

May 17, 1989

Docket No. 50-389

DISTRIBUTION  
See attached sheet

Mr. C. O. Woody, Acting Senior  
Vice President-Nuclear  
Nuclear Energy Department  
Florida Power and Light Company  
Post Office Box 14000  
Juno Beach, Florida 33408-0420

Dear Mr. Woody:

SUBJECT: ST. LUCIE UNIT 2 - ISSUANCE OF AMENDMENT RE: DELETION OF LICENSE  
CONDITIONS NOS. 2.C.10 AND 2.C.11 (TAC NO. 69236)

The Commission has issued the enclosed Amendment No. 41 to Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit No. 2. This amendment consists of changes to the Technical Specifications in response to your letter dated November 20, 1984 and by application dated January 25, 1985.

On September 13, 1988, the staff issued Amendment No. 34, which deleted various license conditions from the St. Lucie Unit 2 license. However, the staff determined that further review was needed concerning the deletion of license conditions 2.C.10 and 2.C.11. The staff has now completed its review and has determined that these conditions can be deleted from the St. Lucie Unit 2 license. Therefore, this amendment deletes license conditions 2.C.10 and 2.C.11 from the St. Lucie Unit 2 Operating License No. NPF-16.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by  
G. E. Edison FOR

Jan A. Norris, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 41 to NPF-16
2. Safety Evaluation w/attachment

cc w/enclosures:  
See next page

See previous concurrence \*

\*LA:PDII-2  
DMiller  
05/02/89

PM:PDII-2  
JNorris  
5/13/89

D:PDII-2  
HBerkow  
5/17/89

\*OGC  
JHLewis  
05/14/89

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*opi*  
*1/1*

DATED: May 17, 1989

AMENDMENT NO. 41 TO FACILITY OPERATING LICENSE NO. NPF-16 - ST. LUCIE, UNIT 2

Docket File

NRC & Local PDRs

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J. Norris

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E. Jordan, 3302 MNBB

B. Grimes, 9/A/2

T. Meek (4), P1-137

Wanda Jones, P-130A

E. Butcher, 11/F/23

ACRS (10)

GPA/PA

ARM/LFMB

P. Frederickson, R-II

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Florida Power & Light Company

St. Lucie Plant

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

FLORIDA POWER & LIGHT COMPANY

ORLANDO UTILITIES COMMISSION OF

THE CITY OF ORLANDO, FLORIDA

AND

FLORIDA MUNICIPAL POWER AGENCY

DOCKET NO. 50-389

ST. LUCIE PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 41  
License No. NPF-16

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Florida Power & Light Company, et al. (the licensee), dated January 25, 1985, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, Facility Operating License No. NPF-16 is amended by deleting paragraphs 2.C.10 and 2.C.11.
3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Herbert N. Berkow, Director  
Project Directorate II-2  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Date of Issuance: May 17, 1989



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 41

TO FACILITY OPERATING LICENSE NO. NPF-16

FLORIDA POWER & LIGHT COMPANY, ET AL.

ST. LUCIE PLANT, UNIT NO. 2

DOCKET NO. 50-389

1.0 INTRODUCTION

By letter dated November 20, 1984 and application dated January 25, 1985, the Florida Power & Light Company, et al. (the licensees, FP&L) requested that certain license conditions be deleted from the St. Lucie Plant, Unit No. 2 Operating License No. NPF-16. On September 13, 1988, the Commission issued Amendment No. 34 to the Facility Operating License No. NPF-16 deleting the requested license conditions with the exception of conditions 2.C.10 and 2.C.11. This Safety Evaluation addresses deletion of the license conditions 2.C.10 and 2.C.11.

2.0 EVALUATION

License conditions 2.C.10 and 2.C.11 currently read as follows:

10. Non-Safety Loads on Emergency Power Sources (Section 8.4.2, SER, SSER 3)

Prior to startup following the first refueling outage, the licensees shall implement the design modification to disconnect four-kilovolt loads on detection of a safety injection signal and provide two isolation devices in series for those non-safety electrical loads that are not disconnected by a safety injection signal or loss of offsite power.

11. Containment Electrical Penetrations (Section 8.4.3, SSER 3)

Prior to startup following the first refueling outage, the licensees shall complete the design modifications to provide independent primary and backup fault protection for each electrical conductor penetrating containment.

These two conditions required the licensees to perform certain modifications, the completion of which had to be verified by a special inspection. Region II inspectors performed the verification during the inspection conducted February 27 - March 3, 1989. The results of that inspection are contained in the attached NRC Inspection Report Nos. 50-355/89-07 and 50-389/89-07.

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### 3.0 SUMMARY

Based on the results of the above inspection, the staff concludes that the modifications referred to in license conditions 2.C.10 and 2.C.11 have been implemented and therefore the license conditions may be deleted.

