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

Report No: 50-302/88-06

Licensee: Florida Power Corporation
3201 34th Street, South
St. Petersburg, FL 33733

Docket No: 50-302 License No: DPR-72

Facility Name: Crystal River 3

Inspection Conducted: February 12 - March 11, 1988

Inspectors: Marge Lewis (for) 4/5/88
T. Stetka, Senior Resident Inspector Date Signed

Marge Lewis (for) 4/5/88
J. Tedrow, Resident Inspector Date Signed

Marge Lewis (for) 4/5/88
P. Holmes-Ray, Senior Resident Inspector Date Signed

Approved by: 4/5/88
R. Crlenjak, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine inspection was conducted by three resident inspectors in the areas of plant operations, security, radiological controls, Licensee Event Reports and Nonconforming Operations Reports, facility modifications, and licensee action on previous inspection items. Numerous facility tours were conducted and facility operations observed. Some of these tours and observations were conducted on backshifts.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Alberdi, Assistant Director, Nuclear Plant Operations
*P. Breedlove, Nuclear Records Management Supervisor
*M. Clary, Principal Nuclear Mechanical Engineer
*G. Clymer, Manager, Nuclear Waste
*J. Colby, Manager, Nuclear Mechanical/Structural Engineering Services
*M. Collins, Nuclear Safety & Reliability Superintendent
*E. Ford, Licensing Specialist
*R. Fuller, Senior Nuclear Licensing Engineer
*D. Gulling, Nuclear Inservice Inspection Specialist
G. Halnon, Nuclear Operations Technical Advisor
*V. Hernandez, Senior Nuclear Quality Assurance Specialist
B. Hickle, Manager, Nuclear Plant Operations
*S. Johnson, Manager, Site Nuclear Services
*A. Kazemfar, Supervisor Radiological Support Services
*H. Koon, Assistant Nuclear Maintenance Superintendent
*G. Longhouser, Nuclear Security Superintendent
*W. Marshall, Nuclear Operations Superintendent
*P. McKee, Director, Nuclear Plant Operations
*S. Robinson, Nuclear Chemistry & Radiation Protection Superintendent
*V. Roppel, Manager, Nuclear Operations Maintenance & Outages
*M. Williams, Nuclear Regulatory Specialist
M. Wilson, Senior Nuclear Maintenance Specialist
*W. Worley, Nuclear Chemistry Supervisor

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry/radiation and corporate personnel.

*Attended exit interview

2. Exit Interview (30703)

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on March 11, 1988. During this meeting, the inspector summarized the scope and findings of the inspection as they are detailed in this report with particular emphasis on the *Unresolved Item and Inspector Followup Item (IFI).

The licensee representatives acknowledged the inspector's comments and did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

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*Unresolved items are matters about which more information is required to determined whether they are acceptable or may involve violations or deviations.

3. Licensee Action on Previously Identified Inspection Findings (92702 and 92701)

(Closed) IFI 302/87-40-05: Review the modification to the containment hydrogen monitoring system to replace drain piping with seismically qualified piping. The licensee has installed and the inspector has reviewed modification MAR 87-11-19-01 to add additional pipe supports to enable this system to meet seismic requirements.

4. Review of Plant Operations (71707)

The plant began this inspection period in power operation (Mode 1). On February 28, 1988, at approximately 11:49 a.m., a reactor trip occurred due to high Reactor Coolant System (RCS) pressure (see paragraph 7.a for details on the reactor trip). Following troubleshooting activities performed on the main feedwater and turbine trip systems, a plant startup was performed and the reactor was taken critical at 10:05 p.m. on March 2, followed by the resumption of power operation at 11:05 p.m. On March 7, the plant was taken off line to perform additional maintenance activities on the main feedwater system. These maintenance activities were completed on March 8 and power operation was resumed at 4:20 a.m. The plant remained in power operation for the remainder of this inspection period.

a. Shift Logs and Facility Records (71707)

The inspector reviewed records and discussed various entries with operations personnel to verify compliance with the Technical Specifications (TS) and the licensee's administrative procedures.

