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PSEG Nuclear LLC

NOV 11 2003

U. S. Nuclear Regulatory Commission
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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING FIRE PROTECTION LICENSE AMENDMENT REQUEST**
**SALEM UNIT NO. 2**
**FACILITY OPERATING LICENSE NO. DPR-75**
**DOCKET NO. 50-311**

On November 4, 2003, the NRC issued a request for additional information in response to PSEG Nuclear LLC's (PSEG) request to amend the Salem Unit 2 Fire Protection License Condition 2.C.10 to document changes to the Salem Post-Fire Safe Shutdown strategy for Fire Areas 2-FA-AB-64B, 2-FA-AB-84C, and 2-FA-AB-84B. The attached information provides PSEG's response to the NRC Staff's questions.

Should you have any questions regarding this submittal, please contact Mr. Brian Thomas at 856-339-2022.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 11/11/03

Sincerely,

Dave Garchow

Dave Garchow
Vice President – Engineering

Attachment

A006

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**SALEM GENERATING STATION**
**UNIT NOS. 2**
**FACILITY OPERATING LICENSE NO. DPR-75**
**DOCKET NO. 50-311**
**REQUEST FOR ADDITIONAL INFORMATION**
**SALEM FIRE PROTECTION LICENSE CONDITION 2.C.10**

On November 4, 2003, the NRC requested the following additional information regarding PSEG Nuclear LLC's (PSEG) request for amendment to revise the Salem Unit 2 Fire Protection License Condition 2.C.10 to document changes to the Salem Unit 2 Post-Fire Safe Shutdown strategy for Fire Areas 2-FA-AB-64B, 2-FA-AB-84C and 2-FA-AB-84B.

NRC Question 1:

**In its June 16, 2003, letter, PSEG stated that, "[m]anual actions relied upon to achieve hot standby and cold shutdown are limited and are practical, reasonable and achievable under the expected environmental conditions." Please describe how PSEG determined that the credited manual actions are practical, reasonable and achievable, and whether or not these actions were verified in the field. Also, briefly describe what environmental conditions were considered in your evaluations.**

PSEG Response to Question 1:

As part of the revision of the safe shutdown analysis for Salem, PSEG performed a manual action feasibility evaluation for each hot standby manual action. Each hot standby manual action was walked down to evaluate accessibility (where is the component located, does the operator have the equipment to operate the component), habitability (radiation, heat and smoke), emergency lighting, and communication. A checklist was generated for each manual action.

Ladders needed to perform manual actions are staged/secured in the vicinity of the component to be operated and are currently surveilled every day as part of the plant log. Keys required to operate equipment are stored in the Appendix R cabinets and are currently surveilled every three months by administrative controls.

Emergency lighting for the ingress/egress pathways and at the equipment locations was evaluated and additional lights were installed as required.

The manual actions were field verified to determine that the actual response time to perform the action was less than the estimated time calculated to perform the action. The "estimated time" is the conservatively determined minimum time that the action must be performed within, in order to ensure safe shutdown of the plant. The validated

time includes time to review procedures, proceed to the required location, and perform the manual action. Validation of the manual actions and timing was performed using plant Operations personnel. The Operations Department was also intimately involved in the development of the revised safe shutdown strategy and guidance procedures.

NRC Question 2

**In Attachment 8 to the June 16, 2003, letter, PSEG provided estimated times for specific operator actions. What does the "estimated time" column represent? That is, do the estimated time values provided in Attachment 8 indicate the time an operator takes to complete the action, or the time available to take the action? Also how were these estimates determined?**

PSEG Response to Question 2

The "estimated time" represents the time available for the operator to perform the action. This time is based on engineering evaluations performed in support of the manual action feasibility evaluation discussed in Question 1. The validated time in all cases is less than the estimated time.

In developing the response to this request for information, PSEG identified a typographical error contained in Attachment 8 of the License Amendment Request in the estimated time to establish RCS inventory control via the CVCS cross-connect. In accordance with Engineering Evaluation S-C-FP-FEE-1746, Rev. 0, "Acceptable Operator Response Times to Appendix R Failures," the estimated time for this action should be 0.5 hour (30 minutes).

NRC Question 3

**For those actions taken outside the control room (e.g., in auxiliary building, switchgear room, etc.), do the time estimates given in Attachment 8 include travel time of the operator to access the specific location, (i.e., do the 0.5 hours estimated to trip the turbine driven AFW pump (2MS52) include the time it takes to dispatch the operator to the specified location, plus the time to access the pump control and actually trip the pump)?**

PSEG Response to Question 3

Yes, the validated time includes the time it takes to dispatch the operator, the travel time to reach the component, the time to access the component, and the time to actually perform the manual action.