### 4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously published a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR §51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

### 5.0 CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: May 17, 1989

Principal Contributors:  
N. Merriweather, Reg. II  
J.A. Norris

Attachment:  
NRC Inspection Report



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
 REGION II  
 101 MARIETTA ST., N.W.  
 ATLANTA, GEORGIA 30323

Report Nos.: 50-335/89-07 and 50-389/89-07

Licensee: Florida Power and Light Company  
 9250 West Flagler Street  
 Miami, FL 33102

Docket Nos.: 50-335 and 50-389

License Nos.: DPR-67 and NPF-16

Facility Name: St. Lucie 1 and 2

Inspection Conducted: February 27 - March 3, 1989

Inspector: *N. Merriweather* 3-29-89  
 N. Merriweather Date Signed

Team Members: T. Humphrey, Consultant Engineer, Idaho National Engineering  
 Laboratory  
 M. Miller, Reactor Inspector, RII  
 C. Paulk, Reactor Inspector, RII  
 A. Ruff, Reactor Inspector, RII

Approved by: *T. E. Conlon* 3-30-89  
 T. E. Conlon, Chief  
 Plant Systems Section  
 Engineering Branch  
 Division of Reactor Safety  
 Date Signed.

SUMMARY

Scope

This special announced team inspection was in the areas of Environmental Qualification of Electrical Equipment and followup on previous inspection findings. The inspection included: a review of Florida Power and Light Company's implementation of a program to meet the requirements of 10 CFR 50.49 at the St. Lucie Plant; walkdown inspections of EQ equipment inside containment; review of EQ maintenance activities; review of EQ design changes; licensee actions in response to NRC initiatives (NRC Notices 86-71 and 88-89); and followup on licensee actions in response to license conditions 2.c.10 and 2.c.11 described in Section 8.4.2 of St. Lucie Safety Evaluation Report, Supplement 3 (also see Violation 389/87-20-02).

Results

In the areas inspected, violations or deviations were not identified.

The results of this inspection support NRC's initial assessment of the March 31, 1986 audit, that FPL had implemented an adequate EQ program and that the program continues to be adequate. The walkdowns

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of EQ equipment resulted in no open or unresolved items. EQ documentation files were considered well organized and complete requiring minimal, if any, additional information to support the analysis provided in the file. EQ Maintenance Program procedural compliance was good and the special maintenance requirements described in the EQ DOC PACs were confirmed to have been incorporated into the procedures for those sample items reviewed. However, the tracking mechanism used by the plant to ensure scheduling and completion of EQ maintenance tasks appeared to be fragmented with separate lists for calibration, surveillance, PMs and replacement. There was no overall program to ensure that all maintenance activities were being accomplished. This was considered a weakness in the licensee's EQ maintenance program. The licensee acknowledged the concern and committed to implement a formalized maintenance tracking system as outlined in the inspection report details in paragraph 2.a. The team considered these actions to be adequate to resolve all concerns.

Management appears to be supporting the EQ program at the St. Lucie Plant. Similar initiatives to those identified at their Turkey Point Plant are also being performed at St. Lucie. The licensee has brought in outside contract support to review the EQ Program at the plant. This was considered a strength in the licensee's EQ program.

The licensee's handling of EQ issues relating to IN 86-71 could have been better for Unit 2. The licensee had hung clearance tags on 122 power panel breakers supplying power to MOV heater circuits. This was intended to be a permanent long term fix for the heater problem. The inspection team did not consider this to be the best method to resolve the concern for unqualified EQ heaters in limitorque MOVs. The licensee acknowledged the concern and committed to either disconnect the heaters similar to Unit 1 or provide mechanical locks and administratively control the breakers. (See paragraph 2.b of report details). This was considered adequate by the inspection team.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. Ball, Mechanical Maintenance Planning Supervisor
- \*J. Barrow, Operations Superintendent
- \*J. Barrow, Fire Protection Representative
- \*G. Boissy, Plant Manager
- \*S. Brain, Independent Safety Engineering Group Chairmen
- \*L. Collins, I&C Foreman
- \*B. Dawson, Maintenance Superintendent
- \*B. Dean, Electrical Maintenance Supervisor
- \*K. Harris, Vice President
- \*J. Hoffman, Mechanical Engineer
- \*R. Holdren, I&C Supervisor
- \*C. Leppla, I&C Superintendent
- \*R. Marr, I&C Supervisor
- \*L. McLaughlin, Technical Staff Nuclear Licensing
- \*K. Mohindroo, Electrical/I&C Supervisor
- \*D. Parker, Senior Engineer
- \*B. Parks, QA Supervisor Performance Monitoring
- \*G. Regal, Corporate EQ Coordinator
- \*L. Rogers, Electrical Maintenance
- \*G. Schmid, I&C Maintenance
- \*D. Smith, Manager Electrical/I&C Engineering
- \*C. Swiatak, Technical Staff Supervisor
- \*D. West, Technical Staff Supervisor
- \*J. West, Operations Representative
- \*C. Wilson, Mechanical Maintenance Representative
- \*D. Wolf, I&C Department Representative
- \*E. Wunderlich, Reactor Engineering Supervisor

Other licensee employees contacted during this inspection included craftsmen, engineers, mechanics, technicians, and administrative personnel.

