



**Florida
Power**
CORPORATION

October 23, 1989
3F1089-12

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

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Licensee Event Report No. 89-016-02

Dear Sir:

Enclosed is supplement two for Licensee Event Report (LER) 89-016 which is submitted in accordance with 10 CFR 50.73. An additional supplement to address any items identified during the current Environmental Qualification walkdown outside of containment will be submitted by January 15, 1990.

Should there be any questions, please contact this office.

Very truly yours,

Rolf C. Widell
Director, Nuclear Operations Site Support

WLR:mag

Enclosure

xc: Regional Administrator, Region II
Senior Resident Inspector

8910270215 891023
PDR ADOCK 05000302
S FDC

IE22
11

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	PAGE (3) 1 OF 13
--	---	----------------------------

TITLE (4) **Administrative Problems Caused Deficiencies in the Environmental Qualification Program Resulting in Plant Equipment Not Properly Qualified**

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	4	8	8	016	0	0	2	1989	N/A		0 5 0 0 0
0	4	1989	8	9	0	0	2	1989	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	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)								

LICENSEE CONTACT FOR THIS LER (12)	
NAME L. W. MOFFATT, NUCLEAR SAFETY SUPERVISOR	TELEPHONE NUMBER AREA CODE: 9 1 0 4 NUMBER: 7 1 9 5 1 - 1 6 4 8 1 6

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS

SUPPLEMENTAL REPORT EXPECTED (14) <input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15) MONTH: 0 1 DAY: 1 5 YEAR: 9 0
--	----	---

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

Crystal River Unit 3 was in MODE 5 (COLD SHUTDOWN) from February 27, 1989 to June 1, 1989. During this outage, NRC inspectors discovered deficiencies related to environmental qualification of plant equipment. Deficiencies included improper cables and splices, improper silicon oil level in instrument junction boxes, and problems related to valve motor operators. Problems were the result of deficiencies in detailed development and implementation of the environmental qualification program. Utility personnel have repaired identified environmental qualification deficiencies, or have justified continued operation with the deficiencies until repairs are completed. The utility has embarked on a major voluntary effort to review the existing Environmental Qualification program, and to correct additional environmental qualification deficiencies that may be discovered.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 9	— 0 1 6	— 0 2	0 2	OF 1 3

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

EVENT DESCRIPTION

Crystal River Unit 3 was in MODE 5 (COLD SHUTDOWN) from February 27, 1989 to June 1, 1989. During this outage, a Nuclear Regulatory Commission inspection team discovered several deficiencies related to environmental qualification (EQ) of Plant Equipment. Inspectors found the following deficiencies:

- 1) Improper electrical cable [CBL] and splice [CON] installation, including cables and splices not qualified for submersion found located below the Reactor Building (RB) [NH] flood level,
- 2) Improper oil level in instrument junction boxes [JBX],
- 3) Missing or painted over T-drains [DRN], and missing or capped grease relief fittings on valve motor operators [84],
- 4) Deterioration of wires and grease associated with the Pilot Operated Relief Valve (PORV) [AB,RN] Block Valve (Tag No. RCV-11) [AB,SHV].

UNQUALIFIED CABLES [CBL] AND SPLICES [CON]

On April 26, 1989, during the NRC Environmental Qualification (EQ) Program audit, inspections found that cable splices on signal cables from two pressure transmitters [PT] had not been installed in accordance with the splice manufacturer's application guide. The application guide required that each splice bend radius be no smaller than five times the outside splice diameter. The manufacturer had no data to determine whether or not splices could be qualified with smaller bend radii. Inspectors found bend radii that were only two to three times the outside radii of the splices. These splices were located in the Reactor Coolant System [AB] instrumentation wiring, between conduit seal assemblies and the field cables.

Original plans called for installation of junction boxes between the instrument conduit seal assemblies and the field conduits. These boxes were to be large enough to allow splice installation with acceptable bend radii. Due to seismic mounting difficulties, the plans were revised to specify 3/4 inch condulets [CDT] instead of the junction boxes. The 3/4 inch condulets were not large enough to allow splice installation without bending to radii less than allowed. Splice installation and inspection instructions did not include bend radius specifications.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	- 0 1 6	- 0 2	0 3	OF 1	3

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

Plant personnel performed extensive investigations following the NRC's EQ audit. On May 6, 1989 utility engineers discovered unqualified splices in Main Steam [SB] and Emergency Feedwater [BA] system instrumentation wiring that was required to be environmentally qualified. During initial splice installation, work instructions for splice installation specified use of heat shrink sleeves [SLV] that were too small for the cable specified. Therefore, the installed splices were not environmentally qualified. Splice installation instructions were changed to specify the proper size sleeves. The documentation prepared to accomplish this change provided no method to assure that the improper splices were reworked to comply with the new instructions. There was also no quality inspection plan developed to verify acceptability of the work.

