



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

February 7, 2013

Mr. Thomas D. Gatlin
Vice President - Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
P.O. Box 88
Jenkinsville, SC 29065

**SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION
REPORT 05000395/2012005**

Dear Mr. Gatlin:

On December 31, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station. The enclosed inspection report documents the inspection results, which were discussed on January 28, 2013, with you and other members of your staff.

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

This report documents one NRC-identified finding and one self-revealing finding of very low safety significance (Green) which were determined to involve violations of NRC requirements. The NRC is treating the findings as non-cited violations (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States 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 Virgil C. Summer Nuclear Station.

Additionally, if you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station.

T. Gatlin

2

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket No.: 50-395
License No.: NPF-12

Enclosure: NRC Integrated Inspection Report 05000395/2012005
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

T. Gatlin

2

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket No.: 50-395
License No.: NPF-12

Enclosure: NRC Integrated Inspection Report 05000395/2012005
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

X PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE X NON-SENSITIVE
ADAMS: X Yes ACCESSION NUMBER: _____ XSUNSI REVIEW COMPLETE X FORM 665 ATTACHED

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRS	RII:DRS	RII:DRS
SIGNATURE	JTR /RA/	ETC1 /RA/	Via email	GJM1 /RA/	Via email	Via email	Via email
NAME	JReece	ECoffman	SNinh	GMcCoy	MCoursey	RWilliams	RHamilton
DATE5	2/6/2013	2/6/2013	2/7/2013	2/7/2013	2/5/2013	2/6/2013	2/4/2013
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICE	RII:DRS	HQ:NSIR					
SIGNATURE	Via email	Via email					
NAME	ELea	JLaughlin					
DATE5	2/4/2013	2/4/2013					
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

T. Gatlin

3

cc w/encl:

J. B. Archie
Senior Vice President
Nuclear Operations and Chief Nuclear
Officer
South Carolina Electric & Gas Company
Electronic Mail Distribution

George A. Lippard, III
General Manager
Nuclear Plant Operations
South Carolina Electric & Gas Company
Electronic Mail Distribution

Andy T. Barbee
Director
Nuclear Training
South Carolina Electric & Gas Company
Electronic Mail Distribution

Wayne D. Stuart
General Manager
Engineering Services
South Carolina Electric & Gas Company
Electronic Mail Distribution

Robin R. Haselden
General Manager
Organizational Development &
Effectiveness
South Carolina Electric & Gas Company
Electronic Mail Distribution

Shaun M. Zarandi
General Manager
Nuclear Support Services
South Carolina Electric & Gas Company
Electronic Mail Distribution

Robert L. Justice
Manager
Nuclear Operations
South Carolina Electric & Gas Company
Electronic Mail Distribution

Bruce L. Thompson
Manager
Nuclear Licensing (Mail Code 830)
South Carolina Electric & Gas Company
Electronic Mail Distribution

Donna W. Railey
Licensing Technician
Nuclear Licensing
South Carolina Electric & Gas Company
Electronic Mail Distribution

Robin J. White
Nuclear Coordinator
S.C. Public Service Authority Mail Code 802
Electronic Mail Distribution

Susan E. Jenkins
SC Department of Health & Environmental
Control
Bureau of Land and Waste Management
Electronic Mail Distribution

Sandra Threatt, Manager
Nuclear Response and Emergency
Environmental Surveillance
Bureau of Land and Waste Management
Department of Health and Environmental
Control
Electronic Mail Distribution

Kathryn M. Sutton, Esq.
Morgan, Lewis & Bockius LLP
Electronic Mail Distribution

Division of Radiological Health
TN Dept. of Environment & Conservation
401 Church Street
Nashville, TN 37243-1532

Senior Resident Inspector
Virgil C. Summer Nuclear Station
U.S. NRC
576 Stairway Road
Jenkinsville, SC 29065

Letter to Thomas D. Gatlin from Gerald J. McCoy dated February 7, 2013

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION
REPORT 05000395/2012005

Distribution w/encl:

C. Evans, RII

L. Douglas, RII

L. Regner, NRR JLD

OE Mail

RIDSNRRDIRS

PUBLIC

RidsNrrPMSummer Resource

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No. 50-395

License No. NPF-12

Report No. 05000395/2012005

Licensee: South Carolina Electric & Gas (SCE&G) Company

Facility: Virgil C. Summer Nuclear Station

Location: P.O. Box 88
Jenkinsville, SC 29065

Dates: October 1, 2012 through December 31, 2012

Inspectors: J. Reece, Senior Resident Inspector
E. Coffman, Resident Inspector
M. Coursey, Reactor Inspector (Section 1R08)
R. Williams, Reactor Inspector (Sections 1R08 and 4OA5.3)
R. Hamilton, Senior Health Physicist (Sections 2RS1 and 2RS8)
E. Lea, Senior Operations Engineer (Section 1R11)
J. Laughlin, Emergency Preparedness Inspector (Section 1EP4)

Approved by: Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000395/2012005; 10/01/2012 - 12/31/2012: Virgil C. Summer Nuclear Station; Radioactive Material Handling, Storage and Transportation; Identification and Resolution of Problems

The report covered a three month period of inspection by resident inspectors, two reactor inspectors, a senior operations engineer and a senior health physicist from RII. Two findings were identified and were determined to be non-cited violations (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0310, "Components Within the Cross Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating System

- Green. A non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for the failure to promptly identify and correct a condition adverse to quality (CAQ) involving alignment of the safety-related refueling water storage tank (RWST) to a non-seismic spent fuel purification (SF) system. The licensee entered the problem into their corrective action program as condition report 12-06193.

