



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

Report Nos.: 50-335/87-21 and 50-389/87-20

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: September 6 - October 31, 1987

Inspectors:	<u><i>R. V. Crlenjak</i></u>	<u>NOV 17, 1987</u>
	R. V. Crlenjak, Senior Resident Inspector	Date Signed
	<u><i>H. E. Bibb</i></u>	<u>NOV 17, 1987</u>
	H. E. Bibb, Resident Inspector	Date Signed
Approved by:	<u><i>Bruce A. Wilson</i></u>	<u>11/17/87</u>
	B. Wilson, Section Chief Division of Reactor Projects	Date Signed

SUMMARY

Scope: This inspection involved on site activities in the area of Technical Specification compliance, operator performance, overall plant operations, quality assurance practices, station and corporate management practices, corrective and preventive maintenance activities, site security procedures, radiation control activities, surveillance activities, refueling outage review, and plant events review.

Results: Of the area inspected, two violations, one with two examples, were identified (paragraphs 3 and 12).

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

K. Harris, St. Lucie Vice President  
G. J. Boissy, Plant Manager  
\*R. Sipos, Services Manager  
\*J. H. Barrow, Operations Superintendent  
T. A. Dillard, Maintenance Superintendent  
J. B. Harper, QA Superintendent  
\*L. W. Pearce, Operations Supervisor  
\*R. J. Frechette, Chemistry Supervisor  
\*C. F. Leppla, I&C Supervisor  
C. A. Pell, Technical Staff Supervisor  
E. J. Wunderlich, Reactor Engineering Supervisor  
H. F. Buchanan, Health Physics Supervisor  
W. White, Security Supervisor  
\*C. L. Burton, Reliability and Support Supervisor  
J. Barrow, Fire Prevention Coordinator  
R. E. Dawson, Assistant Plant Superintendent - Electrical  
C. Wilson, Assistant Plant Superintendent - Mechanical  
\*N. G. Roos, Quality Control Supervisor

Other licensee employees contacted included technicians, operators, mechanics, security force members, and office personnel.

\*Attended exit interview.

### 2. Exit Interview

The inspection scope and findings were summarized on November 3, 1987, with those persons indicated in paragraph 1 above.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

### 3. Licensee Action on Previous Enforcement Matters

Withdrawn (Unit 1) VIO 50-335/85-36-01: Failure to Have Two Shutdown Cooling Loops Operable While In Mode With Reactor Coolant Loops Drained. A Notice of Violation was issued on February 10, 1985, for violating Unit 1 technical specification (TS) 3.4.1.4.2, which requires that two independent trains of shutdown cooling be operable when in mode 5 with reactor coolant loops not filled. Specifically, the violation was written



because the licensee had taken one train of component cooling water (CCW), which supports shutdown cooling, out of service for maintenance. By a letter dated July 22, 1986, the licensee stated that its maintenance of the CCW system in mode 5 with reactor coolant loops not filled did not violate Unit 1 TS 3.4.1.4.2. By memorandum dated November 7, 1986, Region II asked the Office of Nuclear Reactor Regulation (NRR) to review the licensee's arguments and confirm or provide a regulatory position.

The inspection report (50-335/85-36) documented that one of two required shutdown cooling loops were inoperable because the heat exchanger of its respective CCW, CCW train B was out of service for repairs. The licensee's position was that: 1) two shutdown cooling loops were operable because a fully operable CCW system, with emergency diesel power available, was supplying both shutdown cooling loops with cooling water, 2) because CCW heat exchangers are passive rather than active fluid system components, they do not fall under the single failure criterion for fluid systems, and 3) TS Amendment 56 incorporated NRR's long-term shutdown redundancy requirements expressed in the letter dated June 11, 1980, from the Director of the Division of Licensing to the licensee.

