

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Browns Ferry Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 2 6 0	PAGE (3) 1 OF 4
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TITLE (4)
Rust Found in Lower Containment Spray Header Due to Leaking Isolation Valves

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)
0	5	2 7 8 8	8 8	0 0 3	0 0 0	0	6	2 4 8 8			0 5 0 0 0
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)											

OPERATING MODE (9) N	20.402(b)	20.406(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 0 1 0	20.406(a)(1)(i)	50.38(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.406(a)(1)(ii)	50.38(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iii)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)	Information LER
	20.406(a)(1)(iv)	50.73(a)(2)(iii)	50.73(a)(2)(viii)(B)	
	20.406(a)(1)(v)	50.73(a)(2)(ix)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Richard L. Baker, Engineer, Plant Operations Review Staff	TELEPHONE NUMBER AREA CODE 2 0 5 7 2 9 - 2 5 3 8
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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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

This report is being submitted as an information only LER.

On January 15, 1988, at 1100 hours, water was observed flowing from the lower containment spray header in the unit 2 drywell. At the time the water was discovered the residual heat removal (RHR) system was aligned for a hydrostatic pressure test. When the header was drained it was noted that some of the water appeared to have been in the header for quite some time. It was this apparent long-term presence of water in the containment spray header that prompted the investigations and inspections that revealed two spray nozzles with 20 percent of their sparger holes clogged with rust particles and loose rust in the unit 2 lower containment spray header. On May 27, 1988, it was determined that the rust in the header had the potential of degrading the containment spray function of the RHR system on unit 2. Leaking isolation valves and the extended outage is the cause of rust in the header.

The immediate corrective action was to stop the performance of the hydrostatic pressure test, depressurize the system, and drain the lower containment spray header. Visual inspections were performed on the units 1, 2, and 3 containment spray headers. These inspections have identified a 170 degree circumference of the unit 2 lower containment spray header as the only problem area. The nozzles on the unit 2 lower containment spray header have been removed and cleaned. The unit 2 lower containment spray header is to be cleaned and the isolation valves are to be adjusted or repaired as required to stop leakage into the header. The unit 2 lower containment spray header piping wall thickness is to be measured to ensure adequate pipe integrity.

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

DESCRIPTION OF EVENT

Immediately prior to this event all three Browns Ferry units were in cold shutdown with all fuel removed. On January 15, 1988, at 1100 hours, water was observed flowing from the lower containment spray header in the unit 2 drywell. At the time the water was discovered the residual heat removal (RHR) system (EIIS code B0) was aligned for a hydrostatic pressure test. The water was leaking past the lower containment spray header inboard isolation flow control valve (FCV) (EIIS code ISV), 2-FCV-74-61. The hydrostatic test was stopped, the system was depressurized and the lower containment spray header was drained. When the header was drained it was noted that some of the water appeared to have been in the header for quite some time. It was this apparent long-term presence of water in the containment spray header that prompted the inspection of the containment spray headers. The inspection revealed two spray nozzles (with seven sparger holes each) on the unit 2 lower containment spray header with 20 percent of their sparger holes clogged with rust particles. The inspection also revealed loose rust in the unit 2 lower containment spray header.

CAUSE OF EVENT

The RHR system was aligned for the performance of a hydrostatic pressure test and was at a test pressure of 580 psig for 20 minutes when water was observed leaking from three of the lower containment spray header nozzles. The lower containment spray header is arranged such that any water that leaks or flows past the inboard isolation valve, FCV-74-61, will be readily admitted into the normally vented header. No drains exist on the header, therefore any water allowed into the header will remain there until evaporated. The combination of the leaking isolation valves and the extended outage is the cause of rust in the header.

