



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30303

Report Nos.: 50-335/84-33 and 50-389/84-39

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: November 18 - December 15, 1984

Inspectors: Kenneth M Jensen for 11 Jan 85
 C. D. Feierabend Date Signed

Kenneth M Jensen for 11 Jan 85
 H. E. Bibb Date Signed

Approved by: S. A. Elrod 11 January 1985
 S. A. Elrod, Section Chief Date Signed
 Division of Reactor Projects

SUMMARY

Scope: This routine, unannounced inspection entailed 177 inspector-hours onsite in the areas of plant operation, surveillance observation, maintenance observation, Licensee Event Reports, Information Notices, Reactor Trips, Fire in Containment, Licensee Actions on Previous Findings and on TMI Action Plan Items.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Licensee Employees Contacted

C. M. Wethy, Plant Manager
*J. H. Barrow, Operations Superintendent
*T. A. Dillard, Maintenance Superintendent
C. Burton, Acting Operations Supervisor
*N. G. Roos, Quality Control Supervisor
C. F. Leppla, Instrument and Control Supervisor
R. R. Jennings, Technical Department Supervisor
C. A. Pell, Reactor Engineering Supervisor
H. F. Buchanan, Health Physics Supervisor
G. Regal, Assistant Plant Superintendent - Electrical

Other licensee employees contacted included nuclear plant supervisors, assistant nuclear plant supervisors, construction craftsmen, technicians, operators, shift technical advisors, security force members, and office personnel.

2. Exit Interview

The resident inspectors conducted interim interviews with licensee management during the inspection period and held an exit interview at the conclusion of the inspection. The inspector discussed the scope of the inspection and his findings with the licensee.

Persons indicated with an asterisk (*) in paragraph 1 above attended one or more of the interviews.

3. Licensee Action on Previous Inspection Findings

- a. (Closed) Unit 2, 84-27-01, Failure to properly establish and maintain procedures. The licensee has revised the procedures in question and is maintaining a continuous procedure review program.
- b. (Closed) Unit 2, 84-27-02, Diesel generator control cable cut during removal of Flamastic material. The licensee immediately stopped work in the area, took disciplinary action, issued new procedures with greater detail dedicated to safety and increased management supervision in the immediate work area.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. General

Unit 1 operated at power throughout the inspection period. Unit 2 completed physics testing and returned to power operation on November 19, having completed its first refueling. Except for shutdowns described in paragraphs 7 and 8, the unit operated at power. Both units were on line at full power at the end of the inspection.

Visitors to the site on December 12 included NRR Project Managers D. Sells and D. D. Ianno and a team of consultants. This visit was related to a study of decay heat removal systems (Task Action Plan A-45).

6. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the report period. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the reactor, auxiliary and turbine buildings were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector, by observation and direct interview, verified that the physical security plan was being implemented. Hand-over-hand walkdowns of the Unit 1 component cooling water system and the Unit 2 HPSI/LPSI system were conducted during the inspection period to verify the correct position of required valves, switches and circuit breakers.

No violations or deviations were identified in this area.

7. Reactor Trips (Unit 2)

- a. At 12:42 p.m. on 11-19-84, the 2C condensate pump was started (to replace the 2A condensate pump, which had been taken out-of-service to clean its strainer). As the pump was started, 4160 volt bus 2A2 (which feeds the 2A condensate pump) current pegged high and the 2A3 bus separated from the 2A2 on a low voltage trip. the 2A diesel generator started and picked up the 2A3 bus and its loads. The following are the 2A3 loads:

<u>BKR. NO.</u>	<u>Equipment</u>
2-20201	H. P. Safety Injection Pump 2A
2-20202	L. P. Safety Injection Pump 2A
2-20203	Containment Spray Pump 2A
2-20204	Pressurizer Heater Transformer 2A3
2-20205	CEDM Cooling Fan 2HVE-21A

2-20206	Component Cooling Water Pump 2A
2-20207	Intake Cooling Water Pump 2A
2-20208	Feed to 4.16 KV Bus 2AB
2-20209	Incoming Feed from 4.16 KV Bus 2A-2
2-20210	480V L. C. Station Service Transformers 2A2/2A5
2-20211	Emergency Diesel Generator 2A
2-20212	Auxiliary Feedwater Pump 2A

The HPSI, LPSI, CS, and AFW pumps did not start as there was no ESF signal. However, there were sufficient alarms coming in from so many different sources that the operators tripped the reactor manually as a conservative approach.

Removal of the condensate pump showed two of three auger blades to be sheared off even with the shaft in the first stage and one piece was lodged in the second stage impeller. The first stage and its pieces are being shipped to a laboratory to determine the failure mechanism. After repair/replacement of the pump, the 2A and 2B pumps will be removed from service one at a time to inspect for possible similar flaws.

