Public Service
Electric and Gas
Company

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RESPONSES TO NRC QUESTIONS REGARDING THE LICENSING BASIS/FINAL SAFETY ANALYSIS REPORT (FSAR) PROJECT PLAN SALEM GENERATING STATION UNIT NOS. 1 AND 2 FACILITY OPERATING LICENSES DPR-70 AND DPR-75 DOCKET NOS. 50-272 AND 50-311

Gentlemen:

In response to a verbal request by the NRC, Public Service Electric and Gas Company (PSE&G) provides in Attachment 1 responses to seventeen (17) questions regarding the Salem Licensing Basis/Final Safety Analysis Report (FSAR) Project Plan.

The FSAR Project Plan was initially described during a June 11, 1996 NRC/PSE&G meeting at NRC Region I headquarters. Initial PSE&G responses to the NRC questions were provided during a July 2, 1996 NRC/PSE&G meeting at the PSE&G Nuclear Department Administration Building.

The original scope of the FSAR project, as described in the June 11, 1996 meeting and the attached question responses, has been completed, with the exception of preparing reports to document the results of the review activities. Two of the review activities were expanded, per the process described in the attached response to question 2. First, based on the numbers and types of deficiencies noted in two Vertical Slice reviews covering Salem ventilation systems, one additional two week vertical slice is currently underway covering three ventilation systems, specifically Diesel Generator Area Ventilation, Switchgear Area Ventilation, and Service Water Intake Structure Ventilation. As a result, all significant ventilation systems will have either experienced a vertical slice review or other design review/upgrade. Secondly, the Engineering Evaluation/Justification for Continued Operation (EE/JCO) review was expanded to complete the review of EEs associated with the safety analysis systems.

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Initial review of the overall scope and results of the FSAR Project provides reasonable assurance that PSE&G will operate Salem Unit 2 within its licensing/design basis upon Unit 2 restart. This assessment is based on completion of designated restart required corrective actions to address a limited number of items. PSE&G proposes to meet in the near future to discuss in more detail the FSAR Project results and conclusions.

Should you have any questions regarding this submittal, we will be pleased to discuss them with you.

Sincerely,

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ATTACHMENT 1

SALEM GENERATING STATION UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSES DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311
RESPONSES TO NRC QUESTIONS REGARDING THE
LICENSING BASIS/FINAL SAFETY ANALYSIS REPORT (FSAR) PROJECT PLAN

1. Slide 6 and Slides 8-10 mention a Vertical Slice/FSAR review and indicated that the review is complete for several of ten planned systems. The NRC needs more detail on what is involved in this review and what results have been achieved on the systems completed thus far.

Response

Each Vertical Slice review consisted of identification of system requirements, commitments, and descriptive statements contained in the current licensing basis, and validation of a sample of those requirements, commitments, and descriptive statements. The review was performed to facilitate evaluation of: 1) how adequately the system design and operation conform with the licensing/design basis, especially the UFSAR, and 2) how adequately the licensing/design basis, especially the UFSAR, has been maintained.

Four systems were initially reviewed as pilot vertical slice assessments, and they are listed below. These were abbreviated, one week assessments, performed by 3 to 4 person teams having engineering, licensing, and operations background. A sample of licensing/design basis requirements, commitments, and descriptive statements were reviewed against system drawings and procedures to validate conformance, but the sample sizes were small based on the abbreviated scope.

Emergency Diesel Generators
Auxiliary Feedwater System
Service Water System
115 VAC Distribution

Vertical slice assessments of a three week duration have been completed, with the exception of the associated reports, for the following systems.

Containment Building Ventilation
Auxiliary Building Ventilation*
Reactor Protection System
Safety Injection System
Fuel Handling Area Ventilation
Spent Fuel Pool Cooling System

*Note: The Auxiliary Building Ventilation system was substituted for the originally scheduled Reactor Coolant System. The Auxiliary Building Ventilation system became a higher priority candidate because of recent findings associated with the Fuel Handling Area Ventilation system.

