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JAFP-90-0525

United States Nuclear Regulatory Commission
Document Control Desk
Mail Station PL-137
Washington, D.C. 20555

SUBJECT: DOCKET NO. 50-333
LICENSEE EVENT REPORT: 90-016-01
Shutdown Cooling System
Isolations

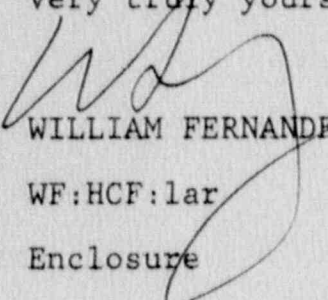
Dear Sir:

Enclosed is Revision 1 to the Licensee Event Report which was originally submitted in accordance with 10 CFR 50.73(a)(2)(iv) on May 23, 1990.

This supplemental report provides the results of the vendor examination of the pressure switch. The vendor did not find evidence of deficiencies in the switch which initiated the isolation.

Questions concerning this report may be addressed to Mr. Hamilton Fish at (315) 349-6013.

Very truly yours,


WILLIAM FERNANDEZ

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Enclosure

cc: USNRC, Region I
USNRC Resident Inspector
INPO Records Center
American Nuclear Insurers

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) JAMES A. FITZPATRICK NUCLEAR POWER PLANT	DOCKET NUMBER (2) 0 5 0 0 0 3 3 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 388A's) (17)

UPDATE REPORT - PREVIOUS REPORT SUBMITTED 05/23/90

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Description

The reactor was shutdown for a refueling outage on March 31, 1990. The reactor vessel head was removed for refueling. The Shutdown Cooling (SDC) mode of the Residual Heat Removal (RHR) [B0] is used during the outage to remove decay heat to maintain the reactor coolant below 212°F.

The piping system and heat exchangers of the SDC are rated for low pressure (compared to normal reactor operating pressure) service. The low pressure RHR system must be protected from exposure to normal reactor operating pressure because the system takes suction from and discharges to the reactor water recirculation system (RWR) [AD] piping which is connected directly to the reactor vessel. This overpressure protection is accomplished by isolation signals which close suction isolation valves (10MOV-17 and -18) on the SDC system when reactor pressure exceeds a setpoint of less than or equal to 75 psig reactor dome pressure (Technical Specification Table 3.2-1).

Startup of the A side of the RHR system was in progress on April 24, 1990. Upon start of the pump and opening of the discharge valve (10MOV-27A), an automatic isolation signal closed the suction valves from the reactor water recirculation system at 2200. The cause of the high pressure signal was false because with the reactor vessel head removed, the reactor pressure could not exceed 0 psig compensated for static head. The SDC was placed in service 2 hours, 51 minutes later at 0051 on April 25.

Later on April 25 it was necessary to transfer from RHR pump A to RHR pump C for collection of test data on pump operation. Both pumps are in the same subsystem. Following transfer to pump C, as flow was being increased by opening the RHR system discharge valve (10MOV-27A), the suction valves 10MOV-17 and -18 closed and the pump tripped at 1207. SDC was restored to service 4 hours, 18 minutes later at 1625.

An investigation of the root cause involved numerous test runs of the system from May 9 through May 14, 1990. Venting of a dead leg ended the chattering of a pressure switch which initiated the isolations. To determine whether or not there was some problem within the switch itself which caused the chattering, it was replaced and returned to the manufacturer for failure analysis. The analysis did not explain the chattering and did not find evidence of a defect in the switch.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)

JAMES A. FITZPATRICK
NUCLEAR POWER PLANT

DOCKET NUMBER (2)

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TEXT (If more space is required, use additional NRC Form 308A's) (17)

Cause

A series of six test runs using controlled variables and identical pressure switches installed in parallel produced repeatable results. The test results showed that isolation signals were being caused by a chattering pressure switch. The system pressure oscillation at pump discharge as measured by test instrumentation was only 5 psi. A pressure transient of at least 45 to 60 psi above reactor pressure at the time of the SDC system initiations would have been required to isolate the system. A duplicate switch connected in parallel did not chatter. Venting of a dead leg to the chattering switch eliminated the chattering condition during the next test run. No isolation signals were received on succeeding test runs. Therefore, the presence of a small air bubble in the pressure switch may have been the cause of the SDC system isolations for the two events of this LER and of the isolations reported in LERs 90-002 and 90-011. Vendor examination of the switch did not explain the chattering and did not find evidence of a defect in the switch. The examination did not find evidence of gas penetration of the Kapton primary diaphragms identified in previous vendor 10 CFR 21 notices.

Analysis

Shutdown cooling system isolation logic actuation is reportable under the provisions of 10CFR50.73(a)(2)(iv) as an activation of an engineering safety feature [JE]. This high reactor pressure permissive safety feature was not needed because the reactor vessel head was removed. Thus, reactor pressure (compensated for static head) could not exceed atmospheric pressure. There were no system or equipment failures. The shutdown cooling system isolation was performed in accordance with design. The SDC was restarted at 2 hours, 51 minutes after the first isolation and 4 hours, 18 minutes after the second isolation. The system could have been restarted more rapidly if it had been required. Because the reactor had been shutdown for 24 days, there was no significant interruption in the removal of decay heat.

Corrective Action

1. The SDC was restarted after each isolation.
2. A testing program was initiated to assist with determination of the cause of the isolation.
3. As a result of the test program, one of the two pressure switches that initiate isolation signals was replaced. The switch which was removed was returned to the manufacturer to determine if a root cause within the switch could have resulted in the chattering. No problems were found in the switch.
4. Instrument Surveillance Test procedures have been revised to include venting of the pressure switches 02PS-128A and B.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Additional Information

Component: Pressure Switch
Function: RHR Interlock - Protect RHR from Reactor Pressure
Plant Identification: 02PS-128A
Manufacturer: Static-O-Ring Company
Model: 6N6-BB5-NX-CIA-JJTTX6
Design Data: 1500 psig, 125 VDC, 0.8 amp
Setpoint: 97 psig (Nominal)
NPRDS Component Code: IBISSW
NPRDS Vendor Code: S382

Related LERs: 90-002 and 90-011 describe similar isolations of the Shutdown Cooling system due to the RHR interlock pressure switch signals.