UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

January 23, 2012

Mr. Jon A. Franke
Vice President, Crystal River Nuclear Plant
Crystal River Nuclear Plant (NA2C)
15760 W. Power Line Street
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 – NRC INTEGRATED INSPECTION REPORT 05000302/2011005

Dear Mr. Franke:

On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Crystal River Unit 3. The enclosed inspection report documents the inspection results, which were discussed on January 10, 2012, with you and other 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.

No NRC-identified or self-revealing findings were identified during this inspection.

However, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest this non-cited violation, 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 20555-0001; 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 the Crystal River Unit 3 site.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Document Access and Management 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/

Daniel W. Rich, Branch Chief
Reactor Projects Branch 3
Division of Reactor Projects

Docket No.: 05000302
License No.: DPR-72

Enclosure: Inspection Report 05000302/2011005
w/ Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Jon A. Franke from Daniel W. Rich dated January 23, 2012

SUBJECT: CRYSTAL RIVER UNIT 3 – NRC INTEGRATED INSPECTION REPORT 05000302/2011005

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	05000302
License No.:	DPR-72
Report No.:	05000302/2011005
Licensee:	Progress Energy (Florida Power Corporation)
Facility:	Crystal River Unit 3
Location:	Crystal River, FL
Dates:	October 1, 2011 – December 31, 2011
Inspectors:	T. Morrissey, Senior Resident Inspector N. Childs, Reactor Inspector R. Hamilton, Senior Health Physicist (Sections 2RS1 and 4OA5) G. Kuzo, Senior Health Physicist (Sections 2RS4 and 4OA1) R. Kellner, Health Physicist (Section 2RS5) W. Pursley, Health Physicist (Sections 2RS2 and 2RS3)
Approved by:	D. Rich, Branch Chief Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000302/2011005; 10/01/2011 -12/31/2011; Crystal River Unit 3; Routine Integrated Report.

The report covered a three month period of inspection by resident inspectors and regional health physicists. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

A. NRC Identified & Self-Revealing Findings

No findings were identified

B. Licensee Identified Violations

One 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 (CAP). The violation and the corrective action program tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status:

Crystal River 3 began the inspection period in "No Mode" with the full core off-loaded to the spent fuel pool. The Unit remained in this condition for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

Seasonal Susceptibility: Cold Weather Preparation

a. Inspection Scope

The inspectors evaluated the licensee's readiness for mitigating cold weather to assure that vital systems and components were protected from freezing in accordance with the licensee's administrative instruction AI-513, Seasonal Weather Preparations, Section 4.1, Cold Weather Preparations. The inspectors walked down portions of the areas listed below to check for any unidentified susceptibilities. Operability of heat trace circuits and set points of temperature controls were verified. Condition reports (CRs) were reviewed to verify that the licensee was identifying and correcting cold weather protection issues.

- alternate AC emergency diesel generator EGDG-1C building
- EGDG-1A and 1B rooms
- auxiliary building sea water pump room
- auxiliary building spent fuel cooling pump area

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Equipment Walkdowns

a. Inspection Scope

The inspectors performed walkdowns of critical portions of the selected trains to verify correct system alignment. The inspectors reviewed plant documents to determine the correct system and power alignments and the required positions of select valves and breakers. The inspectors verified that the licensee had properly identified and resolved

equipment alignment problems that could cause initiating events or impact mitigating system availability. The inspectors verified the following four partial system alignments through system walkdowns. Documents used to facilitate the system walkdowns are listed in the attachment.

- service water pumps SWP-1B and SWP-1C, 4160 volt engineered safeguards (ES) bus 3B, and 4160 volt unit auxiliary bus 3B while SWP-1A was out of service for planned maintenance
- emergency diesel generator EGDG-1A, 4160 volt ES bus 3A, 480 volt ES bus 3A, motor control centers (MCCs) 3A1 and 3A3, and "A" train ES battery and associated inverters and battery chargers while "B" train ES battery was out of service for planned maintenance
- EGDG-1A and A train raw water (RW) and decay heat removal (DHR) systems while EGDG-1B and raw water pumps RWP-1, RWP-2B, and RWP-3B were out of service for planned maintenance
- service water pumps SWP-1A and SWP-1C, 4160 volt ES bus 3A, and 4160 volt unit auxiliary bus 3B while SWP-1B was out of service for planned maintenance

b. Findings

No findings were identified.

.2 Complete System Walkdown: Emergency Feedwater (EFW) and Makeup (MU) Systems

a. Inspection Scope

The inspectors conducted detailed reviews of the condition of the emergency feed water (EFW) system (motor-driven EFW pump EFP-1, turbine-driven EFP-2, and diesel-driven EFP-3) and the MU system (makeup pumps 1A, 1B, and 1C). Both systems have been in an extended layup condition since the unit was shut down in 2009. The inspectors reviewed outstanding maintenance work orders (WOs) to verify that deficiencies identified were properly scheduled to be addressed during the extended shutdown period. In addition, the inspectors reviewed open condition reports (CRs) to verify that system problems were being identified and appropriately resolved. The second quarter 2011 EFW and MU system health reports and system walkdown summary reports (MU system report dated October 25, 2011 and EFW system report dated August 22, 2011) were reviewed to ensure equipment issues identified were properly addressed in the corrective action program (CAP). The inspectors completed walkdowns of both systems to verify deficiencies had been documented in the licensee's CAP.

b. Findings

No findings were identified.

.3 Complete System Walkdown: "B" Train Emergency Diesel and 4160 V Systems

a. Inspection Scope

The inspectors conducted a detailed walkdown and review of the alignment and condition of the emergency diesel generator EGDG-1B and its associated 4160 volt engineered safeguards (ES) Bus 3B. The inspectors utilized licensee procedures, as well as licensing and design documents to verify that the system (i.e., pump, valve, and electrical) alignment was correct. During the walkdown, the inspectors also verified that the pumps, valves, and piping associated with the diesel did not exhibit leakage that would impact its function; major portions of the systems and components were correctly labeled; hangers and supports were installed and functional; and essential support systems were operational. In addition, pending design and equipment issues were reviewed to determine if the identified deficiencies impacted the system functions. The third quarter 2011 EGDG and AC distribution system health reports were reviewed to ensure equipment issues identified were properly addressed in the CAP. A review of open WOs and CRs was performed to verify that the licensee had appropriately characterized and prioritized equipment problems for resolution in the corrective action program. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

Fire Area Walkdowns

a. Inspection Scope

The inspectors walked down accessible portions of the plant to assess the licensee's implementation of the fire protection program. The inspectors checked that the areas were free of transient combustible material and other ignition sources. Also, fire detection and suppression capabilities, fire barriers, and compensatory measures for fire protection problems were verified. The inspectors checked fire suppression and detection equipment to determine whether conditions or deficiencies existed which could impair the function of the equipment. The inspectors selected the areas based on a review of the licensee's probabilistic risk assessment. The inspectors also reviewed the licensee's fire protection program to verify the requirements of Final Safety Analysis Report (FSAR) Section 9.8, Plant Fire Protection Program, were met. Documents reviewed are listed in the Attachment. The inspectors toured the following five areas important to reactor safety:

- make-up pump cubicles
- spent fuel pool pump and heat exchanger areas
- alternate AC emergency diesel generator EGDG-1C building

- “A” and “B” train vital battery rooms
- “B” train building spray and decay heat removal vault

b. Findings

No findings were identified.

