

LICENSEE EVENT REPORT

CONTROL BLOCK / / / / / (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)
/0/1/ /V/A/N/A/S/1/ (2) /0/0/-/0/0/0/0/0/-/0/0/ (3) /4/1/1/1/1/ (4) / / / (5)
LICENSEE CODE LICENSE NUMBER LICENSE TYPE CAT
/0/1/ REPORT
SOURCE /L/ (6) /0/5/0/0/0/3/3/8/ (7) /0/3/0/5/8/2/ (8) /0/3/2/4/8/2/ (9)
DOCKET NUMBER EVENT DATE REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

/0/2/ /On March 5, 1982, with both units in Mode 1 at 100 percent power, the "A" Service /
/0/3/ /Water Return Header from the Unit 1 and 2 charging pumps and air compressors were /
/0/4/ /isolated to repair a pinhole leak in a return line. Since the header was restored/
/0/5/ /to operable status within 72 hours, the health and safety of the public were not /
/0/6/ /affected. This is contrary to T.S. 3.7.4.1 and reportable pursuant to T.S. /
/0/7/ /6.9.1.9.b. Similar events occurred on April 21, May 27, August 27 and September /
/0/8/ /5, 1981, which were reported via LERS 81-024, 81-046 and 81-071. /

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
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LER/RO REPORT NUMBER	EVENT YEAR	SEQUENTIAL REPORT NO.	OCCURRENCE CODE	REPORT TYPE	REVISION NO.			
(17)	/8/2/	/-/	/0/0/6/	/ \ /	/0/3/	/L/	/-/	/0/

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
/A/ (18)	/Z/ (19)	/Z/ (20)	/Z/ (21)	/0/0/0/0/ (22)	/Y/ (23)	/N/ (24)	/A/ (25)	/G/3/4/4/ (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

/1/0/ /A study has been completed by Lehigh University to determine the cause of the pin-/
/1/1/ /holes occurring on service water piping. This study indicated that the corrosion /
/1/2/ /was caused by aggressive water and, to a lesser degree, bacterial reduction of the/
/1/3/ /mild steel piping. The affected piping was cut out and a new section was welded /
/1/4/ /into place in the Service Water System. /

FACILITY STATUS	%POWER	OTHER STATUS	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
/1/5/	/E/ (28)	/1/0/0/ (29)	/ NA / (30)	/A/ (31) / Operator Observation /

ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
/1/6/	/Z/ (33)	/Z/ (34)	/ NA /

PERSONNEL EXPOSURES NUMBER	TYPE	DESCRIPTION (39)
/1/7/	/0/0/0/ (37)	/Z/ (38)

PERSONNEL INJURIES NUMBER	DESCRIPTION (41)
/1/8/	/0/0/0/ (40)

LOSS OF OR DAMAGE TO FACILITY TYPE	DESCRIPTION (43)
/1/9/	/Z/ (42)

PUBLICITY ISSUED	DESCRIPTION (45)	NRC USE ONLY
/2/0/	/N/ (44)	/ NA /

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Description of Event

On March 5, 1982, with both units in Mode 1 at 100 percent power, the "A" Service Water Return Header from the Unit 1 and Unit 2 charging pumps and air compressors was isolated to repair a pinhole leak in return line 4"-WS-57-151-Q3. The "B" Service Water Return Header from the charging pumps and air compressors remained in service while the "A" header was being repaired.

Probable Consequences of Occurrence

Since service water was returned from the charging pumps and air compressors by the "B" header and since the "A" header was restored to operable status within 72 hours as required by the Action Statement, the health and safety of the general public were not affected.

Cause of Event

A study has been completed by Lehigh University to determine the cause of the pin holes occurring on service water piping. This study indicated that the corrosion was caused by a combination of "aggressive water" and bacterial reduction of the mild steel piping. Lake Anna water analysis shows that there is a very low dissolved solids content and the water has a high affinity to dissolve whatever it contacts. In addition, the total alkalinity and hardness levels are very low. All of this contributes to the water being very aggressive or corrosive to metal piping. This corrosive activity is further increased by aerating the service water through the spray system. This provides oxygen to the system which aids the corrosion process. This study estimated that 80 percent of the corrosion present in the Service Water System is attributed to the aggressive water process.

The biological investigation provided positive indication of three types of bacteria in service water which cause corrosion. These are sulfate reducers (sulfide producers), ensheathed iron bacteria and filamentous iron bacteria. The study indicated that 20 percent of the corrosion present is attributed to this bacteria.

Immediate Corrective Action

The affected piping section was cut out and a new section was welded into place in the service water system using approved procedures. The replaced welds were liquid penetrant and hydrostatically tested prior to returning the header to service.

Scheduled Corrective Action

A chemical treatment program has commenced based on recommendations made by the consultants to inhibit further corrosion of the Service Water System.

Actions Taken to Prevent Recurrence

Further chemical treatments are scheduled to provide corrosion inhibition against further degradation of the service water system. Equipment and piping which has been degraded beyond acceptable limits will be replaced during major plant outages.

Generic Implications

This failure is generic to both units at North Anna Power Station. Plans are now being formulated to arrest further degradation of the system and restore or replace damaged material. Meanwhile, it is felt that no gross failures will occur since failures of this nature produce small pin hole leaks which are randomly located in the piping.