The inspectors determined that the failure to promptly identify and correct the CAQ for the alignment of the RWST to the SF system was a performance deficiency (PD). The inspectors reviewed Inspection Manual Chapter (IMC) 0612, Appendix B and determined the PD was more than minor and therefore a finding, because it affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and the respective attribute of configuration control because the alignment of the safety-related RWST to the non-seismic SF system created a CAQ and rendered the RWST inoperable. The inspectors evaluated the finding in accordance with NRC IMC 0609, "Significance Determination Process," Attachment 4 and Appendix A and determined that the finding required a phase 3 evaluation by a senior reactor analyst using the NRC SPAR model. A one year exposure period was used and no recovery credit was assumed in the analysis. The non-seismic RWST purification piping was assumed to fail at the same seismic input as that assumed for a loss of offsite power. The dominant sequence was a seismically induced loss of offsite power leading to a station blackout with failure of the emergency power system and failure to recover offsite power or the EDGs. Subsequent battery depletion and operator failure to control the TDEFW pump would lead to core damage. The risk was mitigated by the low probability of a seismic event. The analysis determined that the risk increase of the performance deficiency was an

Enclosure

increase in core damage frequency less than 1E-6/year a GREEN finding of very low safety significance. The cause of the finding involved the cross-cutting area of problem identification and resolution, the component of corrective action program, and the aspect of complete and thorough evaluation, P.1(c), because the licensee failed to determine that the alignment of the safety-related RWST to the non-seismic SF system was a CAQ. (Section 4OA2.3)

Cornerstone: Public Radiation Safety

- Green. A self-revealing NCV of 10 CFR 61.56(b)(2) was identified because the licensee transported a cask shipment for disposal at the Energy Solutions Disposal Facility, Barnwell, South Carolina, which contained liquid above regulatory limits for final form for burial. The licensee entered the problem into their corrective action program as CR-12-04279.

This finding is greater than minor because it was associated with the low level burial attribute of the Public Radiation Safety Cornerstone and adversely affected the cornerstone objective to ensure adequate protection of the public health and safety from exposure to radioactive materials released into the public domain. The finding is of very low safety significance because the shipping cask was discovered to have minimal liquid exceeding the regulatory limit of one half percent of the waste shipment total volume transported to the burial site for disposal and the liquid was discovered prior to waste disposal. The cause of the finding involved the cross-cutting area of human performance, the component of resources, and the aspect of complete and accurate procedures, H.2(c), because the procedures did not address the permutation of having wet resin added on top of already dewatered resin, nor did it lead the user to the more restrictive dewatering regimen based on internals as a first choice. (Section 2RS8)

B. Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at full rated thermal power (RTP) and on October 13, 2012, the unit was shutdown for refueling outage number 20 (RF20). Unit 1 returned to service on December 7, 2012, achieved full RTP on December 12, 2012, and remained at or near full RTP until the end of the quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Seasonal Weather Susceptibilities

a. Inspection Scope

The inspectors performed one seasonal extreme weather inspection for readiness of cold weather for two risk significant components. The inspectors verified the licensee had implemented applicable sections of operations administrative procedure (OAP)-109.1, Revision (Rev.) 3E, "Guidelines for Severe Weather." The inspectors reviewed preparations for extreme cold weather and walked down the refueling water storage tank (RWST) and associated outside emergency core cooling system (ECCS) suction piping and the sodium hydroxide (NaOH) tank and associated outside piping to assess whether the equipment was adequately protected from cold weather and would function as expected during an accident event. Also, the inspectors reviewed the licensee's corrective action program (CAP) database to verify that freeze protection problems were being identified at the appropriate level, entered into the CAP, and appropriately resolved.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

The inspectors reviewed the licensee's external flood design mitigation plans to determine consistency with design requirements, updated final safety analysis report (UFSAR) and flood analysis documents. The inspectors performed walkdowns of the station to verify flood protection features remained generally as described in the UFSAR and flood analysis documents. Specifically, the inspectors performed visual examinations of the berm which is located on the north side of the plant and which provides protection from a probable maximum flood associated with the Frees Creek and the Monticello Reservoir. Documents reviewed are listed in the Attachment.

Enclosure

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors conducted two partial equipment alignment walkdowns which are listed below, to evaluate the operability of selected redundant trains or backup systems with the other train or system inoperable or out of service (OOS). Correct alignment and operating conditions were determined from the applicable portions of drawings, system operating procedures (SOP), and technical specifications (TS). The inspections included review of outstanding maintenance work orders (WO) and related condition reports (CR) to verify that the licensee had properly identified and resolved equipment alignment problems that could lead to the initiation of an event or impact mitigating system availability.

- 'B' spent fuel system during defueled window and power swap on 'A' spent fuel pump
- Cross-train walkdown of 'A' emergency feedwater (EFW) and turbine driven emergency feedwater (TDEFW) pumps during planned maintenance of the 'B' EFW pump

b. Findings

No findings were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed review and walkdown of the 'B' train chemical and volume control system, charging section interface to identify any discrepancies between the current operating system equipment lineup and the designed lineup. In addition, the inspectors reviewed SOPs, applicable sections of the final safety analysis report (FSAR), design basis document, plant drawings, completed surveillance procedures, outstanding WOs, system health reports, and related CRs to verify that the licensee had properly identified and resolved equipment problems that could affect the availability and operability of the system. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire ProtectionFire Protection Toursa. Inspection Scope

The inspectors reviewed recent CRs, WOs, and impairments associated with the fire protection system. The inspectors reviewed surveillance activities to determine whether they supported the operability and availability of the fire protection system. The inspectors assessed the material condition of the active and passive fire protection systems and features, and observed the control of transient combustibles and ignition sources. The inspectors conducted routine inspections of the following five areas (respective fire zones also noted):

- Auxiliary building 374' elevation (fire zones AB-1.1, 1.2, 1.3)
- Intermediate building 436' elevation (fire zones IB-25.5, 25.6.1/2, 25.7)
- Reactor building 412' elevation (fire zones RB-1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.2.3)
- Reactor building 436' elevation (fire zones RB-1.3.2, 1.3.3)
- Reactor building 463' elevation (fire zones RB-1.4.1, 1.4.2)

b. Findings.1 Unresolved Item (URI) for RCP Motor Oil Collection System Deficiencies

Introduction: A URI was identified by the inspectors for performance deficiencies (PD) associated with the reactor coolant pump (RCP) motor oil collection system.

