

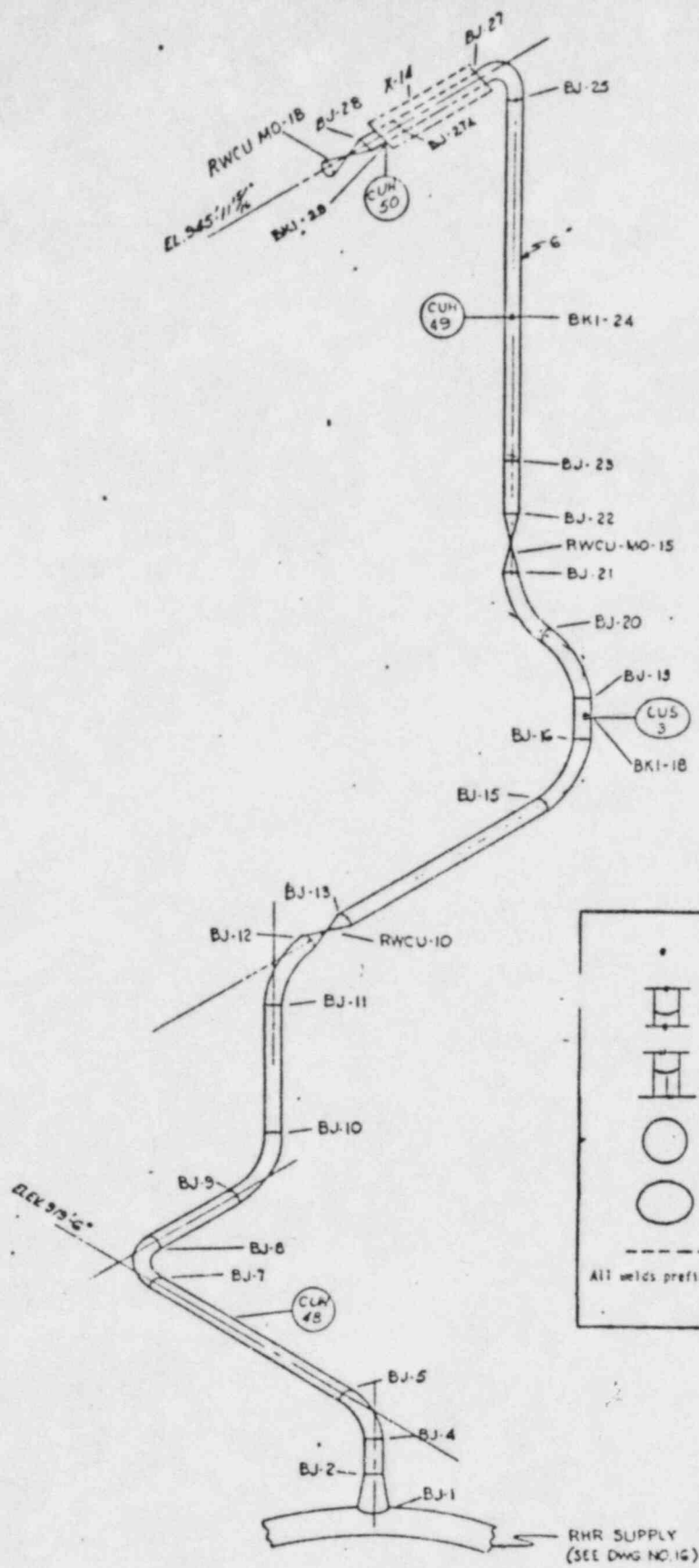
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CON'TEVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

402-825-3811

NRC USE ONLY Y



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|-----|---|
| • | : Weld |
| | : Circumferential weld |
| | : Long Seam weld |
| | : Hanger Location and Number (BA2 Category) |
| | : Seismic Restraint and Number (BA2 Category) |
| --- | : Exempt Piping |

All welds prefixed by CWK-

REVISION NO. 2-11-84

| | | | |
|------------------------------|-------------|---|-----------------|
| GENERAL ELECTRIC | | DATE: 11-1-84 | BY: [Signature] |
| MODEL: NONE | REV: 4-6-78 | TITLE: CLEAN UP COOPER NUCLEAR STATION | |
| REFERENCE: JULCO INC. 1003-1 | | JULCO INC. 1003-1 | |