In summary, NRR acknowledged in a memorandum to Region II, dated September 17, 1987, that the definition of "operability" in the TS is subject to a wide range of potential interpretations. For plant operation in mode 5, Unit 1 TS 3.4.1.4.2 clearly requires two redundant shutdown cooling loops; however, no Unit 1 TS clearly required two redundant CCW cooling loops. Accordingly, the licensee's actions in performing maintenance work on the CCW system heat exchanger in mode 5 does not constitute a violation of Unit 1 TS. This violation is withdrawn.

Closed (Unit 2) P2187-01: Sorento Electronics, a subsidiary of GA Technologies, reported in a letter dated February 23, 1987, a possible defective co-axial cable used in conjunction with the Regulatory Guide 1.97, Post-LOCA High Range Radiation Monitor. This cable was found to be in use on St. Lucie Unit 2. The Licensee conducted a safety analysis. (JPE-LR-018) which concluded that the existing radiation monitors with their associated coaxial cables are acceptable as installed. Additionally, the radiation monitors have been shown to meet the design criteria for St. Lucie Unit 2 and are not an unreviewed safety question.

Closed (Unit 2) UNR 50-389/87-17-01: Containment Penetration Not In Accordance With Regulatory Guide 1.63. A recent inspection (ref. IE Report 50-389/87-17 of Unit 2 identified a concern with respect to conformance with Regulatory Guide 1.63, Rev. 2, for the Maintenance Hatch Hoist Motor. In resolving this concern, the licensee conducted a review of all electrical circuits routed through containment penetrations to ensure proper disposition in accordance with the Regulatory Guide. Additionally, the scope of the review was expanded, by the licensee, to include all associated circuits powered from safety related power sources

to verify conformance with Regulatory Guide 1.75, Rev. 2. The following Unit 2 energized non-essential circuits penetrating containment were identified by the licensee as not meeting their commitments to Regulatory Guides 1.63 or 1.75:

- a. Maintenance Hatch Monorail Hoist (BKR-41381),
- b. Reactor Building Jib Crane Receptacle (BKR-42151),
- c. Power Receptacle 257, 261, 265 and 271 (BKR-41278),
- d. Power Receptacle 227, 232, 258, 262 and 266 (BKR-42044),
- e. Power Receptacle 259, 263, 267 and 270 (BKR-41379) and
- f. Power Receptacle 260, 264, 268 and 269 (BKR-42148)
- g. Reactor Building Telescoping Crane (BKR - 42152), and
- h. Reactor Building Elevator Starter (BKR - 42149)

Additionally, the above listed energized circuits do not comply with license conditions 2.C.10 and 2.C.11, which state:

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.

Containment Electrical Penetration (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.

The failure to meet the license conditions 2.C.10 and 2.C.11, for the above non-essential circuits penetrating containment is a violation (50-389/87-20-02).

The licensee has completed a safety evaluation for the non-conformances discovered during their reviews. The safety evaluation concluded that the non-conformances are not a substantial safety hazard, and as such are not reportable under 10 CFR 21. Included in the licensee's report, are recommended actions for final disposition of these non-conformances, as well as a safety evaluation substantiating these recommendations. The recommended actions are to open the circuit breakers during modes 1-4 for those circuits identified in the safety evaluation. Plant Engineering (Juno) will provide an engineering package to modify the sump pump circuit to conform to the Reg. Guide 1.75, Rev. 2.

#### 4. Plant Tours (Units 1 and 2)

The inspectors conducted plant tours periodically during the inspection interval to verify that monitoring equipment was recording as required, equipment was properly tagged, operations personnel were aware of plant conditions, and plant housekeeping efforts were adequate. The inspectors also determined that appropriate radiation controls were properly established, critical clean areas were being controlled in accordance with procedures, excess equipment or material was stored and combustible materials and debris were disposed of expeditiously. During tours, the inspectors looked for the existence of unusual fluid leaks, piping vibrations, pipe hanger and seismic restraint settings, various valve and breaker positions, equipment caution and danger tags, component positions, adequacy of fire fighting equipment, and instrument calibration dates. Some tours were conducted on backshifts.

