

CATEGORY

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ACCESSION NBR:9610290012 DOC.DATE: 96/10/21 NOTARIZED: NO
 FACIL:50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.
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DOCKET #
05000270

SUBJECT: LER 96-003-00:on 960921,TS required shutdown occurred.Due to inadequate work planning.Spare motor was installed & tested satisfactorily.W/961021 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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DUKE POWER

October 21, 1996

U.S. Nuclear Regulatory Commission
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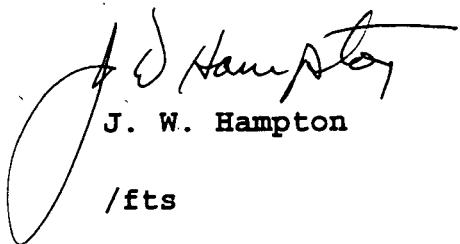
Subject: Oconee Nuclear Station Unit
Docket Nos. 50-269, -270, -287
Licensee Event Report 270/96-03
Problem Investigation Process No.: 2-096-1777

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d),
attached is Licensee Event Report, 270/96-03, concerning
the Technical Specification required shutdown of Unit 2
due to inadequate work planning.

This report is being submitted in accordance with 10 CFR
50.73 (a) (2) (i) (A). This event is considered to be of
no significance with respect to the health and safety of
the public.

Very truly yours,


J. W. Hampton
/fts

Attachment

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Document Control Desk
October 21, 1996

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Mr. M. A. Scott
NRC Resident Inspector
Oconee Nuclear Station

NRC FORM 366 (4-95)				U.S. NUCLEAR REGULATORY COMMISSION				APPROVED OMD NO. 3150-0104 EXPIRES: 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.			
LICENSEE EVENT REPORT (LER)											
FACILITY NAME (1) Oconee Nuclear Station, Unit Two								DOCKET NUMBER (2) 05000 270		PAGE (3) 1 OF 6	
TITLE (4) Technical Specification Required Shutdown Due To Inadequate Work Planning											
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 NAME		DOCKET NUMBER(S)
09	21	96	96	03	00	10	21	96			05000
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more of the following) (11)								
POWER LEVEL (10)		100	<input type="checkbox"/> 20.402(b) <input type="checkbox"/> 20.405(a)(1)(i) <input type="checkbox"/> 20.405(a)(1)(ii) <input type="checkbox"/> 20.405(a)(1)(iii) <input type="checkbox"/> 20.405(a)(1)(iv) <input type="checkbox"/> 20.405(a)(1)(v)		<input checked="" type="checkbox"/> X	<input type="checkbox"/> 20.405(c) <input type="checkbox"/> 50.36(c)(1) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(ii) <input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(iv) <input type="checkbox"/> 50.73(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 50.73(a)(2)(x)		<input type="checkbox"/> 73.71(b) <input type="checkbox"/> 73.71(c) OTHER (Specify in Abstract below and in Text, NRC Form 366A)	
LICENSEE CONTACT FOR THIS LER (12)											
NAME Lanny V. Wilkie, Safety Review Manager								TELEPHONE NUMBER AREA CODE (864) 885-3518			
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		
F	BG	MO	W120	Yes							
SUPPLEMENTAL REPORT EXPECTED (14)											
YES (if yes, complete EXPECTED SUBMISSION DATE)				<input checked="" type="checkbox"/> X	NO				EXPECTED SUBMISSION DATE (15)		MONTH DAY YEAR
ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)											
<p>On September 18, 1996, at 0132 hours, with Unit 2 at 100% full power, the 2B High Pressure Injection pump tripped. The alternate pump automatically started as designed. This required Unit 2 to enter a Technical Specification (TS) 72 hour Limiting Condition for Operation (LCO). An investigation was initiated to determine the cause of the failure. Problems were encountered in the process of investigation and replacing the failed motor. On September 21, 1996, at 0132 hours, the LCO time frame expired and a 12 hours to Hot Shutdown action statement was entered. At 0800 hours, Unit 2 shutdown was initiated and at 1235 hours, the unit was at hot shutdown. At 1606 hours, the 2B HPI pump motor was returned to service. The root cause of the required shutdown is Work Planning; Job scoping did not identify special circumstances. Corrective actions include revising the work processes.</p>											

