UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

October 27, 2003

Mr. Dale E. Young, Vice President
Crystal River Nuclear Plant (NA1B)
ATTN: Supervisor, Licensing &
Regulatory Programs
15760 West Power Line Street
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - NRC INTEGRATED INSPECTION REPORT 05000302/2003005

Dear Mr. Young:

On September 27, 2003, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Crystal River Unit 3. The enclosed integrated inspection report documents the inspection findings, which were discussed on September 29, 2003, with you and members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, there was one inspector identified finding and one self-revealing finding of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because the violations were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in Section 40A7 of this report. If you contest any of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Crystal River Unit 3.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Joel T. Munday, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000302/2003005
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

cc w/encl:
Daniel L. Roderick
Director Site Operations
Crystal River Nuclear Plant (NA2C)
Electronic Mail Distribution

Jon A. Franke
Plant General Manager
Crystal River Nuclear Plant (NA2C)
Electronic Mail Distribution

Richard L. Warden
Manager Nuclear Assessment
Crystal River Nuclear Plant (NA2C)
Electronic Mail Distribution

Donald L. Taylor
Manager Support Services
Crystal River Nuclear Plant (NA2C)
15760 W. Power Line Street
Crystal River, FL 34428-6708

R. Alexander Glenn
Associate General Counsel (MAC - BT15A)
Florida Power Corporation
Electronic Mail Distribution

Steven R. Carr
Associate General Counsel - Legal Dept.
Progress Energy Service Company, LLC
Electronic Mail Distribution

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, FL 32304

William A. Passetti
Bureau of Radiation Control
Department of Health
Electronic Mail Distribution

Craig Fugate, Director
Division of Emergency Preparedness
Department of Community Affairs
Electronic Mail Distribution

Chairman
Board of County Commissioners
Citrus County
110 N. Apopka Avenue
Inverness, FL 36250

Jim Mallay
Framatome Technologies
Electronic Mail Distribution

Distribution wencl: (See page 3)

Distribution w/encl:
B. Mozafari, NRR
L. Slack, RII EICS
RIDSNRRDIPMLIPB
PUBLIC

OFFICE	DRP/RII	DRP/RII	DRP/RII	DRS/RIII	DRS/RII		
SIGNATURE	sn	jm (for)	rr	rs (for)	rs		
NAME	SNinh:vyg	SStewert	RReyes	NMerriweather	RSchin		
DATE	10/22/2003	10/27/2003	10/27/2003	10/23/2003	10/23/2003		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO			
PUBLIC DOCUMENT	YES NO						

OFFICIAL RECORD COPY DOCUMENT NAME: C:\ORPCheckout\FileNET\ML033020363.wpd

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-302
License No.:	DPR-72
Report No.:	05000302/2003005
Licensee:	Florida Power Corporation
Facility:	Crystal River Unit 3
Location:	15760 West Power Line Street Crystal River, FL 34428-6708
Dates:	June 29, 2003 - September 27, 2003
Inspectors:	S. Stewart, Senior Resident Inspector R. Reyes, Resident Inspector N. Merriweather, Senior Reactor Inspector (4OA5) R. Schin, Senior Reactor Inspector (4OA5)
Approved by:	Joel T. Munday, Chief Reactor Projects Branch 3 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000302/2003-005, 06/29/2003 - 09/27/2003; Crystal River Unit 3; Fire Protection and Event Followup.

The report covered a three month period of inspection by resident inspectors and an announced inspection by region based engineering inspectors. Two Green non-cited Violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A self-revealing non-cited violation of Crystal River 3 Technical Specification 3.7.18 was identified. Following Train B chiller maintenance on December 19, 2002, and Train A chiller maintenance on February 25, 2003, neither train of control complex cooling was operable because control complex chiller motor overload relays had been improperly set below their design values. The problem was identified on June 11, 2003, when both chiller motors tripped on overload current, when an overload current condition had not occurred.

  The self-revealing finding is greater than minor safety significance because it resulted in a loss of the control complex cooling safety function and affected the availability and reliability of the Mitigating Systems Cornerstone of Reactor Safety that is used to mitigate events. The finding is of very low safety significance because the alternate non-safety Appendix R cooling system and feedwater pump (FWP-7) were available to mitigate transients involving systems that could be affected by the loss of cooling. (Section 4OA3)

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix R, Section III.G.2, Fire Protection of Safe Shutdown Capability, for failure to protect certain electrical cables for safe shutdown equipment from fire damage in three fire areas. The licensee has corrected related identified procedural deficiencies and plans to resolve the noncompliance with cable protection through licensing correspondence with the NRC.