#### Other Organizations

- \*R. Gonzalez, I&C Supervisor, EBASCO
- \*D. Buckley, Consultant Engineer, Engineering, Planning and Management

#### NRC Resident Inspector

- \*M. Scott, Resident Inspector

#### \*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Evaluation of Licensee's Program for Qualification of Electrical Equipment Located in Harsh Environments (TI 2515/75, TIs.2515/76 and 2500/17)

During the week of February 27 thru March 3, 1989, members of the Nuclear Regulatory Commission (NRC) Region II and Idaho National Engineering Laboratory conducted a phase II EQ inspection of Florida Power and Light's (FPL's) St. Lucie Plant Units 1 and 2 Environmental Qualification (EQ) of Electrical Equipment. The Phase I EQ inspection performed during March 31 through April 4, 1986, verified that the documentation in the EQ files was adequate to support qualification of the electrical equipment within the scope of 10 CFR 50.49. The Phase I inspection also examined the as-built configuration of EQ equipment that was located outside containment. Deficiencies identified during the phase I inspections were subsequently closed out in a followup inspection conducted at the licensee's Juno Engineering Offices during September 1988. The primary purpose of this Phase II EQ inspection was to further evaluate the effectiveness of the implementation of the EQ program and to verify that selected components inside containment were installed as tested. NRC Temporary Instructions 2515/75, 2515/76 and 2500/17 were used as the guidelines for planning and conducting the EQ inspection. The team examined licensee EQ files as the basis for qualification; performed walkdown inspections of equipment inside containment; continued the review of the EQ maintenance program; reviewed recent changes to the EQ master list (PCMs); reviewed the last QA Audit findings; and examined what actions had been taken by the licensee on INs 86-71 and 88-89. The results and conclusions reached are discussed as follows:

a. Maintenance

A review of sampled maintenance records indicated that all EQ maintenance was being performed with the exception of the items identified in NRC Report No. 50-335,389/89-02. However, the overall maintenance program was found to be fragmented. That is, there were several subprograms that tracked certain activities such as surveillance, calibrations, preventative maintenance, and replacement. There appeared to be a lack of an overall tracking program to ensure that all maintenance activities were being performed.

Although, the licensee had developed an unofficial computerized program for tracking EQ maintenance much work was found to be needed on the system to meet 10 CFR 50 Appendix B Requirements. For example, administrative controls were needed to control the use and maintenance of the system and to validate the program to ensure that all EQ items were on the list and that all maintenance activities were included. The licensee made a commitment to take the necessary steps to formalize this system as a short term activity and, as a long term activity, to

include all maintenance activities in one system to be developed by the end of 1992. The licensee will document the plan in response to a violation discussed in NRC Report No. 50-335,389/89-02.

b. Changes to the EQ Master List

The NRC inspection team requested the licensee to provide the Plant Change and Modifications (PCMs) for the last four revisions to the Units 1 and 2 EQ Master Lists. In response to this request, the licensee provided the following documents:

| <u>Unit 1</u>           |                | <u>Unit 2</u>           |             |
|-------------------------|----------------|-------------------------|-------------|
| <u>EQ List Revision</u> | <u>PCM No.</u> | <u>EQ List Revision</u> | <u>PCM</u>  |
| Rev. 15                 | 141-186        | Rev. 7                  | 120-286, R1 |
| 16                      | 119-186        | 8                       | 066-288D    |
| 17                      | 128-187        | 9                       | 044-288D/   |
|                         | 142-188D       |                         | 208-285     |
| 18                      | 043-188D       | 10                      | 217-288     |

The PCMs identified for Unit 2 were subsequently reviewed to determine 1) if the changes were processed by a controlled procedure, 2) if an adequate analysis of the change had been documented, 3) if appropriate drawings/procedures had been revised, 4) if the drawings were being revised in a reasonable period of time, and 5) to determine if appropriate EQ requirements have been incorporated. All of the PCMs reviewed appeared to be adequate. The most significant findings, are included in the comments below:

PCM-066-288D provided for the updating of the Limitorque EQ DOC Pac to prohibit use of marathon 1600 terminal blocks; prohibit use of 3m tape splices in the RCB on Limitorques; document the de-energization of Limitorque limit switch compartment space heaters; document the correct T-drain, torque switch and motor size information on certain operators. Specifically, PCM-066-288D revised the EQ DOC Pac for Limitorque valve operators (2998-A-451-3.1) to show that the correct Model No. for valves MV-09-09, 10, 11, and 12 is SMB-000-5 versus SMB-00-5 which was the model number included in the DOC Pac. The correct model number had been verified during an EQ walkdown. Discussion with the licensee concerning this change revealed that other drawings incorrectly showed these valve operators as being model SMB-00-5. Although some drawings showed a larger operator, it was later determined that the original installation drawing (2998-2886,R1) specified the valve as SMB-000-5. Furthermore, these valves were tested and set for specific thrust values in accordance with the requirements of Bulletin 85-03, which confirmed that an SMB-000-5 operator is adequate under degraded voltage considerations.

