UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-335/95-01 and 50-389/95-01

Licensee: Florida Power & Light Co
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: January 1 - February 4, 1995

Inspectors: R. Lehn for — 2/22/95
R. L. Prevatte, Senior Resident Inspector — Date Signed

R. Lehn for — 2/22/95
M. S. Miller, Resident Inspector — Date Signed

R. Lehn for — 2/22/95
W. K. Poertner, Resident Inspector — Date Signed

Approved by: K. D. Landis — 2/22/95
K. D. Landis, Chief — Date Signed
Reactor Projects Section 2B
Division of Reactor Projects

SUMMARY

Scope: This routine resident inspection was conducted onsite in the areas of plant operations review, maintenance observations, surveillance observations, plant support, and other areas.

Inspections were performed during normal and backshift hours and on weekends and holidays.

Results: Plant operations area:

Operations was acceptable during the inspection period. One violation, involving a failure to perform a TS surveillance on SIT boron concentration was identified. Weak communication between operators and other plant organizations was noted with respect to Unit 1 hot leg stratification. System and area walkdowns by the NRC identified only minor deficiencies.

Maintenance and Surveillance area:

Maintenance/Surveillance activities continued to be conducted well during the period. One violation, involving a failure to perform an adequate independent verification during CVCS maintenance, was identified. The balance of maintenance activities were conducted well. Predictive Maintenance involvement in the identification of Unit 1 CEA MG wiring problems was considered a strength.

Plant Support area:

Plant support activities were conducted well this period. HP support to containment entries for inspection and maintenance was considered good.

Within the areas inspected, the following violations were identified:

VIO 335/95-01-01, Failure to Perform TS-Required Sampling of the 1A1 SIT, paragraph 3.e.

VIO 389/95-01-02, Failure to Follow Procedure 2-LOI-T-89, paragraph 4.a.4.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. Ball, Mechanical Maintenance Supervisor
W. Bladow, Site Quality Manager
L. Bossinger, Electrical Maintenance Supervisor
H. Buchanan, Health Physics Supervisor
* C. Burton, St. Lucie Plant General Manager
* R. Dawson, Licensing Manager
* D. Denver, Site Engineering Manager
* J. Dyer, Maintenance Quality Control Supervisor
H. Fagley, Construction Services Manager
P. Fincher, Training Manager
* R. Frechette, Chemistry Supervisor
K. Heffelfinger, Protection Services Supervisor
* J. Holt, Plant Licensing Engineer
G. Madden, Plant Licensing Engineer
* J. Marchese, Maintenance Manager
W. Parks, Reactor Engineering Supervisor
* C. Pell, Outage Manager
* L. Rogers, Instrument and Control Maintenance Supervisor
* D. Sager, St. Lucie Plant Vice President
J. Scarola, Operations Manager
* D. West, Technical Manager
J. West, Site Services Manager
* C. Wood, Operations Supervisor
W. White, Security Supervisor

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

NRC Personnel

* K. Landis, Chief, Reactor Projects Section 2B
* M. Miller, Resident Inspector
* K. Poertner, Resident Inspector, Oconee
R. Prevatte, Senior Resident Inspector
* S. Sandin, Senior Operations Officer, AEOD
L. Trocine, Resident Inspector, Turkey Point

* Attended exit interview

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

2. Plant Status and Activities

a. Unit 1
Unit 1 operated at essentially 100 percent power throughout the inspection period.

b. Unit 2

Unit 2 operated at essentially 100 percent power throughout the inspection period. At the close of the inspection period, the licensee was addressing the erratic operation of CVCS letdown control valves and had stopped other major maintenance activities in deference to this issue.

c. NRC Activity

K. D. Landis, Chief, Reactor Projects Section 2B, NRC Region II, visited the site on February 2 and 3. His activities included a site tour, discussions with licensee management, and an overview of resident office activities and issues.

S. S. Sandin, Senior Operations Officer, NRC Office for the Analysis and Evaluation of Operating Data, began a six month rotational assignment on January 17. His duties included site familiarization and augmentation of the resident staff. L. Trocine, Resident Inspector, Turkey Point 3 and 4, visited the site on January 24 and 35. Her activities included site familiarization for emergency response. W. K. Poertner, Resident Inspector, Oconee, visited the site from January 31 through February 3. His activities involved augmenting the resident inspection effort.

3. Plant Operations

a. Plant Tours (71707)

The inspectors periodically conducted plant tours 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 properly, 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 frequency of plant tours and control room visits by site management was noted.

The inspector performed a walkdown of DG 2A and 2B to verify that the DGs and support systems were correctly aligned for standby operation as provided by OP 2-2200020, Rev 23, "Emergency Diesel Generator Standby Lineup." The support systems included DGFO and air start and cooling systems in addition to all DG skid mounted systems/components. All valves and electrical breakers/switches were found in correct positions. The below list of minor system

and/or procedure discrepancies was provided to the Unit 2 ANPS for correction. The inspector verified that the deficiencies were corrected prior to the end of the reporting period or PWOs were submitted to incorporate them into the work schedule.

