





FPL

P.O. Box 14000, Juno Beach, FL 33408-0420

SEPTEMBER 22 1989

L-89-347  
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 4  
Docket No. 50-251  
Reportable Event: 89-09  
Date of Event: August 23, 1989  
Boric Acid Transfer Pump Seal Pot Found With  
No Visible Level Resulting in No Flow Path From the  
Boric Acid Tank to Unit 4 Reactor Coolant System

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

J. H. Goldberg  
Executive Vice President

JHG/JRH/cm

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

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## LICENSEE EVENT REPORT (LER)

|   |        |           |  |                   |                 |       |                  |           |                |   |                      |                               |                  |       |  |      |  |
|---|--------|-----------|--|-------------------|-----------------|-------|------------------|-----------|----------------|---|----------------------|-------------------------------|------------------|-------|--|------|--|
| FACILITY NAME (1)<br>Turkey Point Unit 4  |        |           |  |                   |                 |       |                  |           |                | DOCKET NUMBER (2)<br>0 5 0 0 0 2 5 1                |                      |                               |                  |       | PAGE (3)<br>1 OF 0 3   |      |  |
| TITLE (4) Boric Acid Transfer Pump Seal Pot Found With No Visible Level Resulting in No Flow Path From Boric Acid Tank to Unit 4 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 8   | 2 3    | 8 9       | 8 9  | 0 0 9             | 0 0 0           | 0 9   | 2 2              | 8 9       |                |   |                      |                               | 0 5 0 0 0        |       |  |      |  |
| OPERATING MODE (9)<br>1   |        |           | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11) |                   |                 |       |                  |           |                |   |                      |                               |                  |       |  |      |  |
| POWER LEVEL (10)<br>1 0 0   |        |           | 20.402(b)  |                   |                 |       | 20.406(e)        |           |                |   | 50.73(a)(2)(iv)      |                               |                  |       | 73.71(b)   |      |  |
|   |        |           | 20.406(a)(1)(i)  |                   |                 |       | 50.38(c)(1)      |           |                |   | 50.73(a)(2)(v)       |                               |                  |       | 73.71(c)   |      |  |
|   |        |           | 20.406(a)(1)(ii)   |                   |                 |       | 50.38(c)(2)      |           |                |   | 50.73(a)(2)(vi)      |                               |                  |       | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |      |  |
|   |        |           | 20.406(a)(1)(iii)  |                   |                 |       | 50.73(a)(2)(i)   |           |                |   | 50.73(a)(2)(vii)(A)  |                               |                  |       |  |      |  |
|   |        |           | 20.406(a)(1)(iv)   |                   |                 |       | 50.73(a)(2)(ii)  |           |                |   | 50.73(a)(2)(viii)(B) |                               |                  |       |  |      |  |
|   |        |           | 20.406(a)(1)(v)  |                   |                 |       | 50.73(a)(2)(iii) |           |                |   | 50.73(a)(2)(ix)      |                               |                  |       |  |      |  |
| LICENSEE CONTACT FOR THIS LER (12)  |        |           |  |                   |                 |       |                  |           |                |   |                      |                               |                  |       |  |      |  |
| NAME<br>Dennis W. Herrin, Regulation and Compliance Engineer  |        |           |  |                   |                 |       |                  |           |                | TELEPHONE NUMBER<br>AREA CODE 3 0 5 2 4 6 - 6 7 3 1 |                      |                               |                  |       |  |      |  |
| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)  |        |           |  |                   |                 |       |                  |           |                |   |                      |                               |                  |       |  |      |  |
| CAUSE   | SYSTEM | COMPONENT | MANUFACTURER   | REPORTABLE TO NRC |                 | CAUSE | SYSTEM           | COMPONENT | MANUFACTURER   | REPORTABLE TO NRC                                   |                      |                               |                  |       |  |      |  |
| B   | CIA    | SEAL      | G 2 0 0  | N                 |                 |       |                  |           |                |   |                      |                               |                  |       |  |      |  |
| SUPPLEMENTAL REPORT EXPECTED (14)   |        |           |  |                   |                 |       |                  |           |                |   |                      |                               |                  |       |  |      |  |
| YES (If yes, complete EXPECTED SUBMISSION DATE)   |        |           |  |                   |                 |       |                  |           |                | X NO  |                      | EXPECTED SUBMISSION DATE (15) |                  | MONTH | DAY  | YEAR |  |