To resolve the discrepancies between the drawings, the licensee committed to revise all appropriate drawings to include the correct model no. for the valves. The inspector considered this action to be acceptable.

As stated earlier, PCM-066-288D also revised the EQ DOC Pac to document the de-energization of limit torque limit switch compartment space heaters. The heaters were being de-energized in response to NRC Notice 86-71. The Notice warned that internal limit switch compartment wiring could potentially become damaged by coming into contact with the energized space heater or the heater bracket. Additionally, the vendor notified the licensee that qualification data did not exist for the heaters. The action taken by the licensee was to disconnect the space heaters on Unit 1. This work was covered under PC/M 009-188 and was completed during the last outage. Because Unit 2 design was different than Unit 1, it was decided to remove power to PSL-2 space heaters by opening their respective power panel circuit breakers (Safety Evaluation JPE-PSL-SEEJ-88-014). This action was completed on February 26, 1989, by operations placing clearance tags on 122 breakers. The inspector questioned the adequacy of tagging components in this manner for pro-longed periods and suggested that a more permanent long term solution should be investigated. The licensee acknowledged the concern and committed to either 1) procure mechanical locks for the breakers and place the heater supply breakers under administrative control, or 2) disconnect the heaters similar to what was done on Unit 1. The inspector considered this to be acceptable.

PCM 044-288D revised the EQ List in total by eliminating the engineering evaluation requirements for certain components and replacement parts.

c. QA Audits

The NRC inspection team reviewed the result of the last three audits of the St. Lucie EQ Program to determine if the licensee is conforming to procedure requirements and to determine if corrective action is timely on Audit findings. From this review, no concerns were identified.

d. In-Plant Physical Inspection and EQ File Review

The inspection team physically inspected approximately 60 qualified components and associated field cables inside containment for as-built installation characteristics such as mounting, configuration, orientation, interfaces, nameplate data, moisture intrusion seals, splices/terminations, internal wiring, and preservation and protection. Several of the EQ files had been previously examined during the first round EQ inspection, however, in those few cases

where the files were not previously reviewed, they were examined during this inspection and are discussed in this report. In all other cases, only cursory reviews of the EQ files were made to confirm special installation or maintenance requirements, model number and equipment qualified life. The results of these reviews (both file and field walkdowns) and cable traceability are discussed in the paragraphs below:

(1) Conax Electrical Penetration Assemblies (EPA), EQDP 15.1.

The following EPAs were inspected inside the containment for mounting, configuration, identification, stressing of conductors, termination of conductors and general area cleanliness around penetration assemblies. All EPAs inspected (as shown in the list below) were considered to be satisfactory.

| <u>Site ID No.</u> | <u>Manufacturer/Description</u>        |
|--------------------|--|
| B4                 | Conax/600V Low Voltage Power           |
| B7                 | Conax/600V Low Voltage Power           |
| A1                 | Conax/600V Control Voltage             |
| C3                 | Conax/600V Low Voltage Power/Control   |
| C7                 | Conax/600V Low Voltage Power/Control   |
| C10                | Conax/600V Low Voltage Power/Control   |
| D8                 | Conax/600V Low Voltage Instrumentation |
| E6                 | Conax/600V Low Voltage Instrumentation |

The penetration conductors to field cable terminations were accomplished by using Raychem heat shrink tubing. These terminations appeared to be satisfactory. During the walkdown, it was noted that equipment identification labelling of safety-related and nonsafety-related equipment was the same. All label plates were stainless steel with an impressed identification number or plastic labels with a black background and white lettering. It is considered that unique color coding for S/R equipment would provide plant personnel a better tool to do their job. The licensee stated that they had an enhancement program for all equipment labelling (including piping systems, electrical panels, switchgear, MCC, instruments, gages, pumps, etc.) and that both units would have the new color coded labels installed by the end of 1990. An orange or blue trim on the labels would indicate a safety train designation. A yellow or white background would identify the unit. The piping systems labels would have a background color to indicate what the fluid was in the pipe, e.g. sea water, steam, water to extinguish fires, oil, fresh water, air, and etc. In addition to the color coding and unique identifying numbers on the label, the label would have the same information in a computer bar code. This would be used for future processing of work related items

(e.g., job orders, deficiencies, non-conformances, and etc.). This enhancement program is considered a strength in FPL's endeavor to improve the overall safety and operations of the plant.