On May 6, 1989 utility engineers also identified unqualified cables and splices associated with safety related flow and level transmitters in the Reactor Coolant System (RCS) and one motor operated valve in the Makeup and Purification System [CB]. These cables and splices were located below the flood level in the RB. The cables and splices were not qualified for submergence and should not have been routed below the flood level. The instructions by which the cable raceways were installed did not adequately define all EQ requirements.

IMPROPER OIL LEVEL IN INSTRUMENT JUNCTION BOXES

On April 26, 1989 during the NRC EQ audit, it was discovered that the Reactor Building Sump level transmitters [NH,LT] and the Reactor Building flood level transmitters had not been maintained in accordance with EQ requirements. The electrical junction boxes associated with the level transmitters are required to be filled with silicon oil to provide protection from moisture and submersion. When the junction boxes were inspected they were found to have less than the required amount of oil. This compromised the environmental qualification of these components.

Investigators found no record of maintenance which would have removed the oil. Records from the installation of the transmitters show that the transmitters were properly filled when they were installed in 1983. However, since that time, there has been no regular surveillance program to monitor oil level in the junction boxes.

MISSING OR PAINTED OVER T-DRAINS [DRN] AND CAPPED OR MISSING GREASE RELIEF FITTINGS ON VALVE MOTOR OPERATORS

On April 26, 1989 the NRC EQ audit discovered EQ deficiencies associated with four valve motor operators located in the Reactor Building. The EQ deficiencies identified involved the installation and maintenance of motor operator T-drains (enclosure drains) and grease reliefs (thermal expansion reliefs).

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-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	DOCKET NUMBER (2) 0 F 0 0 0 3 0 2 8 9 - 0 1 6 - 0 2 0 4 OF 1 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

Inspectors found problems associated with the following valves:

- 1) CAV-1, Pressurizer [AB,PZR] steam space sampling containment isolation valve [SHV],
- 2) CAV-3, Pressurizer water space sampling containment isolation valve,
- 3) CAV-4, Steam Generator [AB,SG] "A" sampling containment isolation valve,
- 4) RCV-11, Isolation valve for Pressurizer Pilot Operated Relief Valve.

Immediately following the NRC audit, utility personnel performed inspections of the 21 valve motor actuators that require environmental qualification, and are located in the Reactor Building. The inspections addressed installation and maintenance in the areas of T-drains, grease reliefs, and splices and terminations associated with limit switches.

The valve currently installed as RCV-11, and its associated motor actuator, were installed and tested in 1982. The operator qualification test included references to T-drains. It should be noted that in some instances T-drains are shipped with motor operators, but are not attached. Similarly, grease reliefs are covered with a cap during shipping. Based upon current verification data, it appears that T-drains were never installed, and grease relief caps were never removed.

Motor operators on valves CAV-1, CAV-3, and CAV-4 were replaced in 1979 due to EQ concerns. Valve operator test procedures used at that time did not include T-drains. In 1981, plant personnel determined that the valve operators were not qualified for submergence, even though they were located below the postulated flood elevation in the Reactor Building. The valves were relocated. Relocation work did not include T-drain installation.

In 1983, valves CAV-1 and CAV-3 and their associated operators were replaced with different types of valves and operators due to operational problems. Modification instructions for installation of the new valves included directions for installing T-drains. However, the modification contained no instructions for removing grease relief shipping caps. Based upon current inspection data, the T-drains were installed on CAV-1 and CAV-3 (although the CAV-1 T-drain was found plugged), but the grease relief shipping caps for both CAV-1 and CAV-3 had never been removed.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20655, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) CRYSTAL RIVER UNIT 3	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 9	0 1 6	0 2	0 5	OF 1 3

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

In 1985, as a result of additional reviews required by IE Bulletin 79-01B, Florida Power Corporation (FPC) replaced 13 valve actuator motors in the Reactor Building with new Class RH insulation motors and pinion gears. The modification also contained specific instructions for verifying the installation of T-drains and grease reliefs in 9 of the 13 actuators. It appears the verification instructions for the 9 actuators were performed because the current inspection results indicated all 9 had T-drains and grease reliefs installed. However, several of these actuators had plugged grease reliefs and one had only one T-drain. From the documentation, it is not clear why the modification did not include the remaining EQ actuators located in the Reactor Building.

