



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

Report No.: 50-302/85-37

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 Dates: August 17 - September 25, 1985

Inspection at Crystal River site near Crystal River, Florida

Inspector: T. F. Stetka, Senior Resident Inspector

10/25/85
Date Signed

Accompanying Personnel: J. E. Tedrow, Resident Inspector

Approved by: V. W. Pandiera, Chief, Project Section 2B,
Division of Reactor Projects

10/29/85
Date Signed

SUMMARY

Scope: This routine inspection involved 164 inspector-hours on site by two resident inspectors in the areas of plant operations, security, radiological controls, Licensee Event Reports and Nonconforming Operations Reports, Plant startup from modifications and refueling outage, special inspection of station battery spare cells, 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.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Alberdi, Manager, Site Nuclear Operations Technical Services
- *G. Boldt, Nuclear Plant Operations Manager
- *P. Breedlove, Nuclear Records Manager
- *R. Brown, Nuclear Electrical/I&C Supervisor
- *R. Clarke, Radiation Protection Manager
- *D. Green, Nuclear Licensing Specialist
- *V. Hernandez, Senior Quality Assurance Specialist
- E. Howard, Director, Site Nuclear Operations
- *M. Mann, Nuclear Compliance Specialist
- *P. McKee, Nuclear Plant Manager
- *V. Roppel, Nuclear Plant Engineering and Technical Services Manager
- *W. Rossfeld, Nuclear Compliance Manager
- *P. Skramstad, Nuclear Chemistry and Radiation Protection Superintendent
- *R. Wittman, Nuclear Operations Superintendent

Other personnel contacted included office, operations, engineering, maintenance, chem/rad and corporate personnel.

*Attended exit interview

2. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on September 25, 1985. 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 Items. 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 Inspection Items

(Closed) Inspector Followup Item (302/82-18-02): The licensee issued Revision 1 to LER 50-302/82-50 in which it was stated that the motor operators of the four valves in question (EFV-3, 4, 7, and 8) would be left electrically disconnected and that the valves would be locked in an open position. The operation of these valves is not necessary for proper operation of the emergency feedwater system.

(Closed) Inspector Followup Item (302/81-07-04): The licensee issued Revision 1 to LER 50-302/81-22 to identify the cause of the failure and to discuss the corrective actions taken to prevent recurrence. The failure was caused by an apparent flow imbalance across the Main Steam Isolation Valve (MSIV) due to a high differential pressure across the closed valve. To prevent recurrence of this failure, the licensee has installed bypass valves

around each of the MSIVs and slowed the opening time of the valve to assure adequate time for pressure equalization during opening.

(Open) Unresolved Item (302/85-33-02): The licensee has determined that valve FWV-158 was deleted by Emergency Feedwater Initiation and Control (EFIC) modification MAR 80-10-66-04. The inspector has reviewed this modification package and is satisfied with this determination. The licensee is planning to revise the feedwater system drawing FD-302-081 to delete this valve. This item will remain open pending the licensee's revision to the drawing.

(Open) Inspector Followup Item (302/85-04-03): The licensee replaced the original governor with a modified governor that will start controlling the turbine speed immediately upon opening of the steam emission valve. This governor, therefore, responds much faster than the original unit and will prevent turbine overspeed if the shaft is rotating prior to turbine start. During the past refueling outage, this governor was removed and replaced with the original governor because a NUREG-0737 plant modification to add a parallel steam emission valve (ASV-204) negated the use of the new governor. While the original steam emission valve (ASV-5) was replaced with a new valve and no steam leakage past either ASV-5 or ASV-204 presently exists, the possibility of leakage in the future is feasible. The licensee has issued a Field Problem Report (FPR) to investigate a new design that will allow use of the new governor with the current valve configuration.

(Closed) Inspector Followup Item (302/85-11-04): The licensee has repaired the packing leak on valve SFV-20. The inspector has reviewed the work package used to replace the packing on this valve and has no adverse findings.

(Closed) Inspector Followup Item (302/85-29-06): The licensee has reviewed the discrepancies identified in Modification (MAR) 82-09-22-01 and the corrective action taken by the licensee. The licensee has counseled the personnel involved who failed to adhere to procedure requirements, and has corrected the minor administrative mistakes made in the modification package. The licensee has also reviewed four associated MAR packages to determine if this problem was generic. After discussing of the evaluation with licensee representatives, the inspector concluded that this problem was not generic. This matter was reviewed in accordance with the current NRC enforcement policy and is considered to be a licensee identified violation in which appropriate corrective actions were taken to prevent recurrence.