The inspectors routinely conducted partial walkdowns of ECCS systems. Valve, breaker/switch lineups and equipment conditions were randomly verified both locally and in the control room. During the inspection period the inspectors conducted a complete walkdown in the accessible areas of the Units 1 and 2 component cooling water (CCW), emergency diesel generators and AC/DC electrical distribution systems to verify that the lineups were in accordance with licensee requirements for operability and equipment material conditions were satisfactory. Additionally, flow path verifications were performed on the following systems; Units 1 and 2 chemical volume control and auxiliary feedwater (AFW).

The NRR Project Manager (PM) for the St. Lucie Plant visited the site September 15-18, 1987. He reviewed a reactor trip (subject of LER 335/87-13), external missile protection, several plant change/modification packages, mangrove restoration efforts and conducted various plant tours.

The PM reviewed the circumstances associated with the Unit 1 reactor trip of June 14, 1987. The 1B main feedwater pump tripped and the reactor subsequently tripped on a high pressurizer pressure. The review included the licensee event report (LER), 335/87-13, submitted to the staff by letter dated July 10, 1987; the monthly report submitted to the staff by letter dated July 15, 1987; and the post-trip review report (completed Operating Procedure No. 0030119, Revision 4, dated June 14, 1986). Additionally, the event was discussed with the licensee. An in-depth review of the event was performed to evaluate the possibility that the reactor tripped on low steam generator water level, versus high pressurizer pressure, and the discrepancy of whether the power-operated relief valves (PORV's) opened during the event. The sequence of events recorder indicated that the reactor tripped on high pressurizer pressure followed five seconds later by a low steam generator water level trip. Apparently, the pressurizer pressure increase was dominant over the loss of steam generator level. As a result of discussions with the licensee personnel,

it was determined that the time difference between the signal to open the PORV's and the signal to close the PORV's was less than two seconds. Therefore, it would be difficult to determine if they opened under these conditions. However, the post-trip report stated that the PORVs opened but the LER stated that they did not. The licensee agreed to resolve the discrepancy by either revising the LER or correcting the monthly report.

The PM observed that some safety-related equipment, located outside, are not fully protected from postulated tornado/hurricane generated external missiles. The postulated scenario involves a severe weather condition at the site, a missile being generated and propelled toward the safety-related equipment, the missile breaking the boundary of the equipment, and the subsequent inability of the plant to achieve cold shutdown, if required. Additional assumptions include no on-site electrical power and multiple missiles. Equipment observed to have a potential for being not fully protected, under certain conditions, are the Unit 1 condensate storage tank, two Unit 1 diesel fuel oil storage tanks, two Unit 1 component cooling water system heat exchangers, and the refueling water taken for each unit. After detailed discussion with the licensee, the PM was satisfied with the licensee's response and prior actions.

The technical specifications for both units require that the licensee conduct a beach survey and mangrove photographic survey at least once per year. These surveys are associated with flood protection measures for the site. The results of the beach survey were submitted to the staff by a letter dated July 7, 1987. The results indicated that the present dune condition is acceptable. The results of the mangrove survey were submitted to the staff by letters dated March 2 and July 1, 1987. The results indicated that there has been some deterioration of the mangroves. As a result, the licensee performed an engineering evaluation. The licensee concluded that the mangroves are not required to maintain design basis of the St. Lucie site to protect safety-related structures and equipment from probable maximum hurricane surge and erosion damage. Thus, the licensee determined that the deterioration did not create a condition of any safety significance. The licensee has embarked on a program to rejuvenate the 50 acre mangrove tract. The licensee has installed a piping system to water the tract. The piping system draws water from the intake canal and pumps it through PVC pipe to the northern edge of the 50 acre tract, where the water is released along the edge of the tract. Pooled water in the tract is eventually released back to the intake canal. The licensee believes that much of the 50 acre tract will be restored in a few years. The PM believes that, although under no requirement to do so, the licensee is acting in a responsible manner to restore the tract.

