Public Service
Electric and Gas
Company

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United States Nuclear Regulatory Commission
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Gentlemen:

RESPONSE TO IDENTIFIED WEAKNESSES
NRC INSPECTION REPORT NOS. 50-272/90-200 AND 50-311/90-200
DOCKET NOS. 50-272 AND 50-311

Public Service Electric and Gas (PSE&G) has received the Notice of Violation dated August 21, 1990. During the period April 9 - 13 and April 23 - 27, 1990, a maintenance team inspection identified apparent violations of NRC requirements and also identified weaknesses involving maintenance activities. PSE&G transmitted its response to the apparent violations on September 21, 1990.

Pursuant to the requirements of 10 CFR 2.201, PSE&G hereby submits its response to the identified weaknesses of its maintenance activities, as stated in Appendix B of the aforementioned correspondence dated August 21, 1990, in the attachment to this letter.

Should you have any questions in regard to this transmittal, do no hesitate to call.

Sincerely,

Attachment

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Mr. T. Johnson
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ATTACHMENT

1. **Management of maintenance backlog items and an absence of an effective backlog reduction program.**

As identified in the Maintenance Team Inspection report, the backlog of Maintenance Department open work orders was large and growing at the time of the inspection. However, the report also stated that the approaches and methods in place, or being developed appeared responsive to this problem.

PSE&G has recently adopted a more aggressive approach to address both the backlog of work orders and the materiel condition at the Salem Station. At the time of the inspection actions were underway to address the work order backlog. Actions such as the addition of contract I&C resources, and the institution of supervisor and craft work standards had been in place.

In accordance with the Living Engineering Plan (LEP), the Materiel Condition Upgrades were initiated by the Technical Department system engineers, over the past two years. These projects have significantly reduced the amount of emergent corrective maintenance and repetitive maintenance in the following areas; piping and component upgrades of the service water system, circulating water traveling screens and screen back wash system, small bore pipe change out, valve upgrade project, and pump seal upgrade.

Another item that was partially implemented during the Team visit was the use of System Outages with computerized generated reports through the Maintenance Management Information System (MMIS). These systems outages were to include coordinated walk-downs of the system/components, in advance of the system outage, by members of the various station departments, to ensure that the full scope of work is identified. During the Team inspection the majority of the system outage data base had been developed, but the coordinated walk-downs of the systems had not yet been implemented. These walk-downs have since been implemented. As a result, the full scope of the work is identified prior to the system outage, and the efficiency, communication and coordination among plant personnel have been maximized.

Another effort to help reduce the backlog of work has been the implementation of backshift maintenance. The use of backshift maintenance will provide for a more efficient use of resources and better job continuity. Permanent backshift mechanical maintenance coverage was put in place on July 30, 1990, and instrument and control coverage on October 1, 1990.

While the majority of the gain, in the scheduling and productivity areas, has already been realized, other actions are being taken to improve awareness and accountability of plant schedules. This is being accomplished through the daily plant management accountability meetings and the newly restructured daily meetings.

Additionally, the Reliability Centered Maintenance program will eventually produce a more effective preventive maintenance program. This program has been under development over the past two years. PSE&G has taken an aggressive approach to fully implement the program in two additional years. However, a smaller task team is now underway to perform an accelerated review of selected Preventive Maintenance (PM) tasks. It is expected that a substantial reduction of work will be realized by removing PM tasks, which have been determined to have little value added to the overall plant reliability and safety.

Other long term efforts and solutions are being actively pursued by PSE&G.

A general manager has recently been appointed to the newly created Salem Revitalization Project. This project is intended to help coordinate the various improvement projects at Salem, while allowing station personnel to concentrate on daily plant operations and maintenance.

In addition, a recent management reorganization appointed a dedicated general manager to direct the operations of the Procurement and Material Control Department. This general manager will be better able to focus on on-going improvements such as; warehousing facilities, the warehouse automated materials management system, and the backlog of material orders. It is expected that this effort will significantly improve productivity by alleviating job delays due to spare parts availability.