  This finding is greater than minor safety significance because it involved a lack of required fire barriers for equipment relied upon for safe shutdown following a fire and because it affected the objectives of the Mitigating Systems Cornerstone of Reactor Safety. It affected the availability and reliability of systems that mitigate initiating events to prevent undesirable consequences. The finding is of very low safety significance because licensee's proceduralized manual actions are reasonably accomplishable and training would have enabled operators to maintain the makeup function sufficiently to maintain reactor coolant system process variables within acceptable ranges. Therefore, the inspectors identified this issue as a Green finding as described in Inspection Procedure 71111.05, Fire Protection**.** (Section 4OA5)

B. Licensee Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Crystal River 3 operated at full power during the inspection period until September 6, 2003, when a reactor power coastdown to refueling outage 13 was started. On September 14, 2003, reactor power was reduced from 82 percent to 60 percent when a turbine throttle valve went closed on a spurious signal. The control circuit for the valve was repaired and reactor power was restored on the same day.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity [Reactor-R], Emergency Preparedness [EP]

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors monitored the licensee's preparations for Tropical Storm Henri on September 3 to 6, 2003. The licensee activities were checked to assure that vital systems and components were protected from severe weather in accordance with licensee Emergency Instruction EM-220, Violent Weather. During the preparations, the inspectors walked down portions of the following systems/areas to verify the licensee's mitigation strategy. The inspectors attended a licensee Violent Weather Committee meeting and reviewed the readiness checklists to verify that preparations were being tracked to completion. Nuclear condition reports were reviewed to verify that the licensee was identifying and correcting weather protection issues.

- Emergency Feedwater system including EFP-3 and EFP-2
- Emergency Diesel Generator Systems
- Site Switchyard and Berm areas

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Equipment Walkdowns

a. Inspection Scope

The inspectors performed the following partial system walkdowns during this inspection period. The inspectors reviewed the alignment of the selected risk-significant systems to evaluate the readiness of the redundant trains while one train was out of service for maintenance. The inspectors checked switch and valve positions using the alignments specified in the listed operating procedures and checked electrical power alignment to critical components. The inspectors reviewed applicable sections of the Crystal River 3

Final Safety Analysis Report to obtain design and operating requirements. Nuclear condition reports were reviewed to verify that the licensee was identifying and correcting component alignment issues.

- Emergency Diesel Generator EDG-1B using Operating Procedure OP-707, Operation Of The ES Emergency Diesel Generators, when EDG-1A was out of service for testing on August 14, 2003.

- B Service Water Train using OP-408, Nuclear Services Cooling System, and Flow Drawing FD-302-601, Nuclear Services Closed Cycle Cooling, when A service water train was out of service to replace a timing relay per work order 105120, on July 18, 2003. (NCR 98630)

- 120 volt AC Vital Distribution using Operating Procedure OP-700D, Operation Of The 120 Volt AC Vital Buses, when inverter VBIT-1E was out of service for calibration and circuit replacement on September 8, 2003.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown: On July 22 and 23, the inspectors conducted a detailed review of the alignment and condition of the operable B train, emergency core cooling system, including raw water, decay heat, decay heat removal, and building spray systems, during a scheduled A train maintenance outage. The inspectors used plant drawings and procedures, and the operating procedures (OP) and surveillance procedures (SP) listed below, as well as applicable chapters of the Final Safety Analysis Report (FSAR), to verify proper system alignment:

- OP-700A 4160 ES Bus 3B
- OP-404 Decay Heat Removal System
- OP-405 Reactor Building Spray System
- OP-408 Nuclear Services Cooling System
- SP-347 ECCS And Boration Flow Paths

The inspectors verified selected electrical power requirements, labeling, hangers and support installation, and associated support systems status. Operating pumps were examined to ensure that vibration was not excessive, pump leakoff was not excessive, and the pumps were properly ventilated. The walk downs also included evaluation of system piping and supports against the following considerations:

- Piping and pipe supports did not show evidence of water hammer.
- Oil reservoir levels indicated normal.
- Snubbers did not indicate any observable hydraulic fluid leakage.
- Component foundations were not degraded

A review of outstanding maintenance work orders was performed to verify that the deficiencies did not significantly affect the system function. In addition, the inspectors reviewed the condition report (CR) database to verify that the systems equipment alignment problems were being identified and appropriately resolved.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors walked down the following risk-significant plant areas to verify that control of transient combustibles and ignition sources were consistent with the licensee's Fire Protection Plan and 10 CFR Part 50, Appendix R. The inspectors also evaluated the material condition, operational lineup, and operational effectiveness of fire protection systems and assessed material condition of fire barriers used to contain fire damage. The inspections were completed using the standards of the Crystal River Fire Protection Plan; 10 CFR Part 50, Appendix R; the Florida Power Corporation Analysis of Safe Shutdown Equipment; and the Final Safety Analysis Report. The inspectors reviewed sections of OP-880, Fire Service System, and checked performance of SP-802, Fire Hose Hydrostatic Test, and SP-800, Monthly Fire Extinguisher Inspection, to monitor the operational condition of fire protection equipment. When applicable, the inspectors checked that compensatory measures for fire system problems were implemented. The inspectors observed performance of fire alarm checks done in accordance with surveillance procedure SP-323, Evacuation and Fire Alarm Demonstration.