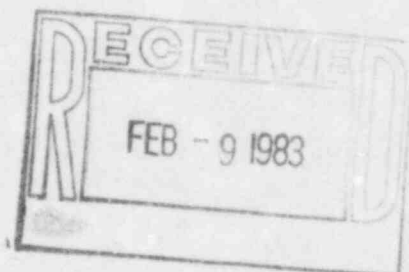
Nebraska Public Power District

COOPER NUCLEAR STATION
P.O. BOX 98, BROWNVILLE, NEBRASKA 68321
TELEPHONE (402) 825-3811

CNSS830073

February 3, 1983

Mr. John T. Collins, Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011



Dear Sir:

This amended report is submitted in accordance with Section 6.7.2.B.4 of the Technical Specifications for Cooper Nuclear Station and discusses a reportable occurrence that was discovered on June 7, 1982. An amended licensee event report form is also enclosed.

Report No.: 50-298-82-14-01
Report Date: February 3, 1983
Occurrence Date: June 7, 1982
Facility: Cooper Nuclear Station
Brownville, Nebraska 68321

Identification of Occurrence:

A condition was discovered which indicated an abnormal degradation of the Class IN Reactor Water Clean-up (RWCU) System pressure boundary inside primary containment.

Conditions Prior to Occurrence:

The reactor was in the refueling mode of operation.

Description of Occurrence:

During the scheduled replacement of RWCU-MO-15, a six inch 900 pound austenitic stainless steel Anchor Darling gate valve, rejectable indications were detected in the heat affected zones (HAZ) of welds BJ-20 and 23 (reference CNS ISI Drawing #3). The indications were detected by liquid penetrant examination on the inside diameter of welds BJ-20 and 23 near the valve. Subsequent examination of the balance of six inch welds on the RWCU line also produced rejectable indications in welds BJ-13 and 15. The rejectable indications in welds BJ-13 and 15 were detected by ultrasonic (UT) examination.

Designation of Apparent Cause of Occurrence:

The cause of the indications in BJ-13 and 15 were attributed to improper fabrication techniques and are not considered service induced. The rejectable transverse indication in weld BJ-13 was present on the

IE22
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original construction radiograph while weld BJ-15 was rejectable due to lack of fusion in the weld joint.

The failure mode in welds BJ-20 and 23 has been identified as Intergranular Stress Corrosion Cracking (IGSCC), due to weld joint sensitization. Failure analysis was performed by Rockwell International under the direction of the Electric Power Research Institute (EPRI). A detailed report is available from EPRI.

Analysis of Occurrence:

The RWCU System provides a method of purifying the primary coolant water by continuously removing a portion of the Reactor Recirculation (RR) System flow from RR "A" loop via a 20" Residual Heat Removal (RHR) System suction line. RWCU piping and fittings are 6" schedule 80, Type 304 austenitic stainless steel.

BJ-20 had several circumferential indications in its HAZ. Two transverse indications were present in the HAZ of BJ-23. At the time of occurrence, there was speculation that the indications were IGSCC. This has been verified through failure mode analysis conducted by the Rockwell International Science Center for EPRI. This analysis has determined the cause of IGSCC to be weld joint sensitization, therefore it is concluded that failure was not service induced. These two weld failures are the first cases of IGSCC in this plant.

One hundred percent of accessible six inch welds from the upstream weld on the outboard isolation valve (RWCU-MO-18) to the attachment weld on the 20" RHR suction line were examined by UT. The UT procedure used was the same procedure that is used to detect IGSCC. Examiners qualified to this procedure had previous training on cracked pipe specimens exhibiting IGSCC. Due to their microstructure, austenitic stainless steels have a "leak before break" characteristic. Therefore, had the indications degraded to a "leak before break" condition, drywell leak detection systems would have detected such leakage.

The reactor was in the refueling mode of operation when this event was discovered. This occurrence presented no adverse consequences concerning public health and safety.

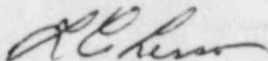
Corrective Action:

The piping and fittings affected by the rejectable welds were replaced. The pipe was replaced by material identical to that used in construction. Fittings used were Type 304L, low carbon nuclear grade fittings rather than the Type 304 fittings used in plant construction. Measures were taken to control heat input to the replacement welds, to avoid sensitization of the weld joints.

Mr. John T. Collins
February 3, 1983
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The scope of Augmented ISI for the 1983 refueling outage is being increased in view of cracking being experienced in primary coolant, service sensitive piping at other operating BWRs.

Sincerely,

A handwritten signature in cursive script, appearing to read "L. C. Lessor".

L. C. Lessor
Station Superintendent
Cooper Nuclear Station

LCL:cg
Attach.