1R06 Flood Protection Measures

Internal Flood Protection

a. Inspection Scope

The inspectors selected five manholes and bunkers for inspection that are subject to flooding and contain equipment important for the safe operation of the plant. The manholes and bunkers listed below were inspected to verify cables were not submerged in water, cables were intact, and cable support structures were adequate to perform their functions. Documents reviewed are listed in the attachment.

- manhole E-2 (southeast berm; circulating water pump (CWP) power cables and intake systems control/alarm circuits)
- manhole E-3 (southwest berm; CWP power cables and intake systems control/alarm circuits)
- manhole E-7 (intake; CWP power cables and intake systems control/alarm circuits)
- bunker SB-1 (bridge east end discharge canal; ES DC control power for switchyard breakers)
- bunker SB-2 (bridge east end discharge canal; ES DC control power for switchyard breakers)

b. Findings

No findings were identified.

1R07 Heat Sink Performance

Annual Review

a. Inspection Scope

The inspectors observed maintenance personnel perform heat exchanger inspections and cleaning for the service water heat exchanger SWHE-1D. The inspectors reviewed the as-found conditions when the heat exchanger was opened for inspection and tube cleaning to verify the heat exchanger was in an acceptable condition to perform its design function. The documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

On October 24, 2011, the inspectors observed and assessed licensed operator crew response and actions for licensed operator simulator evaluated session SES-140, which involved a reactor coolant system (RCS) leak, a dropped control rod, a loss of all main feed water, a reactor trip, and a loss of all emergency feed water. The plant degraded to a point where the crew entered an Unusual Event emergency declaration, followed by an Alert emergency declaration. The inspectors observed the operators' use of the following procedures: emergency operating procedures EOP-02, Vital System Status Verification, and EOP-04, Inadequate Heat Transfer; and abnormal procedures AP-520, Loss of RCS Coolant or Pressure, and AP-545, Plant Runback.

On November 7, 2011, the inspectors observed and assessed licensed operator crew response and actions for licensed operator simulator non-evaluated session SES-154, which involved an ES channel RCS pressure instrument failure, feedwater pump thrust bearing degradation followed by a feedwater pump trip, a once-through steam generator (OTSG) overfeed and excessive heat transfer event, and a main steamline break (MSLB). The plant degraded to a point where the crew entered an Alert emergency declaration. The inspectors observed the operators' use of the following procedures: operating procedure OP-507, Operation of the Engineered Safeguards (ES), Reactor Protection (RPS), and Anticipated Transient without Scram (ATWS) Systems; emergency operating procedures EOP-02, Vital System Status Verification, and EOP-05, Excessive Heat Transfer; and abnormal procedures AP-510, Rapid Power Reduction, and AP-545, Plant Runback.

The operators' actions were verified to be in accordance with the procedures mentioned in the above paragraphs. Event classification and notifications were verified to be in accordance with emergency management procedure EM-202, Duties of the Emergency Coordinator. The simulator instrumentation and controls were verified to closely parallel those in the actual control room. The inspectors attended the crew critique and evaluation to verify the licensee had entered any adverse conditions into the corrective action program. The inspectors evaluated the following attributes related to crew performance:

- clarity and formality of communication
- ability to take timely action to safely control the unit
- prioritization, interpretation, and verification of alarms
- correct use and implementation of abnormal, emergency operating, and emergency plan implementing procedures

- control board operation and manipulation, including high-risk operator actions
- oversight and direction provided by supervision, including ability to identify and implement appropriate technical specification actions, regulatory reporting requirements, and emergency plan classification and notification
- overall crew performance and interactions

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing routine maintenance activities. The review included an assessment of the licensee's practices associated with the identification, scope, and handling of degraded equipment conditions, as well as common cause failure evaluations and the resolution of historical equipment problems. For those systems, structures, and components within the scope of the Maintenance Rule (MR) per 10 CFR 50.65, the inspectors verified that reliability and unavailability were properly monitored and that 10 CFR 50.65 (a)(1) and (a)(2) classifications were justified in light of the reviewed degraded equipment condition. Documents reviewed are listed in the attachment. The inspectors conducted this inspection for the following one equipment issue:

- CR 467513, B emergency diesel room ventilation low flow alarm (functional failure resulting in placing the system in MR (a)(1))

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed one CR to verify that functionality of the system important to safety was properly established, that the affected components or system remained capable of performing its intended design functions, and that no unrecognized increase in plant or public risk occurred. The inspectors assessed whether the functionality assessment of the system and its components was consistent with the improved technical specifications (ITS), the FSAR, 10 CFR Part 50 requirements, and when applicable, NRC Inspection Manual Part 9900, Technical Guidance - Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety. The inspectors reviewed

licensee CRs and procedures to verify that operability and functionality issues were being identified at an appropriate threshold and documented in the corrective action program, consistent with 10 CFR 50, Appendix B requirements as well as licensee corrective action procedure CAP-NGGC-0200, Condition Identification and Screening Process. Additional documents reviewed are listed in the attachment.

- CR 494836, “B” raw water (RW) flume silting exceeded expectations

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors either witnessed or reviewed post-maintenance test procedures and test activities, as appropriate, for selected risk significant systems to verify whether: (1) testing was adequate for the maintenance performed, (2) acceptance criteria were clear, and adequately demonstrated operational readiness consistent with design and licensing basis documents, (3) test instrumentation had current calibrations, range, and accuracy consistent with the application, (4) tests were performed as written with applicable prerequisites satisfied, and (5) equipment was returned to the status required to perform its safety function. The five post-maintenance tests reviewed are listed below:

- post maintenance testing of vital bus transformer VBTR-4A utilizing work order (WO) instructions after performing planned maintenance per WO 1599825

- surveillance procedure SP-344A, RWP-2A, SWP-1A and Valve Surveillance, after performing planned maintenance on SWP-1A per WOs 1784305 and 1652823

- SP-344B, RWP-2B, SWP-1B and Valve Surveillance, after performing planned maintenance on SWP-1B per WO 1648211

- SP-354B, Monthly Functional Test of the Emergency Diesel Generator EGDG-1B, after planned maintenance on diesel jacket water pump DJP-2 per WO 1984578