(Open) Inspector Followup Item (302/84-29-02): Investigation of the relay failure problem by the licensee and the vendor that designed the system indicates that the failures may not be due to the Agastat relays. This conclusion is based upon the fact that the failures only occur on two of the four channels. As a result of this conclusion, the licensee is planning to install monitoring equipment on the affected channels with the hope that the cause of the failure can be identified. Based upon the results of this monitoring, appropriate corrective actions can be initiated.

(Closed) Inspector Followup Item (302/84-21-05): The licensee's investigation determined that the inadvertent isolation of the waste gas decay tank (WGDT) monitoring system was caused by an inadequacy in procedure CH-341, Sampling the Makeup Tank Gas Space. This procedure did not provide an adequate return to normal following system sampling. As a result, procedure CH-341 has been revised to assure an adequate return to normal.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. A new unresolved item is identified in paragraph 5.b.(6) of this report.

5. Review of Plant Operations

The plant started this inspection period in the hot standby mode (Mode 3). Deboration was begun and on August 18, 1985, at 6:27 a.m., the reactor was taken critical. The inspectors observed the approach to criticality and verified that required testing was completed, that technically adequate procedures were in use, and that criticality occurred within expected limits.

Following initial criticality and zero power physics testing, the plant began power operation (Mode 1) on August 19, at 10:40 p.m. On August 20, at 9:02 a.m., due to a rupture of a main turbine steam drain line, the main turbine was manually tripped causing an anticipatory reactor trip. Following drain line weld repairs, the reactor was restarted that same day at 6:44 p.m. only to experience another reactor trip due to a feedwater transient creating a high Reactor Coolant System pressure condition. (See paragraph 7 for further details of these two events.) After adjustments were made to the Integrated Control System (ICS) and repairs completed on the feedwater system, the reactor was restarted on August 21, at 5:30 a.m. Faulty repairs to the same main turbine steam drain line contributed to a second rupture of the line. Consequently, at 7:13 a.m., on August 22, the unit was shutdown to cold shutdown (Mode 5) to effect repairs to the steam drain line and replace the main turbine's governor valves.

The steam line ruptures are believed to be caused by the newly installed modified governor valves which were creating excess steam pipe vibrations.

On August 28, repairs to the main turbine were completed and reactor startup was commenced. At 2:30 a.m., the reactor was critical, but due to an erratic absolute position indication on a control rod, the reactor was shutdown to Mode 3 at 3:45 a.m. After the faulty rod position indication was repaired, the reactor was again taken critical at 5:40 a.m. and the

plant entered Mode 1 at 6:40 a.m. where it remained for the duration of this inspection period.

a. Shift Logs and Facility Records

The inspector reviewed records and discussed various entries with operations personnel to verify compliance with the Technical Specifications (TSs) 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 (STIs); 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

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; Electrical Switchgear Rooms; and Reactor Building.

During these tours, the following observations were made:

- (1) Monitoring Instrumentation - The following instrumentation was observed to verify that indicated parameters were in accordance with the TSs 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.

During these observations, the inspector reviewed operating procedure OP-103, Plant Curve Book, figure 7.10 to determine emergency diesel generator fuel oil storage tank levels. This table compares indicated level, measured in feet and inches, to equivalent volume, measured in gallons. The table's level column

in feet and inches, is designated as "Indicator"; however, the numbers actually reflect a "dipstick" reading. A note at the bottom of this procedure specifies that the indicated volume is a dipstick reading and that to obtain the tank volume using the tank level indicator, six inches must be added to the indicator reading. The inspector found this note confusing and, after discussions with plant personnel, determined that a procedure clarification was in order. The inspector noted that an appropriate resolution was to relabel the level column as "dipstick" in lieu of "indicator". This resolution was discussed with responsible licensee representatives who acknowledged the inspector's remarks and agreed to review OP-103 for appropriate revisions.

Inspector Followup Item (302-85-37-01): Review of licensee activities to revise OP-103 to clarify the level column in Figure 7.10.

- (2) Safety Systems Walkdown - The inspector conducted a walkdown of the emergency diesel generator system to verify that the lineup was in accordance with licensee requirements for system operability and that the system drawing and procedure correctly reflect "as-built" plant conditions.

No violations or deviations were identified.

- (3) Shift Staffing - 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 - 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.

- (5) Radiation Areas - Radiation Control Areas (RCAs) were observed to verify proper identification and implementation. These observations included selected licensee conducted surveys, review of step-off pad conditions, disposal of contaminated clothing, and area posting. Area postings were independently verified for accuracy through the use of the inspector's own radiation monitoring instrument. The inspector also reviewed selected radiation work permits and observed personnel use of protective

clothing, respirators, and personnel monitoring devices to assure that the licensee's radiation monitoring policies were being followed.

No violations or deviations were identified.