For the three week vertical slice assessments, the review teams consisted of 4 to 6 reviewers per system, having engineering, licensing, and operations background. Fuel Handling Area Ventilation and the Spent Fuel Pool Cooling systems were an exception, in that they were reviewed by one team of 4 reviewers, given the existence of other recently completed design reviews on these systems. Again a sample of licensing/design basis requirements, commitments, and descriptive statements were reviewed against system drawings and procedures to validate conformance, but the sample sizes were larger based on the three week scope. Engineering program implementation (e.g., fire protection, inservice testing, equipment qualification) and calculations were reviewed as necessary to validate a particular requirement, commitment, or descriptive statement. Design Change Packages (DCPs) and Deficiency Evaluation Form (DEFs) closures were sampled to enable assessment of how adequately the licensing/design basis has been maintained.

Deficiencies found in the course of the vertical slice reviews are being documented via Action Requests and processed in accordance with the NBU Corrective Action Program. Also, a report for each system vertical slice assessment is being prepared which contains a summary of the results and worksheets documenting the review.

2. What will be the criteria for determining if early results warrant expansion of the reviews, particularly, the sampling of engineering deficiencies (DEFs) and the systems selected for FSAR vertical slice reviews?

Response

The Senior Vice President-Nuclear Engineering is responsible for deciding if and when a specific review activity should be expanded. Decisions regarding review activity expansion were made upon completion of the original scope of the review activity.

Such decisions were and will continue to be based on the review results, including the numbers and types of deficiencies noted, and recommendations regarding the need for expansion from the FSAR Project Manager.

3. Regarding the listing of systems to be reviewed and scope of reviews on Slides 8-10, how are support and interfacing systems (e.g., structures, cooling water, fire protection, instrument air, drains) being treated in the reviews?

Response

Support and interfacing systems, specifically those not listed in Slides 8-11, were treated as described below in specific FSAR Project review activities.

The Safety Analysis Review identified those explicitly assumed system and component related inputs to the various Chapter 15 safety analyses. The validity of each identified input parameter was established by identifying the test results or calculations that support the input parameter, with test results preferred, where available. When test results were not available, calculations identified in the safety analysis review were then reviewed as part of the Design Calculation Validation review. Calculations were reviewed to determine whether the selected design inputs were appropriate and whether the calculation itself satisfied specified design criteria and met design objectives. This defined review scope thereby included support and interfacing system capabilities that are relied upon.

The UFSAR Macro review, covering the System Readiness Review systems listed on Slides 8-11, consisted of a comparison of a sample of design basis statements and significant system attributes listed in the UFSAR against the appropriate Technical Specifications, design output documents, and plant procedures. System interface requirements were among the UFSAR attributes to be verified.

The Vertical Slice review consisted of the identification of system requirements contained in the current licensing basis and validation of a sample of those requirements. Requirements associated with support and interfacing systems were validated

similar to other identified requirements.

4. What is the rationale for PSE&G's treatment of systems with 10 CFR Part 100 and Part 50 (GDC 19) implications that are outside the twelve systems listed under the Safety Analysis Review (SAR)? These include, for example, auxiliary building ventilation, control area ventilation, containment building penetrations, FHB ventilation, SFP (structure) and SFP cooling. Of particular interest are these systems' categorizations relative to the safety analysis reviews and design calculation validations.

Response

The Safety Analysis Review identified those explicitly assumed system and component related inputs to the various Chapter 15 safety analyses. The validity of each identified input parameter was established by identifying the test results or calculations that support the input parameter, with test results preferred, where available. When test results were not available, calculations identified in the safety analysis review were then reviewed as part of the Design Calculation Validation review. Calculations were reviewed to determine whether the selected design inputs were appropriate and whether the calculation itself satisfied specified design criteria and met design objectives.

As such, the safety analysis review includes the inputs necessary to demonstrate compliance with 10 CFR Part 100 and Part 50, specifically GDC 19, and the dose calculations are included in the scope of the design calculation validations. Due to the system categorization used to develop slides 8-11, systems contributing primarily to the dose calculations were not explicitly listed on slide 8.

5. What is the rationale for not including calculation validation for the "risk significant" systems?

Response

The UFSAR Project included a major commitment to calculation validation as part of the scope of the safety analysis review, design calculation validation review, and the vertical slice review. These calculation reviews provided a sufficient sample for assessing calculation quality and adequacy.