- emergency feedwater pump EFP-3 operation per OP-450, Emergency Feedwater System, after performing the planned maintenance on the following components: DAV-22 (EFP-3 Left Bank Air Start Valve) per WO 1548138, DAV-23 (EFP-3 Left Bank Starting Air Solenoid) per WO 1656871, and DLP-14 (AC Power Circulating Oil Pump) per WO 1912354

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities

Steam Generator Replacement Refueling Outage (RFO16)

a. Inspection Scope

On September 26, 2009, the Unit was shut down for a steam generator replacement refueling outage. The previous quarter's NRC inspection activities in this area were documented in NRC integrated inspection report 05000302/2011004. To verify the licensee was managing fatigue, the inspectors verified that the outage shift schedule allowed for the minimum days off in accordance with 10 CFR Part 26. In addition, the inspectors determine there were no fatigue waiver requests since this aspect was last reviewed during the 2010 fourth quarter inspection period. The inspectors reviewed the circumstances associated with one fatigue self-declaration. Three fatigue assessments were reviewed to verify the assessments met 10 CFR Part 26 requirements. During this quarter, the inspectors reviewed the refueling outage activities listed below to verify the activities were properly implemented. Documents reviewed are listed in the attachment.

- outage related risk assessment monitoring
- controls associated with reactivity management of the spent fuel pool (SFP)
- controls associated with electrical and mechanical alignments for those systems used to support spent fuel pool cooling
- implementation of equipment clearances
- foreign material exclusion controls associated with the SFP during containment repair activities
- work controls associated with the protection of SFP cooling and support systems from maintenance activities

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors either observed or reviewed the five surveillance tests listed below to verify that ITS surveillance requirements were followed and that test acceptance criteria were properly specified. The inspectors verified that proper test conditions were established as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria had been met. Additionally, the inspectors also verified that equipment was properly returned to service and that proper testing was specified and conducted to ensure that the equipment could perform its intended safety function following maintenance or as part of surveillance testing.

In-Service Test:

- SP-375A, Chilled Water Pump CHP-1A and Valve Surveillance
- SP-340A, RWP-3A, DCP-1A and Valve Surveillance

Surveillance Test:

- SP-311, Diesel Fuel Transfer Pump Surveillance (DFP-1B only)
- SP-520, Weekly Battery Check
- SP-907B, Monthly Functional Test of 4160V ES Bus "B" Undervoltage and Degraded Grid Relaying

b. Findings

No findings were identified.

2. RADIATION SAFETY (RS)

Cornerstones: Occupational Radiation Safety (OS) and Public Radiation Safety (PS)

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

Hazard Assessment and Instructions to workers: During facility tours, the inspectors directly observed labeling of radioactive material and postings for radiation areas and high radiation areas (HRAs) established within the radiologically controlled area (RCA). The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed and verified survey records for several plant areas including surveys for alpha emitters, airborne radioactivity, and gamma radiation surveys with a range of dose rate gradients. The inspectors also discussed changes to plant operations with Radiation Protection (RP) supervisors that could contribute to changing radiological conditions since the last inspection. The inspectors attended a pre-job discussion and reviewed several radiation work permits (RWP) to assess communication of radiological control requirements and current radiological conditions to workers.

Hazard Control and Work Practices: The inspectors evaluated access barrier effectiveness for selected Locked High Radiation Area (LHRA) and Very High Radiation Area (VHRA) locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with RP supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool were reviewed and discussed. Established radiological controls (including airborne controls) were evaluated for selected tasks including work in auxiliary building HRAs, and radwaste processing and storage. In addition, licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations were reviewed and discussed.

Occupational workers' adherence to selected RWPs and RP technician (RPT) proficiency in providing job coverage was evaluated through direct observations and interviews with licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results for reviewed RWPs.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Problem Identification and Resolution: CRs associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure CAP-NGGC-0200, Condition Identification and Screening Process. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP activities were evaluated against the requirements of FSAR Sections 11 and 12; ITS Section 5.6, Procedures, Programs and Manuals; Section 5.8, High Radiation Area; 10 CFR Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and NRC IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in Section 2RS1 of the Attachment.

The inspectors completed all specified line-items detailed in IP 71124.01 (sample size of 1).

b. Findings

No findings were identified.

2RS2 As Low As Reasonably Achievable (ALARA)

a. Inspection Scope

ALARA Program Status The inspectors reviewed and discussed plant exposure history and current trends including the site's three-year rolling average (TYRA) collective exposure history for calendar year (CY) 2008 through CY 2010. Current and proposed activities to manage site collective exposure and trends regarding collective exposure were evaluated through review of previous TYRA collective exposure data. The impact of the site being in a protracted outage due to required containment building repairs was discussed with ALARA personnel and Radiation Protection Management. The challenge of shifting focus from managing the collective exposure of radiologically significant work involving a few workers to a large population receiving relatively minor individual exposures was also discussed. Current ALARA program guidance and recent changes,

as applicable, regarding estimating and tracking exposure were discussed and evaluated

Radiological Work Planning There was very little radiologically significant work in progress or planned for the period the inspection team was on site. There were no jobs that exceeded the threshold for requiring a formal ALARA plan at the time but the inspectors reviewed the radiation work permits for the most radiologically significant five jobs including entry into an infrequently accessed area in the reactor cavity.
For the selected tasks, the inspectors reviewed dose mitigation actions and the established dose goals. During the inspection, use of remote technologies including teledosimetry and remote visual monitoring were verified as specified in RWP or procedural guidance. Collective dose data for selected tasks were compared with estimates and, where applicable, changes to established estimates were discussed with responsible licensee ALARA planning representatives. The licensee's use of a reference outage for estimating plant exposures and decreasing or increasing the plants dose goals based on trend point survey data was reviewed.

Verification of Dose Estimates and Exposure Tracking Systems The inspectors reviewed select radiation work permits and discussed assumptions with responsible planning personal regarding the bases for the current estimates. The licensee's on-line RWP cumulative dose data bases used to track and trend current personal and cumulative exposure data and/or to trigger additional ALARA planning activities in accordance with current procedures were reviewed and discussed.

Source Term Reduction and Control The inspectors reviewed historical dose rate trends for shutdown chemistry, cleanup, and resultant chemistry and RP trend-point data. The inspectors reviewed the correlation of the exposure trends to the various exposure reduction initiatives taken over the years with historical data. The inspectors discussed the source term reduction activities that had been performed as a result of being in a long term outage as well as the impacts of significant decay of beta-gamma emitting nuclides over the last two years of outage.

Problem Identification and Resolution The inspectors reviewed and discussed selected CRs associated with ALARA program implementation. The reviewed items included CRs, self-assessments, and quality assurance audit documents. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedure CAP-NGGC-0200, Condition Identification and Screening Process.