A number of Unit 1 plant change/modification packages were reviewed by the PM. Emphasis was placed on the safety evaluation conducted by the licensee. These were St. Lucie Unit 1/Unit 2 security systems (141-81); electrical penetration E-4 nozzle (003-184); steam line radiation monitor

weather enclosure (024-184); and environmental qualification update (077-186). Unit 2 plant change/modification packages were reviewed during a prior 1987 site visit. All safety evaluations were adequate. It should be noted that the security system plant change/modification package containing safeguards information was stored in a locked file cabinet, as required. Additionally, the environmental qualification update plant change/modification package is a good example of a change made under 10 CFR 50.59 that is not hardware-orientated. It demonstrates that the licensee envelopes all changes described in the FSAR into their change program, not just hardware changes.

The PM conducted various tours. Particular emphasis was placed on the reactor auxiliary building (RAB) for each unit. The PM toured all levels inside the RAB's and the ground level outside the RAB's and fuel handling buildings. All outside doors to the RAB's were closed as required. All outside doors to the fuel handling buildings were closed as required, except for one door on the Unit 2 fuel handling building, which was open because new fuel was just received on-site and was just moved into the building. A guard was posted because the door was open and personnel were working in the immediate area. The licensee has had some problem, in the past, keeping some exterior RAB doors closed. The reason for keeping the doors closed is if an airborne radiological release occurred in the RAB, an open door would represent an unmonitored and unfiltered escape pathway, partially bypassing the RAB ventilation cleanup and filtration system. Significant improvement has been noted and housekeeping was excellent in both RAB's.

The PM noted a possible discrepancy in the shield building wall penetration (no. 57) associated with the containment mini-purge system line (Unit 2). Apparently, the piping run went through the penetration, but the areas between the outside of the line and the inside of the penetration was not sealed. This discrepancy was discussed with the licensee. The licensee demonstrated, by utilizing drawings, that the seal between the outside of the pipe and the inside of the penetration was made at the inside of the shield building wall. Additionally, the licensee stated that leak tightness of the annulus area is periodically checked to ensure that there is no unacceptable leakage. The licensee's explanation resolved the PM's concern.

#### 5. Plant Operations Review (Units 1 and 2)

The inspectors, periodically during the inspection interval, reviewed shift logs and operations records, including data sheets, instrument traces, and records of equipment malfunctions. This review included control room logs and auxiliary logs, operating orders, standing orders, jumper logs and equipment tagout records. The inspectors routinely observed operator alertness and demeanor during plant tours. During routine operations, operator performance and response actions were

observed and evaluated. The inspectors conducted random off-hours inspections during the reporting interval to assure that operations and security remained at an acceptable level. Shift turnovers were observed to verify that they were conducted in accordance with approved licensee procedures. The inspectors performed an in-depth review of the following safety-related tagouts (clearances):

Unit 1

1-9-64 PM On Reactor Trip Circuit Breakers  
 1-9-94 Pressure Test - 1A Charging Pump  
 1-10-7 Pressure Test - 1C Charging Pump  
 1-10-8 Pressure Test - 1B Charging Pump

Unit 2

2-7-60 Tag Open Breakers To Comply With RG 1.63 and 1.75  
 2-9-88 Repair LCV-2110P  
 2-10-26 2C Charging Pump - Adjust Accumulator Pressure for Mode Change

6. Technical Specification Compliance (Units 1 and 2)

During this reporting interval, the inspectors verified compliance with limiting conditions for operations (LCO's) and results of selected surveillance tests. These verifications were accomplished by direct observation of monitoring instrumentation, valve positions, switch positions, and review of completed logs and records. The licensee's compliance with LCO action statements were reviewed on selected occurrences as they happened.