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EVALUATION:**Background**

The High Pressure Injection (HPI) [EIIS:BG] is a safety related system providing Reactor Coolant (RC) [EIIS:AB] system makeup, RC volume control, seal injection to the RC pumps, and Emergency Core Cooling during an accident. There are three HPI pumps, each capable of taking suction from the Letdown Storage Tank during normal operation or the Borated Water Storage Tank during an emergency. Each HPI pump is a 24 stage, vertical centrifugal pump and is powered by a 600 horsepower electric motor.

Technical Specification 3.3.1 allows testing or maintenance on any one of the HPI pumps, provided two trains of HPI are operable. It further states that if the inoperable pump is not restored to operable status within 72 hours, the reactor shall be brought to hot shutdown within 12 hours.

The Failure Investigation Process is a method used by Oconee Nuclear Station to identify the factors that contributed to the failure of a component.

Description of Event

On September 18, 1996, at 0132 hours, with Unit 2 at 100% full power, the 2B High Pressure Injection (HPI) pump tripped. The 2A HPI pump automatically started to supply Reactor Coolant (RC) makeup. A 72 hour Technical Specification (TS) Limiting Condition for Operation (LCO) was entered. A HPI pump area fire alarm was received concurrent with the 2B HPI pump trip. Operations personnel inspected the area and discovered heat damage at the 2B HPI pump motor junction box. There was no fire observed at the pump or in the area. At 0200 hours, a work request was written to investigate/repair the motor. At 0235 hours, the electrical isolation was completed. Operations personnel and the Shift Work Manager (SWM) discussed the Failure Investigation Process (FIP) and how this should be coordinated with the troubleshooting and repair. The SWM began the process of determining who would be needed to perform the FIP and repair of the HPI pump. At 0325 hours, an oil leak associated with a main transformer was

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discovered. As a result of this unrelated situation, the SWM decided to notify the appropriate personnel for the HPI problem later in the shift.

At approximately 0515 hours, the Shift Work Manager contacted the appropriate duty person to initiate the FIP process. The Mechanical Component Engineering Manager was contacted at 0530 hours. The Engineering Manager contacted an Engineering Supervisor who contacted Engineer A for initiating a FIP at 0600 hours. When the Engineer A reported to work at 0700 hours, he attended the morning meeting for the discussion of the failure and the identification of FIP team members. A FIP team meeting was conducted at 0745 hours to determine the actions to take and the resources that would be required to perform the work. At 0830 hours, an observation of the 2B HPI pump area was performed. The qualified technicians normally assigned to perform this work were in training. Other qualified technicians were obtained from a different work discipline. Another FIP meeting was held at 1000 hours to determine the work scope. The total isolation of the 2B HPI pump electrically and hydraulically was completed and the pump had been rotated at 1130 hours. A third FIP meeting was held at 1230 hours, to identify the proper method to strip the motor leads for testing. The technicians had problems with the test setup, but eventually completed the testing at 1430 hours. The motor failed the test and the decision to replace the motor was made at the fourth FIP meeting at 1530 hours. The final actions required for removal of the motor began at 1600 hours.

On September 19, 1996, at 0600 hours the HPI pump motor had been replaced and preparations were in progress for alignment of the motor to the pump. Engineer B, who has the responsibility for large pumps, decided to use an existing coupling set that had been previously used on the spare HPI pump motor. A motor run uncoupled was completed at 2312 hours. Work associated with installation of the pump coupling was initiated.