- Boric Acid Storage Tank Areas
- Backup Engineered Safeguards Transformer, Start-up Transformer, Auxiliary Transformer, and the A, B, and C Step-up Transformer areas
- 480-Volt Switch Gear Rooms
- 'A' and 'B' EDG Engine Rooms and Compressor Rooms
- Decay Heat Vaults including decay heat pump and heat exchanger areas
- Fire Pump House
- #3 Emergency Feed Pump Building
- Auxiliary Intermediate Building and Turbine Building Intermediate Building Roof area
- Main control room

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a Inspection Scope

The inspectors walked down the turbine and auxiliary building areas, including the decay heat removal pump vaults, to ensure that flood protection measures were in accordance with specifications described in the Final Safety Analysis Report. Specific attributes that were checked included sealing of penetrations between flood areas, operability of watertight doors, and the operability of the sump pumps. Additional flood protection checks were done during severe weather preparations and documented in Section 1R01. The inspectors verified that minor deficiencies involving watertight seals and other flood protection issues were documented in the licensee's corrective action program and corrected.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

On July 29, 2003, the inspectors observed licensed operator actions on the plant specific simulator to Licensed Operator Continuing Training exercise LOR-1-17, Decay Heat Removal Operations and LOR-1-05, Loss of Decay Heat Removal. The session involved crew using plant procedures to establish decay heat removal system operations from a forced circulation - steam dump condition, shifting decay heat removal system loops of operations, and a response to a complete loss of the decay heat removal system. The inspectors specifically evaluated the following attributes related to operating crew performance.

- Clarity and formality of communication including crew briefings
- Ability to take timely action to safely control the unit
- Prioritization, interpretation, and verification of alarms including a loss of decay heat removal pump alarm
- Correct use and implementation of procedures AP-404, Loss of Decay Heat Removal, and OP-404, Decay Heat Removal System Operation
- Control board operation and manipulation, including operator actions such as establishing decay heat removal system operation from a two reactor coolant pump operation configuration
- Oversight and direction provided by supervision, including ability to identify and implement appropriate technical specification actions
- Effectiveness of the training oversight and critique

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the planned maintenance activities listed below to evaluate the licensee's implementation of the maintenance rule (10CFR50.65). The inspectors checked that licensee personnel monitored unavailability of equipment important to safety and trended key performance parameters. For the equipment issues described in the work orders (WO) listed below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10CFR50.65) with respect to the characterization of failures, the appropriateness of the associated a(1) or a(2) classifications, and the appropriateness of either the associated a(2) performance criteria or the associated a(1) goals and corrective actions. The inspectors checked if the licensee maintained safety functions when equipment important to safety was out of service for maintenance. The inspectors also periodically reviewed the licensee's implementation of 10 CFR 50, Appendix B and technical specification requirements regarding safety system problems. The inspectors routinely checked that the licensee promptly entered problems with plant equipment into the corrective action program or the corrective maintenance program. The inspectors checked that the licensee monitored work practices and when appropriate, documented work problems in the corrective action program.

The inspectors reviewed the goal settings and verified corrective actions had been completed for the Substation System which had been entered into the maintenance rule a(1). On August 27, the inspectors attended the Maintenance Rule expert panel meeting to assess the licensee's goal settings on the SW pump and the Control Complex Chillers which had entered into the maintenance rule a(1) as a result of unavailability and functional failures, respectively.

- NCR 76622, Reactor Trip Due to Opening of the Main Generator Output Breaker a(1)
- NCR 95966, Control Complex Chilled Water System Failures a(1)
- NCR 105249, Hi Vibrations on Air Handling Fan AHF-8B a(2)

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the following work risk assessments to assess the effectiveness of licensee's risk assessment and emergent work evaluation in accordance with plant procedural requirements. The inspectors reviewed daily maintenance schedules and observed work controls to check risk management while maintenance was conducted. The inspectors assessed operability of equipment using technical specifications, the Final Safety Analysis Report, licensee procedures, and regulatory information such as NRC Generic Letter 91-18, Revision 1, Information to

Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded And Nonconforming Conditions. The inspectors also reviewed maintenance schedules to check that overall risk was minimized through preservation of safety functions such as decay heat removal capability, reactor coolant system inventory control, electric power availability, reactivity control, and primary containment control. The inspectors checked if licensee personnel were managing risk by assuring that key safety functions were preserved and that upon identification of an unplanned situation, the resulting emergent work was evaluated by the licensee for risk and controlled as described in technical specifications, licensee Compliance Procedure CP-253, Power Operations Risk Assessment and Management, and Administrative Instruction AI-500, Conduct of Operations. The inspectors checked that risk significant emergent work was documented in the corrective action program and that risk management actions were promptly initiated.

