December 13, 2007

Mr. Gordon Bischoff, Manager
Owners Group Program Management Office
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230-0355

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RE: PRESSURIZED WATER REACTOR OWNERS GROUP (PWROG) TOPICAL REPORT (TR) WCAP-15830, REV. 1, "STAGGERED INTEGRATED ESF [ENGINEERED SAFETY FEATURE] TESTING" (TAC NO. MD6206)

Dear Mr. Gresham:

By letter dated July 27, 2007 (Agencywide Documents Access and Management System, Accession No. ML072120207), the PWROG submitted for U.S. Nuclear Regulatory Commission (NRC) staff review TR WCAP-15830, "Staggered Integrated ESF Testing." Upon review of the information provided, the NRC staff has determined that additional information is needed to complete the review. On November 20, 2007, Christine DiMuzio and I agreed that the NRC staff will receive your response to the enclosed Request for Additional Information (RAI) questions by January 18, 2008. If you have any questions regarding the enclosed RAI questions, please contact me at 301-415-1842.

Sincerely,

/RA/

Sean E. Peters, Senior Project Manager
Special Projects Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 694

Enclosure: RAI

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

WCAP-15830, REV. 1, "STAGGERED INTEGRATED ENGINEERED SAFETY FEATURES

AND LOSS OF OFFSITE POWER TESTING AT CE NSSS PLANTS"

PRESSURIZED WATER REACTOR OWNERS GROUP (PWROG)

PROJECT NO. 694

1. Section 1.1.4 of the topical report (TR) regarding Key Safety Principle 4 was revised to state that two effects are considered with regards to risk impacts: 1) the total or aggregate risk impact for all probabilistic risk assessment (PRA) events for each individual surveillance frequency change, and 2) the cumulative risk impact from all surveillance frequency changes. It is not apparent to the NRC staff exactly to what these two risk impacts refer or how they are different, nor is it apparent in the details of the TR risk assessment methodology that two such impacts are separately calculated. Please explain the intent of these two risk impacts and identify how the detailed methodology implements this requirement.
2. Section 1.1.5 of the TR regarding Key Safety Principle 5 was revised to state that, "…output of performance monitoring will be periodically re-assessed by the applicant and appropriate adjustments made to the surveillance frequencies." The NRC staff cannot identify where in the methodology this is implemented, nor is it clear if the intent is to require submitting changes to Technical Specifications (TSs) to "undo" the TR-based changes. Please clarify the intent of this statement and identify how the detailed methodology implements this requirement.
3. Section 2.3.2 of the TR was revised to refer to initiative 4B of the risk-informed technical specifications and Nuclear Energy Institute (NEI) document NEI 06-09. Since this initiative and guidance document applies to changes to completion times and not surveillance test intervals, the NRC staff does not understand the purpose of this reference. Please explain the relationship of this reference to the TR.
4. Section 4.1 of the TR was revised to identify that the impact on plant risk is negligible in part because the operability and reliability of affected components is demonstrated by other surveillance tests performed "on the same or more frequent basis." However, Section 4.3.1 requires identification of tests performed "more frequently" for Category C components. Figure 4.3-1 also identifies Category C as based on surveillance test performed "more frequently". Please review the TR and clarify the intent of Category C components.
5. Section 4.1 of the TR was revised to state both that the methodology is only applicable to plants with an 18-month refueling cycle, and that the methodology is applicable to plants with a 24-month refueling cycle provided additional analyses are performed, but these additional analyses were not defined. Please resolve this inconsistency, and if necessary identify the scope of any additional analyses required.
6. Section 4.3.1 of the TR was revised to allow identification of "alternate special effects testing that could be performed during the refueling cycle that would permit changing the component from Category A to Category C." Please elaborate as to what "special effects testing" might

refer. Further, in other sections of the TR regarding Category C, it is stated that only those tests required by TSs are credited to place a component into Category C. However, Section 4.3.1 seems to imply that a licensee could implement special limited tests to justify the categorization. Please clarify Section 4.3.1 and assure it is consistent with other sections of the TR with regards to component categories and TS required testing.

7. Section 4.2.2.2 of the TR was revised to add a step 7 to recalculate Core Damage Frequency (CDF). However, the PRA model is not revised for Category A3 and A4 components until a subsequent step in the process. Please clarify why CDF is recalculated at this point.

