



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

Report No.: 50-302/94-03

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: January 8 through February 4, 1994

Inspector: Ross Butcher 3/1/94  
R. Butcher, Senior Resident Inspector Date Signed

Inspector: Ross Butcher for 3/1/94  
T. Cooper, Resident Inspector Date Signed

Inspector: Ross Butcher for 3/1/94  
R. Freudenberger, Senior Resident Inspector Date Signed

Inspector: A. Long for 3/1/94  
A. Long, Project Engineer, RII Date Signed

Approved by: K. Landis for 3/1/94  
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, licensee event reports, 10 CFR Part 21 reports, self-assessments, and licensee action on previous inspection items. Numerous facility tours were conducted and facility operations observed. Backshift inspections were conducted on January 14, 15, 16, 18, 31, February 1 and 2.

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 failure to assure proper fill and vent of the fuel oil system on the A emergency diesel generator led to a failure during the initial start attempt following maintenance, due to personnel error. This is considered a weakness. (paragraph 4.a)

Management overview of operator simulator training is considered a strength. (paragraph 4.a)

Operator performance included good coordination between other organizations during surveillances and system outages. (paragraph 4.a)

Maintenance: (Surveillance)

The failure to conduct an adequate post maintenance walkdown and cleanup prior to releasing the emergency diesel generator for an operability test following the A emergency diesel generator outage is considered a weakness. (paragraph 4.a)

The failure to incorporate recommended preventive maintenance on the main feedwater pump governor resulted in a plant trip in December 1992, and is considered a weakness. (paragraph 7.b)

Engineering: (Technical Support)

The licensee's prompt response and action plan to the 10 CFR 21 report regarding emergency diesel generator distributor cam problems is considered a strength. (paragraph 7.b)

The system outages continue to be well planned and coordinated. The post-outage critiques are useful to incorporate lessons learned into future planned system outages. (paragraph 4.a)

Plant Support: (Radiation Controls, Emergency Preparedness, Security, Chemistry, Fire Protection, Fitness for Duty, and Housekeeping Controls)

Housekeeping appears to be erratic. Although overall housekeeping has improved, there are areas of cleanup which later appear to be cluttered.

The inspectors reviewed the following outstanding items:

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
VIO 50-302/92-16-01	Closed	Inadequate procedure results in isolation of residual heat removal system. (paragraph 8.a)
VIO 50-302/92-25-02	Closed	Failure to drain RCP lube oil collection tanks prior to exceeding 10 CFR 50, Appendix R requirement. (paragraph 8.b)
VIO 50-302/92-27-01	Closed	Failure to Follow Procedure Results in Valve Misalignment and Reactor Building Spray. (paragraph 8.c)
URI 50-302/92-18-03	Closed	Evaluation of fire pump diesel engines inspection requirements for implementation of vendor recommendations. (paragraph 8.d)
URI 50-302/92-25-03	Closed	Target Rock Valve Maintenance (paragraph 8.e)
LER 92-04	Closed	Emergency Feedwater Block Valves Fail to Close Due to Degraded Valve Condition and Inadequate Motor Operator Capabilities. (paragraph 7.a)
LER 92-27	Closed	Binding of Main Feedwater Pump Control Actuator Results in Feedwater Flow Reduction, Emergency Feedwater Actuation, and Reactor Trip due to High Reactor Coolant System Pressure. (paragraph 7.b)
10 CFR 21 Report	-	10 CFR 21 Report From COLTEC Industries Regarding Air Start Distributor Cam Problems in Fairbanks Morse Emergency Diesel Generators. (paragraph 7.b)

