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Attention: Sheldon Stuchell
Document Control Desk
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Subject: Additional Clarification with Respect to EPRI Report; *Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-informed Inservice Inspection Programs. EPRI, Palo Alto, CA: 2010. 1021467*

Ref. EPRI Project Number 669

Dear Sheldon:

On July 8, 2010, EPRI submitted EPRI Report "Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-informed Inservice Inspection Programs." EPRI, Palo Alto, CA: 2010. 1021467. This report is an update to EPRI Report 1018427, which was previously submitted to NRC, and incorporated responses developed to Requests for Additional Information (RAIs) issued by the staff.

This report was transmitted as a means of exchanging information with the NRC for the purposes of supporting generic regulatory improvements with respect to application of risk-informed technology to inservice inspection (RI-ISI) programs.

During a conference call on September 15, 2010, NRC staff requested additional clarification. The attached provides this requested information.

If you have any questions on this subject, please contact Patrick O'Regan (poregan@epri.com, 508-497-5045).

Sincerely,

Enclosure

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Issue: NRC has indicated that the basis provided in EPRI Report 1021467 for Capability Category I (CCI) assignments for certain supporting requirements (SRs) additional input is needed. These SRs are AS-A9, SC-B2, SY-B1 and SY-B11. Two issues have been identified:

1) Potential for the CCI requirements to be non-conservative (AS-A9, SC-B2),

2) Need for clarification or reconsideration of the CCI for potential flooding impacts (SY-B1, SY-B11).

The basis for the sufficiency of CCI for these SRs is provided in EPRI report 1021467 as follows:

AS-A9:

"EPRI traditional CCI because the EPRI approach uses an order of magnitude absolute risk ranking and grouping approach. Substantial differences between the generic analyses and realistic plant-specific analyses would be required to impact the RI-ISI results.

EPRI streamlined CCI because substantial differences between the generic analyses and realistic plant-specific analyses would be required to have a significant enough impact to increase the scope of HSS segments, per Section 2(a)(5) of case."

SC-B2, SY-B1, SY-B11

EPRI traditional CCI—Per Table 1.3-1 of the RA-2005, CCI provides resolution and specificity sufficient to identify the importance of the contributors at the system or train level. Thus, this level of detail is sufficient to support implementation of the EPRI RI-ISI methodology (for example, absolute risk ranking versus relative risk ranking).

EPRI streamlined CCI—per Table 1.3-1 of the RA-2005, CCI provides resolution and specificity sufficient to identify the importance of the contributors at the system or train level. Thus, this level of detail is sufficient to support implementation of the EPRI RI-ISI methodology (for example, scope of HSS segments, per Section 2(a)(5) of case).

Clarification: As discussed in EPRI report 1021467 "With respect to risk-informed applications, Section 3 of the PRA Standard provides a roadmap for determining the capability of a PRA needed to support a particular risk-informed application. Key aspects of this roadmap include the following:

- Role of the PRA in the application and extent of reliance of the decision on the PRA results
- Risk metrics to be used to support the application and associated decision criteria
- Significance of the risk contribution from the hazard group to the decision
- Degree to which bounding or conservative methods for the PRA or in a given portion of the PRA would lead to inappropriately influencing the decisions made in the application and approach(es) for accounting for this in the decision-making process
- Degree of accuracy and evaluation of uncertainties and sensitivities required of the PRA results
- Degree of confidence in the results that are required to support the decision
- Extent to which the decisions made in the application will impact the plant design basis"

The PRA Standard provides the following discussion for CCI:

"**Scope and Level of Detail:** The degree to which the scope and level of detail of the plant design, operation, and maintenance are modeled.

Resolution and specificity sufficient to identify the relative importance of the contributors at the system or train level.

Plant-specificity: The degree to which plant-specific information is incorporated such that the as-built and as-operated plant is addressed.

Use of generic data/models acceptable except for the need to account for the unique design and operational features of the plant.

Realism: The degree to which realism is incorporated such that the expected response of the plant is addressed.

Departures from realism will have moderate impact on the conclusions and risk insights as supported by good practices [Note (2)].