- Work Week 03W27, Risk assessment for planned ‘B’ train ECCS outage revised for emergent repairs to raw water pump RWP-130 (NCR 98198)

- Work Week 03W28, Risk assessment for the EGDG-1A engine surveillance, revised to repair the EGDG-1B jacket cooling water heater relay after failure (NCR 98987)

- Work Week 03W29, Risk assessment for Emergency Core Cooling System train outage and piping replacement per clearance 55395 and work order 228448; Elevated Risk Condition Yellow

- Work Week 03W31, Risk assessment for Inspection and Lubrication of auxiliary steam valve ASV-204, revised when makeup pump MUP-1A was removed from service to troubleshoot and repair the bearing thermocouople MU-36-TE per work request 339430

- Work Week 03W32, Risk assessment revised when the 1A Control Complex Chiller failed a post-maintenance test after maintenance had been performed per work request 222359-01

- Work Week 03W35, Risk assessment for planned maintenance on battery charger DPBC-1B revised when main generator output breaker 1661 opened and required troubleshooting and repairs (NCR103415)

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

a. Inspection Scope

For the non-routine event described below, the inspectors observed the activity, reviewed operator logs and plant computer data to determine that the evolution was conducted safely and in accordance with plant procedures.

- Reactor power reduction and withdrawal of Axial Power Shaping Rods (APSR) completed on August 13, 2003, using operating procedure OP-502A, "End of Cycle APSR Withdrawal" and Operations Department Communication 0308-03, "APSR Withdrawal."

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following degraded or nonconforming conditions to determine if operability of systems or components important to safety was consistent with technical specifications, the Final Safety Analysis Report, 10 CFR Part 50 requirements, and when applicable, NRC Generic Letter 91-18, Revision 1, Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions. The inspectors monitored licensee nuclear condition reports (NCRs), work schedules, and engineering documents to check if operability issues were being identified at an appropriate threshold and documented in the corrective action program, consistent with 10 CFR 50, Appendix B requirements, and licensee procedure NGGC-200, Corrective Action Program. The inspectors checked that when plant problems were identified, the resulting change in plant risk was identified and managed. The following issues, including the related nuclear condition reports (NCRs), were specifically checked:

- NCR 97889, Debris Found In The Reactor Building
- NCR 98198, Through wall leak in raw water Socket Weld Between Pipe And Valve RWV-130
- NCR 98511, Ultimate Heat Sink Temperature High
- NCR103426, Small Leak in service water pipe downstream of service water heat exchangers
- NCR 100231, Service Water Heat Exchanger SWHE-1D, divider plate is degraded

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

On July 10, there were four operator work arounds (OWA) listed in the licensee OWA list. The inspectors reviewed the activities associated with Operator Work Around (OWA) SCV-23 Temperature Controller, and discussed it in detail with Operations personnel. The recent work that had been completed in which a new controller had been installed was reviewed with engineering. The planned post maintenance tests associated with installation of the new controller were reviewed as well. The inspectors reviewed the OWA list with reactor operators to determine if they were familiar with the OWA and the required operational activities relating to each OWA.

Cumulative Effects

The inspectors performed a semi-annual evaluation of the potential cumulative effects of all outstanding OWAs. At the time of the inspection, there were four OWAs. The inspectors evaluated all outstanding OWAs for their cumulative effects, and discussed these potential effects with control room supervision and operators. Furthermore, the inspectors reviewed the current OOS logs and walked down the control room and plant areas to verify OWAs were being identified and properly entered into the corrective action program.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed the Crystal River Unit 3, Refuel 13 Outage Risk Assessment for the refueling outage planned to begin on October 3, 2003. The inspectors checked that the risk assessment was based on the licensee's outage schedule and consistent with licensee requirements in Administrative Instruction AI-504, Guidelines for Cold Shutdown and Refueling. The inspectors verified that during evolutions identified as high risk, plans had been established for maintaining key safety functions such as electrical power, reactivity control, reactor inventory control, and decay heat removal. The inspectors checked that the risk assessment included industry experience and previous site-specific problems and had been reviewed by management.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed temporary modifications listed below to ensure that they did not adversely affect the operation of a system that was altered. The inspectors screened temporary plant modifications for systems that were ranked high in risk for departures from design basis and for inadvertent changes that could challenge the systems to fulfill their safety function. The inspectors conducted plant tours and discussed system status with engineering and operations personnel to check for the existence of temporary modifications that had not been appropriately identified and evaluated.

- Engineering Change EC 49716, Reduce flow induced vibration for main steam safety valves, MSV-33 through 48, by using a clamp to connect adjacent coils of valve springs

- Engineering Change EC 48830, Perform a sealant injection to reduce or eliminate external leakage from the pressure seal ring of Decay Heat Valve DHV-4

b. Findings

No findings of significance were identified.

