



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

January 30, 2009

Florida Power and Light Company  
ATTN: Mr. Mano Nazar, Senior Vice President  
Nuclear and Chief Nuclear Officer  
P.O. Box 14000  
Juno Beach, FL 33408-0420

SUBJECT: ST. LUCIE NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000335/2008005, 05000389/2008005

Dear Mr. Nazar:

On December 31, 2008, the US Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant. The enclosed integrated inspection report documents the inspection findings which were discussed on January 8, 2009, with Mr. Costanzo and other members of your staff.

The inspection examined activities conducted under your license as they related 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.

This report documents one self-revealing finding of very low safety significance (Green). The finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the NCV, 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 St. Lucie facility.

In accordance with 10CFR 2.390 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 the 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/*

Marvin D. Sykes, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Docket Nos. 50-335, 50-389  
License Nos. DPR-67, NPF-16

Enclosure: Inspection Report 05000335/2008005, 05000389/2008005  
w/Attachment: Supplemental Information

cc w/encl: (See next page)

Room or from the Publicly Available Records (PARS) component of the 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/*

Marvin D. Sykes, Chief  
 Rector Projects Branch 3  
 Division of Reactor Projects

Docket Nos. 50-335, 50-389  
 License Nos. DPR-67, NPF-16

Enclosure: Inspection Report 05000335/2008005, 05000389/2008005  
 w/Attachment: Supplemental Information

cc w/encl: (See next page)

PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE  
 ADAMS:  Yes      ACCESSION NUMBER: ML090300477       SUNSI REVIEW COMPLETE MDS

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRS	RII:DRS	RII:DRS
SIGNATURE	SON	MDS	MDS for	MDS for	ECM2	GBK1	RPC1
NAME	SNinh	MSykes	THoeg	SSanchez	EMichel	GKuzo	RCarrion
DATE	01/30/2009	01/30/2009	01/30/2009	01/30/2009	01/23/2009	01/22/2009	01/21/2009
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII:DRS	RII:DRS					
SIGNATURE	NJG	AND					
NAME	NGriffis	ANielsen					
DATE	01/21/2009	01/21/2009	2/ /2009	2/ /2009	2/ /2009	2/ /2009	2/ /2009
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

cc w/encl:

Alison Brown  
Nuclear Licensing  
Florida Power & Light Company  
Electronic Mail Distribution

Gordon L. Johnston  
Site Vice President  
St. Lucie Nuclear Plant  
Electronic Mail Distribution

Michael Page  
Operations Manager (Acting)  
St. Lucie Nuclear Plant  
Electronic Mail Distribution

Robert J. Hughes  
Director  
Licensing and Performance Improvement  
Florida Power & Light Company  
Electronic Mail Distribution

Christopher R. Costanzo  
Plant General Manager  
St. Lucie Nuclear Plant  
Electronic Mail Distribution

Eric Katzman  
Licensing Manager  
St. Lucie Nuclear Plant  
Electronic Mail Distribution

Abdy Khanpour  
Vice President  
Engineering Support  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, FL 33408-0420

Don E. Grissette  
Vice President, Nuclear Operations -  
South Region  
Florida Power & Light Company  
Electronic Mail Distribution

M. S. Ross  
Managing Attorney  
Florida Power & Light Company  
Electronic Mail Distribution

Marjan Mashhadi  
Senior Attorney  
Florida Power & Light Company  
Electronic Mail Distribution

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

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

J. Kammel  
Radiological Emergency Planning  
Administrator  
Department of Public Safety  
Electronic Mail Distribution

Douglas Anderson  
County Administrator  
St. Lucie County  
2300 Virginia Avenue  
Ft. Pierce, FL 34982

Senior Resident Inspector  
St. Lucie Nuclear Plant  
U.S. Nuclear Regulatory Commission  
P.O. Box 6090  
Jensen Beach, FL 34957-2010

Peter Wells  
(Acting) Vice President, Nuclear  
Training and Performance Improvement  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, FL 33408-0420

Mark E. Warner  
Vice President  
Nuclear Plant Support  
Florida Power & Light Company  
Electronic Mail Distribution

Report to J.A. Stall from Marvin Sykes dated January 30, 2009.

Distribution w/encl:

B. Mozafari, NRR

C. Evans (Part 72 Only)

L. Slack, RII EICS

OE Mail (email address if applicable)

RIDSNRRDIRS

PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-335, 50-389

License Nos: DPR-67, NPF-16

Report No: 05000335/2008005, 05000389/2008005

Licensee: Florida Power & Light Company (FP&L)

Facility: St. Lucie Nuclear Plant, Units 1 & 2

Location: 6351 South Ocean Drive  
Jensen Beach, FL 34957

Dates: October 1 to December 31, 2008

Inspectors: T. Hoeg, Senior Resident Inspector  
S. Sanchez, Resident Inspector  
E. Michel, Senior Reactor Inspector (Section 4OA5)  
G. Kuzo, Senior Health Physicist (Sections 2OS1, 4OA1)  
R. Carrion, Senior Reactor Inspector (Section 2PS3)  
N. Griffis, Health Physicist (Sections 2OS3, 4OA1)  
A. Nielsen, Health Physicist (Sections 2PS1, 4OA1)

Approved by: M. Sykes, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000335/2008-005, 05000389/2008-005; 09/01/2008 - 12/31/2008; St. Lucie Nuclear Plant, Units 1 & 2; Identification and Resolution of Problems.

The report covered a three month period of inspection by resident inspectors and several region based inspectors. One self-revealing NCV was identified. The significance of most findings is identified by their color (Green, White, Yellow, Red) using 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", and Revision 4, dated December 2006.

### A. Inspector Identified & Self-Revealing Findings

Cornerstone: Initiating Events

Green. A self-revealing Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when a reactor operator (RO) failed to comply with a system surveillance procedure while restoring the 1A Low Pressure Safety Injection Pump from its minimum flow test resulting in a loss of shutdown cooling during a refueling operation on October 22, 2008. The licensee provided remedial training to those operators involved and entered the event in their corrective action program (CAP) as condition report (CR) 2008-32977.

This finding is more than minor because it is associated with the configuration control and human performance attributes of the initiating events cornerstone and adversely impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. In addition, if left uncorrected, this finding would result in a more significant safety concern. At the time of the event, the unit was in Mode 6 and had been shutdown for approximately 7 days. The temperature change in the RCS was minimal (less than 10° F) and the time to boiling was greater than 300 minutes with the upper cavity flooded (RCS level > 23 feet) and the reactor vessel head removed. The inspectors evaluated the finding using Inspection Manual Chapter (IMC) 0609, Appendix G, Figure 1, Road Map for Shutdown Findings, Table 1, Losses of Control and Attachment 1, Shutdown Operations Significance Determination Process Phase 1 Operational Checklist 4 PWR Refueling Operation, RCS level > 23' or PWR Shutdown Operation With Time to Boiling > 2 hours And Inventory in the Pressurizer. The inspectors determined that this finding was screened as having very low safety risk significance (Green) per Figure 1 because this finding did not increase the likelihood of a loss of RCS inventory or could result in a loss of RCS level instrumentation; the finding did not degrade the licensee's ability to terminate a leak or add RCS inventory when needed; and the finding did not degrade the licensee's ability to recover SDC once it is lost. Also, the inspectors determined that this finding did not meet conditions for Losses of Control Criteria per Table 1 and quantitative assessment was not required. This finding was related to the use of human error prevention techniques aspect in the work practices component in the human performance cross-cutting area (IMC 0305 aspect H.4.a). (Section 40A2.1)

Enclosure

B. Licensee Identified Violations

None.



## REPORT DETAILS

### Summary of Plant Status:

Unit 1 and Unit 2 began the period at full Rated Thermal Power (RTP) and operated at full power for the entire period, except for a planned Refueling Outage of Unit 1 which started on October 19, 2008. Unit 1 returned to full power operation on November 23, 2008.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity (Reactor-R)

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

During the week of November 24, 2008, the inspectors reviewed the status of licensee actions in accordance with ADM-04.03, Cold Weather Preparations. The inspectors verified conditions were met for entering the procedure and that equipment status was verified as directed by the procedure. The inspectors performed a walkdown of the following safety-related equipment on both units that are exposed to the outside weather conditions to identify any potential adverse conditions. Condition reports (CRs) were checked to assure that the licensee was identifying and resolving weather related issues.

- Unit 2 Auxiliary Feedwater (AFW) Pump Areas
- Unit 2 Steam Trestle Area
- Unit 2 Emergency Diesel Generator (EDG) Rooms

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment

##### .1 Partial Equipment Walkdowns

##### a. Inspection Scope

The inspectors conducted two partial alignment verifications of the safety-related systems listed below. These inspections included reviews using plant lineup procedures, operating procedures, and piping and instrumentation drawings, which were compared with observed equipment configurations to verify that the critical portions of the systems were correctly aligned to support operability. The inspectors also verified that the licensee had identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers by entering them into the corrective action program (CAP).

- 1B Spent Fuel Pool Cooling
- 1B Component Cooling Water (CCW) System while 1A Out of Service (OOS)

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors conducted a detailed walkdown/review of the alignment and condition of the 1A CCW system to verify its capability to meet its design basis function. The inspectors utilized licensee procedure 1-NOP-14.02, Component Cooling Water System Operation, and drawing 8770-G-083, Unit 1 CCW System Piping and Instrumentation Drawing, as well as other licensing and design documents to verify the system alignment was correct. During the walkdown, the inspectors verified, as appropriate, that: (1) valves were correctly positioned and did not exhibit leakage that would impact their function; (2) electrical power was available as required; (3) major portions of the system and components were correctly labeled, cooled and ventilated; (4) hangers and supports were correctly installed and functional; (5) essential support systems were operational; (6) ancillary equipment or debris did not interfere with system performance; (7) tagging clearances were appropriate; and (8) valves were locked as required by the licensee's locked valve program. Pending design and equipment issues were reviewed to determine if the identified deficiencies significantly impacted the system's functions. Items included in this review were the operator workaround list, the temporary modification list, system health reports, system description, and outstanding maintenance work requests/work orders. In addition, the inspectors reviewed the licensee's CAP to ensure that the licensee was identifying and resolving equipment alignment problems.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

.1 Fire Area Walkdowns

The inspectors toured the following six plant areas during this inspection period to evaluate conditions related to control of transient combustibles and ignition sources, the material condition and operational status of fire protection systems including fire barriers used to prevent fire damage or fire propagation. The inspectors reviewed these activities against provisions in the licensee's procedure ADM-1800022, Fire Protection Plan, and 10 CFR Part 50, Appendix R. The licensee's fire impairment lists, updated on an as-needed basis, were routinely reviewed. In addition, the inspectors reviewed the CR database to verify that fire protection problems were being identified and appropriately resolved. The following areas were inspected:

- Unit 1 Fuel Handling Building 19.5' Level
- Unit 1 B CCW Pump and Heat Exchanger Area
- Unit 1 Spent Fuel Pool Cooling Heat Exchanger Room
- Unit 1 Vital AC Switchgear Rooms
- Unit 1 Emergency Core Cooling System (ECCS) Pumps Room
- Unit 2 A EDG Room

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

.1 Internal Flooding

a. Inspection Scope

The inspectors conducted walkdowns of the following areas which included checks of building structure sumps to ensure that flood protection measures were in accordance with design specifications. The inspectors reviewed Updated Final Safety Analysis Report (UFSAR), Section 3.4, Water Level (Flood) Design and UFSAR Table 3.2-1, Design Classification of SSCs. The inspectors also reviewed plant procedures that discussed the protection of areas containing safety-related equipment that may be affected by internal flooding. Specific plant attributes that were checked included structural integrity, sealing of penetrations, control of debris, and operability of sump pump systems.

