U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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Licensee:	Florida Power Corporation
Facility:	Crystal River 3 Nuclear Station
Location:	15760 West Power Line Street Crystal River, FL 34428-6708
Dates:	October 25 through December 5, 1998
Inspectors:	S. Cahill, Senior Resident Inspector S. Sanchez, Resident Inspector B. Crowley, Reactor Inspector (Sections M1.3, M8.2, M8.3) L. Hayes, Physical Security Specialist (Sections S8.1, S8.2)
Approved by:	L. Wert, Chief, Projects Branch 3 Division of Reactor Projects

Enclosure 2

EXECUTIVE SUMMARY

Crystal River 3 Nuclear Station
NRC Integrated Inspection Report 50-302/98-10

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a six-week period of resident inspection; in addition, it includes the results of announced inspections by a regional reactor maintenance inspector and a Physical Security Specialist.

Operations

- Operator knowledge and documentation of the causes and compensatory actions for disabled alarms was inconsistent. Disabled alarms were not receiving the expected maintenance high priority because a performance indicator meant to prioritize disabled control room alarm repairs had significantly fewer items than the disabled alarm log. The licensee subsequently assigned an accountable operations manager, reconciled the performance indicator discrepancies, and prioritized and scheduled the alarm deficiencies (Section O1.1).

- A non-licensed building operator demonstrated a detailed awareness of plant and equipment conditions during shift rounds by frequently looking at floors for undetected leaks prior to entering an area, questioning any plant and equipment conditions that appeared different from previous rounds, and promptly initiating actions to correct identified deficiencies (Section O1.2).

- The complete revision to the clearance and tagging process was a significant effort and improvement. The separation of danger tags into a stand-alone procedure provided a clear emphasis on personnel and equipment safety. The process developed for other tag types was indicative of extensive multi-disciplined review and detailed analysis of specific licensee tagging needs. The inspectors concluded that the new processes thoroughly resolved problems with the previous tagging system (Sections O1.3 and O8.1).

- The revision to the tagging process was mostly methodically implemented. Implementation of red danger tags was performed very well. The scope of use for danger tags, test tags, and personal danger tags met the intent and requirements of the new licensee procedures. However, numerous inconsistencies were noted with the use of caution tags (Section O1.3).

- A detailed walkdown of the emergency feedwater system concluded that the condition of the system was very good. No significant findings were identified but maintenance of the emergency feedwater pump sump was poor and post-job verification of proper painting activities was not routinely occurring (Section O2.1).

- A Violation (VIO 50-302/98-10-01) was identified for four examples of emergency feedwater and decay heat removal system valves that, contrary to Improved Technical Specification Surveillance Requirements, were not locked or sealed in position and were not periodically verified in the correct position. A licensee extent of condition review identified 27 additional examples in various systems, indicating deficiencies in

understanding and documentation of compliance with the surveillance requirements (Section O2.2).

Maintenance

- Work on the turbine-driven emergency feed pump for a planned outage was performed professionally and Engineering support was constant and valuable. Although the planned out of service schedule was met, opportunities to reduce the unavailability time of the pump were not utilized. The pump was removed from service several hours before work began and opportunities to compress a lightly loaded schedule were not pursued. A plan for a scheduled troubleshooting activity had not been developed, resulting in a four-hour delay (Section M1.2).

- PM and surveillance activities were performed and documented in a quality manner. Procedures were in place and were being conscientiously followed by qualified maintenance personnel. Interface between maintenance and operations personnel was effective. Applicable FME controls, M&TE controls, and QC hold points were being accomplished in accordance with requirements. Although the licensee required extensions of PMs to be adequately supported, there was no measure in place to trend how well PM frequencies were being maintained (Section M1.3).

- A licensee identified Non-Cited Violation (NCV 50-302/98-10-02) was identified for failure to perform pressure testing on Class III components as required by American Society of Mechanical Engineers (ASME) Code Section XI (Section M8.1).

Engineering

- A licensee identified Non-Cited Violation (NCV 50-302/98-10-03) was identified for failure to evaluate before repair, in accordance with ASME Code Section XI, several components and piping in the Nuclear Services and Decay Heat Seawater system (Section E8.1).

Plant Support

- Poor coordination between plant work groups resulted in incomplete resolution of several previously identified Health Physics issues involving reactor coolant pump seal injection filter replacement. The problem was identified during a pre-job briefing (Section R7.1).

Report Details

Summary of Plant Status

The plant began the inspection period at full rated thermal power and remained at that level throughout the report period except for several short term reductions to 85% for waterbox and intake cleaning, in response to an influx of schooling fish from November 25 through 28, 1998.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707 the inspectors performed routine reviews of plant operations which included shift turnovers, operator log reviews, disabled alarm controls, clearance tag verifications, planning meetings, Plant Review Committee activities, and system walkdowns. Notable observations are discussed in the following paragraphs.