The Safety Analysis Review identified those explicitly assumed system and component related inputs to the various Chapter 15 safety analyses. The validity of each identified input parameter was established by identifying the test results or calculations

that support the input parameter, with test results preferred, where available. When test results were not available, calculations identified in the safety analysis review were then reviewed as part of the Design Calculation Validation review. Calculations were reviewed to determine whether the selected design inputs were appropriate and whether the calculation itself satisfied specified design criteria and met design objectives.

In the vertical slice review, calculations were reviewed as necessary to validate a particular requirement, commitment, or descriptive statement from the system licensing/design basis.

6. Were the radwaste systems/facilities treatment considered as candidates for this plan, and with what results/bases?

Response

Radwaste systems/facilities treatment are covered by the UFSAR Project as follows. The safety analysis review encompassed system and component related inputs associated with Accidental Release of Waste Gases and Accidental Release of Radioactive Liquids. The UFSAR Macro review included the Radiation Monitoring System, as covered on Slide 11.

7. Given that this systematic plan involves several simultaneous activities (e.g., vertical slice/FSAR reviews, design calculation validations, and DEF closure reviews), what will be PSE&G's methods for coordinating and reconciling the results of reviews, to account for activities occurring in parallel and possibly out of their optimal sequence?

Response

Project coordination was on three levels. First, all FSAR Project Task Leaders met at least twice-weekly to discuss review status and results and to coordinate review activities accordingly. Second, deficiencies found in the course of the reviews were documented via Action Requests and processed in accordance with the NBU Corrective Action Program. The corrective action program facilitates assignment of Action Requests to achieve coordinated development of corrective actions, as well as performance of cause analysis, operability assessments and reportability assessments as warranted. Additionally, Action Requests generated during the FSAR Project were commonly coded to enable more global assessments of project results. Third, the FSAR Project results, as documented in Action Requests with their associated corrective actions, will be integrated with the System Readiness Review Program. Also, the

UFSAR Macro-reviews specifically have been integrated with the on-going System Readiness Review.

8. How are currently effective operability determinations (ODs) and licensing change notices, as well as past and current action request/problem report dispositions, going to be reconciled with program results?

Response

The backlog of operability determinations (ODs) has been greatly reduced through the System Readiness Review Program. The currently active ODs were provided to both the UFSAR Macro-reviewers and the Vertical Slice review teams. The ODs were sampled where the scope of the OD overlapped with the Macro or Vertical Slice review scope. Pending UFSAR change notices were sampled in a similar manner.

An Engineering Evaluation/Justification for Continued Operation (EE/JCO) review was added to the scope of the FSAR Project. The following scope of active EEs was sampled: 20 known JCO/EEs, 75 EEs related to 16 Safety Analysis systems, and 8 EEs identified from a recent PSE&G self assessment. For each EE reviewed, the review determined whether the EE involved a JCO. If a JCO was involved, the review determined whether the EE should remain effective for Salem Unit 2 restart or whether plant conditions are such that the EE/JCO should be voided.

The FSAR Project results will be integrated with the System Readiness Review Program which will facilitate reconciling remaining ODs and current action request/problem report dispositions with FSAR Project results. Regarding past action request/problem report dispositions, should any reconciliation be warranted, it will occur as part of resolution of individual issues as identified in the course of the FSAR Project.

9. How will operations and testing procedures be reconciled with FSAR Project Plan results?

Response

The Vertical Slice review teams sampled procedures covering normal, abnormal, and emergency system operations, as well as surveillance and testing requirements. This sampling was performed to assess whether system operation is consistent with the system licensing/design basis.

The Safety Analysis Review identified those explicitly assumed system and component related inputs to the various Chapter 15

safety analyses. The validity of each identified input parameter was established by identifying the test results or calculations that support the input parameter, with test results preferred, where available. As such, the safety analysis review validates the adequacy of testing which supports explicitly assumed system and component related safety analysis inputs.

Deficiencies found in the course of the reviews were documented via Action Requests and processed in accordance with the NBU Corrective Action Program.

