

**SALEM/ HOPE CREEK**

**Background information**

**OVERALL LICENSEE  
PERFORMANCE**

**AND THE WORK ENVIRONMENT**

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Act, exemptions 5  
FOIA 2005-124

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### Overview of Salem and Hope Creek Performance

Salem and Hope Creek have had a very strong cross-cutting theme of weak corrective action for the past couple of years. Although the issues include some instances of inadequate problem identification, the much more prevalent cases involve inadequate evaluations, off-target corrective actions, and unduly delayed corrective actions.

Issues have manifested themselves in plant events and repetitive equipment failures. A current White issue at Salem Unit 1 involves catastrophic failure of an emergency diesel generator due to failure to implement corrective actions for previous events. The initial supplemental inspection for this item completed in late 2003 found insufficiently broad corrective actions and the item has therefore been kept open. The licensee's extent-of-condition review, completed in late March 2004, found other examples of unimplemented corrective actions from significance level 1 (the highest level) of root cause reviews.

Issues associated with power distribution logic and setpoints illustrate of the licensee's weak corrective action program. In late Summer 2003, Salem had a partial loss of off-site power, during which the offsite power logic operated improperly due to inadequate design of power distribution and degraded grid protection. The vulnerability had been introduced during modifications in the mid-to-late 1990's. After the 2003 event, the NRC Special Team found that the licensee's initial corrective actions were not adequate to resolve system operability; and the licensee had to immediately tighten their voltage limits. Further, the 2003 Salem event involved issues very similar to questions that an NRC SSDI at Hope Creek had raised in late 2002, and had been left unresolved. PSEG never fully resolved the Hope Creek questions until early 2004; and even then, an NRC inspector found that the licensee's newly reanalyzed voltage limits had not been inserted into operating and surveillance procedures; again prompt licensee action was needed in response to the inspector's finding of inadequate corrective action. Thus, in highly visible issues at both sites, initial licensee corrective actions were inadequate and required immediate attention after NRC had identified the shortcomings.

The current White issue at Hope Creek involves inadequate corrective actions to repair a service water traveling screen – Service Water equipment has been a chronic problem at both Hope Creek and Salem. There are currently pending issues of significance (possibly >Green) involving service water at both Salem 1 and Salem 2.

In the last assessment cycle (CY2003), over 30 findings at Salem and Hope Creek involved inadequate PI&R. For example:

- PSEG deferred a CRDM fuse upgrade, contrary to industry and vendor experience. This deferral led to a dropped rod and reactor trip (Salem)
- A control air transient and plant challenge resulted from a number of organizational weaknesses, including slow corrective action for a significant air leak (Salem)
- Untimely corrective action for a starting air compressor problem led to diesel generator inoperability (Salem)
- The licensee had tolerated repeated water hammers during containment spray and RHR testing until the NRC resident inspector highlighted the chronic problem (Salem)
- Failure to maintain CRDMs resulted in numerous operational complications and operator burdens (Hope Creek)
- A problem with feedwater heaters, known since 1998, caused reactor water level

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control problems after scrams, including an event in October 2003 (Hope Creek)

Also, at Hope Creek, there has been some diminution in procedural adherence and overall operations performance; this is likely related to work environment and operational decision-making issues that had placed operations in a realm of uncertain authority at times.

Recent management changes, initiatives, and operational decision making have created some promise towards better performance; however, due to chronic equipment problems and institutionalized performance issues, real overall improvement is not yet evident.

Attached are:

- Excerpts of the last three assessments letters
- very brief excerpts from interviews conducted by NRC in our special review of the Salem/Hope Creek work environment
- Highlighted excerpts of key PSEG, third-party assessments