NRC information notice (IN) 88-89, Degradation of Kapton Electrical Insulation, discusses possible failures of Kapton due to mechanical damage combined with exposure to moisture and prolonged contact with a strong alkaline solution. A review showed that St. Lucie row E conax EPAs which have Kapton electrical insulation can become submerged during a D.B.A. The Kapton electrical insulation portion of the EPA successfully passed a 30 day submergence test with a pH solution that was essentially neutral. The pH of the test solution meets St. Lucie specifications.

A Conax Service Bulletin (NI dated March 3, 1989) was issued to provide guidance regarding U. S. NRC IN 88-89. It states that no action is required for Kapton insulated wire in Conax's products unless all of the three following conditions are present concurrently:

- (a) The wires are not bent in smaller bend radii than that given in the Bulletin.
- (b) The wires are not exposed to environmental conditions of 100% relative humidity (e.g., inside of an environmentally sealed device such as a transmitter, limit switch, etc.)
- (c) The wires are not exposed to environmental temperature conditions of 60°C (140°F) or greater.

The licensee states that the three conditions do not exist concurrently at St. Lucie. Those Conax insulated wires that were inspected were well within the acceptable bend radii shown in the bulletin and none had nicks or abrasions. In addition, a St. Lucie report (No. 132-33.500) was reviewed and considered acceptable. This report evaluates the effect of the possible degradation of the Kapton electrical insulation on row E Conax EPAs that may be submerged during maximum flood conditions of a DBA. In summary, Kapton electrical insulation degradation as indicated in IN 88-89 is not considered to be a problem for St. Lucie row E Conax EPAs. This is based on the EQ test report, Conax Service bulletin and St. Lucie report 132-33.5000.

(2) Fluid Components Inc. Level Element (EQDP 8.4)

The Fluid Component Inc. Level Elements are used to monitor reactor building (RB) water level. The sensors are manufactured and installed to prevent moisture intrusion. During the walkdown, two level elements, LE-07-13A and 13B, were inspected. The level elements were accessible for maintenance, were properly labelled and the area around them was clean. These instruments are calibrated periodically in accordance with Tech Spec 3.4.4.6.1 on an 18 month interval by I&C procedure 2-1400171.

(3) General Atomics Radiation Detectors (EQDP 8.3.)

Radiation Detectors RD-26-40 and 41 inside the containment were examined during the walkdown. The mounting configuration and nameplate data agreed with the information in EQDP 8.3

During the review of the EQDP, it was noted that anomalies pertaining to the cable and connector failures were experienced during several of the LOCA tests with a G. A. Radiation Detector. This was resolved when an acceptable design was achieved. The detector was qualified with this design which included Raychem heat shrink tubing for the cable/connector interfaces. A visual examination of the cable/connector interface appeared to meet the requirement shown and referenced in the EQDP. The area around the detector and cable/connector interfaces was clean.

(4) Barton Model 763 Pressure Transmitters, Equipment ID Nos. PT-8013A, PT-8013B, PT-1102A, PT-1102C, and PT-1102D; and Barton Model 764 Differential Pressure Transmitter, Equipment ID Nos. LT-1109, LT-1105, FT-1158, FT-1168, PDT-1111A, and PDT-1111B.

The instruments inspected are located inside containment. The Model 763 transmitters are used to measure steam generator pressure and pressurizer pressure. The Model 764 transmitters are used to measure pressurizer level, component cooling water flow and steam generator differential pressure. Each transmitter installed was examined for location, orientation, mounting, tag number, model number, serial number, range, qualified electrical connections, cover, and housing.

The housing cover was removed from each transmitter to verify wiring and examine the Barton moisture intrusion seal. Each transmitter's electrical connection assembly was inspected to ensure that the pigtails from the transmitters to the field cable was made in a splice box using Raychem shrink material.



The licensee had removed the two cover o-ring seals from each transmitter during the required refueling outage calibration. The o-ring seals are removed and destroyed each time the housing cover is removed. The licensee's maintenance program requires that new replacement o-rings be installed just prior to the end of the outage. The inspector reviewed and verified Nuclear Plant Work Orders XA881127102607, XA881126095327, and XA881126095132 have been issued requiring o-ring replacement per EQ Maintenance TABs EQ-2 and EQ-3 in procedure IMP-99.01 for the transmitters inspected.

EQ DOC Pac 8.2, including Barton Test Report R3-764-9 copy No. 010017, and Barton Test Report 9999.3154.2, Revision 2 were reviewed for the Model 764 differential pressure transmitters. The EQ Doc Pac for the Model 763 was not reviewed since it had been reviewed previously.

The documentation reviewed and the installed transmitters were found to be acceptable.

