LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
Byron, Unit 2	0 5 0 0 0 4 5 5	1 of 0 5

Title (4) Technical Specification Violation Due to Operational Mode Changes Made While Auxiliary Feedwater Pump Inoperable Due to Level Switch Failure

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)
									NONE	0 5 0 0 0		
0 5	0 6	8 8	8 8	--- 0 0 5	--- 0 0	0 6	0 6	8 8		0 5 0 0 0		

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
2		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 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 and in Text)
		20.405(a)(1)(iii)	X 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)	

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
D. Brindle, Operating Engineer Extension 2218	AREA CODE 8 1 5 2 3 4 - 5 4 4 1

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
X	B A	7 1	M 0 4 0	N					

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
Yes (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e, approximately fifteen single-space typewritten lines) (16)

The 2B Diesel Driven Auxiliary Feedwater Pump (AFP) had been operated twice on May 6, 1988. The second operation was an automatic start due to low steam generator levels following the trip of a Main Feed Pump and resultant Reactor Trip. Following an investigation for root cause of the Reactor Trip, Unit 2 entered the startup operational mode at 2355 and the Power Operations Mode at 0111 on May 7, 1988. At about 0300 the 2B AFP fuel oil day tank level was discovered to be less than the Technical Specification limit. Level was not restored until 1030 on May 8, 1988. It is most likely that level dropped below the allowable limit during one of the 2B AFP runs on May 6, 1988, however the appropriate alarm did not actuate. Because the licensed operators were unaware of the low day tank level, the two operational mode changes were made in violation of Technical Specification 3.0.4.

The root cause of the event was the failure of the day tank low level switch to generate the attendant annunciator actuation. Contributing to the delay in the restoration of day tank level were inconsistencies between the operating logs and a placard affixed to the day tank.

The faulty low level switch was replaced with a like switch. Plant procedures are being revised to minimize recurrence of this event.

There have been no previous occurrences of this event.

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A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 5/6/88 / 2355

Unit 2 MODE 2 - Startup Rx Power 0% RCS [AB] Temperature/Pressure 557°F/2235 psig

B. DESCRIPTION OF EVENT:

On May 2, 1988, during the operation of the 2B Diesel Driven Auxiliary Feedwater Pump (AFP) [BA] the "AF Pump DO Day Tank Level Low" control room annunciator actuated. This annunciator is set to actuate when level decreases to less than 77 percent. A non-licensed Equipment Attendant (EA) filled the tank to a level of 85 percent as indicated on the local level meter. The control room annunciator, however, did not clear. A Nuclear Work Request (NWR) was written to investigate the discrepancy. Subsequent investigation determined that the accuracy of the local level meter is plus or minus 11 percent of tank level, while the accuracy of the level switch that controls the annunciator is plus or minus 1 percent. Similar accuracy discrepancies had caused similar incidents on the Emergency Diesel Generator [EK] day tanks in the past. An Operating Engineer (licensed senior reactor operator) toured the Unit 2 main control room and noted that the "AF Pump DO Day Tank Level Low" annunciator was not illuminated on May 3, 1988. After discussions with Electrical Maintenance Department personnel, the Operating Engineer cancelled the NWR in the belief that there was no equipment problem, but rather that the accuracy discrepancies could be overcome by filling the tank to a higher level as had been previously done for the Emergency Diesel Generators.

At approximately 0300 on May 6 1988, an EA conducting daily operating equipment rounds logged that the 2B AFP Fuel Oil Day Tank level was at 78 percent. Byron Station Technical Specification 3.7.1.2 requires that the day tank contain a minimum of 420 gallons of fuel. This fuel requirement is satisfied by maintaining indicated level above 73.5 percent. If tank level is below 73.5 percent then the applicable Limiting Condition for Operation Action Requirement (LCOAR) requires the restoration of level above specification within 72 hours or be in at least Hot Standby within the next 6 hours and in Hot Shutdown within the following 6 hours.