Description: On November 28, 2012, during containment walkdowns the inspectors identified three PDs regarding failures to comply with licensee's fire protection program requirements associated with 10 CFR 50, Appendix R, Section O, for a RCP motor oil collection system. Specifically, the inspectors identified (1) a split in the sealing boot for the 'B' RCP motor oil cooler enclosure, (2) a design deficiency on all three RCP motor oil lift pump enclosures, and (3) a design deficiency on all three RCP motor exhaust ductwork components. The design deficiency on the oil lift pump enclosure involves a small rectangular door with no latch that can be opened to view the respective oil pressure gauge. A leak at the gauge fitting would allow pressurized oil at approximately 1200 psig to push the door open and release oil from the enclosure. The design deficiency on the motor exhaust ductwork involves the collection of oil mist from leakage internal to the motor which then leaks out of the ductwork flange connections as evidenced by observed drips of oil at the affected joints. The inspectors also observed white silicone caulking at these joints where the licensee had attempted to prevent leakage. The licensee initiated CR-12-05736 and CR-12-05756 to address these deficiencies.

Pending completion of additional inspection and review of information to determine if the PD is more than minor, this is identified as URI 05000395/2012005-01, Nonconformance of RCP Motor Oil Collection System with the Fire Protection Program.

Enclosure

.2 URI for Containment Fire Hose Deficiency

Introduction: A URI was identified by the inspectors for a PD associated with fire hoses within containment during Modes 1 through 4.

Description: On November 28, 2012, the licensee initiated CR-12-05730 in response to inspector concerns relating to the potential impact on the containment ECCS sump screens during a postulated loss of coolant accident (LOCA) from degradation of new collapsible, lined fire hoses which were installed during the refueling outage and would remain during Modes 1 through 4. The inspectors noted that the previously installed red rubber hose had been evaluated for post-LOCA conditions, but a similar evaluation of the replacement hoses was not performed. The inspectors determined that the failure to perform this evaluation in accordance with engineering services procedure, ES-0419, "Equal To/Better Than (ETBT) Evaluation Process," Attachment IV, was a performance deficiency. Specifically, the licensee failed to adequately answer questions 3 and 7 regarding environmental qualifications and failure mechanisms, respectively. The licensee subsequently performed an evaluation prior to Mode 4 and determined that the replacement hoses were found to degrade at elevated temperatures (265 degrees F) when subjected to sodium hydroxide and boric acid, thereby impacting the ECCS sump. Consequently, the hoses were replaced by six new hoses which would not degrade in post-LOCA conditions.

Pending completion of additional evaluations in determining if the PD is more than minor, this is identified as URI 05000395/2012005-02, Post-LOCA impact of Replacement Fire Hoses on the ECCS Sump.

1R06 Flood Protection Measures

Internal Flooding

a. Inspection Scope

The inspectors reviewed and walked down portions of the intermediate building flood detection level instrumentation and reviewed the related calibration and testing PMs to verify adequacy of the periodicity and test methodology such that flood challenges to safety related components within the affected areas would be adequately detected. The related flood design evaluations for the area of interest as documented in the licensee's flooding calculations were also reviewed as well as the licensee's CAP database to verify that internal flood protection problems were being identified at the appropriate level, entered into the CAP, and appropriately resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities: From October 22, 2012 through October 26, 2012, the inspectors conducted an on-site review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, emergency feedwater systems, risk-significant piping and components, and containment systems in Unit 1. The inspectors' activities included a review of non-destructive examinations (NDEs) to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI (Code of record: 2001 Edition with Addenda 2003), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI, acceptance standards.

The inspectors directly observed the following NDE mandated by the ASME Code to evaluate compliance with the ASME Code Section XI and Section V requirements and, if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- Ultrasonic (UT) examinations of the 'C' steam generator feedwater inlet nozzle
- UT of the reactor vessel studs

The inspectors observed the welding activities referenced below and reviewed associated documents in order to evaluate compliance with procedures and the ASME Code. The inspectors reviewed the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- WO 1103681-49 Install 3" air trap suction vent line and new vent valve
- WO 1203743-41 Shaw mechanical field install tubing & components for normal and alternate seal injection flow transmitters

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service. Therefore, no NRC review was completed for this inspection procedure attribute.

PWR Vessel Upper Head Penetration (VUHP) Inspection Activities: For the Unit 1 vessel head, a bare metal visual (BMV) examination was required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D). The inspectors observed portions of the Unit 1 BMV and ultrasonic examinations and reviewed NDE records for penetration Nos. 24, 30, 31, 39, 51, 57, 63 for the BMV and penetration Nos. 19, 24, 31, 37, 52 for the UT examinations, to evaluate if the activities were conducted in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). In particular, the inspectors

Enclosure

evaluated if the required visual examination and ultrasonic examination scope/coverage was achieved and limitations (if applicable) were recorded in accordance with the licensee procedures. Additionally, the inspectors evaluated if the licensee's criteria for visual and ultrasonic examination quality and instructions for resolving interference and masking issues were consistent with 10 CFR 50.55a.

