Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

September 2, 2008
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File No. G25
10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Proposed Amendment to UFSAR Section 13.7 for Assessment of Risk Significance

In accordance with the provisions of 10 CFR 50.90, STP Nuclear Operating Company (STPNOC) submits this request for an amendment to South Texas Project Operating Licenses NPF-76 and NPF-80 to revise Updated Final Safety Analysis Report (UFSAR) Section 13.7.2.3. This change will add a separate set of criteria for assessing the risk significance of the Risk Achievement Worth (RAW) values of common cause failures (CCFs) as part of its Probabilistic Risk Assessment (PRA) analysis of the risk importance of components.

The proposed amendment will allow STPNOC's method of assessing RAW values to be consistent with the method used in the NRC-accepted industry guidance document NEI 00-04, 10 CFR 50.69 SSC Categorization Guideline. Currently, when assessing the risk significance of CCF RAW values, STPNOC applies the same criteria as that used for independent component failure RAW values, whereas the NEI 00-04 process utilizes separate higher criteria for common cause failure RAW values.

The Enclosure provides a technical and regulatory evaluation of the proposed change. Proposed UFSAR page markups are included as attachments to the Enclosure.

STPNOC requests approval by August 31, 2009, and requests 60 days for implementation.

In accordance with 10 CFR 50.91(b), STPNOC is notifying the State of Texas of this request for license amendment by providing a copy of this letter and its attachments.

The STPNOC Plant Operations Review Committee has reviewed and concurred with the proposed change to the UFSAR.

STI: 32313950

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NRR

If there are any questions regarding this request, please contact either Mr. Philip Walker at (361) 972-8392 or me at (361) 972-7454.

There are no commitments in this submittal.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 2, 2008
Date

Charles T. Bowman
General Manager, Oversight

PLW

Enclosure: Evaluation of the Proposed Change

cc:
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**SOUTH TEXAS PROJECT**

**UNITS 1 AND 2**

**ENCLOSURE**

**Evaluation of the Proposed Change**

Subject: Proposed Change to UFSAR Section 13.7.2.3

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ATTACHMENTS:

1. UFSAR Page Markups

# ENCLOSURE

## 1. SUMMARY DESCRIPTION

The proposed amendment will incorporate a revision to the Updated Final Safety Analysis Report (UFSAR) Section 13.7.2.3 to add a separate set of criteria for assessing the risk significance of the Risk Achievement Worth (RAW) values of common cause failures (CCFs) as part of the Probabilistic Risk Assessment (PRA) analysis of the risk importance of components.

This change in STPNOC's method of assessing RAW values is consistent with the method used in the NRC-accepted industry guidance document NEI 00-04, 10 CFR 50.69 SSC Categorization Guideline (Reference 1). This guideline states that RAW values for common cause failures should be assessed using a different criterion than that used for the individual component RAW. As stated in the guideline, the RAW for common cause events reflects the relative increase in Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) that would exist if a set of components or an entire system were made unavailable. As a result, the risk significance of the RAW values of common cause basic events is considered separately from the RAW values of basic events that reflect an individual component.

Currently, when assessing the risk significance of CCF RAW values, STPNOC applies the same criteria as that used for independent component failure RAW values, whereas the NEI 00-04 process utilizes separate higher criteria for common cause RAW values.

The proposed change will add a new set of criteria, consistent with the NEI 00-04 guideline, to be used when assessing the risk significance of common cause failures.

The proposed revision to the UFSAR requires NRC approval in accordance with UFSAR Section 13.7.5.2, Regulatory Process for Controlling Changes. Provision (a) of this section states: "Changes to Section 13.7.2, 'Component Categorization Process' may be made without prior NRC approval, unless the change would decrease the effectiveness of the process in identifying HSS and MSS components." The proposed change could result in fewer components classified as HSS or MSS, and is therefore considered to require NRC approval.

## 2. DETAILED DESCRIPTION

The risk categorization process uses two standard PRA importance measures, Fussell-Vesely (FV) and RAW, as screening tools to identify candidate safety-significant components. The assessment of importance for a component involves the identification of PRA basic events that represent the component. These include events that explicitly model the performance of an individual component (e.g., pump A fails to start) and events that can be described as "multiple similar equipment failures that occur within a short period of time due to the same underlying cause" (e.g., failure of both pump A in Train A and pump B in Train B). The latter types of events are known as common cause failures and are included in the PRA system model as CCF basic events. The scope of the proposed change concerns only the RAW value assessment for common cause basic events.