In 1986, plant personnel inspected each of the 21 environmentally qualified valve actuators in the Reactor Building. This inspection discovered deficiencies related to T-drains and grease reliefs. The inspection instructions provided guidance for identifying the deficiencies and notifying appropriate supervision. The identified deficiencies were documented on individual inspection data sheets which were then forwarded to the Site Nuclear Procurement Engineer for review. It appears the completed inspection sheets and work requests were never adequately reviewed and appropriate corrective actions were never pursued.

PORV BLOCK VALVE DETERIORATION

On May 1, 1989 a utility electrician found that the PORV Block Valve control cable insulation [ISL] and motor operator grease had deteriorated due to high ambient temperatures. The electrician made this discovery as part of the NRC EQ audit. Valve RCV-11 is located on top of the Pressurizer. During the May 1 inspection, the electrician also noted that the motor leads were not properly spliced. The reason for the incorrect splices appears to be that inadequate instructions were provided when splices were installed.

During the 1981 refueling outage, personnel discovered high temperature damage to the motor control cables associated with the PORV Block Valve, RCV-11, as well as two other valves. Plant personnel replaced the damaged cables and installed junction boxes to facilitate replacement of the cables. During the 1983 refueling outage, the RCV-11 control cables were replaced again because of heat damage to the insulation. During the 1985 refueling outage, plant personnel proposed replacement of the RCV-11 control cables with new cables insulated with a material resistant to high temperature and radiation. However, the proposed cables would have been susceptible to damage by high humidity. The modification was rejected, and the cables were replaced with new cables of the original type.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	— 0 1 6	— 0 2	0 6	OF	1 3

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

The original cables were considered to be Environmentally Qualified. However, the cable insulation will not endure long term exposure to the temperatures encountered in the area where valve RCV-11 is installed. Insulation that will withstand the temperatures at this location are porous and may fail due to high humidity.

The RCV-11 actuator has been refurbished and the motor and motor control leads have been replaced. Also, the motor limit switch compartment space heater has been removed. The utility will develop a preventive maintenance program to inspect and replace interconnect wiring as required, and will replace the RCV-11 operator motor during the next refueling outage. Utility engineers are investigating replacement of the RCV-11 motor with a newer style motor equipped with RH insulation. Such a motor would be rated for higher temperatures than the currently installed motor.

INCORRECT PLUGS INSTALLED IN PRESSURE TRANSMITTER CONDUIT CONNECTIONS

On May 5, 1989 utility personnel discovered plastic plugs installed in conduit connections associated with two Steam Generator pressure transmitters. The transmitters were shipped with plastic plugs in the conduit connection openings. The plastic plugs should have been replaced with stainless steel plugs during transmitter installation. Plastic plugs remained in place due to personnel oversight. During development of plans and instructions for installing the two transmitters, personnel did not recognize the need to replace plastic plugs with stainless steel plugs.

Plant personnel have replaced plastic plugs with stainless steel plugs.

SUBSEQUENT EQ DEFICIENCIES

Subsequent to the NRC inspection and following return to POWER OPERATION on July 6, 1989, two additional EQ discrepancies were identified by FPC:

At 1800 on June 30, 1989, during maintenance on Feedwater Valve 30 (FWV-30) [SJ,V], an unqualified splice was found in the motor operator of this valve.

On July 7, 1989, during review of EQ documentation, it was determined that all four channels of core flood tank level instrumentation [BP,LI] did not have proper conduit seals installed at the location where the conduit connects to the transmitter.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2 8 9	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		0	1	6	0	7	OF 13

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

CAUSE

These events are varied in nature and root cause. However, the events indicate the overall environmental qualification program was deficient in the following areas:

- 1) Development of overall EQ program definition, responsibilities, administrative controls, and detail procedures,
- 2) Technical and programmatic training at levels or stages of program implementation,
- 3) Communication and coordination of program requirements and responsibilities necessary to achieve and maintain desired program objectives,
- 4) Post EQ installation verification, inspection and acceptance,
- 5) Maintenance of EQ performance capability; i.e., specific EQ surveillance programs and procedures, specific EQ preventative maintenance activities.
- 6) Insufficient controls to assure corrective actions related to design deficiencies are implemented.