To assure getting the backlog on a downward trend, as an interim measure, additional contract resources have been authorized to support plant maintenance. These resources include control technicians, mechanical technicians, painting and insulating personnel.

In summary, PSE&G is confident that this multi-directional approach consisting of:

Project teams to address long standing and repetitive maintenance.

Backshift coverage in the maintenance area.

Increased accountability to plant schedules.

Improved efficiencies in the scheduling of work, and in the availability of materials.

The addition of contractor resources in the controls, mechanical, and housekeeping areas.
The development of a preventive maintenance program to concentrate on greater equipment reliability.

These efforts and anticipated results will not only reduce the maintenance backlog, but it will improve the reliability of the Salem station and the availability of its spare parts. Based upon these processes and programs, PSE&G expects to reduce the work order backlog by 1,500 work orders by December 31, 1991.

2. Lack of root cause analysis training for system engineers. General lack of adequate root cause analysis.

PSE&G is committed to a strong root cause analysis program as a means to achieve safe and reliable operation of its nuclear facilities. To this extent, the Significant Event Response Team (SERT) was created to ensure that all significant events are thoroughly investigated and understood. This investigation is conducted in real time, and the team is composed of technically qualified individuals from the various station departments. For the most part all personnel serving as SERT members are root cause analysis trained. The SERT team is always headed by a non-station manager who has been trained in root cause analysis and whose department had no direct involvement with the event.

PSE&G recognizes that some of the system engineers have not yet received the formal root cause analysis training (root camp). However, their educational background, technical qualification and extensive system engineers training make them a valuable asset to the team and to the root cause determination. All system engineer department heads, including the Technical Department manager, have been trained in root cause analysis.

PSE&G has presently scheduled four one week sessions of root cause analysis training for 1991, and ten seats have been reserved for system engineers in each session. The Technical Department will schedule two or more engineers form each discipline to attend these classes. Based upon this schedule all system engineers will be root cause analysis trained by the end of 1991.

A new procedure, Root Cause Analysis Program, will be incorporated into the Technical Department Manual. This procedure will provide general guidance on root cause analysis to all system engineers. This procedure will be issued by January 31, 1991.

Additionally, the system engineer training program will be enhanced to insure that all engineers admitted into the training course, and that successfully complete it, will be trained and qualified to perform root cause analysis. This will be accomplished by incorporating a training module in root cause analysis and decision making into the regular system engineers training program. The next scheduled regular training course begins on January 7, 1991.

3. Lack of capability to readily analyze older maintenance data for performance monitoring and evaluation.

PSE&G agrees that presently the capability to easily retrieve and analyze old maintenance data is weak. As stated in the Maintenance Team Inspection Report, the Maintenance Management Information System (MMIS) data base only includes equipment history and records from 1987 until the present time.

However, PSE&G has been reporting component failures history to the Nuclear Plant Reliability Data Base System (NPRDS) since 1984, for NPRDS identified components. This provides Salem with the ability to retrieve historical data from computer data bases from 1984 to present.

The Reliability Centered Maintenance (RCM) Group is reviewing Salem systems and identifying critical components. When the MMIS and NPRDS data reviews indicate historical problems with these critical components, then the hard copy records, including those prior to 1987, are retrieved and reviewed, on an as needed basis. Additionally, when reviewing all PM change requests, the hard copy records, including those prior to 1987, are retrieved and reviewed by the RCM group.

To date the RCM has completed the review of 12 systems and data bases exist for these systems' critical components. As the RCM group completes these system reviews, the ability to retrieve and monitor the old maintenance data will become more readily available.

PSE&G believes that including the old maintenance data for critical components with history problems (prior to MMIS), into the RCM data base, is the appropriate action to take to resolve this issue.

4. Inadequate technical procedures, absence of formal maintenance procedures for important and repetitive tasks.

PSE&G had recognized, as a result of internal and external evaluations, the need to improve the quality and content of the Salem Station procedures. The Procedure Upgrade Project (PUP) began in September 1989. One of the PUP's objectives is a total technical upgrade of station implementing procedures. Since its inception, the PUP has been evaluating every existing maintenance procedure to determine the technical accuracy and level of detail necessary to perform a task, as well as performing a human factors upgrade. As a result of this upgrade, the number of mechanical/electrical maintenance procedure has increased from an original 251 to 313 procedures.

