

PMSTPCOL PEmails

From: Foster, Rocky
Sent: Monday, May 18, 2009 1:42 PM
To: Stillwell, Daniel
Cc: STPCOL
Subject: Draft Chapter 19 RAIs (2nd Set) - Publically Available
Attachments: Draft RAI 2412.pdf; Draft RAI 2624.pdf

Bill,

Attached are the next two sets of RAIs for Chapter 19 of the STP COLA. Please review and provide me with feedback on need for clarification, or if I can formally issue them to STP as is.

Thanks,

Rocky D. Foster
Project Manager
US Nuclear Regulatory Commission
Office of New Reactors
Division of New Reactor Licensing
ESBWR/ABWR Project 2
(301) 415-5787
rocky.foster@nrc.gov

Hearing Identifier: SouthTexas34Public_EX
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Recipients:
"STPCOL" <STP.COL@nrc.gov>
Tracking Status: None
"Stillwell, Daniel" <dwstillwell@STPEGS.COM>
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Post Office: HQCLSTR01.nrc.gov

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Request for Additional Information No. 2412 Revision 0

South Texas Project Units 3 and 4
South Texas Project Nuclear Operating Co
Docket No. 52-012 and 52-013

SRP Section: 19.01 - Determining the Technical Adequacy of Probabilistic Risk Assessment Results for
Risk-Informed
Application Section: 19.0-19R

QUESTIONS for PRA Licensing, Operations Support and Maintenance Branch 2 (ESBWR/ABWR
Projects) (SPLB)

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP T1 2.4-2 (Feedwater Line Break Mitigation), it is stated that this departure is not explicitly modeled in the ABWR DCD PRA. In the ABWR DCD original design, the feedwater was assumed to be unavailable when hotwell inventory was depleted. No automatic isolation of feedwater flow was assumed. In ABWR Standard R-COL design modification, the condensate pumps are tripped in the event of high containment pressure from Feedwater line break.

Please explain whether this design change was included in the STP plant-specific PRA model. If so, explain its impact on the PRA results.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP T1 2.4-3 (RCIC Turbine/Pump), it is stated that the new design has fewer support systems than the original design. Please explain how this new design was modeled in the STP plant-specific PRA model and its impact on the PRA results.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP T1 3.4-1 (Safety-Related I&C Architecture), it is stated that a delta-PRA assessment was performed to assess the updates affect on the instrument fault trees and common cause failures of the ECF and the Chapter 19D fault trees and Chapter 19N CCF. However, these changes were not provided in the STP FSAR Chapter 19D and Chapter 19N. Please provide these changes and explain the impact on the PRA results.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP 1.2-1 (Control Building Annex), the applicant stated that the Reactor Internal Pump MG Sets (2) and their switchgear are moved from the Control Building to the new Control Building Annex. Please explain if this new building is considered in the internal flooding and internal fire PRA analysis. If so, explain the effect of this new building on the fire risk assessment and on the internal flooding analysis.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP 3MA-1 (Correction of Inconsistencies in System Evaluation for ISLOCA Description), it is stated in the Evaluation Summary of the Departure Report, that "...these clarifications add numerous valves and piping to the list of ISLOCA upgraded components...". Please discuss the impact of these added components on the results of ISLOCA analysis.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP 8.3-1 (Plant Medium Voltage Electrical System [MVES] Design), it is stated in ABWR Standard R-COL design modification that dual MVES consisting of 13.8KV and 4.16KV are used to replace the single 6.9 KV MVES in the ABWR DCD. Provide a list of PRA components that are supported by the 13.8 KV and 4.16 KV systems. Explain whether this new design was modeled in the STP plant-specific PRA model. If so, explain its impact on the PRA results.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STP DEP 9.2-5 (Reactor Service Water [RSW] system), it is stated that RSW and Ultimate Heat Sink (UHS) system designs are modified to meet the increased heat removal requirements of the reactor cooling water system for STP 3&4 and potential impact is included in the delta-PRA analysis. Please describe these model changes in the STP plant-specific PRA and explain the impact on the PRA results.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP 10.4-5 (Condensate and Feedwater System), it is stated that in the ABWR DCD, normal rated power operation is with all 3 MD Reactor FW Pumps operating. If one operating Reactor Feedwater Pump trips, the other 2 operating reactor FW pumps must increase speed and discharge flows to maintain rated power operation. In ABWR Standard R-COL design modification, It has

4 Variable Speed (ASD driven) Reactor FW Pumps and 4 condensate booster pumps. Normal rated power operation is with 3 MD Reactor FW Pumps operating and one in auto standby. If one operating Reactor FW Pump trips and the Reactor FW Pump in auto start does not successfully start, automatic power reduction (by recirculation runback) occurs to avoid reactor scram.