7. Maintenance Observation

Station maintenance activities of selected safety-related system and components were observed/reviewed to ascertain that they were conducted in accordance with requirements. The following items were considered during this review; limiting conditions for operations were met, activities were accomplished using approved procedures, functional tests 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 the priority was assigned to safety-related equipment. The inspectors observed portions of the following maintenance activities;

Unit 1

PWO 7608 Pre/Post Test Calibration of IST Test Gages

Unit 2

PWO 5885 Auto Load Sequence Test

## 8. Review of Nonroutine Events Reported by the Licensee (Units 1 and 2)

The following Licensee Event Reported (LER's) were reviewed for potential generic impact, to detect trends, and to determine whether corrective actions appeared appropriate. Events which were reported immediately were also reviewed as they occurred to determine that technical specifications were being met and that the public health and safety were of upmost consideration. The following LER's are considered closed:

Unit 1

87-13 Reactor Trip on High Pressure, Loss of 1B S/G Feedpump (ref. paragraph 4, this report and IE Report No. 335/87-14, dated July 28, 1987)

87-14 Unidentified RCS Leakage Greater Than TS Limits (ref. paragraph 12, this report).

Unit 2

87-06 2A and 2B Diesel Generator Automatic Load Sequence Relays Missed Surveillance

On September 17, 1987, the licensee's QA organization discovered that the surveillance for the 2A and 2B Emergency Diesel Generator (DG) 12 month test of the automatic load sequence relays had not been properly completed when last performed (May 4, 1987). The review of the surveillance procedure indicated that only the components on the 4160 volt 2A3 and 2B3 switchgear were tested. The test did not include the components on the 4160 volt 2AB switchgear and the 480 volt load centers/motor control centers. Apparently, the May 1987 reviews by individual(s) implementing the maintenance surveillance procedure as well as quality control personnel given charge of reviewing the plant work order and the surveillance maintenance procedure for completeness and compliance to the surveillance requirements did not identify the incomplete surveillance procedure.

The immediate and corrective actions implemented by the licensee were; (1) electrical maintenance personnel satisfactorily performed the required surveillance in accordance with the approved procedure, (2) plant management have reemphasized the importance of adequate review of plant work orders and surveillance procedures, and (3) the surveillance procedure was revised for clarity.

Unit 2 technical specification (TS) 4.8.1.1.2.d requires that while operating in modes 1, 2, 3, and 4 each diesel generator shall be demonstrate operable by verifying at least once per 12 months that the automatic load sequence times are operable. The last 12 month DG surveillance of the automatic load sequence relays was satisfactorily performed in May 1986. As an immediate action the surveillance procedure was performed satisfactorily on September 18, 1987. This is approximately 18 days past the TS allowable 25% extension of the testing interval. The surveillance was completed, with all components testing satisfactorily, approximately 22 hours after discovery of the incomplete status of the previous surveillance of May 4, 1987.

In summary, the failure to properly complete the scheduled surveillance of the diesel generator on May 4, 1987 and the subsequent exceeding the allowed 25% extension is a violation of Unit 2 TS. However, since it was identified by the licensee, considered to be severity level IV or V, reported, corrected within a reasonable length of time, and was not a violation which could be expected to have been prevented by the licensee's previous corrective actions, in accordance with 10 CFR 2, Appendix C, V.A., a Notice of Violation will not be issued.

#### 9. Physical Protection (Units 1 and 2)

The inspectors verified by observation and interviews during the reporting interval that measures taken to assure the physical protection of the facility met current requirements. Areas inspected included the organization of the security force, the establishment and maintenance of gates, doors and isolation zones in the proper conditions, that access control and badging was proper, and procedures were followed.