- b. After the preceding trip, the 2A condensate strainer was cleaned and the 2A pump returned to service. A startup was attempted, but at 3:37 p.m. on 11-19-84, the plant tripped on a high start-up rate (SUR) signal. The trip point is set at 2.49 DPM. A SUR of about 1.0 DPM was being maintained, but a noise spike of about 1.5 DPM caused the trip. The operators were cautioned to use a lower (0.5 DPM or less) SUR to accommodate noise spikes without tripping.
- c. On 11-21-84 at 9:29 a.m., the pedestal bearing on the main generator's exciter "wiped", causing the loss of the permanent magnet generator and resultant loss of excitation, turbine trip, and reactor trip. The turbine vendor site representative feels that a loss of pedestal bearing insulation from ground through the pedestal caused the bearing loss (due to severe arcing through the bearing to ground). The exciter was repaired and the unit returned to service on 11-25-84 at 3:27 a.m.
- d. At 4:48 a.m. on 11-29-84, the "MA" inverter power supply to the "A" ESF panel failed. (Later found to be a failed diode in the "MA" inverter.) The "MA" and "MC" inverters supply power to the "A" ESF panel in parallel on an auctioneered basis, i.e. if "MA's voltage is slightly

higher, it is supplying power. But if "MA" fails, "MC" begins supplying power without any power interruption. This occurred and "MC" was now the power supply to the "A" ESF panel.

About two minutes after "MC" became the power supply to "A" ESF, the fuse on the "A" ESF panel (through which "MC" inverter supplies its power) blew. This caused a total loss of power to "A" channel of ESF. This causes the following "A" channel initiations: CIS, MSIS & SIAs. However, an "A" channel ESF also feeds a "close" signal to the "B" MSIV's and main feed isolation valves. Shutting the B MSIV's drove S/G pressure up, lowering S/G level sharply, and eight seconds later - Rx trip on low S/G level @ 4:50:33.

No violations or deviations were identified in this area.

8. Reactor Coolant Pump Lagging - Oil Fire (Unit 2)

At 9:38 p.m. on 11-14-84, a fire in containment was reported to the control room by a health physics technician. The fire was smoldering lagging on reactor coolant pump piping which had been soaked with some oil spilled during the recent refueling outage. The RCP oil has a flash point of 450°F, fire point of 480°F and ignition point of 530°F. An "unusual event" was declared by the NPS. The fire brigade responded and the fire was declared out at 9:50 pm. The unusual event was secured at 10:20 pm. The plant fire supervisor conducted an investigation and issued a local report to plant management.

No violations or deviations were identified in this area.

9. Maintenance Observation (62703)

Station maintenance activities of selected safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with requirements. The following items were considered during this review: the limiting conditions for operations were met; activities were accomplished using approved procedures; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; and radiological controls were implemented as required. Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may affect system performance.

The following items are typical of the type of work reviewed during the inspection period.

Unit 1

PWO-2665	1B Waste Gas Compressor
PWO-2670	1A Charging Pump - Repack
PWO-2688	1A Boric Acid Makeup Pump - Replace Gasket

During the inspection period, the inspector closely followed the licensee's efforts to solve the problem of a continuously spinning steam driven auxiliary feedwater pump. Steam leaking by the seat of one or more valves, caused the turbine to spin continuously. No regulatory requirements were being exceeded, but it is not desirable to have continuous operation. The solution to the problem was solved on 12-13-84, by changing the sequence of closing steam supply valves from the "A" and "B" steam headers. Apparently steam back pressure from the "A" header was preventing the "B" supply valve from closing fully. These valves will be reworked during the next outage.

No violations or deviations were identified in this area.

Surveillance Observation

During the inspection period, the inspector verified plant operations in compliance with at least sixteen different technical specifications (TS) requirements. Typical of these were confirmation of compliance with the TS for reactor coolant chemistry, refueling water tank, containment pressure, control room ventilation and AC and DC electrical sources. The inspector verified that testing was performed in accordance with adequate procedures, test instrumentation was calibrated, limiting conditions for operation were met, removal and restoration of the affected components were accomplished, tests results met requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The following are typical of some of the major surveillances observed/reviewed during the inspection period:

I&C 2-1220052, Rev. 3 - Linear Power Range Safety & Control Channel Monthly Calibration

I&C 2-1400050, Rev. 9 - Reactor Protection System Monthly Functional Test

I&C 2-1400052, Rev. 6, Engineered Safeguards System Channel Functional Test

The inspector confirmed that procedure 2-1400052 conducted on December 7, 1984, had been modified to amend the setpoint for containment pressure trips, complying with License Amendment No. 8. This was accomplished utilizing a plant Work Order No. PWO 6949 which was reviewed and approved in accordance with licensee procedures. The procedure was identified for permanent revision prior to the next test due date.