Please explain how this new design was considered in the STP plant-specific PRA model and its impact on the PRA results.

19.01-***

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STD DEP 12.3-3 (Steam Tunnel Blowout Panels), it is stated that the ABWR standard R-COL design modification does not have blowout panels in the steam tunnel. The steam produced in the main steam tunnel is vented to the turbine building. Due to this design change, the steam or any heated gas, and extra water is directed to the turbine building during accident scenario. Please discuss the potential impact of this change on the Turbine building fire risk assessment and flooding analysis.

19.01-***

10 CFR 52.79(a)(46) states that a COL application must contain an FSAR that includes a description of the plant specific PRA and its results. RG 1.206, Section C.I.19, Appendix A also provides the content for Chapter 19 of the FSAR and describes what results should be included in the FSAR (e.g., CDF, significant core damage sequences, importance measures, etc.). In accordance with this guidance, the staff requests the following for internal event at full power:

- a. Total CDF and LRF for the STP PRA.
- b. Top 100 cutsets for CDF and LRF.
- c. Descriptions of the significant core damage sequences and large release sequences .
- d. Risk-importance measures including Fussel-Vesely (FV) and Risk Achievement Worth (RAW) for components basic events in the STP plant-specific PRA model.
- e. Risk-importance measures (FV and RAW) for HEP (Human Error Probability).
- f. Risk-importance measures (FV and RAW) for CCF (Common Cause Failures).
- g. Description of how individual departures contributed to the delta-CDF and delta-LRF from the STP plant-specific PRA model.
- h. CDF contributions by initiating events.

19.01-***

A list of new components and their locations in the Turbine building for STP units 3&4 is provided in Table 9A.6-4 in STP FSAR Section 9A.6, Fire Hazard Analysis Database. However, the impact of these additional components on the fire PRA associated with Turbine building was not discussed in Section 19M.

Please explain whether these additional components are included in the fire risk assessment and, if so, please discuss their impact on the fire PRA results.

19.01-***

In Section 19M, the applicant concluded that the fire risk analysis results for STP units 3& 4 are bounded by the existing ABWR DCD FIVE (Fire-induced Vulnerability Evaluation) results. Please explain why the physical arrangements of new components and equipment in Turbine building, Control Building Annex, and other buildings do not affect the ABWR DCD fire risk analysis. In addition, please explain why the results of the STP plant-specific fire risk analysis are bounded by the ABWR DCD fire risk analysis. The applicant did not provide the Fire Risk Screening Analysis Summary, including the fire ignition frequency and CDF for the safety-related buildings, Control Room, and Turbine Building. Please provide the specific values for these items, or explain how to find them from any available reference documents.

19.01-***

The applicant provided supplemental COL license information in Section 19.9 to address the resolution of the COL license information, which the applicant asserted could not be completed before the issuance of the COL license. In accordance with RG 1.206, Chapter C, Part III, Section C.III.4, subsection C.III.4.3, the applicant is requested to provide additional information to support the issuance of COL.

Please provide your plan, including the implementation schedule, for addressing the resolution of the COL license items and commitments in Section 19.4S, as described in RG 1.206, Chapter C, Part III, Section C.III.4, subsection C.III.4.3.

19.01-***

In STP FSAR, Rev. 2, Section 19.4S, "PRA Maintenance", sub-section 19.4S.1.2, Construction phase, it is stated that ".....STP 3 & 4 commits to the NRC to develop and implement procedures similar to those used to control STP 1 & 2 PRA prior to construction start maintenance and update during the operations phase to control the incorporation of changes to the as-designed, as-to-be-built, plant PRA (COM 19.4S-3)....". Please clarify if PRA maintenance and update procedures developed prior to construction phase will be used in the operational phase.