The following records were reviewed:

Shift Supervisor's Log; Reactor Operator's Log; Equipment Out-Of-Service Log; Shift Relief Checklist; Auxiliary Building Operator's Log; Active Clearance Log; Daily Operating Surveillance Log; Work Request Log; Short Term Instructions (STI); and Selected Chemistry/Radiation Protection Logs.

In addition to these record reviews, the inspector independently verified clearance order tagouts.

No violations or deviations were identified.

b. Facility Tours and Observations (71707)

Throughout the inspection period, facility tours were conducted to observe operations and maintenance activities in progress. Some operations and maintenance activity observations were conducted during backshifts. Also, during this inspection period, licensee meetings were attended by the inspector to observe planning and management activities.

The facility tours and observations encompassed the following areas: security perimeter fence; control room; emergency diesel generator room; auxiliary building; intermediate building; battery rooms; and, electrical switchgear rooms.

During these tours, the following observations were made:

(1) Monitoring Instrumentation - The following instrumentation and/or indications were observed to verify that indicated parameters were in accordance with the TS for the current operational mode:

Equipment operating status; area atmospheric and liquid radiation monitors; electrical system lineup; reactor operating parameters; and auxiliary equipment operating parameters.

No violations or deviations were identified.

(2) Safety Systems Walkdown (71710) - The inspector conducted a walkdown of the Decay Heat Closed Cycle Cooling (DC) system to verify that the lineup was in accordance with license requirements for system operability and that the system drawing and procedure correctly reflected "as-built" plant conditions.

No violations or deviations were identified.

(3) Shift Staffing (71707) - The inspector verified that operating shift staffing was in accordance with TS requirements and that control room operations were being conducted in an orderly and professional manner. In addition, the inspector observed shift turnovers on various occasions to verify the continuity of plant status, operational problems, and other pertinent plant information during these turnovers.

No violations or deviations were identified.

(4) Plant Housekeeping Conditions (71707) - Storage of materials 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.

(5) Radiological Protection Program (71709) - 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:

- Selected licensee conducted surveys;

- Entry 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.

Area postings were independently verified for accuracy by the inspector. The inspector also reviewed selected Radiation Work Permits (RWPs) to verify that the RWP was current and that the controls were adequate.

The implementation of the licensee's As Low As Reasonably Achievable (ALARA) program was reviewed to determine personnel involvement in the objectives and goals of the program.

No violations or deviations were identified.

(6) Security Control (71881) - In the course of the monthly activities, the inspector included a review of the licensee's physical security program. The composition of the security organization was checked to insure that the minimum number of guards were available and that security activities were conducted with proper supervision. The performance of various shifts of the security force were observed in the conduct of daily activities to include: protected and vital area access controls; searching of personnel, packages, and vehicles; badge issuance and retrieval; escorting of visitors; patrols; and compensatory posts. In addition, the inspector observed the operational status of Closed Circuit Television (CCTV) monitors, the Intrusion Detection system in the central and secondary alarm stations, protected area lighting, protected and vital area barrier integrity, and the security organization interface with operations and maintenance.

No violations or deviations were identified.

(7) Fire Protection (71707) - Fire protection activities, staffing and equipment were observed to verify that fire brigade staffing was appropriate and that fire alarms, extinguishing equipment, actuating controls, fire fighting equipment, emergency equipment, and fire barriers were operable.

No violations or deviations were identified.

(8) Surveillance (61726) - Surveillance tests were observed to verify that approved procedures were being used; qualified personnel were conducting the tests; tests were adequate to verify equipment operability; calibrated equipment was utilized; and TS requirements were followed.

