



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

Report No.: 50-302/93-31

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: December 4, 1993 thru January 7, 1994

Inspector: K. Landis 1/21/94
 for R. Butcher, Senior Resident Inspector Date Signed

Inspector: K. Landis 1/21/94
 for P. Holmes-Ray, Senior Resident Inspector Date Signed

Inspector: K. Landis 1/21/94
 for T. Cooper, Resident Inspector Date Signed

Inspector: K. Landis 1/21/94
 for A. Long, Project Engineer, Region II Date Signed

Approved by: Marvin V. Chukule for 1/21/94
 K. Landis, Section Chief Date Signed
 Division of Reactor Projects

SUMMARY

Scope:

This routine inspection was conducted by the resident inspectors in the areas of plant operations, radiological controls, security, surveillance observations, maintenance observations, and licensee event reports. Numerous facility tours were conducted and facility operations observed. Backshift inspections were conducted on 12/18 and 12/19.

Results:

Within the scope of this inspection, the inspectors determined that the licensee continued to demonstrate satisfactory performance to ensure safe plant operations.

During this inspection period, the inspectors had comments in the following Systematic Assessment of Licensee Performance functional areas:

Plant Operations:

The inspectors considered the parallel use and critique of the improved Technical Specifications for a trial period prior to actual implementation to be a strength.

Maintenance: (Surveillance)

The inspectors considered the December 27, 1993, loss of power event due to switchyard cable problems, similar to previous events, to be a weakness.

Engineering: (Technical Support)

The inspectors considered the identification and timely replacement of the make-up valve torque arms a strength.

The inspectors reviewed the following outstanding items:

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
LER 92-18	Closed	Safety Valve Test Results Lead to a Condition Prohibited by Technical Specifications. (paragraph 7.a)
LER 93-10	Closed	Failure to Assign Task Leads to Nonperformance of Surveillance Resulting in Entry into TS 3.0.3. (paragraph 7.b)
IFI 50-302/93-31-01	Open	Loss of Power Due to Inadequate Switchyard Maintenance. (paragraph 4.a)

REPORT DETAILS

1. Persons Contacted

Licensee Employees

J. Alberdi, Manager, Nuclear Plant Operations
G. Boldt, Vice President Nuclear Production
*R. Davis, Manager, Nuclear Plant Maintenance
G. Halnon, Manager, Nuclear Operations
*B. Hickie, Director, Nuclear Plant Operations
*D. Jones, Nuclear Shift Supervisor
*G. Longhouser, Security Superintendent
*W. Marshall, Nuclear Shift Manager
*M. McCown, Senior Quality Auditor
P. McKee, Director, Quality Programs
*R. McLaughlin, Nuclear Regulatory Specialist
*A. Miller, Senior Nuclear Scheduling Coordinator
*L. Moffatt, Manager Nuclear Plant Technical Support
*B. Moore, Manager, Nuclear Integrated Scheduling
W. Neuman, Supervisor, Inservice Inspection
*A. Petrowsky, Manager Nuclear Engineering Services (Acting)
W. Rossfeld, Manager, Site Nuclear Services
*J. Terry, Manager Nuclear Plant Systems Engineering
*R. Widell, Director, Nuclear Operations Site Support
*K. Wilson, Manager, Nuclear Licensing

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

NRC Resident Inspectors

*R. Butcher, Senior Resident Inspector
*T. Cooper, Resident Inspector

Other NRC Personnel on Site

M. Sinkule, Branch Chief, Division of Reactor Projects, RII
A. Long, Project Engineer, Division of Reactor Projects, RII

*Attended exit interview

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

2. Other NRC Inspections Performed During This Period

<u>REPORT NO.</u>	<u>Inspection Period</u>	<u>AREA INSPECTED</u>
50-302/93-16	12/6 thru 12/10 (Second half of inspection)	Emergency Operating Procedures
50-302/93-30	12/13 thru 12/17	Safeguards

3. Plant Status

At the beginning of this reporting period, Unit 3 was operating at 100% power and had been on line since September 20, 1993. Unit 3 operated at 100% power throughout this assessment period.