- Unit 1 ECCS Pumps Room
- Unit 2 Component Cooling Water Building

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Training Program

Resident Inspector Quarterly Review

a. Inspection Scope

On December 10, 2008, the inspectors observed and assessed licensed operator actions during a simulated reactor coolant system (RCS) leak and subsequent reactor trip followed by a security event and loss of vital electrical bus, to verify that operator performance was adequate and that evaluators were identifying and documenting crew performance problems. The exercise was performed in accordance with St. Lucie Plant Simulator Exercise Guide 0815003, Revision 18. The inspectors also reviewed simulator physical fidelity and specifically evaluated the following attributes related to the operating crews' 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 off-normal and emergency operation procedures; 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
- Crew overall performance and interactions
- Effectiveness of the post-evaluation critique.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed system performance data and associated CRs for the two systems listed below to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65 (Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants) and licensee Administrative Procedure ADM-17-08, Implementation of 10CFR50.65, Maintenance Rule. The inspectors' efforts focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of a(1) and a(2) classification, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also interviewed responsible engineers and observed some of the corrective maintenance activities. The inspectors also attended applicable expert panel meetings and reviewed associated system health reports. The inspectors verified that equipment problems were being identified and entered into the CAP

- Unit 1 High Pressure Safety Injection (HPSI)
- Unit 2 Component Cooling Water

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors completed in-office reviews, plant walkdowns, and control room inspections of the licensee's risk assessment of five emergent or planned maintenance activities. The inspectors verified the licensee's risk assessment and risk management activities using the requirements of 10 CFR 50.65(a)(4); the recommendations of Nuclear Management and Resource Council 93-01, Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,

Enclosure

Revision 3; and procedure ADM-17.16, Implementation of the Configuration Risk Management Program. The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from the degraded equipment. The inspectors interviewed responsible Senior Reactor Operators on-shift, verified actual system configurations, and specifically evaluated results from the online risk monitor (OLRM) for the combinations of out of service (OOS) risk significant systems, structures, and components (SSCs) listed below:

- 1A Intake Cooling Water (ICW) pump, ECCS exhaust fan HVE-9B, and control room fan HVA-3B OOS
- Unit 1 Mid-loop Operations – Orange Risk
- Unit 1 Entry Into Mode 3 After Refuel – Yellow Risk
- 2A Instrument Air Compressor (IAC) and Ultimate Heat Sink (UHS) Barrier Valve SB-37-1 OOS
- 2B-IAC and 2B Charging Pump OOS

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following four CR interim dispositions and operability determinations to ensure that operability was properly supported and the affected SSCs remained available to perform its safety function with no increase in risk. The inspectors reviewed the applicable UFSAR, and associated supporting documents and procedures, and interviewed plant personnel to assess the adequacy of the interim disposition.

- CR 2008-31678, Water Intrusion in 1-HVE-9B ECCS Fan Plenum
- CR 2008-32421, 1A EDG High Voltages During 24-hour Run
- CR 2008-32418, 1A EDG Fuel Oil Transfer Pump Failure to Auto Start
- CR 2008-35269, Unit 1 Reactor Auxiliary Building Ventilation Supply Flow Low

b. Findings

No findings of significance were identified

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the documentation for a permanent modification affecting both units, plant change modification PCM 07094, Replacement of Ultimate Heat Sink Barrier Valves Actuators. The inspectors reviewed the 10 CFR 50.59 screening and evaluation, fire protection review, environmental review, As Low As Reasonably Achievable (ALARA) screening, and license renewal review, to verify that the modification had not affected system operability/availability. The inspectors reviewed

Enclosure

all associated plant drawings and UFSAR documents impacted by this modification and discussed the changes with licensee personnel to verify that the installation was consistent with the modification documents. Additionally, the inspectors verified that problems associated with modifications were being identified and entered into the CAP.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the five post maintenance tests (PMTs) listed below, the inspectors reviewed the test procedures and either witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately verified that the work performed was correctly completed and demonstrated that the affected equipment was functional and operable. The inspectors verified that the requirements of procedure ADM-78.01, Post Maintenance Testing, were incorporated into test requirements. The inspectors reviewed the following WOs and/or work requests (WR):

- WO# 38010727, Unit 1 Control Room Fan HVA/ACC-3B Quarterly Maintenance
- WO# 38010139, Replacement of Auxiliary Feedwater Actuation System Relay for Valve MV-09-10
- WO# 38024041, Replacement of the 1A2 Emergency Diesel Generator (EDG) Day Tank Level Switch
- WO# 38025792, 1A-EDG Output Breaker Failed to Open
- WO# 38001139, Ultimate Heat Sink Barrier Valve SB-37-1 Actuator Replacement

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

Outage Planning, Control and Risk Assessment

During pre-outage planning, the inspectors reviewed the risk reduction methodology employed by the licensee for refuel outage (RFO) SL1-22, in particular the Risk Assessment Team (RAT) notebook. The inspectors also examined the licensee's implementation of shutdown safety assessments during SL1-22 in accordance with Administrative Procedure 0-AP-010526, Outage Risk Assessment and Control, to verify whether a defense in depth concept was in place to ensure safe operations and avoid unnecessary risk. Furthermore, the inspectors regularly monitored outage planning and control activities in the Outage Control Center (OCC), and interviewed responsible OCC management, during the outage to ensure system, structure, and

component configurations and work scope were consistent with TS requirements, site procedures, and outage risk controls.

#### Monitoring of Shutdown Activities

The inspectors observed portions of the reactor plant shutdown and cooldown of Unit 1 beginning on October 19, 2008. The inspectors also monitored plant parameters and verified that shutdown activities were conducted in accordance with Technical Specifications and applicable operating procedures, such as: 1-GOP-123, Turbine Shutdown - Full Load to Zero Load; 1-GOP-203, Reactor Shutdown; 1-GOP-305, Reactor Plant Cooldown - Hot Standby To Cold Shutdown; and 1-NOP-03.05, Shutdown Cooling.

#### Outage Activities

The inspectors examined outage activities to verify that they were conducted in accordance with TS, licensee procedures, and the licensee's outage risk control plan. Some of the more significant inspection activities accomplished by the inspectors were as follows:

- Walked down selected safety-related equipment clearance orders
- Verified operability of RCS pressure, level, flow, and temperature instruments during various modes of operation
- Verified electrical systems availability and alignment
- Reviewed actions taken in preparation for Hurricane season
- Verified shutdown cooling system and spent fuel pool cooling system operation
- Evaluated implementation of reactivity controls
- Reviewed control of containment penetrations
- Examined foreign material exclusion (FME) controls put in place inside containment (e.g., around the refueling cavity, near sensitive equipment and RCS breaches) and around the spent fuel pool (SFP).

#### Refueling Activities and Containment Closure

The inspectors witnessed selected fuel handling operations being performed according to TS and applicable operating procedures from the main control room, refueling cavity inside containment and the SFP. The inspectors also examined licensee activities to control and track the position of each fuel assembly. Furthermore, the inspectors evaluated the licensee's ability to close the containment equipment, personnel, and emergency hatches in a timely manner per procedure 1-MMP-68.02, Containment Closure.

#### Heatup, Mode Transition, and Reactor Startup Activities

The inspectors examined selected TS, license conditions, license commitments and verified administrative prerequisites were being met prior to mode changes. The inspectors also reviewed measured RCS leakage rates, and verified containment integrity was properly established. The inspectors performed a containment sump closeout inspection prior to plant heat up operations. The inspectors also conducted

a containment walkdown on November 19, 2008, after the Unit 1 reactor plant had reached Mode 3 and was at normal operating pressure and temperature. The results of low power physics testing were discussed with Reactor Engineering and Operations personnel to ensure that the core operating limit parameters were consistent with the design. The inspectors witnessed portions of the RCS heatup, reactor startup and power ascension in accordance with the following plant procedures:

- Pre-operational Test Procedure (POP) 1-3200088
- Unit 1 Initial Criticality Following Refueling
- POP 0-3200092, Reactor Engineering Power Ascension Program
- 1-GOP-201, Reactor Plant Startup - Mode 2 to Mode 1
- 1-GOP-302, Reactor Plant Startup - Mode 3 to Mode 2
- 1-GOP-303, Reactor Plant Heatup - Mode 3 <1750 to Mode 3 >1750
- 1-GOP-403, Reactor Plant Heatup - Mode 4 to Mode 3
- 1-GOP-504, Reactor Plant Heatup - Mode 5 to Mode 4

#### Correction Action Program

The inspectors reviewed CRs generated during SL1-22 to evaluate the licensee's threshold for initiating CRs. The inspectors reviewed CRs to verify priorities, mode holds, and significance levels were assigned as required. Resolution and implementation of corrective actions of several CRs were also reviewed for completeness. The inspectors routinely reviewed the results of Quality Assurance (QA) daily surveillances of outage activities.

#### b. Findings

No findings of significance were identified.

#### 1R22 Surveillance Testing

##### a. Inspection Scope

The inspectors either reviewed or witnessed the following five surveillance tests to verify that the tests met the TS, the UFSAR, the licensee's procedural requirements and demonstrated the systems were capable of performing their intended safety functions and their operational readiness. In addition, the inspectors evaluated the effect of the testing activities on the plant to ensure that conditions were adequately addressed by the licensee staff and that after completion of the testing activities, equipment was returned to the positions/status required for the system to perform its safety function. The tests reviewed included one in-service test and two containment isolation valve surveillances. The inspectors verified that surveillance issues were documented in the CAP.