While reviewing controls for disabled annunciators, the inspectors questioned operators on the cause of specific annunciator problems and the need for any contingency actions. The inspectors observed that operators were always aware of which alarms were disabled but often not why they were disabled or if any contingency actions were necessary. The process for disabling of annunciators did not require documentation of details justifying a decision to remove an alarm or why compensatory actions were or were not needed in the Disabled Alarm Log. Operators were able to correctly postulate why no compensatory actions were needed in response to the inspectors' questions, but were not routinely questioning these aspects during shift turnovers. The inspectors also observed that it was difficult for operators to determine the reason an alarm was disabled because the Disabled Annunciator Log in the main control room was inconsistently completed in that component identification numbers were often used in the field for "reason for removal from service." The inspectors also identified that a maintenance performance indicator for disabled control room alarms did not agree with the disabled alarm log. Approximately 22 alarm points were listed in the disabled alarm log whereas the performance indicator listed only eight, of which only four were also listed in the log. Consequently, disabled alarms were not receiving the management attention and maintenance prioritization expected by the licensee for control room problems. The licensee subsequently assigned an accountable operations manager, reconciled the performance indicator discrepancies, and prioritized and scheduled the alarm deficiencies.

O1.2 Operator Rounds (71707)

The inspector accompanied a non-licensed auxiliary building operator during swing shift rounds. The inspector observed the operator frequently looking at floors prior to entering an area to avoid stepping in unknown or undetected puddles of water. The operator questioned any plant or equipment conditions that appeared different from previous rounds. When a problem was identified, the operator promptly initiated actions to correct the deficiency. The inspector concluded that the non-licensed building

operator demonstrated a detailed awareness of plant and equipment conditions during shift rounds.

O1.3 Revised Clearance Process and Implementation

a. Inspection Scope (71707, 92901)

The inspector reviewed the licensee's new clearance and tagging processes in detail and verified implementation of the processes by auditing selected tags hanging in the plant and reviewing corrective action databases for implementation problems.

b. Observations and Findings

On September 21, 1998, the licensee canceled the previous single tagging procedure and implemented two entirely new and separate clearance tagging procedures, Compliance Procedure (CP) 115A, Operations Danger Tagouts, and CP-115B, Personal Danger Tags, Caution Tags and Test Tags. The inspector's review focused on the adequacy of the new process and the licensee's implementation plan.

The inspector determined the decision to separate the red tag safety clearance process in a new stand-alone procedure was very appropriate. CP-115A provided a clear emphasis on personnel and equipment safety with red tags. This addressed previous problems with the use of red tags for status control and uses other than safety. The inspector also observed that licensee procedures made it clear to default to use of red tags when any potential existed for personnel or equipment safety concerns. The inspector did not identify any problems with implementation of red tags. The licensee's corrective action system and procedure comment database did not contain any notable problems associated with implementing the new process. The inspector consequently determined that implementation of CP-115A was performed very well.

The inspector noted that the expectations and requirements for use of the other tags in CP-115B reflected the extensive multi-disciplined review the tagging process received. Personal Danger Tags (PDT) were designed primarily for non-power block maintenance, such as office building renovations, to reduce the involvement of Operations personnel. A second function was for testing and troubleshooting, such as testing of motor-operated valves. The inspector observed that most PDT were used for the former function and the testing and troubleshooting feature was rarely used. PDT were assigned to a small list of maintenance and test supervision with a demonstrated need for them. They contained a picture of the assigned individual and had very restrictive and conservative requirements on the extent and duration of use. The inspector did not identify any concerns with PDT implementation.

Test Tags (TT) were used to annotate that maintenance, testing, or modification work was in progress. They replaced the licensee's former blue tags and modification tags and as such could also be used to convey that control of a component was potentially transferred to a group other than Operations. The inspector did not identify any problems with the scope of use for TT and observed a clear focus on maintaining configuration control of plant equipment. Some implementation problems were

observed regarding TT that were approved without a work package present to be reviewed by the Work Control Supervisor. The licensee corrected this practice by reemphasizing management expectations and the requirements of CP-115B. The inspector also noticed that the TT index log was inconsistent and vague, making it difficult to determine specific tagged components potentially transferred to control outside of Operations. The inspector also noted that there was no requirement to audit or consolidate the TT or PDT logs and they were getting large and disorganized as a result. However, the Caution Tag log was required to be audited and consolidated every three months. The licensee was evaluating corrective actions to address these deficiencies.

Caution Tags (CT) were used to convey operational guidance or restrictions prior to operating a component. CP-115B had a very closely defined scope for their use and the inspector identified that they were primarily used within those requirements. However, the inspector identified several discrepancies while sampling CT implementation, prompting the performance of a complete verification of open CT. The inspector identified that several CT were on malfunctioning components that did not also have a maintenance deficiency tag as required by CP-115B. Cross references to a maintenance work request or corrective action system item were not required or routinely used so it was difficult to determine the reason for the CT amplifying instructions and what would ultimately fix the problem. As a result, personnel were often unable to determine the reason for a CT in response to inspector questions. This lack of cross-reference also resulted in no link to remove a CT after a problem was fixed. The inspector identified one example where a maintenance activity had corrected the need for the CT, but the CT was still hanging. The inspector also noted that there was no duration limit for CT, so tags could hang indefinitely. The inspector identified several tags that appeared semi-permanent, with no action in progress to correct the problem. CT were also used liberally. There were 101 active CT as of November 17. The open CT total trend was upward due to the lack of resolution for current CT. The inspector observed that the licensee had not established expectations for the amount of CT or for timely resolution of CT. The inspector also identified numerous discrepancies with tags hanging in the plant. Outdoor tags were not weatherproof and one CT was found blank due to the ink bleaching from the sun while others were found with the amplifying information sticker peeling off. Numerous examples were found where tag fields for date or time hung and authorization signatures were blank or incorrect and amplifying information differed from that recorded in the CT Log. Several examples of incomplete or useless CT amplifying instructions were also identified. For example, one CT stated that a permissive plaque was wrong but did not provide any information or guidance as to what was wrong or what action to take. The inspector noted that minimal (half of one page) guidance was provided for CT in CP-115B.