- (6) Security Control - Security controls were observed to verify that security barriers are intact, guard forces are on duty, and access to Protected Area (PA) is controlled in accordance with the facility security plan. Personnel within the PA were observed to verify proper display of badges and that personnel requiring escort were properly escorted. Personnel within vital areas were observed to ensure proper authorization for the area.

During a routine tour of the berm area, the inspector noticed that the security guard usually posted at the entrance to the Reactor Building Spray Additive Tank (BST-1) room was no longer stationed. This post had previously been stationed in response to a violation identified by the NRC in Inspection Report No. 50-302/84-23 (Item 302/84-23-01). Upon questioning licensee representatives, the inspector was informed that new compensatory measures to control access to this area, consisting of door modifications and a roving security guard were instituted. The inspector discussed his observations with NRC Region II Physical Security personnel. NRC Region II is presently evaluating the adequacy of these compensatory measures. In the interim, the licensee has re-established the security guard post at the BST-1 room. This matter remains unresolved pending completion of the NRC evaluation.

Unresolved Item (302/85-37-02): Determine the adequacy of compensatory measures taken by the licensee to control access to the BST-1 room.

- (7) Fire Protection - 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 - 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, as required, were utilized; and TS requirements were followed.

The following tests were observed and/or data reviewed:

- SP-110, Reactor Protective System Functional Testing;
- SP-112, Calibration of the Reactor Protection System;
- SP-113, Power Range Nuclear Instrumentation Calibration;
- SP-158, Meteorological Monitoring Instrumentation Calibration;
- SP-312, Heat Balance Calculations;
- SP-317, RC System Water Inventory Balance;
- SP-344, Nuclear Services Cooling System Operability;
- SP-349, Emergency Feedwater System Operability Demonstration;
- SP-401, Control Rod Programming Verification;
- SP-422, RC System Heatup and Cooldown;
- SP-425, Control Rod Drive Patch Panel Access Control;
- SP-520, Weekly Battery Check; and
- SP-702, Reactor Coolant and Decay Heat Daily Surveillance Program and associated procedure CH-101.

No violations or deviations were identified.

- (9) Maintenance Activities - 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 abnormal gearbox noise from Nuclear Services Closed Cycle Cooling Pump (SWP-1B) and pump alignment in accordance with maintenance procedures MP-509 and MP-123;
- Repacking of containment isolation valve CAV-7 in accordance with procedure MP-111;

- Repacking of spent fuel system valve SFV-20; and
- Troubleshooting of Reactor Coolant System Pressure Transmitter RC-3B-PT-1 in accordance with procedure MP-531.

No violations or deviations were identified.

- (10) Radioactive Waste Controls - Selected liquid releases and solid waste compacting were observed to verify that approved procedures were utilized, that appropriate release approvals were obtained, and that required surveys were taken.

No violations or deviations were identified.

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

No violations or deviations were identified.

6. Review of Licensee Event Reports and Nonconforming Operations Reports

- a. Licensee Event Reports (LERs) were reviewed for potential generic impact, to detect trends, and to determine whether corrected actions appeared appropriate. Events, which were reported immediately, were reviewed as they occurred to determine if the TSs were satisfied.

LERs 84-11, 85-04, 85-09, 85-10, 85-11, 85-12, 85-13, and 85-15 were reviewed in accordance with current NRC enforcement policy.

LERs 84-11, 85-09, 85-10, 85-12, 85-13, and 85-15 are closed.

LERs 85-04 and 85-11 remain open for the following reasons:

- (1) LER 85-04, which reported the improper installation of concrete anchor supports for the Control Complex Heating and Ventilation (HVAC) System, will remain open pending the inspector's review of the licensee's analysis of the remaining 34 deceit and deficient anchors to determine the adequacy of the supports as they exist.
- (2) LER 85-11 reported the failure to verify the operability of the cable tunnel sump pumps and remaining power source electrical lineup when the "A" Emergency Diesel Generator was out of service for maintenance as required by the TSs. The licensee's corrective actions include critiquing the event with operations personnel and implementation of appropriate procedure changes. This report will remain open pending completion of these corrective actions.

- b. The inspector reviewed Non-Conforming Operations Reports (NCORs) to verify the following: compliance with the TSs, 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 TSs.

All NCORs were reviewed in accordance with the current NRC enforcement policy.

NCORs 85-147, 85-160, and 85-184 reported excessive start times for the "A" Emergency Diesel Generator (EDG-3A). The licensee has replaced the EDG-3A governor and a fuel supply regulating relief valve (DFV-35) in an attempt to correct the slow starting time. These repairs were completed on August 15, and although the diesel testing has been satisfactory after those repairs, on September 13, another excessive start time occurred. The inspector discussed this with licensee representatives and expressed his concern that the intermittent problem of slow starting times for EDG-3A may not yet be corrected. The licensee is presently performing an evaluation of the excessive start time problem and of the adequacy of corrective action already taken on EDG-3A.