- (5) Rosemount Series 1153 Pressure Transmitters (EQDP 8.8), Equipment ID Nos. PT-1104 and PT-1105; and Rosemount Series 1154 Differential Pressure Transmitters (EQDP8.7), Equipment ID Nos. LT-9014A, LT-9013B, LT-9013C, and LT-9013D.

The transmitters inspected are located inside containment. The Series 1153 transmitters are used to measure the pressurizer pressure. The Series 1154 transmitters are used to measure steam generator level. Each transmitter was examined for location, orientation, mounting, tag number, model number, serial number, range, qualified electrical connections, cover, and housing.

The housing cover was removed from each transmitter to verify wiring. The threads for the cover and the housing were examined for damage. Each series 1153 transmitter electrical connection assembly was inspected to ensure that a Conax ECSA PN N-11006-71 was installed and the pigtailed from the ECSA to the field cable was made in a splice box using Raychem shrink material. Each Series 1154 transmitter electrical connection assembly was inspected to ensure that Namco Conduit Seal Type EC210 -34001 receptacle and 44010 connector/cable assembly were installed. The pigtailed from the Namco Conduit Seal to the field cable were inspected to verify the electrical connection was made inside a splice box using Raychem shrink material.

Each transmitter cover o-ring seal had been removed and discarded during the required refueling outage calibration and will be replaced just prior to the end of the outage. The inspector reviewed and verified Nuclear Plant Work Orders

XA881126095132 and XA881127094249 have been issued requiring o-ring replacement per EQ Maintenance TAB EQ-1 in procedure IMP-99.01 for the transmitters inspected.

The following documentation was reviewed which qualified the Rosemount Series 1154 transmitter using the Namco Conduit Seal Type EC210 connector assembly:

- Doc Pac 8.7, Rosemount Transmitters (1154-xx-x in RCB)
- Rosemount Test Reports D8300131, D8400084, D8600010
- Doc Pac 9.5, Namco Conduit Seals
- Namco Test Reports, OTR 126, 142, and 145
- Equipment Qualification Documentation Package, Drawing No. 2998-A-451-1000, PCM 279-283, Revision 1, Appendix C - Calculation Record.

The Calculation Record was reviewed to determine the baseline requirements for the insulation resistance (IR) of the instrumentation cable and loop components assuming maximum errors resulting from a DBA. The inspector confirmed that the IR values assumed in their analysis were supported by test data. In addition, the inspector reviewed the acceptance criteria from a proprietary Namco test procedure QTP-207 which is a production test performed on 100% of all Namco seals manufactured. The acceptance criteria was found acceptable to determine IR which is considered a critical performance characteristic for the Namco seal in this application on instrumentation.

The documentation and installed transmitters were found to be acceptable.

(6) RDF Corporation Resistance Temperature Detectors, Model 21286, TE-07-3A an TE-07-3B

The RTDs inspected are located inside containment. They are used to measure containment air temperature. The RTDs installed were examined for location, orientation, mounting, tag number, model number, serial number, qualified electrical connections and housing. The RTDs are installed using a Conax ECSA which provides the moisture seal from the head assembly to the field cable. The head assembly contains a terminal block for the RTD and one end of the the ECSA terminations. The connection of the pigtails from the other end of the ECSA is made inside a splice box using Raychem shrink material.

EQ DOC Pac 39.1 and National Technical Systems Test Report 557-1352-1 were reviewed for the RDF RTDs using the Conax ECSA. The component maintenance history and requirements were reviewed to ensure their adequacy.

The documentation and the installed RTDs were found to be acceptable.

(7) Weed Corporation Resistance Temperature Detectors, Model N9004D, TE-1122CB and TE-1122CD (EQDP 39.2)

The RTDs inspected are located inside containment. They are used to measure the reactor coolant loop cold leg temperature. The RTDs installed were examined for location, orientation, mounting, tag number, model number, serial number, qualified electrical connections and housing. The RTDs are installed using a Conax ECSA N-11006 which provides the EQ moisture seal from the head assembly to the field cable. The head assembly contains a terminal block for the RTD and one end of the ECSA terminations. The connection of the pig tails from the other end of the ECSA to the field cable is made inside a splice box using Raychem shrink material which was found satisfactory.

EQ DOC PAC 39.2 containing Weed Test Report, No. 06-8680-003, and Westinghouse Test Report No. 86-0450 were reviewed for the Weed RTDs with Conax ECSA. The component maintenance history and requirements were also reviewed to ensure their adequacy.

The documentation and installed RTDs were found to be acceptable.