EVENT ANALYSIS

IMPROPER ELECTRICAL CABLE AND SPLICE INSTALLATION, INCORRECT PLUGS INSTALLED IN PRESSURE TRANSMITTER CONDUIT CONNECTIONS

- 1) BEND RADII LESS THAN ALLOWED BY MANUFACTURER'S GUIDELINES
- A) Affected Equipment : RC-3A-PT3, RC-3B-PT3, [AB, PT]
RC-14A-DPT1, RC-14A-DPT2, RC-14A-DPT3, RC-14A-DPT4, RC-14B-DPT1,
RC-14B-DPT2, RC-14B-DPT4 [AB, FT]

Transmitters RC-3A-PT3 and RC-3B-PT3 monitor RCS pressure. They provide input signals for actuation of the Engineered Safeguards System (ES) [JE]. The other transmitters listed above provide RCS flow signals to the Reactor Protection System [JC] (RPS) for the Flux/Flow Imbalance Trip.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	- 0 1 6	- 0 2	0 8	OF	1 3

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

Failure of these transmitters would not have occurred unless a harsh environment existed in the Reactor Building. Such conditions would only exist following a Loss of Coolant Accident (LOCA) or Main Steam line break in the RB. If either of these events occurred, ES and/or RPS actuation should occur before splice failure occurred. Also, the Engineered Safeguards and Reactor Protection Systems monitor other parameters that would cause the systems to actuate.

The bend radius lower limit of five diameters was based on the bounds of the splice manufacturer's analysis. The manufacturer had no data to verify whether or not splices would function properly with bend radii less than five diameters. Florida Power Corporation obtained test reports concerning this issue from another utility. The test reports indicate that the type of splice in question would maintain its qualification at bend radii of one diameter or less. Therefore, there is low probability that these splices would have failed due to their bend radius. The splices in question may be considered to be qualifiable.

- 2) SPLICE SLEEVES TOO SMALL, INCORRECT PLUGS INSTALLED IN PRESSURE TRANSMITTERS
- A) Affected Equipment (Splice Sleeves): MS-106-PT, MS-107-PT, MS-108-PT, MS-109-PT, MS-110-PT, MS-111-PT, MS-112-PT, and MS-113-PT [BA, PT]
Affected Equipment (Incorrect Plugs): MS-111-PT and MS-113-PT

These instruments sense pressure in the secondary side of the Steam Generators (SG) and transmit signals to the Emergency Feedwater Initiation and Control System (EFIC) [BA]. Signals from these instruments are used for Main Steam and Feedwater isolation, initiation of Emergency Feedwater (EFW) flow to the Steam Generators, and control of feedwater flow.

Failure of three or more of these instruments on either SG in an emergency situation requiring EFW, would prevent proper EFW actuation or Steam Generator isolation, or could cause unwarranted EFW actuation or Steam Generator isolation. Failure of these instruments could also prevent proper EFW flow rate during Natural Circulation. In either of these events, operators would be able to manually operate equipment to isolate SG's, unisolate SG's, or control EFW flow.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	- 0 1 6	- 0 2	0 9	OF	1 3

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

A harsh environment in the Intermediate Building would result from a Main Steam or Main Feedwater line Break in the building. In the event of a Main Steam or Main Feedwater Line break, EFIC should isolate Main Steam and Main Feedwater before splices failed due to harsh environment. Splice failure later in either event could defeat the EFIC logic that controls EFW flow during RCS natural circulation flow, or the logic that prevents EFW flow to a faulted Steam Generator. If EFIC did not automatically isolate Main Steam and Main Feedwater, operators would be able to manually isolate these systems.

Florida Power Corporation has obtained data from another utility that demonstrates that the splices in question were qualifiable.

- B) Affected Equipment: EF-24-FT, EF-25-FT, and EF-26-FT [BA, FT]

These instruments measure Emergency Feedwater flow, and provide flow indication to the Main Control Board. Loss of these instruments would not directly prevent proper control of Emergency Feedwater flow. However, lost or failed indication could mislead operators during a transient.

Florida Power Corporation has obtained data from another utility that demonstrates that the splices in question were qualifiable.

- 3) SUBMERSION

- A) Affected Equipment: RC-14A-DPT1, RC-14A-DPT2, RC-14A-DPT3, RC-14B-DPT1, RC-14B-DPT2, and RC-14B-DPT3 [AB, FT]

Each of these instruments provide signals to the Reactor Protection System for the Flux/Flow/Imbalance Trip. Also, transmitters RC-14A-DPT1, RC-14A-DPT2, RC-14B-DPT1 and RC-14B-DPT2 provide indication of Reactor Coolant System flow on the Main Control Board.

