February 26, 2002

MEMORANDUM TO: Cynthia A. Carpenter, Program Director
Policy and Rulemaking Program
Division of Regulatory Improvement Programs

FROM: David T. Diec, Reactor Engineer ***/RA/***
Policy and Rulemaking Section A
Division of Regulatory Improvement Programs

SUBJECT: TRIP REPORT – OBSERVATION OF RIP50 OPTION 2 PILOT ACTIVITIES (IDP DEMONSTRATION) AT SURRY NUCLEAR POWER PLANT

On February 4-6, 2002, the Westinghouse Owners Group (WOG) RIP50 Option 2 integrated decision-making panel (IDP) met at the Surry nuclear power plant to pilot the draft implementation guidance for Option 2 contained in NEI-00-04. Surry piloting activity incorporated lessons learned from the Quad Cities Boiler Water Reactor Owners Group (BWROG) pilot activity (August 2001) and a recent WOG pilot activity at the Wolf Creek nuclear power plant (October 2001). The NRC staff observed the IDP deliberations and provided feedback to the panel.

Included in this memo is the trip report documenting the staff's observations.

Attachment: As stated

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Trip Report
RIP50 Option 2 Pilot Activity
Observation of IDP at Surry (WOG Pilot)

Introduction

On February 4-6, 2002, the Westinghouse Owners Group (WOG) RIP50 Option 2 integrated decision-making panel (IDP) met at the Surry nuclear power plant to pilot the draft implementation guidance for Option 2 contained in NEI-00-04. Surry piloting activity incorporated lessons learned from the Quad Cities Boiler Water Reactor Owners Group (BWROG) pilot activity (August 2001) and a recent WOG pilot activity at the Wolf Creek nuclear power plant (October 2001).

Surry representatives stated that its IDP is intended to assess for cost benefit and to test NEI and ASME guidance. Surry representatives also stressed that the cost benefit of implementing Option 2 would not be realized based on the currently available draft 50.69 rule language.

The NRC staff and representatives from Nuclear Energy Institute (NEI), South Texas Project, Framatome, and ASME observed the IDP deliberations. At the end of each session, observations of the IDP process were discussed with representatives from Surry and WOG. Where applicable, the lessons learned were documented for possible updates to NEI guidance documents. These lessons-learned also will be considered in the staff's RIP50 Option 2 rulemaking efforts.

As part of the Surry pilot activity, the Chemical and Volume Control System (CVCS) and the Feedwater (FW) system were chosen for the categorization process. The IDP activity focused on the categorization of these systems SSCs into the risk-informed safety classes. Treatment requirements for the re-categorized SSCs were not within the scope of this IDP session. The panel deliberated on "active" system functions and the "passive" function of retention of system pressure-boundary.

Draft reports/worksheets for the categorization of each function within the CVCS and FW system were prepared by WOG and provided to the IDP panel. The SSCs responsible for these functions were also documented in these worksheets. These worksheets provided a substantial portion of related information on which the IDP deliberated. The panel deliberations were guided by a draft WOG guidance document for Option 2 IDP process. This draft guidance document was devised from guidance provided in NEI 00-04 and the Westinghouse risk-informed in-service-inspection (RI-ISI) methodology.

PRA training was conducted for panel members prior to the IDP deliberations. The training emphasized the use of the plant-specific PRA to categorize SSCs. The staff did not observe this activity.

Summary of IDP Approach

The IDP's review of the piloted systems was intended to validate the proposed categorization of SSCs based on related functions. Initial identifications of system functions were based on the reviews of associated system design basis functions and functions identified from implementation of the maintenance rule.

Categorization of SSCs performing an active function was based on design basis functions; core damage prevention and mitigation functions; results of the PRA importance analyses and other risk insights (e.g., from screening methodologies or from other plant programs like the Maintenance Rule); PRA sensitivity analyses results; and defense-in-depth considerations.

The process for passive component categorization included (1) quantitative ranking as defined in Table I-5 of ASME Code Case N-658; (2) potential effects on initiating event frequency; (3) reactor coolant pressure boundary considerations as defined in 1200(b) of Code Case N-658; (4) consideration of whether failure of the piping segment would fail a high safety significant function; (5) indirect effects of pipe failures; (6) role of piping in maintaining plant safe shutdown capability; (7) role of piping as a fission product barrier; (8) role of piping in EOPs and SAMGs; (9) potential for unintentional releases of radioactive material; (10) defense-in-depth; and (11) safety margins.