OP 1-0700050 Unit 1 Auxiliary Feedwater Periodic Test
 OP 2-0700050 Unit 2 Auxiliary Feedwater Periodic Test

No violations or deviations were identified in this area.

10. IE Information Notices

The following IE Information Notices were reviewed to ensure their receipt, review by appropriate management and appropriate action taken.

<u>IEN NO.</u>	<u>Title</u>
84-01	Excess lubricant in electric cable sheaths
84-02	Operating a nuclear power plant at voltage levels lower than analyzed
84-03	Compliance with conditions of license and notification of disability by licensed operators
84-04	Failure of elastomer seated butterfly valves used only during cold shutdowns
84-05	Exercise frequency
84-06	Steam binding of auxiliary feedwater pumps
84-07	Design-basis threat and review of vehicular access
84-08	10 CFR 50.7 Employee Protection
84-09 (Rev. 1)	Lessons learned from NRC Inspections of Fire Protection Safe Shutdown Systems
84-10	Motor-operated valve torque switches set below the manufacturer's recommended value
84-11	Training program deficiencies
84-12	Failure of soft seat valve seals
84-13	Potential deficiency in motor-operated valve control circuits and annunciation
84-14	Highlights of recent transport regulatory revisions by DOT & NRC

- 84-15 Reporting of radiological releases
- 84-16 Failure of automatic sprinkler system valves to operate
- 84-17 Problems with liquid nitrogen cooling components below the nil ductility temp.
- 84-18 Stress corrosion cracking in pressurized water reactor systems
- 84-19 Two events involving unauthorized entries into PWR reactor cavities
- 84-20 Service life of relays in safety-related systems
- 84-21 Inadequate shutdown margin
- 84-22 Deficiency in Comsip, Inc. Standard Bed Catalyst
- 84-23 Results of the NRC sponsored Qualification Methodology Research Test on ASCO Solenoid Valves
- 84-24 Physical qualification of individuals to use respiratory protective devices
- 84-25 Recent serious violations of NRC requirements by a radiography licensee
- 84-26 Recent serious violations of NRC requirements by moisture density gauge licensees
- 84-27 Recent serious violations of NRC requirements by medical licensees
- 84-28 Recent serious violations of NRC requirements by well logging licensees
- 84-29 GE magne-blast circuit breaker problems
- 84-30 Discrepancies in record keeping and material defects in Bahnsen Heating, Ventilation, and Air Conditioning Units

- 84-31 Increased stroking time of Bettis Actuators because of swollen ethylene-propylene rubber seals & seal set
- 84-32 Auxiliary feedwater sparger and pipe hanger damage
- 84-33 Main steam safety valve failures caused by failed cotter pins
- 84-34 Respirator user warning: Defective self-contained breathing apparatus air cylinders
- 84-35 BWR Post-scrum drywell pressurization
- 84-36 Loosening of locking nut on limitorque operator
- 84-37 Use of lifted leads and jumpers during maintenance or surveillance testing
- 84-38 Problems with design, maintenance and operation of offsite power systems
- 84-39 Inadvertent isolation of containment spray systems
- 84-40 Emergency worker doses
- 84-41 IGSCC in BWR plants
- 84-42 Equipment availability for conditions during outages not covered by Technical Specifications
- 84-43 Storage and handling of ophthalmic beta radiation applicators
- 84-44 Environmental qualification testing of rockbestos cables
- 84-45 Reversed differential pressure instrument sensing lines
- 84-46 Circuit breaker position verification

- 84-47 Environmental qualification tests of electrical terminal blocks
- 84-48 Failures of rockwell international globe valves w/suppl 1 dated 11/16/84
- 84-49 Intergranular stress corrosion cracking leading to steam generator tube failure
- 84-50 Clarification of scope of quality assurance programs for transport packages pursuant to 10 CFR 50 Appendix B
- 84-51 Independent verification
- 84-52 Inadequate material procurement controls on the part of licensees & vendors
- 84-53 Information concerning the use of loctite 242 & other anaerobic adhesive/sealants
- 84-54 Deficiencies in design base documentation and calculations supporting nuclear power plant design
- 84-55 Seal tube leaks of PWRs
- 84-56 Respirator users notice for certain 5-minute emergency escape self-contained breathing apparatus
- 84-57 Operating experience related to moisture intrusion in safety-related electrical equipment at commercial power plants
- 84-58 Inadvertent defeat of safety function caused by human error involving wrong unit, wrong train, or wrong system
- 84-59 Deliberate circumventing of station health physics procedures
- 84-60 Failure of air-purifying respirator filters to meet efficiency requirements
- 84-61 Overexposure of diver in a pressurized water reactor (PWR) refueling cavity