(1) Oil leaks around crankcase covers, all engines.
(2) Oil leaks from 2A/2B diesel air compressors.
(3) Oil on floor under 2A1 turbo filter.
(4) Oil/water leaks 2A1 attached pumps.
(5) Oil leaks 2A2 fuel oil filters.
(6) Both DG areas were in need of general area cleanup.
(7) Fire Extinguisher bottle missing surveillance tag near entrance to DGFO tank rooms
(8) LIS 17-9B in DGFO tank room missing cover.
(9) Valves V59160 and V59161 missing tags.
(10) Oil and water on floor under 2A2 lube oil cooler.
(11) 2A1/2A2 - 2B1/2B2 soakback pump lube press and turbo lube AC pump discharge press, has two isolation valves and a drain valve in line between instrument tap and transmitter. Second isolation valves and drain valves not tagged in three of four above systems. One system uses duplicate tag numbers.
(12) V38201 Demineralized water common vent listed for 2B diesel room, actually in 2A DG room, OP 2-2200020, Rev 23 (page 15).
(13) Oil leak around 2B1 fuel oil filter.
(14) Oil leak 2B2 DC soak back pump.

b. Plant Operations Review (71707)

The inspectors periodically 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. They observed and evaluated control room staffing, control room access, and operator performance during routine operations. The inspectors conducted random off-hours inspections to ensure that operations and security performance remained at acceptable levels. Shift turnovers were observed to verify that they were conducted in accordance with approved licensee procedures. Control room annunciator status was verified. Except as noted below, no deficiencies were observed.

(1) Unit 1 Hot Leg Temperature Stratification

In December, 1994, the inspector noted, during a Unit 1 control room tour, that the hot leg temperature indications displayed on temperature recorder FP-118C showed a difference between individual hot leg temperatures. The hot legs varied by several degrees. An examination of the recorder trace indicated that hot leg temperatures had tracked together well and then had abruptly deviated from one another approximately one half hour prior to the observation. One hot leg's

temperature increased while the other decreased. The inspector brought the condition to the attention of a control room operator, who stated that the condition had occurred sporadically, and then abated, since startup from the recent refueling outage.

The inspector informed the operator that the behavior appeared indicative of a hot leg flow anomaly, identified in other PWRs, which involved the radial rotation of hot leg flow regimes. The behavior had been found, at other facilities, to be the result of a stratified vertical temperature profile combined with a spurious radial rotation of the flow regime, which resulted in warmer (or cooler) water being moved relative to the position of hot leg RTDs. Unit 1 hot leg RTDs were positioned at 45° on either side of vertical, such that when the flow regime swirled, cooler water was moved up toward one RTD and hotter water was moved down toward the other RTD.

The inspector brought the condition to the attention of the Operations Manager. During the discussion, the inspector pointed out that NRC personnel with knowledge in the area had stated that some CE units had experienced TM/LP pre-trips as a result of the phenomenon due to the higher temperatures sensed by the hot leg RTDs. As the RPS employed the higher of NI or ΔT power, changes in hot leg temperatures resulted in changes in ΔT power which was then sensed by the RPS. Thus, an increase in the sensed hot leg temperature resulted in an increase in calculated ΔT power and the potential for challenges to the TM\LP pre-trip and trip setpoints.

Several days thereafter, the inspector again noted the condition and, as the Operations Manager was in the control room at the time, directed his attention to the subject recorder. The Operations Manager directed that an STA obtain data from the ERDADs computer on the parameters to verify that safety-related RTDs were sensing the same variations in temperature (the recorder displayed the output of non-safety-related RTDs employed in the Reactor Regulating System). On January 6, the inspector noted the condition again and, in discussions with control room operators, found that the condition had resulted in a series of TM/LP pretrips on December 24, 1994. At this time, at the direction of the Operations Manager, the licensee's Operations Department began a systematic evaluation of the phenomenon.

The licensee's evaluation resulted in the determination that the anomalous behavior was, indeed, due to a swirling of thermally stratified coolant, consistent with observations made during the startup of Arkansas Nuclear One, at Millstone, and at St. Lucie Unit 1 during cycle 5. A safety evaluation was prepared which indicated that the phenomenon did not represent a threat to unit safety, as only the TM/LP trip was affected

and the TM/LP trip was not credited in the accident analysis. The VHPT, which relied upon NI inputs, was relied upon for providing the necessary trips in response to power escalations. The inspector found the licensee's safety evaluation to be satisfactory. Additionally, Operations prepared a Night Order on January 11 describing the phenomenon to operators.