NRC Question 4

**In Attachment 8, are the "available personnel" part of the minimum shift staff or are they in addition to the minimum shift staff? Will the required number of personnel always be available to perform the required manual actions?**

PSEG Response to Question 4

Yes, the available personnel are part of the minimum shift staffing. Minimum shift staffing for post-fire safe shutdown is controlled as discussed below.

As documented in letter LR-N970817, dated January 22, 1998, PSEG controls the minimum shift staffing levels for fire safe shutdown via administrative procedures. Procedure NC.NA-AP.ZZ-0005 (Q), "*Station Operating Practices,*" specifies the minimum shift personnel that are required to be available all the time. Currently PSEG has an approved exemption request for the Salem Control Room Complex for the lack of suppression in the Control Room Complex fire area. As stated in PSEG's request for exemption (Exemption No. 2 in the letter) dated July 15, 1988 and approved in the NRC's SER dated July 20, 1989, Salem Generating Station is committed to maintain minimum shift staffing levels for the performance of a simultaneous alternate shutdown of Salem Units 1 and 2 from outside the control room. Since Salem Units 1 and 2 have a common control room, a fire in this area would necessitate the simultaneous shutdown of both units from outside the control room. These staffing levels are above the current levels in the Salem Technical Specifications.

For the three fire areas listed in the current license amendment, post fire safe shutdown is being performed only on one unit. The manual actions identified in Attachment 8 are well within the limits of our proceduralized minimum staffing levels. For each shift, the minimum shift complement is verified and documented by the shift manager.

NRC Question 5

**What are the consequences, if any, of an operator failing to take the manual actions that are being credited in the analyses for the three fire protection areas (e.g., if the operator fails to de-energize 21 and 22 charging pumps for the reactor coolant system inventory control in the 2FA-AB-84B sequence)? What defense-in-depth measures are available to prevent adverse consequences to the plant or the public?**

PSEG Response to Question 5

In each fire area, only one train of safe shutdown equipment is protected to ensure that it will remain available in the event of fire in accordance with regulatory requirements. The post fire safe shutdown procedures were developed using the protected train of safe shutdown equipment. In regard to failures that are required to be evaluated, a single failure is not assumed during a fire event. The failures that are assumed to occur are a result of the fire event itself. Failure of an operator to perform a manual action is a single failure that is not required to be specifically evaluated in the fire event; however,

PSEG provides the following insights into the level of defense that exists in the event that a manual action is not completed.

For the fire areas identified in this license amendment, although these areas are identified as alternate shutdown areas (due to use of the CVCS cross-connect), the monitoring of the plant systems and parameters will still be performed from the control room. The operator in the control room would be in communication through radios with operators performing manual actions in the field. After the manual action is completed, the operator in the field notifies the control room of completion of the action.

In the event the field operator fails to perform the action, process monitoring indication would be available in the control room that would indicate the plant condition if the manual action is not performed. For example, if the operator does not stop the charging pump, the pressurizer level would start to rise which would be indicated in the control room through the pressurizer level indication. At this point, the control room operator would then take necessary actions in accordance with their training to address the failure to perform the manual action utilizing the guidance available in existing operating procedures and available personnel. Since Salem is manned at a level to perform a simultaneous alternate shutdown of both Units from outside the common control room, additional personnel are available to complete actions that are required or to perform an alternate manual action to complete the necessary safe shutdown function.

Operators are trained to the fire safe shutdown procedures. The procedures have been walked down by the Operations personnel who are expected to perform the manual actions. Feedback from the operators has been incorporated into the procedures to ensure the ease of implementing the manual actions. It should also be pointed out that each operator is assigned a limited number of manual actions.

With regards to overall defense in depth, the Salem Fire Protection Program utilizes defense in depth with multiple levels of protection including limiting combustibles and ignition sources in plant design, administrative control of transient combustibles and ignition sources, the use of both smoke and heat detectors for prompt detection of fires, suppression in areas with high fire loads, fire barriers to provide for separation and containment of fires and an onsite fire department (separate from the operating staff) which responds and extinguishes fires upon detection.

Therefore, multiple barriers in the Fire Protection Program would have to fail before there would be any adverse consequences to the plant or public.