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SUBJECT: LER 89-013-01:on 890910,boric acid transfer pump not declared out of svc prior to refilling seal pot.
W/9 ltr.

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MAY 29 1990

L-90-188
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 89-013-01
Date of Event: September 10, 1989
Boric Acid Transfer Pump not Declared Out of Service Prior to Refilling the Seal Pot Resulting in no Flow Path from a Boric Acid Tank to the Unit 3 Reactor Coolant System

The attached Licensee Event Report supplement is being provided pursuant to the requirements of 10CFR50.73 as notification of a change to Corrective Action No. 5. The interim corrective action previously identified has been determined by Florida Power & Light Company to no longer be necessary. The existing administrative actions identified in this supplement are considered adequate interim measures until the review of alternate Boric Acid Transfer Pump seal design is completed.

Very truly yours,

J. H. Goldberg
Executive Vice President
Nuclear Energy

JHG/GRM/slh

Attachment

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Turkey Point Unit 3	0 5 0 0 0 2 5 0	1 OF 5

TITLE (4) Boric Acid Transfer Pump not Declared Out of Service Prior to Refilling the Seal Pot Resulting in no Flow Path from a Boric Acid Tank to the Unit 3 Reactor Coolant System

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 9	1 0	8 9	8 9	0 1 3	0 1				N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 6 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		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, NRC Form 366A)
		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
David R. Powell, Superintendent of Licensing	AREA CODE 3 0 5 2 4 6 6 5 5 9

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)		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)

On September 10, 1989, at 1345, Unit 3 entered Technical Specification 3.0.1 for 19 minutes when the 3A Boric Acid Transfer Pump (BATP) was declared out of service. At the time of the event, the 3A BATP was the only BATP aligned to take suction from the A Boric Acid Tank (BAT) and discharge to the Unit 3 charging pumps. At 1345, while refilling the 3A BATP seal pot, maintenance personnel accidentally damaged the nitrogen pressure indicator. Since nitrogen pressure on the seal pot could not be monitored, the 3A BATP was declared out of service. This resulted in loss of a flow path from the A BAT to the Unit 3 Reactor Coolant System. The 3B BATP was aligned to take suction from the A BAT and discharged to the Unit 3 charging pumps. Unit 3 exited Technical Specification 3.0.1 at 1404 on September 10, 1989. Further review revealed that the BAPTs are technically "inoperable" when the nitrogen pressure indicators are removed to refill the seal pot. Operations personnel were not aware that the BATPs are considered inoperable when the seal pot nitrogen pressure indicator is removed; therefore the BATPs were not declared out of service prior to refilling the seal pot. An entry has been made in the Operations Night Order Book to convey this operability concern to Control Room operators.

DESCRIPTION OF THE EVENT

On September 10, 1989, at 1345, Unit 3 entered Technical Specification 3.0.1 for 19 minutes when the 3A Boric Acid Transfer Pump (BATP) (EIIS:CA, Component:P) was declared out of service. Unit 3 was operating in Mode 1 at approximately 60 percent power. At the time of this event, the 4A and 4B BATPs were aligned to take suction from the C Boric Acid Tank (BAT) and discharge to the Unit 4 charging pumps, the 3A BATP was aligned to take suction from the A BAT and discharge to the Unit 3 charging pumps, and the 3B BATP was aligned to recirculate the B BAT.

At 1345, the 3A BATP was declared out of service when maintenance personnel accidentally damaged the nitrogen pressure indicator while refilling the 3A BATP seal pot. In order to refill the seal pot, the seal pot is depressurized, the nitrogen pressure indicator is removed, water is added via the nitrogen pressure indicator connection, the nitrogen pressure indicator is reinstalled, and the seal pot is repressurized with nitrogen. Since pressure on the 3A BATP seal pot could not be monitored after reinstallation of the nitrogen pressure indicator and the 3A BATP was the only BATP aligned from the A BAT to the Unit 3 charging pumps, no flow path existed from a BAT to the Unit 3 Reactor Coolant System as required by Technical Specifications.

Technical Specification 3.6.d requires that during power operation, "System piping, interlocks and valves shall be operable to the extent of establishing one flow path from the boric acid tanks, and one flow path from the refueling water storage tank, to each Reactor Coolant System." Unit 3 entered Technical Specification 3.0.1 which states, in part, "When a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements, within 1 hour action shall be initiated to place the unit in a MODE in which the specification does not apply . . .". Upon entering Technical Specification 3.0.1, the 3B BATP was realigned to take suction from the A BAT and discharge to the Unit 3 charging pumps. At 1404, Unit 3 exited Technical Specification 3.0.1.

Further review of this event raised the question of seal water system pressure impact on the "operability" of the BATPs. A nitrogen pressure between 35 psig and 40 psig is maintained in the seal pot, in part, to ensure seating of the inner seal faces and minimize inner seal leakage. FPL has determined that as long as the BATP seal water system is "closed", loss of the seal pot nitrogen pressure would not render the BATP "inoperable". Any leakage through the BATP inner seal faces into the seal water system would tend to pressurize the seal pot and limit the amount of leakage to a value which would not significantly affect the BATP minimum required flow rate. However, whenever the seal pot nitrogen indicator is removed, the seal water system is an "open"

system. BATP inner seal leakage during pump operation with the seal water system "open" would not be enough to affect the minimum required flow rate of the BATP, however, the inner seal leak would result in lost inventory from the BAT. For this reason, FPL considers a BATP to be "inoperable" while refilling the seal pot.

