PSE&G

Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038-0236

Nuclear Business Unit

OCT 27 1995

LR-N95188

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

SALEM GENERATING STATION
LICENSE NO. DPR-70
DOCKET NO. 50-272
UNIT NO. 1

LICENSEE EVENT REPORT NO. 95-019-01

This Licensee Event Report entitled "Operability Functional Test Not Performed Prior to Mode Entry" is being submitted pursuant to the requirements of the Code of Federal Regulation 10CFR50.73(a)(2)(i)(B). Attachment A contains a listing of those commitments made as a result of the investigation into this issue.

Sincerely,

Clay C. Warren
General Manager
Salem Operations

Attachment A
Attachment LER
SORC Mtg. 95-123
RJB

C Distribution
LER File 3.7

IE22
1/1

Attachment A
PSE&G Commitments

The commitments below have been made by PSE&G as a result of the investigation into LER 272/95-019-01. These commitments supersede those commitments contained in the previous revision of this LER and apply to both units.

Completed Actions

1. The procedure which governs the requirement for entering tracking LCO's against equipment that is unavailable or inoperable for future modes has been revised. When operability issues exist, specific direction has been provided to ensure consistency in the tracking of the affected systems/equipment.

2. A tracking AS was entered for the 1VC1 and 1VC2 for Mode 6 to ensure that the open and inspect work orders are completed in determining the cause for the leak rate failures. The OD was revised declaring the valves operable in modes 5 & 6. In addition, a review of open ODs was performed to assure degraded conditions imposing mode restrictions are incorporated into the tracking log.

3. MMIS has been revised to include an "Affects Mode change? Y/N" entry in the OD section of the Action Request. This information will be determined by an SRO during the review of the request.

4. The requirement to comply with the LCO for the containment purge system was incorporated into the IOP on 9/22/95.

5. The procedure, "Removing and Returning to Service of Safety Related Equipment" was revised to incorporate the process for tracking action statements. Specifically, this revision includes the requirement to specify equipment that is removed from service for normal scheduled maintenance and equipment that becomes inoperable for other reasons (i.e. degraded conditions, ODs, failed surveillances, etc.). This revision includes modifications to the TSAS tracking form. In particular, the form includes entries for applicable TS and Modes; associated action requests and status, work orders, condition reports, design changes, and other documents/actions to be performed while the equipment is inoperable. Included also are those actions required prior to operability restoration. The above revision was implemented on 9/1/95.

Completed Actions (Cont'd)

6. The OD process was revised to include a mechanism to track additional/ contingency actions and identification of responsibility for those actions. This was completed on 8/30/95.

7. The IOPs applicable for defueling and refueling have been revised to include the requirement to review outstanding items that may impact an associated Mode change (i.e., OD log and Action Requests). The procedures for unit restart are currently on hold.

Future Actions

1. System Engineering will establish improved program controls to monitor the performance of the containment purge valves. These program controls will be implemented prior to restart.

2. The planning/scheduling process will be revised to clearly address action requests that are conditionally tied to specific plant evolutions and incorporated into the scheduling process. The process will be changed as part of our ongoing efforts to support restart.

3. A Unit Coordinator (UC) position will be established in the revised work control process. The UC will review action requests with an SRO and specify conditional limitations (i.e. Mode restrictions, system operability, etc.), and schedule the work request accordingly.

4. The applicable IOPs will be revised to include the requirement to review outstanding items that may impact an associated Mode change (i.e., OD log and Action Requests). The procedures for unit restart are currently on hold.

5. Required reading of the LER by all Licensed and Non-Licensed Operators and maintenance planners and schedulers will be conducted after issuance of the Supplemental LER. This is expected to be completed by 12/9/95.

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
SALEM - Unit 1	05000272	1 OF 8

TITLE (4)

Operability Functional Test Not Performed Prior to Mode Entry

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
07	26	95	95	- 019 -	01	10	27	95	FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
POWER LEVEL (10)	000	20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)(B)		50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Bob Gallaher, Operations Engineer	(609) 429 - 5200