The inspectors reviewed records of welded repairs on the upper head penetration 19 and 52 completed during the current outage to evaluate if the licensee applied the pre-service nondestructive examinations and acceptance criteria required by the NRC-approved Code relief request and the ASME Code Section XI. In addition, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to evaluate if the weld procedure(s) used were validated in accordance with the Construction Code and the ASME Code Section IX requirements.

Boric Acid Corrosion Control (BACC) Inspection Activities: The inspectors reviewed the licensee's BACC program activities to ensure implementation with commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and applicable industry guidance documents. Specifically, the inspectors performed an on-site record review of procedures and the results of the licensee's containment walkdown inspections performed during the current fall refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC and corrective action programs.

The inspectors reviewed the following evaluations and corrective actions related to evidence of boric acid leakage to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code Section XI and 10 CFR Part 50, Appendix B, Criterion XVI.

- Boric acid leak was identified on XVTO8100-CS
- Boric acid leakage on safety injection accumulator 'B' discharge header valve XVG-08808B-SI
- Boric acid diaphragm leak from FCV00113B

Identification and Resolution of Problems: The inspectors performed a review of a sample of ISI-related problems that were identified by the licensee and entered into the corrective action program as CRs. The inspectors reviewed the CRs to confirm the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment.

b. FindingsURI for Reactor Vessel Supports Not Included in the Licensee's ASME Section XI ISI Program

Introduction: The inspectors identified an URI concerning the reactor vessel supports not being included in the licensee's ASME Section XI ISI Program.

Description: The inspectors identified that the scope of the V. C. Summer Unit 1 ISI program may not meet the requirements of 10 CFR 50.55a which requires that in-service inspections be conducted in accordance with the requirements of ASME Code, Section XI, "Rules for In-service Inspection of Nuclear Power Plant Components." The V. C. Summer plant is currently in the third inspection interval and is required to meet the requirements of the 1998 Edition of the ASME Section XI Code, with addenda through 2000, as modified by 10 CFR 50.55a. The inspectors identified that the nuclear Class 1 reactor pressure vessel supports were not included in the scope of the V. C. Summer Unit 1 ISI Program for the third inspection interval.

In accordance with the requirements of Section XI, Subsection IWB, the attachment weld associated with the RPV supports is required to be subjected to a surface examination, and in accordance with Subsection IWF, the RPV supports are required to be VT-3 visually examined.

The V. C. Summer RPV is supported, in part, by six supports that are made up of a buildup of welded metal attached to the pressure boundary. The function of the reactor support assembly is to provide support to the reactor vessel and attached piping and to allow for thermal movement of the piping during normal and accident conditions, thereby ensuring the reactor pressure boundary and reactor coolant system boundary can perform their intended safety function of providing the second barrier to fission product release. The ISI program required by 10 CFR 50.55a, and the periodic examinations required by Section XI identified above, provides reasonable assurance that these supports can continue to perform their portion of the intended safety function.

This issue remains unresolved as the licensee asserts that the integrally welded attachment of the nozzle that rests upon the support is excluded from examination per ASME Section XI, Table IWB-2500-1, Examination Category B-K, Welded Attachments for Vessels, Piping, Pumps, and Valves, Note 1. Additionally, the licensee asserts that the reactor vessel supports are exempt from examination in accordance with ASME Section XI Subsection IWF-1230 due to inaccessibility. The inspectors have requested the following in order to evaluate this condition more fully in order to close this URI:

- Calculation of the loading on the welded attachment or support to ensure the welded attachment meets the exclusion of Note 1 for Table IWB-2500-1, Exam Category B-K.

- A construction drawing or QA records of the configuration of the weld buildup for the integral attachments. This information will be used to determine if the welded attachment does not meet the exclusion requirements of ASME Section XI, Table IWB-2500-1, Examination Category B-K, Welded Attachments for Vessels, Piping, Pumps, and Valves, Note 1.
- The licensee's written technical justification for calling the Reactor Vessel supports inaccessible IAW Section XI IWF-1230.

This information is expected to be received and evaluated beyond the required time period of this report. This issue is identified as URI 05000395/2012005-03, "Reactor Vessel Supports Not Included in the Licensee's ASME Section XI ISI Program."

1R11 Licensed Operator Regualification Program

.1 Resident Quarterly Review of Operator Regualification

a. Inspection Scope

The inspectors observed a beyond design basis mitigating guidelines (BDMG) operator requalification course occurring on December 27, 2012, which involved discussions on how to appropriately respond to various beyond design basis events. The inspectors observed the requalification classroom training in lieu of a simulator scenario as no requalification scenarios were offered during the quarter due to an extended refueling outage. The inspectors observed the classroom instruction in terms of communications, instruction on the proper prioritization and timeliness of BDMG actions, coverage of the proper procedures, and inclusion of operating experience where appropriate. The inspectors also reviewed classroom comments captured during the training to verify that any procedural performance deficiencies were captured for appropriate corrective action.

b. Findings

No findings were identified.

.2 Resident Observation of Control Room Operations

a. Inspection Scope

During the inspection period, the inspectors conducted observations of licensed reactor operator activities to ensure consistency with licensee procedures and regulatory requirements. For the following activities, the inspectors observed the following elements of operator performance: (1) operator compliance and use of plant procedures including technical specifications; (2) control board component manipulations; (3) use and interpretation of plant instrumentation and alarms; (4) documentation of activities; (5) management and supervision of activities; and (6) control room communications.