Environmental qualification of these instruments could be compromised due to RB flooding concerns. Reactor Building flooding sufficient to threaten operability of these transmitters would only occur following a Loss of Coolant Accident. The major source of RB flooding following a LOCA would occur as a result of water injected by the Engineered Safeguards system. The RPS will trip the reactor before ES actuation since the RPS setpoints are higher than or equal to Engineered Safeguards setpoints. The subject transmitters are not required to function after a reactor trip. The same reasoning would apply in the case of a small break LOCA too small to initiate ES.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2 8 9	LER NUMBER (6)		PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		8 9	0 1 6	0 2	1 0 OF 1 3

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

Following a LOCA which depleted the entire RCS volume, there would be no RCS flow to monitor. Therefore the transmitters need not be functional following a large break LOCA. Indication of RC flow following a small break LOCA that did not deplete the entire RCS volume could be derived from the status of other RCS parameters.

B) Affected Equipment: RC-1-LIT3 [AB, LIT]

This transmitter provides the signal used for automatic Pressurizer level control, as well as indication of Pressurizer level on the Main Control Board.

Following a LOCA or Main Steam or Main Feedwater line Break, RCS inventory could be controlled by the High Pressure Injection (HPI) [BJ] and Low Pressure Injection (LPI) [BP] systems. Loss of the control signal from RC-1-LIT3 at this point would not hinder transient mitigation. However, this transmitter is required by Nuclear Regulatory Guide 1.97 to be functional for a period of 24 hours following either a large or small break LOCA.

C) Affected Equipment: RC-3A-PT4 [AB, PT]

This instrument provides an RCS pressure signal to initiate ES. Since the major source of RB flooding is the ES system, the safety function of this instrument would be accomplished before flooding occurred. This transmitter is also required by Nuclear Regulatory Guide 1.97 to mitigate the consequences of a LOCA.

D) Affected Equipment: SP-21-LIT, SP-22-LIT, SP-23-LIT, SP-24-LIT, SP-31-LIT, and SP-32-LIT [AB, LIT]

These transmitters monitor level in the "B" Steam Generator. Transmitters SP-21-LIT, SP-22-LIT, SP-23-LIT and SP-24-LIT monitor "High Range" level. Transmitters SP-31-LIT and SP-32-LIT monitor "Low Range" level. These instruments provide a signal for EFIC actuation, and EFW Block Valve [BA,SHV] control. These transmitters are required for the proper operation of the Emergency Feedwater System. The transmitters are required to operate 24 hours post accident.

The EFIC system controls EFW flow based on "High Range" level indication during RCS natural circulation flow. The system also uses "High Range" level indication for initiation of Steam Generator overflow protection. Failure of the SP-21-LIT or SP-22-LIT would cause improper EFW flow control during RCS natural circulation flow. Failure of SP-23-LIT or SP-24-LIT would cause EFW Block Valves to close prematurely, or would prevent valves from closing when required. In either case, operators would be able to manually control EFW flow or operate EFW Block Valves as necessary.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. 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	DOCKET NUMBER (2) 0500030289	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9	016	02	1	1	OF 13

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

Failure of the "Low Range" instruments could cause premature EFIC actuation, or prevent EFIC actuation on two of the four EFIC channels. In the event of a LOCA, Engineered Safeguards system actuation would actuate the EFIC system independently of Steam Generator levels before RB flooding occurred. In the event of a Main Steam or Main Feedwater Line Break, EFIC system would actuate due to low Steam Generator Pressure. Therefore, Reactor Building flooding due to these events would not prevent EFIC actuation. Since both of these events would require EFIC actuation, Reactor Building flooding would not cause premature actuation due to failure of these transmitters.

- E) Affected Equipment: RC-163A-LIT1, RC-163B-LIT1, RC-164A-LIT1 and RC-164B-LIT1 [AB, IT]

The transmitters provide Reactor Vessel [AB,RPV] water level indication to the Reactor Coolant Inventory Tracking System (RCITS) This system is not required for transient mitigation. Failure of these instruments would not degrade performance of ES equipment or hinder accident mitigation capabilities.

- F) Affected Equipment: Valve MUV-505 Motor Operator [CB, MO]

Valve MUV-505 [CB,ISO] is a containment isolation valve for one of the three letdown coolers [CB, HX]. The valve is closed by ES actuation, and is required to remain closed. In the event of a LOCA and accompanying ES actuation, the valve will perform its isolation function before RB flooding occurs. Once closed, the valve could not reopen if the operator were flooded.