(8) Hydrogen Recombiners and Containment and Cooler Motors/Reliance Motors)

Walkdown inspection of the Hydrogen Recombiners and the Reliance fan motors for containment did not reveal any discrepancies. The hydrogen Recombiners utilized Raychem kits for the splices which appeared to be installed properly. The reliance fan motors were in the process of being refurbished and three out of four fan motors were in the hot repair shop. The terminations had been made by in-line Raychem splices, but they had been disconnected prior to the walkdown. The motors had the required vent plug installed, however, the inspector was not able to verify if the vent was cleared.

(9) Limitorque Valve Actuators, Model SMB-1-40, Equipment ID Nos. V3480, V3481, V3545, and V3652

The above Limitorque actuators were inspected during the audit. All were inspected for T-drains, grease reliefs, and internal wiring, mounting configuration, and nameplate data.

All of the actuators had the limit switch covers off with the internals removed for grease changeout. The limit switch internals were available for inspection near the valves or in the contaminated equipment ship. Wire No. 11 on the limit switch contacts for V-3652 was severely bent. The licensee relugged and reconnected the wire. No open items were identified.

- (10) Target Rock Solenoid Valves, Model 78E-006, Equipment ID Nos. SE-03-1A, SE-03-1B, SE-03-1C, and SE-03-1D; Model 78E-009, Equipment ID No. SE-05-1A; and Model 84V-001, Equipment ID Nos. V-5200, V-5201, and V-5202

The above eight Target Rock solenoid valves were inspected. All appeared to be in good condition and rigidly mounted with sealed electrical connections. The licensee removed the cover from one valve for inspection of the internal wiring which appeared to be in good condition. No open items were identified.

- (11) ASCO Solenoid Valves, Model NP8321, Equipment ID Nos. FCV-5-20 SOL and LCV-7-11A SOL; and Model 206-381-6RF, Equipment ID No. HCV-3648 SOL

The above four ASCO solenoid valves were inspected. All appeared to be rigidly mounted and in good condition. The electrical connections to the valve were sealed. The licensee removed the cover from one valve for inspection of the internal wiring which appeared to be in good condition. No open items were identified.

- (12) NAMCO Limit Switches, Model EA-180, Equipment ID Nos. HCV-3648 LS(o), NOV 5640 LS(c), LCV 07-11A LS(o), and LCV-07-11A LS(c), and Model EA-740, Equipment ID Nos. FCV-25-20 LS(O) and FCV-25-20 LSIC)

The above six NAMCO limit switches were inspected. All appeared to be rigidly mounted and in good condition. The electrical connections to the valve were sealed. No switch covers were removed for inspection. No open items were identified.

- (13) Valcor Solenoid Valves, Model V52600-515, Equipment ID Nos. FSE-27-10 and FSE-27-11

The above two Valcor solenoid valves were inspected. Both appeared to be rigidly mounted and in good condition. Electrical connections were through a NAMCO "Quick disconnect" electrical connector. The licensee removed the cylindrical outer body of the valve for inspection of the internal wiring which was in good condition. The O-rings used to seal the outer body were flexible and free of abrasions. No open items were identified.

- (14) Raychem Splices

Raychem splices, where present, associated with the above equipment items were inspected. The splices were checked for adequate splice overlap, proper bend radius, and visible sealing material at each end of the outer tubing. No open items were identified.

(15) Cables Traceable to EQDP

Prior to the walkdown inspection, some cables were randomly selected and identified to the licensee for specific components and EPAs. These cables were verified during walkdown either at the EPA or Device end. The licensee was requested to show how these selected cables were similar to the cables addressed in their EQDP. The licensee informed the inspector that Cables are traceable to the EQDP by the specific cable code designation.

All cable pull cards included the reel number and the licensee's cable code designation. The following cables were examined for traceability to the EQDP. No open items were identified during this review.

| <u>Cable ID No.</u> | <u>Cable Code</u> | <u>Mfgr</u> |
|---------------------|-------------------|-------------|
| 23101H-SA           | D61-05            | Kerite Co   |
| 23376F-MB           | D61-05            | Kerite Co   |
| 23376R-MD           | D61-05            | Kerite Co   |
| 23378E-MA           | D61-05            | Kerite Co   |
| 23296H-SA           | D61-05            | Kerite Co   |
| 23324B-SA           | D61-10            | Kerite Co   |
| 23324S-SA           | D61-08            | Kerite Co   |
| 23324F-SA           | D61-10            | Kerite Co   |
| 23324R-SA           | D61-05            | Kerite Co   |
| 23324N-SA           | D52-12            | Kerite Co   |
| 23285B-SA           | D26-02            | Kerite Co   |
| 23286B-SA           | D26-02            | Kerite Co   |
| 23304B-SB           | D26-02            | Kerite Co   |
| 23305A-SB           | D26-02            | Kerite Co   |

## 3. Action on Previous Inspection Findings (92702)

(Closed) Violation 50-389/87-20-02, Failure to Meet License Condition 2.c.10 ad 2.c.11 for Non-Essential Circuits Penetrating the Containment.