The inspector found that, while the licensee's actions ultimately resulted in the conclusion that the phenomenon did not represent a threat to safety, operators were slow to respond to the anomalous behavior. The inspector discussed the issue with a number of operators who stated that they had observed the behavior over an approximate one month period. The inspector reviewed strip chart recorder data dating to the Unit 1 post-refueling startup and found that the anomaly was identifiable in approximately 35 instances over an approximate one month period. Several operators stated that they assumed the behavior was a result of problems in instrumentation, although both safety-related and non-safety-related channels indicated that anomalous behavior was occurring.

Following the occurrence of TM/LP pretrips, operators initiated a PWO to I&C to affect repairs to instrumentation, however discussions with the I&C system supervisor indicated that he believed the phenomenon to be related to real process changes, not an instrumentation failure. The I&C system supervisor produced correspondence, dated October 14, 1994, in which I&C informed the licensee's Nuclear Fuels group of variations in hot leg temperatures which were believed, by I&C, to be due to hot leg stratification. The correspondence went on to reference CE Infobulletin 89-05, which described hot leg stratification and flow swirling in other CE units.

The inspector concluded that the resolution to this issue was impeded by a number of communications failures between operators, Operations management, I&C, and JPN Nuclear Fuels. Additionally, operators showed reluctance to believe indications of the anomalous behavior when there was no cause to doubt them.

c. Plant Housekeeping (71707)

Storage of material and components, and cleanliness conditions of various areas throughout the facility were observed to determine whether safety and/or fire hazards existed.

No violations or deviations were identified.

d. Clearances (71707)

During this inspection period, the inspectors reviewed the following tagouts (clearances):

- The inspector walked down clearances 2-94-12-117 on the 2B primary makeup pump and 2-94-12-119 on 2A hold up drain pump. All required tags were in place and all breakers and valves associated with these clearances were in the correct position.

e. Technical Specification Compliance (71707)

Licensee compliance with selected TS LCOs was verified. This included the review of selected surveillance test results. These verifications were accomplished by direct observation of monitoring instrumentation, valve positions, and switch positions, and by review of completed logs and records. Instrumentation and recorder traces were observed for abnormalities. The licensee's compliance with LCO action statements was reviewed on selected occurrences as they happened. The inspectors verified that related plant procedures in use were adequate, complete, and included the most recent revisions.

On December 31, 1994, the licensee identified a failure of Unit 1 personnel to satisfy TS surveillance requirements. The occurrence involved a failure to sample a SIT for boron concentration within the TS-mandated time frame following the addition of water to the SIT. Specifically, at 2:07 p.m., operators began adding water to the 1A2 SIT. TS 4.5.1.1.b required, in part, that within six hours of such an addition, a sample for adequate boron concentration be obtained. The control room log indicated that, at 4:19 p.m., a satisfactory sample result was obtained from chemistry for the 1A1 SIT. At 11:15 p.m., the oncoming ANPS noted the SIT designation discrepancy in the log, and a sample of the 1A2 SIT was obtained. At 11:35 p.m., the 1A2 SIT was shown to contain a satisfactory concentration of boron.

The apparent root cause for the event was confusion between control room operators and the chemist concerning which SIT required sampling. The inspector reviewed the control room chronological log and found that the entry made at 2:07 p.m. stated "Started 1B HPSI pp to fill ~~2A1~~, ~~1A1~~, [sic] 1A2 SIT." An entry made at 4:19 p.m. stated "1A1 SIT sample 2229 ppm." The inspector found that the failure to recognize the difference between the SIT added to and the SIT sampled represented poor attention to detail on the part of control room operators.

While the subject occurrence was, in and of itself, of low safety significance, the inspector found that the event was similar to an event discussed in paragraph 7.e of IR 93-23. The IR closed LER 50-389/93-001, which described a failure of the licensee to sample the 2A1 SIT following the addition of water to 2A1, 2A2, and 2B2 SITs on January 8, 1993. In this event, the failure to satisfy the TS surveillance requirements was attributed to an error on the part of a chemist, who sampled only the 2A2 and 2B1 SITs. However, an additional causal factor was identified on the part of control room operators, who failed to identify that the chemist only reported

sample results on two of the three SITs to which water had been added. As in the current case, the failure was identified by an oncoming ANPS during control room log reviews. As one of the corrective actions cited by the licensee in the LER, operations personnel were counselled on the subject and on the need to carefully track surveillances.

TS 4.0.3 stated, in part, that the time limits of TS action statements are applicable from the time that a failure to perform a required surveillance is identified. TS 4.0.3 further stated that the action requirements may be delayed for up to 24 hours to permit the completion of the surveillance. Since the licensee completed the surveillance in 20 minutes after the failure to perform the surveillance was identified, they were not required to initiate the TS 3.5.1 SIT action requirements. However, the failure to perform the required surveillance within 7.25 hours (the 6 hour TS requirement plus a 25 percent allowance under TS 4.0.2) of adding water to the 1A2 SIT on December 31 did represent a failure to satisfy TS 4.5.1.1.b and is a violation (VIO 335/95-01-01, Failure to Perform TS-Required Sampling of the 1A2 SIT). This violation is being cited because the event was similar to an event that occurred on January 8, 1993, which was identified as a non-cited violation.

f. Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems (40500)

(1) The inspector attended the January 12 FRG meeting and verified that a quorum was present. The meeting agenda covered twelve procedure/technical manual changes. Several of the items did not contain all needed information and were returned for additional information. The inspector was impressed with the extensive questioning on several items by the plant general manager. It appears that the PGM uses this meeting to establish and reemphasize standards and expectations. The inspector noted that several items presented had not been thoroughly prepared. It was also noted that some members reviewed and accepted the proposed changes without questions. The inspector has noted at this and several past FRG meetings that several members appear to go through the motions of reviewing agenda items, but the PGM always has the majority of questions and enforces the standards.