The licensee's ALARA program activities and results were evaluated against the requirements of FSAR Sections 11 and 12; ITS Section 5.6, Procedures, Programs and Manuals; Section 5.8, High Radiation Area; 10 CFR Parts 19 and 20; and approved licensee procedures. Records reviewed are listed in Sections 2RS1 and 2RS2 of the report Attachment.

b. Findings:

No findings of significance were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

a. Inspection Scope:

Engineering Controls The inspectors reviewed the use of temporary and permanent engineering controls to mitigate airborne radioactivity inside the auxiliary building, reactor building and radioactive waste processing building. The inspectors reviewed and discussed the use of negative pressure units (NPUs) and vacuums to control contamination, observed physical controls in place to prevent unauthorized use of NPUs and vacuums, and reviewed NPU testing records. The inspectors also reviewed ventilation flow, charcoal, and High Efficiency Particulate Air (HEPA) filter test records for the Control Room Emergency Filter and Reactor Building Ventilation Systems. The inspectors evaluated the effectiveness of continuous air monitors and air samplers placed in work area "breathing zones" to provide indication of increasing airborne levels. In addition, plant guidance and its implementation for the monitoring of potential airborne beta-gamma and alpha-emitting radionuclides were reviewed and discussed with licensee representatives.

Respiratory Protection Equipment The inspectors reviewed the use of respiratory protection devices to limit the intake of radioactive material. This included review of program guidance for issuance and use of respiratory protection devices, discussion with responsible licensee representatives, and review of devices used for routine tasks and devices stored for use in emergency situations. Selected whole-body count (WBC) routine and investigative analysis results for occupational workers were reviewed and discussed. The inspectors toured selected onsite air compressors available for supplying breathing air for and filling of Self-Contained Breathing Apparatus (SCBA) bottles and reviewed recent air quality sampling results. Training, fit testing, and medical qualifications for selected HP, maintenance, operations and support staff were reviewed. The inspectors reviewed the current status, operability and availability of selected SCBA equipment maintained within the control room and fire brigade staging facilities. This review included material condition, number of units, number of spare masks and bottles, the last two years maintenance records and compliance with various regulatory requirements.

SCBA for Emergency Use: Maintenance activities for selected respiratory protective equipment, e.g., compressed gas cylinders, regulators, valves, and hose couplings, by certified vendor technicians was evaluated for selected SCBA units. For selected control room operators, the inspectors discussed annual hands-on SCBA training activities including donning, doffing and functionally checking SCBA equipment and availability of corrective lens, as applicable, for on-shift personnel.

Problem Identification and Resolution CRs associated with airborne radioactivity mitigation and respiratory protection were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure CAP-

NGGC-0200, Condition Identification and Screening Process. Documents reviewed are listed in section 2RS3 of the Attachment to this report.

Licensee activities associated with the use of engineering controls and respiratory protection equipment and airborne radioactivity monitoring and controls were evaluated against details and requirements documented in FSAR Sections 11 and 12; ITS Section 5.6, Procedures, Programs and Manuals; 10 CFR Part 20; RG 8.15, Acceptable Programs for Respiratory Protection; and approved licensee procedures. Documents reviewed are listed in Section 2RS3 of the report Attachment.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment

a. Inspection Scope

The inspectors evaluated current Radiation Protection (RP) program guidance and its implementation for monitoring and assessing occupational workers' internal and external radiation exposure. The review included recent changes to program guidance and equipment, as applicable; quality assurance activities, results, and responses to identified issues; and individual dose results for selected occupational workers.

External Dosimetry. The inspectors reviewed and discussed RP program guidance for monitoring external and internal radiation exposures of occupational workers. The inspectors verified National Voluntary Laboratory Accreditation Program (NVLAP) certification data and discussed program guidance for storage, processing and results for dosimeters currently in use. Licensee evaluations of biases identified between electronic dosimeter (ED) and thermoluminescent dosimeter (TLD) data were reviewed and discussed in detail.

Internal Dosimetry. Program guidance, instrument detection capabilities, and select results for the internally deposited radionuclides were reviewed in detail. The inspectors evaluated licensee follow-up of *in vivo* monitoring results and dose assessments for selected workers involved in contamination events having the potential for internal deposition of radioactive material. In addition, the current licensee analysis capabilities for the collection and analysis of *in vitro* samples were reviewed and discussed.

Special Dosimetric Situations: The inspectors reviewed monitoring conducted and dose results for declared pregnant workers for calendar year 2010 and year-to-date for CY 2011. The methodology and results of monitoring occupational workers within non-uniform external dose fields were discussed. In addition, the adequacy of dosimetry program guidance and its implementation for shallow dose assessments and supporting calculations for personnel involved in selected contamination events were evaluated. Program guidance for collection and analysis of tritium bioassay samples for spent fuel pool diving operations and for potential intake of alpha-emitting radionuclides were reviewed and discussed. RP staff proficiency involved in conducting skin dose assignment, Whole Body Counting equipment operations, and internal dose evaluations were evaluated through direct interviews, onsite observations of work activities, and review and discussion of completed records and supporting data with responsible RP staff members

Corrective Action Program (CAP) Review The inspectors reviewed and discussed selected CAP documents associated with occupational dose assessment. The reviewed items included CAP Action Request (AR) and self-assessment documents. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedure CAP-NGGC-0200, Condition Identification and Screening Process.

RP program occupational dose assessment guidance and activities were evaluated against the requirements of the FSAR Section 11; ITS Sections 5.6.1, Procedures, Programs and Manuals, and 5.8, High Radiation Area; 10 CFR Parts 19 and 20; and approved licensee procedures. Records reviewed are listed in Sections 2RS1, 2RS4, and 4OA1 of the report Attachment.

The inspectors completed all specified line-items detailed in Inspection Procedure (IP) 71124.04.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation

a. Inspection Scope

Radiation Monitoring Instrumentation: During tours of the auxiliary building, SFP areas, and RCA exit point, the inspectors observed installed radiation detection equipment including the following instrument types: area radiation monitors (ARM), continuous air monitors (CAM), liquid and gaseous effluent monitors, personnel contamination monitors (PCM), small article monitors (SAM), and portal monitors (PM). The inspectors observed the physical location of the components, noted the material condition, and compared sensitivity ranges with FSAR requirements.

In addition to equipment walk-downs, the inspectors observed source checks and alarm setpoint testing of various portable and fixed detection instruments, including ion chambers, teletector, PCM, SAM, and PM. For the portable instruments, the inspectors observed the use of a high-range calibrator and discussed periodic output value testing with a radiation protection technician. The inspectors reviewed the last two calibration records and evaluated alarm setpoint values for selected ARM, PCM, PM, SAM, effluent monitors, laboratory counting systems, and WBC systems. This included a sampling of instruments used for post-accident monitoring such as containment high-range ARMs, and effluent monitor high-range noble gas and iodine channels. The inspectors discussed and reviewed calibration data, and laboratory quality assurance and independent cross-check analysis results for whole-body counter equipment. The radioactive source used to calibrate the WBC equipment was evaluated for traceability to national standards. Staff proficiency in implementing WBC analyses was evaluated through review of applicable data and interviews with responsible staff. Radioactive sources used to calibrate selected ARMs and effluent monitors were evaluated for traceability to national standards. Calibration stickers on portable survey instruments and air samplers were noted during inspection of storage areas for “ready-to-use” equipment. The most recent 10 CFR Part 61 analysis for DAW was reviewed to determine if calibration and check sources are representative of the plant source term. The inspectors also reviewed countroom quality assurance records for beta scaler counting equipment.