- Observation of control room personnel during down power and transition to Mode 2
- Observation of reactor coolant system (RCS) cooldown and depressurization
- Observation of RCS drain down to nine inches below reactor vessel flange

b. Findings

No findings were identified.

.3 Licensed Operator Requalification

a. Inspection Scope

Annual Review of Licensee Requalification Examination Results: On August 16, 2012, the licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Appendix I, "Operator Requalification Human Performance Significance Determination Process."

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated two equipment issues described in the CRs listed below to verify the licensee's effectiveness with the corresponding preventive or corrective maintenance associated with SSCs. The inspectors reviewed Maintenance Rule (MR) implementation to verify that component and equipment failures were identified, entered, and scoped within the MR program. Selected SSCs were reviewed to verify proper categorization and classification in accordance with 10 CFR 50.65. The inspectors examined the licensee's 10 CFR 50.65(a)(1) corrective action plans to determine if the licensee was identifying issues related to the MR at an appropriate threshold and that corrective actions were established and effective. The inspectors' review also evaluated if maintenance preventable functional failures or other MR findings existed that the licensee had not identified.

The inspectors reviewed the licensee's controlling procedures consisting of engineering services procedure (ES)-514, Rev. 5, "Maintenance Rule Program Implementation," and station administrative procedure (SAP)-0157, Rev. 0, Change A, "Maintenance Rule Program," to verify consistency with the MR program requirements.

- CR-12-02358, Maintenance Rule (a)(1) goal setting established on the chilled water system due to maintenance preventable functional failures on the 'C' chiller
- CR-12-04732, containment penetration XRP-208 failed pre-maintenance local leak rate test (LLRT)

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessment and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the four selected work activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and, (4) that emergent work problems were adequately identified and resolved. The inspectors evaluated the licensee's work prioritization and risk characterization to determine, as appropriate, whether necessary steps were properly planned, controlled, and executed for the planned and emergent work activities.

- RF20 Week 2012-01, risk assessments for reduced RCS inventory control
- RF20 Week 2012-02, risk assessments of RCS inventory control
- RF20 Week 2012-03, risk assessments for transfer of power supplies for 'A' spent fuel pump during No Mode
- RF20, qualitative risk assessments involving time to core boil

b. Findings

URI for Time to Core Boiling Impact on Qualitative Risk Assessment

Introduction: A URI was identified by the inspectors for a PD associated with a failure to modify the computer program for time to core boiling during conditions where reactor vessel upper internals are installed, reactor vessel head is removed, and the reactor cavity is at greater than reactor vessel flange level in addition to the impact on the refueling outage qualitative risk assessment.

Description: On October 23, 2012, the licensee initiated CR-12-04757 in response to inspector concerns that the program which calculates time to core boiling did not account for installation of reactor vessel upper internals when reactor cavity level was increased above the reactor vessel flange and the corresponding impact on the licensee's risk assessment. The inspectors noted that on October 21, 2012, when reactor cavity fill operations began at approximately 0135 hours, the qualitative risk assessment was shifted from 'Yellow' to 'Green' and the time to core boil was moved from approximately 22 minutes (level at 9 inches below flange) to 2.1 hours (level at approximately 6 feet above flange). At a reactor cavity level of greater than 23 feet

above the flange with upper internals installed the time to core boil was identified as approximately 7.44 hours. The upper internals were removed at approximately 1644 hours on October 22, 2012.

The inspectors noted that procedure SSP-004, "Outage Safety Review Guidelines," Revision 3, definition for a high risk evolution states in part, "Considerations for establishing High Risk Evolutions (HREs) include equipment availability, inventory, and time to boil." The inspectors also noted that SSP-004 did not appear to adequately address the impact of upper internals installation on time to core boiling. Section 7.1.3, "Inventory Control Guidelines," states in part, "During Lowered or Reduced Inventory operations, boiling and potential core uncoverage can occur in a relatively short time period (less than one hour)." However, there is no discussion on time to core boil and any potential core uncoverage with the reactor cavity greater than flange level and upper internals installed. The inspectors also noted that industry guidance stated that the most effective way to reduce outage risk or core damage probability is to minimize the duration of the highest risk periods consisting of loops not filled, internals installed, and the core not off-loaded. The inspectors did, however, note that SSP-004 required both trains of RHR operable while the upper internals are installed.

Pending completion of additional evaluations in determining if the PD is more than minor, this is identified as URI 05000395/2012005-04, Failure to Consider the Risk Impact of Time to Core Boil With Reactor Vessel Upper Internals Installed and Cavity Level is Greater Than Reactor Vessel Flange.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed three operability evaluations listed below, affecting risk significant mitigating systems to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred; (3) whether other existing degraded conditions were considered; (4) that the licensee considered other degraded conditions and their impact on compensatory measures for the condition being evaluated; and, (5) the impact on TS limiting conditions for operations and the risk significance in accordance with the significance determination process. The inspectors also verified that the operability evaluations were performed in accordance with SAP-209, Rev. 1, "Operability Determination Process," and SAP-999, Rev. 10, "Corrective Action Program."