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
				N						

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On June 20, 1995, while in Mode 5, containment purge valves, 1VC1 and 1VC2, failed an "in series" Local Leak Rate Test (LLRT). 1VC2 was then cycled open and closed and the valves were tested satisfactorily. An Operability Determination (OD) was issued on 6/21/95 which stated: "the valves are considered to be inoperable, although the penetration...(due to the satisfactory LLRT) is operable for containment integrity". On July 5, the OD was amended to document the operability of containment purge while in Mode 5 but cautioned "prior to Mode 6, further testing and/or inspections are to take place to investigate the valve seals. The operability of these valves will be re-evaluated at that time". On 7/25/95, Unit 1 entered Mode 6 with containment purge in service and the valves inoperable. This is contrary to the OD requirement and interpretation of Technical Specification (TS) 3.9.9. This event is reportable per 10CFR 50.73(a)(2)(i)(B). This condition was discovered on 7/26/95 and the purge valves were stroke checked (same day) to verify closure. The lack of managerial oversight and organizational interface allowed for inadequate procedures, inadequate tracking of system operability status, and inadequate tracking and follow through of corrective maintenance activities. TS Action Statement tracking logs, OD procedures, and the Operating Procedures are being revised.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SALEM - Unit 1	05000272	95	-- 019 --	01	2 OF 8

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

PLANT AND SYSTEM IDENTIFICATION

Westinghouse - Pressurized Water Reactor
Containment Purge and Pressure Relief System - EIIS Identifier {BF}
Manufacturer Name - Masoneilan International Inc - M120

IDENTIFICATION OF OCCURRENCE

Event Date: July 25, 1995
Discovery Date: July 26, 1995
Report Date: August 25, 1995
Supplemental Date: October 27, 1995

CONDITIONS PRIOR TO OCCURRENCE

Operational Mode: 6
Reactor Power 0% of Rated Thermal Power

DESCRIPTION OF OCCURRENCE

On June 20, 1995, containment purge isolation valves 1VC1 and 1VC2 were leak rate tested in series to comply with Technical Specification (TS) Action Statement (AS) 3.8.2.2 which requires "containment integrity" to be established within 8 hours with less than 2 AC buses operable (e.g., more than one Unit 1 diesel generator unavailable). The containment penetration associated with valves 1VC1 and 1VC2 failed its Local Leak Rate Test (LLRT). Valve 1VC2 was cycled open and closed to assist in seating the valve, and the LLRT was re-performed satisfactorily.

Based on this failure, the operability of 1VC2 was then questioned as no cause was identified nor corrective maintenance performed to determine why it had failed its initial LLRT. Both 1VC1 and 1VC2 were addressed since they were both cycled to obtain a satisfactory LLRT two weeks prior to this occurrence. An Operability Determination (OD) was issued on 6/21/95. The valves were considered inoperable for containment purge purposes until the cause for the failed LLRT was determined and/or corrected. However, the OD stated "the valves are considered to be inoperable, although the penetration...(due to the satisfactory LLRT) is operable for containment integrity" (i.e., valves remain in a closed position).

On July 5, 1995 the OD was revised to document the operability of containment purge while in Mode 5 but cautioned "prior to Mode 6, further testing and/or inspections are to take place to investigate the valve seals. The operability of these valves will be re-evaluated at that time". Work requests were initiated to check the stroke of the valves to verify valve closure when

Description of Occurrence (Cont'd)

demanded. These work requests indicated that the check be performed prior to Mode 6.

On July 24, 1995, while in Mode 5, containment purge was placed in service. At 1435 on July 25, 1995 Unit 1 entered Mode 6 upon detensioning of the first Reactor vessel head stud. The containment purge system was in service during the transition from Mode 5 to Mode 6. This is contrary to the OD requirement and interpretation of TSAS 3.9.9 which states, "With the Containment Purge...System inoperable, close each of the Purge...penetrations providing direct access from the containment atmosphere to the outside atmosphere."

On July 26, 1995, at 1716 hrs., it was realized that the containment purge was in service but inoperable, contrary to the OD requirements. The valves were subsequently stroke tested to verify closure with no abnormalities identified.

On July 27, 1995, the OD was amended and recommended that the valves be declared operable for Modes 5 and 6 since they are capable of performing their specified safety function for "containment closure" as identified in the TS bases and the functional requirements of TS 3/4.9.4 and 3/4.9.9. It further specified that should "containment integrity" be needed in Modes 5 and 6 (e.g., due to less than the two operable vital buses per TS 3/4.8.2.2, 3/4.8.2.4 or 3/4.8.2.6), leak tightness will be verified by performance of another LLRT in accordance with TS 3/4.6.1.2."

ANALYSIS OF OCCURRENCE

The containment purge system is normally isolated. The containment purge valves are administratively locked closed and tested in Modes 1-4. In these modes, they are LLRT'd every 6 months. One supply air penetration (1VC1 and 1VC2) and one exhaust penetration (1VC3 and 1VC4) are provided for purging the containment atmosphere. In modes 5 and 6, this purging mode is designed to refresh the containment atmosphere to acceptable levels and minimize the accumulation of any long-lived radioisotopes in the containment. In Mode 6, these penetrations are required to be operable which includes automatic closure of the valves. The operability and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential.