#### 10. Surveillance Observations

During the inspection period, the inspectors verified plant operations in compliance with selected 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 inspectors verified that testing was performed in accordance with adequate procedures, test instrumentation was calibrated, limiting conditions for operations were met, removal and restoration of the affected components were accomplished, test 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 inspectors observed portions of the following surveillance(s):

Unit 1

- 1-0110050 Control Element Assembly Periodic Exercise  
 1-0010125 Check Sheets 1, 2, 3, 4, 6, and 10; and Data Sheets 1, 3, 4, and 9  
 HP-4 Attachment B-Daily Area Surveys

Unit 2

- HP-4.2 Health Physics Weekly Checks  
 Boric Acid/Safety Injection Tanks - Activity/Concentration

## 11. Refueling Outage Review

During the inspection period, the inspector observed certain aspects of the licensee's preparations for refueling of Unit 2 (scheduled, October 3 thru November 1). The following objectives were addressed:

- a. Ascertain the adequacy of licensee procedures for the conduct of refueling operations,
- b. Ascertain the adequacy of the licensee's administrative requirements for control of:
  - (1) Refueling operations, and
  - (2) Plant conditions during refueling, and
- c. Ascertain the adequacy of the licensee's implementation of controls for items 2a. and b., above.

The inspector reviewed the following refueling related procedures to ensure that the licensee had implemented controls for the conduct of refueling operations and for establishing and maintaining control of plant conditions in accordance with technical specifications:

Operations

- 2-0030127 Reactor Plant Cooldown - Hot Standby to Cold Shutdown  
 2-0030128 Reactor Shutdown  
 2-011022 Coupling and Uncoupling of Control Element Assembly (CEA) Extension Shafts  
 2-0120021 Draining the Reactor Coolant System  
 2-1600022 Unit 2-Refueling Operation  
 2-1600023 Refueling Sequencing Guidelines  
 2-1610020 Receipt and Handling of New Fuel  
 2-1630021 New Fuel Elevator Operation  
 2-1630022 Spent Fuel Handling Machine Operation  
 2-1630023 Fuel Transfer System Operation  
 2-1630024 Refueling Machine Operation  
 2-1630025 CEA Change Fixture Operation  
 2-1630028 New Fuel Handling Crane Operation

Administration

0005746 Outage Management  
 0010438 Control of Heavy Load Lifts

Maintenance

2-M-0036 Reactor Vessel Maintenance - Sequence of Operations

Instrument and Control

2-120054 Low Temperature Overpressure Protection Setpoint Verification

Health Physics

HP-23 Health Physics Activities in the Reactor Containment Building  
 During Shutdown

HP-40A Receipt of Radioactive Material

## 12. Review of Plant Events

On October 8, 1987, with Unit 1 in mode 1 at 100% power, during a leak rate calculation, the licensee discovered that unidentified reactor coolant leakage was 1.08 gpm, greater than the TS limit of 1 gpm. An unusual event was declared at 5:29 a.m. and the NRC notified (ref. PN). Operations personnel entered containment at 5:30 a.m. to investigate and possibly identify the source of the leakage. The containment entry team reported leaks in several reactor coolant pump (RCP) areas. At 6:12 a.m., a reactor shutdown was commenced so that detailed investigations could be conducted in containment. At 9:13 a.m. the turbine was removed from the grid.

At 9:30 a.m., another containment entry was conducted by a team of operators and maintenance personnel to reassess the leaks. From this investigation it was discovered that the 1A1 RCP vapor seal was slinging a mist of water. Additionally, the 1A2 RCP vapor seal was showing signs of leakage along with the 1B1 charging header to the 1B1 loop and safety injection line to the 1B2 loop. Because the exact sources of the leakage could not be identified the licensee decided to remain in an unusual event.

The licensee assigned a team to evaluate the event and prepare a plan to positively identify the leak sources and plan for necessary repairs. At 12:05 p.m., the unit was shut down and in mode 3. The unusual event was terminated at 2:05 p.m. because the RCS leaks were now identified with total identified leakage less than the TS limit of 10 gpm.



The following sources of leakage were identified and repaired:

- a. 1A1 RCP seal leak from a cracked weld joint on a seal nozzle flange,
- b. 1B1 loop 2-inch charging line check valve cover plate gasket leak,
- c. 1B2 loop 12-inch safety injection line check valve hinge pin gasket leak,
- d. 2-inch pressurizer auxiliary spray line check valve gasket leak,
- e. 1B1 loop 3-inch pressurizer main spray line check valve gasket leak, and
- f. a minor PORV discharge flange gasket leak.