[Note (2)] Differentiation from moderate, to small, to negligible is determined by the extent to which the impact on the conclusions and risk insights could affect a decision under consideration. This differentiation recognizes that the PRA would generally not be the sole input to a decision. A moderate impact

implies that the impact (of the departure from realism) is of sufficient size that it is likely that a decision could be affected; a small impact implies that it is unlikely that a decision could be affected, and a negligible impact implies that a decision would not be affected."

The key term in the above bases is "**moderate**". As noted above "substantial" differences would be needed in results and insights to potentially impact the EPRI RI ISI approaches. Thus, potentially non-conservative impacts of CCI (AS-A9, SC-B2), or clarifications for potential flooding impacts (SY-B1, SY-B11) are addressed next.

AS-A9: CCI allows for the use of generic thermal hydraulic analyses to determine accident progression parameters that could potentially affect the operability of mitigating systems, whereas CCII uses realistic, applicable analyses. The only potential issue with using CCI versus CCII or CCIII for this SR, in an EPRI RI-ISI application, is if its use would result in an un-conservative risk assignment (e.g. risk category 6 versus risk category 4 in the EPRI traditional approach and LSS versus HSS in the EPRI streamlined approach). That is, provided that the generic analyses are conservative or realistic for the plant-specific RI-ISI application, then conservative or RI-ISI results are assured. This SR is one of twenty-one AS SRs. In particular, AS-5 through AS-A10 address modeling details (i.e. what is to be included in the model) which taken together assure that un-conservative results are not produced. Further, the bases for using generic analyses would be included in the documentation, and as discussed in EPRI TR-1021467, documentation issues that impact the results would need to be clearly identified and therefore there is no reason to conclude that the use of such analyses would substantially impact the results of RI ISI application in a negative manner. Finally, the RI ISI approaches themselves use a robust categorization process which would address potential non-conservatism in this single SR where the potential impact could be "moderate" such that a potentially substantial impact would be effectively mitigated.

SC-B2: CCI does not restrict the use of expert judgment whereas CCII/III provides language to constrain the use of expert judgment. This SR is one of fourteen SRs for the SC technical element. The bases for using expert judgment is required to be included in the documentation (i.e. SC-C2 must be met) and per EPRI TR-1021467 any impact on the results would also need to be identified. As discussed above for AS-A9, given that only un-conservative application of this SR is of potential importance, taken together with the other thirteen SRs for this technical element and that the RI ISI approaches use a robust categorization process which would address potential non-conservatism in this single SR where the potential impact could be "moderate" a potentially substantial impact would

be effectively mitigated.

SY-B1: The CCI requirement is to "model intrasystem common cause failures when supported by generic or plant-specific data (an acceptable model is the screening approach of NUREG/CR-5485 [Note (1)], which is consistent with DA-D5), or SHOW that they do not impact the results." This is the same wording as CCII/CCIII except that it is allowed to not model intrasystem common cause if it can be shown to not impact the results. In the EPRI traditional approach, an explicit consequence of failure assessment is required for each piping segment. That is, each piping segment is postulated to fail with a probability of 1.0 and the complete impact on the plant (i.e. direct and indirect effects) is determined. EPRI TR-112657, section 3, contains a detailed description of the consequence assessment process. For the EPRI streamlined approach, explicit requirements are identified in the IF technical element to assure a robust determination of the impact (failure of a component, system, multiple components and systems) of an individual piping segment failure. As such, there is no reason to believe that meeting CCI for this SR would impact the RI ISI application in a negative manner.

SY-B11: CCI allows development of a technical basis for not modeling initiation and control of a system, whereas CCII/III requires modeling. In the EPRI traditional approach, an explicit consequence of failure assessment is required for each piping segment. That is, each piping segment is postulated to fail with a probability of 1.0 and the complete impact on the plant (i.e. direct and indirect effects) is determined. EPRI TR-112657, section 3, contains a detailed description of the consequence assessment process. For the EPRI streamlined approach, explicit requirements are identified in the IF technical elements (e.g. IF-D) to assure a robust determination of the impact (failure of a component, system, multiple components and systems) of an individual piping segment failure. As such, there is no reason to believe that meeting CCI for this SR would impact the RI ISI application in a negative manner.

Based upon the above, assignment of Capability Category I for AS-A9, SC-B2, SY-B1 and SY-B11 remains appropriate.