A) Current Methodology

STP currently applies the same criteria (shown below) for assessing the PRA risk importance of components, regardless of whether the FV and RAW values are associated with individual basic events or common cause basic events.

| **PRA Ranking** | **Criteria –** currently applied to both individual component and common cause basic events | **NEI 00-04 Categorization **** applicable only to individual component basic events |
|---|---|---|
| High | RAW ≥ 100.0 or<br>FV ≥ 0.01 or<br>FV ≥ 0.005 and RAW ≥ 2.0 | Safety Significant (RISC-1 or RISC-2) |
| Medium (Further Evaluation is Required)* | FV < 0.005 and 100.0 > RAW ≥ 10.0 | |
| Medium | FV ≥ 0.005 and RAW < 2.0 or<br>FV < 0.005 and 10.0 > RAW ≥ 2.0 | |
| Low | FV < 0.005 and RAW < 2.0 | Low Safety Significant (RISC-3 or RISC-4) |

* This category indicates that Full QA is applied to the component critical attributes associated with the RAW value.

** This column is shown only for comparison. The NEI categorization of Safety Significant corresponds to STP's categorization of Medium or High safety significant.

B) Proposed Change

STP proposes to add the following new set of criteria for assessing the risk importance of components included in common cause basic events:

| **PRA Ranking** | **Criteria -** applicable only to common cause basic events | **NEI 00-04 Categorization **** applicable only to common cause basic events |
|---|---|---|
| High | CCF RAW ≥ 100.0 or<br>FV ≥ 0.01 or<br>FV ≥ 0.005 and CCF RAW ≥ **20.0** | Safety Significant (RISC-1 or RISC-2) |
| Medium | FV ≥ 0.005 and CCF RAW < **20.0** or<br>FV < 0.005 and **100.0** > CCF RAW ≥ **20.0** | |
| Low | FV < 0.005 and CCF RAW < **20.0** | Low Safety Significant (RISC-3 or RISC-4) |

Note: The Medium (Further Evaluation is Required) category would not be used as a CCF RAW criterion.

** This column is shown only for comparison. The NEI categorization of Safety Significant corresponds to STP's categorization of Medium or High safety significant.

STPNOC will continue to use the current criteria, as described in Section 2.A above and in the current UFSAR Section 13.7.2.3, for assessing the risk importance of individual component failures (non-common cause). A component's final risk would be based on the higher of the two risk assessments (FV - RAW or FV - CCF RAW) for CDF and LERF.

The above change will require a revision to UFSAR section 13.7.2.3 to add the above separate set of criteria for assessing CCF RAW. The markup of the proposed change is provided in the enclosed enclosure attachment.

## 3. TECHNICAL EVALUATION

Background

The STP PRA is an internal and external initiating events, full power, level 1, level 2 PRA that calculates both CDF and LERF. Contributions from internal and external initiating events at full power are included in the importance measure calculations that are used in the risk categorization process.

The risk categorization process uses two standard PRA importance measures, FV and RAW, as screening tools to identify candidate safety-significant components. The assessment of importance for a component involves the identification of PRA basic events that represent the component. These can include events that explicitly model the performance of a component (e.g., pump A fails to start), events that implicitly model a component (e.g., some human actions, initiating events, etc.) or a combination of both types of events. Failures that can be described as "multiple similar equipment failures that occur within a short period of time due to the same underlying cause" (e.g., failure of both pump A in Train A and pump B in Train B) are known as common cause failures and are included in the PRA system models as CCF basic events. The scope of the proposed change concerns only the RAW value determination and assessment (the latter being limited to common cause basic events).

