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TSTF-446 Revision 3
Project Number 694

OG-08-364

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Subject: **PWR Owners Group Recommended Requirements to be Included in the Notice for Comment for TSTF-446, Rev. 3, "Risk Informed Evaluation of Extensions to Containment Isolation Valve Completion Times (WCAP-15971)."**

Reference: (1) OG-08-253 - PWR Owners Group Submittal of WCAP-15791-P/NP-A, Revision 2, "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times," June 2008 (PA-LSC-0029/0135)

(2) NRC Letter dated February 13, 2008 from Ho K. Neih to G. Bischoff, "Final Safety Evaluation (SE) for Westinghouse Owners Group (WOG) Topical Report (TR) WCAP-15791-P Revision 2, "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times (TAC NO. MD3834)"

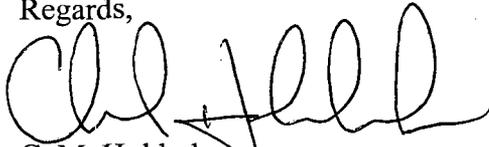
The PWROG met with the NRC staff on September 23, 2008 to discuss the Consolidated Line Item Improvement Process (CLIIP) Notice for Comment (NFC) for TSTF-446, Rev. 3, "Risk Informed Evaluation of Extensions to Containment Isolation Valve Completion Times (WCAP-15971)." The purpose of the meeting was to discuss the CLIIP requirements for the plant specific applicability confirmation to be included in license amendment requests to implement the generic Completion Times (CTs) contained in TSTF-446, Rev. 3. This will ensure that these requirements are consistent with WCAP-15791-P-A, Rev. 2, "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times," and the NRC's Final Safety Evaluation (SE).

The attachment to this letter contains additional clarifications to the Limitations and Conditions and Additional Information contained in Sections 4.0 and 5.0, respectively, of the Final SE. These clarifications are shown as Tracked Changes, as discussed in the meeting.

If you have any questions, please do not hesitate to contact Mr. James Andrachek at (412) 374-5018 or Mr. Chad Holderbaum of the PWR Owners Group Program Management Office at (412) 374-6230.

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Regards,



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CMH:rfn

Enclosure

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Attachment to Letter OG-08-364

4.0 LIMITATIONS AND CONDITIONS

1. WCAP-15791 is based on only one CIV being in maintenance at any time. The TR states that it is not expected that multiple systems will be out of service simultaneously during extended CTs, but the TR does not preclude the practice. Although TS LCO 3.6.3 Note 2 allows separate condition entry for each penetration flow path, proposed Condition D (see Section 3.3.3 of this SE) addresses an inoperable CIV in more than one penetration flow path and limits the CT to four hours. If the licensees' proposed TS change does not include this Condition D, then the licensees' applications must verify that the potential for any cumulative risk impact of failed CIVs and multiple CIV LCO entries has been evaluated and is acceptable. The licensee must confirm that its Tier 3 risk management program in accordance with 10 CFR 50.65(a)(4) will address the possibility of simultaneous LCO entries of inoperable CIVs in separate penetrations such that defense-in-depth for safety systems is maintained. (See Section 3.2 of this SE.)

2. The existing and proposed TS 3.6.3 must not allow multiple simultaneous extended CIV CTs to occur for more than four hours, which is the existing CT for an inoperable CIV in ISTS LCO 3.6.3. This is to meet the TR assumption listed in Section 3.2 of this SE that only one valve within a single penetration can be in maintenance at a time (i.e., for more than the four hours allowed by the current ISTS LCO 3.6.3 Condition A). The existing ISTS LCO 3.6.3 Condition B, and the proposed ISTS 3.6.3 Conditions A and D, assure that this assumption is being met. If the TSs do not prevent this case (i.e., Condition D is not adopted), then this case must be evaluated in the plant-specific applications to demonstrate that the risk impact assumptions of CDF, LERF, ICCDP and ICLERP remain less than the RGs 1.174 and 1.177 acceptance guidelines as discussed in Section 3.3.3 of this SE. Also, the plant-specific application must address if the position of the remaining CIVs in the affected penetration flow path, or another penetration flow path, are confirmed before entering the extended CT for the inoperable CIV. (See Section 3.3.3 of this SE.)