Effectiveness and reliability of selected radiation detection instruments were reviewed against details documented in the following: 10 CFR Part 20; NUREG-0737, Clarification of TMI Action Plan Requirements; ITS Section 3.3 and 5.6; FSAR Chapters 11 and 12; and applicable licensee procedures. Documents reviewed during the inspection are listed in section 2RS5 of the report Attachment.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with radiological instrumentation. The reviewed items included CRs, self-assessment, and quality assurance audit documents. The inspectors evaluated the licensee’s ability to identify, characterize, prioritize, and resolve identified issues in accordance with licensee procedures CAP-NGGC-200, Condition Identification and Screening Process”, and CAP-NGGC-205, Condition Evaluation and Corrective Action Process. Documents reviewed are listed in section 2RS5 of the Attachment to this report.

The inspectors completed 1 sample as required by IP 71124.05.

b. Findings:

No findings were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

Occupational Radiation Safety Cornerstone The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from October 1, 2010, through September, 30, 2011. For the assessment period, the inspectors reviewed ED alarm logs and selected CRs related to controls for exposure significant areas. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in sections 2RS1, 2RS4, and 4OA1 of the report Attachment.

Public Radiation Safety Cornerstone The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from October 1, 2010, through September 30, 2011. For the assessment period, the inspectors reviewed cumulative and projected doses to the public and CRs related to Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in section 4OA1 of the report Attachment.

The inspectors completed two of the required samples specified in IP 71151.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program (CAP). This review was accomplished by attending daily plant status meetings, interviewing plant operators and applicable system engineers, and accessing the licensee's computerized database.

b. Findings

No findings were identified.

.2 Annual Sample Review

a. Inspection Scope

The inspectors selected condition report (CR) 467392 for a more in-depth review of the circumstances surrounding and decisions made after a malfunction of the fuel handling crane (FHCR-1) fuel hoist. On May 22, 2011, while performing core off-load activities, a loud noise was heard from the FHCR-1 fuel hoist while withdrawing a fuel assembly from the reactor core. After some discussion and initial troubleshooting activities, the fuel assembly was left suspended approximately 3 feet above the core plate. A temporary cable restraint system was installed on May 24, 2011, and the licensee subsequently secured the refueling senior reactor operator (SRO) position believing they were no longer in a core alteration. Several hours later, after determining that the suspended fuel assembly was considered to be a core alteration, the licensee re-stationed an SRO at FHCR-1.

CR 467392 was initially classified as significance level two requiring an apparent cause evaluation, but was later reclassified as significance level one requiring a root cause evaluation. The root cause evaluation focused on the leadership behaviors and decisions made surrounding the event. The inspectors checked that the issues had been completely and accurately identified in the licensee's corrective action program; safety concerns were properly classified and prioritized for resolution; the root cause evaluation was sufficiently thorough; and appropriate corrective actions were initiated. The inspectors also evaluated the CR using the requirements of the licensee's CAP as delineated in corrective action procedure CAP-NGGC-0200, Condition Identification and Screening Process. Additional documents reviewed are listed in the attachment.

b. Findings and Observations

No NRC-identified or self-revealing findings were identified; however, the inspectors had several observations. The inspectors concurred with the licensee's conclusions that the refueling procedures did not provide sufficient guidance when it came to consulting departments outside of the refueling team when equipment issues arose. The procedures gave the refueling supervisor broad authority to make troubleshooting decisions without consulting management or licensing. This is of particular concern because malfunctions of fuel handling equipment could potentially result in fuel damage or cause the licensee to be in violation of regulations.

The refueling SRO did not initially notify the shift manager or others outside of the refueling team prior to allowing the refueling contractor to perform initial troubleshooting activities on FHCR-1. Considering the damage identified during inspection of the gear box after the event, it is possible that additional troubleshooting activities could have resulted in a dropped fuel assembly. The refueling procedures in place at the time allowed the refueling SRO to make the decision to troubleshoot without consulting outside departments. Another issue the inspectors observed was that site licensing was not informed of the decision to secure the refueling SRO until several hours after the

decision was made. If licensing had been consulted early on, the decision to secure the refueling SRO may not have occurred. The inspectors verified that the licensee initiated the appropriate corrective actions to prevent recurrence of this issue or similar issues.

The inspectors noted that the root cause evaluation of this incident was not completed until October 10, 2011, almost five months after the incident occurred. The licensee initiated CR 487174 which addressed, in part, the role that leadership behaviors played in the delayed completion of the FHCR-1 root cause evaluation. This delay did not affect the safety significance of the condition since immediate actions were taken to station the refueling SRO, repair the failed crane components, and secure and lower the fuel assembly.

The inspectors determined that the licensee's decision to secure the refueling SRO position while the fuel assembly was suspended (core alteration) was a performance deficiency. The finding was determined to be of greater than minor significance because it affected the barrier integrity cornerstone objective to provide reasonable assurance that physical barriers protect the public from radionuclide releases caused by accidents or events. Specifically, leaving the suspended fuel assembly unsupervised, even though secured by a temporary cable restraint system, would reduce the level of assurance that fuel damage would be prevented. The licensee re-stationed an SRO at FHCR-1 once it was determined that the suspended fuel assembly was considered to be a core alteration. A licensee identified violation of Improved Technical Specification 5.6.1.1a was assessed by the inspectors and is documented in Section 4OA7 of this inspection report.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during normal and off-normal plant working hours. These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings were identified.

.2 Steam Generator Replacement Project and Containment Wall Repair (IP 50001)

a. Inspection Scope

During this quarter, the inspectors observed and monitored the licensee's actions associated with additional radial anchor installation in containment building Bays 2-3, 4-5, and 6-1. The additional anchors were installed to limit the likelihood of any additional delaminations of the containment building during future repair activities. The inspectors observed the installation of several anchors to verify they were being installed per approved work instructions. A summary of NRC oversight of activities related to the Crystal River Unit 3 containment building is available on the NRC website at http://nrcweb:400/info-finder/reactor/cr3/summary-public-documentation.html

b. Findings

No findings were identified.