Proposed Change Evaluation

The proposed change to the method for assessing the risk importance of a component by examining the maximum CCF RAW value (in combination with the FV value) of associated basic events is based on the guidance provided in NEI 00-04. Section 5.1 of this guideline states, in part:

> In the case of RAW, the common cause event is considered using a different criterion than the individual component RAW. The RAW for common cause events reflects the relative increase in CDF/LERF that would exist if a set of components or an entire system was made unavailable. As a result, the risk significance of the RAW values of common cause basic events is considered separately from the basic events that reflect an individual component. A RAW value of 20 was conservatively selected to reflect the fact that the common cause RAW is measuring the failure of two or more trains, including the higher failure likelihood for the second train due to common causes. As with the individual component RAW values, if the component being evaluated is included in more than one common cause basic event, the maximum of the common cause RAW values is used to evaluate the significance.

The importance measure criteria used to identify candidate safety significance are:

- Sum of FV for all basic events modeling the SSC of interest, including common cause events > 0.005
- Maximum of component basic event RAW values > 2

- Maximum of applicable common cause basic events RAW values > 20

If any of these criteria are exceeded, it is considered candidate safety-significant.

The proposed change integrates the NEI methodology for assessing a component as safety significant or not safety significant into the existing STP PRA categorization breakdown of High, Medium, or Low risk as detailed earlier in the description of the change. For common cause RAW values > 20.0 and/or individual component (non-common cause) RAW value > 2.0, the component would be categorized as High or Medium (both categories considered risk significant, per UFSAR Section 13.7). In addition, a component with a common cause RAW value < 20.0 and an individual (non-common cause) RAW < 2.0 could be classified as Medium risk if its FV value is ≥ 0.005.

Other Considerations

For individual component failures (non-common cause), no change to the current assessment criteria is being proposed. In addition, no change to the method of calculating or assessing FV values for all basic events, including common cause, is being proposed.

## 4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The following criteria apply to the PRA analysis process used to determine the risk significance of Structures, Systems, or Components:

NRC Regulatory Guide 1.201, *Guidelines For Categorizing Structures, Systems, And Components In Nuclear Power Plants According To Their Safety Significance,* Issued For Trial Use, May 2006

Although the above requirements and guidelines discuss the importance of including common cause considerations in the PRA analysis, they do not specify the criteria to be used in assessing the risk significance of components based on common cause RAW values. Regulatory Guide 1.201 states that "the guidance in NEI 00-04 provides an acceptable approach for use in categorizing SSCs to support the implementation of 10 CFR 50.69". The regulatory position and clarifications provided in Regulatory Guide 1.201 for the process described in NEI 00-04 do not take exception or provide any comment on the use of the separate criteria for evaluating common cause RAW values, as stated in NEI 00-04. Therefore, STPNOC's proposed change satisfies and is consistent with all applicable requirements and guidelines.

4.2 Significant Hazards Consideration

STPNOC evaluated whether a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response:

   No. The proposed change does not involve the modification of any plant equipment or affect basic plant operation. The proposed change revises the STPNOC method of assessing Risk Achievement Worth (RAW) values as part of the Probabilistic Risk Assessment analysis of the risk importance of components to be consistent with the methods used in NRC-accepted industry guidance document NEI 00-04, "10 CFR

50.69 SSC Categorization Guideline." The proposed change will have no impact on the design or function of any safety-related structures, systems or components. The proposed change could result in a decrease in the safety significance ranking of some components, with a corresponding decrease in special treatment for such components. However, the treatment of such components would still be sufficient to ensure their reliable operation and would not result in a significant increase in their failure probability.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response:

   No. The proposed change does not involve any physical alteration of plant equipment and does not change the method by which any safety-related structure, system, or component performs its function. The proposed change revises the STPNOC method of assessing Risk Achievement Worth (RAW) values as part of the Probabilistic Risk Assessment analysis of the risk importance of components to be consistent with the methods used in NRC-accepted industry guidance document NEI 00-04, "10 CFR 50.69 SSC Categorization Guideline." As such, no new or different types of equipment will be installed, and the basic operation of installed equipment is unchanged. The methods governing plant operation remain consistent with current safety analysis assumptions.

   Therefore, the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response:

   No. The proposed change does not negate any existing requirement, and does not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. The proposed change revises the STPNOC method of assessing Risk Achievement Worth (RAW) values as part of the Probabilistic Risk Assessment analysis of the risk importance of components to be consistent with the methods used in NRC-accepted industry guidance document NEI 00-04, "10 CFR 50.69 SSC Categorization Guideline." As such, there are no changes being made to safety analysis assumptions, safety limits or safety system settings that would adversely affect plant safety as a result of the proposed change.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, STPNOC concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of 'no significant hazards consideration" is justified.

