(.1) = 0.001	(.1)(.1)(.1) = 0.001	(.1)(.1)(.1) = 0.001	(1)(.1)(.1) = 0.01	(.1)(.1)(.1) = 0.001	(.1)(.1)(.1) = 0.001
2	X[YZ]	(.1)(.1)= 0.01	(1)(.1) = 0.1	(.1)(.1)= 0.01	(.1)(.1)= 0.01	(.1)(.1)= 0.01	(1)(.1) = .1	(.1)(.1)= 0.01	(.1)(.1)= 0.01
3	Y[XZ]	(.1)(.1)= 0.01	(.1)(.1)= 0.01	(.1)(1)= 0.1	(.1)(.1)= 0.01	(.1)(1)= 0.1	(.1)(1)= 0.1	(.1)(.1)= 0.01	(.1)(1)= 0.1
4	Z[XY]	(.1)(.1)= 0.01	(.1)(.1)= 0.01	(.1)(1)= 0.1	(.1)(.1)= 0.01	(.1)(1)= 0.1	(.1)(1)= 0.1	(.1)(1)= 0.1	(.1)(.1)= 0.01
5	[XYZ]	.1	.1	.1	1.0	1.0	1.0	.1	.1
	TOTAL	0.131	0.23	0.311	1.031	1.211	1.31	0.221	0.221

Therefore,
(1) Using the STP proposed method.....
$RAW_{doublet}$ = ½ RAW[XY] + ½ RAW[XZ] = ½ (0.221) + ½ 0.221 = 0.221

(2) Using the above chart....
$RAW_{doublet}$ = 0.311

(3) Using the STP GQA method....
$RAW_{doublet}$ = RAW[XY] + RAW[XZ] = 0.221 + 0.221 = 0.442

This example demonstrates that the method used for GQA to account for the RAW from CCFs overestimates the "true" value. However, it also demonstrates that the proposed method underestimates the RAW contribution from CCFs.

2.2.1 Engineering Evaluation Guidelines

The engineering evaluation should assess whether the impact of the proposed change is consistent with the defense-in-depth philosophy. An acceptable set of guidelines for making that assessment is summarized below. Other equivalent decision guidelines are acceptable.

- A reasonable balance among prevention of core damage, prevention of containment failure, and consequence mitigation is preserved.
- Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided.
- System redundancy, independence, and diversity are preserved commensurate with the expected frequency and consequences of challenges to the system and uncertainties (e.g., no risk outliers).
- Defenses against potential common cause failures are preserved and the potential for introduction of new common cause failure mechanisms is assessed.
- Independence of barriers is not degraded.
- Defenses against human errors are preserved.
- The intent of the General Design Criteria in Appendix A to 10 CFR 50 is maintained.

The engineering evaluation should also assess whether the impact of the proposed change is consistent with the principle that sufficient safety margins are maintained. An acceptable set of guidelines for making that assessment is summarized below. Other equivalent decision guidelines are acceptable.

- Codes and standards or alternatives approved for use by the NRC are met.
- Safety analysis acceptance criteria in the licensing basis (e.g., Final Safety Analysis Report (FSAR) and supporting analyses) are met, or proposed revisions provide sufficient margin to account for analysis and data uncertainty.

2.2.2 Guidelines for Defense in Depth and Safety Margins

Defense in depth and safety margins are expected to be addressed generally by considering the following GQA program aspects.

- The GQA process will not result in changes to the plant configuration. Therefore, no existing plant barriers will be removed. Additionally, existing system redundancy, diversity, and independence will be maintained.
- The GQA process will not result in changes to the technical requirements (e.g., design bases or operational parameters) associated with SSCs.
- The resulting QA provisions will provide the necessary level of assurance that low safety-significant, safety-related and high safety-significant, non-safety-related SSCs remain capable of performing their safety function.

The core damage frequency (CDF) and large early release frequency (LERF) figures of merit do not fully cover long-term containment overpressure protection. Functions credited in the PRA for long-term overpressure protection, but which do not contain any SSCs with CDF or LERF based importance measures above the guideline values, should be identified and the safety significance explicitly assigned. For example, the containment spray systems for PWRs may not contribute to the prevention or mitigation of core damage or large early release.

An important factor to ensure that defense-in-depth and safety margin considerations are not degraded during the implementation of GQA is control of potential common mode failures. As discussed in Regulatory Position 2.1.2.1, groups of nominally identical SSCs, utilized in multiple systems throughout the plant, can as an aggregate have high safety significance.