In response to the aforementioned CT concerns, the licensee initiated an item in their corrective action system to resolve the amount of needed guidance. A complete CT audit was performed on November 21 and 22, 1998. The audit corrected the specific deficiencies as well as others identified by the licensee. The inspector determined that no violations or deviations of NRC requirements were identified.

The inspector also noted that as part of their implementation plan, the licensee had scheduled an audit by the Nuclear Quality Assessments (NQA) organization for three months after implementation and a self-assessment for early 1999 which had not been initiated yet and would likely have identified many of the observed problems.

c. Conclusions

The complete revision to the clearance and tagging process was a significant effort and improvement. The separation of danger tags into a stand-alone procedure provided a clear emphasis on personnel and equipment safety. The process developed for other tag types was indicative of extensive multi-disciplined review and detailed analysis of specific licensee tagging needs. The inspectors concluded that the new processes thoroughly resolved problems with the previous tagging system.

The revision to the tagging process was mostly methodically implemented. Implementation of CP-115A for red danger tags was performed very well. The scope of use for danger tags, test tags, and personal danger tags met the intent and requirements of the new licensee procedures. However, numerous inconsistencies were noted with the use of caution tags.

O2 Operational Status of Facilities and Equipment

O2.1 Emergency Feedwater Detailed System Walkdown

a. Inspection Scope (71707)

The inspectors completed a detailed walkdown of the Emergency Feedwater (EF) and support systems versus licensee lineup requirements. Initial results of the walkdown on the EF fluid portion of the system were previously discussed in Inspection Report 50-302/98-09. Maintenance and corrective action backlogs were reviewed and compliance with Improved Technical Specification (ITS) requirements was verified.

b. Observations and Findings

The inspectors identified minor discrepancies between the flow prints and the field installation for support systems (main steam, auxiliary steam, and sump drains), similar to those found on the fluid portion of EF. Most of the discrepancies had been previously identified for correction during the licensee labeling upgrade project walkdown and involved minor components not required to be on the flow schematics per licensee guidelines but which were inconsistently included. The support systems also yielded similar results to that of the EF system in that system condition was good based on the absence of observed deficiencies and open work requests. However, the emergency feed pump (EFP) sumps were an exception. The inspector identified constant standing water in the sumps, partially submerging and corroding several valves and pipes, including an alternate suction line pipe from the condenser hotwell. The overflow line from an enclosed drain box accepting pump seal leakoff and steam exhaust stack condensation was only partially connected to a drainage standpipe, causing water to be directed to the EFP sump. The licensee subsequently found the sump pump to be

inoperable and of a different model than indicated in the licensee's configuration management database. The discrepancies did not impact operability of either EFP but were indicative of poor upkeep and were a potential long term corrosion concern. The inspectors verified that work requests were initiated and that the misconfigured pipes were realigned and the sump drained.

The inspectors also noted the overspeed linkage for EFP-2, the steam turbine-driven pump, appeared to be painted inappropriately, potentially binding the mechanism at the end of the turbine shaft. A licensee component engineer assessed the painted linkage as acceptable but undesirable in that it partially intruded upon moving surfaces. A planned overspeed trip test was performed successfully on EFP-2 later the same day with no impact from the painted linkage. The engineer initiated a work request to have some of the paint removed. The inspectors have observed that detailed pre-job surveys have been performed between Operations personnel and the plant refurbishment painting contractor over the past year. Plant areas were surveyed prior to painting to highlight sensitive equipment and discuss acceptable component painting practices. The inspectors have observed very few painting related problems. However, in response to the EFP-2 linkage observation, the inspectors questioned how verification of acceptable equipment painting was performed after the painting was completed by the contractor. The licensee determined that systematic post-job reviews were not being performed to look for latent painting-induced failures. The licensee instituted walkdowns by a multi-disciplined minor maintenance repair team following completion of painting in any area.

The inspectors reviewed open corrective action program items for the EF system and did not identify any notable problems that were not being appropriately addressed. The inspectors also reviewed open EF maintenance work requests for correct prioritization and timely resolution. The open items were reviewed against the scope of work included in a planned EFP-2 maintenance outage on November 4. No problems were noted and the inspectors considered the backlogs low and appropriately prioritized.

c. Conclusions

A detailed walkdown of the emergency feedwater system concluded that the condition of the system was very good. No significant findings were identified but maintenance of the emergency feedwater pump sump was poor and post-job verification of proper painting activities was not routinely occurring.

O2.2 Locked and Sealed Valve Surveillance Requirements

a. Inspection Scope (71707, 61726)

During the detailed Emergency Feedwater (EF) system walkdown discussed in section O2.1, the inspectors verified compliance with the EF Improved Technical Specification (ITS) Surveillance Requirements (SR).

b. Observations and Findings

ITS section 3.7.5 contains five SR, three of which were 24 month refueling outage periodicity requirements. The inspectors verified these three had supporting surveillance procedures (SP) and had been performed during the last outage and startup. SR 3.7.5.2 required testing the output of each of the two EFP on a 45 day staggered test basis. The inspectors verified that licensee procedures fulfilled this requirement and were performed on a 45 day staggered test basis. Finally, SR 3.7.5.1 required each EF manual, power operated, and automatic valve in each water flow path and the two steam flow paths to EFP-2, that is not locked, sealed, or otherwise secured in position, to be verified in the correct position. The ITS Bases for SR 3.7.5.1 stated that the SR included valves in the main flow paths and the first normally closed valve in a branch line. The bases also listed several exclusions to the SR such as instrument valves, check valves, and vent and drain valves. The inspectors identified several discrepancies with the licensee SP designated to fulfill SR 3.7.5.1 on several branch line valves.