(2) QA Audit Review

The inspector reviewed QA audit report QSL-OPS-94-28 conducted in December 1994. This audit evaluated quality activities in the areas of plant maintenance and surveillance activities, TS amendments, plant modifications performed during the recently completed Unit 1 outage, Engineering support services and plant security. No significant deficiencies were identified in the audit. The audit consisted of documentation and record reviews and observation of field activities. The audit reports

appeared to be of sufficient detail to discover potential problems. The inspector noted that several of the same items audited had also been recently reviewed by the resident staff with the same overall conclusions.

(3) Incorporation of ISEG into QA

During the inspection period, the licensee received amendment 69 to Unit 2 TSs, removing the requirement for an ISEG. As a result, the licensee has disbanded the ISEG as an organization and transferred its responsibilities to the site QA organization. The previous ISEG chairman has been assigned as a Technical Assistant to the QA Manager, from which position he will perform Independent Technical Reviews. The licensee revised Site Quality Manual 18.0, "Nuclear Assurance Review Activities," and created Quality Instruction SLQDQI-18.4, "Independent Technical Reviews," to describe the manner in which the ISEG function would be performed. The inspectors will follow the ITR effort as it develops.

In conclusion, Operations showed mixed performance during the inspection period. One violation, involving a failure to perform a TS surveillance on SIT boron concentration was identified. Weak communication between operators and other plant organizations was noted with respect to Unit 1 hot leg stratification. System and area walkdowns resulted in only minor deficiencies.

4. Maintenance and Surveillance

a. Maintenance Observations (62703)

Station maintenance activities involving selected safety-related systems and components were observed and reviewed to ascertain that they were conducted in accordance with requirements. The following items were considered during this review: LCOs 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 the status of outstanding jobs and to ensure that priority was assigned to safety-related equipment. Portions of the following maintenance activities were observed:

(1) PWO 62/2207 - Preventive maintenance on the Unit 2 feedwater isolation valves.

These PMs included fabrication of parts, leak testing of fittings, performing a dump test, and adding hydraulic fluid as needed to the hydraulic actuators for the four feedwater isolation valves. This work was done in conjunction with the

performance of the quarterly valve tests in paragraph 4.6.4. The inspector observed portions of the above work and noted that the NPS required that procedure 2M-018, Rev 41, "Mechanical Maintenance on Safety Related Equipment" be revised to do the required PM task after completion of the surveillance test and restoring the MSIV and FWIV to full operability. No deficiencies were identified during the above tasks.

(2) PWO 64/3921 - Calibration of Pressurizer Level Channel LIC 1110Y.

The inspector observed the calibration of level transmitter LT-1110Y, performed January 24. The calibration was requested when operators noted an approximate 5 percent deviation between X and Y channels.

The subject transmitter was located in containment, necessitating an entry and continuous HP support. The inspector attended a pre-job briefing conducted by HP prior to the containment entry. The briefing was thorough, covering the areas of stay times, general radiological conditions, heat stress, and contingencies to be considered in the event of a disabling injury.

The inspector noted that the I&C personnel performing the calibration entered containment with an adequate collection of tools and equipment, made frequent use of appropriate calibration procedures and supported one another well in what was a high noise and high temperature environment. Overall, the I&C personnel performing the calibration were well-prepared and executed the calibration professionally.

(3) 2C AFP Maintenance

The inspector witnessed selected portions of the planning and execution of maintenance on the 2C AFP and associated MOVs. The evolution was controlled under AP 0010460, Rev 1, "Critical Maintenance Management." The licensee's maintenance, planning and operations organizations participated in the planning of what was to be on-line maintenance. Individual work tasks included an inspection of the stem of MV-08-03 (turbine trip/throttle valve) for the existence of dimpling to accept a set screw which ensured integrity of the valve-stem-to-actuator connection. The inspection for the set screw was the result of a 10 CFR 21 notification from the vendor. Additionally, the licensee planned to perform preventive maintenance on the operators of MV-08-03, MV-08-12 and MV-08-13.

The licensee's planning included a detailed schedule and the designation of shift directors to coordinate activities. In accordance with the licensee's CMM procedure, the outage was to last less than one half of the allowable outage time for the

AFP. PRA data was prepared to quantify the increase in risk assumed by the voluntary entry into the AFP LCO AS.