- 1-OSP-68.02, Local Leak Rate Test on Penetration P29A
- 1-OSP-68.02, Local Leak Rate Test on Personnel Hatch
- 0-OSP-37.01, Emergency Cooling Water Canal – Periodic Test
- 1-OSP-69.14A, Engineered Safeguards Test 18 Month EDG Start on Safety Injection Actuation Signal Without Loss of Offsite Power

Enclosure



- 2-OSP-03.05A, 2A-HPSI Code Run

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

Emergency Preparedness Drill

a. Inspection Scope

On December 10, 2008, the inspectors observed Emergency Offsite Facility (EOF) staff during a drill of the site emergency response organization. The drill included a RCS leak and subsequent reactor trip followed by a security event and loss of a vital electrical bus. During the drill the inspectors assessed EOF staff actions to verify that emergency classification and notifications were made in accordance with licensee emergency plan implementing procedures and 10 CFR 50.72 requirements. The inspectors specifically reviewed the Site Area Emergency and General Emergency classifications and notifications were in accordance with licensee procedures EPIP-01, Classification of Emergencies and EPIP-02, Duties and Responsibilities of the Emergency Coordinator. The inspectors also observed whether the initial activation of the emergency response centers was timely and as specified in the licensee's emergency plan. The required TS actions for the drill scenario were reviewed to assess correct implementation. Licensee identified critique items were discussed with the licensee and reviewed to verify that drill weaknesses were identified and captured.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

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

2OS1 Access Control to Radiologically Significant Areas

a. Inspection Scope

Access Controls Licensee activities for controlling and monitoring worker access to radiologically significant areas and tasks were evaluated. The inspectors evaluated changes to and adequacy of procedural guidance; directly observed implementation of established administrative and physical radiological controls; appraised radiation worker and health physics technician (HPT) knowledge of and proficiency in implementing radiation protection activities; and assessed occupational exposures to radiation and radioactive material.

The inspectors directly observed or discussed controls established for workers and HPT staff in airborne radioactivity area, radiation area, high radiation area (HRA),

locked-high radiation area (LHRA), and very high radiation area (VHRA) locations within select reactor auxiliary building (RAB) and the Independent Spent Fuel Storage Installation (ISFSI) locations. Controls and their implementation for HRA/LHRA keys and for storage of irradiated material within the spent fuel pool (SFP) area were reviewed and discussed in detail. The inspectors reviewed and evaluated select medium and high radiological risk tasks performed between October 1, 2007, and October 3, 2008, including resin transfer activities, and chemical volume control system (CVCS) filter change-out. The inspectors observed RWP briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements to workers. Occupational workers' adherence to selected RWPs and HPT proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Direct Reading Dosimeter (DRD) alarm set points and worker stay times were evaluated against area radiation survey results and actual dose rates encountered and doses received. In addition the inspectors reviewed and discussed radiological controls implemented previously completed high risk activities including cleanout and removal of high level legacy radioactive waste, and for Unit 1 Refueling Cycle 22 Outage Alloy 600 repair and 10 year in-service inspection tasks. Worker exposure as measured by DRD, by licensee evaluations of potential skin doses resulting from discrete radioactive particle (DRP) or dispersed skin contamination events from October 1, 2007, through September 30, 2008 were reviewed and assessed independently. For HRA tasks involving potentially significant dose rate gradients, the inspectors evaluated the potential use of dosimeter multi-badging to monitor worker exposure.

For the ISFSI, the inspectors observed HP staff performing gamma surveys and compared the results to previous monthly surveys. The inspectors also observed and evaluated implementation of radiological controls, including RWPs and postings, and discussed the controls with Health Physics supervisory staff. Selection and appropriate use of neutron survey instrumentation for ISFSI boundary and cask surveys was reviewed and discussed with cognizant licensee personnel. In addition, the inspectors observed placement of thermoluminescent dosimeters around the facility and discussed monitoring results.

Postings for access to radiologically controlled areas (RCAs) and physical controls for the RAB locations designated as LHRA's were evaluated during facility tours. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys and results for RAB and ISFSI equipment and work locations, and radioactive waste/material storage areas. All results were compared to current licensee surveys and assessed against established postings and radiological controls.

Internal exposures of greater than 30 millirem (mrem) Committed Effective Dose Equivalent were evaluated from review of whole body counting analyses conducted between October 1, 2007, through September 30, 2008. The inspectors evaluated the implementation and effectiveness of administrative and physical controls including air sampling, alpha-monitoring, barrier integrity, engineering controls, and postings.

Radiation protection activities were evaluated against Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS), and 10 Code of Federal Regulations (CFR) Parts 19, 20, and 72 requirements. Specific assessment criteria included Updated Final Safety Analysis Report (UFSAR) Section 11, Radioactive Waste

Management, and Section 12, Radiation Protection; 10 CFR 19.12; 10 CFR 20, Subpart B, Subpart C, Subpart F, Subpart G, Subpart H, and Subpart J; TS Sections 6.8.1, Procedures and Programs; 6.11, Radiation Protection Program; and 6.12, High Radiation Area; and approved procedures. Detailed procedural guidance and records reviewed for this inspection area are listed in Sections 2OS1, 2OS3, and 4OA1 of the report Attachment.

Problem Identification and Resolution Licensee Corrective Action Program (CAP) documents associated with access control to radiologically significant areas were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with PI-AA-204, Condition Identification and Screening Process, Rev. 0. Licensee Condition Report (NCR) documents and audits associated with access controls, personnel monitoring instrumentation, and personnel contamination events were reviewed. Licensee CAP documents reviewed and evaluated in detail during inspection of this program area are identified in Section 2OS1 of the report Attachment.

The inspectors completed 21 of the specified line-item samples detailed in Inspection Procedure (IP) 71121.01. In addition, the inspectors completed the radiation protection line-item sample activities specified in IP 60855.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

Radiation Monitors The operability, availability, and reliability of selected area radiation monitor (ARM) and continuous air monitor (CAM) equipment used for routine and accident monitoring activities were reviewed and evaluated. The inspectors directly observed ARM equipment material condition and installed configurations where accessible.

Current calibration data for the Unit 1 Containment High Range Monitors (CHRM), the Unit 1 Containment Isolation Signal (CIS) Monitors, Unit 1 Fuel Handling Building Vent Process Monitor, the Unit 2 Containment Atmosphere Particulate, Iodine and Gas (PIG) Monitors, and the Unit 2 Emergency Core Cooling System (ECCS) Area Monitor were reviewed and discussed with responsible personnel.

Program guidance, monitor performance, and equipment material condition were reviewed against details documented in 10 CFR Parts 20 and 50; Unit 1 UFSAR Section 12.1.4, Area Monitoring and Section 12.2.4, Airborne Radioactivity Monitoring; Unit 2 UFSAR Section 12.3.4, Area Radiation and Airborne Radioactivity Monitoring; and approved licensee procedures. Reviewed documents are listed in Section 2OS3 of the report Attachment.

Personnel Survey Instrumentation Current program guidance, including calibration and operation procedures, and its implementation to maintain operability and accuracy of selected personnel survey instruments, were reviewed and evaluated.

Enclosure

Instrument selection and operability determinations conducted by HPT staff prior to performing selected radiological surveys and monitoring were reviewed and discussed. Conduct of daily source checks for teletector survey meters were observed, and the results compared to specified tolerances. Responsible staff's knowledge and proficiency regarding on-site instrumentation calibration activities were evaluated through interviews, record reviews, and direct observation of source calibrations of selected survey instrumentation. The inspectors interviewed an HP supervisor regarding the licensee's program for the use of ED equipment. The inspectors reviewed current calibration data for selected personnel survey instruments and assessed operability of various portable survey instruments staged or in use by the HP staff. The most recent 10 CFR Part 61 analysis for Dry Active Waste (DAW) was reviewed to determine if calibration and check sources are representative of the plant source term. In addition, inspectors reviewed the calibrations for a REM-500 neutron survey meter (Serial Number (S/N) 240), an RO-20 ion chamber (S/N 5552), and a telepole (S/N 6605-035) that had been used by HPTs providing job coverage during movement of spent fuel to the ISFSI facility.

Operability and analysis capabilities of the licensee's whole-body counter (WBC), personnel contamination monitor (PCM), and portal monitor (PM) equipment were reviewed and evaluated. Reviewed PCM and PM detectors included equipment staged at the RCA exit points. For selected WBC, PCM, and PM equipment, current calibration and recent operational/performance test surveillance data, as applicable, were evaluated. The inspectors observed and discussed the conduct and results of a daily WBC source check with the responsible dosimetry technician.

Licensee activities associated with personnel radiation monitoring instrumentation were reviewed against UFSAR Section 12; TSS; 10 CFR 20.1204 and 20.1501; and applicable licensee procedures listed in Section 2OS3 of the report Attachment.

Respiratory Protection - Self-Contained Breathing Apparatus (SCBA) The licensee's respiratory protection program guidance and its implementation for SCBA use were evaluated and discussed with plant personnel. The number of available SCBA units and their general material and operating condition were observed during tours of the Control Room and RAB storage locations.

Current records associated with supplied air quality for staged SCBA equipment were evaluated. In addition, Unit 1 and Unit 2 control room operators were interviewed to determine their level of knowledge of available SCBA equipment storage locations, proper use, bottle change-out, and availability of prescription lens inserts, if required.

Program guidance, performance activities, and equipment material condition were reviewed against details documented in 10 CFR Part 20; Regulatory Guide (RG) 8.15, Acceptable Programs for Respiratory Protection, Rev.1; and applicable licensee procedures. Reviewed guidance documents and applicable records are listed in Section 2OS3 of the report Attachment.

Problem Identification and Resolution Issues identified through selected CAP documents including department self-assessments, audits, and CRs associated with ARM equipment, portable radiation detection instrumentation, and respiratory protective program activities were reviewed and assessed. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in

Enclosure

accordance with PI-AA-204, Condition Identification and Screening Process, Rev. 0. Licensee audits, self-assessments and CR documents reviewed and evaluated in detail during inspection of this program area are identified in Sections 2OS3 of the report Attachment.

The inspectors completed nine of the specified line-item samples detailed in IP 71121.03.

b. Findings

No findings of significance were identified.

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

Effluent Monitoring and Radwaste Equipment During inspector walk-downs, accessible sections of the liquid and gaseous radwaste and effluent systems were assessed for material condition and conformance with system design diagrams. The inspection included floor drain tanks, liquid waste system piping, waste gas decay tanks, hold up tanks, liquid radwaste monitors, plant vent effluent monitors, and associated airborne effluent sample lines. The inspectors interviewed licensee staff regarding radwaste equipment configuration and effluent monitor operation.

