



**Florida
Power**
CORPORATION

Crystal River Unit 3
Docket No. 50-302

June 1, 1992
3F0692-02

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

Subject: Licensee Event Report (LER) 92-07

Dear Sir:

Enclosed is Licensee Event Report (LER) 92-07 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

9206050071 920601
PDR ADDOCK 05000302
S PDR

JE22

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 (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, 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)

Inadequate Level of Detail of Initial Plant Design Calculations Causes Operation 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)		
																											N/A			0 5 0 0 0		
0 5			0 1			9 2			9 2			0 0 7			0 0 0			6 0 1			9 2			N/A			0 5 0 0 0					

OPERATING MODE (9)

5

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:

CHECK ONE OR MORE OF THE FOLLOWING:

(11)

POWER LEVEL (10)

0 0 0

20.402(b)

20.405(c)

50.73(a)(2)(v)

73.71(b)

20.405(a)(1)(i)

50.96(c)(1)

50.73(a)(2)(v)

73.71(c)

20.405(a)(1)(ii)

50.96(c)(2)

50.73(a)(2)(v)

OTHER (Specify in Abstract below and in Tack. NRC Form 306A)

20.405(a)(1)(iii)

50.73(a)(2)(i)

50.73(a)(2)(v)(KA)

20.405(a)(1)(iv)

X

50.73(a)(2)(ii)

50.73(a)(2)(v)(KB)

20.405(a)(1)(v)

50.73(a)(2)(iii)

50.73(a)(2)(i)

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 6 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

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED

MONTH

DAY

YEAR

SUBMISSION

DATE (15)

YES (If yes, complete EXPECTED SUBMISSION DATE)

X NO

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

On May 1, 1992 at 1700, Crystal River Unit 3 (CR-3) determined that the calculated input voltage to the motor operators on the two steam admission valves for the steam driven Emergency Feedwater Pump (EFP) may be below the required voltage for operation during a Design Basis (DB) event. The required voltage was derived from differential pressure (D/P) testing and conservative valve factor assumptions. CR-3 discovered this condition while performing evaluations under Florida Power Corporation's Electrical Calculation Enhancement Program (ECEP). This design issue causes the steam driven EFP to be inoperable. The cause of this issue is initial plant design calculations not performed to a level of detail that would demonstrate voltage at the end device. Enhancements to the calculation performed under the ECEP identified this DB issue. To resolve this issue, the springpack size and unit ratio of the motor operators will be increased to reduce the voltage required to achieve adequate thrust.

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 20545, 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)						
CRYSTAL RIVER UNIT 3 (CR-3)		<table border="1"><tr><td data-bbox="1037 276 1148 329">YEAR</td><td data-bbox="1148 276 1280 329">SEQUENTIAL NUMBER</td><td data-bbox="1280 276 1387 329">REVISION NUMBER</td></tr><tr><td data-bbox="1037 329 1148 366">0 5 0 0 0 3 0 2 8 2</td><td data-bbox="1148 329 1280 366">0 0 7</td><td data-bbox="1280 329 1387 366">0 0</td></tr></table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	0 5 0 0 0 3 0 2 8 2	0 0 7	0 0	0 2 OF 0 3
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
0 5 0 0 0 3 0 2 8 2	0 0 7	0 0							

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

EVENT DESCRIPTION

On May 1, 1992, Crystal River Unit 3 (CR-3) was in Cold Shutdown (MODE 5) when a condition outside the Design Basis (DB) was discovered. It was determined by calculation that the DC motor operators on the two steam admission valves [V] for the steam driven Emergency Feedwater Pump (EFP) [BA,P] may experience an input voltage lower than the minimum required to provide adequate thrust under DB conditions. This is based on a conservative electrical analysis that assumes a DB event and maximum loading on the station batteries. This is considered a situation outside the DB and is being reported per 10CFR50.73(a)(2)(ii)(B).

On April 6, 1992, a review of the DC calculation portion of the Electrical Calculation Enhancement Program (ECEP) was performed and it was determined that a potential problem existed. The ECEP concluded that the minimum voltage available for the motor operators, Limitorque SMB-00, could be as low as 201 volts DC during a DB event. This is based on the conservative assumption of maximum horsepower rating for all loads used in the calculation, not taking any credit for system configuration changes. Other calculations performed, based on successful in-plant differential pressure (D/P) testing of the valves, concluded the minimum voltage required was 233 volts DC. These calculations use thrust required by the motor operator to overcome the D/P for the worst case DB scenario, measured during D/P testing and converts the thrust to motor torque. This calculation is also considered conservative because it uses a stem factor based on a coefficient of friction of 0.2 for the conversion. This would be representative of a degraded Limitorque operator. The valves can not practically be tested at worst case D/P with reduced voltage.

On May 1, 1992, after extensive evaluation, the two valves were declared inoperable which renders the steam driven EFP inoperable. In this condition, the Technical Specifications (TS) prohibit unit operation in MODE 3 (Hot Standby) and above.

CAUSE

In the initial design of the plant, calculations were not available to the level of detail that is now common practice. This resulted in the selection and installation of equipment in the plant that can not be shown by current analytic methods to be capable of performing under DB conditions.

EVENT ANALYSIS

Declaring these two valves inoperable renders the steam driven EFP inoperable. At the time of discovery, the plant was shutdown in MODE 5 with Reactor Coolant System (RCS) temperature at 190°F and pressure at 80 psig. The Emergency Feedwater (EF) system is not required to be operable in this condition. If the plant had been in Hot Standby (MODE 3), TSs would have required that the pump be returned to operable status within 72 hours or be in Hot Shutdown (MODE 4) within the next 12 hours. Redundancy within the EF system is supplied by the motor driven EFP. Furthermore, the Emergency Core Cooling Systems (ECCS) are available to remove decay heat from the core.

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) CRYSTAL RIVER UNIT 3 (CR-3)	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2 9 2	LER NUMBER (6)			PAGE (3) 0 3 OF 0 3
		YEAR 0 0 7	SEQUENTIAL NUMBER 0	REVISION NUMBER 0	

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

CORRECTIVE ACTION

The unit ratio for the motor operators determines the torque output that can be delivered to the valve stem. This ratio will be increased from 30.0 to 67.5. This will increase the mechanical advantage of the motor. This will also increase the valve stroke time. After this modification is complete, testing will be performed to ensure the technical specification surveillance requirements are met.

The springpack size of the motor operators will be increased from 145 ft.lbs to 240 ft.lbs. This provides a wider thrust band for the actuator to allow an increase in the torque switch settings. Motor protection is still provided by the thermal overloads.

PREVIOUS SIMILAR EVENTS

There have been instances where the ECEP calculated voltage has not met the in-plant required voltage. However, after calculating the required voltage based on actual thrust readings on the components, the ECEP calculated voltages have been greater than the required voltage. This has been true for both AC and DC loads.

There have not been any previous LERs due to inadequate voltage.