While the licensee's planning efforts were judged to be excellent, the schedule was accelerated on January 12, when entrance into the AS was necessitated by the development of a through-wall steam leak in an elbow in line 1-3/4-MS-106. The affected line was a 3/4 inch steam line which provided steam bypass around MV-08-12 for warming the 2C AFP. The licensee isolated the leak and declared the 2C AFP OOS. STAR 2-950079 was initiated to document the condition and the resolution included the replacement of the affected elbow.

The inspector observed portions of the maintenance activities associated with the 2C AFP outage and found them generally well-controlled. The licensee's inspection of the stem of MV-08-03 indicated that a set screw dimple was not machined in the stem of the valve. The licensee's planning had considered this possibility and the dimple was machined in accordance with the vendor's recommendations.

Two difficulties were experienced in the reassembling of the trip linkage to MV-08-03. The first involved the discovery that the emergency trip spring holder had been installed backwards. Maintenance personnel worked with the vendor to obtain accurate drawings and to install the holder properly. Following reassembly of the trip linkage, operators found that they could not operate the AFP due to a failure of a trip linkage limit switch roller to be properly aligned to its actuating plate. The inspector reviewed the work package which had governed the disassembly/reassembly of the linkage and found that a drawing was included in the package which improperly represented the orientation of the limit switch with respect to its actuating plate. The inspector questioned the existence of the drawing. The licensee stated that the drawing was not to be worked to, as evidenced by a "For Info Only" stamp. While the licensee could not explain why the drawing was in the package, they were able to identify a working drawing in the same package which showed the limit switch in its proper orientation. The licensee initiated a STAR 2-950081 to address the occurrence.

The inspector found that the 2C AFP maintenance outage was well-coordinated and involved comprehensive actions to ensure continued system reliability.

(4) CVCS Letdown Valve Maintenance Activities

On January 23, Unit 2 operators were forced to isolate charging and letdown when a pressurizer level control valve in the CVCS letdown line, responding to a change in controller bias setting, opened excessively. The excessive opening resulted in

an increase in downstream pressure which lifted a downstream relief valve. The lifted relief valve resulted in an ongoing loss of inventory. The event was terminated when the letdown line was isolated and pressure reduced sufficiently to allow the relief valve to reseat. The event recurred on January 24.

Operations initiated a STAR to document the condition and to affect corrective actions. In the course of reviewing the condition, the following was determined:

- The condition was initiated when operators shifted from single to two charging pump operation. Such a shift necessitated an adjustment to the bias of controller HIC 1110, which controlled the position of one or both (operator selected) pressurizer level control valves LCV 2110P and 2110Q.
- Operators found that, while adjusting the bias, the selected valve remained unresponsive to a point, following which the selected valve's response overshot the required position.
- The valve position overshoot resulted in an increase in pressure downstream of the valve from a nominal 450 psig to approximately 600 psig, the relief valve setpoint.
- The relief valve design incorporated a 25 percent blowdown, meaning that the valve would not reseat until pressure was reduced to below approximately 450 psig, a pressure which was never achieved prior to letdown isolation due to the action of the letdown pressure control valve to maintain pressure at approximately 450 psig.

The inspector attended a number of multidisciplinary meetings on the subject. Operations personnel stated that the observed behavior of the pressurizer level control valves had occurred, albeit to a lesser degree, throughout the unit's life. Operations management expressed a clear expectation that the problem would be addressed such that it would not recur. Additionally, operations delayed a scheduled Unit 2 CCW mid-cycle heat exchanger cleaning until the letdown issue was resolved. Cooperation and support was noted from Maintenance, Engineering, Tech Staff, and Health Physics. A preliminary troubleshooting plan was developed which included isolating one of the level control valves and performing static testing to ensure smooth valve operation. Additional plans were made to perform dynamic valve testing.

The licensee elected to pursue dynamic valve testing at a lower letdown pressure such that, if valve position overshoot occurred, the peak pressure experienced at the relief valve would not be sufficient to cause a lift. A safety evaluation was prepared by engineering which considered the potential effects of a 360 psig letdown pressure setpoint. The inspector

reviewed the subject safety evaluation and found it to be generally thorough. The safety evaluation indicated that, under steady state operation, the letdown pressure control setpoint could be reduced to 360 psig with no ill effects. However, the safety evaluation also found that, should a unit transient result in maximum letdown flow (as might be the case for a load rejection) that some flashing may occur. The inspectors noted that the Unit 1 letdown pressure setpoint was normally set for 360 psig. The licensee was reviewing the Unit 1 setpoint for adequacy as of the end of the inspection period.