The inspectors reviewed performance records and calibration results for selected radiation monitors, flowmeters, and air filtration systems. For effluent monitors 1-RE-6627 (Liquid effluent discharge) and 2-RIM-26-90 (Plant vent gas) the inspectors reviewed the last two isotopic calibration records. The last two surveillances on the Unit 1 RAB High Efficiency Particulate Air (HEPA) air treatment system were also reviewed. The inspectors evaluated out-of-service effluent monitors and compensatory action data for the period November 2006 - September 2008. In addition, isokinetic sample line flow rates were reviewed and discussed with chemistry staff to evaluate the adequacy of representative sampling.

Installed configuration, material condition, operability, and reliability of selected effluent sampling and monitoring equipment were reviewed against details documented in the following: 10 CFR Part 20; RG 1.21, Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials In Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants; American Nuclear Standards Institute (ANSI)-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities; TS Section 5; the Offsite Dose Calculation Manual (ODCM); and UFSAR, Chapter 11. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the report Attachment.

Effluent Release Processing and Quality Control Activities The inspectors directly observed the weekly collection of airborne effluent samples from the Unit 1 Plant Vent and Unit 1 Fuel Handling Building. Chemistry technician proficiency in collecting, processing, and counting the samples, as well as preparing the applicable release permits was evaluated. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results and effluent monitor setpoints. The

inspectors also reviewed the 2006 and 2007 annual effluent reports to evaluate reported doses to the public and to review ODCM changes.

QC activities regarding gamma spectroscopy and beta-emitter detection were discussed with count room technicians and Chemistry supervision. The inspectors directly reviewed and discussed gamma spectroscopy systems efficiency verification worksheets and results of daily quality control activities with chemistry technicians. In addition, results of the 2006 and 2007 radiochemistry cross-check program were reviewed.

Observed task evolutions, count room activities, and offsite dose results were evaluated against details and guidance documented in the following: 10 CFR Part 20 and Appendix I to 10 CFR Part 50; ODCM; RG 1.21; RG 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I; and TS Section 5. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the report Attachment.

Current licensee programs for monitoring, tracking, and documenting the results of both routine and abnormal liquid releases to the onsite and offsite surface and ground water environs were reviewed and discussed in detail. The inspectors reviewed and discussed a self-assessment regarding compliance with the Nuclear Energy Institute (NEI) Ground Water Protection Initiative, results of monitoring conducted since calendar year 2006 and proposed changes to the program. Maximum tritium concentrations have been identified for samples collected from monitoring wells associated with the Unit 1 Component Cooling Water (CCW) area. All perimeter well sample tritium results were at or near detection levels which were established at a small fraction of the drinking water limits.

Problem Identification and Resolution Selected CRs associated with effluent release activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve selected issues in accordance with procedure PI-AA-204, Condition Identification and Screening Process, Rev. 0. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Reviewed documents are listed in Section 2PS1 of the report Attachment.

The inspectors completed the three specified line-item samples detailed in IP 71122.01.

b. Findings

No findings of significance were identified.

## 2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program

### a. Inspection Scope

REMP Implementation The inspectors observed routine sample collection and surveillance activities required by the licensee's ODCM. The inspectors noted the material condition and operability of airborne particulate and iodine sampling stations at monitoring locations H-14, H-33 (supplemental), and H-34. The inspectors also noted that the vacuum pumps at each of the sampling stations had been calibrated within the required six-month period. Environmental thermoluminescent dosimeters (TLDs) at locations N-1, H-14, H-33 (supplemental), H-34, SSE-5, SSE-10, and SE-1 were checked for material condition. Collection of broadleaf vegetation was observed at sample locations H-51, H-14, and H-59 (control); collection of surface water samples was observed at locations H-13 (supplemental), H-15, H-36 (supplemental), and H-59 (control); and collection of water samples from ground water wells was observed at locations H-72, H-73, and H-75. Land use census results, changes to the ODCM, and sample collection/processing activities were discussed with environmental technicians.

The inspectors also reviewed the 2006 and 2007 Radiological Environmental Operating Reports and discussed any missed samples and anomalous measurements with licensee staff. In addition, results of Calendar Year's 2006 and 2007 inter-laboratory cross-check program and applicable procedures for environmental sample collection and processing were reviewed. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements. In addition, control charts from the responsible vendor laboratory were reviewed to determine if the instruments "drifted" and gave biased results.

Procedural guidance, program implementation, and environmental monitoring results were reviewed against: 10 CFR Parts 20 and 50; TS Section 6; the ODCM; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; and RG 4.8, Environmental Technical Specifications for Nuclear Power Plants. Documents reviewed are listed in Section 2PS3 of the report attachment.

Meteorological Monitoring Program During a walkdown of the meteorological tower, the inspectors observed the physical condition of the tower and discussed equipment operability and maintenance history with an Instrumentation and Controls (I&C) maintenance supervisor. The inspectors compared locally generated meteorological data with information available to control room operators for the meteorological measurements of wind speed, wind direction, and temperature at the 57.9- and 10-meter elevations. The inspectors reviewed calibration records for applicable tower instrumentation for the second half of 2006, all of 2007, and 2008 through June. The inspectors also evaluated measurement data recovery data for compliance to Safety Guide 23.

The inspectors also reviewed condition reports generated over the last two years to determine the general “health” of the tower and its monitoring systems and how identified issues are addressed and resolved.

Licensee procedures and activities related to meteorological monitoring were evaluated against: the ODCM; UFSAR Section 2.3; ANSI/ANS-2.5-1984, Standard for Determining

Meteorological Information at Nuclear Power Sites; and Safety Guide 23, Onsite Meteorological Programs. Documents reviewed are listed in Section 2PS3 of the attachment.

Unrestricted Release of Materials from the RCA The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, PCMs, and PM instruments. The inspectors also observed source check testing of these instruments and discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors compared recent 10 CFR Part 61 results for the DAW waste stream with radionuclides used in calibration and check sources to evaluate the appropriateness and accuracy of release survey instrumentation. The inspectors also reviewed the last two calibration records for selected release point survey instruments.

Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in Section 2PS3 of the report Attachment.

Problem Identification and Resolution Selected CRs associated with the licensee’s REMP program were reviewed and assessed. The inspectors evaluated the licensee’s ability to identify, characterize, prioritize, and resolve selected issues in accordance with procedure PI-AA-204, Condition Identification and Screening Process, Rev. 0. The inspectors also evaluated the scope of the licensee’s internal audit program and reviewed recent assessment results. Reviewed documents are listed in Section 2PS3 of the report Attachment.

b. Findings

No findings of significance were identified.

OTHER ACTIVITIES

4OA1 Performance Indicator Verification

Initiating Events and Mitigating Systems Cornerstones

a. Inspection Scope

The inspectors checked licensee submittals for the performance indicators (PIs) listed below for the period October 2007 through September 2008, to verify the accuracy of the PI data reported during that period. Performance indicator definitions and guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator

Enclosure



Guideline, and licensee procedures ADM-25.02, NRC Performance Indicators, and NAP-206, NRC Performance Indicators, were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, CRs, system health reports, and PI data sheets to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution.

- Unit 1 Mitigating Systems Performance Indicators
- Unit 2 Mitigating Systems Performance Indicators

b. Findings

No findings of significance were identified.

Radiation Protection Performance Indicators

a. Inspection Scope

The inspectors sampled licensee records to verify the accuracy of reported Performance Indicator (PI) data for the periods listed below. To verify the accuracy of the reported PI elements, the reviewed data were assessed against guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Rev. 5.

Occupational Radiation Safety Cornerstone The inspectors reviewed PI data collected from January 1, 2007, through September 30, 2008, for the Occupational Exposure Control Effectiveness PI. For the reviewed period, the inspectors assessed CAP records to determine whether HRA, VHRA, or unplanned exposures, resulting in TS or 10 CFR 20 non-conformances, had occurred during the review period.

In addition, the inspectors reviewed selected personnel contamination event data, internal dose assessment results, and DRD alarms for cumulative doses and/or dose rates exceeding established set-points. The reviewed documents relative to this PI are listed in Sections 2OS1, 2OS3, and 4OA1 of the report Attachment.

Public Radiation Safety Cornerstone The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the period of January 1, 2007, through September 30, 2008. For the assessment period, the inspectors reviewed dose totals to the public, out-of-service (OOS) effluent radiation monitors and selected compensatory sampling data, and selected NCRs related to Radiological Effluent Technical Specific/ Offsite Dose Calculation Manual issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in Sections 2PS1 and 4OA1 of the report Attachment.

b. Findings

No findings of significance 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 to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a screening of items entered daily into the licensee's corrective action program (CAP). This review was accomplished by reviewing daily printed summaries of condition reports (CR) and by reviewing the licensee's electronic CR database. Additionally, reactor coolant system unidentified leakage was checked on a daily basis to verify no substantive or unexplained changes.

#### b. Findings

No findings of significance were identified.

### .2 Annual Sample: Unit 1 Loss of Shutdown Cooling

#### a. Inspection Scope

The inspectors selected CR 2008-32977, "Unit 1 Loss of Shutdown Cooling," for a more in-depth review of the circumstances that led up to the 1B Low Pressure Safety Injection (LPSI) pump being inadvertently stopped when in the shutdown cooling mode of operation and the corrective actions that followed.

The inspectors reviewed the licensee's evaluation of the event and the associated corrective actions. The inspectors reviewed the apparent cause evaluation and interviewed Operations personnel. The inspectors evaluated the licensee's administration of this selected condition report in accordance with their CAP as specified in licensee procedures PI-AA-204, Condition Identification and Screening Process and PI-AA-205, Condition Evaluation and Corrective Actions.

#### b. Findings and Observations

Introduction: A Green self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when the licensee failed to comply with a system surveillance procedure while restoring the 1A LPSI Pump from its minimum flow test resulting in a complete loss of shutdown cooling (SDC). Specifically, procedure 1-OSP-03.23A, Appendix B, step 1.6, was not accomplished as written and an operator stopped the LPSI pump that was providing shutdown cooling (SDC) vice the LPSI pump in test. The finding had human performance cross-cutting aspects in that an operator failed to comply with procedural requirements.

Description: On the morning of October 26, 2008, Unit 1 was in a scheduled RFO with the 1B LPSI pump in the SDC mode of operation and the 1A LPSI pump running in recirculation per surveillance minimum flow test procedure 1-OSP-03.23A,

Appendix B, Safety Injection System Check Valve Cold Shutdown Testing. At 5:00 am, upon completion of the 1A LPSI pump minimum flow test, the licensed Reactor Operator (RO) reached step 1.5 in procedure 1-OSP-03.23A that required him to stop the 1A LPSI pump and instead stopped the 1B LPSI by mistake resulting in a loss of SDC. The control room board RO noticed a change in SDC flow and alerted the RO. The licensed operators then entered TS 3.9.8.1, "Refueling Operations, Shutdown Cooling and Coolant Circulation, High Water Level" and were required to take action (b) to suspend operations that may increase reactor decay heat load. At 5:20 am, the SDC train was returned to service and the remaining restoration steps of 1A LPSI surveillance test were completed.