The valve position indication limit switches would short out if flooded, and position indication would be lost to the Main Control Board. This would not degrade performance of ES equipment or hinder accident mitigation capabilities.

IMPROPER OIL LEVEL IN INSTRUMENT JUNCTION BOXES

Affected Equipment: WD-301A-LIT, WD-301B-LIT, WD-302A-LIT, WD-302B-LIT, WD-303A-LIT, WD-303B-LIT, WD-304A-LIT, WD-304B-LIT

Transmitters WD-301A/B-LIT and WD-302A/B-LIT are the Reactor Building Sump level transmitters. Transmitters WD-303A/B-LIT and WD-304A/B-LIT measure Reactor Building Flood Level (water level above the Reactor Building Floor). These transmitters provide indication on the main control board. The instruments provide no automatic control function. Loss of indication from these instruments would not prevent operation of ES equipment. However, operators

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), 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	DOCKET NUMBER (2) 05000302	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		89	016	02	1	2	OF 13

TEXT (If more space is required, use additional NRC Form 36A's) (17)

use indications from the flood level instruments when swapping LPI Pump [BP,P] suction from the Borated Water Storage Tank [BP,TK] to the Reactor Building sump during a LOCA. Loss of indication from the flood level transmitters would complicate the transition.

During a LOCA, the sump Level transmitters may fail due to submersion. However, as water level would continue to rise, the flood level instruments would provide adequate level indication. The flood level transmitters are located above the Reactor Building flood level. Therefore, it is not likely that the flood level instruments would fail due to flooding.

CAPPED OR MISSING T-DRAIN AND VENTS ON VALVE MOTOR OPERATORS

Valves CAV-1, CAV-3, and CAV-4 automatically close upon receipt of an automatic diverse containment isolation signal from the ES system. These valves promptly receive an ES signal to close and will have performed their safety function before being exposed to a harsh environment. Each of these valves have redundant containment isolation valves outside of the RB. In the event of LOCA, the outboard valves would still be available for containment isolation.

PORV BLOCK VALVE DETERIORATION

If RCV-11 failed in the closed condition, there is no safety significance. If RCV-11 and the PORV both failed open, operators would not be able to isolate flow through the PORV. However, operators would be able to maintain RCS inventory via the HPI and LPI systems. Plant small break LOCA analysis bounds this event.

In the event of a LOCA and accompanying low RCS pressure, the PORV would not open automatically. Operators would have no reason to open the valve manually. Therefore, it is not likely the PORV and RCV-11 would both fail open in this event. If the RCS repressurized following a LOCA, operators would be required to use the PORV to maintain RCS pressure below 2300 psig. In this scenario, there is a possibility that the PORV and PORV block valve would both fail open.

SUBSEQUENT EQ DEFICIENCIES

FWV-30 is the main block valve in the feedwater flow path to Steam Generator "B" [AB,SG]. The safety function of this valve is to close on a low steam generator pressure actuation of the Emergency Feedwater Initiation and Control System (EFIC) [BA]. There are other valves in the flow path which also close on this signal which would also isolate this flow path.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. 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	DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	- 0 1 6	- 0 2	1 3	OF	1 3

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

The core flood tank level instrumentation is used by operators to monitor and maintain the core flood tanks at the proper level during normal operations. Following an accident, these indicators are used to verify proper operation of the Core Flood Tanks [BP,TK]. This instrumentation is qualified for its normal environment. The accident in which the core flood tanks are needed to ensure that the ECCS acceptance criteria are met is the large break LOCA. In this type of accident, the Core Flood tanks empty within the first few minutes after the break occurs. Once the tanks have emptied and the operators have verified that they are empty, the core flood tank level instrumentation is no longer needed. Due to the short time frame during which operation in an accident environment is required, FPC determined that the level instrumentation was operable.

CORRECTIVE ACTION

The deficiencies which were identified in the inspection were corrected during the 1989 spring outage. The unqualified splice in FWV-30 has been replaced with a qualified splice. A modification will be developed to install conduit seals on all core flood tank level transmitters.

In order to prevent future occurrences, the utility has committed to perform EQ training in August 1989 and to implement an enhancement to the present EQ program. The enhancement will address the following seven areas:

- a. Organization
- b. Procedures
- c. Field Verification
- d. Documentation
- e. Environmental Profile
- f. EQ Master List
- g. Training

PREVIOUS SIMILAR EVENTS

The utility has submitted five previous Licensee Event Reports concerning environmental qualification deficiencies.