The licensee initiated a Technical Staff Letter of Instruction to conduct dynamic testing of the Unit 2 CVCS letdown subsystem to determine the cause of the unstable operation. The testing was accomplished by LOI-T-89, "Diagnostic Testing of Letdown Level Control System." The procedure installed recorders on the HIC-1110 Output Controller, Output Limiter, Output Lag Circuit, and Letdown Flow. The procedure also installed a valve position transducer on the actuator of the level control valves to record valve operation under dynamic conditions. The initial testing was conducted on safety-related valve LCV-2110P and consisted of 1) starting and stopping a second charging pump, 2) alternating selection of letdown pressure control valves, and 3) using bias control to vary flow conditions to gather valve response data. Subsequent to the initial testing of valve LCV-2110P the licensee initiated a temporary change to the LOI to obtain data with valve 2110P isolated and the controller in the "BOTH" position to obtain data on the valve response under static conditions.

Following the testing of valve LCV-2110P the license attempted to perform dynamic testing on safety-related valve LCV-2110Q. When valve LCV-2110Q was placed in service the valve did not respond and remained closed resulting in a loss of letdown flow. The operators in the control room secured charging flow due to insufficient letdown and then attempted to reestablish letdown through valve LCV-2110Q unsuccessfully. The licensee then reestablished letdown using valve LCV-2110P. Subsequent investigation by the licensee determined that the positive and negative leads to the valve had been swapped by the I&C technicians during the calibration of the valve position recorder and this condition prevented the valve from opening to control letdown flow.

2-LOI-T-89, Diagnostic Testing of Letdown Level Control System, Step 4.2.24 stated "Remove the Transmation, reconnect the positive and negative leads to E/P 2110Q and connect up the valve position recorder for the test" and required that the step be Independently Verified for adequacy. During the performance of this step in the procedure the I&C technicians reversed the positive and negative leads to valve LCV-2110Q and this resulted in the valve not opening when the valve was

placed in service and a subsequent loss of letdown flow. The failure to properly reconnect the positive and negative leads to valve LCV-2110Q is identified as a Violation (VIO 389/95-01-02, Failure to follow procedure 2-LOI-T-89). This violation is cited because it included not only a failure to follow the procedure but also a failure of the independent verification process.

The licensee properly relanded the positive and negative leads to valve LCV-2110Q, placed the valve in service and suspended testing of valve LCV-2110Q. Initial indications from the data collected on valve LCV-2110P indicated the valve was sticking during operation resulting in pressure perturbations and unstable operation. As of the end of the inspection period the licensee was reviewing the data collected with the valve vendor and generating an action plan to improve system performance.

b. Surveillance Observations (61726)

Various plant operations were verified to comply with selected TS requirements. Typical of these were confirmation of TS compliance for reactor coolant chemistry, RWT conditions, 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, LCOs were met, removal and restoration of the affected components were accomplished properly, 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 following surveillance tests were observed:

(1) OP 1-2200050A, Rev 18, "1A Emergency Diesel Generator Periodic Test and General Operating Instructions"

The inspector witnessed portions of the preparation and execution of this surveillance test, performed on January 4. This performance involved a fast start, initiated from the control room, and a fast loading; satisfying the requirements of TS 4.8.1.1.2.a.4 and 5.

SNPOs performing pretest evolutions were observed and found to have a procedure available and to be knowledgeable of the EDG and of the test being performed. Control room operators were also found to have a procedure in hand and had obtained a calibrated stopwatch for determining EDG start time. Good coordination was noted between the RCO performing the test and the ANPS, who verified in a step-by-step fashion that the RCO was aware of the actions which would be required. Additionally, the ANPS stopped ESF surveillance testing, which was being performed in the control room at the time, to

minimize activities and to focus the attention of operators to the test.

The EDG performed satisfactorily, with a 9.89 second start time. The RCO performing the test successfully paralleled the EDG with the grid and loaded the EDG to approximately 3500 KW within 60 seconds, as required by TS. The inspector verified that the KW meter (strip chart recorder) used for the test was within its calibration interval.

(2) OP 2-2200050A, Rev 14, "2A Emergency Diesel Generator Periodic Test and General Operating Instructions"

The inspector observed the 2A Emergency Diesel Generator monthly surveillance test, conducted in accordance with the subject procedure. The inspector reviewed the test procedure and verified that all prerequisites for this test were met. In January and July this surveillance performs a fast start of the DG from the control room and the elapsed start time is recorded. The inspector observed the start from the control room and verified that the DG started in 8.16 seconds. The DG was then loaded to approximately 3500 KW and was run at this load for approximately 1.5 hours. The inspector observed the engine starting and found that the control operator completed this task in accordance with procedural requirements. The inspector then went to the DG building and did a detailed walkdown inspection of the running DG.

The following deficiencies were identified by the inspector or the NPO and system engineer who were conducting the test.

- The fuel rack on 2A2 engine was oscillating slightly.
- The 2A2 governor bodine motor was loose on its base plate. This item was subsequently reworked on January 13 under PWO 0431/66.
- Air/oil temperature indicator point 2 not reading correctly.
- One broken and one missing indicator light cover for fuel oil transfer pump switch on DG gauge board.
- Lube oil pressure indicator PI 59-007A reading below recommended value

The inspector verified that PWOs were submitted to correct the above deficiencies. The inspector noted that oil was added to the governors of both engines while at idle speed as required by the procedure. This oil was verified to be the correct type. The operator performing the DG run and the system engineer appeared to be knowledgeable on the engine and the surveillance procedure. The test was completed without significant problems.

