

TENNESSEE VALLEY AUTHORITY  
CHATTANOOGA, TENNESSEE  
37401



October 2, 1974

50-259

Mr. Edson G. Case  
Acting Director of Licensing  
Office of Regulation  
U.S. Atomic Energy Commission  
Washington, DC 20545

Dear Mr. Case:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 1 -  
DOCKET NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - ABNORMAL  
OCCURRENCE REPORT BFAC-50-259/7449W

The enclosed report is to provide details concerning a 1-inch,  
stainless-steel recirculation system flow sensing line which failed  
at the toe of a fillet weld where it attached to a 6,000-pound  
half coupling and is submitted in accordance with Appendix A to  
Regulatory Guide 1.16, Revision 1, October 1973. This event  
occurred on Browns Ferry Nuclear Plant unit 1 on September 22,  
1974.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*E. F. Thomas*  
for E. F. Thomas  
Director of Power Production

Enclosure  
CC (Enclosure):

Mr. Norman C. Moseley, Director  
Region II Regulatory Operations Office, USAEC  
230 Peachtree Street, NW., Suite 818  
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## ABNORMAL OCCURRENCE REPORT

Report No.: BFAO-50-259/7449W  
Report Date: October 2, 1974  
Occurrence Date: September 22, 1974  
Facility: Browns Ferry Nuclear Plant unit 1

### Identification of Occurrence

A 1-inch, stainless-steel recirculation system flow sensing line failed at the toe of a fillet weld where it attached to a 6,000-pound half coupling. The half coupling was attached to the 28-inch recirculation line on "A" loop. This instrument line is the static pressure tap for flow element 68-5 on the "A" recirculation pump discharge line.

### Conditions Prior to Occurrence

The reactor was in the cold shutdown mode during a scheduled outage.

### Description of Occurrence

Contaminated water was found in the drywell during an inspection of the "A" recirculation pump discharge isolation valve bypass line. An investigation revealed that the failure was leaking reactor water from a 1-inch, stainless-steel recirculation flow sensing line adjacent to the fillet weld at the half coupling. The water leak was stopped by externally applying pressure to the sensing line in a direction that closed the crack. Proper radiological safety precautions were taken to assure that personnel working inside the drywell would not receive unacceptable radiation dosages.

### Designation of Apparent Cause of Occurrence

The line was improperly supported and vibration generated by the recirculation flow exceeded the vibration fatigue limit of the line.

### Analysis of Occurrence

There was no damage to systems, components, or structures as a result of the crack. There was no jeopardy to reactor safety as adequate safety systems were operable. There were no adverse effects on the health or safety of the general public, and no personnel injuries or abnormal radiation exposure were experienced.

### Corrective Action

The leak was repaired by installing a fixture consisting of a split sleeve fabricated from 304 stainless steel which encompassed the crack. The sleeve was TIG welded using 308 filler rod. The root pass and final pass were liquid-penetrant tested, and a hydrostatic test at 1,326 psi was successfully accomplished. A pipe hanger analysis was performed for all recirculation flow sensing lines to determine the hanger adequacy. Hanger modifications were made as required to provide proper support.

### Corrective Action (continued)

During insulation removal to inspect the sensing lines, a second leak was discovered at a valve vent weld on recirculation valve 68-1. This leak was repaired by removing the 45° elbow and pipe where the leak had occurred and installing a new section of pipe. The removed section of pipe will be given thorough metallurgical examination to determine the mechanism of this failure.

After the discovery of this second leak, an extensive inspection program (which included all instrument sensing lines, vent, drain, and packing leak-off lines on principal piping isolation valves inside the drywell) was performed. The inspection included a liquid-penetrant examination of the instrument line welds where they connect to the principal piping; liquid-penetrant examinations of welds on valve vent, drain, and packing leak-off lines; and a design review of all these lines for proper support. Additional supports were installed as needed. Nondestructive examinations revealed discontinuities in three additional locations. A lack of fusion on the final pass of one weld in the bonnet vent valve line on valve No. 68-3, two linear indications in one test connection on valve No. 74-68, and an incomplete weld in the drain line on valve No. 68-1 were discovered. Repairs were made by grinding out discontinuities and rewelding. A similar inspection program will be performed on unit 2 when the unit is shut down for the inspection required by RO Bulletin 74-10.

### Failure Data

There is no previous record of vibration fatigue failure on the recirculation system.