

Southern Nuclear Operating Company  
Post Office Box 1295  
Birmingham, Alabama 35201  
Telephone 205 868-5086



Southern Nuclear Operating Company

*the southern electric system*

J. D. Woodard  
Vice President  
Farley Project

June 22, 1992

10 CFR 50.73

Docket No. 50-364

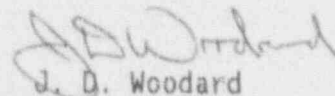
U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Joseph M. Farley Nuclear Plant - Unit 2  
Licensee Event Report No. LER 92-007-00

Gentlemen:

Joseph M. Farley Nuclear Plant, Unit 2, licensee Event Report No. LER 92-007-00 is being submitted in accordance with 10 CFR 50.73. If you have any questions, please advise.

Respectfully submitted,

  
J. D. Woodard

JDW/EFB:map 2659

Enclosure

cc: Mr. S. D. Ebner  
Mr. G. F. Maxwell

9206290187 920622  
PDR ADOCK 05000364  
S PDR

TE22  
11

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Joseph M. Farley Nuclear Plant - Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 3 6 4				PAGE (3) 1 of 4					
TITLE (4) Reactor Manually Tripped Following Loss of Steam Generator Feed Pump																			
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)									
MONTH	DAY	YEAR	YEAR	SEQ NUM	REV	MONTH	DAY	YEAR	FACILITY NAMES				DOCKET NUMBER(S)						
0 5	2 5	9 2	9 2	0 0 7	0 0	0 6	2 2	9 2					0 5 0 0 0						
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)																	
1		20.402(b)				20.405(c)				<input checked="" type="checkbox"/> 50.73(a)(2)(iv)				73.71(b)					
POWER LEVEL		1 0 0				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)				OTHER (Specify in Abstract below)					
		20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)									
		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)(x)									
LIC. SEE CONTACT FOR THIS LER (12)																			
NAME R. D. Hill, General Manager - Nuclear Plant										TELEPHONE NUMBER 205 899-5156									
COMPLETE ONE LINE FOR EACH FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORT 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 (16)																			

At 0545 on 5-25-92, while operating at 100 percent power, the Unit 2 reactor was manually tripped following the loss of the 2A steam generator feedwater pump (SGFP). The 2A SGFP tripped due to low auto stop oil pressure. Investigation revealed that the low auto stop oil pressure was caused by excessive water in the lube oil system for the 2A SGFP. The water intrusion into the lube oil system is believed to have been partially caused by shaft leakage while the SGFP was not rotating. Investigations are continuing to determine other possible sources of water intrusion.

The 2A SGFP bearing oil seals were replaced to reduce shaft leakage into the oil system through the bearing housing. All lube oil pumps for the 2A SGFP were disassembled, cleaned, inspected, repaired and reassembled. The oil sump was cleaned and filled with new oil. The bearing oil pressure, auto stop oil pressure, oil pump discharge pressure and the oil pump control circuit voltage were instrumented with recorders for monitoring. The 2A SGFP was returned to service. A portable oil cleaning/water removal unit has been attached to the 2A SGFP oil system and water removal is being monitored while investigation is continuing into the source of water in the oil.

The unit returned to power operation at 0549 on 05-26-92.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
Joseph M. Farley Nuclear Plant - Unit 2	05000364	92	007	00	2	OF 4

TEXT

Plant and System Identification

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System codes are identified in the text as [XX].

Summary of Event

At 0545 on 5-25-92, while operating at 100 percent power, the Unit 2 reactor was manually tripped following the loss of the 2A steam generator feedwater pump (SGFP). The 2A SGFP tripped due to low auto stop oil pressure. Investigation revealed that the low auto stop oil pressure was caused by degradation of the lube oil pumps and excessive water in the lube oil system for the 2A SGFP [SL]. The water intrusion into the lube oil system is believed to have been partially caused by shaft leakage while the SGFP was not rotating. Investigations are continuing to determine other sources of water intrusion.

Description of Event

Unit 2 was operating at 100 percent power on 5-25-92 when the 2A SGFP miscellaneous annunciator alarmed at 0544. The 2A SGFP speed was decreasing so a ramp down was initiated in accordance with FNP-2-AOP-13.0 (Loss of Main Feedwater). However steam generator water levels continued to decrease and the reactor was manually tripped at 0545 on 5-25-92.