The ISI procedure requires compliance with 10CFR 50, Appendix J and the Technical Specifications. Appendix J requires recording of as-found test data. These valves are tested prior to entering mode 4 following a shutdown and every 6 months while at power. Once these valves are seated, as determined by a satisfactory LLRT, the penetrations have not failed the as-found administrative

Analysis of Occurrence (Cont'd)

or Appendix J leak rate acceptance criteria. Therefore, the valves performed their intended function to maintain containment integrity during power operation.

In modes 5 and 6, certain TS Action Statements such as inoperability of all AC Busses or Emergency Diesel Generators require that containment integrity be established. In these cases, a LLRT is required. These are the Action Statements under which the initial test of these valves are susceptible to failure since the valves are likely to have been cycled for purging operations. This is the mode under which the initial failure occurred on June 20, 1995. When attempting to establish containment integrity due to electrical action statements in modes 5 and 6, these valves are stroked and tested, and if the LLRT fails, the valve is stroked (i.e., no maintenance) and tested again. An unsuccessful second test would result in a corrective maintenance work order (WO) being generated for rework. Since 1988, two corrective maintenance WOs were generated for 1VC1, and 2. Based on the LLRT satisfactory leak rate test values, interviews with ISI personnel, and a recent vendor inspection and durometer reading on 2VC4, no trend is apparent which indicates a degradation of the seal due to aging or other factors.

The resilient rubber seats of the valves have not been replaced. To our knowledge, no other power plant uses these valves. The butyl rubber is heat treated and molded into the seat. The vendor originally estimated the installed life to be ten (10) to fifteen (15) years. More recent vendor estimates indicate that seal life may be higher depending on the frequency of cycle, environmental conditions, maintenance history, and radiation exposure. For these valves, the frequency of valve cycle is low, temperature conditions are mild, maintenance history is primarily actuator related only, and radiation exposure is low.

IE Circular 77-11, dated 9/6/77, addressed numerous reports on unsatisfactory performance of the resilient seats for the isolation valves in containment purge and vent lines. Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" was established to evaluate and establish appropriate testing frequencies for these valves. Excessive seat leakage in these valves is typically caused by severe environmental conditions and/or wear due to frequent use. As a result of Generic Issue B-20 and the long term resolution of Generic Issue B-24 "Containment Purging During Normal Plant Operations," it was determined that passive purge lines shall be administratively controlled during Modes 1 through 4 and tested at least once every six months to demonstrate their leak tight integrity.

Analysis of Occurrence (Cont'd)

A survey was performed of other nuclear power plants to determine what options were available for improved valve performance. The review of these options resulted in the determination that improved program controls to monitor the performance and reliability of the containment purge valve is the best available option at this time.

PRIOR SIMILAR OCCURRENCES

A review of previous LER's identified two instances of Mode changes with required safety systems inoperable due to administrative process deficiencies. The processes consisted of the "control of EQ surveillances" and "TS amendment implementation." Neither event had causes similar to this event. For further information, refer to LER 272/88-004 and 311/90-013. It is assumed (no validation review performed) that the IOP inadequacy may have caused previous similar occurrences.

There are similarities between the causes of this event and several other events at Salem. These events were discussed in the Enforcement Conference dated July 23, 1995. In particular, these causes include a less than adequate program implementation for ODs and the failure to promptly resolve component reliability issues. Specifically, in this case, the OD (dated 7/5/95) did not undergo proper peer reviews and the OD process was not properly coordinated with the IOP's. Similarly, prompt action was not taken to disposition the condition report (dated 6/21/95) associated with the containment purge valves. The lack of prompt action necessitated a supplement to this LER. The Station response to the Enforcement Conference issues will further address the corrective actions associated with these programmatic issues.

CAUSE OF THE CONDITION

The lack of managerial oversight and organizational breakdowns allowed for the existence of an inadequate Integrated Operating Procedure (IOP). The cause of this event was an inadequate IOP mode entry procedure (from Mode 5 to Mode 6). While the IOP does address the TS LCO for assuring purge system operability prior to core alteration, it does not require assuring that the containment purge and pressure/vacuum relief system valves are closed or operable prior to entry into Mode 6. In addition, the IOP does not require that the operator verify the impact of active ODs prior to mode change.