Analysis: The inspectors determined that mistakenly stopping the 1B LPSI pump while in the SDC mode of operation was a performance deficiency requiring an evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening." The inspectors determined that the finding was more than minor because it was associated with the configuration control and human performance attributes of the initiating events cornerstone and adversely impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. In addition, if left uncorrected, this finding would result in a more significant safety concern. The inspectors determined the issue also affected the cross-cutting area of human performance because of ineffective peer and self-checking which contributed to a licensed SRO and RO not recognizing that the wrong LPSI pump control switch (1B LPSI pump) was selected prior to stopping the pump in test (1A LPSI pump).

At the time of the event, the unit was in Mode 6 and had been shutdown for approximately 7 days. The temperature change in the RCS was minimal (less than 10° F) and the time to boiling was greater than 300 minutes with the upper cavity flooded (RCS level > 23 feet) and the reactor vessel head removed. The inspectors evaluated the finding using Inspection Manual Chapter (IMC) 0609, Appendix G, Figure 1, Road Map for Shutdown Findings, Table 1, Losses of Control and Attachment 1, Shutdown Operations Significance Determination Process Phase 1 Operational Checklist 4 PWR Refueling Operation, RCS level > 23' or PWR Shutdown Operation With Time to Boiling > 2 hours And Inventory in the Pressurizer. The inspectors determined that this finding was screened as having very low safety risk significant (Green) per Figure 1 because this finding did not increase the likelihood of a loss of RCS inventory or could result in a loss of RCS level instrumentation; the finding did not degrade the licensee's ability to terminate a leak or add RCS inventory when needed; and the finding did not degrade the licensee's ability to recover DHR once it is lost. Also, the inspectors determined that this finding did not meet conditions for Losses of Control Criteria per Table 1 and quantitative assessment was not required. This finding was related to the use of human error prevention techniques aspect in the work practices component in the human performance cross-cutting area (IMC 0305 aspect H.4.a).

Enforcement: Appendix B, Criterion V, of 10 CFR Part 50, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, and drawings. Contrary to the above, on October 26, 2008, the operators failed to accomplish prescribed procedure step 1.5 that instructed the

Enclosure

operators to stop the running 1A LPSI pump. The licensee provided remedial training to those operators involved and entered the event into their CAP as CR 2008-32977. Because the failure to accomplish prescribed procedure steps was of very low safety significance and had been entered into the licensee's CAP, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000335/2008005-01: Failure to Accomplish Prescribed Procedure Steps Resulting in Loss of Shutdown Cooling.

.3 Annual Sample: 1A Emergency Diesel Generator (EDG) Fuel Oil Transfer Pump Not Starting When Required

a. Inspection Scope

The inspectors selected CR 2008-32418, "1A-EDG Fuel Oil Transfer Pump Did Not Start When Required," for a more in-depth review of the circumstances that led to the EDG day tank low level switch not functioning as designed and the corrective actions that followed.

The inspectors reviewed the licensee's evaluation of the event and the associated corrective actions. The inspectors reviewed the apparent cause evaluation and interviewed Engineering personnel. The inspectors evaluated the licensee's administration of this selected CR in accordance with their CAP as specified in licensee procedures PI-AA-204, Condition Identification and Screening Process and PI-AA-205, Condition Evaluation and Corrective Actions.

b. Findings and Observations

While reviewing CR 2008-32418, "1A-EDG Fuel Oil Transfer Pump Did Not Start When Required," the inspectors determined that during the TS required 24-hour surveillance run of the 1A-EDG performed on October 22, 2008, the licensee had to mechanically agitate the day tank level switch LS-59-008A for the fuel oil transfer pump to automatically start. The day tank low level switch should have actuated to start the transfer pump and begin refilling the day tanks. The inspectors noted that LS-59-008A had failed previously during a routine calibration in June of 2007, and was replaced under WO 37012672. Design Basis Document (DBD) Section 7.14.1 states, in part, that the EDG day tanks shall be provided with level switches to automatically operate the transfer pumps and the solenoid isolation valves. This was necessary to ensure uninterrupted operation of the associated diesel generator set. The inspectors determined that Technical Specifications do not specifically address either day tanks or level switches, or the automatic function of the fuel oil system itself. Therefore, additional inspections are needed to resolve this issue. This item is identified as Unresolved Item (URI) 05000335/2008-002, Failure of the Automatic Diesel Fuel Oil Transfer System Could Potentially Result in the 1A EDG Being Inoperable.

4OA5 Other Activities.1 Quarterly Resident Inspector Observation of Security Personnel and Activitiesa. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel activities to ensure that the activities were consistent with the licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both 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 of significance were identified.

.2 (Discussed) NRC Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (DMBW)a. Inspection Scope

From December 8-12, 2008, the inspectors reviewed the licensee's activities related to the inspection and mitigation of dissimilar metal butt welds in the Reactor Coolant System (RCS) to ensure that the licensee's activities were consistent with industry requirements established in the Materials and Reliability Program (MRP) document MRP-139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines," July 2005.

The inspectors reviewed documentation of overlay and NDE activities covering mitigation of the Unit 1 Shutdown Cooling (SDC) outlet to hot leg "A" pipe nozzle dissimilar metal butt weld (DMBW) full structural weld overlays (FSWOL) from the fall of 2008. Inspection activities also included a review of MRP-139 program documentation.

b. Findings and Observations

No findings of significance were identified.

**MRP-139 Baseline Inspections**

- 1) Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance? Were the baseline inspections of the pressurizer temperature DMBWs of the nine plants listed in TI 2515/172, 03.01.b completed during the spring 2008 outages?

Yes, all baseline volumetric inspection activities required to be completed per MRP-139 Section 1.2 at the time of this report have been completed.

Pressurizer (PZR) Activities: Unit 1 PZR has no dissimilar metal welds at typical locations. All nozzle safe-end welds are stainless steel, and therefore outside the scope of MRP-139. The Unit 2 PZR has 2 DM weld locations, one at the surge line nozzle and the other at the relief line nozzle. The other typical locations (3 safety nozzles and the spray nozzle) were replaced with stainless steel welds and are therefore outside the scope of MRP-139. The surge line and relief line nozzles have both been mitigated by the use of a full structural weld overlay (FSWOL) during the SL2-17 (fall 2007) refueling outage. Baseline examinations via ultrasonic testing (UT) were performed at both locations. Therefore the licensee has completed all required baseline exams for welds at PZR temperature scoped into the MRP-1-39 program prior to the December 31, 2007 deadline.

Hot Leg Activities: Unit 1 has four DM weld locations which operate at hot leg temperatures (two SDC nozzles, the PZR surge line nozzle, and the hot leg drain nozzle). All four locations contain weld materials susceptible to primary water stress corrosion cracking (PWSCC), and all four locations were mitigated with FSWOLs during the SL1-22 (fall 2008) refueling outage. Unit 2 has an identical arrangement. All four Unit 2 DM welds were mitigated with FSWOLs during the SL2-17 (fall 2007) refueling outage. Therefore the licensee has completed all required baseline exams for welds at hot leg temperature scoped into the MRP-139 program prior to December 31, 2008.

Cold Leg Activities: Unit 1 and Unit 2 have similar arrangements for DM weld locations containing PWSCC susceptible weld metal. Both units have four reactor coolant pump (RCP) inlet nozzles and four RCP outlet nozzles. Both units have four safety injection nozzles, two PZR spray inlet nozzles, two charging nozzles, and four intermediate drain nozzles. The PZR spray inlet nozzles are <4" nominal pipe size (NPS), and therefore not scoped into MRP-139, but the licensee has scheduled exams for 2010 in anticipation of them being included in the requirements of ASME Code Case N-770. The charging nozzles are 2" NPS, but have an Emergency Core Cooling (ECCS) function, therefore are scoped in MRP-139 and are scheduled for baseline exams in 2010. The Unit 1 Intermediate Drain Nozzles have an ECCS function and are scoped in MRP-139 with baseline exams planned for 2010. While the Unit 2 intermediate drain lines do not have an ECCS function, baseline exams are planned for 2010 in anticipation of N-770. Additionally, a planned power uprate may require the licensee to credit the Unit 2 intermediate drain line nozzles as having an ECCS function. The safety injection nozzles are scheduled for examination in 2010. Coverage calculations for the safety injection nozzles indicate that it will not be possible to obtain >90% coverage, therefore FSWOLs are planned. RCP nozzles (inlet and outlet) are subject to significant challenges including cast stainless steel and permanent obstructions. The licensee recognizes these issues and is working towards an alternative to the current MRP-139 requirements through the Combustion Engineering Owner's Group and EPRI/MRP. In general terms, the alternative being considered includes a combination of gradually phased-in weld overlays and finite element analysis to demonstrate continued safe operation.

Enclosure

- 2) Is the licensee planning to take any deviations from MRP-139 requirements?

With the possible exception of the RCP inlet and outlet welds at cold leg temperatures, no the licensee is not planning on taking any deviations from MRP-139 requirements.

### **Volumetric Examinations**

- 1) For each examination inspected, was the activity performed in accordance with the examination guidelines in MRP-139, Section 5.1, for unmitigated welds or mechanical stress improved welds and consistent with NRC staff relief request authorization for overlaid welds?

#### **Unit 1 Loop A Shutdown Cooling Nozzle**

Yes, the volumetric examination of the Unit 1 "A" SDC nozzle was performed in accordance with the requirements of the proposed alternative authorization (St. Lucie, Unit 1 – Safety Evaluation of Relief Request to Use Structural Weld Overlay and Alternative Examination Techniques on Safe End Dissimilar Metal Welds, dated November 3, 2008). The phased array UT procedure (Structural Integrity SI-UT-126, Rev 3) was qualified in accordance with ASME Section XI, Appendix VIII, as implemented by the Electrical Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) Program, with specific reliefs having been granted by the SER. The required pre-service inspection volumes indicated by ASME Section XI, Non-Mandatory Appendix Q, Figures Q-4100-1 and Q-4300-1, were examined with >90% coverage excluding cast material for Figure Q-4100-1 and 100% coverage for Figure Q-4300-1. The inspectors reviewed the licensee's procedure, equipment and personnel certifications, transducer selection documentation, and conducted interviews with plant personnel.

- 2) For each examination inspected, was the activity performed by qualified personnel?