On September 20, 1996, at approximately 1200 hours, problems with the alignment of the couplings were encountered. At approximately 1400 hours, Engineer B discussed the situation with the Maintenance Superintendent. A decision was made to begin machining a custom coupling set while continuing the attempt to align the existing couplings to the pump and motor. There were delays in locating machinists to perform the work on the coupling set.

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At approximately 1800 hours, the machinists were on site to begin work. The existing coupling alignment attempt was discontinued at approximately 2200 hours and the new couplings were ready for installation at 2400 hours. The technicians worked through the night to remove the existing couplings.

On September 21, 1996, at 0132 hours, the TS LCO expired and a 12 hour action statement was entered to be at Hot Shutdown conditions by 1332 hours.

On September 21, 1996, at approximately 0700 hours, the work to remove the existing couplings was complete. At 0800 hours, Operations began power reduction. At 0801 hours, a one hour non-emergency phone call was made to the NRC, per 10 CFR 50.72. At 1235 hours, the unit was subcritical at Hot Shutdown. At 1300 hours, the alignment was completed. Following satisfactory testing, the pump was declared operable and placed in service at 1606 hours.

The failed motor was shipped to the manufacturer and disassembled on September 26, 1996. On October 2, 1996, the results of the analysis indicated that the probable cause of the motor failure is a random insulation failure due to localized degradation of insulation.

Conclusion

The root cause of this event is Work Organization/Planning; Job scoping did not identify special circumstances. Items which added time to the process were:

1. The Shift Work Manager did not expedite the Failure Investigation Process (FIP) or decide the priority of repair versus investigation. A transformer oil leak, that occurred about the same time, had some impact on this process.
2. The FIP process is not well understood by the personnel involved.
3. Since qualified personnel were in training, extra time was spent obtaining qualified personnel to do the troubleshooting and repair.

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4. Since the decision to use the existing coupling set was made, there was no machinist scheduled for work on the weekend. Extra time was spent locating machinists.

It is concluded that successful completion of any of these items could have prevented exceeding the Technical Specification (TS) Limiting Condition for Operation (LCO).

A historical search of events and problem reports over the last two years indicates there have not been any failures resulting in TS required shutdown of a unit. The Operating Experience database indicated that there have been motor failures; however, there have been no motor failures of this type.

The HPI pump motor is a Westinghouse model number CSP-688.5P30. The failure of the motor is NPRDS reportable.

There were no personnel injuries, radiation exposures, or releases of radioactive materials associated with this event.

CORRECTIVE ACTION:**Immediate:**

1. Operations verified the 2A High Pressure Injection (HPI) pump was supplying proper Reactor Coolant Pump seal injection flow.

Subsequent:

1. The 2B HPI pump motor was removed and shipped to the manufacturer for further analysis.
2. The spare motor was installed and tested satisfactorily.

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Planned:

1. Review the process for addressing the failure of Technical Specification (TS) required equipment and revise as necessary to ensure all work is coordinated in a timely manner.
2. Provide Failure Investigation Process training to appropriate personnel.

SAFETY ANALYSIS:

The failure of one High Pressure Injection pump is identified in the Technical Specification as a 72 hour Limiting Condition for Operation. In this event the HPI pump inoperability exceeded the LCO and a 12 hour action statement. The unit was shutdown within the 12 hour time frame. The HPI pump was returned to operable status at 1606 hours (2 hours 34 minutes after the unit had been shutdown).

The HPI system is used to prevent uncovering the core for small Reactor Coolant System (RCS) piping leaks where high system pressure is maintained, and to delay uncovering the core for intermediate sized leaks. The Final Safety Analysis Report Chapter 15 has shown that two HPI pumps through two injection trains are sufficient to prevent core damage for those smaller leak sizes which do not allow the RCS pressure to decrease rapidly to the point where the Low Pressure Injection system is initiated.

This event was evaluated for Probability Risk Assessment concerns and the resulting conditional core damage frequency is much less than 1.0E-06.

The health and safety of the public was not affected by this event.