8. Section 9.0 of the TR was added to identify activities which are required to be addressed by licensees in their submittals for implementation. The NRC staff requests further clarifications on such items:

   a. Section 9.0.2 requires Category A components to be classified as Risk Significant by the Maintenance Rule (Title 10 of the *Code of Federal Regulations,* Section 50.65). This is not addressed in any other section of the TR. Since the Maintenance Rule does not use the term “Risk Significant” nor provide for classification of components, this activity needs further clarification as to the specific basis for this activity and its relationship to the surveillance test interval revisions.

   b. Section 9.0.3 requires specific actions in the event of failures of components during testing on an extended interval. This level of detail seems to be inappropriate in that it reflects activities which are already required by the TSs (e.g., retesting failed components) or which are overly proscriptive (e.g., requiring immediate testing of redundant components if a potential common-mode failure is determined, even though the plant would be in a shutdown mode where the components are not necessarily required to be operable.) This activity needs to be simplified to identify the specific unique new requirement being imposed, and not be overly prescriptive in specifying corrective action requirements.

   c. Section 9.0.4 requires additional testing for Category A components with evidence of increasing failure rates. Given that these components may only be tested every 36 months after implementation, it is not clear how the available data generated could ever support a determination of an increasing failure rate. Therefore, this activity may not be possible to implement as written, and should be revised to provide an acceptable alternative.

   d. Section 9.0.6 restates some of the specific elements of the TR methodology for adjusting the baseline PRA model. Please explain why these specific items are singled out in Section 9.0.

   e. Section 9.0.7 mixes PRA technical adequacy per Regulatory Guide 1.200 and evaluation of external events risk and shutdown risk. Please explain why these specific requirements are singled out in Section 9.0.

   f. Section 9.0.9 identifies items that are requirements per Regulatory Guide 1.174, includes an apparently unrelated statement regarding Mean Time Between Failure, and prescribes the use of a simplified Large Early Release Frequency (LERF) model per NUREG/CR-6595. The grouping of these items in item 9 is not understood. Furthermore, it is not clear why these particular elements are being singled out in Section

9.0 nor is it clear why a simplified LERF model is required. Please clarify the intent of this information.

g. Section 9.0.10 requires a sensitivity study to address key assumption 2 of Section 1.3 regarding constant failure rates. However, no requirement for sensitivity studies to address key assumptions 1 and 3, i.e., limitation of demand failures and zero impact on Common Cause Failure (CCF) probability has been provided. Please provide this information.

h. In Section 9.0.13, please elaborate on what "process elements" refers, and its relationship to NEI 04-10.

i. Section 9.0.14 requires use of a multi-disciplinary team to evaluate the proposed changes; these are not reflected in the detailed methodology. Please elaborate on the use of this team and team and what actions it would take per this TR.

j. Section 9.0.15 addresses a "reliability review" per NEI 04-10; NEI 04-10 does not use this term, and is not clear to what this refers or requires. Please explain this relationship.

9. In order to facilitate NRC staff review of licensee submittals referencing the TR, the NRC staff intends to require the following specific information be submitted to supplement the requirements of Regulatory Guide 1.174 and 1.177. The PWROG should consider including this guidance in the TR.

- The licensee's basis for its plant-specific PRA model conformance to Regulatory Guide 1.200, including identification of any gaps to capability category II of the internal events PRA standard and any unresolved open items (e.g., facts and observations from the peer review), and the basis for why those gaps and open items do not adversely affect the risk evaluations conducted to support the proposed changes to surveillance test intervals.
- Disposition of plant changes (e.g., procedure changes, operational changes, plant modifications) not yet incorporated into the PRA model, as well as any PRA deficiencies not yet resolved, with regards to their potential adverse impact on the risk evaluations conducted to support the proposed changes to surveillance test intervals.
- For each plant component that impacted the risk evaluation:
  - i. The specific subcategory (A-1 through A-4) to which it was assigned,
  - ii. The PRA basic event to which it was mapped,
  - iii. The probability of the PRA basic event before the proposed change,
  - iv. The probability of the PRA basic event after the proposed change, and
  - v. For subcategories A-3 and A-4 components, how the PRA model was adjusted to reflect the proposed STI change.
- Rationale for each plant component eliminated from further consideration in the risk evaluation because the integrated engineered safety feature test does not test a risk-significant failure mode (Category B components).
- Description of the post-implementation monitoring and performance measurement strategies, including the corrective action plans for unacceptable performance.

- Validation of, or plant-specific sensitivity studies to address, the key assumptions of the TR:
    i. Only on demand failures are of interest for the proposed change.
    ii. The likelihood of a component demand failure is proportional to the Surveillance Test Interval.
    iii. The likelihood of CCF is unchanged.

cc:
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