The following tests were observed and/or data reviewed:

- SP-110, Reactor Protection System Functional Testing;

- SP-192, High Density Rack Poison Sampling,

- SP-317, RC System Water Inventory Balance;

- SP-340A, "A" Train ECCS Pump & Valve Operability;

- SP-358B, Operations ES Monthly Actuation Logic Functional Test #2;

- SP-433, In-Core Neutron Detectors Channel Check; and,

- PT-137, BSP-1A Alternate Seal Water Supply & Cyclone Separator Flow Adjustment.

No violations or deviations were identified.

(9) Maintenance Activities (62707) - The inspector observed maintenance activities to verify that correct equipment clearances were in effect; work requests and fire prevention work permits, as required, were issued and being followed; quality control personnel were available for inspection activities as required; and TS requirements were being followed.

Maintenance was observed and work packages were reviewed for the following maintenance activities:

- Troubleshooting of the control switch for valve FWV-31;

- Troubleshooting and repair of the Engineered Safeguards (ES) test status light for valve SWV-12 in accordance with procedures MP-531, Troubleshooting Plant Equipment, and SP-356, Operations ES Refueling Manual Actuation Channel Functional Test for RB Isolation and Cooling;

- Replacement and calibration of steam generator level transmitter SP-30-LT in accordance with procedures MP-531, SP-111, Valve Lineup Verification for Critical Instrumentation, and SP-193, EFIC Transmitters Channel Calibration;

- Troubleshooting of Reactor Protection System (RPS) Channel "D" high power and power/flow trips in accordance with procedures MP-531, and SP-110, Reactor Protective System Functional Testing; and,

- Disassembly and reassembly of main feedwater block valve FWV-29 in accordance with procedures MP-402, Maintenance of "Limitorque" Valve Controls, and SP-435, Valve Testing During Cold Shutdown.

No violations or deviations were identified.

(10) Pipe Hangers and Seismic Restraints (71707) - Several pipe hangers and seismic restraints (snubbers) on safety-related systems were observed to insure that: fluid levels were adequate and no leakage was evident, restraint settings were appropriate, and anchoring points were not binding.

No violations or deviations were identified.

5. Review of Licensee Event Reports (92700) and Nonconforming Operations Reports (71707)

a. Licensee Event Reports (LERs) were reviewed for potential generic impact, to detect trends, and to determine whether corrective actions appeared appropriate. Events, which were reported immediately, were reviewed as they occurred to determine if the TS were satisfied. LER 88-03 was reviewed in accordance with the current NRC Enforcement policy and will remain open.

(Open) LER 88-03: This LER reported that a surveillance procedure was not adequate to implement the 31 day containment integrity verification required by TS 4.6.1.1. During a quality programs audit, the licensee discovered that four manual containment isolation valves were not being verified closed every 31 days as required. The licensee maintains these valves in the locked closed position, and the valves have been documented to be in the correct position on a quarterly basis by a separate surveillance procedure. The licensee has subsequently revised procedure SP-341, Monthly Containment Integrity Check, to include the four valves so that they are documented as locked closed on a monthly basis. This matter is considered to be a licensee identified violation in which adequate corrective action was taken to prevent recurrence.

The licensee is also considering enhancements to their TS amendment review process to help prevent recurrence of this event. The LER will remain open pending completion of these enhancements.

b. The inspector reviewed Nonconforming Operations Reports (NCORs) to verify the following: TS are complied with, corrective actions as identified in the reports or during subsequent reviews have been accomplished or are being pursued for completion, generic items are identified and reported as required by 10 CFR Part 21, and items are reported as required by TS.

All NCORs were reviewed in accordance with the current NRC Enforcement Policy.

NCOR 88-37 reported that several safety related instruments and instruments used in TS surveillance procedures had exceeded the required calibration frequency. The licensee identified this problem through the use of a computerized preventive maintenance program (PM-200) which schedules instrument calibration due dates and identifies which instrumentation has exceeded the due date.

The licensee has performed a preliminary evaluation of this instrumentation and has determined that although some of these instruments are located in safety related systems, they do not perform a safety function. The licensee is presently performing a detailed evaluation of this event to determine the effect this instrumentation may have on safety system function and corrective action necessary to prevent recurrence. This item is considered to be unresolved pending the inspector's review of the licensee's completed detailed evaluation.