4. Plant Operations (71707 & 93702)

Throughout the inspection period, facility tours were conducted to observe operations and maintenance activities in progress. The tours included entries into the protected areas and the radiologically controlled areas of the plant. During these inspections, discussions were held with operators, health physics and instrument and controls technicians, mechanics, security personnel, engineers, supervisors, and plant management. Some operations and maintenance activity observations were conducted during backshifts. Licensee meetings were attended by the inspector to observe planning and management activities. The inspections confirmed FPC's compliance with 10 CFR, Technical Specifications, License Conditions, and Administrative Procedures.

a. Operational Events

- At 11:00 p.m. on December 14, 1993, the B ECCS system was taken out of service for a planned system outage. The system outage was scheduled to repair numerous leakage sites in the B decay heat pit area from both the DH and BS systems. Additionally, scheduled PMS on the BS, DH, DC, RW and DO systems were performed. The System Manager issued a safety benefits determination letter to the Manager, Nuclear Plant Operations, as required by AI-255, Systems Outage Scheduling and Implementation. The major benefit to be gained from performing these activities on-line during a system outage was to improve system reliability and reduce shutdown risk on all systems. Radiological and housekeeping benefits also resulted through the reduction of leakage from contaminated systems. The System Manager verified that the PRA did not identify any additional concerns on entering the outage.

The applicable TS action statements all required restoration within 72 hours and were satisfied as follows:

<u>TS</u>	<u>Component</u>	<u>Entry Date/Time</u>	<u>Exit Date/Time</u>
3.5.2	DHP-1B/ DHP-111	12-14/11:00 p.m.	12-17/12:00 p.m.
3.7.4.2	RWP-3B	12-14/11:00 p.m.	12-16/5:00 a.m.
3.6.2.1	BSP-1B	12-14/11:00 p.m.	12-17/12:00 p.m.
3.7.4.1	RWP-2B/ DOV-377	12-14/11:00 p.m.	12-15/3:10 p.m.

The inspectors attended the post-outage debriefing for this evolution. Even though the outage went as expected, feedback was presented, with discussions on improvements that could be realized

in future outages. The inspectors will continue to monitor system outages, including the implementation of these planned improvements.

- By letter dated December 20, 1993, the NRC approved the improved TS for the Crystal River nuclear plant. The licensee had 120 days to implement the improved TS, with implementation scheduled for approximately March 1994. In order to ensure familiarization with the improved TS and provide for a smooth transition, the licensee issued night orders (NO# 93-073) to the operating crews directing that the operators maintain an unofficial log of experience using the improved TS in parallel with the existing TS. Operators are to provide references to LCOs, conditions, required actions and completion times that would apply under the improved TS. Also, any comments, questions, or other information is to be provided to permit critique of the usage of the improved TS prior to implementation. The inspectors discussed this issue with operations personnel and they considered their previous training and this parallel use period would prepare them for the eventual switch over to the improved TS. The inspectors considered the parallel use and reference to the improved TS for a trial period prior to actual implementation a strength.

- On December 27, 1993, at approximately 8:15 a.m. the control room received annunciators indicating the loss of the 230 kV south bus feed. The 230 kV north and south buses each provide power to the offsite power transformer (which is normally aligned to the A 4160 V ES bus) and the backup ES transformer (which is normally aligned to the B 4160 V ES bus). The loss of the south 230 kV bus left the A and B 4160 ES busses still powered from the north 230 kV bus. The nonvital in house loads, also are normally powered from the 230 Kv bus via the startup transformer. The operators placed all in house loads powered from the 230 kV bus, except for the ES busses, on the auxiliary transformer. The ES busses are backed up by the EDGs and were not transferred. Problem Report PR93-0278 was initiated to document this event.

The licensee's investigation indicated that breaker 1695, the connecting breaker from Unit 2 to the south 230 kV bus, tripped first resulting in the subsequent tripping of all breakers from the south 230 kV bus. Unit 2 was in the process of a startup when breaker 1695 failed.

The Nuclear Plant Systems Engineering group performed a root cause investigation for the failure of breaker 1695. The root cause analysis for the failure of breaker 1695 indicated that air pressure was lost, which resulted in the C phase of the feeder to Unit 2 from breaker 1695 showing approximately 7000 amps for 3 to 4 seconds. Since breaker 1695 was already open in preparation for startup when the trip signal for breaker 1695 was sensed and current through the C phase of breaker 1695 continued to flow, the breaker 1695 failure circuitry initiated trips to clear the