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

J. Alberdi, Manager, Nuclear Plant Operations  
\*S. Balliet, Supervisor, Site Nuclear Engineering Services  
G. Boldt, Vice President Nuclear Production  
\*W. Brewer, Supervisor, Nuclear Plant Technical Support  
\*R. Davis, Manager, Nuclear Plant Maintenance  
\*G. Halnon, Manager, Nuclear Plant Operations  
B. Hickie, Director, Nuclear Plant Operations  
\*S. Johnson, Manager, Nuclear Chemistry and Radiation Protection  
W. Marshall, Nuclear Shift Manager  
P. McKee, Director, Quality Programs  
\*R. McLaughlin, Nuclear Regulatory Specialist  
\*B. Moore, Manager, Nuclear Integrated Scheduling  
W. Neuman, Supervisor, Inservice Inspection  
V. Roppel, Nuclear Engineering Services Supervisor  
W. Rossfeld, Manager, Site Nuclear Services  
\*R. Widell, Director, Nuclear Operations Site Support  
\*G. Wilson, Nuclear Shift Manager  
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

H. Berkow, Director, Project Directorate II-2, NRR  
H. Silver, Sr. Project Manager, Project Directorate II-2-2  
R. Crouteau, Project Manager, Project Directorate II-2-2  
\*R. Freudenberger, Sr. Resident Inspector, Catawba Site  
A. Long, Project Engineer, Region II

\*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>
N/A	1/11 - 13/94	Site Visit by NRR Personnel to Gather Environmental Qualification Information
50-302/94-01	1/18 - 21/94	Emergency Preparedness Drill

50-302/94-04	1/31 - 2/11/94 (first week)	Implementation of Surveillance Program for Improved TS
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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 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. Operations

- On January 10, 1994, at 11:00 p.m. the A EDG was taken out of service to accommodate a system outage to upgrade and replace various instrumentation that was obsolete or non-functional. This outage was also used to correct system fuel and air leaks. The inspectors attended pre-outage briefings where the overall scope of work to be accomplished, a system outage work flow chart, material availability, and work coordination were discussed. The inspectors reviewed the outage justification report which is required by AI-255, System Outage Scheduling and Implementation. A determination was made by the licensee that a safety benefit would result from the proposed outage.

The applicable TS action statement (3.8.1.1.b) requires that with one EDG inoperable, the operability of the remaining AC sources be demonstrated by performing surveillance requirement 4.8.1.1.1.a within one hour and at least once per eight hours thereafter; and by performing surveillance requirement 4.8.1.1.2.a.4 within twenty-four hours. Further, it requires that the licensee restore two EDGs to operable status within seventy-two hours or be in hot standby within the next six hours and cold shutdown within the following thirty hours. The inspectors verified the TS requirements were satisfied. The A EDG was returned to service at 2:30 p.m. on January 12, 1994.

The inspectors followed the outage activities and considered the A EDG outage to be well planned and coordinated. The licensee's

incorporation of lessons learned from previous system outages (i.e., incorporating an outage work flow chart) helped achieve a shorter outage than previously scheduled.

The inspectors performed a post maintenance walkdown of the A EDG prior to the conduct of the surveillance to prove operability and found plastic sheeting, old rags and empty or near empty oil drums still in the EDG rooms. This lack of housekeeping following maintenance while ready to return the EDG to operation is considered a weakness. The inspectors notified the shift manager, who was touring the control building, of their observations and he immediately initiated clean up efforts.

On January 12, 1994, the inspectors witnessed the attempt to restart the EDG following the system outage. On the first attempt, the A EDG failed to start. During the outage, maintenance had changed the fuel oil filters, but operations failed to fill and vent the fuel oil system prior to the start attempt, leading to the start failure. This was not considered a valid failure of the EDG because it resulted from personnel error following the system outage. The failure to verify proper fill and vent of the fuel oil system prior to the start attempt is a weakness.