ANALYSIS OF EVENT

During operation the drywell is purged of oxygen and inerted with nitrogen. This reduces the corrosion of the piping in the drywell such as the vented containment spray headers. Also, during operation the drywell is maintained at temperatures between 135°F and 150°F. These temperatures would cause the water allowed into the header to be evaporated rather quickly. However, during extended outages, as unit 2 is presently in, the drywell is not inerted and it is at or near ambient temperature. There are 160 nozzles with 7 sparger holes each on the unit 2 lower containment spray header. There were two (2) spray nozzles found with 20 percent of their sparger holes clogged with rust particles. No other nozzles were found with clogged sparger holes. However, layers of loose flakes of rust were found in the

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

header and loose flakes of rust were found in 30 to 40 percent of the nozzles on the unit 2 lower containment spray header. Each containment spray header is designed to deliver 9150 gallons per minute (GPM) through the 160 nozzles attached to the header. 158 of the nozzles on the unit 2 lower containment spray header and all 160 nozzles on the unit 2 upper containment spray header, which is the redundant header, were available to pass rated flow. The nozzle assembly consists of a nozzle body and seven removable fulljet spray caps. Each cap has an internal vane which is designed to break up and clear particles which could block the hole in the spray cap. Once flow is established through each spray nozzle, clearing of the spray nozzle by the action of the vanes inside can occur. This clearing action was confirmed by testing by another utility. This utility also performed a study, which indicated that only 6 percent of the nozzles were required for the containment spray function of the RHR system to be operable.

Although the rust found in the unit 2 lower containment spray header and nozzles could have reduced the containment spray function of the RHR system, there is reasonable assurance that the required cooling would have been delivered. The containment spray function of the RHR system is considered to have been operable. Therefore this report is being submitted as an information only LER.

CORRECTIVE ACTION

The immediate corrective action was to stop the performance of the hydrostatic pressure test, depressurize the system, and drain the lower containment spray header. Visual inspections were performed on the units 1, 2, and 3 containment spray headers. These inspections have identified a 170 degree circumference of the unit 2 lower containment spray header as the only problem area. The nozzles on the unit 2 lower containment spray header have been removed and cleaned. The unit 2 lower containment spray header was flushed with a low flow of demineralized water and the exiting water was strained through a screen with 1/16-inch openings. Only four (4) flakes of rust were flushed out of the header. The unit 2 lower containment spray header was dried out with a flow of air and another visual inspection of the header was performed. From this inspection it was determined that the rust in the header was loosely adhered and had the potential of degrading the lower containment spray header. The unit 2 lower containment spray header is to be cleaned to remove the potential of having more loose flakes of rust in the header. The inboard and outboard isolation valves for the unit 2 lower containment spray header are to be adjusted or repaired as required to stop leakage into the header. The unit 2 lower containment spray header piping wall thickness is to be measured to ensure adequate pipe integrity.

PREVIOUS SIMILAR EVENTS - None

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

COMMITMENTS - The nozzles on the unit 2 lower containment spray header have been removed and cleaned.

The unit 2 lower containment spray header is to be cleaned prior to the unit 2 startup to remove the potential of having more loose flakes of rust in the header.

The inboard (FCV-74-61) and the outboard (FCV-74-61) isolation valves for the unit 2 lower containment spray header are to be adjusted or repaired prior to the unit 2 startup as required to stop leakage into the header.

The unit 2 lower containment spray header piping wall thickness is to be measured prior to the unit 2 startup to ensure adequate pipe integrity.

TENNESSEE VALLEY AUTHORITY

Browns Ferry Nuclear Plant
Post Office Box 2000
Decatur, Alabama 35602

JUN 27 1988

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

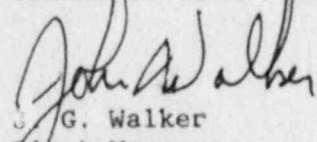
Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 2 - DOCKET
NO. 50-260 - FACILITY OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT
BFRO-50-260/88003

The enclosed report provides details concerning the rust found in the lower
containment spray header due to leaking isolation valves. This licensee event
report is being submitted for information only.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


J. G. Walker
Plant Manager
Browns Ferry Nuclear Plant

Enclosures

cc (Enclosures):

Regional Administration
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30303

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

NRC Resident Inspector, Browns Ferry Nuclear Plant

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