Isolation valves to steam generator chemical cleaning lines, were closed and blank flanged, but neither the valve nor the flange was locked/sealed or verified by the applicable SP. However, the licensee determined the lines were verified monthly by another SP for containment isolation valve SR requirements. Although the licensee's EF SP cross-reference did not take credit for this other SP fulfilling SR 3.7.5.1, the inspectors determined it fulfilled the SR for the chemical cleaning lines.

Secondly, several valves in the alternate EFP suction line from the condensate storage tank (CST) were not locked/sealed or verified. The licensee determined that the first normally closed valve in this line was a check valve and that the valves in question, further up the suction line towards the CST, were not within the scope of the SR. However, the last valve on this line, the isolation valve from the CST, was locked closed which was inconsistent with the licensee reliance on the check valve. The licensee was not able to determine the basis for locking that valve. The inspectors verified that the check valve was verified closed every three months during pump testing, so the reliance on it for SR 3.7.5.1 was considered acceptable. The licensee subsequently verified the position of the valves in question and included them in a planned SP revision scope as a conservative measure.

The third area involved steam drain trap valves branching off of the steam flow path lines to EFP-2 that were not locked/sealed or verified. The inspectors observed an inconsistency because four other steam trap lines, from the EFP-2 trip-throttle valve and turbine casing, had all valves locked in position. The licensee considered that the SR Bases exclusion for "vent and drain" valves was applicable to the drain trap lines. Although the licensee was unable to determine the basis for locking the four other paths, the inspectors verified the drain trap lines were not routinely manipulated after startup and had a very low potential to be mispositioned. The inspectors considered that the SR was met.

The fourth area questioned by the inspectors was main feedwater (FW) motor-operated valves (MOV) FWV-34 and 35, the first normally closed valves in the respective branch lines connecting the A train and B train EF discharge water flow paths to the A train and B train FW water flow paths. The breakers supplying power to the valve motors for FWV-34 and 35 were locked but the local handwheels were not locked or sealed. The inspectors determined that locking the breakers only prevented the valve from being repositioned by the motor operator and did not prevent local manual operation. On November 18, 1998, the inspectors identified that the licensee SP intended to fulfill SR 3.7.5.1 did not verify FWV-34 and 35 position because they were considered locked. The licensee was unable to identify any other SP that routinely verified FWV-34 and 35 position. Therefore, SR 3.7.5.1 was not fulfilled because FWV-34 and 35 were not locked, sealed or otherwise secured in position and were not verified in position every 45 days. This was identified as Violation 50-302/ 98-10-01, Valve Surveillance Requirements to Lock or Secure in Position or Routinely Verify Positions Were Not Completed.

The inspectors performed an extent of condition review for other MOV's that were locked only at the breaker to comply with a SR. The inspectors did not identify any further MOV examples but did identify emergency core cooling system (ECCS) manual valves that were not locked/sealed or verified as of November 23. Decay heat removal (DH) valves DHV-120 and 121, which are bypass line isolations around DHV-39 and 40 in the suction line cross-connection to the DH pumps, were not locked/sealed or verified. Operations personnel performed a detailed extent of condition review in parallel with the inspectors and identified 27 more examples of valves in other systems with similar SR's that were not locked/sealed or verified. ITS SR 3.5.2.1 requires verification that each ECCS manual valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position on a frequency of 31 days. The ITS Bases for SR 3.7.2.1 states that the SR include valves in the main flow paths and the first normally closed valve in a branch line. DHV-120 and 121 are the first normally closed valves in the ECCS DH pump suction line cross-connect, and therefore are identified as additional examples of Violation 50-302/ 98-10-01.

The inspectors observed that none of the valve examples were found in an incorrect position. As an immediate corrective action, the licensee verified the position of each of the identified valves and entered them into an Operations required action tracking system until they were incorporated into SP to be either verified or locked/sealed. The licensee initiated a root cause investigation and issued Licensee Event Report 98-013 detailing the examples found. Most of the examples involved branch lines, although many of the licensee-identified examples were valves added by the modification process that were not recognized as applicable to the ITS SR. The LER addressed the causes of these problems and identified appropriate and committed corrective actions to prevent recurrence. Therefore, no written response is needed for Violation 50-302/ 98-10-01.