1RST Post-Maintenance and Surveillance Testing - Pilot

This pilot inspection procedure combines both post-maintenance and surveillance testing activities.

a. Inspection Scope

The inspectors observed or reviewed the following post-maintenance and surveillance testing activities for risk significant systems to check the following (as applicable): (1) the effect of testing on the plant had been adequately addressed; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and demonstrated operational readiness; (4) test instrumentation was appropriate; (5) tests were performed as written; and (6) equipment was returned to its operational status following testing. The inspectors evaluated the licensee activities against the technical specifications, the Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications. The inspectors routinely checked that post maintenance testing and surveillance testing issues were resolved and documented in the licensee's corrective action program.

Inservice test (IST) activities were reviewed to ensure testing methods, acceptance criteria, and corrective actions were in accordance with the ASME Code, Section XI, and Florida Power Corporation ASME Section XI, Ten Year Inservice Testing Program, dated May 4, 1998.

Post- Maintenance Testing

- Work Order 339430-01, MUP-1A Radial Inboard Bearing Thermocouple Replacement, testing of thermocouple and oil leak test

- Surveillance Procedure SP-375A, CHP-1 And Valve Surveillance, after performing preventive maintenance on the 1A Chiller

- Surveillance Procedure SP-206, Visual Examination for Leakage, after replacing raw water spool piece RW-84, including RWV-133 using work order WO 228448

- Work Order 456040, data collection and engineering evaluation of vibration following repair of air handling fan AHF-8B

Surveillance Testing

- SP-130, Engineered Safeguards Monthly Functional Tests, performed on July 7, 2003
- SP-349B, EFP-2 And Valve Surveillance, performed on August 6, 2003 (IST)
- SP-363, Fire Protection System Tests, performed on August 6, 2003
- SP-521, Quarterly Battery Check for 3B1 and 3B2 Station Batteries performed on August 25, 2003

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness (EP)

1EP6 Drill Evaluation

a. Inspection Scope

On July 23, 2003, the inspectors observed the site emergency response organization respond to a tabletop scenario of a security threat to the Crystal River Nuclear Plant. The tabletop was held in the emergency offsite facility, and participants included representatives of the Federal Bureau of Investigation, Florida Department of Law Enforcement, Florida Division of Emergency Management, and Citrus County and Levy County emergency management personnel. During this scenario, the inspectors assessed the licensee's ability to classify an emergent situation, and make timely notification to state and federal officials in accordance with 10 CFR Part 50.72. Emergency activities were checked to be in accordance with the Crystal River Radiological Emergency Response Plan, Section 8.0, Emergency Classification System, and 10 CFR Part 50, Appendix E.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Initiating Event and Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors checked the accuracy of the performance indicators for reactor coolant system activity and leakage. Performance indicator data submitted from June 2002, to June 2003, was compared for consistency to data obtained through the review of chemistry department records, monthly operating reports, and control room records. Surveillance Procedure SP-317, Reactor Coolant System Water Inventory Balance and

Chemistry Department Procedure, CHA-263, Dose Equivalent Iodine were reviewed. Data gathering using both procedures was monitored. During routine plant tours, the inspectors checked proper controls for plant personnel exposure and radioactive releases. The inspectors checked the licensee's compliance with station procedure CP-155, Fuel Integrity Program and Failed Fuel Action Plan.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

Routine Problem Review

a. Inspection Scope

The inspectors selected the following nuclear condition report (NCR) for detailed review and discussion with the licensee. The report was examined to verify whether problem identification was timely, complete and accurate; safety concerns were properly classified and prioritized for resolution; technical issues were evaluated and dispositioned to address operability and reportability; root cause or apparent cause determinations were sufficiently thorough; extent of condition, generic implications, common causes, and previous history were adequately considered; and appropriate corrective actions were implemented or planned in a manner consistent with safety and technical specification compliance. The inspectors evaluated the report against the requirements of the licensee's corrective action program in Administrative Procedures CAP-NGGC-0200, "Corrective Action Program" and 10 CFR 50, Appendix B. Nuclear Condition Reports 68148 and 68365 involving non-conforming conditions with the station batteries, the January to June 2003 System Health Report regarding DC Electric Power System, and the licensee's (10 CFR 50.65) maintenance rule event data base were also reviewed.

- Nuclear Condition Report 64202: During performance of surveillance procedure, SP-522, "Station Battery Inspection", the inspection criteria could not be met due to connection cleanliness and copper contamination

b. Findings and Observations

There were no significant licensee performance issues or NRC violations identified by the inspectors regarding the condition report. The inspectors verified that the apparent cause evaluation and initial corrective actions were appropriate and timely in relation to the safety significance of the problem. Long term corrective actions were appropriately planned to maintain system readiness.