- On January 20, 1994, the inspectors observed the licensee's annual emergency exercise, in the TSC and the EOF. The inspectors considered the licensee's actions technically sound and professionally implemented. The inspectors attended the post-emergency exercise critique and considered the licensee's critique comments to be appropriate and comprehensive. (See NRC IR 50-302/94-01 for details.)
- The inspectors witnessed operator training on the simulator and observed several EOP scenarios being performed. Following several days of simulator training, any areas noted as possibly requiring more detailed discussion were noted and the areas were discussed in detail to enhance the operators knowledge. The inspectors noted that operations management was at the simulator periodically to monitor the training program. This management overview of operator simulator training is considered a strength.
- On February 1, 1994, at 3:00 a.m. the A emergency feedwater train was removed from service for a system outage. The primary reason for this system outage was that an oil sample taken from EFP-1 as part of the preventive maintenance program indicated that an oil change was required. Other maintenance tasks to be performed and the major work consisted of the following:
  - Verify and adjust (if necessary) the mechanical interlock on EFV-14;
  - Inspect, refurbish and change lubricant on EFV-2;



- Verify and adjust (if necessary) mechanical interlock on EFV-33;
- Calibrate and functionally test relays on EFP-1;
- Disassemble and repair seat leak on EFV-2;
- Calibrate EF-17-PS; and
- Reinstall indicator light on electrical box EF-4.

TS 3.7.1.2, action a., requires that with one emergency feedwater pump and/or associated flow path inoperable, restore the inoperable system to operable status within 72 hours or be in hot shutdown within the next 12 hours. The TS action statement was satisfied as follows:

<u>TS</u>	<u>Component</u>	<u>Entry date/time</u>	<u>Exit date/time</u>
3.7.1.2	EFP-1	2-1-94/ 3:00 a.m.	2-1-94/ 5:30 p.m.

The inspectors attended the pre-outage briefings, accompanied the outage manager on a pre-outage walkdown and reviewed the licensee's determination of a safety benefit for an on-line system outage. This safety benefit determination is required by AI-25b, System Outage Scheduling and Implementation. As noted above, the licensee's primary justification for this on-line system outage was due to the results from the latest oil sample from EFP-1 indicating an oil change was required. Due to problems obtaining isolation of EFV-2, this valve work was dropped from the system outage.

The inspectors witnessed the post-maintenance performance of SP-349A, EFP-1 and Valve Surveillance. Vibrational analysis showed no anomalies and the pump was well within normal range. In observing the surveillance, the inspector noted good coordination between Operations, Maintenance, and Scheduling, as well as involvement of the System Engineer in the testing process. The inspector attended the post-outage critique on February 4, 1994.

#### 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; practice drills 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-100, Reactor Protection System Functional Testing (Channel A);



- SP-101, Moderator Temperature Coefficient Determination at 300 ppm Boron;
- SP-113, Power Range Nuclear Instrumentation Calibration;
- SP-120B ATWS - AMSAC Functional Test;
- SP-349, EFP-1 and Valve Surveillance; and
- SP-354A Monthly Functional Test of the Emergency Diesel Generator EGDG-1A.

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 NU0301992, Perform MAR 86-08-04-01B, Install New Thermowells and Temperature Switches on EGDG-1A;
- WR NU0316326, Clean and Inspect EGV-56 and EGV-57, Replace Rubber Tubes;
- WR NU0309915, Change Thermal Overloads in Starters for EGM-1A;
- WR NU0316760, Relocate Underwater Limit Switches to Above Water per MAR 92-10-02-01;

- WR NU0300213, Replace [Fuel Handling System] Hydraulic Cylinders and New Flexible Hoses; and
- AI-605A, Predictive Maintenance Program - Pump Vibration and Oil Sampling on SWP-2A Due to an Unexplained Increase in Vibration, and MUP-1B monitoring.

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 or other applicable procedural controls.

