UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

cc: WKane
CHehl
MHodges
JWhite
2/27/92-TTM

February 25, 1992

MEMORANDUM FOR: Thomas T. Martin
Regional Administrator
Region I

FROM: James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

SUBJECT: REGION I REQUEST FOR NRR EVALUATION OF GENERIC ISSUES RELATING TO THE SALEM UNIT 2 TURBINE OVERSPEED EVENT (TAC NO. M82696)

In your memorandum dated January 27, 1992, you requested that NRR evaluate five generic safety concerns resulting from the AIT of the Salem Unit 2 turbine overspeed event that occurred on November 9, 1991. This memorandum provides the results of the NRR evaluation.

Your first concern was in regard to an apparent inadequacy in the Standard Technical Specifications (STS). The staff agrees that the current STS could be written more clearly. However, the new STS, currently under development, would relocate the requirements for turbine overspeed protection to licensee-controlled documents (i.e., procedures) in accordance with the criteria in the Commission's policy statement on technical specification improvements. Nevertheless, the staff is considering generic correspondence to clarify this issue.

Item 2 concerns generic communications regarding Solenoid-Operated Valve failures. The staff has issued Information Notice 91-83, "Solenoid-Operated Valve (SOV) Failures Resulted in Turbine Overspeed," to ensure all licensees are aware of the possibility and the consequences of SOV failures in turbine overspeed control systems. The NRR staff does not consider further generic communications on SOVs to be warranted at this time. However, the EDO has asked AEOD to perform a study of turbine-related operating experience to identify generic turbine related safety concerns.

With respect to Item 3, fire vulnerabilities, such vulnerabilities are currently being evaluated by NRR. A fire vulnerability evaluation was started in response to the Vandellos Nuclear Power Plant (Spain) turbine rotor failure and secondary fire event. The industry will be informed of the results of the vulnerability evaluation through the issuance of generic correspondence.

Regarding Item 4, Balance of Plant Systems (BOP), the staff believes that the final maintenance rule addresses your identified concerns. Therefore, there are no current plans to pursue more regulatory requirements regarding BOP.

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Finally, Item 5 concerns turbine missile generation. The staff agrees that the Standard Review Plan (SRP) requires updating. The SRP will be revised during the Standard Review Plan Update and Development Program. The revision will address your concerns.

Detailed responses to each of the five points you raised are enclosed. Should you have any further questions, the technical contact is identified for each issue.

Frank J. Miraglia

for James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosure:
Evaluation of AIT Generic
Concerns

Public Sen. Elec. Dir

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CHAIRMAN

May 13, 1992

The Honorable Joseph R. Biden, Jr.
United States Senate
Washington, D.C. 20510-0802

Dear Senator Biden:

This is in response to your letter of April 2, 1992, concerning the November 9, 1991, turbine generator failure at the Salem Generating Station. In particular, you raised several thoughtful concerns largely with the NRC's decision to mitigate a civil penalty assessed against the licensee, and with the NRC's regulatory activities in general as they relate to the Salem facility.

Be assured that the NRC's chief concern resulting from this event has been and remains that the event was preventable and that the underlying causes could potentially affect nuclear safety under other circumstances. The decision to mitigate the penalty is not an indication of diminished concern by the NRC of the significance of the event.

Enclosure 1 contains additional information concerning mitigating factors under our Enforcement Policy relating to the November 9 event and the issues you raise. Mitigation is intended to encourage actions on the part of the licensee that will identify deficiencies and root causes of events and which help to prevent recurrence of events. For example, the Salem licensee identified one of the root causes of the November 9 event and is implementing procedures to correct its process for tracking commitments. While the NRC is satisfied, at this point, that appropriate actions are underway to ensure that underlying causes are being addressed and to prevent events of similar nature, the NRC will monitor the licensee's efforts closely and will not hesitate to take any future actions appropriate to effect necessary changes in operations or attitude.

Enclosure 2 addresses NRC's requirements as they relate to safety-related equipment and non-safety-related equipment with specific references to our actions at Salem. Your letter raises a number of issues concerning the scope of NRC's regulations in general. For example, the problem with the binding of solenoid valves, which you cited in your letter, involves equipment not subject to NRC's quality assurance requirements. The Commission and the NRC staff have periodically examined our role in overseeing balance of plant systems and components. We have

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adopted a maintenance rule requiring licensees to establish programs to monitor the effectiveness of maintenance activities including balance of plant equipment but this rule is not yet in force pending development of supporting implementation guidance. We continue to develop probabilistic methods intended to measure the contributions of systems and components -- "safety-related" or not -- to risk.