4.3 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's

regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 5. ENVIRONMENTAL CONSIDERATION

The proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c) (9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement, or environmental assessment need be prepared in connection with the proposed amendment.

## 6. REFERENCES

1. NEI 00-04, Nuclear Energy Institute 10 CFR 50.69 SSC Categorization Guideline, Revision 0, dated July 2005 [found acceptable by Regulatory Guide 1.201 (for trial use)]
2. Letter, J. A. Zwolinski to W. T. Cottle, "South Texas Project Units 1 and 2 – Safety Evaluation on Exemption Requests from Special Treatment Requirements of 10 CFR Parts 21, 50, and 100 (TAC Nos. MA6057 and MA6058)," dated August 3, 2001

# ENCLOSURE, ATTACHMENT 1

## UFSAR Page Markups

13.7.2.3 PRA Risk Categorization Process. A component's risk categorization is initially based upon its impact on the results of the PRA. STP's PRA calculates both core damage frequency (CDF) and containment response to a core damaging event, including large early release frequency (LERF). The PRA models internal initiating events at full power, and also accounts for the risk associated with external events.

The PRA configuration control program incorporates a feedback process to update the PRA model. The updates are segregated into two categories:

- The plant operating update incorporates plant design changes and procedure changes that affect PRA modeled components, initiating event frequencies, and changes in SSC unavailability that affect the PRA model. These changes will be incorporated into the model on a period not to exceed 36 months.

- The comprehensive data update incorporates changes to plant-specific failure rate distributions and human reliability, and any other database distribution updates (examples would include equipment failure rates, recovery actions, and operator actions). This second category will be updated on a period not to exceed 60 months.

The PRA model may be updated on a more frequent basis.

Only components that are modeled in the PRA are given an initial risk categorization. The PRA risk categorization of a component is based upon its Fussell-Vessely (FV) importance, which is the fraction of the CDF and LERF to which failure of the component contributes, and its risk achievement worth (RAW), which is the factor by which the CDF and LERF would increase if it were assumed that the component is guaranteed to fail. Specifically, PRA risk categorization is based upon the following:

For individual component failures:

| **PRA Ranking** | **Criteria** |
|---|---|
| High | RAW $\geq$ 100.0 or<br>FV $\geq$ 0.01 or<br>FV $\geq$ 0.005 and RAW $\geq$ 2.0 |
| Medium (Further Evaluation is Required) | FV < 0.005 and 100.0 > RAW $\geq$ 10.0 |
| Medium | FV $\geq$ 0.005 and RAW < 2.0 or<br>FV < 0.005 and 10.0 > RAW $\geq$ 2.0 |
| Low | FV < 0.005 and RAW < 2.0 |

For common cause component failures:

| PRA Ranking | Criteria |
|---|---|
| High | CCF RAW $\geq$ 100.0 or<br>FV $\geq$ 0.01 or<br>FV $\geq$ 0.005 and CCF RAW $\geq$ 20.0 |
| Medium | FV $\geq$ 0.005 and CCF RAW < 20.0 or<br>FV < 0.005 and 100.0 > CCF RAW $\geq$ 20.0 |
| Low | FV < 0.005 and CCF RAW < 20.0 |

To determine the impact of a potential change in reliability of the LSS components on the overall plant risk, a sensitivity study is performed as part of the periodic updates to the PRA to determine the cumulative impact on CDF and LERF from postulating a factor of 10 increase in the failure rates for all modeled LSS components and non-categorized low ranking PRA components. The increases in CDF and LERF are determined to be acceptable using the guidelines for changes as outlined in Regulatory Guide 1.174.

To address defense-in-depth issues related to Late Containment Failures, a similar sensitivity analysis is performed as part of the periodic updates to the PRA. This study postulates an increase in component failure rates by a factor of 10 for all modeled LSS components and non-categorized low ranking PRA components. STP compares the resulting late containment failure frequency with its nominal frequency to assure that the delta increase in the late containment failure frequency is small in support of adhering to the defense-in-depth philosophy stated in Regulatory Guide 1.174.