- CR-12-02739, multiple alarms on RMG-18, containment high range area monitor
- CR-12-02364, 'A' chiller trip on circuit 1 high pressure
- CR-12-04139, Door, DRIB/409, was inoperable and not screened for approximately 138.5 hours

b. Findings

The enforcement aspects of CR-12-04139 are discussed in Section 4OA7 of this report.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed one procedurally controlled temporary modification for removal of temporary alternate feeder cable for spent fuel cooling motor during No Mode, to evaluate the change for adverse effects on system availability, reliability, and functional capability. Documents reviewed included the implementation WO 1117787004, modification design and implementation packages, engineering calculations, site drawings, applicable sections of the FSAR, supporting 10 CFR 50.59 evaluations, TS, and design basis information. The inspectors evaluated the change documents and associated 10 CFR 50.59 reviews against the system design basis documentation and FSAR to verify that the changes did not adversely affect the safety function of safety systems. The inspectors also reviewed any related CRs to confirm that problems were identified at an appropriate threshold, were entered into the CAP, and appropriate corrective actions had been initiated.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the four maintenance activities listed below, the inspectors reviewed the associated post-maintenance testing (PMT) procedures and either witnessed the testing and/or reviewed test records to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) test acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and, (8) equipment was returned to the status required to perform its safety function. The inspectors verified that these activities were performed in accordance with general test procedure (GTP)-214, Rev. 5, Change B, "Post Maintenance Testing Guideline."

- WO 1113262-002, perform stroke timing of service water outlet header component cooling water (CCW) loop 'B' cross-connect valve following unplanned maintenance
- WO 1114352-002, perform post maintenance LLRT of 'B' residual heat removal (RHR) pump suction from loop 'C' containment isolation valve

- WO 1210673-001, perform 'A' emergency diesel generator (EDG) operability test following K1 exciter relay replacement
- WO 1112656-001, perform 'A' feedwater isolation valve (FWIV) testing following control block replacement

b. Findings

No findings were identified.

1R20 Refueling Outage and Other Outage Activities

a. Inspection Scope

On October 13, 2012, the unit was shut down to commence RF-20. The planned 35 day outage was completed in 58 days on December 12, 2012. The inspectors used inspection procedure 71111.20, "Refueling and Outage Activities," to complete the inspections described below. Documents reviewed are listed in the Attachment.

Prior to and during the outage, the inspectors reviewed the licensee's outage risk assessments and controls for the outage schedule to verify that the licensee had appropriately considered risk, industry experience and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of any key safety functions.

In the area of licensee control of outage activities, the inspectors reviewed equipment removed from service to verify that defense-in-depth was maintained in accordance with applicable TS and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage schedule and risk control plan.

The inspectors reviewed selected components which were removed from service to verify that tag outs were properly installed and that associated equipment was appropriately configured to support the function of the clearance.

During the outage, the inspectors reviewed and/or observed the following:

- RCS pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication
- The status and configuration of electrical systems to verify that those systems met TS requirements and the licensee's outage risk control plan. The inspectors also evaluated if switchyard activities were controlled commensurate with their risk significance and if they were consistent with the licensee's outage risk control assessment assumptions
- Spent Fuel (SF) cooling operations to verify that outage work was not impacting the ability of the operations staff to operate the SF cooling system during and after core offload. The inspectors also reviewed the licensee's calculation results of SF and reactor vessel heat up rates in case of a potential loss of cooling event

- Heavy load lifts for the reactor vessel head removal and reinstallation to ensure the activities were conducted in a controlled and safe manner. Heavy load lift procedures were reviewed to determine whether past and current practices were within the licensing basis and consistent with guidance in NUREG-0612, "Control of Heavy loads at Nuclear Power Plants"
- The control of containment penetrations and containment entries to verify that the licensee controlled those penetrations and activities in accordance with the appropriate TS and could achieve/maintain containment closure for required conditions
- All accessible areas inside the reactor building prior to reactor startup to verify that debris had not been left which could affect the performance of the containment emergency core cooling system recirculation sumps

The inspectors reviewed the following activities for conformance to applicable TS and licensee procedural requirements:

- Plant shutdown activities
- Decay heat removal system operations
- Inventory controls and measures to provide alternate means for inventory addition
- Electrical power availability controls
- Reactivity controls
- Reactor vessel defueling and refueling operations
- Reactor heat up, mode changes, initial criticality, startup and power ascension activities

The inspectors reviewed various problems that arose during the outage to verify that the licensee was identifying problems related to outage activities at an appropriate threshold and was entering them in the CAP.

b. Findings

URI for Adequacy of Temporary Containment Penetration Design for Shutdown Operations

Introduction: A URI was identified by the inspectors for an issue of concern associated with adequate design of a temporary containment penetration fixture installed in a spare containment penetration.

Description: On October 18, 2012, the inspectors noted that the licensee was using Dow Corning foam as a sealant for a temporary containment penetration fixture installed during the refueling outage to support various work activities within containment. An issue of concern was developed regarding the pressure retention capability of the fixture's design when considering the increase in containment pressure following a loss of the RHR system and other means of core decay heat removal are unavailable. The licensee initiated CR-12-04599 and CR-12-04810 for additional evaluations.

Pending completion of evaluations in determining related PDs and their characterization, this issue is identified as URI 05000395/2012005-05, Adequacy of Temporary Containment Penetration Design for Shutdown Operations.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed and/or reviewed the four surveillance test procedures (STPs) listed below to verify that TS or risk significant surveillance requirements were followed and that test acceptance criteria were properly specified to ensure that the equipment could perform its intended safety function. The inspectors verified that proper test conditions were established as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria were met.

In-Service Tests:

- STP-271.002, "30 Day Water Seal Test of XVG08701A-RH and XVG08701B-RH," Rev. 7, Change C
- STP-230.006A, "ECCS/Charging Pump Operability Testing (Refueling)," Rev. 7, Change A

Containment Isolation Valve:

- STP-215.004, "Containment Isolation Valve Leakage Test for AC, CC, DN, FS and SW Systems," Rev. 6, Change E

Other:

- STP-125.002B, "Diesel Generator 'B' Operability Test," Rev. 2

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

The NSIR headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures (EPIPs) and the Emergency Plan located under ADAMS accession numbers ML12194A672, ML12229A349 and ML12258A059, as listed in the Attachment.