(3) The inspector observed selected portions of the calibration of Unit 1 containment particulate process monitor performed on January 10 and 11. The detector installed on January 10 was defective and had to be replaced. This calibration was a coordinated effort involving Chemistry and I&C. The calibration is performed by Chemistry under Chemistry Procedure 1-C-67, Rev 13. If high voltage adjustments are needed then I&C assistance is required to perform the task. The inspector found that the technicians performing this test were knowledgeable and followed procedural requirements.

(4) OP 2-0810050, Rev 20, "Main Steam/Feedwater Isolation Valves Periodic Test"

This is a quarterly surveillance test that partially closes each MSIV and FWIV to verify their operation. Since this is a high risk item, a prejob briefing is required prior to conducting this test.

The inspector attended the prejob briefing that was conducted in accordance with AP-0010020, "Conduct of Infrequently Performed Test and Evolutions," by the ANPS. The inspector found the briefing to be adequately detailed for the test. The inspector then accompanied personnel from the test group, I&C, Mechanical Maintenance, and Operations, into the field and observed the tests. The inspector noted that the NPS provided oversite in the field to ensure the test was conducted in a timely and safe manner. The test on MSIVs A and B were satisfactorily performed and they were returned to service. The tests on all MFIVs were satisfactorily performed but it was noted that hydraulic pressure on HCV-09-2A fell to approximately 3000 psig during dump test on this valve. This was because the HCV accumulators were improperly discharging during the dump test. The licensee determined that this did not affect component operability. However, PWO 64/3962 was issued to troubleshoot and repair this malfunction.

Overall this test was accomplished in a professional manner. The inspector was impressed with the supervision and direction provided by the NPS. When a problem was encountered he immediately assembled the technical assistance needed, verified equipment operability, and ensured the plant stayed in a safe condition. His detailed oversite of the test also identified procedural improvements that were needed.

(5) OP 2-0700050, Rev 36, "Auxiliary Feedwater Periodic Test"

The inspector observed the performance of this test on the 2C AFP, conducted January 13. The test followed significant work activities on the pump's trip/throttle valve and other associated MOVs and was performed as post-maintenance testing to establish pump operability. The inspector noted that the

pump started without incident and operated steadily. Additionally, the inspector noted the operator monitoring the test locally to have a current copy of the governing procedure in hand. Test equipment was verified to be properly calibrated. Upon completion of the test, the inspector verified that the pump's performance was in accordance with the applicable ASME Section XI requirements. The inspector found the test to be performed well.

(6) AP 2-0010125, Rev 52, "Schedule of Periodic Tests Checks and Calibrations"

The inspector accompanied a SNPO on a Unit 2 containment anomalies inspection, conducted per check sheet 4 of the subject procedure. The tour included a walkdown of radiologically accessible portions of containment. The inspector noted good HP support and control of the tour.

The inspection was successful in identifying boric acid deposits on two valves. No visible leakage was identified. Additionally, what appeared to be an approximately one drop/second packing leak was identified on a root valve in a B SG level instrument reference leg. Due to the elevations involved, positive identification of the valve could not be established. Following the inspection, Unit 2 control room personnel initiated PWOs to inspect the identified boron deposits during the next anomalies inspection. The ANPS stated that drawings were being reviewed to help identify the valve noted to be leaking.

The inspector found the SNPO to conduct a thorough inspection of accessible areas. The practice of periodic containment inspections continues to provide early identification of potential problems.

c. Predictive Maintenance (62703)

As part of the predictive maintenance program the licensee routinely monitors vibration on selected rotating equipment. On December 22, the motor vibration alarm actuated and locked in on 1A CEAMG. The predictive maintenance group reviewed their data and found that a step change had occurred in the 120 Hz vibration component since routine data had been collected on the previous day. A review of data by the predictive maintenance group determined that:

- The 120 hz vibration component had increased over a 24 hour period from 0.05 in/sec-pk to 0.37 in/sec-pk, measured at the motor horizontal probe locations.

- The overall vibration levels had increased over the same time interval from 0.20 in/sec-pk to 0.48 in/sec-pk measured at the motor horizontal probe location.

- An increase in the 120 hz vibration component was seen throughout the machine in the horizontal direction, but did not increase as much at the generator and flywheel bearings.

- Real-time diagnostics indicated that the 120 hz vibration signal was a narrow-band fairly steady component.

- The above data indicated a potential electrical anomaly in the power supply system or motor. Electrical maintenance was requested to collect voltage/amperage data and any other data that might assist in evaluating the electrical condition of the machine.