Maximum unidentified leakage recorded during the event based on letdown system mismatch was 4.9 gpm. The failure of the 1A1 RCP seal cracked weld was probably responsible for the leak rate going from less than to greater than 1 gpm unidentified over a short period of time (between normal leak rate calculations). All leaks were repaired and the unit returned to service on October 18, 1987.

On October 25, 1987, while reassembling the Unit 2 reactor vessel internals and performing a lift of the in-core instrument (ICI) plate onto the work platform, the plate was deformed due to excessive force being applied using the polar crane. The procedure, 2-M-0036, Reactor Vessel Maintenance - Sequence of Operations, paragraph 9.10.36, requires that the load cell readout be continuously observed during the lift and that the free hanging weight not be exceeded by more than 600 lbs. Due to the confusion caused by the shift change and the use of the crane, without the load cell, for other lifts in containment immediately following the shift change, the load cell was not reinstalled prior to continuing procedure 2-M-0036. The failure to continuously observe the load cell readout when proceeding to step 37 of the procedure resulted in the deformation of the instrument plate. This is a violation of Unit 2 TS 6.8.1, failure to establish/implement procedures, first example (50-389/87-20-01).

As of the end of the reporting period, the licensee had completed taking measurements to determine the extent of the ICI plate deformation and inspections of the plate welds. The plate was found to have a maximum deformation on the outer edge or rim of 1 7/8 inches. The manufacturer's specification is a maximum 1/2 inch deformation. Additionally, the licensee was in the process of fabrication the tools, in accordance with Combustion Engineering recommendations, necessary for straightening the plate. The licensee has completed a review of other lifts which had been performed previously during the outage to ensure that all lifts were conducted properly. No further problems were identified. The outage was expected to be delayed approximately seven days.

On October 28, 1987, the licensee had removed the Unit 1 turbine generator from the grid to balance the generator exciter. The exciter had developed a vibration problem earlier in the month. On October 29, 1987, after

successfully completing balancing of the exciter and returning the turbine generator to service, the turbine operator inadvertently stopped the only operating condensate pump, the 1A pump. Subsequently, a trip of the main feed pump occurred and at 3:35 a.m., at 20% power, and the reactor tripped on low steam generator water level. All system functioned as designed.

The 1A condensate pump was stopped while electric realigning the operating condensate pumps (from 1A and 1B to 1A and 1C operating). After completing the pump electrical realignment, using procedure 1-0700020, Condensate and Feedwater, the operator encountered problems removing one (of three) of the interlock keys required for changing the disconnect lineup. The control room was informed of the problems and sent an electrical supervisor to the disconnect area to provide assistance to the operator. At this point, for reasons undetermined, the operator inserted one of the three keys into the 1A pump electrical disconnect lock. The interlock was then activated which tripped the remaining, 1A condensate pump. The interlock prevents either opening an energized disconnect or aligning the 1C condensate pump to two independent power sources. In summary, the procedure, 1-070020, was inadequate because it does not specify how or under what conditions the interlock keys may be removed after the disconnect lineup is completed. Additionally, the operator failed to follow procedures, in that, upon encountering problems in removing the last remaining key, he inserted another key without the utilization of the procedure. This is a violation of Unit 1 TS 6.8.1, failure to establish/implement procedures, second example, (50-335/87-21-01).

While recovering from the event described above, on October 29, 1987, with startup operations in progress, shutdown rods withdrawn and Unit 1 not critical at 5:42 a.m., the unit tripped on a spurious channel B high startup rate (SUR). All equipment functioned as designed. Channel C SUR was tripped because of previous problems with the instrument. When the spurious channel B SUR occurred the required 2 out of 4 logic was made up, initiating the reactor trip. The licensee repaired channel C, placed channel B in bypass and commenced a reactor startup. The reactor was critical at 11:10 a.m. and the unit placed on-line at 1:10 p.m. the same day. No further problems were experienced.