NRC Observations

Overall, the staff concluded that categorized SSCs were thoroughly discussed and the final decisions were robust relative to the guidance provided in current guidance documents. The following staff comments address areas where the process could be made more efficient and transparent.

1. Categorization and treatment of SSCs are somewhat dependent. It is difficult to separate them during an IDP session. As such, potential changes in treatment should be discussed by the panel to determine the safety significance. For example, discussion of the potential effects of SSCs being categorized as RISC-3 may influence the panel's decision to re-categorize the SSC or to remove a specific special treatment from the SSC. For SSCs being categorized as RISC-2, it is important to understand what treatment is currently being applied and whether this treatment adequately addresses the safety significant attribute(s) identified for the SSC. Note that this discussion could be at a higher level and specific details of the requirements may not be necessary at the categorization phase.

2. Documentation of the bases, assumptions, system related functions, credits taken for a system (e.g., from a support system, or a redundant system, or for existing plant programs), any operator actions, and any risk increase are important to the IDP decision. This helps structure future deliberations of other systems, particularly for systems that have similar functions, and for situations such as selective or phased implementation. During the observation of this pilot, it was obvious to the staff that useful and pertinent information was considered, however, it was not clear how much of this information will be retained as part of the IDP records.

3. To date, all IDP (including the Surry IDP) exercises focused on categorization of SSC functions. The related safety significant functions will then be mapped onto SSCs and subsequently be categorized within that function. It is not clear how this "second level" categorization will be re-evaluated by the IDP. Current guidance in NEI 00-04 (and Appendix T) focuses on SSC categorization, with less guidance on how to categorize system functions. (For example, PRA risk importance is focused on component-level importance, and the defense-in-depth discussion is focused at the SSC or train level). If the IDP indicates that the categorization of functions is an important first step, then the guidance documents should address and provide guidance on this step, and transition to the next steps.

4. Safety-margin was rarely discussed. This perhaps stems from the fact that currently available guidance lacks details on how margins should be treated in Option 2 applications.

5. Bases for risk classification rankings should be documented and made available to panel members during the deliberations to help explain the ranking in terms of the accident sequence(s) and the role the function/SSC plays in the sequence of concern. This topic came up often, especially when panel members wanted to know the basis for a high ranking, and whether the reasons for this high ranking should also be applied to other SSCs/functions (e.g., support systems, SSCs upstream or downstream, etc.). In contrast, the availability of the RI-ISI notes and minutes for all pipe segments greatly facilitated the deliberation process for passive components.

6. The role of sensitivity studies as discussed in NEI 00-04 (e.g., sensitivity of SSC importance to HEP or CCF values) should be better understood by panel members. Decision guidelines on how to deal with the results of these studies would be helpful.

7. It is not clear how the defense-in-depth matrix (Figure 4.2-1 of NEI 00-04) was implemented by the IDP. Similar NRC comments on NEI 00-04 guidance indicate that the staff would need clarification on how Figure 4.2-1 is implemented. This may be a topic that needs further discussion with NEI.

8. The IDP deliberation on passive component functions was effective. The use of the information from the plant-specific RI-ISI process together with other elements of the ASME RI-ISI code case provided a robust basis for the categorization of piping and other passive components.

<u>Observations Provided By Industry Participants and Observers</u>

Industry participants and observers provided the following observations regarding the pilot IDP process:

1. Documentation of the basis for IDP decisions is critical.

2. Additional PRA training would benefit IDP members.

3. Direct participation of system and PSA engineers on those systems studied would benefit IDP panel members in terms of understanding historical/deterministic information and PRA assumptions.

4. In cases when a function/SSC is categorized as high safety significant for the first several decision elements, the IDP may skip the rest of the elements since the function/SSC will already be categorized as “high.” The suggestion was for the remaining elements to be marked “N/A” so that future applications will be aware of the elements that were not deliberated by the IDP.

5. It was noted that Surry has an advantage in the categorization of passive components since it had in place a RI-ISI program. Plants without such a program may have to do additional pre-planning prior to the IDP.