Excerpts of the Last Three Assessments Letters

I. CY 2003 End-of-Cycle

A. Salem Annual Assessment Letter dated March 3, 2004

"....As discussed in the annual assessment letter dated March 3, 2003, and the mid-cycle assessment letter dated August 27, 2003, the staff identified a substantive cross-cutting issue in the area of problem identification and resolution (PI&R). The cross-cutting issue involved instances of ineffective, untimely problem evaluations and corrective actions. In the most recent annual assessment, we concluded that this substantive cross-cutting issue should remain open, based on the numerous inspection findings which indicate that weaknesses continue in this area. The weaknesses impacted equipment reliability and involved deficient determinations of root causes. For example, inspection findings included the deferred fuse uprating of control drive mechanisms, which resulted in dropping of control rods and a manual Unit 2 reactor trip; an inadequate operability evaluation of offsite power supply breakers following a Unit 1 partial loss of offsite power; insufficient evaluation of an air leak on an EDG starting air compressor; and incomplete preventive maintenance and inadequate corrective actions for the control air system. We request that you discuss this matter at our upcoming annual assessment meeting."

"In a January 28, 2004 letter, we provided interim results of an ongoing NRC special review of the work environment at Salem and Hope Creek. The letter outlined areas of NRC concerns, particularly as they relate to the handling of emergent equipment issues and associated operational decision-making. The letter also requested a written response to provide a plan for an in-depth PSEG assessment of the work environment. We have received your response and are reviewing your plans. We expect to discuss this matter with you at the management meeting specified in our January 28 letter (tentatively planned for mid-March)."

B. Hope Creek Annual Assessment Letter dated March 3, 2004 – Similar to Salem except for the following passage:

....The weaknesses impacted equipment reliability and involved deficient problem identification, or once identified, insufficient recognition of the problem's significance. For example, inspection findings included inadequate evaluations of conditions, such as a hydraulic leak on a turbine valve, which resulted a manual reactor scram; a pressure transient during a reactor shutdown, which enabled a second pressure transient; and a coolant leak on an emergency diesel generator (EDG), which resulted in the initiation of a plant shutdown...."

II. CY 2003 Mid-Cycle

A. Salem Mid-Cycle Letter Dated August 27, 2003

"In the recent mid-cycle assessment, we determined that this substantive cross-cutting issue continued to apply, based on the continuation of inspection findings and documented shortcomings within the PI&R area. These shortcomings continued to enable problems to recur and longstanding problems to go uncorrected. In a number of cases, poor implementation of

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maintenance work, insufficient coordination and work control, equipment reliability weaknesses, and engineering's deficient determinations of root causes were involved. The most noteworthy recent examples included an inadvertent letdown isolation in February caused by a control air transient which involved incomplete corrective actions, a reactor pressure transient in April due to an inadvertent pressurizer spray actuation with missed opportunities to identify the problem, and an auxiliary feed water (AFW) pump surveillance test failure in May which involved inadequate maintenance work instructions and a missed corrective action opportunity."

- B. Hope Creek Mid-Cycle Letter Dated August 27, 2003 - Similar to Salem except for the following passage:

"The most noteworthy recent examples included a repetitive seal leak on an emergency diesel generator intercooler pump that resulted in a technical specification-required shutdown in June, a low power excursion during a reactor shutdown in March with an incorrect problem evaluation, and a recurring lubrication oil low pressure condition on the high pressure coolant injection (HPCI) pump in March."

### III. CY 2002 End-of-Cycle

- A. Salem Annual Assessment Letter dated March 3, 2003

"Numerous inspection findings documented shortcomings within the problem identification and resolution area, and these shortcomings enabled problems to recur and longstanding problems to go uncorrected. The most noteworthy examples included repetitive emergency diesel generator (EDG) problems involving fuel oil leaks and the fatigue-induced failure of an EDG turbocharger, the failure of a charging pump by a known problem due to inadequate preventive maintenance, an inadvertent carbon dioxide actuation in an EDG room due to a degraded EDG cylinder isolation valve, and the June 2002 failure of an air-operated service water valve following corrective actions for a similar January 2001 failure."

"We also note that the same overall corrective action program is concurrently implemented at both Salem and Hope Creek, and that both stations have experienced an adverse PI&R trend. This appears to indicate that program improvements to address these trends will need to be broadly based and site-wide to improve PI&R performance at Salem Units 1 and 2, as well as at Hope Creek. We plan to closely monitor your performance in the PI&R area."