At 1106 on May 6, 1988, a licensed reactor operator Nuclear Station Operator (NSO) conducted a routine start of the 2B AFP in accordance with the "Auxiliary Feedwater Pump _B (Diesel) Startup on Recirc Operating Procedure" (BOP AF-7). At 1154, following the demonstration of satisfactory performance of the 2B AFP, the NSO stopped the pump in accordance with the "Auxiliary Feedwater Pump _B (Diesel) Shutdown Operating Procedure" (BOP AF-8). At 1216 the 2B AFP automatically started in response to low narrow range steam generator levels caused by a Main Feedwater Pump [SJ] trip and a resultant reactor trip. The reactor trip event is reported in Licensee Event Report (LER) number 88-004-00. At 1308, with Unit 2 in Hot Standby, the NSO stopped the 2B AFP after determining that its operation was no longer required to maintain steam generator levels.

Upon conclusion of the Reactor Trip Root Cause Investigation, preparations were made to start the reactor. At 2355 on May 6, 1988, Unit 2 entered the Startup Operational Mode (Mode 2). A reactor startup was conducted and Unit 2 entered the Power Operations Operational Mode (Mode 1) at 0111 on May 7, 1988. During daily operating equipment rounds at approximately 0300, an EA logged 2B AFP Fuel Oil Day Tank level at 65%. The EA recognized this as an out-of-tolerance condition and explained in a remark on the log that a placard was affixed to the day tank that specified level be maintained greater than 50 percent. At approximately 0300 on May 8, 1988, another EA logged the tank level at 65%, recognized the out-of-tolerance, and excused the condition due to the placard.

B. DESCRIPTION OF EVENT: (Continued)

At 1020 on May 8, 1988, a third FA reviewed the logs from the previous shift, noted the out-of-tolerance condition that had been recorded on the previous shift, and informed the NSO. The NSO immediately performed a lamp test on the "AF Pump DO Day Tank Level Low" control room annunciator since the annunciator was not actuated. The annunciator lamps functioned properly. The NSO directed that the EA immediately fill the day tank to a level greater than 73.5 percent. The EA commenced the day tank filling operation, and then mechanically agitated the level switch that provides the low level signal to the control room annunciator. The low level annunciator actuated due to the EA's action. By 1030 the day tank level had been increased to 89 percent and the EA stopped the filling operation. The low level annunciator did not clear until the EA again mechanically agitated the level switch at 1034. This event had no effect on stable plant operations.

It cannot be determined with certainty at what time the day tank level decreased below the Technical Specification requirement, however it is likely that it occurred during one of the two 2B AFP operations on May 6, 1988. Technical Specification 3.7.1.2 permits continued power operation for 72 hours with below specification day tank level. A worst case estimate assumes that the level decreased below the allowable level at 1130 on May 6, 1988. Level was restored by 1030 on May 8, 1988, and accounts for a total duration of 47 hours for the inoperability of the 2B AFP. Technical Specification 3.0.4 prevents entry into an operational mode unless the conditions for the Limiting Condition for Operation are met without reliance on provisions contained in the Action Requirements. Because the licensed operators were unaware of the low day tank level and associated reliance on the LCOAR, Modes 1 and 2 were entered while the 2B AFP was inoperable. Therefore, Technical Specification 3.0.4 was violated and this LER is submitted in accordance with 10CFR50.73 (a)(2)(i)(B).

C. CAUSE OF EVENT:

The root cause of the Technical Specification violation was the failure of the 2B AFP Fuel Oil Day Tank low level switch to generate the attendant main control room annunciator actuation. This annunciator is relied upon to warn licensed operators of a low day tank level condition so that filling operations can be accomplished before level decreases to less than the Technical Specification allowable level. Had the annunciator actuated as designed on May 6, 1988, the licensed operators would have been alerted to the low day tank level condition and would have taken immediate action to fill the tank. Therefore, the out-of-tolerance condition would not have occurred and the operational mode changes would have complied with Technical Specification 3.0.4.