The following items were considered noteworthy:

- Although vibration levels on MUP-1B were well within acceptable range, Component Engineering conducted a special test to gain an increased understanding of alignment and thermal expansion effects on rotating equipment. The inspectors witnessed activities in progress to collect pump vibration data with the pump in normal operation, and discussed test objectives and methodology with the component engineers. Additional data will be collected and analyzed from cold startup through the attainment of thermal equilibrium between the pump and the associated welded piping. This testing is part of overall efforts to become more proactive in improving system reliability through effective predictive maintenance. The pump will remain operable throughout the test.
- A Fuel Handling system outage, performed in preparation for the upcoming refueling outage, included approximately twenty WRs or surveillances. Also included in the outage were modification initiatives to improve system reliability, such as raising the fuel handling limit switches above water level so that future maintenance would not require the use of divers. The inspectors witnessed portions of the diving activities to relocate the underwater limit switches and remove a fuel handling system hydraulic cylinder.

Overall, the maintenance activities observed by the inspectors were well planned and coordinated, and demonstrated an increasingly proactive approach to improving system reliability.

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 92-04: Emergency Feedwater Block Valves Fail to Close Due to Degraded Valve Condition and Inadequate Motor Operator Capabilities.

The inspector verified the modifications of the EFW block valves, completed under MARs 92-04-02-01, 92-04-02-02 and 92-04-2-04. The inspector also verified that industry experience had been factored into calculations used to determine MOV thrust requirements. In addition, modifications to enhance MOV reliability were evaluated, and one additional valve was modified. This LER is closed.

- b. (Closed) LER 92-27: Binding of Main Feedwater Pump Control Actuator Results in Feedwater Flow Reduction, Emergency Feedwater Actuation, and Reactor Trip due to High Reactor Coolant System Pressure.

On December 29, 1992, the unit was operating at full power. At 4:16 a.m., the plant tripped due to high reactor coolant system pressure caused by inadequate main feedwater flow to the B OTSG. Binding of the B main feedwater pump turbine governor caused the pump speed to decrease, resulting in a reduction of main feedwater flow to the B OTSG. Reactor coolant system pressure increased to the high pressure trip setpoint due to inadequate primary-to-secondary heat transfer.

The licensee engineering evaluation of the cause of the failure was detailed and identified the root cause. The cause of this event was inadequate preventive maintenance of the turbine governor. Normal wear combined with dirt and foreign material in the control oil led to internal binding of the turbine governor. Also, the governor linkage was binding due to hard grease and paint in linkage joints. A reliability centered maintenance evaluation of the feedwater system, performed in 1991, had identified the absence of preventive maintenance to rebuild the governor; however, this activity had not been added to the preventive maintenance program at the time of the trip. The failure to incorporate recommended preventive maintenance activities to prevent a recurring problem is considered a weakness.

The inspector reviewed the LER, licensee corrective actions, the manufacturer failure analysis and corrective actions including the establishment of preventive maintenance activities to periodically replace the main feedwater pumps' governors and rebuild the governor linkage on a six year frequency. Also, the inspector reviewed preventive maintenance activities to clean portions of

the lube oil system on a two year frequency. The main feedwater pump turbine oil system filter elements were upgraded to 3 micron filters to provide cleaner oil to extend the life of governor components. The manufacturer specified 10 to 15 micron filters for the governor control oil system. The inspector verified that the above improvements to the main feedwater pump preventive maintenance program had been incorporated into the Maintenance Activity Control System. This LER is closed.

- c. On January 10, 1994, COLTEC Industries, Fairbanks Morse Engine Division of Beloit, Wisconsin, made a 10 CFR Part 21 notification due to a problem with an air start distributor cam used in emergency diesel generators. Fairbanks Morse was notified by Virginia Power that a cracked cam was found during a normal maintenance activity.

The cams were manufactured by Fairbanks Morse as part of the original engine orders. The nature of the defect is cracking due to stress risers resulting from arc marking of the cam. Growth of the crack is by intergranular stress corrosion until a critical size is met. When the critical size is met, high hoop stress loading occurs and cracking results to relieve the stress. The discovery date was April 19, 1993, and the evaluation completion date was January 7, 1994.