#### **Unit 1 Loop A Shutdown Cooling Nozzle**

Yes, personnel involved in the phased array UT examinations of the Unit 1 "A" SDC nozzle were qualified in accordance with MRP-139 requirements and the previously noted proposed alternative authorization. The examiners were qualified UT Level II as required by the UT procedure and in accordance with the vendor's written practice for NDE personnel. The UT examiners were also PDI qualified for the specific UT procedure they implemented. The final examination report was reviewed by a vendor's UT Level III, a licensee's UT Level III, and the Authorized Nuclear Inservice Inspector (ANII).

- 3) For each examination inspected, was the activity performed such that deficiencies were identified, dispositioned, and resolved?

#### **Unit 1 Loop A Shutdown Cooling Nozzle**

Yes, the inspectors reviewed documentation conducted interviews with plant personnel to verify that deficiencies were identified, dispositioned, and

resolved. Based on the inspection activities, the inspectors determined that the examination was conducted in a manner such that deficiencies were identified, dispositioned, and resolved.

### **Weld Overlays**

- 1) For each weld overlay inspected, was the activity performed in accordance with ASME Code welding requirements and consistent with NRC staff relief requests authorizations? Has the licensee submitted a relief request and obtained NRR staff authorization to install weld overlays?

#### **Unit 1 Loop A Shutdown Cooling Nozzle**

Yes, the licensee installed Unit 1 loop A SDC nozzle FSWOL in accordance with the proposed alternative authorization (St. Lucie, Unit 1 – Safety Evaluation of Relief Request to Use Structural Weld Overlay and Alternative Examination Techniques on Safe End Dissimilar Metal Welds, dated November 3, 2008). The inspectors reviewed welding procedure specifications, procedure qualification records, weld wire certifications, and the in-process welding process control sheets for compliance to ASME Section IX requirements and adherence to the SER. The inspectors also evaluated corrective action program documents, and third party contractor corrective action process issue reports regarding weld overlay quality issues.

- 2) For each weld overlay inspected, was the activity performed by qualified personnel?

#### **Unit 1 Loop A Shutdown Cooling Nozzle**

Yes, welding personnel were qualified in accordance with the requirements identified in ASME Code Section IX. The inspectors reviewed the welder performance qualification test records and compared them with the requirements of QW-300. The in-process welding process control sheets were reviewed for compliance with the proposed alternative and ASME Code Section IX requirements.

- 3) For each weld overlay inspected, was the activity performed such that deficiencies were identified, dispositioned, and resolved?

#### **Unit 1 Loop A Shutdown Cooling Nozzle**

Yes, the inspectors reviewed documentation and interviewed appropriate licensee personnel to verify that deficiencies were identified, dispositioned, and resolved. Based on inspection activities, the inspectors determined that the installation of the FSWOL was conducted in a manner such that deficiencies were identified, dispositioned, and resolved.

### **Mechanical Stress Improvement (Not Applicable)**

The licensee has not implemented Mechanical Stress Improvement as a mitigation method for DMBWs.

Enclosure



### **In-service Inspection Program**

- 1) Has the licensee prepared an MRP-139 in-service inspection program?

The licensee did not have a stand alone MRP-139 inservice inspection program document, however the licensee incorporated MRP-139 program requirements into the Alloy 600 Management Program (ENG-CSI-A600, Rev 2) and the WinISI program used to maintain ISI program scheduling. Therefore, the licensee is managing the MRP-139 commitments. Determination of the locations of Alloy 600 DMBW's was assisted by a Combustion Engineering Owner's Group 2001 report. The inspectors reviewed these and other documents and interviewed appropriate licensee representatives.

- 2) Are welds appropriately categorized?

The inspectors reviewed all welds included in the scope of MRP-139 for appropriate categorization in accordance with MRP-139, Section 6. Welds were not explicitly categorized, however an examination of the inspection schedule revealed that all welds were to be inspected at an interval consistent with the correct category. The licensee intends to label each weld with its appropriate category and has captured this in the licensee's corrective action program (CR 2008-37746). There were also some minor discrepancies between the two primary program documents (WinISI and the Alloy 600 Management Program) in terms of scheduling; again these were captured in CR-2008-37746.

- 3) Are inspection frequencies consistent with the requirements of MRP-139?

Yes, planned inspection frequencies for welds in the MRP-139 program are consistent with the requirements of MRP-139 with the exception of some minor discrepancies noted in 2) above.

- 4) What is the licensees' basis for categorizing welds as H or I and plans for addressing potential PWSCC?

The 16 DMBWs associated with the four RCPs (inlet and outlet nozzles) are categorized as Category I. Weld profiling performed to satisfy MRP 2004-05 and MRP-139 Section 1.2 revealed that there are significant challenges with respect to obtaining adequate (>90%) examination coverage. These challenges include permanently installed instrumentation lines, profile geometry not conducive to UT examination, and the cast stainless steel in the RCP bowl. As this is potentially a generic issue among all Combustion Engineering plants the licensee has initiated efforts within the CE Owner's Group and EPRI/MRP to develop alternatives to the requirements of MRP-139. These alternatives include fracture mechanics analysis, weld overlays and best effort volumetric examinations.

- 5) What deviations has the licensee incorporated and what approval process was used?

No deviations to MRP-139 have been incorporated by the licensee at present therefore, no approval was necessary. However, the RCP DMBW's may be deviation candidates in the future based on the information provided above.

4OA6 Exit

Exit Meeting Summary

The resident inspectors presented the inspection results to Mr. Costanzo and other members of licensee management on January 8, 2009. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary information. The licensee did not identify any proprietary information.

ATTACHMENT: SUPPPLEMENTAL INFORMATION

Enclosure

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee personnel:

C. Ali, Licensing Engineer  
P. Bailey, Senior Analyst, Nuclear Division (Corporate)  
E. Belizar, Projects Manager  
M. Bladek, Assistant Operations Manager  
D. Calabrese, Emergency Preparedness Supervisor  
D. Cecchett, Licensing Engineer  
J. Connor, Engineering Manager - Programs  
T. Cosgrove, Site Engineering Director  
C. Costanzo, Plant General Manager  
A. Day, Chemistry Manager  
M. Delowery, Maintenance Manager  
A. Dong, Instrumentation and Controls Maintenance Supervisor  
S. Duston, Training Manager  
R. Filipek, Engineering Manager - Performance Indicators  
K. Frehafer, Licensing Engineer  
J. Heinold, Chemistry Technical Supervisor  
M. Hicks, Operations Manager  
D. Huey, Acting Work Control Manager  
B. Jacques, Security Manager  
G. Johnston, Site Vice President  
B. Kelly, System Engineer  
J. Klauck, Acting Assistant Operations Manger  
J. Kramer, Site Safety Manager  
R. McDaniel, Fire Protection Supervisor  
M. Moore, Radiation Protection Manager  
B. Mouring, Radiation Protection Supervisor  
B. Neff, System Engineer  
M. Page, Acting Operations Manager  
P. Paradis, Fix-It-Now Team Supervisor  
T. Parr, Nuclear Materials Manager  
T. Patterson, Performance Improvement Department Manager  
J. Porter, Design Engineering Manager  
W. Raasch, System Engineer  
M. Snyder, Site Quality Assurance Manager  
N. Sorensen, Business Operations Manager  
G. Swider, Systems and Component Engineering Manager  
R. Walker, Emergency Preparedness

#### Florida Department of Health, Bureau of Radiation Control

M. Seidensticker, Environmental Manager  
J. Tardaguila, Environmental Specialist II  
J. Williamson, Environmental Administrator

NRC personnel:

M. Sykes, Chief, Branch 3, Division of Reactor Projects

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**Opened

NONE

Opened and Closed

05000335/2008005-01	NCV	Unit 1 Loss of Shutdown Cooling (4OA2)
---------------------	-----	--

Opened

05000335/2008005-02	URI	Failure of the Automatic Diesel Fuel Oil Transfer System Could Potentially Result in the 1A EDG Being Inoperable (4OA2).
---------------------	-----	--

Discussed

2515/172	TI	Reactor Coolant System Dissimilar Metal Butt Welds (DMBW's) (4OA5)
----------	----	--

## LIST OF DOCUMENTS REVIEWED

### Section 2OS1: Access Controls to Radiologically Significant Areas

#### Procedures, Manuals, and Guidance Documents

Administrative Procedure (ADM)-05.02 HP Controls of Spent Fuel Pool Non-SNM, Revision (Rev. 2.b)  
ADM 05.03, Radiation Work Permits, Rev. 6  
Health Physics Procedure (HPP) – 1, Preparing Radiation Work Permits, Rev. 29  
HPP-3, High Radiation Areas, Rev. 24  
HPP-5, Health Physics Department Conduct of Operations, Rev. 8  
HPP-20, Area Radiation and Contamination Surveys, Rev. 27  
HPP-22, Air Sampling, Rev. 18  
HPP-30, Personnel Monitoring, Rev. 43A  
HP-56, Instructions for Radiography, Rev. 10  
Review of Alpha Monitoring Guidelines, Rev.2,  
RWP 08-0106, Unit 1 and Unit 2, 62' Spent Fuel Pool. Inspections, PMs, Funnel Movements, Handling Tool & Underwater Lights. Repair & Manipulation, Rev. 01  
RWP 08-111, Load TC / DSC's, Transfer to CHF, Weld DSC Covers, Drain / Perform VDS, Transport / Load into HSM. (To Include Decon / Tri-Nuc Vacuum and all Misc Support, Revs. 0 – 3.  
RWP 08-110, HP Support, Surveys, Job Coverage, Decon Support, Tri-Nuc Vacuum and Support Activities, Revs. 1-3.  
RWP 08-123, Unit 1 19.5 foot (') Drumming Room/LHRA Storage Area, RCA Storage Areas: Move, Sort, Prep, Ship High Rad/Locked High Rad Trash and Material, Rev.0  
RWP 08-0127, Unit 1: Transfer Ion Exchanger Resins to SRT, Rev. 0  
RWP 08-0133, U1 Reactor Auxiliary Building, Radiation Control Area , 19/5 ' Volume Control Tank '1B' CVCS filter cubicle: Remove/replace '1B' CVCS filter. Transport, place in liner/storage location. All support, Rev.01  
RWP 08-0137, Unit 1 & 2 Turbine Decks, All Elevations. Secondary Side Areas, New Components, Radiography Vault. Perform Radiography Operations, Rev. 0j  
RWP 08-1345, Ten year ISI on Core Support Barrel, Reactor Vessel and Upper Guide Structure, All Support, Rev. 00  
RWP 08-1415, Unit 1 (U1) Reactor Containment Building (RCB) Alloy 600 Repairs: Structural Weld Overlay (SWOL) "A" Shut Down Cooling, Rev. 00  
RWP 08-1416, U1 RCB Alloy 600 Repairs: "B" Surge Line Whip Restraint Removal, Rev. 00  
RWP 08-1417, U1 RCB Alloy 600 Repairs: SWOL "B" SDC & "B" Surge Line Nozzle, Rev. 00