- B. Hope Creek Annual Assessment Letter dated March 3, 2003 - Similar to Salem except for the following passage:

"The most noteworthy examples included an inservice test failure of a standby liquid control (SLC) pump in October 2002, which represented a repetition of a similar test failure of the other SLC pump in March 2002, and a February 2002 incident on the standby service water (SW) pump, which represented a recurrence of a similar February 2001 standby SW pump event. Further, there were multiple occasions in which problems were not promptly identified...."



# NRC Oversight Status of Salem & Hope Creek

## Organizational Effectiveness & Work Environment

June 29, 2004

# HISTORY

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**Extended S/D and Watch List - Late 1990's**

**Recovery Satisfactory but Performance Improvements**

**Stalled in Early 2000's**

- Poorly-conceived realignment to "3-Unit Site"
  - stretched mgt thin and created confusion, especially in engineering
- Equipment Reliability/Outages/Events stressed the organization
- Corrective Action issues and Work Management ineffectiveness evident
- ORG Changes and Management Turnover

## **NRC Oversight 2000-2003**

- All Three Units Have Stayed in Licensee Response or Regulatory Response Column--Occasional White Indicators or Findings
- Strong Cross-Cutting Theme, PIR, Highlighted in Three Assessment Letters; Continues Today
- Increased NRC Management Attention and Site Visits
  - (e.g. RA: 7/02, 4/03, 7/03, 12/03, 3/04)
- Late 2003: Initiated Special Review Based on:  
Crosscutting  
Themes, Events, and Allegations



# **NRC Oversight 2004**

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## **January 28: Interim Results of Special Review**

NRC Concerns related to work environment and station capacity for:

- Handling emergent issues and associated operational decision-making
- Addressing potential safety issues

These Concerns included:

- Openness of management to concerns and alternate views
- Strength of communication
- Effectiveness of corrective actions and feedback processes

Concerns did not involve any serious safety violations

Recognized some change under new management but need to understand and address lingering issues

**NRC Requested PSEG to do their own Assessment**

## NRC Oversight 2004 (cont)

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- NRC Letter to PSEG  
1/28/04
- PSEG letter to NRC  
2/27/04
  - ▶ Provided interim assessment plant
- Public Meeting  
3/18/04
  - ▶ Discussed assessment plans
- PSEG letter to NRC  
5/21/04
  - ▶ Submitted assessment results
- NRC Public Meeting  
6/16/04
  - ▶ Discussed PSEG assessment results and action plan
- PSEG Commitment letter

## **PSEG Assessments submitted 5/21/04:**

- Synergy Cultural Assessment (Dec 2003)
- USA Group Safety Culture Assessment (Mar 2003)--  
DBLL SOER review
- Independent Review by IAT (Feb-May 2004)--  
Interviews  
and overall review, included corporate
  - Results consistent with NRC inspections, assessments  
and special review
  - Very detailed results ( $\approx$  200 pages docketed)
  - Includes stark, unvarnished verbiage

## **External Stakeholder Involvement**

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Key Allegor -- revealed allegor status publicly in March; has ongoing civil suit against PSEG. Very frequent contact with

NRC Region I

UCS -- Increasing involvement over past several months--

Advocates plant S/D, Order, or CAL

Unplug Salem --small group consistently advocates S/D

New Jersey -- Very interested; supportive of NRC

Congressional -- Interest, but little direct involvement so far

Financial -- some attendance at meetings

Media -- mostly local

## PSEG Action Plans

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PSEG letter recently submitted, summarizes plans  
PSEG focus areas: SCWE, CAP, Work Mngmt, Leadership Effectiveness, Facilities. (Detailed plans ECD July 31, 2004)

PSEG Intends to pursue action plans thru Business plan

Recent emphasis: Conservative decisions, and communications.

Expanded

outage scope to fix more equipment.