The placard affixed to the 2B AFP Day Tank stated that level should be maintained above 50 percent, but provided no explanation for this requirement. The intent of the placard is to ensure that, while the 2B AFP is operating, day tank fill operations are conducted when level is above 50 percent. This precludes air entrainment that may be caused by the tank fill pipe relationship to the tank outlet pipe. Air entrainment can result in the undesired stopping of the 2B AFP. The lack of explanation on the placard and lack of operator knowledge of the 50 percent criteria basis contributed to the delay in correcting the low day tank level condition. The Technical Specification violation would still have occurred even if consistent instructions were provided on the placard and in the operator logs, because the operational mode changes occurred prior to the performance of operator rounds.

D. SAFETY ANALYSIS:

Throughout the time of inoperability of the 2B AFP, the pump could have started and supplied feedwater if required, however, its endurance would have been reduced from approximately 6 hours to approximately 5 hours and 20 minutes. A worst case condition in which the day tank would become completely empty would have made the 2B AFP unavailable, but the 2A Motor Driven AFP was operable throughout the event and could have supplied all required emergency feedwater to the steam generators. Neither plant nor public safety were affected by this event.

E. CORRECTIVE ACTIONS:

A Nuclear Work Request was written to repair the low level switch, and the switch was replaced with a like switch from stores. The calibration of the local level meter was checked. The meter reading was approximately 2 percent higher than actual tank level which is within the acceptable tolerance band.

The following actions are being or have been taken to prevent recurrence of this event:

1. A new Operating Procedure "Diesel Driven Auxiliary Feedwater Pump Alignment to Standby Condition" (BOP AF-1) will be implemented to require verification of adequate diesel driven AFP day tank level among other parameters important to AFP operability.

2. The following procedures, which require the operation of the diesel driven AFP, will be revised to require the performance of BOP AF-1:

   a. "Securing the Auxiliary Feedwater System After Initiation" (BOP AF-2).
   b. "Auxiliary Feedwater Pump __B (Diesel) Startup on Recirc" (BOP AF-7).
   c. "Auxiliary Feedwater Pump __B (Diesel) Shutdown" (BOP AF-8).

3. The placard affixed to the day tank has been revised to clarify the level requirements.

4. The "Equipment Daily Logs Administrative Procedure" (BAP 350-5) will be revised to require that all out-of-tolerance readings be brought to the attention of operating shift supervision.

Completion of Corrective Actions is tracked by Action Item Record 454-225-86-0119.

F. PREVIOUS OCCURRENCES:

LER NUMBER	TITLE
Unit 1 85-102	Missed ISI Surveillance Due to Outage Procedure Deficiency
Unit 2 86-003	Mode Change With Required Emergency Core Cooling System Technical Specification Not Satisfied Due to Personnel Error
Unit 1 87-016	Limiting Condition for Operation for Containment Spray Additive System Exceeded Due to Misaligned Valves Caused by Procedural Error

Three LER's document the violation of Technical Specification 3.0.4 at Byron Station, however, none of these events involved the Auxiliary Feedwater System nor were they caused by a component failure. Corrective actions taken as a result of those events should not have been reasonably expected to prevent the event described in this LER.

G. COMPONENT FAILURE DATA:

a)

MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MFG SERIAL NUMBER
Magnetrol	Level Switch	291-X-EP/VP-1.0-SM.D4DC	762629

b) RESULTS OF NPRDS SEARCH:
Not Applicable

Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

DATE: June 6, 1988

LTR: BYRON 88-0561

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

Dear Sir:

The enclosed Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(i).

This report is number 88-005; Docket No. 50-455.

Very truly yours,

R. Pleniewicz
Station Manager
Byron Nuclear Power Station

RP/RJP/bb (0016R/0002R)

Enclosure: Licensee Event Report No. 88-005-00

cc: A. Bert Davis, NRC Region III Administrator
P. Brochman, NRC Senior Resident Inspector
INPO Record Center
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