.3 Institute of Nuclear Power Operations (INPO) Operations Training Accreditation Report Review

The inspectors reviewed the final INPO operator training accreditation report, dated February 17, 2011. The report did not identify any significant licensee performance issues that had not been previously addressed or reviewed by the NRC.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On January 10, 2012, the resident inspectors presented the inspection results to Mr. J. Franke, Site Vice President, and other members of licensee management. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and was a violation of NRC requirements which met the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation:

- Improved Technical Specification 5.6.1.1a requires that written procedures recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, be established, implemented, and maintained. RG 1.33, Appendix A, includes general operating procedures for Refueling & Core Alterations in the list of recommended procedures. Plant Operating Manual FP-601A, Operation of the Main Fuel Handling Bridge FHCR-1, Section 3.2.22, requires, in part, that a refueling SRO be stationed during a core alteration. Contrary to this requirement, the licensee secured the

refueling SRO during activities determined to be a core alteration for approximately seven-hours on May 24, 2011. The licensee entered this issue into their CAP as CR 467392. The significance of the finding was determined using Manual Chapter 0609, “Significance Determination Process”, Appendix G, Checklist 4 (PWR Refueling Operation, RCS level > 23 ft) and determined to be of very low safety significance (Green), because it did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. Additional information regarding this NCV is discussed in Section 4OA2 of this inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

J. Franke, Vice President, Crystal River Nuclear Plant
J. Swartz, Director, Site Operations
B. Akins, Superintendent, Radiation Protection
S. Cahill, Director, Engineering
F. Dola, Nuclear Oversight Superintendent
P. Dixon, Manager Training
D. Douglas Manager, Maintenance
D. Herrin, Licensing, Lead Engineer
T. Hobbs, Plant General Manager
L. Hughes, Chemistry Manager
J. Huegel, Manager, Nuclear Oversite
C. Poliseno, Supervisor, Emergency Preparedness
D. Westcott, Supervisor, Licensing
R. Wiemann, Manager, Systems Engineering
B. Wunderly, Manager, Operations

NRC personnel:

D. Rich, Branch Chief, Division of Reactor Projects

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

OP 707, Operation of the ES Emergency Diesel Generators
OP-700A, 6900, 4160, and 480 Volt AC Buses
OP-700B, 480 Volt AC Motor Control Centers
OP-408, Nuclear Services Cooling System
OP-404, Decay Heat Removal System

Section 1R05: Fire Protection

Procedures

AI-2205A, Pre Fire Plan – Control Complex
AI-2205C, Pre Fire Plan – Auxiliary Building
AI-2205F, Pre Fire Plan – Miscellaneous Buildings and Components

Condition Reports

492961, NRC Found Pre-Fire Plan Typo

Section 1R06: Flooding

Work Orders

1845101-02, Group 2 Manhole and Handhole Inspections
1926602-01, Miscellaneous Sump Pump Maintenance and Operational Check

Section 1R07: Heat Sink Performance

Procedures

PM-275, General Preventive Maintenance

Work Orders

1948176-09. Shoot and Clean SWHE-1D

Section 1R12: Maintenance Effectiveness

Condition Reports
455251, Low flow alarm in when fans running
466569, No CR initiated for as-found failed pressure switches

Work Orders

1905067, Low flow AHF-22C, calibrate/check switch
1918720, AHF-22D, low flow alarm
1940712, B emergency diesel room, troubleshoot low flow alarm
478031, AHF-22D has no power indicated locally or in control room
478068, Loss of control power MTMC-5-2D due to incorrect fuses

Section 1R15: Operability Determinations and Functionality Assessments

Work Orders
1414478, Rebuild Traveling Screen CWTS-2

Procedures
CAP-NGGC-0205, Condition Evaluation and Corrective Action Process
OPS-NGGC-1305, Operability Determinations

Section 1R19: Post Maintenance Testing

Condition Reports

494911, DJP-2 Flange Leak & Seal Leakage during Coolant Fill
495231, EGDG-1 Dresser Coupling Leak
498510, OP-450 Enclosure 3 could not be performed as written

Section 1R20: Refueling and Outage Activities

Procedures
AI-504, Guidelines for Cold Shutdown and Refueling
WCP-102, Outage Risk Assessment

Section 2RS1: Radiological Hazards Assessment

Procedures and Guidance Documents
DOS-NGGC-0006, Personnel Exposure Investigations, Rev. 14
HPP-112, Hard to Detect Radionuclides Analyses, Rev.2
HPP-216, Diving Operations in Radiological Environments, Rev .11
HPP-219, RP Failed Fuel Action Plan, Rev.10
HPP-221, High Radiation Area, Locked High Radiation Area, and Very High Radiation Area Controls, Rev.12
HPP-250, Control of Radiography Operations, Rev. 8
HPP-307, Unmonitored Individual RCA Access, Rev. 8
HPS-NGGC-0003, Radiological Posting, Labeling and Surveys, Rev. 15
HPS-NGGC-0014, Radiation Work Permits, Rev. 10
HPS-NGGC-0016, Access Control, Rev. 8
HPS-NGGC-0023, Remote Radiological Monitoring, Rev. 4
HPS- NGGC-0024, Alpha Monitoring Guidelines, Rev. 4

Records and Data Reviewed
RWPs 4701, 4710, 4731, 4747, 6223 and 6224

Corrective Action Program Documents
Quick Hit Self Assessment Report 382005, Electronic Dosimeter Setpoints, Dated 2/19/10

Section 2RS2: Occupational ALARA Planning and Controls

Procedures and Guidance Documents
ADM-NGGC-0105 - ALARA Planning, Revision 10
AI-1602 - ALARA Committee, Revision 10

Records and Data Reviewed
Departmental Dose results for current year through October
ALARA Work Plan #11-2013, HAM, Fuel, Incores, 04-19-11
In-Progress ALARA Review of AWP#11-2013, 05-30-2011
In-Progress ALARA Review of AWP#11-2013, 10-07-2011
CR3 Daily Outage Dose Report, 11-14-2011
CR3 RWP ALARA Task Totals, October 2011
Current active RWPs and Associated ALARA tasks, including dose, and dose rate setpoints.
HPP-112 - Radionuclide Analysis Summary Sheet, dated, 11-19-2010
Benchmark #439668 - Radiation Dose Reduction/ALARA Program, Conducted: January 17-21, 2011
RP Survey #11-11-0107, Rx Bldg, all elevations, 10-28-11
RP Survey #s 11-11-0379, 11-11-0406, 11-11-0011, 11-11-0029, & 11-11-0030, dated 10-28 through 11-02-11 for RCP-1A Seal work.