Following the trip, the operators implemented FNP-2-EOP-0 (Reactor Trip or Safety Injection) and FNP-2-ESP-0.1 (Reactor Trip Response). The unit was maintained in a stable condition in Mode 3 (Hot Standby).

After the reactor trip, it was determined that the 2A SGFP had tripped due to low auto stop oil pressure. It was noted that both AC bearing oil pumps for the 2A SGFP were running which indicated that a drop in system pressure had occurred. An investigation was performed to determine the cause of the trip. The auto stop oil and low bearing oil pressure set points were tested. The mechanical system was reviewed to consider possible blockages or other items which could affect control oil pressure. This included inspecting the bearing oil relief back pressure regulator, and inspecting the lube oil strainers for blockage. Additionally the trip logic and the bearing oil pump start logics were checked. These checks did not reveal a conclusive cause of the feed pump trip. Therefore, a monitoring plan, which included installing instrumentation devices for various parameters, was developed to verify the proper operation of the SGFP to the extent possible before returning to power.

The unit returned to power operation at 0549 on 5-26-92.

Operation of the 2A SGFP and its oil system was monitored during reduced power operations. No anomalies of the oil system were observed during this time period. The decision was made to return to full power operation.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQ NUM	REV			
Joseph M. Farley Nuclear Plant - Unit 2	05000364	92	007	00	3	OF	4

TEXT

At 0358 on 05-29-92, with the unit at 72 percent power, the 2A SGFP tripped again on low auto stop oil pressure. The 2A SGFP trip did not result in a reactor trip. The instrumentation installed for monitoring the SGFP indicated that the auto stop oil and bearing oil pressure had spiked low causing the trip. The feedwater pump was isolated for maintenance and an inspection of the oil system revealed water in the lube oil system and degradation of the oil pumps. The dip in oil pressure is believed to have been caused by the running lube oil pump taking a "slug" of water into its suction from the excessive water in the SGFP lube oil sump. A rapid change in viscosity from oil to water would cause the discharge pressure to drop. It is believed that a significant contributor to water in the lube oil system was from SGFP shaft seal leakage into the pump bearing housings.

The 2A SGFP and its lube oil system were inspected, repaired and returned to service. Additional water ingress was experienced. Subsequent investigation has discovered another water source to be condensation from steam on the turbine shaft being trapped by insulation and drawn into the oil. Removal of portions of this insulation has greatly reduced the overall water intrusion. Investigations are continuing to determine other sources of this ingress.

Cause of Event

Investigation and testing indicates that excessive water in the lube oil system caused the 2A SGFP to trip due to low auto stop oil pressure. The 2A SGFP trip on 05-25-92 resulted in a manual reactor trip.

Reportability Analysis and Safety Assessment

This event is reportable because of the actuation of the reactor protection system. After the trip, the following safety systems operated as designed:

- Main feedwater was isolated by automatic closure of the flow control valves and bypass valves,
- Auxiliary feedwater pumps started automatically and provided flow to the steam generators, and
- Pressurizer heaters and spray valves operated automatically as required to maintain system pressure.

The source range nuclear detectors were manually energized prior to reaching the automatic reset setpoint.

There was no effect on the health and safety of the public.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)  Joseph M. Farley Nuclear Plant - Unit 2	DOCKET NUMBER (2)  05000364	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQ NUM	REV		
		92	007	00	4	OF 4

TEXT

Corrective Action

The 2A SGFP bearing oil seals were replaced to reduce shaft leakage into the oil system through the bearing housing. All lube oil pumps for the 2A SGFP were disassembled, cleaned, inspected, repaired and reassembled. The oil sump was cleaned and filled with new oil. The bearing oil pressure, auto stop oil pressure, oil pump discharge pressure and the oil pump control circuit voltage were instrumented with recorders for monitoring. The 2A SGFP was returned to service. A portable oil cleaning/water removal unit has been attached to the 2A SGFP oil system and water removal is being monitored while investigation is continuing into the source of water in the oil.

Additional Information

This event would not have been more severe if it had occurred under different operating conditions.

No similar events have been reported by FNP.