#### Records and Data Reviewed

Personnel Contamination Events, 10/01/07 -09/30/08  
Internal Dose Calculations, 10/01/07 – 09/30/08  
Alpha Air Sample Analysis Results, 01/01/07 – 09/30/08  
Beta-Gamma to Alpha Smear Ratios, 01/01/07 – 09/30/08  
Exposure Investigation Reports 10/01/07 – 09/30/08, Selected Events  
Personnel Skin and Clothing Contamination Reports, 10/01/07 – 09/30/08, Selected Events

Spent Fuel Pool Non-SNM Item Inventory Log Sheets, Unit 1 & Unit 2, September 2007 and March 2008

Monthly Survey Log# 081-4097, ISFSI – Independent Fuel Storage Installation, 09/19/08  
 ISFSI Environmental TLD Results: 03/04/08 – 06/30/08  
 Radiological Survey No. 081-1278, Monthly ISFSI Survey, dated 4/17/08  
 Radiological Survey No. 081-4097, Monthly ISFSI Survey, dated 9/18/08  
 2008 ISFSI Cumulative Doses by DSC U1

#### Corrective Action Program (CAP) Documents

2007 Annual Radiation Protection (RP) Programmatic Assessment, December 10-15, 2007  
 Condition Report (CR) 2008-12350, Dose rate alarm malfunction  
 CR 2008-10062, E/M dose alarm  
 CR 2008-8318, Dosimetry Alarm  
 CR 2008-30495, Cover to a cable tray on the ISFSI-HSM roof is coming apart, 10/02/2008  
 CR 2008-30515, ISFSI Horizontal Storage Module (HSM) Postings, 10/02/2008  
 CR 2007-40001, SGT worker received dose alarm  
 CR 2007-39793, SGT carpenter experienced a dose rate alarm in the Unit 2 (U2) annulus

### **Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment**

#### Procedures and Guidance Documents

HP-13A, Operation of Portable Survey Instruments, Rev. 25  
 HP-13C, Calibration of Portable Dose Rate Survey Instruments, Rev. 23  
 HPP-02, Calibration and Operation of the Bicron-NE Small Article Monitor (SAM), Rev. 11  
 HPP-10, Multichannel Analyzers, Rev. 14  
 HPP-35, Operation and Calibration of TSA Systems Model SPM-906 Portal Monitor, Rev. 6  
 HPP-60, Respiratory Protection Manual, Rev. 7B  
 HPP-61, Use of Respiratory Protective Equipment, Rev. 16A  
 HPP-62, Inspection and Maintenance of Respiratory Protection Equipment, Rev. 13  
 HPP-64, Setup and Inspection of Breathing Air Purification Systems, Rev. 11A  
 HPP-114, Calibration and Operational Check of the Nuclear Enterprises Personnel Contamination Monitors, Rev. 13  
 QI-12-PR/PSL-6, Radiation Protection Measuring and Test Equipment, Rev. 17  
 Lesson Plan 4702100, Don, Operate and Remove the Scott 2.2 SCBA Initial Training, Rev. 07  
 OJT Guide 4705100, Don, Operate and Remove the Scott 2.2 SCBA Initial Training, Rev. 05  
 Training Module 4721100, Don, Operate, and Remove the Scott 2.2 SCBA, Rev. 08

#### Records and Data Reviewed

Work Order (WO) 34013944, RIS-26-5 (U1 CIS Rad Monitor) Calibration, 10/2005  
 WO 37008269, RIS-26-5 (U1 CIS Rad Monitor) Calibration, 4/2007  
 WO 34013874, RIS-26-58/59 (U1 Containment High Range Monitor) Calibration, 11/2005  
 WOs 36002176 and WO 37010751, RIS-26-58/59 (U1 Containment High Range Monitor) Calibration, 5/2007  
 WO 35007208, RSC-26-4 (U1 Fuel Handling Building PIG Monitor) Calibration, 7/2005  
 WO 36021962, RSC-26-4 (U1 Fuel Handling Building PIG Monitor) Calibration, 5/2007  
 WO 35018634, RM-26-25 (U2 Containment Atmosphere PIG Monitor) Calibration, 1/2006  
 WO 37000547, RM-26-25 (U2 Containment Atmosphere PIG Monitor) Calibration, 7/2007  
 WO 36000254, RM-26-26 (U2 Containment Atmosphere PIG Monitor) Calibration, 7/2006  
 WO 37013533, RM-26-26 (U2 Containment Atmosphere PIG Monitor) Calibration, 3/2008  
 WO 34007420, RM-26-22, 23, 24, 27, 28 (ECCS Area Rad Monitors) Calibration, 12/2004

WO 36004397, RM-26-22, 23, 24, 27, 28 (ECCS Area Rad Monitors) Calibration, 7/2006  
 Instrument Calibration Data Sheet for Telepole S/N 6605-035, 5/01/07  
 Instrument Calibration Data Sheet for Telepole S/N 6605-035, 10/29/07  
 Instrument Calibration Data Sheet for RO-20 Ion Chamber S/N 5552, 4/05/07  
 Instrument Calibration Data Sheet for RO-20 Ion Chamber S/N 5552, 9/29/07  
 Instrument Calibration Data Sheet and Battelle Calibration Report for REM-500 Neutron  
 Survey Meter S/N 2841, 2/13/07  
 Instrument Calibration Data Sheet for REM-500 Neutron Survey Meter S/N 240, 3/21/07  
 Instrument Calibration Data Sheet for REM-500 Neutron Survey Meter S/N 240, 9/21/07  
 Instrument Calibration Data Sheet for SPM-906 Portal Monitor, S/N 906063, 9/05/08  
 Instrument Calibration Data Sheet and Parameter Form for IMP-9D S/N 248, 9/09/08  
 Respiratory Protective Equipment Use Log, Dated 10/05/07 – 12/08/07  
 Part 61 Waste Stream Analysis Report Dated 8/12/08  
 Scott PosiChek3 Visual/Functional Test Results for multiple units, performed on 9/22/04,  
 8/25/06, and 8/27/08  
 Compressed Air/Gas Quality Testing Laboratory Reports for CY2007 and CY2008  
 Investigation of Programmatic Gaps in Daily Source Checks, CR 2008-999 Action 34,  
 8/20/2008

#### CAP Documents

PI-AA-204, Condition Identification and Screening Process, Rev. 0  
 CR 2006-30199, HP Instrument left Out-of-Tolerance after Calibration, 10/23/2006  
 CR 2007-32528, HP Air Sampler Found Out of Calibration, 10/08/2007  
 CR 2007-35774, While Performing a TPE for source checking the SPM-906 Portal Monitors,  
 source did not alarm monitor, 10/30/2007  
 CR 2008-6832, Out of Calibration equipment found in the field, 2/27/2008  
 CR 2008-11598, IPM-9 Portal Monitor in use past calibration due date, 4/04/2008  
 CR 2008-12290, U1 ARMs calibration for CH 16, 20, 24, 26, 27 cannot be completed,  
 4/10/2008  
 CR 2008-16421, Radiation Area Monitors in alarm can lead to complacency, 5/14/2008  
 CR 2008-30500, SCBA Training does not require demonstration of bottle changeout,  
 10/2/2008  
 2005 Radiation Protection Program Review  
 QSL-RP-05-07, Radiation Protection Functional Area Audit, June 8 – August 1, 2005

#### **Section: 2PS1 Radioactive Gases and Liquid Effluent Treatment and Monitoring Systems**

##### Procedures, Guidance Documents, and Manuals

COP-01.05, Processing Aerated Liquid Wastes, Rev. 16  
 COP-01.06, Processing Gaseous Waste, Rev. 9C  
 COP-06.10, Alternate Sampling Methods for Effluent and Process Radiation Monitors, Rev. 6  
 PI-AA-204, Condition Identification and Screening Process, Rev. 0

##### Records and Data Reviewed

Annual Radioactive Effluent Release Report, 2006 and 2007  
 Radiation Monitoring System Health Report, 4/1/08 – 6/30/08  
 MEP 07039, Unit 1 Liquid Waste Radiation Monitor (RE-6627) Flow Switch Replacement,  
 10CFR50.59 Screen, 4/20/07  
 PSL-ENG-SENS-00-108, 2000 FSAR Review Findings Requiring Changes or Clarifications  
 to the FSARs in Accordance with 10 CFR 50.59, Rev. 0

Work Order (WO) 35007697 02, Calibration of Liquid Radwaste Discharge Monitor RE-6627, 10/3/05

WO 36026506 01, Calibration of Liquid Radwaste Discharge Monitor RE-6627, 10/27/07

WO 34014047 01, Calibration of U2 Plant Vent Gas Monitor RIM-26-90, 12/30/04

WO 36002435 01, Calibration of U2 Plant Vent Gas Monitor RIM-26-90, 8/7/06

Gaseous Radioactive Waste Release Permits, 7/18/08 1458, 7/25/08 2053, 7/31/08 1042, 9/26/08 2038, 9/26/08 2016, 9/26/08 2210, and 9/26/08 2230

Liquid Radioactive Waste Release Permits, 7/5/07 1000, 7/21/08 1044, and 9/30/08 0330

Results of Radiochemistry Cross-Check Program, 2006, 2007, and 2008

Efficiency Verification Worksheets for Gamma Spectroscopy System No 1, No. 2 and No 3 Including: Gas Sphere Shelf 1, June 2007; Gas Marinelli, June 2007, 16 milliliter vial shelf 1, June 2007; 1 liter liquid marinelli, July 2007; particulate filter shelf 0, July 2007, and charcoal cartridge shelf 1, June 2007

OSP-25.04, Filter Testing, U1 RAB Surveillances, 3/20/07 and 8/31/05

Out-of-service data for U1 and U2 effluent monitors, 11/6/06 – 9/1/08

#### CAP Documents

PSL-08-03, Chemistry and Effluents Functional Area Audit, 5/12/08 – 6/27/08

FPL Quick Hit Self-Assessment, Industry Groundwater Protection Initiative – NEI 07-07, August 11-13, 2008

CR 2006-31664, Fuel Handling Building vent stack monitor declared out-of-service, 11/1/06

CR 2008-24697, 2B S/G blowdown monitor out-of-service greater than 30 days, 7/31/08

CR 2008-30556, Interlaboratory comparison incomplete for 1<sup>st</sup> quarter 2008 due to changes in personnel, 10/3/08

### **Section 2PS3: Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program**

#### Procedures and Guidance Documents

State of Florida, Department of Health, Bureau of Radiation Control, Sampling

Procedures(SP):