These evolving activities and others already in existence, like the SALP process and the team inspection programs, help ensure that activities in the balance of plant area which could impact on safety are not ignored but receive appropriate attention.

The NRC is committed to ensuring that the lessons learned from the November 9 event are fully understood and that corrective actions are taken to address the deficiencies identified; we will keep you and your staff informed of the licensee's corrective actions.

Sincerely,

Ivan Selin

Enclosures:
1. Mitigating Factors
2. NRC Regulatory Requirements - Salem

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Ivan Selin

Enclosures:
1. Mitigating Factors
2. NRC Regulatory Requirements - Salem

KR - Approved
JC - Approved/edit
FR - Approved/edit
GD - Approved w/edits

Originating Office: EDO/OE

Ref: CR-92-074
Commission Correspondence

OFFICE	SECY	OCA	OCM	OCM			
SURNAME	ATilton						
DATE	5/13/92	5/13					

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Ivan Selin

Enclosures:
1. Mitigating Factors
2. NRC Regulatory Requirements - Salem

Originating Office: EDO/OE
Ref: CR-92-074 (Rev.)
Commission Correspondence

OFFICE	SECY	OGC*	OCM/KR	OCM/JC	OCM/ER	OCM/GD	OCM/IS
SURNAME	Fleton		M. Kaufman	w/ edit	w/ edit	E. Neiberman	
DATE	5/12/92		5/13/92	5-13-92	5/13/92	5/13/92	

MITIGATING FACTORS

The staff's decision to mitigate the penalty is not an indication of diminished concern by the NRC of the significance of the event. Mitigation is intended to encourage actions on the part of the licensee that will identify deficiencies and root causes of events and which help to prevent recurrence of events. This enforcement action was in conformance with the provisions of the Enforcement Policy and reflected an appropriate exercise of judgment for the circumstances of the case.

The mitigation is not given for reporting the obvious, but for getting to the root cause of the event. In this case, the licensee identified the failure of its staff to communicate and correct the results of the testing of the turbine performed on October 20, 1991, which is one of the root causes of the event and is the basis of the violation at issue. Therefore, some mitigation was warranted for the licensee's root cause identification effort.

As to corrective actions, the fact that the licensee failed to implement its earlier commitment to replace the solenoid valves, as detailed in the cover letter to the Notice of Violation, was of concern to the NRC. However, rather than being a case in which a licensee ignored a commitment, the NRC's Augmented Inspection Team found a significant flaw in the method used by the licensee to track such commitments which contributed to that failure. Enforcement action was not taken for this failure because it did not constitute a violation of the Commission's requirements -- the solenoid, not being safety-related equipment, was not subject to the Commission's quality assurance requirements. Nevertheless, the licensee is implementing procedures to correct this process. The staff will be monitoring these corrective actions.

As to the licensee's past performance, the last two years of performance are normally considered in evaluating this factor. On balance, NRC assessment of this licensee's performance up to the November 1991 event was found to warrant one half of the mitigation allowed under that civil penalty adjustment factor. In that regard, the most recent SALP report noted improvements in control room communications and conduct of operations.

With respect to the prior notice factor, although the licensee had prior notice of problems with mechanical binding of identical solenoid valves in Unit 1, no adjustment on this factor was

warranted because the primary focus in this case was the performance of the NRC licensed operators on October 20, 1991, rather than the maintenance of the solenoids. The failure of operators to respond to the deficient test results on October 20, 1991, was viewed as the most significant reason that this event was not prevented by the licensee.

A civil penalty was not assessed by the NRC staff based on its evaluation of these mitigation factors. Although a civil penalty was not assessed, a Severity Level III violation is a matter of significant regulatory concern and may adversely affect a licensee's Systematic Assessment of Licensee Performance (SALP) ratings, or result in escalation of future proposed civil penalties due to past poor performance.

NRC REGULATORY REQUIREMENTS - SALEM

"Safety-related" equipment is that equipment used in conjunction with the nuclear steam supply system which is relied upon to ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents which could cause undue risk to the health and safety of the public. "Non-safety-related" is everything else in the balance of plant. Some of the non-safety-related equipment is very useful both in avoiding an emergency and in dealing with one, but it is not itself necessary for reactor safety.