surrounding zone. The protective relaying functioned as designed to strip the south bus since breaker 1695 was unable to clear the fault. Visual inspection of the interrupter heads upon removal showed that the arcing contacts were damaged and the interior of the head had ionized. It could not be determined whether the breaker drifted shut or that an arc-over occurred due to contaminated air inside the interrupter head. The breakers do have an interlock with low air pressure in both the close and trip circuitry to prevent operation when insufficient pressure is available. In either case, the root problem is that air pressure was lost to breaker 1695. The GE ATB-7 style circuit breakers require air to operate in either direction and are known for seal leakage in the open position. The leakage rate is aggravated by cold weather. Breaker 1695 was identified as leaking by licensee personnel, however repairs were not accomplished due to the proximity of Unit 2 start-up. Prior to start-up, breaker 1695 was maintained in the closed position to enhance the seal system with the disconnects open. When the breaker was realigned for start-up it remained in the open position long enough to lose all air pressure. Also, all the 230 kV switchyard compressors were de-energized during the start-up period due to the faulted power supply cable which failed at around 6:00 a.m. that morning. The emergency power supply could not handle the instant restart of all the loads so additional time without air pressure occurred while the loads were started individually. The emergency power supply to the compressors remained in service until the normal supply cable was repaired. The faulty normal supply cable was found submerged in water, within its conduit run, most likely from the March, 1993 storm. The normal supply cable had just been installed during the previous Unit 1 outage (less than 1 year) and had several nicks and light bends.

One of the initiating causes for this loss of power event was the degradation of equipment due to poor preventive maintenance practices, in that the normal power supply cable to the 230 kV switchyard air compressors showed evidence of damage (i.e. several nicks and tight bends) and was submerged in water. The emergency power supply could not handle the instant restart of all the loads so additional time without air pressure occurred while the loads were manually started individually.

This loss of power due to degraded equipment and inadequate preventive maintenance was similar to a previous event, where the power was lost due to saltwater immersion of degraded switchyard power control cables (Reference LER 93-02).

The licensee's immediate corrective actions included the following:

- The south 230 kV bus was restored to normal operation;
- The normal power supply cable to the air compressor for the 230 kV switchyard was replaced; and

- The interrupter head for the C phase of breaker 1695 was replaced.

Other corrective actions being considered are as follows:

- Relocation of the backup/emergency power supply to the 230 kV switchyard air compressors from Unit 4; and
- A feasibility study to add air accumulators on the individual breakers to act as an emergency backup air supply.

The inspectors considered the loss of power event due to switchyard cable problems similar to previous events to be a weakness. The licensee's corrective actions will be followed by the resident inspectors as Inspector Followup Item 50-302/93-31-01, Loss of Power Due to Inadequate Switchyard Maintenance.

b. 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;
- RCA exiting practices; and
- Proper wearing of personnel monitoring equipment, protective clothing, and respiratory equipment.

The implementation of radiological controls observed during this inspection period were proper and conservative.

c. Security Control

In the course of the monthly activities, the inspector included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities to include: protected and vital areas 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 protected area lighting, protected and vital areas barrier integrity, and the security organization interface with operations and maintenance. No performance discrepancies were identified by the inspectors.

d. 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.

Violations or deviations were not identified.

5. Surveillance Observations (61726)

The inspectors observed TS required surveillance testing and verified that the test procedures conformed to the requirements of the TSs; testing was performed in accordance with adequate procedures; test instrumentation was calibrated; limiting conditions for operation were met; test results met acceptance criteria requirements and were reviewed by personnel other than the individual directing the test; deficiencies were identified, as appropriate, and were properly reviewed and resolved by management personnel; and system restoration was adequate. For completed tests, the inspectors verified testing frequencies were met and tests were performed by qualified individuals.

The inspectors witnessed/reviewed portions of the following test activities:

- SP-130, Engineered Safeguards Monthly Functional Test;
- SP-169C, Decay Heat Removal/Building Spray Instrumentation;
- SP-332, Monthly Steam Line and Feedwater Isolation Functional Test;
- SP-340F, MUP-1C and Valve Surveillance; and
- SP-353, Control Room Emergency Ventilation System and RM-A5 Monthly Test.

The inspectors determined that the above testing activities were performed in a satisfactory manner and met the requirements of the TSs.

Violations or deviations were not identified.

6. Maintenance Observations (62703)

Station maintenance activities of safety-related systems and components were observed and reviewed to ascertain they were conducted in accordance with approved procedures, regulatory guides, industry codes and standards, and in conformance with the TSs.

The following items were considered during this review, as appropriate: LCOs were met while components or systems were removed from service; approvals were obtained prior to initiating work; activities were accomplished using approved procedures and were inspected as applicable; procedures used were adequate to control the activity; troubleshooting activities were controlled and repair records accurately reflected the maintenance performed; functional testing and/or calibrations were performed prior to returning components or systems to service; QC

records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were properly implemented; QC hold points were established and observed where required; fire prevention controls were implemented; outside contractor force activities were controlled in accordance with the approved QA program; and housekeeping was actively pursued.