CAP Documents
AR 00486036
AR 00458392
AR 00476851
AR 00471572

Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

Procedures, Guidance Documents, and Manuals
HPS-NGGC-0024 - Alpha Monitoring Guidelines - Revision 4
HPP-502 - Respiratory Equipment Inspection and Maintenance - Revision 25

Records and Data
Quarterly PMs on Fume Hoods, 1st Qtr 2010, 2nd Qtr 2010, 3rd Qtr 2010, 4th Qtr 2010, 1st Qtr 2011, 2nd Qtr 2011.
WO# 219482-01 – Model Work Order Instructions – Fume Hoods – 10-17-11
WO# 219482-01 – Model Work Order Instructions – Fume Hoods – 08-02-11
WO# 219482-01 – Model Work Order Instructions – Fume Hoods – 04-19-11
Operations Respiratory requirements Training Matrix – 11-16-2011
Current status of Medical Qualification dates for Emergency Response personnel

Progress Energy Florida – MSA M7 MMR Certification, Registration No. M-2942, expiration 03-30-14.
MSA SCBA Maintenance Training Session Roster, 03-09-2011
CR3 Lesson Plan GNP0012C, MAS Firehawk SCBA Users Practical Training
Annual SCBA Flow Test, 05-10-2010, as required per HPP-502 - Respiratory Equipment Inspection And Maintenance
Annual SCBA Flow Test, 05-16-2011, as required per HPP-502 - Respiratory Equipment Inspection And Maintenance.
2010 & 2011 Complete SCBA Test for SCBA #s AOAA352508, AOAA352505, AOAA352633, AOAA351562, dated 04-14-2010 & 04-07-11..
In-service Respiratory Inspection Report, as required per Hpp-502, Dated 02-11-2011
Survey # IH-07-07-0016, Leak Test results of HEPA Ventilation Units, dated 04-13-2011.

CAP Documents
AR 00396694
AR 00381904
AR 00495887
AR 00500049

Section 2RS4: Occupational Dose Assessment

Procedures and Guidance Documents
CAP-NGGC-0200, Condition Identification and Screening Process, Revision (Rev.) 34
RSP-101, Basic Radiological Safety Information and Instructions for Radiation Workers, Rev. 52
HPP-216, Diving Operations in Radiological Environments, Rev. 11
HPP-219, RP Failed Fuel Action Plan, Rev. 10
HPS-NGGC-0024, Alpha Monitoring Guidelines, Rev. 4
HPS-NGGC-0014, Radiation Work Permits, Rev. 10
DOS-NGGC-0002, Dosimetry Issuance, Rev. 27
DOS-NGGC-0005, Skin Dose From Contamination, Rev. 11
DOS-NGGC-0007, Internal Dose Calculations, Rev. 13
DOS-NGGC-0008, In Vitro Bioassay, Rev. 11
HPS-NGGC-0013, Personnel Contamination Monitoring, Decontamination, and Reporting, Rev. 14

Records and Data Reviewed
National Voluntary Laboratory Accreditation Program (NVLAP) Scope of Accreditation to ISO/IEC 17025:2005, NVLAP Lab Code 100517-0, 2011-10-01, through 2012-09-01
National Voluntary Laboratory Accreditation Program (NVLAP) Scope of Accreditation to ISO/IEC 17025:2005, NVLAP Lab Code 100517-0, 2010-10-01, through 2011-09-01
TLD/EPD Differences: September 01, 2010, through August 31, 2011
Quarterly TLD versus ED Readings: January 1, 2009, through August 31, 2011
CR3 ISFSI Dose Rate Evaluation, Calculation N09-0001,
Total Exposure – Positive Bioassay Data, October 01, 2009, through October 19, 2011
Personnel Contamination Event Log: October 1, 2009, through November 1, 2011
Personnel Contamination Event Number (PCE) 10-008, Facial Contamination
PCE 11-009, Facial Contamination

PCE 11-005, Facial Contamination

Corrective Action Program (CAP) Documents
Quick Hit Self-Assessment Report Number 382005, Electronic Dosimetry Set-Points,
Action Request Number (AR) 00359577, Electronic Dosimeter Failure
AR 00370176, Worker Entered Reactor Building Without Electronic Dosimeter
AR 00378114, Two Insulation Workers Received Level 1 PCEs
AR 00465937, Level 2 PCE
AR 00467322, Unexpected Thermoluminescent Dosimeter Reading
AR 00496696, Inconsistencies Between three Dose Assessment Procedures
AR 00499448, Dosimeter Communication Issue

Section 2RS5: Radiation Monitoring Instrumentation

Procedures, Guidance Documents, and Manuals
CAP-NGGC-200, Condition Identification and Screening Process, Rev. 34
CAP-NGGC-201, Self-Assessment/Benchmark Programs, Rev. 17
CAP-NGGC-205, Condition Evaluation and Corrective Action Process, Rev. 14
CH-401G, RM-A8 Calibration [Auxiliary Building Exhaust Gaseous], Rev. 1
CH-401G, RM-A8 Calibration [Auxiliary Building Exhaust Gaseous], Rev. 5
Crystal River Unit 3, Offsite Dose Calculation Manual (ODCM), Rev. 32
HPS-NGGC-0005, Calibration of Portable Radiation/Contamination Survey Instruments, Rev. 12
HPS-NGGC-0009, Operation of Portable Radiation/Contamination Survey Instruments/ Equipment, Rev. 8
HPS-NGGC-0011, Cs-137 Calibration Source Standardization, Rev. 12
HPS-NGGC-0005, Calibration of Portable Radiation/Contamination Survey Instruments, Rev. 12
HPP-112, Hard to Detect Radionuclides Analyses, Rev. 3
HPP-320A, Apex Fastscan Whole Body Counting System Operation, Rev. 4
HPP-322A, Apex Fastscan Whole Body Counter Calibration, Rev. 2
HPP-401, Area and Main Steam Line Alarm Monitoring Setpoint Change, Rev. 9
HPP-438, Calibration and Operation of NE Technology Model SAM-11, Rev. 12
HPP-442, Operation and Calibration of the GEM-5 Gamma Exit Monitor, Rev. 7
HPP-448, Operation and Calibration of the ARGOS-5AB Exit Monitor, Rev. 7
HPP-453, Operation and Calibration of the Cronos-4 and Cronos-11 Contamination Monitors, Rev. 1
HPP-455, Calibration and Operation of Canberra Tennelec S5/XLB Low Background Counting System, Rev. 3
SP-701L, RM-A11 Calibration [Waste Gas Decay Tank Gaseous], Rev.5

Records and Data

Email: Vendor Radon Rejection Parameter Recommendation for ARGOS monitors, 12/30/10
Calibration Package, Beckman LS6500 Scintillation System, 4/15/10
Calibration Package, Beckman LS6500 Scintillation System, 4/20/10
Certificate of Calibration, Beta Standard, S/N: C4-375, 9/1/06
Certificate of Calibration, Gamma Standard, S/N: 952-29, 12/1/02
CR3 Rad Monitoring System Health Report, Q3-2011, 11/14/11

