

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Salem Generating Station - Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 3 1 1					PAGE (3) 1 OF 4					
TITLE (4) Both CS Header Isolation Valves Have Through Wall Cracks																				
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 NAMES				DOCKET NUMBER(S)							
1	0	3	1	8	8	8	8	0	2	2	0	0	1	1	1	6	8	8	Salem Unit 1	0 5 0 0 0 2 7 2
OPERATING MODE (9) 5			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																	
POWER LEVEL (10)		R E F		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)				
				20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)				
				20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 365A)				
				20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)				Information Only				
				20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)								
				20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)								
				20.405(a)(1)(vi)				50.73(a)(2)(iv)				50.73(a)(2)(x)								
LICENSEE CONTACT FOR THIS LER (12)																				
NAME M. J. Pollack - LER Coordinator										TELEPHONE NUMBER AREA CODE 6 0 9 3 3 9 - 4 0 2 2										
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																				
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC										
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)			MONTH	DAY	YEAR					
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO										

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

On 10/22/88 and 10/23/88 visual examination of the Containment Spray valves 21 & 22CS6 revealed cracks in the valve casting. Radiography and liquid penetrant (LP) examinations of the valve verified casting cracks. This was discovered with the unit in "Cold Shutdown". Analysis indicates the apparent cause of the CS6 valve cracks is attributed to transgranular stress corrosion cracking originating on the outside surface of the valve body. The failure did not involve the weld or the heat affected zone metal. It appears the cracking was induced by chlorides originating from historical Service Water (SW) System leakage from piping associated with No. 25 Containment Fan Coil Unit (CFCU), located above the CS6 valves. In 1982, No. 25 CFCU SW leakage occurred however, records of chloride/fluoride analysis could not be found. Admin. Procedure AP-21, "Mechanical Systems Cleanliness Program", Rev. 2 was in effect in 1982. Per the AP, it was not mandatory to check for chlorides or fluorides after cleaning a stainless steel surface. Currently, AP-21, Rev. 5 is in effect which does require requesting this analysis. The valves were replaced with piping spools until new valves can be obtained. Pipe welds in the vicinity of the #25 CFCU were LP tested. Random chloride swipes were taken on piping and components in the vicinity of the U-1 & U-2 CS6 valves. The inlet and outlet side of the U-1 CS6 valves were radiographed. Salem station management will issue a letter, to station supervisory personnel, addressing the need for continued compliance with AP-21.

IEZ

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station	DOCKET NUMBER	LER NUMBER	PAGE
Unit 2	5000311	88-022-00	2 of 4

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as {xx}

IDENTIFICATION OF OCCURRENCE:

Both Containment Spray System Header Isolation Valves (CS6) Valves Were Found To Have Through Wall Cracks

Event Date: 10/21/88

Report Date: 11/16/88

This report was initiated by Incident Reports 88-450 and 88-451.

CONDITIONS PRIOR TO OCCURRENCE:

Refueling Outage: Mode 5 Reactor Power 0% - Unit Load 0 MWe

DESCRIPTION OF OCCURRENCE:

On October 22, 1988 a visual examination of Containment Spray {BE} valve 22CS6 (Header Isolation Valve) revealed a 2 inch crack in the valve casting. On October 23, visual examination of the 21CS6 valve revealed a 2.5" crack with buildup of boric acid crystals. Radiography and liquid penetrant examinations of the valves verified casting cracks.

Although the Containment Spray System is not required to be operable in Mode 5, the casting cracks on the CS6 valves makes both trains of Containment Spray potentially inoperable. Subsequently, this was reported to the Nuclear Regulatory Commission within four hours as required by Code of Federal Regulations 10CFR 50.72(b)(2)(iii)(D).

APPARENT CAUSE OF OCCURRENCE:

Analysis by Maplewood Laboratories (reference Lab Report No. 72215) indicates the apparent cause of the CS6 valve cracks is attributed to transgranular stress corrosion cracking originating on the outside surface of the valve body. The failure did not involve the weld or the heat affected zone metal. The lab analysis indicated that the valve material was within the chemical requirements of A351 cast stainless steel, grade CF8.

Upon discovery of the cracking, random chloride swipes were taken on piping and components in the vicinity of the Unit 2 CS6 valves. Results indicated chloride contamination levels ranging up to 5.61 mg/dm². The maximum permissible limit for chlorides on a stainless steel component which has been cleaned as a result of foreign material surface contamination is 0.015 mg/dm².