Throughout these reviews, the inspector noted that it was difficult for licensee personnel to correlate the licensee SP with the ITS SR. The licensee did not have a formal SR to SP cross-reference and individual SP's did not delineate what sections fulfilled which SR. Actions in SP often were in excess of surveillance requirements for reasons the

licensee was unable to determine. The SP containing all locked and sealed valves did not reference the source of the locking requirement.

c. Conclusions

A violation was identified for four examples of emergency feedwater and decay heat removal system valves that contrary to Improved Technical Specification Surveillance Requirements, were not locked or sealed in position and were not periodically verified in the correct position. A licensee extent of condition review identified 27 additional examples in various systems, indicating deficiencies in understanding and documentation of compliance with the surveillance requirements.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) VIO 50-302/98-01-01: Closure of Electrical Linkages While Under a Red Tag Clearance. In their response to this violation, the licensee committed to revise the clearance process in the short-term to incorporate human factors enhancements, to assemble a multi-disciplined team to revise and simplify the clearance process, and to modify the contractor control program. The inspector verified the licensee implemented revision 77 to CP-115, Nuclear Plant Tags and Tagging Orders, on May 1, 1998, to clarify the known procedure problems. The inspector also monitored the efforts of the team to completely revise CP-115. The team reviewed other plant tagging procedures and industry good practices and incorporated them into the new process. The inspector noted the team had licensee management approval to completely revamp the clearance process to correct the source of previous problems. The inspector reviewed the new processes as discussed in section O1.2 of this report. The inspector also verified the licensee had modified their contractor control program. The most notable change was the designation of the licensee System Maintenance Crew (SMC) personnel, who rotate between licensee fossil fuel plants and the nuclear plant, as contract personnel. This placed them under the same controls as any offsite contractor and effectively addressed the SMC involvement with the original problem. These actions fulfilled the licensee's commitments in response to the item and were effective corrective action to prevent recurrence, so this item is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments (61726, 62707)

The inspectors observed all or portions of the following maintenance and surveillance activities:

- WR#NU0357430, Reactor Coolant Pump (RCP) Seal Injection Filter Replacement
- WR#NU0357934, "A" Waterbox Debris Filter Shear Pin Replacement

- SP-340E, Decay Heat Pump (DHP)-1B, Building Spray Pump (BSP)-1B, and Valve Surveillance

- SP-113G, Power Range Nuclear Instrumentation Gain Adjustment

- SP-104, Hot Channel Factors Calculation

Several issues that had not been resolved were identified at the RCP seal injection filter replacement pre-job meeting. Most of these unresolved issues were health physics related and are discussed in this inspection report under Section R7.1. The inspectors noted no other concerns during the performance of the work. The inspectors considered the work activities associated with the replacement of three waterbox shear pins to be well coordinated and executed, as demonstrated by Operations' control of the reactor power reduction and Maintenance's identification of the problem and expeditious repair of the components. The surveillances listed above were satisfactorily completed with no significant concerns noted by the inspectors.

M1.2 Emergency Feedwater Pump (EFP)-2 Planned Maintenance Outage

a. Inspection Scope (62707)

On November 4, 1998, the licensee scheduled a planned outage of the turbine-driven EFP. EFP-2 is a significant safety-related emergency pump with a high contribution to plant risk when unavailable. Using Inspection Procedure 62707, the inspectors observed all or portions of the following Work Requests (WR) included in the scope of the outage and reviewed associated documentation:

- WR 0350639, Change Oil in Woodward Governor

- WR 0350639, Lubricate Trip/Throttle Valve Moving Parts

- WR 0355651, Troubleshoot Ground Condition When Valve Strokes

b. Observations and Findings

The inspectors observed that the licensee practice was not to schedule outages of Improved Technical Specification (ITS) equipment beyond 50% of the allowed Limiting Condition for Operation (LCO) outage time. The EFP-2 outage was scheduled for 27 hours of a 72-hour LCO. The inspectors observed that the schedule was met since the actual time EFP-2 was inoperable and in the LCO was 27 hours and 15 minutes. However, the inspectors observed that the LCO was entered at 5:00 a.m. on November 3 when EFP-2 was tagged out, but no actual maintenance activity on EFP-2 occurred until after 9:00 a.m. due to pre-job briefings and equipment gathering. The inspectors considered this to be several hours of unnecessary unavailability for EFP-2. The outage schedule was lightly loaded and the inspectors observed that licensee personnel did not exhibit much urgency as long as their activity was on schedule. Several opportunities to pull forward scheduled activities and shorten the unavailability time of EFP-2 were not pursued.

The troubleshooting plan for the last listed work activity was scheduled to commence at 3:00 p.m. The inspectors observed at a 3:30 p.m. scheduling meeting, that the troubleshooting plan had not been written even though it was scheduled to have already commenced. Neither Operations Work Control nor Maintenance personnel had looked ahead on the schedule to verify the activity was ready to commence. Licensee Scheduling Management appropriately addressed the oversight by initiating a corrective action system item and evaluating the risk at canceling the troubleshooting. The licensee elected to perform the troubleshooting but the delay to write the plan resulted in the activity not commencing until 7:00 p.m. Heightened licensee management attention from this point on recovered the lost time and was responsible for the outage finishing when originally scheduled.

The inspectors observed that the maintenance activities were performed professionally. The inspectors specifically verified control of lubrication oil for the activities and did not identify any problems. The inspectors also observed that engineering support for the maintenance activities was constant and valuable and that controlled vendor technical manuals were frequently used as references.

c. Conclusions

The inspectors concluded that work on the turbine-driven emergency feed pump was performed professionally and Engineering support was constant and valuable. Although the planned out of service schedule was met, opportunities to reduce the unavailability time of the pump were not utilized. The pump was removed from service several hours before work began and opportunities to compress a lightly loaded schedule were not pursued. A plan for a scheduled troubleshooting activity had not been developed, resulting in a four-hour delay.

M1.3 Maintenance and Surveillance

a. Inspection Scope (62700)

The inspectors observed portions of the following preventive maintenance (PM) and surveillance activities.