19.01-***

1. In STP FSAR, Rev.2, Section 19.6.5, it is stated that "Finally, as noted in Subsection 19.D.5.2 Accident Classes, (2) Class II.....". Please clarify if this statement is referred to ABWR SSAR subsection 19.D.5.2.

2. In STP FSAR, Rev.2, Section 19.11, "Human Action Overview", there are two instances in the text that refers to subsection 19D.7, Please clarify if this statement is referred to ABWR SSAR subsection 19.D.7.

Request for Additional Information No. 2624 Revision 0

South Texas Project Units 3 and 4
South Texas Project Nuclear Operating Co
Docket No. 52-012 and 52-013
SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section: 19.0

QUESTIONS for PRA Licensing, Operations Support and Maintenance Branch 2 (ESBWR/ABWR Projects) (SPLB)

19-***

Table 19.2-2 of the STP COLA, Revision 2, describes Dual Units at STP 3 and 4 (STP DEP 1.1-2). This departure changes from a single fire protection system for a single unit to a single fire protection system for a dual unit. Please explain whether manual switchover from one unit to the other unit was modeled and, if so, its impact on CDF due to a Fire event? Describe the impact of this single fire protection system for two units on the PRA results due to an initiating event that can simultaneously affect both units (i.e. LOOP).

19-***

Table 19.2-2 of the STP COLA, Revision 2, describes Residual Heat Removal Flow and Heat Capacity Analysis (STD DEP 5B-1). In Table 19.2-2, the increased RHR heat removal rate (0.0427 MW/°C) does not match that listed in the Departures Report (4.27 x 10⁵ W/ °C or 0.427 Mw/°C). Please clarify what the correct value is. Explain whether PRA results are impacted by this change in the RHR heat exchanger heat removal capacity.

19-***

Table 19.2-2 of the STP COLA, Revision 2 describes ADS Manual Control (STD DEP 7.3-7). The Departures Report states that key lock switches are replaced with normal manual pushbutton switches. Please explain if this component is modeled in the PRA and, if so, what was the impact on PRA results. In Table 19.2-2, it states that there is a potential beneficial effect for plant-specific PRA. Please explain why this is beneficial with respect to the PRA.

19-***

Table 19.2-2 of the STP COLA, Revision 2, describes ESF Logic and Control System (ELCS) Mode (STD DEP 7.3-10). Table 19.2-2 states that this change is a clarification to text but the Departures Report states that this is a design change. Please clarify and explain how the PRA results are affected due to this design change of the ESF Logic and Control System (ELCS) Mode.

19-***

Table 19.2-2 of the STP COLA, Revision 2, describes Containment Spray Logic Change (STD DEP 7.3-13). Table 19.2-2 states that this change is a clarification to text but the Departures Report states that this is a design change. Please clarify and explain how the PRA results are affected due to the Containment Spray Logic Change.

19-***

Table 19.2-2 of the STP COLA, Revision 2, describes Residual Heat Removal Suppression Pool Cooling modification (STD DEP 7.3-14). Table 19.2-2 states that this change is a clarification to text but the Departures Report states that this is a design change. Please clarify and explain how the PRA results are affected due to the design change of the SPC manual initiation switch.

19-***

Table 19.2-2 and the Departures Report of the STP COLA, Revision 2, describe changes in testing of Safety Relief Valve Solenoid Valves (STD DEP 7.3-16). Please explain if these components are modeled in the PRA and, if so, what was the impact of these changes on PRA results. In Table 19.2-2, it states that there is a potential beneficial effect for plant-specific PRA. Please explain why this is beneficial with respect to the PRA.

19-***

Table 19.2-2 of the STP COLA, Revision 2, describes updated Reactor Building Cooling Water System (STD DEP 9.2-1). Table 19.2-2 states that this change is a clarification to text but the Departures Report states that this is a design capacity change. Please clarify and explain how the PRA results are affected due to the design capacity change of the Reactor Building Cooling Water System.

19-***

Section 19.9.2 of the STP COLA, Revision 2, states: "An evaluation of CUW operation in the heat removal mode will be completed and PRA will be updated prior to fuel load in accordance with 10 CFR 50.71 (h)(1)." This appears to be a commitment just as the "emergency operating procedure to operate the CUW in heat exchanger bypass mode will be developed and implemented prior to fuel loading" is annotated as Commitment 19.9-2. Please explain how this activity will be tracked for future implementation.