The Commission periodically examines the extent to which it should oversee balance of plant systems and components. For example, our recently adopted rule (10 CFR 50.65, adopted July 10, 1991) requiring licensees to establish programs to monitor the effectiveness of maintenance activities explicitly recognizes that inclusion of balance of plant equipment in the program is necessary and proper. Equipment to be monitored includes non-safety-related components: 1) relied upon to mitigate accidents; 2) whose failure could prevent functioning of safety related equipment; and 3) whose failure could cause a reactor scram or actuation of a safety related system.

Under current rules and practice NRC does not routinely review or approve the design detail nor the operational procedures for non-safety-related equipment, nor is it routinely inspected by NRC, except with respect to the effect such equipment may have on the overall safe nuclear operation of the facility. For example:

> NRC reviews the design of the turbine to the extent of assuring that the nuclear reactor and other nuclear safety equipment is protected against turbine missiles by orientation or otherwise;
>
> NRC reviews features of the turbine and its auxiliary equipment to the extent of assuring the nuclear reactor and safety-related equipment are protected against potential fire hazards from such balance of plant equipment.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

DEC 15 1992

Docket Nos. 50-272
50-311

MEMORANDUM FOR: Charles W. Hehl, Director, Division of Reactor Projects
Wayne M. Hodges, Director, Division of Reactor Safety
Richard W. Cooper, Director, Division of Radiation Safety and Safeguards

FROM: Thomas T. Martin, Region Administrator

SUBJECT: AUGMENTED INSPECTION TEAM CHARTER FOR REVIEW OF THE DECEMBER 13, 1992, ANNUNCIATOR SYSTEM FAILURE AT SALEM 2

As a result of failure of the Salem Unit 2 control room annunciator system to function as designed on December 13, 1992, NRR and AEOD senior management and I have determined that an Augmented Inspection Team (AIT) inspection should be conducted to verify the circumstances and evaluate the significance of this event.

The Division of Reactor Safety (DRS) is directed to conduct the AIT with William Ruland as the Team Leader. Further, DRS, in coordination with the Division of Reactor Projects, is responsible for the timely issuance of the inspection report, the identification and processing of potentially generic issues, and the identification and completion of any enforcement action warranted as a result of the Team's review. The Division of Radiation Safety and Safeguards is directed to provide support to the AIT as needed to assess the emergency preparedness aspects of this event.

Enclosed is the charter for the Augmented Team delineating the scope of this inspection. The inspection shall be conducted in accordance with NRC Management Directive (MD) 8.3, NRC Inspection Manual 0325, Inspection Procedure 93800, and this memorandum. The bases for this inspection, per MD 8.3, are: the staff's need to fully understand the causes of the event and the staff's need to determine if there are potential generic issues worthy of staff action associated with this event. Preliminary information indicates that the annunciator failure involved a recently installed computer controlled annunciator system. The failure of the system went undetected for about 1.5 hours. Additional questions also exist with regard to operational and managerial performance associated with reporting this event.

Thomas T. Martin
Regional Administrator

Enclosures:
1. Augmented Inspection Team Charter
2. Team Membership

K/1

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cc w/encls:
J. Taylor, EDO
J. Sniezek, OEDO
T. Murley, NRR
J. Partlow, NRR
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C. Rossi, NRR
C. Miller, PD I-2, NRR
F. Miraglia, NRR
C. McCracken, NRR
F. Rosa, NRR
W. Russell, NRR
J. Richardson, NRR
A. Thadani, NRR
B. Grimes, NRR
J. Roe, NRR
E. Jordan, AEOD
D. Ross, AEOD
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C. Hehl, DRP, RI
J. Wiggins, DRP, RI
J. White, DRP, RI
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T. Johnson, SRI, Salem/Hope Creek
J. Stone, PD I-2, NRR
W. Ruland, DRS, RI
J. Durr, DRS, RI
W. Hodges, DRS, RI
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E. Wenzinger, DRP, RI
K. Abraham, PAO, RI
M. Banerjee, SLO, RI
S. Pindale, RI, Salem
S. Barr, RI, Salem
J. Ibarra, AEOD
R. Spence, AEOD
L. Cheung, DRS, RI
A. Pelletier, NRR

ENCLOSURE 1

Salem Generating Station, Unit 2

Failure of the Control Room Annunciator System to Perform as Designed

Augmented Inspection Team (AIT) Charter

The general objectives of this AIT are to:

1. Confirm that the licensee has taken sufficient action to assure that the annunciator system is currently operable and reliable for continued use.