Some cams had been manufactured using the arc marking technique. This marking, coupled with a higher bolt torque due to shaft taper resulted in the high hoop stress. The method of the marking was changed in the past to scribing the data on the cam. Units shipped before 1979 are suspect. Fairbanks Morse considers that a substantial safety hazard exists, as cracking could result in a shift in the air distributor timing, thus causing a start failure.

Fairbanks Morse strongly suggested that the sites referenced in the Part 21 report inspect the air start distributor cam as soon as practical. If the cam is arc marked the owners should penetrant test the cam and regardless of its condition obtain a new cam.

Among the affected sites referenced in the Part 21 report was the Crystal River Nuclear Plant. The resident inspectors ensured the licensee was notified of the Part 21 report. The licensee followed up on the Part 21 report and developed inspection/replacement guidelines for the upcoming refueling outage scheduled to start April 8, 1994.

Per the instructions for air start distributor cam inspections issued by Coltec Industries, the following is an outline for planned inspections on each air start distributor cam for EDG-1A and EDG-1B.

**EDG-1A:**

During the 9R Outage, inspections will be performed on EDG-1A, which include both the refuel inspections and the 4-1/2 to 5 year inspections. Included in the 4-1/2 to 5 year inspections is the refurbishment of the air start distributor. Disassembly of the air start distributor is required, and it is at this time the cam will be inspected and dye-penetrant tested for cracks. If the cam is arc marked (for identification), or found in unsatisfactory condition, it will be replaced.

**EDG-1B:**

EDG-1B is scheduled for minor work and routine calibrations during the 9R Outage. WR 316881 has been generated to address the 10 CFR Part 21 notification on the air start distributor cam issue, and Systems Engineering is recommending this inspection/refurbishment be performed in the 9R Outage. This work package will perform refurbishment of the air start distributor (as performed on EDG-1A) as well as the cam inspections.

EDG-1B was scheduled for refuel and 4-1/2 to 5 year inspections during the 10R Outage. Refurbishment of the air start distributor during the 9R Outage would eliminate the need to perform this work in the 10R Outage (the time interval, 4-1/2 to 5 years, for this particular activity will begin when EDG-1B is returned to service).

The inspectors will follow the licensee's inspection activities during the refueling outage. The licensee's prompt response and action plan to the 10 CFR Part 21 notification was commendable and is considered a strength.

Violations or deviations were not identified.

8. Followup on Items of Noncompliance (92702)

A review was conducted of the following noncompliances to assure that corrective actions were adequately implemented and resulted in conformance with regulatory requirements. Verification of corrective action was achieved through record reviews, observation, and discussions with licensee personnel. Licensee correspondence was evaluated to ensure the responses were timely and corrective actions were implemented within the time periods specified in the reply.

- a. (Closed) Violation 50-302/92-16-01: Inadequate procedure results in isolation of residual heat removal system.

On June 27, 1992, CR-3 was in mode 5 (Cold Shutdown) with the A train of DHR in service. The plant had been shut down since April 30, 1992, for a scheduled refueling outage. Fuel had been recently reloaded into the reactor vessel. I&C technicians were



recalibrating one of the RCS pressure instrument strings. The recalibration was necessitated by a recently completed plant modification. When the buffer amplifier module was removed, one of the valves in the RCS dropline closed. This isolated the suction of the operating DHR pump from the RCS. The pump was turned off to protect it. Cooling water flow to the reactor core was interrupted for approximately ten minutes while power to the instrument string was recovered. The valve was reopened and the pump was restarted. A report was made to the NRC in accordance with 10 CFR 50.72.

The root cause of this event was an inadequate surveillance procedure, SP-132, Engineered Safeguards Channel Calibration, Revision 29. The procedure authorized removal of the ES Channel 1 buffer amplifier module without requiring the automatic closure and interlock channel to be placed in bypass or providing information that the action directed by the procedure would result in automatic closure of the decay heat removal isolation valve.