With the implementation of the Work Standards, the charge of the Maintenance Department is to identify for correction any procedure deficiency or notify the appropriate personnel of the need of a new procedure. First line supervisors and maintenance technicians, being the users, have the primary knowledge and experience in determining the need for upgrading or creating a procedure. This resulted in approximately 75 new procedure requests being issued since the Maintenance Team Inspection. This hands-on knowledge, accumulated over years of experience, is a most valuable ingredient in determining the proper level of detail of the procedures.

As of this date 42 mechanical/electrical procedures have been approved for implementation. It is expected that approximately 20 maintenance procedures per month, out of 30 total procedures per week, will be approved for implementation until all procedures have been upgraded.

As further evidence of PSE&G's commitment to the attention to detail and procedure compliance, 122 revision request have been received and processed in the day-to-day maintenance of procedures since the beginning of the year. Additionally, all procedures received an accelerated review to incorporate all significant outstanding changes while awaiting their PUP upgrade. As of this date no procedure is overdue in its two year review.

PSE&G is confident that procedures presently in used are technically adequate.

Specifically to address the Team's concern, a new maintenance procedure SC.MD-CM.DG-0002(Q), Diesel Generator Head Replacement will be issued by February 1991, prior to the start of the Unit 1 ninth refueling outage. Other procedures identified as weak, by the Team, are in the process of being upgraded and will be issued prior to Unit 1 ninth refueling outage. These procedures are;

1. M15A (18 Month Diesel Generator Inspection),
2. M11F (Tool and Miscellaneous Items, Cleanliness and Closure Control),
3. M11A (Use of Freeze Seal in Stainless Steel Pipe) and,
4. M23A (Torquing Guidelines).

In addition, the Reliability Centered Maintenance (RCM) Group is currently evaluating the station preventive maintenance program for potential enhancement to the reliability of station components. If an existing instruction/procedure task is determined to be inadequate or insufficient, the RCM will initiate the appropriate procedure change request. The RCM group will also initiate work standards for simple tasks as well as notifying the PUP of any new procedures needed to perform more complex tasks.

In conclusion, PSE&G is assured that the processes in place for development and approval of procedures are adequate to ensure that maintenance activities are carried out with technically accurate procedures.

5. **Poor control of contractor maintenance activities.**

During the Team inspection various maintenance activities were identified where contractor personnel were not properly supervised. In general, the findings involved:

1. Work performed on valve 22BF19,
2. Signed off of work performed on the 22 Service Water Header and,
3. Poor housekeeping conditions with the 22 SW header work.

PSE&G views these events with sincere concern, for contractor personnel failed to adhere to PSE&G's work standards of attention to detail and procedure compliance. PSE&G fully investigated each of these events and clearly emphasized the importance of strict procedure compliance and attention to detail to all PSE&G and contractor personnel.

PSE&G has recently revised the Salem Administrative Procedure (SC.MD-AP.ZZ-005), Control of Contractor Work and Engineering and Plant Betterment (E&PB), "E&PB Contractor Site Qualifications and Training" to clarify and strengthen the training on Salem Work Standards. Some of the changes incorporated or changes that will be incorporated prior to the start of the Unit 1 ninth refueling outage are;

1. Requirement that all contractor personnel receive, and are briefed on the Salem Handbook of Standards.

2. The institution of the Work Standards monitoring of contractor personnel at Salem Station.

3. Expectation meetings with all contractor personnel by PSE&G management prior to performing work on site.

4. Requirement that all new contractor personnel will be shown the PSE&G Attention to Detail Video prior to authorization for access to the Site.

While some of the above items were in the implementation stages during the Maintenance Team Inspection, PSE&G believes that the control of contractors has significantly improved. PSE&G realizes that continued improvement in this area is vitally important to the safe and reliable operation of the facility. PSE&G is confident that adequate administrative procedures are or will be in place to assure that activities are properly supervised and carried-out in accordance with PSE&G's work standards.