10. What is the interface or relationship of the FSAR Project Plan with the emergency operating procedures (EOPs)?

Response

The Salem EOPs have been significantly improved as a result of the EOP upgrade program. The Salem EOP Verification and Validation program has been recently completed, and it was determined that the Salem EOPs are consistent with the recovery strategies of the Westinghouse Owners' Group Emergency Response Guidelines.

An operations department representative familiar with the EOP upgrade participated when the FSAR Project Task Leaders met to discuss review status and results, and to coordinate review activities. The operations department representative provides the interface to facilitate consideration of EOPs when warranted by FSAR project issues and to facilitate processing of FSAR Project issues such that they do not adversely impact the upgraded EOPs.

In addition, the NBU corrective action program facilitates assignment of Action Requests to achieve coordinated development of corrective actions for deficiencies identified by the FSAR Project.

11. How do "Engineering Programs" depicted on the "Process" slide (slide 7) interface with or relate to the FSAR Project Plan? Such programs include, for example, fire protection, EQ, ISI, IST, and MOV programs.

Response

Where engineering programs influence testing or calculations supporting explicitly assumed system and component related safety analysis inputs (e.g., valve timing, pump performance testing, etc.), such program implementation was evaluated during the Safety Analysis Review/Design Calculation Validation. In

addition, the Vertical Slice review teams sampled engineering program implementation, such as fire protection and EQ, as necessary to validate conformance with selected licensing/design basis requirements. For example, during the vertical slice reviews of ventilation systems, the documented basis for various area temperatures was sampled.

12. How will the vendor information program interface with or relate to the FSAR Project Plan?

Response

There is no direct connection between the FSAR Project and the vendor information program, except through the NBU corrective action program should issues be uncovered which relate to vendor information.

13. How does the Commitment Tracking Program interface with or relate to the program for maintaining the licensing basis?

Response

The Commitment Tracking Program was added to the "Process" section of the FSAR Project Plan, and was reviewed and evaluated as a process activity.

14. How will the results of the FSAR Project Plan be integrated with the Salem Restart Plan and particularly, to what restart review processes will the Project Plan be subjected?

Response

The FSAR Project is a programmatic restart issue, item 19, on the NRC Restart Action Plan. As such, project results and closure are subject to the defined PSE&G closure process for such items.

15. How will PSE&G ensure that individuals responsible for implementing the FSAR Project Plan are adequately trained for the Project Plan responsibilities?

Response

Personnel were selected for participation in the program based on their experience and qualifications for this type of work. Indoctrination, regarding review scope and standards, was provided at the start of each specific review activity. As such, no formal training was necessary.

16. What plans does PSE&G have for independent assessment of their efforts?

Response

Two experienced individuals have performed an independent review of the FSAR Project plan to identify any plan weaknesses. These individuals have substantial design inspection and readiness review program experience.

Another team of three, later expanded to four, well qualified independent reviewers visited the NBU site for two, one week periods during the course of the FSAR Project to assess project implementation. During the first week, the team interviewed participants and reviewed whether the project was proceeding in accordance with the plan. During the second week, the last week of the original project schedule, the team completed their independent assessment by reviewing project results and conclusions.

Both the two independent reviewers of the FSAR Project plan and the independent review team provided formal feedback in writing. PSE&G has and will continue to document its response to the feedback.

The independent oversight of the FSAR Project, as described above, is enhanced by the use of independent reviewers who are not PSE&G employees.

In addition, the FSAR Project is within the scope of the normal oversight activities of the PSE&G Quality Assurance/Nuclear Safety Review organization.

17. Provide additional information on the scope of the UFSAR Macro-Reviews.

Response

The UFSAR Macro-review was added to the scope of the System Readiness Review program. The UFSAR Macro review covered the System Readiness Review systems listed on Slides 8-11. It consisted of a comparison of the design basis statements and significant system attributes listed in the UFSAR against the appropriate Technical Specifications, design output documents, and plant procedures. The scope included a review of system information for consistency among the UFSAR sections and the NRC Safety Evaluation Report. The verification of significant system attributes listed in the UFSAR included Chapter 15 accident analysis attributes and requirements for the systems reviewed.

For each of the systems reviewed, a report has been developed which documents the attributes reviewed and the results of the verification. Deficiencies found in the course of the reviews were documented via Action Requests and processed in accordance with the NBU Corrective Action Program.