A significant causal factor included the inability of the containment purge valve to meet the LLRT acceptance criteria This led to several administrative actions (e.g., ODs) to ensure valve operability for TS "Closure" and "Integrity" Action Statements. The revised OD process was relatively new and its application had resulted in a less than adequate OD.

Cause of the Condition (Cont'd)

Other contributing causal factors included:

- inadequate procedures governing entries into the TSAS tracking log. This log was not updated to reflect the status of the degraded containment purge system nor was it used to record tracking action statements for a future mode. Consequently, the NSS and NCO were not aware of these restrictions. The tracking action statements are also currently logged in the "Control Room Unit Status" report by the Shift Supervisor; however, this computerized system was not available at the time the ODs were completed.

- lack of a clear procedural interface between the ODs and the TSAS tracking log. As a result there is inconsistency in the manner in which the interface is employed by each individual/shift.

- the planning/scheduling process failed to control or identify a Mode-restricting maintenance activity. Action requests were written on July 6 to perform stroke checks on 1VC1 and 1VC2 to ensure the required closure was obtained prior to entry into Mode 6. Mode 6 was entered on July 25 without any planning/scheduling restrictions or requirements. The work orders for 1VC1 and 1VC2 were initiated and planned, yet no outage schedule or "priority list" identified the need to perform the work prior to Mode 6.

- the absence of a mode change requirement to perform additional actions or reviews (e.g., Tech Specs, unavailable equipment, components off-normal (tagged) report) other than those specified in the IOP table for the mode change.

SAFETY SIGNIFICANCE

The reactor head was on the vessel at the time the containment purge system was in service and the purge system valves were closed prior to core alterations. The containment purge valves were closed at approximately 1716 hrs. on 7/26/95. The reactor head was lifted on 7/28/95 at approximately 0525 hrs. There were no industrial safety or radiological impacts associated with this event.

CORRECTIVE ACTIONS

The following Corrective Actions apply to both units.

1. The procedure which governs the requirement for entering tracking LCO's against equipment that is unavailable or inoperable for future modes has been revised. When operability issues exist, specific direction has been provided to ensure consistency in the tracking of the affected systems/equipment.

Corrective Actions (Cont'd)

2. A tracking AS was entered for the 1VC1 and 1VC2 for Mode 6 to ensure that the open and inspect work orders are completed in determining the cause for the leak rate failures. The OD was revised declaring the valves operable in modes 5 & 6. In addition, a review of open ODs was performed to assure degraded conditions imposing mode restrictions are incorporated into the tracking log.

3. The procedure, "Removing and Returning to Service of Safety Related Equipment" is being revised to incorporate the process for tracking action statements. Specifically, this revision includes the requirement to specify equipment that is removed from service for normal scheduled maintenance and equipment that becomes inoperable for other reasons (i.e. degraded conditions, ODs , failed surveillances, etc.). This revision includes modifications to the TSAS tracking form. In particular, the form includes entries for applicable TS and Modes; associated action requests and status, work orders, condition reports, design changes, and other documents/actions to be performed while the equipment is inoperable. Included also are those actions required prior to operability restoration. The above revision was implemented on 9/1/95.

4. MMIS has been revised to include an "Affects Mode change? Y/N" entry in the OD section of the Action Request. This information will be determined by an SRO during the review of the request.

5. System Engineering will establish improved program controls to monitor the performance of the containment purge valves. These program controls will be implemented prior to restart.

6. The requirement to comply with the LCO for the containment purge system was incorporated into the IOP on 9/22/95.

7. The planning/scheduling process will be revised to clearly address action requests that are conditionally tied to specific plant evolutions and incorporated into the scheduling process. The process will be changed as part of our ongoing efforts to support restart.

8. A Unit Coordinator (UC) position will be established in the revised work control process. The UC will review action requests with an SRO and specify conditional limitations (i.e. Mode restrictions, system operability, etc.), and schedule the work request accordingly.

9. The OD process was revised to include a mechanism to track additional/ contingency actions and identification of responsibility for those actions. This was completed on 8/30/95.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SALEM - Unit 1	05000272	95	-- 019	-- 01	8 OF 8

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Corrective Actions (Cont'd)

10. The applicable IOPs will be revised to include the requirement to review outstanding items that may impact an associated Mode change (i.e., OD log and Action Requests). The procedures for unit restart are currently on hold. These IOPs will be revised prior to their respective mode change. The IOPs applicable for defueling and refueling have been revised.

11. Required reading of the LER by all Licensed and Non-Licensed Operators and maintenance planners and schedulers will be conducted after issuance of the Supplemental LER. This is expected to be completed by 12/9/95.