SP 1, Collection of Air Particulates and Radioiodines, Rev. 9

SP 4, Collection of Surface Water, Rev. 4

SP 5, Collection of Broadleaf Vegetation, Rev. 2

SP 12, Annual Land Use Census, Rev. 2

SP 13, Collection of Drinking and Ground Water, Rev. 1

Chemistry Operating Procedure, C-200, Offsite Dose Calculation Manual (ODCM), Revision 31A

Operations Surveillance Procedure (OSP) 0-OSP-57.01, Meteorological Data System Daily Channel Check, Revision 1

Nuclear Plant Support Services (NPSS)-HP-WP-002, Radiological Environment Monitor Program, Rev. 2

Quality Procedure A, Radiological Environmental Monitor Program, Rev. 1

#### Records and Data Reviewed

2006 Annual Radiological Environmental Operating Report

2007 Amended Annual Radiological Environmental Operating Report, including Interlaboratory

Crosscheck Results for 2007 (Attachment C of Report)

2006 Annual Radioactive Effluent Release Report

2007 Annual Radioactive Effluent Release Report



Work Order (WO) 34016557, Hire Contractor to Perform Inspection of Meteorological Tower, 9/13/04

Meteorological Tower Instrument Calibration 11/27/06, (WO 36014136)

Meteorological Tower Instrument Calibration 6/25/07 (WO 36026774)

Meteorological Tower Instrument Calibration 10/29/07 (WO 37012327)

Meteorological Tower Instrument Calibration 6/2/08 (WO 37026346)

Meteorological Data Percent Recovery 2007

Meteorological Data Percent Recovery First Quarter 2008

#### CAP Documents

CR 2004-04430, Meteorological Tower Shows Signs of Corrosion and Structural Wear, 7/19/04

CR 2005-02912, Meteorological Tower Data Recorder Needs Replacement, 1/27/05

CR 2005-31023, Meteorological Data Lost after Hurricane Wilma, 11/11/05

CR 2006-10274, Contractor Hired to Evaluate Structural Integrity of Meteorological Tower, 4/3/06

CR 2006-32660, QSL-EP-06-06, Finding 2, Meteorological Tower Instrumentation, 11/15/06

CR 2008-09914, The Met Tower Temperatures from 10m and 57.9m are Failed, 3/23/08

CR 2008-20613, Met Tower "A" Channel Bad Data, 6/23/08

CR 2008-24311, Met Data Lost during Met Tower Maintenance, 7/29/08

#### **Section: 4OA1 Performance Indicator Verification**

##### Procedures

ADM-25.02, NRC Performance Indicators, Rev. 21A

##### Records and Data Reviewed

Out-of-service data for U1 and U2 effluent monitors, 11/6/06 – 9/1/08

Gaseous Effluent Dose Summation, U1 and U2, November 2008

Liquid Effluent Dose Summation, U1 and U2, November 2008

##### CAP Documents

CR 2008-10062, Dose Alarm

CR 2007-40621, Locked High Rad lights getting unplugged,

CR 2007-40521, Individual showed low level positive activity on an investigational wholebody count

CR 2007-40168, Individuals with minimal positive activity allowed to leave site

CR 2007-37618, Personnel Contamination,

CR 2007-34479, Posting and barricade discrepancies in the U2 RCB identified during walk-down

CR 2007-31649, High Radiation Area barricade found out of position at the pressurizer cubicle ladder

CR 2006-35804, Liquid effluent monitor out-of-service greater than 30 days

#### **Section: 4OA5 NRC Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (DMBW)**

##### Procedures

SI-UT-126, Structural Integrity Associates Procedure for the Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds, Rev 3

Corrective Action Documents – Condition Reports (CR)

AREVA CR 2005-5192, Nonconformances, Problems and Concerns from Traveler 50-5053663 Unit 1 PZR piping  
 CR-2008-37746, NRC inspection using Temporary Instruction TI 2515-172, 12/10/2008  
 CR-2008-37810, Additional Review of the “A” SDC WOL indication during an NRC inspection indicates that the acceptance criteria in RR 2 may not have been fully addressed, 12/10/2008  
 CR-2008-35179, Rejectable Indication found during final UT in “A” SDC WOL, 11/11/2008  
 CR-2008-33949, Alloy 600 SWOL 0 Existing Porosity detected in “A” SDC safe-end to HL nozzle dissimilar metal weld while laying bridge weld, 11/02/2008  
 CR-2007-37253, Interim Guidance for MRP-139 to perform UT of hot leg <4” NPS DMBWs, 11/9/2007

Other

Drawing No. ENG-05102M-002, St. Lucie Unit #1 Reactor Coolant Pressurizer Spray Piping Welding Services, Inc. Job/Project No. 104423-WPI-001, Florida Power and Light (FPL) St. Lucie Unit 1 FSWOL, 10/20/2008  
 FPL Letter L-2003-007, FPL Response to NRC Request for Additional Information (Nov 22, 2002) to NRC Bulletin 2002-01, Jan 31, 2003  
 FPL Letter L-2008-210, RAI Reply for Fourth Ten-Year Interval Unit 1 Relief Request 1, 9/25/2008  
 Drawing No. 8770-15291, Florida Power & Light Company St. Lucie Plant Unit 1 Pressurizer Details, Rev 0  
 Drawing No. 8770-15292, Florida Power & Light Company St. Lucie Plant Unit 1 Replacement Pressurizer Lower Head and Heater Support Details, Rev 0  
 Drawing No. 8770-16163, Florida Power & Light Company St. Lucie Plant Unit 1 PSL-1 Pressurizer Spray Nozzle Safe End Local Cavity Repair, Rev 0  
 St. Lucie, Unit 1 – Safety Evaluation of Relief Request to Use Structural Weld Overlay and Alternative Examination Techniques on Safe End Dissimilar Metal Welds (TAC No. MD9256)  
 Drawing No. 405517, WSI Traveler 104423-TR-017-01, Construction Drawing SDC A Loop, St. Lucie U1, Rev 3  
 Welding Services Inc St. Lucie As Found Base Metal Contour Sketch “A” SDC 0°, 90°, 180°, 270°  
 Welding Services Inc St. Lucie as Contoured WOL Sketch “A” SDC 0°, 90°, 180°, 270°  
 Drawing 0800024.550, Structural Integrity Associates Hot Let Shutdown Cooling Nozzle Weld Overlay Design, St. Lucie Nuclear Plant, Unit 1, Rev 1  
 104423-TR-017-01, Welding Services Inc., Work Traveler Nozzle WOL Repair Shutdown Cooling Nozzle Loop A, FPL Weld ID: RC-162-FW-2000, 10/15/2008  
 WSI Non-Conformance Report No. 08-097, Porosity in DMW RC-162-FW-2000 SDC “A”, 11/2/2008  
 WSI Non-Conformance Report No. 08-099, U.T. Indication on RC-162-TW-2000 SDC “A”, 11/12/2008  
 WPS-08-43-T-001-Bridge, WSI Welding Procedure Specification for Bridge Bead on SDC “A” Nozzle, Rev 1  
 Contractor/Engineering Services Project Scope Document, Justification for Deviation from 90% Weld Inspection Coverage for St. Lucie Unit 1 and 2 Large Diameter Reactor Coolant Pump Dissimilar Metal (DM) Welds, 8/27/2008  
 FPL Dissimilar Weld Checklist, PSL-1 Weld Number RC-121-6-504

NRC Letter to FPL, St. Lucie, Unit 2 – Safety Evaluation of Relief Request to Use Structural Weld Overlay and Alternative Examination Techniques on Safe End Dissimilar Metal Welds (TAC No. MD5114), 12/12/2007

NRC Letter to FPL, St. Lucie, Unit 1 – Safety Evaluation of Relief Request to Use Structural Weld Overlay and Alternative Examination Techniques on Safe End Dissimilar Metal Welds (TAC No. MD9256), 11/03/2008

Structural Integrity Associates, NDE Examination Summary, Examination Report # SLU1-22-RC-162-FW-2000, 11/15/2008

CE-NPSD-1211-P, Combustion Engineering Owner's Group Report, Identification of Bi-metallic Weld Locations in C-E NSSS Primary Components, Rev 1

ENG-CSI-A600, Alloy 600 Management Program for St. Lucie Units 1 and 2, Turkey Point Units 3 and 4, Rev 2

WinISI printouts for various DMBMs

### Condition Reports

2008-30433	2008-38333	2008-36056
2008-36858	2008-37618	2008-37867
2008-30490	2008-39214	2008-32722
2008-34704	2008-31984	2008-36071
2008-36906	2008-35629	2008-37883
2008-38406	2008-37622	2008-32954
2008-30541	2008-32089	2008-36143
2008-34884	2008-35630	2008-37973
2008-36989	2008-37658	2008-32977
2008-38797	2008-32161	2008-36354
2008-31881	2008-35773	2008-38015
2008-34880	2008-37678	2008-33022
2008-37011	2008-32211	2008-36616
2008-38810	2008-35921	2008-38153
2008-31884	2008-37793	2008-33886
2008-35008	2008-32351	2008-36663
2008-37216	2008-36022	2008-38178
2008-34172	2008-37813	2008-33962
2008-39133	2008-32418	2008-36753
2008-31900	2008-36036	2008-38185
2008-35060	2008-37979	2008-33968
2008-37279	2008-32421	2008-36790
2008-39187	2008-36040	2008-38299
2008-31947	2008-37490	2008-32058
2008-35071	2008-32702	

## LIST OF ACRONYMS

ANSI	American National Standards Institute
ARM	area radiation monitor
CAM	continuous airborne monitor
CAP	Corrective Action Program
CCW	component cooling water
CFR	Code of Federal Regulations
CHRM	containment high range monitor
CIS	containment isolation signal
CR	condition report
CY	calendar year
DRD	direct reading dosimeter
DAW	dry active waste
DRP	discrete radioactive particle
ECCS	Emergency Core Cooling System
HEPA	high efficiency particulate air
HPT	health physics technician
HRA	high radiation area
I&C	instrumentation and controls
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LHRA	locked-high radiation area
mrem	millirem
NCR	Nuclear Condition Report
ODCM	Offsite Dose Calculation Manual
OS	Occupation Radiation Safety
PCM	personnel contamination monitor
PI	Performance Indicator
PIG	particulate, iodine and gas monitor
PS	Public Radiation Safety
PM	portal monitor
PSL	Plant St. Lucie
QC	quality control
RAB	reactor auxiliary building
radwaste	radioactive waste
RB	reactor building
RCA	radiologically controlled area
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
RM	radiation monitor
RWP	radiation work permit
SCBA	self-contained breathing apparatus
SFP	spent fuel pool
TLD	thermoluminescent dosimeter
TMI	Three Mile Island
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VHRA	very high radiation area
WBC	whole-body counter
WO	work order