



**Florida  
Power**  
CORPORATION

Crystal River Unit 3  
Docket No. 50-302

October 14, 1992  
3F1092-07

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

Subject: Licensee Event Report (LER) 92-20

Dear Sir:

Enclosed is Licensee Event Report (LER) 92-20 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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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-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) CRYSTAL RIVER UNIT 3 (CR-3)		DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	PAGE (3) 1 OF 0 4
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TITLE (4)  
Insufficient Detail In Temporary Modification Installation Instructions Leads To Inoperable HPI Valves Under Degraded Voltage Conditions

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 N/A									
0	9	1	4	9	2	9	2	0	2	0	0	1	0	1	4	9	2	N/A

OPERATING MODE (9) 1

POWER LEVEL (10) 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (CHECK ONE OR MORE OF THE FOLLOWING) (11)

20.402(b)	20.405(c)	50.73(a)(2)(v)	73.71(b)
20.405(a)(1)(i)	50.36(o)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(o)(2)	50.73(a)(2)(v)(i)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(vii)(A)	
20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(v)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: W. A. Stephenson, Nuclear Safety Supervisor

TELEPHONE NUMBER: 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 NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE)  NO

EXTENDED SUBMISSION DATE (15)

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

On September 14, 1992 at 1620, Florida Power Corporation (FPC) determined that two of four High Pressure Injection valves at Crystal River Unit 3 may not function under certain Design Basis conditions due to low input voltage at the control devices. This was based on a conservative electrical analysis that assumes a simultaneous Design Basis Event during a degraded grid voltage condition. FPC discovered this condition after performing field walkdowns of the control power transformers for the referenced valves. The "as found" conditions, when considered in the analyses, resulted in the High Pressure Injection System being declared inoperable. The root cause is considered to be insufficiently detailed temporary modification installation instructions which contributed to personnel error. To resolve this issue FPC rewired control circuits to make use of a higher voltage tap on the control transformer. Both valves were restored to operable status by 1835 on September 14, 1992.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 60.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-640), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20556, 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)	LOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
	0 5 0 0 0 3 0 2 9 2	0 2 0	0 0	0 2	OF	0 4

TEXT: If more space is required, Use additional NRC Form 306A's (17)

**EVENT DESCRIPTION**

On September 14, 1992, Crystal River Unit 3 (CR-3) was operating at 100 % power when a condition outside the Design Basis (DB) was discovered. It was determined that two of four High Pressure Injection (HPI) valves (MUV-23 and MUV-25) [BQ,V] may not function under DB conditions due to low voltage at the control devices. This was based on a conservative electrical analysis that assumes a simultaneous DB event and offsite power at the minimum possible voltage without an actuation of the undervoltage relay protection. This is considered a situation outside the DB and is being reported per 10CFR50.73(a)(2)(ii)(B).

Florida Power Corporation (FPC) performed a field walkdown to verify the control power transformer data for numerous safety related components. This walkdown is part of FPC's Electrical Calculation Enhancement Program (ECEP). Based on the results of the walkdown, FPC determined that a potential problem existed. A preliminary calculation using our motor control center/AC distribution panel voltage drop calculation data base concluded that the minimum voltage available to the referenced valve control devices, during a degraded grid voltage condition, may be less than required for proper operation.

Upon completion and verification of the preliminary calculations, the valves were conservatively declared inoperable. This caused both trains of the HPI system to also be considered inoperable. Thus, CR-3 entered Technical Specification (T.S.) 3.0.3 at 1620. The voltage for MUV-23 was raised by using a higher voltage tap on the control power transformer and T.S. 3.0.3 was exited at 1645. The voltage for MUV-25 was likewise raised and the associated Action statement (T.S. 3.5.2) was exited at 1835.

**CAUSE**

The low voltage condition was caused by insufficient work instructions and design review. In 1980, the failed control power transformers for MUV-23 and MUV-25 [BQ,MCC] were replaced with non-safety related transformers using a temporary modification. The non-safety related transformers had been seismically qualified utilizing engineering judgement prior to installation and were intended for use only until equivalent safety related devices could be obtained. The work instructions for the temporary modification did not identify the actual secondary terminals to wire to. This resulted in the installation being performed incorrectly. Additionally, the instructions called for the voltage and current to be measured, and to be within specified limits, after the transformer installation work was completed. Although there was a signature indicating that the tests had been performed, there were no voltage values listed. The testing thus failed to identify the problem.

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

A permanent modification package was installed later in 1980 to replace the non-safety related control power transformers with equivalent safety related transformers. A failure to follow modification installation instructions resulted in the transformers feeding the indicating lights being changed out rather than the control power transformers. That being the case, the incorrect installation from the temporary modification work remained intact and the low voltage condition continued to exist. It is important to note that the voltage on the low side of the transformers was to be tested as part of this modification. This test, which was never performed, would have provided conclusive evidence that the permanent installation work was in error. Weaknesses in the post modification test program resulted in the testing requirement being deleted from the modification.

EVENT ANALYSIS

The HPI valves are a part of the discharge flow path for the A and B HPI trains. With two valves inoperable, the system would fail to provide adequate HPI flow for some DB accident mitigation. The redundant HPI valves (MUV-24 and MUV-26) were verified to have acceptable voltage supplies even though they were modified in 1980 at the same time as MUV-23 and MUV-25.

If a DB Event had occurred coincident with a degraded grid voltage condition, the valves may not have operated when required. This condition, however, could be mitigated by supplying the Engineered Safeguard Busses with power from the Emergency Diesel Generators. This condition is only a concern during a degraded voltage condition since the valve controls have adequate voltage during nominal voltage conditions.

CORRECTIVE ACTIONS

The control power voltage was raised by changing transformer taps and verified to be adequate for the control circuit to function during an undervoltage condition.

There have been considerable improvements in the overall modification process including design control, work control and post modification testing since 1980. Additionally, responsibility for translation of the design to a field work package, including detailed work instructions and test procedures was subsequently assigned to the engineering organization in the mid 1980's. Field work for modifications is now scheduled and controlled under the same process as normal plant maintenance. It is therefore FPC's position that adequate controls and checks in our current programs exist to preclude recurrence of this type of problem.

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)  CRYSTAL RIVER UNIT 3 (CR-3)	DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)																
			YEAR	SEQUENTIAL NUMBER	REVISION NUMBER																	
	0	5	0	0	0	3	0	2	9	2	---	0	2	0	---	0	0	0	4	OF	0	4

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

FPC is planning to replace the control and indicating lamp transformers with safety related transformers. Continuation of the ECEP will ensure that DB issues of this nature are identified and are promptly corrected.

PREVIOUS SIMILAR EVENTS

There have been two previous Licensee Event Reports generated due to insufficient voltage to safety-related components (LER 92-007 and LER 92-010).