



**Florida
Power**
CORPORATION

Crystal River Unit 3
Docket No. 50-302

October 1, 1992

3F1092-02

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

Subject: Licensee Event Report (LER) 92-019

Dear Sir:

Enclosed is Licensee Event Report (LER) 92-019 which is submitted in accordance with 10 CFR 50.73.

Sincerely,

G. L. Boldt
Vice President
Nuclear Production

EEF:mag

Enclosure

xc: Regional Administrator, Region II
Project Manager, NRR
Senior Resident Inspector

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EXPIRES 4/30/92

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.

FACILITY NAME (1)

CRYSTAL RIVER UNIT 3 (CR-3)

DOCKET NUMBER (2)

0 5 0 0 0 3 0 2 1 OF 0 3

PAGE (3)

TITLE (4)

Improved Methods of Computer Analysis, Not Available During Initial Plant Design Results In Discovery of Condition Outside Design Basis

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 | 0 | 2 | 9 | 2 | 9 | 2 | 0 | 1 | 9 | 0 | 0 | 1 | 0 | 0 | 1 | 9 | 2 | N/A | 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 9 9

20.402(b)

20.405(c)

50.73(a)(2)(iv)

73.71(b)

20.405(a)(1)(i)

50.36(v)(1)

50.73(a)(2)(v)

73.71(c)

20.405(a)(1)(ii)

50.36(v)(2)

50.73(a)(2)(vi)

OTHER (Specify in Abstract below and in Text, NRC Form 366A)

20.405(a)(1)(iii)

50.73(a)(2)(x)

50.73(a)(2)(vii)(A)

20.405(a)(1)(iv)

50.73(a)(2)(xi)

50.73(a)(2)(vii)(B)

20.405(a)(1)(v)

50.73(a)(2)(xii)

50.73(a)(2)(x)

LICENSEE CONTACT FOR THIS LER (12)

NAME

W. A. Stephenson, Nuclear Safety Supervisor

TELEPHONE NUMBER

AREA CODE

9 0 4 7 9 5 - 6 4 8 6

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC |
|-------|--------|-----------|--------------|-------------------|-------|--------|-----------|--------------|-------------------|
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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 2, 1992, Crystal River Unit 3 was operating in MODE 1 (POWER OPERATION) at 99.9% of RATED THERMAL POWER and 867 MW_e. At 1445, both Chemical Addition System boric acid pumps were declared inoperable due to undersized thermal overload elements. This condition constituted operation outside the plant's design basis. The determination of pump inoperability was based on preliminary results of a design calculation being performed as part of Florida Power Corporation's (FPC) Electrical Calculation Enhancement Program. These results indicated that the thermal overload elements might cause an unnecessary pump trip if a pump were to be operated with the associated 4160V Engineered Safeguards (ES) bus at a voltage slightly above the undervoltage actuation setpoint. This condition was not discovered previously since the methods of computer analysis and modeling presently utilized were not available during initial plant design. The thermal overload elements were replaced later that day with elements sized to prevent nuisance undervoltage tripping. FPC is conducting an evaluation of the remaining safety related and selected non-safety related thermal overload elements installed on the 480V ES motor control centers to determine if similar problems exist with other elements.

EXPIRES 4/30/92

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
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| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| CRYSTAL RIVER UNIT 3 (CR-3) | 0 5 0 0 0 3 0 2 | 9 2 | 0 1 9 | 0 0 | 0 2 OF 0 3 |

TEXT (If more space is required, Use additional NRC Form 365A (17))

EVENT DESCRIPTION:

On September 2, 1992, Crystal River Unit 3 (CR-3) was operating in MODE 1 (POWER OPERATION) at 99.9% of RATED THERMAL POWER and 867 MW_e. At 1445, both Chemical Addition System [CB] boric acid pumps [P], CAP-1A and CAP-1B, were declared inoperable based on preliminary calculations which indicated that the thermal overload elements [49] might cause an unnecessary pump trip if the pump were started with the associated 4160V Engineered Safeguards (ES) [B] bus [BU] at a voltage which was degraded slightly but had not reached the undervoltage relay actuation setpoint. This condition was contrary to Technical Specification (T.S.) 3.1.2.7 which requires at least one of the boric acid pumps to be OPERABLE in MODES 1, 2, 3, and 4 to maintain the boron injection flow path from the concentrated boric acid storage tanks [CB,TK]. The unavailability of this flow path in turn is contrary to T.S. 3.1.2.2, which requires two boron injection flow paths (3.1.2.2.a from the concentrated boric acid storage tanks, 3.1.2.2.b from the borated water storage tank [BP,T] (BWST)) to be OPERABLE in MODES 1, 2, 3, and 4. The condition thus constituted operation outside the plant's design basis. The ACTION statements for T.S. 3.1.2.7 and 3.1.2.2 were entered at 1445, requiring that at least one boric acid pump to be restored to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% delta-k/k at 200°F within the next six hours. The Nuclear Regulatory Commission (NRC) was notified of the event at 1454 via the Emergency Notification System per 10CFR50.72(b)(i)(ii)(B).

The thermal overload elements were replaced with devices sized to prevent undervoltage tripping, thus restoring both boric acid pumps to OPERABLE status. Following the successful completion of post maintenance testing, the ACTION statements associated with T.S. 3.1.2.2 and 3.1.2.7 were exited at 1930, approximately 4 hours and 45 minutes into the allotted 72 hour time frame. This report is being submitted in accordance with 10CFR50.73(a)(2)(ii)(B).

CAUSE OF EVENT:

The determination of pump inoperability was made based on preliminary results of a design calculation being performed as part of Florida Power Corporation's (FPC) Electrical Calculation Enhancement Program (ECEP). Current methods of computer [CPU] analysis and modeling were not available during the original design of CR-3. Specifically, undervoltage evaluation of thermal overload elements was not performed since the required computer voltage drop and load flow modeling techniques were not available at the time. The installed overload element was sized based on the manufacturer's recommendations considering motor nameplate full-load current and service factor. The full-load current was based on motor rated voltage.

EXPIRES 4/30/92

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 10.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (8) | | | PAGE (3) |
|-----------------------------|-------------------|----------------|-------------------|-----------------|----------|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| CRYSTAL RIVER UNIT 3 (CR-3) | 0500030292 | 01 | 9 | 00 | 03 OF 03 |

TEXT (If more space is required, Use additional NRC Form 365A's (17))

EVENT ANALYSIS:

CR-3 is protected from unplanned positive reactivity excursions by various significant control features. Of primary importance are the automatic control rod [ROD] withdrawal inhibits on high startup rate in both the source and intermediate ranges, and the Reactor Protection System (RPS) [JC] trips on high RCS pressure and nuclear overpower. Further protection against positive reactivity excursions is provided by basic reactor [RCT] core physics design via negative reactivity coefficients. The net result of this design is inherent negative reactivity feedback whenever an increasing fission rate in the reactor core produces an increase in moderator and/or fuel temperature.

It is important to note that although the thermal overload elements for CAP-1A and CAP-1B were determined to be unreliable during undervoltage conditions, the elements were always capable of carrying the motor Full Load Ampere (FLA) rating under nominal voltage conditions. Additionally, the redundant flow path for establishing emergency boration to the RCS from the borated water storage tank remained intact throughout the event.

CORRECTIVE ACTION:

On September 2, the thermal overload elements on CAP-1A and CAP-1B were replaced with elements sized to prevent nuisance undervoltage tripping. FPC is presently evaluating the remaining safety related and selected non-safety related thermal overload elements installed on the 480V ES motor control centers (MCC) [MCC] to determine if a similar problem exists with other overload elements. Any conditions discovered as a result of this analysis that are determined to be reportable per 10CFR50.73 will be reported to the NRC in a supplement to this LER.

PREVIOUS SIMILAR EVENTS:

LER 91-001 reported the inoperability of the "A" ES train High Pressure Injection System [BQ] recirculation isolation valve [ISV], MUV-53, due to undersized thermal overload elements. In that particular situation, however, the overload element had been sized based on an erroneous FLA rating for the valve that resulted from a discrepancy between a MCC design drawing and an associated auxiliary loading data sheet. The root causes of these two events are thus dissimilar.

Although there have been instances where the ECEP calculated voltage has failed to meet the actual in-plant required voltage, there were no previous LERs written regarding the potential for undervoltage tripping of thermal overload elements.