If Condition D in TSTF-446, Rev. 3 is implemented, Limitations and Conditions 1 and 2 do not need to be addressed.

5.0 ADDITIONAL INFORMATION NEEDED IN APPLICATIONS REFERENCING TR WCAP-15791

The additional information that must be provided in the plant-specific applications referencing WCAP-15791 is as follows:

1. Address how the first, third, and sixth items of the basis and general assumptions of WCAP-15791, which are listed in Section 3.2 in the SE, are incorporated in the specific plant practices, procedures, TSs, and PRA. (See Section 3.2 of this SE.)

First item:

Only one CIV is in maintenance with an extended CT at any time. This is a Tier 2 requirement, unless the licensee has proposed the additional ISTS LCO 3.6.3 Condition D in its plant-specific application.

Implementation of Condition D in TSTF-446, Rev. 3 addresses this item.

Third item:

Before maintenance or corrective maintenance (repair) is performed on a GIV, the TR evaluation assumes that the other CIV(s) in the penetration flow path has been checked to ensure that they are in their proper position. This is a Tier 2 requirement.

A licensing commitment to include a Tier 2 requirement addresses this item. The licensee will identify where the Tier 2 commitment is located, e.g., Technical Specification Bases, Licensee Controlled Document, or implementing procedures.

Sixth item:

Multiple systems are not expected to be out of service simultaneously during the extended CTs.

It is acceptable to have multiple systems out of service simultaneously. A licensing commitment to include Tier 2 requirements and Tier 3 (10CFR50.65(a)(4)) assessments will address this item.

2. Not all penetrations have the same impact on CDF, LERF, ICCDP, or ICLERP, therefore, verify the applicability of WCAP-15791 to the specific plant, including verification that (a) the CIV configurations for the specific plant match the configurations in the TR and (b) the risk-parameter values used in the TR are bounding for the specific plant. Any additional CIV configurations, CT extensions, or non-bounding risk parameter values not evaluated by the TR should be addressed in the plant-specific analyses. Note that CIV configurations and extended CTs not specifically evaluated by the TR, or non-bounding risk parameter values outside the scope of the TR will require NRC staff review of the specific penetrations and related justifications for the proposed CTs. (See Sections 3.2 and 3.3.1 of this SE.)

The approach for implementing the generic analysis and associated CTs provided in Section 9 of WCAP-15791-P-A, Rev. 2, addresses this item.

3. Confirm that the Tier 2 conclusion of the TR (i.e., no Tier 2 requirements are needed) is applicable to the specific plant, or provide the plant-specific Tier 2 requirements needed for the plant. (Section 3.3.2 of this SE.)

Inoperable CIVs will not result in a risk-significant configuration for the plant. The licensee will discuss why no Tier 2 requirements are necessary, consistent with the Tier 2 conclusion in the TR. If the licensee chooses to address Additional Information (AI) #1, the third or sixth items, via Tier 2 requirements, this should be discussed.

4. WCAP-15791 does not address Tier 3, therefore, each plant-specific application must address Tier 3 for the specific plant. The plant-specific application must discuss conformance to the requirements of the Maintenance Rule (i.e., 10 CFR 50.65(a)(4)), as the requirements relate to the proposed CIV CTs and the guidance contained in NUMARC 93-01, Section 11, as endorsed by RG 1.182, including verification that the licensee's maintenance rule program, with respect to CIVs, includes a LERF/ICLERP (i.e., ILERP as defined in NUMARC 93-01) assessment as part of the maintenance rule process, and that the PRA quality is adequate as part of the basis of a risk-informed licensing action. (See Sections 3.3.3 and 3.4 of this SE.)

The licensee's configuration risk management program that implements 10CFR50.65(a)(4) addresses this item. The containment isolation model may need to be changed to meet this requirement. Two approaches can be utilized: 1) model representative CIVs/penetrations or 2) model all CIVs/penetrations for those CIVs with extended CTs. CIVs/penetration flow paths with inside diameters less than or equal to two inches connected to the containment atmosphere do not need to be modeled.