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station	DOCKET NUMBER	LER NUMBER	PAGE
Unit 2	5000311	88-022-00	3 of 4

APPARENT CAUSE OF OCCURRENCE: (cont'd)

The results of the chloride analysis indicate that the cracking was induced by chlorides. Located above the CS6 valves is the No. 25 Containment Fan Coil Unit (CFCU) {BK}. Service Water System {BI} water is used in the CFCU's cooling coils as the medium for heat removal. Service Water is obtained from the Delaware River which has a high salt concentration. Significant Service Water leakage has occurred from this piping as documented in LER 82-074/01T, and LER 82-078/01X-1. A review of the 1982 records associated with the service water leakage did not reveal any chloride/fluoride analysis or request for analysis.

Administrative Procedure AP-21, "Mechanical Systems Cleanliness Program" specifies cleanliness classifications and the methods to maintain cleanliness standards. AP-21, Revision 2 was in effect in 1982 at the time of the No. 25 CFCU service water leakage. The requirements to request stainless steel surface analysis for chlorides/fluorides was not mandatory, after cleaning a stainless steel surface of foreign material. Currently, Revision 5 to AP-21 is in effect. This latest revision does include wording which specifically requires completion of a form requesting analysis for chlorides/fluorides after cleaning stainless steel components of foreign material surface contamination.

ANALYSIS OF OCCURRENCE:

The Containment Spray System is required to be operable in Modes 1, 2, 3, and 4 as per Technical Specification 3.6.2.1. The system is 100% redundant to the Containment Fan Coil Units in providing containment depressurization and cooling capability in the event of a Loss of Coolant Accident (LOCA). In addition the system sprays NaOH into the containment atmosphere to enhance iodine removal from the atmosphere after a LOCA. In Mode 5 (Cold Shutdown), the system is not required to be operable as per the Updated Final Safety Analysis Report (UFSAR).

The CS6 valves are locked open in Modes 1 - 4 to prevent their inadvertent closure if a design base accident were to occur. These valves are used to isolate the Containment Spray header nozzles from the rest of the system to support full flow testing and type "C" testing.

A preliminary engineering assessment of the valve cracks indicate that the system would have functioned in accordance with the UFSAR within the last fuel cycle. This is based upon a successfully completed full flow test conducted approximately two weeks prior to discovery of the cracks and the relatively small amount of observed leakage from the cracks (slight trickling).

Due to the relatively significant nature of having cracks on both valves, this event is being reported via the LER system for information.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station	DOCKET NUMBER	LER NUMBER	PAGE
Unit 2	5000311	88-022-00	4 of 4

CORRECTIVE ACTION:

The valves have been cut out of their line and have temporarily been replaced with piping spools until new valves can be obtained.

Pipe welds up and downstream of the CS6 valves as well as other area pipe welds were liquid penetrant (LP) tested. This included all Containment spray pipe welds from the Containment penetrations up to 10' above the top of the No. 25 CFCU. Of the 65 Containment Spray pipe weld LP tests, 16 were rejects due to rounded indications (pitting) that exceeded ASME code B31.7 criteria. This pitting is believed to be chloride induced. These areas were reworked by flapping and were retested with successful results. Of the remaining 22 non Containment Spray pipe welds, none failed LP testing.


Service Water System leakage has occurred from the other CFCUs, although, no piping or components are present below them which would warrant a stress corrosion cracking concern.

The inlet and outlet side of the Unit 1 CS6 valves were radiographed. Results were acceptable.

The chloride contaminated piping and components were cleaned to within the chloride contamination limit.

Salem Unit 1 CS6 valves and associated piping were also checked for chloride contamination. Results indicated levels significantly lower than found in Unit 2, however, these levels were still above the AP-21 acceptance criteria. The piping and components were cleaned to within the chloride contamination limit.

Salem station management will issue a letter, to station supervisory personnel, addressing the need for continued compliance with AP-21 as it pertains to the controls associated with maintaining mechanical systems and equipment cleanliness.


General Manager -
Salem Operations

MJP:pc

SORC Mtg. 88-101



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

Salem Generating Station

November 16, 1988

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

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-75
DOCKET NO. 50-311
UNIT NO. 2
LICENSEE EVENT REPORT 88-022-00

This Licensee Event Report is being submitted pursuant to the requirements of the Code of Federal Regulations 10CFR 50.73 for information only. This report is being submitted within thirty (30) days of discovery.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "L. K. Miller".

L. K. Miller
General Manager-
Salem Operations

MJP:pc

Distribution

IE22
11