- 84-62 Therapy misadministrations to patients undergoing cobalt-60 teletherapy treatments
- 84-63 Defective RHR replacement piping
- 84-64 BWR high-pressure coolant injection (HPCI) initiation seal-in and indication
- 84-65 Underrated fuses which may adversely affect operation of essential electrical equipment
- 84-66 Undetected unavailability of the turbine-driven auxiliary feedwater train
- 84-67 Recent snubber inservice testing with high failure rates
- 84-68 Potential deficiency in improperly rated field wiring to solenoid valves
- 84-69 Operation of emergency diesel generators
- 84-70 Reliance on water level instrumentation with a common reference leg
- 84-71 Graphite corrosion of cast iron in salt water
- 84-72 Clarification of conditions for waste shipments subject to hydrogen gas generation
- 84-73 Downrating of self-aligning ball bushings used in snubbers
- 84-74 Isolation of reactor coolant system from low-pressure systems outside containment
- 84-75 Calibration problems-berline instrument model 6112B analog teletectors
- 84-76 Loss of all AC power
- 84-77 Incident involving teletherapy unit (AECL Eldorado-78)
- 84-78 Underacted terminal blocks that may adversely affect operation of essential electrical equipment

84-79	Failure to properly install steam separator at Vermont Yankee
84-80	Plant transients induced by failure of non-nuclear instrumentation power
84-81	Inadvertent reduction in primary coolant inventory in boiling water reactors during shutdown & startup
84-82	Guidance for posting radiation areas
84-83	Various battery problems

Several minor accounting type errors were noted in the licensee's operating experience feedback tracking system which resulted in a few information notices not receiving timely response for action taken. The licensee's administrative procedure 0005724 recommends a monthly followup, but it appears that this is not being properly implemented.

No violations or deviations were identified in this area.

11. Licensee Event Reports Review

The following LER's were reviewed to verify that reporting requirements had been met, causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, and the LER forms were complete. Additionally, for those reports identified by asterisk, a more detailed review was performed to verify that the licensee had reviewed the events, corrective actions had been taken, no unreviewed safety questions were involved, and violations of regulations or Technical Specification conditions had been identified.

Unit 1

LER

*84-06	RPS Actuation on Loss of Load
*84-07	Reactor Trip During RPS Logic Matrix Surveillance
*84-08	Spurious Containment Isolation Signal
*84-09	Manual Reactor Trip - Intake Screen Fouling By Jellyfish
*84-10	Charging Pumps Inoperable Due To Administratively Inoperable Diesel Generator
84-11	Diesel Generator Fuel Oil Tank Level Lower Than T. S. Requirement

Unit 2LER

- *84-02 Mode Changes With Inoperable Equipment
- *84-03 Turbine Trip/Reactor Trip
- *84-04 Reactor Trip Due To Low Steam Generator Level
- *84-05 Reactor Trip During AFAS Functional Test
- *84-06 2B AFW Pump Discharge Valve Inoperable

During the review of the above LER's, several discrepancies were noted that were not compatible with the guidance given in NUREG-1022. These were discussed with the licensee's technical staff and agreement was reached to issue corrections as necessary.

No violations or deviations were identified in this area.

12. Licensee Actions Taken on TMI Action Plan (TAP) Items

- a. (Closed - Unit 2) TAP 1.G.1.3 Training During Low Power Testing

This item was previously inspected, (IE Inspection Report No. 334/84-10) but was incorrectly identified as TAP 1.G.3

- b. (Closed - Unit 2) TAP II.B.2.3 Plant Shielding Equipment Qualification

This item was included in License Condition 2.C.4 as a part of requirements of 10 CFR 50.49, Closed in IE Inspection Report No. 389/84-37. Followup inspections will be conducted to confirm licensee compliance with 10 CFR 50.49.

- c. (Closed - Unit 1) TAP II.B.2.3 Plant Shielding Equipment Qualification.

NRR letter date November 15, 1984, Subject: Environmental Qualification Of Electrical Equipment Important To Safety, St. Lucie Plant, Unit No. 1 concludes that the licensee's program is in compliance with 10 CFR 50.49. Followup inspections will be conducted to confirm licensee compliance with 10 CFR 50.49.

- d. (Closed - Units 1 and 2) TAP II K.3.1.B Auto PORV Isolation

NRR evaluation of the licensee's response to this item, documented in NRR letter to the licensee dated October 6, 1983 concurs that an automatic PORV isolation system is not required.

- e. (Open - Units 1 and 2) TAP II K 3.5.B Auto Trip of Reactor Coolant Pumps

This item remains open pending NRR evaluation of owners group recommendations.

No violations or deviations were identified in this area.