4OA3 Event Followup

(Closed) Licensee Event Report 05000302/2003-001-00, Incorrectly Set Motor Overload Relays Result in Loss of Both Control Complex Chillers

a. Inspection Scope The inspectors reviewed the LER and the associated nuclear condition report (NCR 95966) to verify that the cause of the June 11, 2003, failure of both trains of control complex chillers had been identified and that the corrective actions were reasonable. The failure was caused when technicians incorrectly calibrated the chiller motor overload relays due to inadequate work instructions. CHHE-1A motor overload relays had been incorrectly set on February 25, 2003, and CHHE-1B on December 19, 2002. The two units operated successfully until June 11, 2003, when a failed component on the 1B chiller initiated a transient that resulted in both machines being concurrently tripped on overload. Maintenance was required to return the chillers to operation. The inspectors reviewed the licensee's corrective actions described in the LER, reviewed the nuclear condition report, and discussed the status of continuing corrective actions with appropriate personnel. Florida Power letter 3F0902-06, License Amendment Request #271, Revision 1, Revised Improved Technical Specification 3.7.18, for Two Inoperable Control Complex Chillers, dated September 20, 2002, was used in the inspector's review.

b. Findings

Introduction: A Green self-revealing finding of TS 3.7.18 was identified for failure to maintain two operable control complex cooling trains due to incorrectly calibrated chiller motor overload relays.

Description: The licensee determined that the root cause of the failure of both control complex chillers was the incorrect calibration of the chiller motor overload relays. The incorrect calibration was attributed to inadequate work instructions.

Analysis: The inspectors determined that the licensee failed to meet the requirement of Technical Specification, Limiting Condition for Operability (LCO) 3.7.18, that states: "Two Control Complex Cooling trains shall be operable," when on December 19, 2002, and February 25, 2003, overload protection relays for CHHE-1B, and CHHE-1A, respectively were set below the design range. Because the incorrect calibration resulted in the failure to meet a technical specification requirement and was attributed to inadequate work instructions, it was a performance deficiency. The finding was greater than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and affected the cornerstone objective of equipment reliability. Because the finding involved a loss of safety function for the safety related control complex cooling system, a Phase 2, Significance Determination was completed using NRC Manual Chapter 0609, Appendix A. The most dominant core damage sequences involved plant transients. For this finding, the inspectors assumed that the Emergency Feedwater Isolation and Control (EFIC) system could be affected by the loss of room cooling, and further assumed that no loss of emergency feedwater function would occur because 1) the redundant Appendix R cooling system was available for alignment to the EFIC control system room coolers, and 2) alternate feedwater was available using either the main feedwater system, or the Feedwater Pump FWP-7 system. The finding was determined to be of very low safety significance (Green).

Enforcement: Technical Specification LCO 3.7.18, requires “Two Control Complex Cooling Trains shall be Operable.” A cooling train consists of a chiller, a chill water pump, and ducting to deliver cooling to safety related areas. Contrary to the above, following Train B chiller maintenance on December 19, 2002, and Train A chiller maintenance on February 25, 2003, neither train of control complex cooling was operable because control complex chiller motor overload relays had been improperly set below their design values. The problem was identified on June 11, 2003, when both chiller motors tripped on overload current, when a design overload current condition had not occurred. The licensee entered Technical Specification 3.0.3, and initiated a plant shutdown when the problem was found. Maintenance was promptly conducted and the A train chiller was returned to service on the same day. Chiller CHHE-1B was repaired and returned to service on June 13, 2003. Because the failure to maintain an operable control complex cooling train requirement was of very low safety significance and had been entered into the licensee’s corrective action program (NCR 95966), this violation is being treated as a Non Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000302/2003005-01, Failure to Maintain Two Operable Control Complex Cooling Trains. At the end of the inspection period, in addition to having returned both trains of equipment to service, the licensee had completed an extent of condition review and had summarized the occurrence to maintenance personnel to prevent similar problems. Additional corrective actions were being tracked in the licensee’s corrective action program. The LER is closed.

4OA5 Other

(Closed) Unresolved Item (URI) 05000302/2002005-01, Failure to Protect One Train of Safe Shutdown Equipment From Fire Damage in Accordance with Appendix R, Section III.G.2 (Three Examples)

a. Inspection Scope

This inspection followed up on URI 05000302/2002005-01, which had been opened for NRC review of the local manual operator actions for three fire areas. The licensee had relied on these operator actions instead of physically protecting electrical cables for the makeup (high pressure injection) and emergency electrical power systems from fire damage. The URI also described a concern with unprotected cables for a fire service valve that could potentially degrade the response of the fire brigade. The URI was also open for NRC review of the overall safety significance of the potential finding.

During this inspection, the inspectors reviewed the potential findings that were described in the URI and also reviewed the licensee’s proceduralized local manual operator actions for the three fire areas of concern for feasibility, using the guidance of NRC Inspection Procedure 71111.05, Enclosure 2. To accomplish this review, the inspectors inspected the three fire areas of concern and walked down all of the local manual operator actions for the three fire areas. The inspectors also reviewed cable routings of concern in the three fire areas, design information for affected equipment, fire brigade procedures, and records of previous fire drills in the fire areas of concern. In addition, the inspectors discussed the plant design, procedures, and staffing with licensee operators and engineers and evaluated the safety significance of identified deficiencies and findings.

b. Findings

Introduction. A Green non-cited violation (NCV) of 10 CFR 50, Appendix R, Section III.G.2, Fire Protection of Safe Shutdown Capability, was identified for failure to protect certain electrical cables for safe shutdown equipment from fire damage in three fire areas.