5. Verify that the plant-specific PRA quality is acceptable for Tier 3 applications in accordance with the guidelines given in RGs 1.174 and 1.177, which are identified in the six items listed in Section 3.3.1.1 of this SE. (See Section 3.3.1.1 of this SE.)

Item 1. Assurance that the plant-specific PRA reflects the as-built, as-operated plant.

Differences between the PRA and as-built, as operated plant are acceptable, if a discussion is provided regarding any differences and the potential impacts on Tier 3 (10CFR50.65(a)(4)) assessments.

Item 2. Assurance that the applicable PRA updates include the findings from the individual plant evaluation (IPE) and the IPE for external events. External events

may include seismic, high winds, fires, floods, or other related events applicable to each licensee. Licensees must demonstrate, by either quantitative or qualitative means, that external event risk will not have an adverse impact on the conclusions of the plant-specific analyses with respect to the TR evaluation. For some participating plants, internal fires and other external event risk may contribute significantly to overall plant baseline risk which may impact the WCAP-15791 methodology results such that a plant-specific application of the WCAP-15791 methodology may not be found acceptable in all cases. Specifically, the risk from external events should not make the total baseline risk exceed 1 E-4/yr CDF or 1 E-5/yr LERF without justification.

The impact of any open IPE and IPEEE findings on the PRA model should be discussed with regard to the Tier 3 (10CFR50.65(a)(4)) assessments associated with this license amendment request. If the impact of any open IPE and IPEEE finding is insignificant with respect to this license amendment request, it does not need to be closed to implement TSTF-446, Rev. 3.

Item 3. Assurance that conclusions from the peer review, including facts and observations (A and B), per NEI 00-02, "Probabilistic Risk Assessment (PRA) Peer Review Process Guidance," Revision A3 and American Society of Mechanical Engineers (ASME) RA-S- 2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," that are applicable to the proposed CIV extended CTs were considered and resolved. If not resolved, justification for acceptability of conclusions (e.g., sensitivity studies showing negligible impact) must be provided. The licensee should indicate the PRA revision that underwent the peer review and the PRA revision that was used in the plant-specific application.

No clarification proposed.

Item 4. Assurance that there is PRA configuration control and updating, including PRA quality assurance programs, associated procedures, and PRA revision schedules.

No clarification proposed.

Item 5. Assurance that there is PRA adequacy, completeness, and applicability with respect to evaluating the risk associated with the proposed CIV CT extensions.

Two approaches can be utilized to address this item with respect to modifying the PRA model to perform the LERF assessment: 1) model representative CIVs/penetrations or 2) model all CIVs/penetrations for those CIVs with extended CTs. CIVs/penetration flow paths with inside diameters less than or equal to two inches connected to the containment atmosphere do not need to be modeled.

Item 6. Assurance that plant design or operational modifications that are related to or could impact the proposed CT extensions are reflected in the PRA revision used in the plant specific application, or a justification provided for not including these modifications in the PRA.

No clarification proposed.

6. Verify that external event risk, including seismic and fires, either through quantitative or qualitative evaluation, is bounded by the TR assumptions and will not have an adverse impact on the conclusions of the plant-specific analysis for extending the CIV CTs. (See Section 3.3.1.1 of this SE.)

This item is addressed by demonstrating the total plant CDF is less than $1E-04/yr$ and the seismic CDF is less than $4.4E-05/yr$ for the generic analysis, and associated CTs. If these values are met, then an adverse impact on the WCAP conclusions is not expected.

7. Address how plant-specific CIV availability is monitored and assessed at the plant under the Maintenance Rule (i.e., 10 CFR 50.65) to confirm that performance continues to be consistent with the analysis assumptions used to justify extended CIV CTs, including the assumptions in WCAP-15791 (which are discussed in Section 3.2 of this SE). (See Section 3.3.3 of this SE.)