The licensee's reply to the Notice of Violation, dated September 30, 1992, and LER 92-12 indicated that an evaluation of the human performance aspects of the personnel error involved would be performed. Also, enhanced training would be provided for operators and instrument and controls technicians to reinforce their cognizance of the power interlock between the ES channel and the automatic closure interlock for the decay heat isolation valves.

The inspector reviewed revision 30 of SP-132, Engineered Safeguards Channel Calibration. Appropriate procedure steps and caution statements were included in the revision to address the issue.

The inspector reviewed the human performance evaluation, noting that a recommended action to reinforce work stoppage and notification of a supervisor when procedure guidance is questioned was accomplished through internal communication within the instrument and controls organization.

The inspector also reviewed relevant portions of lesson plans 08-35 and 08-35B, Nuclear Technical Support Technician, Engineered Safeguards System, Initial and Continuing Training; ROT-4-54, Replacement Operator Training, Decay Heat Removal System; and 08-934, Fourth Quarter Special Training for Technical Support Technicians, to verify that the power interlock between the ES channel and the automatic closure interlock for the decay heat isolation valves was included in the training of operators and I&C technicians. This item is closed.

- b. (Closed) Violation 50-302/92-25-02: Failure to drain RCP lube oil collection tanks prior to exceeding 10 CFR 50, Appendix R requirement.



On October 4, 1992, during the performance of surveillance procedure SP-300, Operating Daily Surveillance Log, an operator identified that the level of the RCP lube oil collection tanks was at 14%, as indicated by level indicator LO-48-LI. This exceeded the maximum allowable level of 12%. The purpose of the RCP lube oil collection tanks is to collect the potentially flammable contents of the RCP lube oil systems, assuming a common mode failure of all four of the RCP lube oil systems, to meet 10 CFR 50, Appendix R requirements.

Prior to the draining of the RCP lube oil collection tanks on October 4, the SP-300 logs indicated that the indicated level of the tanks increased from 10% to 14% over a twenty four hour period from the morning of October 3 to the morning of October 4. This rate of increase was substantially faster than normal, but consistent with a decrease in intake water temperature and realignment of cooling water systems in service to the reactor building.

The safety significance of failing to maintain the required free volume in the RCP lube oil collection tanks is extremely minimal based on the short time frame of the condition and the remote probability of the simultaneous failure of all four of the RCP lube oil systems. However, the inspectors were concerned about the repetitive nature of this issue, the apparent lack of attention to detail on the part of plant operators to identify the unusual rate in the trend of the RCP lube oil collection tanks level and therefore exceeding the procedural limits.

The licensee's reply to the Notice of Violation described corrective actions including an Operations Study Book Entry to inform operations personnel of the event and the need for prompt action to drain the RCP lube oil collection tanks prior to exceeding administrative requirements. The use of hand held electronic computer for SP-300 data logging and rewording of the SP-300 log requirements were implemented to improve operations personnel awareness of actions required. The inspector verified that the hand held computers were in use and reviewed revision 123 of SP-300, Operating Daily Surveillance Log, which incorporated the changes mentioned above.

Additionally, the inspector noted that plant conditions which contributed to the higher than normal rate of increase in the RCP lube oil collection tank level were addressed by the licensee's reply to the notice of violation. The feedwater leak inside the reactor building was repaired and the modification to control cooling water temperature were installed during the Mid-Cycle 9 Outage. The inspector verified that no further instances of exceeding the RCP lube oil collection tank level requirement had occurred by a review of LERs issued since LER 92-22, Inadequate Lube Oil Collection Tank Reserve Capacity due to Personnel Error Results in Operation Outside Appendix R Design Bases. This issue is closed.

- c. (Closed) Violation 50-302/92-27-01: Failure to Follow Procedure Results in Valve Misalignment and Reactor Building Spray.

On October 15, 1992, with the unit at full power and a quarterly surveillance run of the A building spray pump in progress, a valve misalignment resulted in the discharge of borated water into the reactor building. Inspector review of the circumstances of the event concluded that the root cause was licensed operator error.