Principle 4 in Regulatory Guide 1.174 (Ref. 3) states that any proposed increase in CDF and risk are small and are consistent with the intent of the Commission's Policy Statement (Ref. 1). Although the risk impact of GQA changes on individual components is expected to be minimal, reduced QA oversight may be applied to a large number of SSCs. It is recognized that limited data are available to define the impact of QA programs on SSC reliability. Accordingly, the licensee should perform a bounding analysis in which the failure rates or probabilities for basic events representing SSCs that may be subjected to reduced QA controls are set at some increased level (chosen and justified by the licensee). Alternatively, the licensee may choose to address the bounding analyses by modifying the uncertainty distributions in some manner (also chosen and justified by the licensee).

The bounding analysis should include all SSCs modeled in the PRA on which QA controls may be

ENGINEERING EVALUATIONS FOR EQ - - INSERT FOR UFSAR SECTION 13.7.3.3.4

Technical requirements (including applicable environmental conditions) are specified for items to be procured, which are based on the original design inputs and assumptions for the item. One or more of the following methods are used to determine that the procured item can perform its function under design basis conditions, including applicable environmental conditions:

- Vendor Documentation - - The performance characteristics for the item, as specified in vendor documentation (e.g., catalog information, certificate of conformance), satisfy STP's technical requirements.
- Equivalency Evaluation - - An equivalency evaluation determines that the procured item has a form, fit, and function under design basis conditions that is equivalent to the item being replaced.
- Engineering Evaluation - - An engineering evaluation compares the differences between the procured item and original item and determines that the differences are not sufficient to preclude the procured item from performing its function under design basis conditions.
- Engineering Analysis - - In cases involving design changes or substantial differences between the procured item and replacement item, an engineering analysis is performed to determine that the procured item can perform its function under design basis conditions. The engineering analysis may be based upon a computer calculation, evaluations by multiple disciplines, test data, or operating experience related to the procured item.

Documentation of the implementation of these methods is maintained. Additionally, documentation is maintained to identify the preventive maintenance needed to preserve the capability of the procured item to perform its function under applicable environmental conditions.

INSTALLATION TESTING - - INSERT FOR UFSAR SECTION 13.7.3.3.5

A test is performed if the installation could affect an SSC's design function. The test verifies that the SSC is operating within expected parameters and functionality is verified prior to return to service.

PERIODIC TESTING - - INSERT FOR UFSAR SECTION 13.7.3.3.7

ASME pumps and valves are subject to routine operation or periodic tests. This includes one or more of the following:

- Running of the pump or actuation of the valve during normal operation, system alignment changes, or mode changes.
- Testing of the pump or valve using the inservice test (IST) methodology specified in 10 CFR 50.55a(f), but at a reduced frequency and without the other special treatment

required by that section.

- Periodic testing of the pump or valve using a method that is less rigorous than the IST methodology specified in 10 CFR 50.55a(f) but still sufficient to provide confidence that the component has not failed.

NATIONAL CONSENSUS STANDARDS - - INSERTS FOR UFSAR SECTION 13.7.3.3

STP uses the following national consensus standards in the _________ process, as necessary to ensure the functionality of components:

- Standards required by the State of Texas to be used for the process.

- Existing standards at the time of the granting of the exemption, where STP determines that it is reasonable to apply those standards to the process.

- Future standards, at STP's discretion or in lieu of a standard in use at the time of the granting of the exemption.

STP is not required to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

The processes for determining the risk categorization and deterministic categorization of a component are described in more detail in Sections 13.7.2.3 and 13.7.2.4.

Based upon these processes, a component is placed into one of four categories: 1) high safety/risk significant (HSS), 2) medium safety/risk significant (MSS), 3) low safety/risk significant (LSS), and 4) non-risk significant (NRS). This categorization process does not, in and of itself, affect the other classifications of the component (e.g., safety, seismic, ASME classification).

The process is implemented by a Working Group comprised of individuals experienced in various facets of nuclear plant operation and reviewed by an Expert Panel. This integrated decision process is described in more detail in Section 13.7.2.2.

13.7.2.2 <u>Comprehensive Risk Management Process</u>. The integrated decision-making process used by STP is documented by procedure. The integrated decision-making process incorporates the use of an Expert Panel and Working Groups. The Expert Panel is comprised of qualified senior level individuals and is responsible for oversight of the program and for reviewing the activities and recommendations of the Working Group. The Working Group is comprised of experienced individuals who apply risk insights and experience to categorize components in accordance with the process described in this Section and make recommendations to the Expert Panel.

<u>The Expert Panel and Working Group have expertise in the areas of risk assessment, quality assurance, licensing, engineering, and operations and maintenance. The combined membership of the Expert Panel and Working Group includes at least three individuals with a minimum of five years experience at STP or a similar nuclear plant, and at least one individual who has worked on the modeling and updating of the PRA for STP or a similar plant for a minimum of three years.</u> <u>*[Note to STP: NRC's 7/19/00 Draft Review Guidelines do not allow for such experience to be on "a similar plant."]*</u>

Procedures control the composition of and processes used by the Expert Panel and Working Group. Procedures also identify training requirements for members of the Expert Panel and Working Group, including training on probabilistic risk assessment, risk ranking, and the graded quality assurance process. Finally, the procedures specify the requirements for a quorum of the Expert Panel and Working Group, meeting frequencies, the decision-making process for determining the categorization of components, the process for resolving differing opinions among the Expert Panel and Working Group, and periodic reviews of the appropriateness of the programmatic control and oversight provided to categorized components.