Description. The inspectors identified that the licensee had failed to protect certain electrical cables, for equipment that was relied upon for safe hot shutdown, from fire damage. The affected equipment included:

- Electrical control cables for makeup system motor-operated valves (MOVs) MUV-23, -24, -25, and -26 (which were in parallel in the required flowpath) were not protected from fire damage in fire areas CC-108-102 [hallway and remote shutdown room on the 108 foot elevation of the control complex] and CC-108-107 [3B 4160 volt engineered safeguard switchgear room on the 108 foot elevation of the control complex]. At least one of these valves should have been protected from fire damage because one was needed to establish and maintain a makeup flowpath to the reactor coolant system (RCS) for safe hot shutdown.

- Electrical control cables for makeup pump (MUP) 1A, 1B, and 1C were not protected from fire damage in fire area CC-108-106 [battery charger room 3A on the 108 foot elevation of the control complex]. MUP 1C should have been protected as it was relied upon, per the licensee's safe shutdown analysis and procedures, to supply makeup to the RCS for safe hot shutdown.

- Electrical control cables for MUP flow recirculation MOVs MUV-53 and MUV-257 (which were in series in the required flowpath and affected all three MUPs) were not protected from fire damage in fire areas CC-108-102 and CC-108-107, respectively. Both valves should have been protected from fire damage to ensure that the MUP minimum flow recirculation flowpath would be available as needed for safe hot shutdown.

After reviewing the potential effects of cable damage due to fire, the system design, and the operating procedures, the inspectors found that even with these unprotected electrical cables and some deficient operator actions, licensee procedures and training would have enabled operators to maintain the makeup function as needed for safe shutdown following a fire in fire areas CC-108-102, -106, or -107. [The deficient operator actions involved locally manually repositioning MOVs that were vulnerable to spurious actuations and failing to open the power supply breakers to the MOVs, leaving the MOVs still vulnerable to spurious actuations.] The inspectors evaluated that with the proceduralized operator actions, the makeup function would have been sufficient to maintain reactor coolant system process variables within acceptable ranges. The inspectors also noted that the licensee had corrected all of the identified deficient operator actions in the current revision of the procedure. In addition, the licensee planned to resolve the noncompliance with cable protection through licensing correspondence with the NRC. These factors limited the safety significance of the licensee's failure to physically protect the cable from fire damage as required by 10 CFR 50, Appendix R, Section III.G.2.

The inspectors determined that some other concerns described in the URI should not be considered as findings, as described below:

- Electrical cables for emergency diesel generators (EDGs) 1A and 1B were not protected from fire damage in fire area CC-108-106; however, the licensee's safe shutdown analysis and procedures did not rely on the EDGs. The licensee had determined that offsite power would not be affected by a fire in fire area CC-108-106 and would be available for safe shutdown. Inspector review of selected electrical circuits did not identify any flaws in the licensee's determination that offsite power would be unaffected by the fire.

- Electrical cables for fire service valve FSV-257 were not protected from fire damage in the fire areas of concern. The inspectors verified that this could delay the fire brigade by about three minutes in pressurizing a fire hose from a fire station in the control building. However, by procedure and also by actual practice during fire drills, the fire brigade brought a second fire hose that would be pressurized from the turbine building. That hose would be unaffected by FSV-257. Since the fire brigade needed only one hose, they would not be delayed by damage to FSV-257 cables. The inspectors verified that the hose from the turbine building, plus an additional 50 feet of hose from the fire brigade cart, would provide sufficient length and water pressure to fight fires in all of the fire areas of concern. The inspectors also verified that fire brigade response time during drills was less than the acceptance criteria, such that a three-minute delay to locally manually open FSV-257 would not result in the fire brigade being considered degraded.

<u>Analysis</u>. The inspectors determined that the licensee's failure to protect the electrical cables for certain makeup system components from fire damage was a performance deficiency because the licensee failed to comply with the requirements of 10 CFR 50, Appendix R, Section III.G.2. This finding is greater than minor safety significance because it involved a lack of required fire barriers for equipment relied upon for safe shutdown following a fire and because it affected the objectives of the Mitigating Systems Cornerstone of Reactor Safety. The finding affected the availability and reliability of systems that mitigate initiating events to prevent undesirable consequences. The inspectors determined that manual actions are reasonably accomplishable and licensee procedures and training would have enabled operators to maintain the makeup function sufficiently to maintain reactor coolant system process variables within acceptable ranges. Therefore, the inspectors identified this issue as a Green finding as described in Inspection Procedure 71111.05, Fire Protection.