NRC Inspection Report 50-302/92-27 included assessment of licensee immediate actions in response to the event and the development of the action plan.

The inspector reviewed the licensee's reply to the Notice of Violation, dated January 20, 1993; Problem Report 92-0144, Introduction of Borated Water to the Reactor Building Atmosphere; revisions to Surveillance Procedures SP-340B, DHP-1A, BSP-1A and Valve Surveillance, and SP-340E, DHP-1B, BSP-1B and Valve Surveillance; and improvements to the pre-job briefing checklist included in AI-500 Conduct of Operations.

The root cause of the event was licensed operator error in that the operator involved did not use proper self-checking techniques while performing the surveillance. Training on self-checking for operators was performed during the first requalification training cycle in 1993 in accordance with lesson plan ROT 6-5, Self-Checking. In addition, the affected operator provided summary presentations of lessons learned to approximately 60 operations personnel. This violation is closed.

- d. (Closed) Unresolved Item 50-302/92-18-03: Evaluation of fire pump diesel engines inspection requirements for implementation of vendor recommendations.

The issue identified by the inspector involved the implementation of vendor recommendations for inspection of the fire pump diesel engines on a five year frequency. Although a five year inspection was performed in 1991, it appeared to include no more than the annual inspection.

Since the unresolved item was opened, TS requirements for the inspection of the fire pump diesel engine were deleted and moved to the Fire Protection Plan. Table 6.2b of the Fire Protection Plan now addresses the inspection of the fire pump diesel engine. It requires inspections in accordance with manufacturer recommendations for the type of service.

In conjunction with the manufacturer, Cumins Engine Company, the licensee's systems engineering department developed a preventive maintenance/inspection program with activities to be performed on two year and four year frequencies. The inspector reviewed the

planned maintenance schedule. It was judged appropriate for the standby service of the fire pump diesel engine.

Final incorporation of the planned maintenance schedule for the fire pump diesel engine into a plant procedure had not been completed at the time of the inspection. The licensee had established an action item (NOTES 20446A) to incorporate the planned maintenance schedule into a Preventive Maintenance procedure by August of 1994, prior to the next planned performance of the preventive maintenance activities. This item is closed.

e. (Closed) Unresolved Item 50-302/92-25-03: Target Rock Valve Maintenance

This Unresolved Item included two issues related to maintenance performed on Target Rock solenoid valves installed in the Emergency Feedwater System.

The first issue (part 1 of the Unresolved Item) involved the evaluation of the incorporation of vendor information into appropriate maintenance procedures. The licensee performed an evaluation of why the details for installing the cover bolts were not incorporated into applicable maintenance procedures. The evaluation determined that since the valve cover was not part of the equipment qualification moisture boundary, the review of the vendor technical information considered screw tightening of the covers to be journeyman skills; therefore, details regarding the installation of the cover bolts were not needed in the procedures. Based on the conditions of the cover installation identified, the licensee chose to add additional guidance to the procedures.

The second issue (part 2 of the Unresolved Item) was the resolution of the poor quality of workmanship on the valves. Maintenance procedures MP-199A, Target Rock Valve Maintenance (Electrical/Solenoid Assembly) Model 82 G Modulating Valve, and MP-199D, Target Rock Valve Maintenance Model 80K and 81VV Valves Direct Acting Normally Closed Solenoid Valves, were revised to include proper tightening of the valve cover bolts. Inspector review of the procedures indicated that appropriate directions and signoffs were noted.

The inspector reviewed Problem Report 92-0133, EFV-55 and EFV-56 Found with Missing Lockwashers and Loose Nuts. The problem report corrective action plan included corrective action, in addition to actions mentioned above, to provide training to instrument shop personnel on the proper use of fasteners. This training was completed in January of 1993. The inspector observed the condition of the subject valves. No discrepancies were identified. This item is closed.