- Work Order (WO) NU 0350638 - Surveillance Procedure (SP)-607, Fire Damper Inspections - Dampers FD-67 and FD-74
- SP-521, Quarterly Battery Check
- WOs NU 0337854 and NU 0356665, PM of Industrial Cooling Fan Motors CIF-1A and CIF-1B
- WO NU 0350285, PM on Industrial Cooling Circulating Water Pump Motor CIP-8
- WO NU 0346491, PM Calibration of Actuator and Positioner for Valve MSV-9

- SP-907B, Monthly Functional Test of 4160V ES Bus "B" Under-Voltage and Degraded Grid Relaying

- SP-176B, Calibration of Decay Heat Removal/Building Spray Instrumentation Train B

- SP-354B, Monthly Functional Test of the Emergency Diesel Generator EGDG-1B

During observation of the above in-process activities, the inspectors evaluated procedure use, assignment and performance of Quality Control (QC) hold points, foreign material exclusion (FME) controls, measuring and test equipment (M&TE) controls, and qualification of maintenance personnel.

b. Observations and Findings

The applicable revisions of procedures were in place and were being conscientiously followed by knowledgeable and qualified maintenance personnel. Personnel were meticulous about exact procedure compliance and had any procedure questions clarified before proceeding with an activity. Maintenance supervision was closely involved with monitoring in-process maintenance work. Detailed pre-job briefings were performed for all work observed. Good interface between maintenance and operations personnel was observed. Applicable FME controls, M&TE controls, and QC hold points were being accomplished in accordance with requirements. The inspectors also observed that work activities were properly documented and problems encountered during the performance of the work activities were appropriately resolved.

During evaluation of personnel knowledge and qualification, the inspectors reviewed the licensee's recently initiated program for multi-discipline supervisor qualification and assignment. Table 1-3 of the Final Safety Analysis Report (FSAR) identifies commitment to Regulatory Guide 1.8, which endorses American Nuclear Standard Institute (ANSI) N18.1-1971, Selection and Training of Nuclear Power Plant Personnel. ANSI N18.1-1971 requires that maintenance supervisors have a high school diploma and a minimum of 4 years experience in the craft or discipline he supervises. The Crystal River Maintenance Manual defines the qualification and assignment requirements for disciplined and multi-disciplined maintenance supervisors. In accordance with the Maintenance Manual, the licensee has evaluated their supervisors and determined which discipline(s) each supervisor is qualified for. If, based on having the required experience in each discipline or multi-discipline experience, a supervisor can satisfy the experience requirements for all disciplines, the individual is given a multi-discipline qualification. The Maintenance Manual allows assignment of supervisors based on maintenance risk of the particular job. All jobs are assigned a risk category - low, medium or high, based on the perceived risk to the plant from performing the maintenance. For high-risk jobs, a discipline or multi-discipline supervisor is required. For medium risk jobs, the program allows not using a discipline or multi-discipline supervisor provided compensatory measures, such as the use of a system engineer or proficient journeyman with demonstrated technical abilities providing technical

knowledge, are used. For low maintenance risk activities, discipline supervisors are not required.

No specific examples were identified in which supervisors who did not meet the ANSI standard guidelines performed safety significant maintenance. The licensee maintenance management indicated that they had been were aware that the FSAR needed further clarification and planned to do so. Precursor Card 3-C98-4909 was issued to resolve this problem with the FSAR commitment.

Since overdue PMs have been a problem in the past, the inspectors questioned the licensee relative to how overdue PMs are tracked and trended. Procedure AI-605, Preventive Maintenance Program, was provided for review. This procedure, which covered PMs and not Technical Specification surveillances, required that an extension request be initiated and processed prior to a PM exceeding its grace period. Since this process does not allow overdue PMs, the licensee was not tracking and trending overdue PMs. Also, the number of PM extensions being issued was not being tracked and trended. Therefore, there was no measure of how well PM frequencies were being maintained. The licensee stated that they had recognized some performance indicator was needed in this area and planned to initiate such.

c. Conclusions

PM and surveillance activities were performed and documented in a quality manner. Procedures were in place and were being conscientiously followed by qualified maintenance personnel. Interface between maintenance and operations personnel was effective. Applicable FME controls, M&TE controls, and QC hold points were being accomplished in accordance with requirements. Although the licensee required extensions of PMs to be adequately supported, there was no measure in place to trend how well PM frequencies were being maintained

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) LER 50-302/98-07-00 and 01: American Society of Mechanical Engineers (ASME) Section XI System Pressure Tests Were Not Performed Due to Personnel Errors. During the licensee's review of WRs to close out the second 10-year inservice inspection (ISI) interval, it was identified that thirty WRs did not contain or perform pressure testing as required by the ASME Code Section XI, Rules for ISI of Nuclear Power Plants. All of the WRs were associated with ISI Class III components and satisfactory pressure testing has subsequently been performed. The licensee identified two root causes: inadequate monitoring and management of the ASME Section XI Repair and Replacement and ISI Pressure Testing Programs; and, inadequate training of plant personnel on the relationship between the ASME and ISI Programs and ASME Section XI in general. Actions to prevent recurrence included additional training for Maintenance and Field Engineering planners and Nuclear Engineering Programs personnel, and changes to the maintenance activities control computer-based program to include ISI class designation and electronic ISI department approval of all WRs associated with ISI Class 1, 2, and 3 components. The inspector considered these actions appropriate to address the causes of the LER. Failure to perform ASME

Section XI testing is considered a violation of Improved Technical Specifications, Sections 5.6.2.8 and 5.6.2.9, Surveillance Requirements. Consistent with Section VII.B.1 of the NRC Enforcement Policy, this non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, NCV 50-302/98-10-02, ISI Class III Components Not Pressure Tested as Required by ASME Section XI.