The inspectors witnessed/reviewed portions of the following maintenance activities in progress:

- WR NU 0271210 Calibrate Control Rod Drive Cooling unit discharge pressure switch, SW-91-PI.
- WR NU 0273949 Repair body to bonnet leak on valve DHV-7.
- WR NU 0315137 Replace the torque bar (anti-rotation device) on the valve actuator for MUV-024.

In NRC IR 50-302/93-24, paragraph 5.b discussed the issue of HPI valves MUV-23, 24, 25 & 26 having been identified as having torque arms (anti-rotation devices) that were theoretically inadequate. The licensee obtained replacement torque arms rated to carry the larger thrust ratings and installed the new torque arms the week of January 3, 1994. The inspectors witnessed the installation of the new torque arm on MUV-24. The licensee's identification of this issue and the timely replacement of the MUV torque arms was considered a strength.

For those maintenance activities observed, the inspectors determined that the activities were conducted in a satisfactory manner and that the work was properly performed in accordance with approved maintenance work orders.

Violations or deviations were not identified.

7. Onsite Followup and In-Office Review of Written Reports of Nonroutine Events and 10 CFR Part 21 Reviews (90712/90713/92700)

The Licensee Event Reports and/or 10 CFR Part 21 Reports discussed below were reviewed. The inspectors verified that reporting requirements had been met, root cause analysis was performed, corrective actions appeared appropriate, and generic applicability had been considered. Additionally, the inspectors verified the licensee had reviewed each event, corrective actions were implemented, responsibility for corrective actions not fully completed was clearly assigned, safety questions had been evaluated and resolved, and violations of regulations or TS conditions had been identified. When applicable, the criteria of 10 CFR Part 2, Appendix C, were applied.

- a. (Closed) LER 92-18: Safety Valve Test Results Lead to a Condition Prohibited by Technical Specifications.

This LER reported an event where a delay in the performance of the required testing of a removed pressurizer code safety valve, until after the resumption of power operations, led to a failure to meet TS requirements when the valve did not meet the required pressure lift setpoint. The companion valve was not tested, at that point, as required by the TS.

The inspector verified that the licensee completed the corrective actions for the LER; specifically the removal and testing of the code safety valves during the mid-cycle outage and the development of a guideline to assure that the requirements of the ASME code are met. The licensee developed a policy that both companion code safety valves will be removed and tested prior to restart from an outage. The inspector reviewed the changes to the standard procurement documents and the work planning standards for the task and determined that sufficient guidance has been developed to meet the LER corrective action. This LER is closed.

- b. (Closed) LER 93-10: Failure to Assign Task Leads to Nonperformance of Surveillance Resulting in Entry into TS 3.0.3.

This event was discussed in NRC IR 50-302/93-28 and NCV 50-302/93-28-01 was issued. The corrective actions have been completed and no further action is considered necessary. This LER is closed.

Violations or deviations were not identified.

8. Exit Interview

The inspection scope and findings were summarized on January 7, 1993, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
LER 92-18	Closed	Safety Valve Test Results Lead to a Condition Prohibited by Technical Specifications. (paragraph 7.a)
LER 93-10	Closed	Failure to Assign Task Leads to Nonperformance of Surveillance Resulting in Entry into TS 3.0.3. (paragraph 7.b)
IFI 50-302/93-31-01	Open	Loss of Power Due to Inadequate Switchyard Maintenance. (paragraph 4.a)

9. Acronyms and Abbreviations

AI	- Administrative Instruction
a.m.	- ante meridiem
amps	- amperes
ASME	- American Society of Mechanical Engineers
BS	- Building Spray
BSP	- Building Spray Pump
CFR	- Code of Federal Regulations
DC	- Decay Heat Closed Cycle Cooling
DH	- Decay Heat
DHP	- Decay Heat Pump
DHV	- Decay Heat Valve
DO	- Domestic Water
DOV	- Domestic Water Valve
ECCS	- Emergency Core Cooling System(s)
EDG	- Emergency Diesel Generators
ES	- Engineered Safeguards
FPC	- Florida Power Corporation
HPI	- High Pressure Injection
IR	- Inspection Report
kV	- kilovolt
LCO	- Limiting Condition for Operation
LER	- Licensee Event Report
MUP	- Make-up Pump
MUV	- Make-up Valve
NO	- Night Order
NCV	- Non-cited Violation
NRC	- Nuclear Regulatory Commission
p.m.	- post meridiem
PM	- Preventive Maintenance
PR	- Problem Report
QA	- Quality Assurance
QC	- Quality Control
RCA	- Radiation Control Area
RM	- Radiation Monitor
RW	- Raw Water
SP	- Surveillance Procedure
TS	- Technical Specification
V	- Volt
WR	- Work Request