Licensing conditions:

a. License Condition 2.c.10. Nonsafety Loads on Emergency Power Sources (Section 8.4.2, SER, SSER 3)

Prior to startup following the first refueling outage, the licensee shall implement the design modification to disconnect four-kilovolt loads on detection of a safety injection signal and provide two isolation devices in series for those non-safety electrical loads that are not disconnected by a safety injection signal or loss of offsite power.

b. Licensee Condition 2.c.11. Containment Electrical Penetration  
(Section 8.4.3, SSER 3)

Prior to startup following the first refueling outage, the licensee shall complete the design modifications to provide independent primary and backup fault protection for each electrical conductor penetrating containment.

Inspection findings:

The licensee performed plant change modification PC/M 15-283 and by their letter #L-84-33 dated 11/20/84, to NRC, indicated that the modification had been implemented which completed action for licensing conditions 2.c.10 and 2.c.11.

In August 1986 the resident inspector observed that a breaker which energizes a non-essential circuit penetrating containment was closed while the plant was operating. This circuit was considered to have no backup fault protection as required by License Condition 2.c.11.

A violation (86-19-01) was issued for this finding and was subsequently closed by the Resident Inspector. In July of 1987, the Resident Inspector observed a similar condition and documented the finding in unresolved item (URI), 50-389/87-17-01 which was up-graded to the violation indicated above (87-20-02). The licensee conducted a review of all electrical circuits, routed through the containment penetrations to ensure compliance to their R.G 1.63 commitments. Included in this review was all associated circuits powered from safety-related power sources to verify conformance to licensee's commitment to R.G. 1.75.

The licensee responded to violation 87-20-02 by their letter L-87-514 dated December 16, 1987. The response was accepted by NRC. Their response indicated that the eight electrical circuits listed in the violation were brought into compliance with R.G 1.63 commitments (Breakers for these circuits were opened and included on Operating Procedure 2-0030120, Prestart Check-off List). A re-review, as indicated above, of RG 1.63 and 1.75 commitments was made and FP&L investigated the situation for potential reportability under 10 CFR 21.

The review of licensee actions included portions of PCM 15-282, which initially implemented modifications to satisfy licensing conditions 2.c.10 and 2.c.11.; some PCM Drawings, BCS-015-283-3000 (series numbers), and records of the licensee's re-review for compliance to RG 1.63 and 1.75 commitments following the issuance of URI-87-17-01. Based on interviews and discussions with licensee representatives and on a partial review of the licensee's actions, this violation is closed. Licensing Conditions 2.c.10 and 2.c.11 which are tracked on NRC Region II tracking system as FPL 88-01 and 02 are also closed based on the above.

## 4. Exit Interview

The inspection scope and results were summarized on March 3, 1989, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Dissenting comments were not received from the licensee, however, the licensee did make a verbal commitment in response to the inspector's concern over tagout of MOV heater supply breakers. The licensee's commitment is described in paragraph 2.b. In addition, the licensee committed to a long term improvement in the maintenance tracking system for EQ maintenance and committed to describe this program in response to a previous violation, see paragraph 2.a for details. The licensee was also informed in the exit that violation 50-389/87-20-02 and licensing conditions 2.c.10 and 2.c.11 are considered closed requiring no further action, paragraph 3. During the inspection, an unresolved item was identified regarding the potential for row E Conax electrical penetrations inside containment being degraded during a DBA due to chemical interaction with containment spray and the Kapton insulation. This item was resolved shortly after the inspection after further review of additional information provided by the licensee (paragraph 2.d(1)).

Although reviewed during this inspection, proprietary information is not contained in this report.

## 5. Acronyms and Initialisms

|            |                                   |
|------------|-----------------------------------|
| DBA        | Design Bases Accident             |
| ECSA       | Electrical Conduit Seal Assembly  |
| EQ DOC PAC | EQ Documentation Package          |
| EQDP       | EQ DOC PAC                        |
| EPA        | Electrical Penetration Assemblies |
| ID         | Identification                    |
| IR         | Insulation Resistance             |
| IN         | NRC Information Notice            |
| JP         | Junction Box                      |
| FPL        | Florida Power and Light Company   |
| LE         | Level Element                     |
| LT         | Level Transmitter                 |
| MCC        | Motor Control Center              |
| PCM        | Plant Change Modification         |
| PSL-2      | Plant St. Lucie 2                 |
| PT         | Pressure Transmitter              |
| RI         | Resident Inspector                |
| RTD        | Resistance Temperature Detector   |
| QR         | Qualification Report              |
| TE         | Temperature Element               |
| TI         | Temporary Instruction             |
| RB         | Reactor Bldg                      |
| I&C        | Instrumentation and Control       |
| LOCA       | Loss of Coolant Accident          |
| URI        | Unresolved Item                   |
| R.G.       | NRC Regulatory Guide              |