M8.2 (Closed) Violation 50-302/98-05-02: Failure to Monitor SSCs Adequately Under the Maintenance Rule. The licensee's letter of response was dated August 17, 1998, and met the requirements of 10 CFR 2.201. The inspectors verified that the corrective actions as stated in the letter of response had been completed. This violation was issued for not counting unavailability time for maintenance rule purposes for some surveillances on the emergency diesel generators (EDGs). As part of the corrective actions, the licensee added the surveillance times that were not counted, plus conservative estimates for surveillances to be performed between the time of the violation and the next refueling outage, to the accumulated unavailability at the time of the violation. The licensee also determined that the currently established EDG maintenance rule performance criteria was not exceeded. The licensee also used the probabilistic safety assessment (PSA) to evaluate the effect of the additional EDG unavailability time on the plant core damage frequency (CDF) and concluded the affect was minimal. Inspection Followup Item 50-302/98-05-01, noted below, was opened to evaluate the licensee's performance criteria for all SSCs relative to linking the performance criteria to the PSA assumptions. As part of evaluation of the performance criteria relative to PSA assumptions and closeout of the IFI, the established EDG unavailability performance criteria and its affect on the PSA CDF will be evaluated. This item is closed.

M8.3 (Open) IFI 50-302/98-05-01: Linking Performance Criteria to PSA Assumptions. The licensee was still in the process of linking the maintenance rule performance criteria to the PSA assumptions. NRC's review of the process and closeout of this IFI will include review of the appropriateness of the EDG unavailability performance criteria when compared to the PSA assumptions.

III. Engineering

E1 Conduct of Engineering

E1.1 Engineering Design Basis Evaluations and Licensee Amendment Requests (37551)

The inspectors reviewed the results of several licensee license amendment requests and engineering evaluations to ensure they adequately resolved outstanding long term issues and dispositioned emergent problems. Emergent problems included issues relative to Regulatory Guide 1.97 instrument requirements for main steam line radiation monitors and ongoing review of steam generator tube end anomaly defects. The inspectors concluded the licensee adequately addressed the long-term design items and resolved the emergent problems.

E8 Miscellaneous Engineering Issues (92903)

E8.1 (Closed) LER 50-302/98-08-00: Personnel Error Results In a Condition Prohibited by Technical Specifications. This issue was identified during the licensee's review of work requests (WRs) and nondestructive examination reports associated with ASME Code Class III components to close out the second 10-year inservice inspection (ISI) interval. The ASME Code evaluations were not performed due to Engineering personnel not applying Generic Letter (GL) 91-18 guidance for operability determinations and GL 90-05 guidance for flaw evaluations on moderate energy Class III piping. The affected components have since been repaired in accordance with ASME Section XI, and an operability determination completed for the RW standpipe. The RW standpipe, which is a passive, non-pressure retaining pipe that is open to the atmosphere, provides a vent path for the RW sump. Actions to prevent recurrence included a procedure revision to Compliance Procedure (CP)-150, Identifying and Processing Operability Concerns, that added guidance for operability determinations in accordance with GL 91-18, and a new procedure, Nuclear Engineering and Projects procedure (NEP)-308, Guidance for Performing Temporary Non-Code Repair of ASME Code Class III Piping, to evaluate flaws in accordance with GL 90-05. Improved Technical Specifications, Section 5.6.2.8, requires an inservice inspection program with the provision that ASME Code Class 1, 2, and 3 components and supports be inspected in accordance with ASME Section XI, as required by 10 CFR 50.55a. Consistent with Section VII.B.1 of the NRC Enforcement Policy, this non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, NCV 50-302/98-10-03, RW System Components Not Evaluated in Accordance With ASME Section XI.

IV. Plant Support

R2 Status of Radiological Protection and & Chemistry Activities Facilities and Equipment

R2.1 Sluicing of Liquid Waste Disposal Tank (71750)

The inspector observed work activities associated with the sluicing of Radwaste Demineralizer System liquid waste disposal tank (WDT)-15. Step 4.2.12.1 of Nuclear Waste Procedure (WP)-210, Sluicing Out, Loading, and Venting the Process Tanks of the Radwaste Demineralizer System, calls for the use of an air operated pump to aid in the process. The inspector noticed that up to and after that particular step, every valve or component manipulation had been clearly dictated in the procedure by the use of an identification label (i.e., valve identification number), but the air pump and associated valves were not labeled, nor called out in the procedure by a unique identification. The inspector questioned why the pump and associated valves were not labeled, with the concern that improper lineup of the air operated pump due to lack of equipment tags could impact the sluicing activities if not properly aligned. Subsequent licensee evaluation determined that the pump was not a permanent part of the system but it was normally left connected. The licensee determined that it would be appropriate to disconnect and reconnect the pump as needed and were modifying the procedure to provide detailed valve-by-valve instructions. The inspector had no additional concerns.