- Electrical maintenance found A and B phases to be carrying 158 amperes and phase C to be carrying 0 amperes. Post maintenance data found that each phase should normally be about 120 amperes. Further investigation found the C phase line connection to the breaker was discolored, cracked, and melted off. Repairs were completed under W/O 94031847 and the component was returned to service.

- After the repair, vibration readings returned to previous normal values.

The above indicates the ability of the licensee's predictive maintenance program to detect, evaluate, and repair plant problems before a failure. This is only one of several past examples that demonstrate the success of the licensees predictive maintenance program. The inspector has found that this program uses state of the art equipment and is staffed with very competent and motivated personnel who provide a very valuable and beneficial service to the plant. This program is considered a strength.

In conclusion, Maintenance/Surveillance activities continued to be conducted well during the period. One violation, involving a failure to perform an adequate independent verification during CVCS maintenance, was identified. The balance of maintenance activities were conducted well. Predictive Maintenance involvement in the identification of Unit 1 CEA MG wiring problems was considered a strength. Surveillances were conducted well.

5. Plant Support (71750)

a. Fire Protection

During the course of their normal tours, the inspectors routinely examined facets of the Fire Protection Program. The inspectors reviewed transient fire loads, flammable materials storage, housekeeping, control hazardous chemicals, ignition source/fire risk reduction efforts, fire protection training, fire protection system surveillance program, fire barriers, fire brigade qualifications, and QA reviews of the program. No deficiencies were identified.

b. Physical Protection

During this inspection, the inspector toured the protected area and noted that the perimeter fence was intact and not compromised by erosion or disrepair. The fence fabric was secured and barbed wire was angled as required by the licensee's Physical Security Plan (PSP). Isolation zones were maintained on both sides of the barrier and were free of objects which could shield or conceal an individual.

The inspector observed that personnel and packages entering the protected area were searched either by special purpose detectors or by a physical patdown for firearms, explosives, and contraband. The processing and escorting of visitors was observed. Vehicles were searched, escorted, and secured as described in the PSP. Lighting of the perimeter and of the protected area met the 0.2 foot-candle criteria.

In conclusion, selected functions and equipment of the security program were inspected and found to comply with the PSP requirements.

c. Radiological Protection Program

Radiation protection control activities were observed to verify that these activities were in conformance with the facility policies and procedures, and in compliance with regulatory requirements. These observations included:

- Entry to and exit from contaminated areas, including step-off pad conditions and disposal of contaminated clothing;
- Area postings and controls;
- Work activity within radiation, high radiation, and contaminated areas;
- Radiation Control Area (RCA) exiting practices; and,
- Proper wearing of personnel monitoring equipment, protective clothing, and respiratory equipment.

No violations or deviations were identified.

6. Exit Interview

The inspection scope and findings were summarized on February 3, 1995, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection results listed below. Proprietary material is not contained in this report. Dissenting comments were not received from the licensee; however, with respect to violation 95-01-02, the licensee stressed that the condition was licensee identified and that corrective actions were being aggressively pursued. With respect to hot leg stratification, the licensee stated that operator training has been augmented to include a

discussion of the issue and to stress the documentation of anomalous plant behavior.

Type	Item Number	Status	Description
VIO	50-335/95-01-01	Open	Failure to Perform TS-Required Sampling of the 1A1 SIT, paragraph 3.e.
VIO	50-389/95-01-02	Open	Failure to Follow Procedure 2-LOI-T-89, paragraph 4.a.(4).

X. Abbreviations, Acronyms, and Initialisms

AC	Alternating Current
AEOD	Analysis and Evaluation of Operational Data, Office for (NRC)
AFP	Auxiliary Feedwater Pump
ANPS	Assistant Nuclear Plant Supervisor
AP	Administrative Procedure
AS	Action Statement
ATTN	Attention
cc	Cubic Centimeter
CCW	Component Cooling Water
CE	Combustion Engineering (company)
CEAMG	Control Element Assembly Motor Generator
CFR	Code of Federal Regulations
CMM	Critical Maintenance Management
CVCS	Chemical & Volume Control System
DC	Direct Current
DG	Diesel Generator
DGFO	Diesel Generator Fuel Oil
DGFOS	Diesel Generator Fuel Oil System
DPR	Demonstration Power Reactor (A type of operating license)
EDG	Emergency Diesel Generator
ERDADS	Emergency Response Data Acquisition Display System
ESF	Engineered Safety Feature
FPL	The Florida Power & Light Company
FRG	Facility Review Group
FWIV	Feedwater Isolation Valve
HCV	Hydraulic Control Valve
HIC	Hand Indicating Controller
HP	Health Physics
HPSI	High Pressure Safety Injection (system)
Hz	Hertz (cycle per second)
I&C	Instrumentation and Control
IR	[NRC] Inspection Report
ISEG	Independent Safety Engineering Group
JPN	(Juno Beach) Nuclear Engineering
KW	KiloWatt(s)
LCO	TS Limiting Condition for Operation
LCV	Level Control Valve