The assumptions made in the generic analysis are identified by the first, third, and sixth bullets in Section 3.2 of the SE. These assumptions are not required to be monitored via the Maintenance Rule (10CFR50.65). Only the CIV unavailability time with respect to that assumed in the generic analysis is required to be monitored.

8. The cumulative risk impact of the proposed CIV CT extensions must be addressed in the plant-specific application in accordance with the acceptance guidelines in RG 1.174. The cumulative risk impact must include both previous plant license changes and additional plant applications still under review. (See Section 3.3.2 of this SE.)

No clarification proposed.

9. Uncertainty due to plant PRA models is not addressed in WCAP-15791, therefore, the plant-specific applications must discuss uncertainties in the risk assessment. (See Section 3.3.1.3 of this SE.)

Uncertainty can be characterized as aleatory and epistemic. Uncertainties related to data are termed aleatory. This uncertainty is often associated with component failure rates and initiating event frequencies, for example. Epistemic uncertainty is related to model uncertainties and associated with, for example, assumptions and simplifications. Both are discussed in the following.

This analysis did not directly address data uncertainty by assigning distributions to the component failure rates, initiating event frequencies, etc. and then propagating them through to the results. However, the generic analysis indirectly addresses this component of uncertainty by using conservative values for the key parameters. The key parameters that form the basis of the analysis include:

- isolation valve failure rates
- core damage frequency (CDF) from internal and external events
- CDF from seismic events
- CDF from steam generator tube ruptures
- common cause failure factors

The values used for these parameters were obtained from Westinghouse NSSS plant PRA models. The values for each parameter were compared across the plants and the most conservative values chosen. For example, the most conservative value for CDF for seismic events is $4.41\text{E-}05/\text{yr}$ (see WCAP-15791-P-A, Rev. 2, Table 8-1), which came from one plant, while the most conservative value for a motor-operated valve to fail to close is $1.09\text{E-}02/\text{demand}$ (see WCAP-15791-P-A, Rev. 2, Table 8-1), which came from another plant. Using this approach provides an extremely conservative analysis, since the most conservative values for most parameters are used based on all the possible values in Westinghouse NSSS plant PRA models. This provides a bounding analysis that is applicable to all Westinghouse NSSS plants, therefore, no data uncertainty analysis was necessary in the analysis.

This analysis did not directly address epistemic uncertainty. A review of all the PRA models considered when collecting the appropriate values for the parameters was not done to determine if the PRA models appropriately address this uncertainty source. But epistemic uncertainty is indirectly addressed by the approach used in the analysis to determine appropriate parameter values. Individual PRA models may contain sources of epistemic uncertainty, but the same source would most likely not carry across all Westinghouse NSSS plants, and since the more conservative values for the parameters are used in the analysis, epistemic uncertainty should not be a concern.

Epistemic uncertainty of particular interest in this analysis is the CDF contribution from external events other than seismic. This primarily includes fire, external flooding, and high winds. Depending on the plant, these may or may not be a significant contributor to CDF. However, the total internal and external CDF value used in the analysis is relatively high, therefore, for most plants, if not all, this CDF value should represent a conservative (enveloping) value.

10. Address the plant CRMP, including the Maintenance Rule program implemented under 10 CFR 50.65(a)(4), and explain how the LERF/ICLERP is

assessed in the program. This assessment is to be documented in a regulatory commitment in the plant-specific application. (See Section 3.4 of this SE.)

No clarification proposed.

PRA Model Quality/Regulatory Guide 1.200

There are limited areas where inconsistencies with Regulatory Guide 1.200 could have an impact on this license amendment request. These areas are associated with the plant specific input parameters used to demonstrate the applicability of the generic results. It is expected that the F&O's from all peer reviews and gap assessments related to input parameters will have no impact on this license amendment request due to the conservatisms in the generic analysis. The licensee will need to confirm this conclusion in the license amendment request for the generic CT changes. The results of the peer reviews and GAP analyses to Regulatory Guide 1.200, and the impact on this license amendment request should be discussed. The impact of fires should also be discussed.