This interpretation would not normally affect Unit 4 since the 4A and 4B BATPs are both aligned to take suction from the C BAT and discharge to the Unit 4 charging pumps. Refilling a seal pot on either BATP would leave the other pump available to provide a flow path from a BAT to the Unit 4 Reactor Coolant System. The Unit 3 Boric Acid System configuration utilizes only one BATP, usually the 3A BATP, to take suction from the A BAT and discharge to the Unit 3 charging pumps. Refilling the 3A BATP seal pot without first realigning the 3B BATP to take suction from the A BAT and discharge to the Unit 3 charging pumps would place Unit 3 in Technical Specification 3.0.1 when the 3A BATP is placed out of service. Since Control Room personnel were not provided with this "operability" criteria, the 3A BATP was not declared out of service during previous fillings of the seal pot and Technical Specification 3.0.1 was not entered.

CAUSE OF THE EVENT

The cause of the failed pressure indicator is a non-cognitive error by utility maintenance personnel. When removing the nitrogen pressure indicator, the wrench slipped off the "rounded flats" inducing vibration in the indicator. The vibration resulted in the pointer falling off the indicator.

The root cause of the failure to declare previous Technical Specification 3.0.1 entries is a cognitive error by licensed utility personnel. A requirement to maintain a water level within the range of the sightglass and a nitrogen pressure between 35 psig and 40 psig in the BATP seal pots appears as a prerequisite in Operating Surveillance Procedure 0-OSP-046.1, "Boric Acid Transfer Pump Inservice Test," and as a precaution/limitation in Operating Procedure 0-OP-046, "CVCS-boron Concentration Control." Operating Surveillance Procedure 0-OSP-201.2, "SNPO Daily Logs," requires operations personnel to log the water level and nitrogen cover pressure on each BATP seal pot every four hours. Operations personnel were not provided with "operability" criteria to enable them to recognize these requirements as having the potential to adversely affect BAT inventory, had the BATPs been required to run while refilling the seal pot.

ANALYSIS OF THE EVENT

No credit is taken for the concentrated boric acid contained in the BATs in any of the Design Basis Accidents described in the Turkey Point Final Safety Analysis Report (FSAR). Sufficient shutdown capability for the most severe anticipated cooldown transient (main stem line break), assuming the most reactive rod control cluster to be fully withdrawn, is achieved via the use of boron from the refueling water storage tank through the safety injection system. The BATs and the BATPs provide a source of concentrated boric acid to be added to the reactor coolant system to offset reactivity changes caused by normal plant operating transients, changes in power level, and in order to attain and maintain shutdown conditions. An additional means of providing borated water is from the refueling water storage tank through the charging pumps to the reactor coolant system. These flow paths (refueling water storage tank to the charging pumps and to the safety injection pumps) were available throughout the event.

It should be noted that boration via the BATPs and BATs is required for various plant conditions, however, these conditions are not Design Basis Accidents for Turkey Point.

During previous refillings of the 3A BATP seal pots, the Boric Acid System was not considered to be "inoperable" and no physical changes to the system were made (i.e., the 3A BATP motor breaker was not "racked out", suction and/or discharge valves were not closed). In these instances, the 3A BATP remained "operational" and would have started and supplied boric acid solution to the Reactor Coolant System, had it been required to operate. With operations and maintenance personnel present while refilling the seal pot, FPL believes the nitrogen pressure indicator could have been reinstalled in sufficient time to preclude significant loss of boric acid solution inventory in the A BAT resulting from 3A BATP inner seal leakage.

CORRECTIVE ACTIONS

1. The 3B BATP was realigned to take suction from the A BAT and discharge to the Unit 3 charging pumps. Unit 3 exited Technical Specification 3.0.1 at 1404 on September 10, 1989.

2. The nitrogen pressure indicator on the 3A BATP seal pot was replaced. At 2110, on September 10, 1989, the 3A BATP was returned to service.

3. An entry was added to the Operations Night Order Book on September 13, 1989 to inform Control Room personnel that BATPs are to be considered out of service during the time the nitrogen pressure indicator is removed to refill the seal pots.

4. Caution tags were placed at each of the Unit 3 and Unit 4 BATP seal pots. These tags require operations and/or maintenance personnel to notify Control Room personnel prior to opening the seal pots so appropriate actions can be taken to maintain Boric Acid System operability.

5. LER 251/89-009 stated that FPL was continuing the review of alternate seal designs for the BATPs. A cartridge type single seal compatible with twelve (12) weight percent boric acid cannot be located. FPL is currently pursuing a boric acid concentration reduction program which will allow plant operation at or below four (4) weight percent boric acid. Cartridge type single seals are available which are compatible with this boric acid concentration. Plant operation at or below four (4) weight percent boric acid would also eliminate the need for a BATP seal water system.

6. Additionally, LER 251/89-009 stated that, as an interim measure, a plant change/modification (PC/M) would be issued by May 31, 1990. This PC/M would provide improved level indication for the BATP seal pots and provide a means of adding makeup water to the seal pots without having to remove the nitrogen pressure indicator. These hardware changes were initially proposed to eliminate Licensee Event Reports generated as a result of the present BATP seal water system design.

   This interim measure is no longer considered by FPL to be necessary. Operations Department personnel ensure that an operable BATP is aligned to take suction from a BAT and supply the affected unit's charging pumps prior to allowing the addition of makeup water to an inoperable BATP. Additionally, mechanical maintenance personnel carefully measure the amount of makeup water added to the inoperable BATP in order to determine if the BATP was actually inoperable. Approximately 0.866 gallons of makeup water has to be added to a BATP seal pot for the BATP to have actually been inoperable due to a low seal pot water level. These actions are acceptable interim measures until the review of alternative BATP seal designs is completed.

ADDITIONAL INFORMATION

The BATPs are manufactured by Goulds, Inc., Model No. 3196-ST-8. The seals are manufactured by Durametallic.

Similar occurrences have been reported in LER 251/89-009, LER 250/88-019, LER 250/88-005, and LER 250/87-017.