Violations or deviations were not identified.

## 9. Self Assessment (40500)

The licensee routinely performs Quality Program audits of plant activities as required under its QA program or as requested by management. To assess the effectiveness of these licensee audits, the inspectors examined the status, scope, findings and recommendations of the following audit report:

<u>REPORT NO.</u>	<u>TITLE</u>	<u>NO. OF FINDINGS</u>	<u>NO. OF RECOMMENDATIONS</u>
93-11-INPL	Inspections, Tests and Special Processes	two	twelve

No additional NRC followup will be taken on the findings referenced above because they were identified by the licensee's audit program and corrective actions have either been completed or are currently underway. Problem Reports were initiated on the findings and plant management is aware of the findings.

Violations or deviations were not identified.

## 10. Exit Interview

The inspection scope and findings were summarized on February 4, 1994, 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>
VIO 50-302/92-16-01	Closed	Inadequate procedure results in isolation of residual heat removal system. (paragraph 8.a)
VIO 50-302/92-25-02	Closed	Failure to drain RCP lube oil collection tanks prior to exceeding 10 CFR 50, Appendix R requirement. (paragraph 8.b)
VIO 50-302/92-27-01	Closed	Failure to Follow Procedure Results in Valve Misalignment and Reactor Building Spray. (paragraph 8.c)
URI 50-302/92-18-03	Closed	Evaluation of fire pump diesel engines inspection requirements for implementation of vendor recommendations. (paragraph 8.d)

URI 50-302/92-25-03	Closed	Target Rock Valve Maintenance (paragraph 8.e)
LER 92-04	Closed	Emergency Feedwater Block Valves Fail to Close Due to Degraded Valve Condition and Inadequate Motor Operator Capabilities. (paragraph 7.a)
LER 92-27	Closed	Binding of Main Feedwater Pump Control Actuator Results in Feedwater Flow Reduction, Emergency Feedwater Actuation, and Reactor Trip due to High Reactor Coolant System Pressure. (paragraph 7.b)
10 CFR 21 Report	-	10 CFR 21 Report From COLTEC Industries Regarding Air Start Distributor Cam Problems in Fairbanks Morse Emergency Diesel Generators. (paragraph 7.b)

## 14. Acronyms and Abbreviations

AI	- Administrative Instruction
AMSAC	- ATWS (Anticipated Transient Without Scram) mitigating system actuation circuitry
a.m.	- ante meridiem
ATWS	- Anticipated Transient Without Scram
BSP	- Building Spray Pump
CFR	- Code of Federal Regulations
DHK	- Decay Heat Removal
dP	- differential pressure
DHP	- Decay Heat Pump
EDG	- Emergency Diesel Generators
EF	- Emergency Feedwater
EFP	- Emergency Feedwater Pump
EFV	- Emergency Feedwater Valve
EOF	- Emergency Operating Facility
EOP	- Emergency Operating Procedure
ES	- Engineered Safeguards
FPC	- Florida Power Corporation
I&C	- Instrumentation and Control
IR	- Inspection Report
LCO	- Limiting Condition for Operation
LER	- Licensee Event Report
MAR	- Modification Approval Record
MOV	- Motor Operated Valve
MUP	- Make-up Pump
NOTES	- Nuclear Operations Tracking & Expediting Systems
NRC	- Nuclear Regulatory Commission
NRR	- Office of Nuclear Reactor Regulation
OTSG	- Once Through Steam Generator
p.m.	- post meridiem
ppm	- parts per million
psid	- pounds per square inch differential
QA	- Quality Assurance
QC	- Quality Control
RCA	- Radiation Control Area
RCP	- Reactor Coolant Pump
RCS	- Reactor Coolant System
ROT	- Replacement Operator Training
SP	- Surveillance Procedure
SWP	- Service Water Pump
TS	- Technical Specification
TSC	- Technical Support Center
URI	- Unresolved Item
VIO	- Violation
WR	- Work Request