Unresolved Item (302/88-06-01): Review the licensee's detailed evaluation of the effect instrumentation which exceeded the required calibration frequency may have on safety system function.

6. Design, Design Changes and Modifications (37700)

Installation of new or modified systems were reviewed to verify that the changes were reviewed and approved in accordance with 10 CFR 50.59, that the changes were performed in accordance with technically adequate and approved procedures, that subsequent testing and test results met acceptance criteria or deviations were resolved in an acceptable manner, and that appropriate drawings and facility procedures were revised as necessary. This review included selected observations of modifications and/or testing in progress.

The inspector reviewed modification TMAR 86-03-04-07, Temporary Modification to Inverters-480 VAC Input, and observed the performance of functional test procedure TP#1 for this modification.

No violations or deviations were identified.

7. Nonroutine Event Followup (93702)

a. On February 28 at approximately 11:49 a.m., a reactor trip from approximately 55% power occurred due to high Reactor Coolant System (RCS) pressure. During a decrease in power, a feedwater transient occurred when the "B" main feedwater block valve (FWV-29) failed to close properly. Although this block valve indicated closed, actual valve position was approximately 17% open. The feedwater flow through this partially open valve generated a feedwater flow error signal in the Integrated Control System (ICS) which responded by closing the "B" side feedwater control valves to reduce feedwater flow. In an attempt to stop this feedwater transient, operators opened the feedwater crossover valve (FWV-28) to the "A" main feedwater train. This action resulted in the automatic full closure of valve FWV-29 and in conjunction with the already closed feedwater control valves, resulted in the underfeeding of the "B" steam generator and subsequent rapid increase in RCS temperature and pressure which was followed by the reactor trip.

During this event, the main turbine did not automatically trip as expected upon a reactor trip and attempts to manually trip the turbine from the control room were also unsuccessful. Control room operators opened the generator output breakers, shut the Main Steam Isolation Valves (MSIV) and dispatched an operator who locally tripped the main turbine. This action was effective in securing the main turbine and prevented an excessive plant cooldown.

The opening of the generator output breakers automatically closed the steam supply to the main feedwater pumps which secured feedwater flow to the steam generators. A low steam generator water level signal actuated the emergency feedwater system which supplied the necessary feedwater to stabilize plant conditions.

The root cause for this event was the failure of a yoke nut on the motor operator for valve FWV-29. This failure allowed the operator limit switches and indication to be offset from actual valve position. The failure of the main turbine to trip was due to a faulty trip solenoid. These failures were examined by the Region II Engineering Branch during a March 8-11, 1988 inspection, and will be detailed in NRC Inspection Report 50-302/88-08.

The inspector reviewed the licensee's post trip review and restart justification and also reviewed work packages associated with the replacement of the turbine trip solenoid and troubleshooting of valve FWV-29.

No violations or deviations were identified.

b. On March 1, 1988, prior to increasing reactor pressure to normal operating pressure, the Group 1 control rods were manually tripped from the main control board to prevent an automatic trip. After

clearing pressure limitations, an attempt to shut the Control Rod Drive (CRD) breakers was made. The "A" CRD breaker would not shut. Troubleshooting of this problem revealed a faulty relay in the CRD power supply. This relay was subsequently replaced and the breaker functionally tested satisfactory.

This event was similar to an event which occurred on July 2, 1987, discussed in NRC Inspection Report 50-302/87-17 (item IFI 302/87-17-03), in which the "B" CRD breaker could not be re-closed. Troubleshooting of the failure for this CRD breaker to close did not identify the failure mechanism for this problem because the failure mode could not be recreated.

The inspector discussed these two breaker failures with licensee personnel who agreed to review this matter to determine if similar or generic causes were involved.

Inspector Followup Item (302/88-06-02): Review the licensee's investigation into similar causes for failure of CRD breakers to re-close.