CR3 Shepherd Calibrator Annual Recertification of the Calibration Range of Model 89 Source # HP-125/126, 7/8/10
CR3 Shepherd Calibrator Annual Recertification of the Calibration Range of Model 89 Source # HP-125/126, 6/15/11
Eckert & Ziegler Gamma Spectroscopy Geometry Source Calibration Certificates for source S/N's: 81606-03, 81628-03, 81629-03, 81630-03, 81631-03, 81632-03, 81633-03, 81634-03, 81635-03, 81636-03, 81637-03, 81638-03, 81639-03, 81640-03, and 81641-03, dated 1/1/2010
Fast Scan (Whole-Body Counter [WBC]) Calibration Data: 05/14/2010, 04/19/2011
Health Physics Survey Record, Survey # 11-08-0076, 143' Auxiliary Building, 8/6/11
Health Physics Survey Record, Survey # 11-08-0082, 143' Auxiliary Building, 8/7/11
Low-Level Radioactive Waste Analysis Data Sheet, 2010 DAW Smears, 9/3/10
Master Instrument History Log, 11/14/11
Perkin Elmer Certificate of Radioactivity, Tritium and Carbon 14 Liquid Scintillation Standards Serial # 157, 2/5/10
Perkin Elmer Certificate of Radioactivity, Tritium and Carbon 14 Liquid Scintillation Standards Serial # 5, 5/17/10
Radionuclide Analysis Summary Sheet, Waste Stream Isotopic Characterization for Beta, Gamma, and Alpha Emitters, 11/19/10
Rad Mon Project Milestones, Project Schedule, 10/24/11
Radiation Protection Instrument Calibration Certificate, RMG-14, 6/3/10
Radiation Protection Instrument Calibration Certificate, RMG-14, 6/1/11
Radiation Protection Instrument Calibration Certificate, Model 3 S/N 253494, 8/2/11
Report of Calibration for Electrometer, Standard Imaging Model MAX-4000, S/N F100464, 10/14/11
Report of Calibration for Ionization Chamber, Exradin Model A3, S/N XR092681, 10/14/11
Report of Calibration for Ionization Chamber, Exradin Model A5, S/N XY092934, 10/14/11
Ludlum 2000 Scaler with Alpha and Beta Detectors Daily Reliability and Background Log, HPS-NGGC-0009-4-4, Beta Scaler S/N 277291, and S/N 269992, 11/1 – 11/16/11
RM-A8 Calibration Package [Auxiliary Building Exhaust Gaseous], 8/14/03
RM-A8 Calibration Package [Auxiliary Building Exhaust Gaseous], 5/22/07
RM-A8 Calibration Package [Auxiliary Building Exhaust Gaseous], 5/29/09
RM-A8 Calibration Package [Auxiliary Building Exhaust Gaseous], 10/20/11
RM-A11 Calibration Package [Waste Gas Decay Tank Gaseous], 6/26/09
RM-A11 Calibration Package [Waste Gas Decay Tank Gaseous], 2/22/11
RM-L2 Calibration Package, 1/20/08
RM-L2 Calibration Package, 9/9/10
RM-A1 [RCB Gaseous] Radiation Monitor Detector Calibration Stability Data: 8/8/2001, 3/25/2003, 2/25/2004, 8/17/2005, 2/12/2007, 7/22/2008, & 2/4/2010
RM-A2 [AB/FHB Gaseous] Radiation Monitor Detector Calibration Stability Data: 11/22/2001, 5/20/2003, 9/1/2004, 2/2/2006, 4/6/2006, 8/7/2007, 7/29/2010
RM-A11 [WGDT Gaseous] Radiation Monitor Detector Calibration Stability Data: 1/10/2001, 7/23/2002, 5/1/2003, 9/24/2004, 4/11/2006, 10/16/2007, 6/24/2009, 2/22/2011
RM-A12 [Cond. Offgas Gaseous] Radiation Monitor Detector Calibration Stability Data: 12/5/2001, 4/4/2002, 4/24/2002, 9/2/2002, 8/28/2003, 1/20/2005, 7/25/2006, 1/28/2008, 7/2/2009, 2/9/2011

Whole-Body Counter Cross-Check Results: Calendar Year (CY) 2009, 1st through 4th Quarter Results; CY 2010, 1st through 4th Quarter Results; CY 2011, 1st through 2nd Quarter Results.
Whole-Body Counter May 1, 2011 through November 14, 2011, Quality Assurance Results Including the Following: Low, High and Summed Background Count Rates; Calibration Check 662 keV and 1332 keV Centroid and Full-Width Half-Max data

CAP Documents
Quick Hit Self-Assessment Report, Assessment # 424754, "Quality Control of Gamma Isotopic Analysis at GEL Laboratory", 9/28/10
Memo Serial No: CNOS11-0012, Radiation Protection C-RP-11-01, Assessment Plan, no date
Memo Serial No: CNOS11-0037, Environmental & Chemistry C-EC-11-01, Assessment Plan, 4/4/11
AR 00454187, RM-A2G (H) Cannot Receive 'High' Alarm
AR 00412992, RM-A2 Total Corrected Flow Out of Spec Low
AR 00456957, RM-G14 Detector/Cabling Check for Loose Connections
AR 00456955, Radiation Monitor RM-G14 Alarmed
AR 00404467, Unplanned RM-A2 Inoperability
AR 00480788, RM-G14 Not Responding to Check Source or Wand
AR 00468975, Radiation Monitor Calibration Use Uncontrolled Reference
AR 00113218, RMA Gas Calibration Methodology
.

Section 4OA1: Performance Indicator Verification

Procedures and Guidance Documents
REG-NGGC-009, NRC Performance Indicators and Monthly Operating Report Data, Rev. 10

Records and Data Reviewed
Direct Reading Dosimeter Evaluations: 10/01/2010 through October 31, 2011
Crystal River Unit 3 – 2010 Radioactive Effluent Release Report, March 31, 2011
Crystal River Unit 3 – 2009 Radioactive Effluent Release Report, April 29, 2011

Corrective Action Program (CAP) Documents
AR 00451441, Unanticipated Dosimeter Audible Chirp Received
AR 00479635, Dose Rate Alarm Received by a CRT HP
AR 00479413, CR3 DRD Alarm Evaluation,
AR 00480145, CR3 DRD Alarm Evaluation
AR 00482662, Worker Receives Unanticipated Rate Alarm
AR 00485815, CR3 DRD Alarm Evaluation
AR 00487932, Worker Taking EAD's Outside of the Protected Area

Section 4OA2: Identification and Resolution of Problems

Condition Reports

466864, FHCR-1 Hoist Gear Box Concern Core Offload Halted
467674, Review Response to Fuel Handling Problems

Procedures

MNT-NGGC-1001, Conduct of Refueling
FP-203, Defueling and Refueling Operations
FP-601A, Operation of Main Fuel Handling Bridge FHCR-1
SP-406, Refueling Operations Daily Data Requirements

Modifications

Engineering Change (EC) 81364, Use of Temporary Clamping Restraints to Secure FHCR-1 Load