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

On August 23, 1989, at 1715, Unit 4 entered Technical Specification 3.0.1 for 33 minutes when the 4B Boric Acid Transfer Pump (BATP) was declared out of service. At the time of the event, the 4A BATP was out of service to repair a flange leak. At 1715, while making normal rounds, operations personnel discovered that the seal pot, which provides seal cooling water to the 4B BATP, had no visible water level. Following the discovery, the 4B BATP seal pot was refilled and pump flow was verified. The seal pot level was observed to remain stable. This was completed after 33 minutes, and Unit 4 exited Technical Specification 3.0.1. The cause of this event is most likely attributable to the design of the BATP double seals. FPL believes that frequent pump starts and stops may cause axial shaft movement which results in separation of the inner seal faces. When the 4B BATP stopped automatic make-up to the Volume Control Tank at approximately 1700, FPL believes the inner seal faces temporarily "cocked", resulting in a drain of seal water into the pump casing. FPL engineering is continuing to review alternate seal designs for the BATPs which will not require quench water to the seal.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|  |  |                |                   |                 |          |    |     |
|--|--|----------------|-------------------|-----------------|----------|----|-----|
| FACILITY NAME (1)<br>Turkey Point Unit 4 | DOCKET NUMBER (2)<br><br>0 5 0 0 0 2 5 1 8 9 | LER NUMBER (6) |                   |                 | PAGE (3) |    |     |
|  |  | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |    |     |
|  |  |                | 0 0 9             | 0 0 0           | 0 2      | OF | 0 3 |

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Description of the Event

On August 23, 1989, at 1715, Unit 4 entered Technical Specification 3.0.1 for 33 minutes when the 4B Boric Acid Transfer Pump (BATP) (EIS:CA, Component:P) was declared out of service. Unit 4 was operating at 100 percent power with the 4A BATP out of service to repair a leak. At the time of this event, the 4B BATP was 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 1715, the 4B BATP was declared out of service when Operations personnel making normal rounds discovered that the seal pot, which contains seal cooling water under Nitrogen (N<sub>2</sub>) pressure, had no visible water level. (These normal rounds are performed on a four hour interval.) Since the 4A BATP had previously been declared out of service, there was no flow path established from the BATs to the Unit 4 Reactor Coolant System (RCS). 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 4 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...". Following the discovery, the 4B BATP seal pot was re-filled and pump flow was verified. The seal pot level was observed to remain stable. This was accomplished 33 minutes later at 1748, and Unit 4 exited Technical Specification 3.0.1.

Cause of the Event

The cause of this event is most likely attributable to the design of the BATP double seals. FPL believes that frequent pump starts and stops may cause axial shaft movement which results in separation of the inner seal faces. When the 4B BATP stopped automatic make-up to the Volume Control Tank at approximately 1700 on August 23, 1989, FPL believes the inner seal faces temporarily "cocked", resulting in a drain of seal water into the pump casing.

Upon discovery of the low water level on the 4B BATP seal pot, operations personnel inspected the BATP area. No evidence of seal water leakage from the seal pot drain valve, the 4B BATP outer seal, or from any seal water system fittings was identified. After adding water to the seal pot and verifying pump flow, the seal pot level was observed to remain stable.

Analysis of the Event

Sufficient shutdown capability for the most severe anticipated cooldown transient (main steam line break), assuming the most reactive control cluster is fully withdrawn, is achieved via the use of boron from the refueling water storage tank through the safety injection system. This flow path is a normal alignment required by Technical Specification 3.6.c.4.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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|                     |                   | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |    |     |
| Turkey Point Unit 4 | 0 5 0 0 0 2 5 1   | 8 9            | — 0 0 9           | — 0 0           | 0 3      | OF | 0 3 |

TEXT (If more space is required, use additional NRC Form 366A's) (17)

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 levels, and to maintain shutdown conditions. An additional means of providing borated water is from the refueling water storage tank through the charging pumps to the RCS. Although a flow path from the BAT to the Unit 4 Reactor Coolant System (RCS) was not available, the flow path from the refueling water storage tank to the RCS was available throughout the event. The BATPs are required for 10CFR50, Appendix R transients and for post-LOCA chemistry control. These transients do not require immediate boration, therefore, substantial time is available to realign the Unit 3 BATPs to supply water from the C BAT to the Unit 4 charging pumps. Based on the above, the health and safety of the public were not affected.

Corrective Actions

- 1) The 4B BATP seal pot drain valve was opened and it was confirmed that the seal pot contained water. Maintenance personnel then added approximately two quarts of water to the 4B BATP seal pot to restore the level.
- 2) Pump flow from the 4B BATP was verified and the seal pot level was observed to remain stable. A visual inspection of the 4B BATP following restoration of the seal pot level showed no signs of pump outer seal leakage.
- 3) In LER 250/88-019, FPL made a commitment to evaluate the BATP seal design and initiate a modification to remove the seal pots. Due to the inability to locate an acceptable BATP seal which does not require seal cooling water, this commitment is hereby modified by FPL. FPL is continuing the review of alternate seal designs for the BATPs.

As an interim measure to improve the present BATP seal water system design, a plant change/modification (PC/M) will be issued by May 31, 1990. This PC/M will provide improved level indication for the seal pots and will provide a means of adding make-up water without having to remove the seal pot nitrogen pressure indicator from service.

Additional Information

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

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