2. Determine the specific circumstances, events, and causal factors (including precursors), that led up to the undetected failure of the annunciator system. Develop a Sequence of Events analysis of activities and processes that occurred before and after the failure of the annunciator system. Determine and evaluate any changes made in the design, maintenance, testing, or operation of the annunciator system prior to failure. Assess the Sequence of Events and Changes Analyses for potential impact on expected annunciator system performance and operation.

3. Determine if any similar failures have occurred at Salem and Hope Creek, and what actions were taken by the licensee in response. Interface with the equipment vendor to determine if other nuclear plants have incorporated this design.

4. Review the design and modification activities associated with the installation of the annunciator system and associated central processing unit (CPU) hardware and software. Review post-modification testing, associated safety evaluations (including associated activities performed in accordance with 10 CFR 50.59), deficiency resolutions, operability determination, and final acceptance of the system. Review and evaluate how the annunciator system interfaces with other plant systems and components.

5. Assess the adequacy of surveillances performed on this system, including evaluation of hardware or software self-test features.

6. Evaluate the licensee's actions following the event, including the implementation of appropriate procedures (i.e., emergency operating procedures, alarm response procedures, emergency plan procedures, troubleshooting procedures, system procedures, instrument and control procedures, etc.). Evaluate the adequacy of the licensee's post-maintenance testing and analysis that was performed upon the loss of the annunciator system. Evaluate the response of operators and management personnel to this occurrence. Evaluate operator training and the adequacy of procedures, as appropriate. Evaluate the licensee's decision-making relative to the emergency classification and reportability of this occurrence.

7. Determine the root cause(s) of the event and identify any generic implications or vulnerabilities. Evaluate the licensee's root cause analysis of the event and associated corrective actions, proposed or implemented. Review and evaluate the licensee's plans and schedules relative to corrective actions. Evaluate the licensee's assessment of this event relative to other operating units on-site.

8. Review and evaluate personnel performance (including engineering personnel, shift supervisors, reactor operators, shift technical assistant, instrument and control technicians, and managers) relative to adherence to procedures, appropriateness of training, and quality and effectiveness of communications. Evaluate the manner that this event was communicated to licensee management and the NRC.

9. Prepare a report documenting the results of this review for signature by the Regional Administrator within 30 days of the completion of the inspection.

ENCLOSURE 2

Salem AIT Membership

William Ruland, AIT Leader, Section Chief, Division of Reactor Safety (DRS), Region I (RI)

Leonard Cheung, Inspector, DRS, RI

Jose Ibarra, Office for Analysis and Evaluation of Operational Data (AEOD)

Robert Spence, AEOD

Allison Pelletier, Office of Nuclear Reactor Regulation

John Calvert, Inspector, DRS, RI

Observer

Thomas Kolesnik, New Jersey Bureau of Nuclear Engineering

Other NRC personnel, consultants, or contractors will be engaged in this AIT, as needed. The designated emergency preparedness inspection specialist assigned to the event is Craig Gordon, Division of Radiation Safety and Safeguards, Region I.

SALEM AIT DEBRIEF

12/31/92
Rumrowd

Console annunciator remained functional, so did alarm typer
Overhead annunciator provides "E" Plan entry points.
Remote (Back Panel) keyboard not observable for foreseeable
SOE recorder must be reset with pen into hole
Two CPUs, each with 2 parallel memory (A+B) MPUs

SNSS

SS	SS
RO	RO
RO	RO

- 2 weeks earlier, black tie annunciator comes in they succeed in clearing, don't right work request
- now comes in again, they go to back panel to try ~~again~~ to trouble shoot, they admit did this, but don't believe they were ~~the~~ there when looked up. Further, no one remembers moving black box switch.

- With moving switch on black box to SOE "A", enabled communication from RCW 8 tate to SOE "A" and then hitting CTRL-L vs ALT-L, caused SOE "A" to wait (forever) for next command.

- Alt-L would have been per procedure although operators weren't supposed to be using this proc.

- Noisy power supply cabling to distributed logic cards appears to have caused other anomalous indications

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