The licensee determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

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

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

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

Enclosure

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

Problem Identification and Resolution: Condition Reports associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure SAP-999, Corrective Action Program, Rev. 10. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP activities were evaluated against the requirements of Updated Final Safety Analysis Report (UFSAR) Section 12; TS Sections 6.11 "Radiation Protection Program" and 6.12 "High Radiation Areas"; 10 CFR Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in Section 2RS1 of the Attachment.

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

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

The inspectors reviewed a violation levied by the South Carolina Department of Health and Environmental Control for noncompliance with the Energy Solutions Disposal Facility license. Specifically reviewed was the process used for dewatering a steel 14-195H High Integrity Container (HIC) and any variation from normal that would account for the HIC arriving at the Barnwell South Carolina facility with excessive freestanding water.

b. Findings

Resin Shipment in Steel High Integrity Container Noncompliance with 10 CFR 61.56(b)(2)

Introduction: A Green, self-revealing NCV was identified for the failure to comply with 10 CFR 61.56(b)(2), in that the licensee transported a shipment of waste (resin) for disposal to Energy Solutions Disposal Facility, Barnwell, South Carolina, which had liquid in the waste cask exceeding 0.5 percent of the volume.

Enclosure

Description: On September 29, 2012, the licensee shipped a waste shipment in a 14-195H Steel Liner (HIC) SN 621456-5, Shipment Identification No. 0912-14101 (V.C. Summer Shipment Manifest No. 75147) for disposal at the Energy Solutions Disposal Facility in Barnwell, South Carolina. After receipt of the waste cask shipment for disposal, on October 4, 2012, Energy Solutions punctured the bottom of the cask to determine the volume of free standing liquid in the cask. Energy Solutions determined the cask contained 8 gallons of liquid which exceeded the one half percent limit of 6.7 gallons of waste by volume of non-corrosive liquids by 1.3 gallons. Based on the sample results, Energy Solutions notified V.C. Summer Nuclear Station of the liquid quantity exceeding the regulatory limit of 0.5 percent. The inspectors discussed with licensee personnel the process control procedure used for dewatering a cask containing resin waste prior to shipment. The licensee had partially filled the HIC with steam generator blowdown bead resin in late July 2012 and had fully dewatered it for shipment. The licensee then recognized that the steel HIC was not sufficiently filled to meet the requirements of 10 CFR 61.56(b)(3) and held the HIC until additional resin with similar radiological characteristics, was available to reduce the void space from 21 percent to 15 percent by volume. In September, the licensee added 28 cubic feet of closed cooling water system bead resin to the already dewatered HIC. After the resin was added, the licensee then followed their Process Control Procedure for dewatering.

The inspectors determined the licensee conducted three separate eight hour cask pumping evolutions with the last one being the final sample for liquid. The licensee did not obtain any measurable water on the third pumping and had determined the liquid in the cask to be less than one-half gallon. Based on the absence of measurable water in the third 8 hour pumping, the licensee had met the apparent procedural requirements for completion of the dewatering evolution for a steel hic with bead resin. The Process Control Program (PCP) specifies that for bead resin in a steel liner that three eight hour dewatering cycles with a minimum separation of 16 hours between cycles and less than one half gallon on final cycle is required. The licensee conducted an apparent cause evaluation of this event and determined that the PCP and procedures did not give adequate guidance to ensure successful liner dewatering following addition of wet resin on top of dewatered resin. Additionally twice as many dewatering cycles were indicated if the resin liner had flat internals. The licensee initiated interim corrective actions to include several enhancements to the PCP. The licensee determined that the water was introduced when 28 ft³ of resin, used to top off the cask to eliminate void space, was added to resin that had already been dewatered. The water took several days to migrate through the interstitial spaces to the bottom of the cask and was not removed in the dewatering evolution.

Analysis: The inspectors determined that the failure to dewater the HIC to meet the requirements of 10 CFR 61.56(b)(2) for low level burial disposal is a performance deficiency. The inspectors reviewed Inspection Manual Chapter (IMC) 0612 and determined that the inspection finding is more than minor because the finding is associated with the Plant Facilities/Equipment and Instrumentation attribute of the public radiation safety cornerstone and adversely affected the objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, the process failure incurred when water in the interstitial space of the resin,

Enclosure

added on top of previously dewatered resin, was not removed during a subsequent dewatering evolution and indications did not indicate that there was still substantial mobile water in the resin. This finding was evaluated using the Public Radiation Safety Significance Determination Process IMC 0609, Appendix D and was determined to be of very low safety significance (Green) because the low level burial ground nonconformance was a minor contents deviation that did not involve a 10 CFR 61.55 waste under classification. The cause of the finding involved the cross-cutting area of human performance, the component of resources, and the aspect of complete and accurate procedures, H.2(c), because the procedures did not address the permutation of having wet resin added on top of already dewatered resin, nor did it lead the user to the more restrictive dewatering regimen based on internals as a first choice.

Enforcement: 10 CFR 61.56(b)(2) specifies minimum requirements for solid waste and requires that solid waste containing liquid to contain as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 0.5 percent of the volume. Contrary to these requirements, on September 25, 2012, the licensee transported a steel cask containing resin for disposal to Energy Solutions Disposal Facility, Barnwell South Carolina, which contained greater than one half percent liquid by volume. Because this failure to comply with 10 CFR 61.56(b)(2) is of very low safety significance and has been entered into the licensee's corrective action program as CR 12-04279 this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000395/2012005-06, Resin Shipment in Steel High Integrity Container Noncompliance with 10 CFR 61.56(b)(2).