Commitments:

- Submit Key metrics (SCWE and SCWE drivers)
- SCWE and Safety Culture Survey after the HC outage, submit to

NRC

early 2005

- Meet in early 2005
- Survey for five years

Assessment of effectiveness to be part of normal line management processes

# Regulatory Oversight--Principles

Considerations for NRC Oversight:

- Provide appropriate safety perspective
- Understand that these issues will take some time to address
- Recognize that things could get worse before improving
- Look for effectiveness of efforts vs merely completing action items
- Recognize that metrics can be helpful but cannot become the sole measure of effectiveness.
- Have a clear exit path to de-escalate as licensee improves.
- Needn't satisfy all stakeholders, but NRC action should be

# NRC Next Steps

We are at a key point right now

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The following are being pursued for completion in July

- Finalize NRC Special Review 2004
- Complete Evaluation of PSEG Assessments
- Compare NRC & PSEG Results
- Evaluate PSEG Plans
- Decide Additional Regulatory Actions and Basic Plan for Future Followup--Three Highly Coupled Questions
  - ▶ Need for additional PSEG commitments
  - ▶ Scope/Nature of NRC Oversight
  - ▶ Regulatory "footprint"
- Stakeholder Communication

## **Regulatory Options**

### **Additional PSEG Commitments**

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Considering the need for additional PSEG commitments in several areas:

- Metrics submittal -- better coverage of equipment issues.
- Management meetings -- one this Fall, semi-annually thereafter
- Additional effectiveness review -- possible independent assessment covering more than work environment



## **Regulatory Options-Monitoring &**

### **Followup**

Some combination of some of the following:

Site Visits (some with HQ assist)

Review PSEG assessment in more detail?

Review PSEG approach method for future assessments  
(with

HQ assist or lead)

Focused Inspection followup of selected actions

Periodic management meetings (how often?)

SCWE x-cut in mid-cycle assessment? (Probably)

Deviation Memo?

Remove site from ROP due to corrective action  
weaknesses?

(Not needed)

## **Regulatory Options-Regulatory “Footprint”**

- ORDER
- CAL
- LETTER ACCEPTING COMMITMENTS
  - ▶ Possibly to include Oversight Panel and Deviation Memo

## **PSEG Assessments**

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The following slides are not intended to provide an overall perspective. Instead, they are designed to show the type of blunt detail that has been docketed and is available to any interested stakeholder.

## **Independent Assessment Team (IAT)**

- 190 interviews, 14 events examined, reviewed Synergy, USA, NRC reports
- "Personnel will raise nuclear safety concerns"(but some expressed hesitancy to raise lesser concerns) (p2)
- "...management...ineffective in addressing other [lesser]... concerns, particularly longstanding equipment problems, principally due to ineffective implementation of the corrective action programs and work management practices." (p2)
- "...management has not been effective at understanding or addressing the potential for a chilling effect in response to how management has addressed highly visible employee concerns..." (p3)

## **IAT: Stark Words About Leadership's Conflict Mgt**

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## IAT: Stark Quotes About Corporate:

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"...some assumed that site management is not fixing longstanding equipment issues because corporate is not providing the necessary funds"

"...some involved in the unresolved conflicts, assumed that site management's conduct in the course of those events resulted from a perceived pressure from corporate to place a greater emphasis on production and scheduling considerations than conservative decision-making."

"Corporate policies, practices, business planning, and compensation may

have had the unintended consequence of having site management focus

on production and schedule, at times, over conservative decision-making.

Corporate policies and practices may have similarly had an unintended consequence of leaving longstanding equipment issues unresolved."

(p43, similar to statement on p9)

## SYNERGY - December 2003

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- Priority 1 Key issue and opportunity for improvement from this survey -Plant equipment & material condition of plants are perceived to be in a degraded condition as manifested by longstanding or recurring equipment problems, work-arounds, and compensatory measures. This situation is perceived to be worsening. This was considered to be the driving force behind low trust/confidence in senior management as well as very low rating or concerns with CAP effectiveness, maintenance work planning, and effectiveness of maintenance

Mgt perceived to be concerned about short-term performance results

Mgt perceived as uncommitted to resolving chronic equip problems

S/HC compared poorly with other facilities surveyed:

- Nuclear Safety Values/Practices (11th%)
- SCWE (11th percentile)
- ECP (16th percentile)
- Leadership Behaviors (11th%)
- Business/Resource Mgt. Behaviors 11%
- other areas not directly related to SCWE scored 26th-44th%;

"...these ratings indicate that many employees correlate the current situation

## **Utilities Service Alliance (USA) Review of DBLL SOER - March 2004**

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