Inspector Followup Item (302/85-37-03): Review the licensee's evaluation of the excessive start times for EDG-3A and adequacy of corrective action.

- c. Licensee Special Reports were reviewed to ensure that the information is technically accurate, reporting requirements established in the TSs were satisfied, and corrective actions as identified in the reports have been accomplished or are being pursued for completion.

Special Reports 84-04, 84-05, and 85-03 were reviewed in accordance with current NRC enforcement policy and are closed.

The issue discussed in report 85-03, regarding the calibration of the intermediate and high range channels of radiation monitors RM-A1 and RM-A2, will continue to be tracked in accordance with NRC Inspector Followup Item (302/85-05-03).

7. Nonroutine Event Followup

- a. At 9:02 a.m. on August 20, 1985, a reactor trip occurred from 21% of full power due to a rupture of a 2-inch drain line on the main turbine high pressure crossover line. The operators tripped the main turbine to isolate the ruptured line which also resulted in an anticipatory reactor trip. Following repairs to the drain line, a reactor restart was attempted. However, at 6:44 p.m., the reactor tripped from approximately 20% power. This trip was caused by sluggish control of the feedwater control valves that resulted in excessive plant temperature and pressure oscillations with a subsequent automatic reactor trip on high reactor coolant system pressure.

The inspector reviewed the plant's parameters, conditions, and the licensee's post trip evaluation and has no further questions on the 9:02 a.m. trip. The inspector has not completed his review of the licensee's post trip evaluation for the 6:44 p.m. trip.

Inspector Followup Item (50-302/85-37-04); Review the licensee's post trip evaluation for the reactor trip which occurred at 6:44 p.m. on August 20, 1985.

- b. At 6:00 p.m., on August 30, the licensee declared an Unusual Event upon notification of a hurricane warning by the National Weather Service. The licensee closed watertight flood control doors and augmented the plant staff with additional operations and maintenance personnel.

The inspector arrived on site early the next morning and verified the status of the plant, availability of safety systems, compliance with the facility's TSs, and ensured that appropriate adverse weather procedures were being followed. The inspector periodically toured the facility checking the licensee's tracking of the path of the hurricane and that meteorological instrumentation was functioning properly and being monitored. The unusual event was exited on September 1, upon termination of the hurricane warning. The plant remained in the operating mode (Mode 1) for the duration of this event and no plant damage was sustained by the storm.

- c. At 4:59 a.m., on September 19, a Reactor Coolant System pressure transmitter (RC-3B-PT-1) failed high. This caused the "B" Reactor Protection System (RPC) channel to trip, the pressurizer spray valve RCV-14 to open, the pressurizer Power Operated Relief Valve (PORV) RCV-10 to open, and pressurizer heaters to turn off.

The tripping of only one RPS channel and prompt operator actions prevented a reactor trip. The operators shut the PORV block valve and spray valve, and placed the pressurizer heaters in manual to regain plant control.

The inspectors reviewed this event and noted that the plant experienced a pressure transient of approximately 90 psig and that no other plant abnormalities occurred. The inspectors have no further questions on this event.

8. Station Battery Spare Cell Storage

The inspector reviewed the licensee's storage and maintenance practices of station battery spare cells to determine if these activities were sufficient to ensure that these cells were available if needed to replace a station battery cell.

The licensee had six spare cells in storage. All cells were stored wet and four of the cells are connected to a battery charger. The licensee checks

the four cells connected to the battery charger on a weekly basis in accordance with surveillance procedure SP-520.

During this review, the inspector noted that the two unconnected cells were stored in their shipping boxes in the "A" battery room. Labels on these boxes read that the cells were due for charging by December 1983. Discussions with and subsequent research by plant personnel indicated that these cells had never been charged. As a result of this discussion, these two cells were discarded.

Review of the weekly data from SP-520 for the remaining four cells indicated that the cell voltages had degraded below the procedure required 2.15 volts to 2.06 volts though this voltage degradation was not reflected in the cell specific gravity results (they were within specification). Subsequent reviews of this data by supervisory plant personnel failed to identify the degraded conditions. It appears that this degradation occurred during the week of August 19 and continued until the data was reviewed by the inspector.

When notified of these conditions by the inspector, the licensee began an investigation. This investigation revealed that the spare cell battery charger voltage setting had been inadvertently lowered and that procedure SP-520 was inadequate to ensure that spare cell degraded conditions would be identified and corrected.

The licensee has reset the battery charger voltage to bring the spare cell voltage into specification and will revise procedure SP-520 to ensure that the spare cell condition will be adequately monitored.

Inspector Followup Item (302/85-37-05): Review the licensee's activities to correct spare cell voltages and to revise SP-520 to ensure that spare battery cells are properly monitored.