R7 Quality Assurance in Radiological Protection and & Chemistry Activities

R7.1 Reactor Coolant Pump Seal Injection Filter Replacement

a. Inspection Scope (71750)

The inspector attended the pre-job meeting for the replacement of a reactor coolant pump seal injection filter (MUFL-3B). During the meeting several unresolved issues were raised that resulted in postponement of the work.

b. Observations and Findings

The unresolved issues were mostly related to As Low As Reasonably Achievable (ALARA) radiation dose practices and were determined to have been raised during the previous filter replacement work in March of 1998 (Precursor Card (PC) 98-1257). The issues were: the use of a long-handed tool to remove the filter from its housing versus the use of the already installed overhead pulley; handling the filter by hand for faster retrieval and placement in shielded cart; and, which of various equipment carts to use to transport the filter from the triangle room to the radwaste remote handling room (yellow room). PC 98-1257 did not correct the problem of tool usage because the corrective action only discussed actions to be taken, not when the action would be completed, nor by which plant work group. However, during the pre-job briefing the licensee re-identified the issue of tool usage, postponed the work, and corrected the problems prior to beginning any field work. No further problems were observed during the filter replacement. The inspector determined that a contributing cause to the previous issues not being resolved was that various plant work groups were involved in the job, including Operations, Health Physics, and Radwaste, and no one group took, or was assigned, the responsibility for resolution.

c. Conclusions

Poor coordination between plant work groups resulted in incomplete resolution of several previously identified Health Physics issues involving reactor coolant pump seal injection filter replacement. The problem was identified during a pre-job briefing.

S8 Miscellaneous Security and Safeguards Issues

S8.1 (Closed) Violation 50-302/98-04-04: Failure to adhere to 10 CFR 50.54(p). The inspector verified the licensee's corrective actions described in the licensee's response letter dated June 23, 1998, to be reasonable and complete. No similar problems were identified.

S8.2 (Closed) IFI 50-302/97-10-01: Adequacy of perimeter intrusion detection equipment. The licensee's intrusion detection equipment in one zone was tested during an inspection conducted earlier. Several performance tests of the zone revealed a vulnerability that an intruder could possibly circumvent the intrusion detection system by slowly crawling along the wave steps in that zone. Subsequently, the licensee conducted an engineering analysis and installed concertina wire and fence fabric in the

vulnerable area. The inspector observed numerous tests in that zone conducted by the licensee. All tests were satisfactory and the zone alarmed appropriately.

V. Management Meetings

X1 Exit Meeting Summary

The inspection scope and findings were summarized on December 7, 1998. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

Licensees

S. Bernhoft, Director, Nuclear Regulatory Affairs
J. Cowan, Vice President, Nuclear Operations
R. Davis, Assistant Plant Director, Operations
R. Grazio, Director, Nuclear Site and Business Support
G. Halnon, Director, Nuclear Quality Programs
J. Holden, Director, Site Nuclear Operations
L. McDougal, Acting Manager, Nuclear Regulatory Compliance
C. Pardee, Director, Nuclear Plant Operations
D. Roderick, Director, Nuclear Engineering & Projects
M. Schiavoni, Assistant Plant Director, Maintenance
T. Taylor, Director, Nuclear Operations Training

NRC

C. Casto, Deputy Director, Division of Reactor Projects, Region II (November 30, 1998)
B. Crowley, Reactor Inspector, Region II (October 26-30, 1998)
L. Hayes, Physical Security Specialist, Region II (November 16-20, 1998)

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62700:	Maintenance Implementation
IP 62707:	Conduct of Maintenance
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 81700:	Physical Security Program for Power Reactors
IP 92901:	Followup - Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering
IP 92904:	Action on Previous Inspection Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

Type	Item Number	Status	Description and Reference
VIO	50-302/98-10-01	Open	Valve Surveillance Requirements to Lock or Secure in Position or Routinely Verify Were Not Completed. (Section O2.2)
NCV	50-302/98-10-02	Closed	ISI Class III Components Not Pressure Tested as Required by ASME Section XI. (Section M8.1)
NCV	50-302/98-10-03	Closed	RW System Components Not Evaluated in Accordance With ASME Section XI. (Section E8.1)

Closed

Type	Item Number	Status	Description and Reference
VIO	50-302/98-01-01	Closed	Closure of Electrical Linkages While Under a Red Tag Clearance. (Section O8.1)
LER	50-302/98-07-00 and 98-07-01	Closed	ASME Code Section XI System Pressure Tests were not Performed Due to Personnel Error. (Section M8.1)
NCV	50-302/98-10-02	Closed	ISI Class III Components Not Pressure Tested as Required by ASME Section XI. (Section M8.1)
VIO	50-302/98-05-02	Closed	Failure to Monitor SSCs Adequately Under the Maintenance Rule. (Section M8.2)

LER	50-302/98-08-00	Closed	Personnel Error Results in a Condition Prohibited by Technical Specifications. (Section E8.1)
NCV	50-302/98-10-03	Closed	RW System Components Not Evaluated in Accordance With ASME Section XI. (Section E8.1)
VIO	50-302/98-04-04	Closed	Failure to Adhere to 10 CFR 50.54(p). (Section S8.1)
IFI	50-302/97-10-01	Closed	Adequacy of Perimeter Intrusion Detection Equipment. (Section S8.2)

Discussed

IFI	50-302/98-05-01	Open	Linking Performance Criteria to PSA Assumptions Follow-up to PM Program Changes. (Section M8.3)