13.7.2.3 <u>PRA Risk Categorization Process</u>. A component's risk categorization is initially based upon its impact on the results of the PRA.

STP's PRA calculates both a core damage frequency (CDF) and a large early release frequency (LERF). The PRA models internal initiating events at full power, and also accounts for the risk associated with external events.

implementing programs. Additionally, the risk-significant functions of these components will receive consideration for enhanced treatment. This consideration is described in Section 13.7.3.2.

- **Safety-Related LSS and NRS Components – These components receive normal commercial and industrial practices. These practices are described in Section 13.7.3.3.**
- **Non-Safety-Related LSS and NRS Components – The treatment of these components is not subject to regulatory control.**
- **Uncategorized Components – Until a component is categorized, it continues to receive the treatment required by NRC regulations and STP's associated implementing programs, as applicable.**

13.7.3.2 Enhanced Treatment for Non-Safety Related Components. Non-safety-related HSS and MSS components may perform risk-significant functions that are not addressed by STP's current treatment programs.

When a non-safety-related component is categorized as HSS or MSS, STP documents the condition under the corrective action program and determines whether enhanced treatment is warranted to enhance the reliability and availability of the function. In particular, STP evaluates the treatment applied to the component to ensure that the existing controls are sufficient to maintain the reliability and availability of the component in a manner that is consistent with its categorization. This process evaluates the reliability of the component, the adequacy of the existing controls, and the need for any changes. If changes are needed, additional controls are applied to the component. In addition, the component is placed under the Maintenance Rule monitoring program, if not already scoped in the program (i.e., failures of the component are evaluated and Maintenance Rule Functional Failures (MRFF) involving the component are counted against the performance criteria at the plant/system/train level, as applicable). Additionally, as provided in the approved GQA program, non-safety-related HSS and MSS components are subject to the TARGETED QA program. These controls will be specifically 'targeted' to the critical attributes that resulted in the component being categorized as HSS or MSS. Components under these controls will remain non-safety-related and will be procured commercial, but the special treatments will be appropriately applied to give additional assurance that the component will be able to perform its function when demanded.

Examples of process enhancements for non-safety-related HSS and MSS components may include:

- **Performing routine preventive maintenance (PM) tasks more frequently to ensure component reliability**
- **Ensuring that the component's critical attributes are functionally validated following maintenance activities**

~~In addition, management of LSS and NRS components subject to commercial practices is also governed by technical and administrative procedures as described throughout Section 13.7.3.3.~~
Procedures provide for the qualification, training, and certification of personnel, commensurate with the functions they perform. Experienced personnel may be exempted from prerequisite training. STP considers vendor recommendations and commercially accepted national accepted consensus standards in the training, qualification, and certification of personnel. STP may deviate from these recommendations and standards based on specific circumstances and sound business practices. Such deviations are not required to be documented.

Documentation, review, and retention requirements of completed work activities are governed by administrative procedures and work instructions.

Procedures identify the types of inspection, test, and surveillance equipment requiring control and calibration, and the interval of calibration. Equipment that is in error or defective is removed from service or properly tagged to indicate the error or defect, and a determination will be made of the functionality of the SSC that was checked using that equipment.

13.7.3.3.10 Configuration Control Process. The Station's configuration control process is controlled through approved procedures and policies. The design control process ensures that the configuration of the Station is properly reflected in design documents and drawings. ~~Changes to the Station are controlled through design change packages (modifications) which require that control drawings and documents be updated prior to closeout of the modification package.~~

~~In addition, configuration control addresses the status of components day-to-day in the field. SSCs are tagged and are manipulated by qualified Operations personnel per procedure. The configuration control process manages and controls the physical changes (procedural and equipment) to the facility to assure that the plant configuration and practices correctly reflect the licensing bases. Non-ASME components installed in ASME Code systems are identified and tracked.~~

13.7.4 Continuing Evaluations and Assessments

13.7.4.1 Performance Monitoring. STP has performance monitoring processes for the changes in the special treatment. This monitoring includes the following:

- **Maintenance Rule Program – Specific performance criteria are identified at the plant, system, or train level. Regardless of their risk categorization, components that affect MSS or HSS functions will be monitored and assessed in accordance with plant, system and/or train performance criteria. ~~Data used for monitoring is obtained from various sources, such as work orders, condition reports, and test results.~~**