<u>Enforcement</u>. 10 CFR 50, Appendix R, Section III.G.2 requires in part that where cables or equipment, that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of

primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided: a) physical protection by a three-hour fire barrier, b) physical protection by a separation of more than 20 feet, with no intervening combustibles or fire hazards, plus fire detectors and automatic suppression, or c) physical protection by a one-hour fire barrier plus fire detectors and automatic suppression.

Contrary to the above, the licensee failed to protect cables that could prevent operation or cause maloperation due to hot shorts, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions, from fire damage by one of the prescribed methods. This nonconforming design was identified by NRC inspectors in July 2002 and had been in existence for years. Because this failure to protect cables is of very low safety significance and has been entered into the licensee's corrective action program as Non-Conformance Report (NCR) No. 061781; this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 0500302/2003005-02, Failure to Protect One Train of Safe Shutdown Equipment From Fire Damage.

4OA6 <u>Meetings, Including Exit</u>

<u>Exit Meeting Summary</u>

The fire protection specialist inspectors presented their inspection results (Section 4OA5) to Mr. D. Young and other members of the licensee's staff on September 12, 2003. The licensee acknowledged the findings presented. Proprietary information is not included in the inspection report.

The resident inspectors presented the inspection results to Mr. Young and other members of licensee management at the conclusion of the inspection on September 29, 2003. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. The licensee did not identify any proprietary information.

4OA7 <u>Licensee Identified Violation</u>

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an Non-Cited Violation.

Crystal River 3 Technical Specification 5.6.1, requires that the procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, be implemented. The regulatory guide, in Paragraph 9.a, specifies procedures for performing maintenance on safety related equipment. Crystal River 3, Work Order 456040 required for the post-maintenance test on safety-related air handling fan, AHF-8B, vibration analysis by engineering. Contrary to the above, on September 23, 2003, AHF-8B was returned to service following maintenance under Work Order 456040, without completion of vibration analysis by engineering. Instead, engineering evaluated the running AHF-8A and reported the results to plant operators. The discrepancy was identified during the next operations shift turnover, plant status review. The vibration analysis was then conducted the same day, and when evaluated, it was determined to be unsatisfactory for vibrations and re-work was authorized. The finding was of very low safety significance because it was identified within a few hours of occurrence and the redundant fan, AHF-8A, remained available. There was no actual safety consequence. The occurrence is documented in the licensee corrective action program as NCR 105249.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

J. Huegel, Acting Manager, Operations
S. Bernhoft, Supervisor, System Engineering
W. Brewer, Manager, Work Controls
R. Davis, Manager, Training
J. Franke, Plant General Manager
J. Kreuhm, Manager, Maintenance
D. Roderick, Director Site Operations
S. Glenn, Supervisor, Corrective Actions Program
S. Powell, Supervisor, Licensing
M. Rigsby, Radiation Protection Manager
J. Stephenson, Supervisor, Emergency Preparedness
J. Terry, Manager, Engineering
R. Warden, Manager, Nuclear Assessment
D. Young, Vice President, Crystal River Nuclear Plant
S. Young, Security Manager

NRC personnel:

J. Munday. Chief, Reactor Projects Branch 3, NRC Region II
J. Riveria-Ortiz, NRC Intern

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

05000302/2003005-01	NCV	Failure to Maintain Two Operable Control Complex Cooling Trains (Section 4OA3)
05000302/2003005-02	NCV	Failure to Protect One Train of Safe Shutdown Equipment From Fire Damage (Section 4OA5)

Closed

05000302/2002005-01	URI	Failure to Protect One Train of Safe Shutdown Equipment From Fire Damage in Accordance with Appendix R, Section III.G.2 (Three Examples) (Section 4OA5)
05000302/2003-001-00	LER	Incorrectly Set Motor Overload Relays Result in Loss of Both Control Complex Chillers (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 4OA5, Other

Procedures

AR-801, Fire System Annunciator Response, Rev. 17
AP-880, Fire Protection, Rev. 15
AP-880, Fire Protection, Rev. 19
Emergency Plan Implementing Procedure, EM-216, Duties of the Fire Brigade, Rev. 23
OP-880A, Appendix “R” Post-Fire Safe Shutdown Information, Rev. 0
OP-880A, Appendix “R” Post-Fire Safe Shutdown Information, Rev. 3

Drawings

E-213-013, 10 CFR 50 Appendix R Protected Raceways, Control Complex El. 108’-0”, Rev. 13
FD-302-661, Make-up & Purification, Sheet 2 of 5, Rev. 74
FD-302-661, Make-up & Purification, Sheet 3 of 5, Rev. 76
FD-302-661, Make-up & Purification, Sheet 4 of 5, Rev. 76

Analyses and Calculations

Crystal River Unit 3 Fire Hazards Analysis, Rev. 11
Crystal River 3 Individual Plant Examination of External Events, Rev. 1