4. OTHER ACTIVITIES

40A1 Performance Indicator (PI) Verification

Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors verified the accuracy of the licensee's PI submittals listed below for the period October 1, 2011 through September 30, 2012. The inspectors used the performance indicator definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Rev. 6, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure SAP-1360, Rev. 2, "NRC and INPO/WANO Performance Indicators," to check the reporting of each data element. The inspectors sampled licensee event reports (LERs), operator logs, plant status reports, CRs, and performance indicator data sheets to verify that the licensee had properly reported the PI data.

- Mitigating System Performance Index (MSPI) – Heat Removal System
- MSPI – Cooling Water Systems
- Safety System Functional Failures

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by either attending daily screening meetings that briefly discussed major CRs, or accessing the licensee's computerized corrective action database and reviewing each CR that was initiated.

b. Findings

No findings were identified.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The review was focused on repetitive equipment issues, but also considered trends in human performance errors, the results of daily inspector corrective action item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The review nominally considered the six-month period of July, 2012, through December, 2012. Documents reviewed included licensee monthly and quarterly corrective action trend reports, engineering system health reports, maintenance rule documents, department self-assessment activities, and quality assurance audit reports.

b. Findings

No findings were identified. In general, the licensee has identified trends and has addressed the trends within their CAP. However, inspectors noted that appendix R fire doors, including some doors functioning as steam propagation barriers, control room pressure boundaries or CO₂ boundaries, continue to have issues. This trend was previously discussed in inspection report 05000395/2011005, and the licensee continues to monitor the trend under CR-11-04579. Specifically for the previous six months ending December 2012, the inspectors identified the following CRs:

- CR-12-02693, Door did not latch
- CR-12-04132, Door closer arm broken

Enclosure

- CR-12-04336, Door fails to close and latch under its own power
- CR-12-05021, Door did not latch
- CR-12-05206, Door fails to close under its own power
- CR-12-05554, Door fails to close under its own power
- CR-12-05709, Door seal replaced, now door does not close under its own power
- CR-12-05716, Door closer arm broken loose
- CR-12-05720, Door gasket replaced, now door does not close under its own power
- CR-12-05822, Door fails to close under its own power

.3 Annual Sample Review

a. Inspection Scope

On June 14, 2012, the licensee issued LER 05000395/2012-002-00 based on the alignment of the safety-related refueling water storage tank (RWST) to a nonsafety-related SF purification system during various times while the unit was in modes requiring operability of the RWST in order to obtain samples and for filtration prior to a refueling outage. The licensee issued CR-12-02439 to address the corrective actions related to the LER. The CR was reviewed by the inspectors in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues. The inspectors also assessed whether the issue was properly identified, documented accurately and completely, properly classified and prioritized, adequately considered extent of condition, generic implications, common cause, and previous occurrences, adequately identified root causes/apparent causes, and identified appropriate and timely corrective actions. Also, the inspectors verified the issues were processed in accordance with procedure, SAP-999, "Corrective Action." This LER remains open pending review of a licensee revision.

b. Findings

Failure to Promptly Identify and Correct a Condition Adverse to Quality for Alignment of the Safety-Related Refueling Water Storage Tank to a Non-Seismic Spent Fuel Purification system

Introduction: A Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for the failure to promptly identify and correct a condition adverse to quality (CAQ) involving alignment of the safety-related RWST to a non-seismic SF system.

Description: The inspectors reviewed historical CAP documents relating to the problem described in the LER and noted that in 2010, CR-10-03912 was entered into the licensee's CAP for an operating experience (OE) event involving another utility who received a non-cited violation for a similar occurrence in which the safety-related RWST was aligned to a non-seismic purification system. The licensee's review determined that they were within their design basis and the RWST was operable. Consequently, they did not identify a CAQ regarding the inoperability of the RWST when aligned to the nonsafety-related SF system for purification.

Enclosure

The inspectors identified that CR-11-01413 was initiated on March 30, 2011, due to a licensee concern that the previous operability evaluation discussed periodic alignment to the SF system for samples but did not discuss extended alignment for RWST purification. A paragraph from this CR stated:

“On 4/11/11, representatives from Chemistry, Operations and Design Engineering met to discuss resolving the issue. DE resolved to perform calculations to determine the impact on system operability if the RWST was placed on long term recirculation. Following this design input operation placed Special Order 11-06 to explain operator action while placing RWST on recirculation (see attached). RWST was placed on long term recirculation on 4/12/11 and was allowed to recirculate continuously until 4/17/11. An evaluation of RWST chemistry shows that the tank met cleanup guidelines per CP-625, Chemistry Refueling Shutdown and Startup plan prior to placing on long term recirculation and that the 5 days of continuous recirculation would serve to further ensure RWST cleanup requirements. No further actions are required.”

The inspectors noted that in effect the licensee justified this long term recirculation by creating compensatory measures as determined by engineering calculation DC04680-032 and evaluation, EIR81785, and implemented by the operations special order (SO) 11-06. The inspectors determined that this rendered the RWST inoperable, was therefore a CAQ, and that the associated Technical Specification (TS) 3.5.4 limiting condition for operation (LCO) time of 1 hour, and action time of 6 hours and 30 hours to go to Mode 3 and Mode 5 respectively, was exceeded.

The inspectors identified that CR-11-03659 was initiated on July 7, 2011, to evaluate additional OE regarding potential vortex formations during RWST purification. The licensee added an action to CR-10-03912 to perform additional technical evaluations for the vortex concern.

On several occasions between July and October, 2011, the inspectors discussed with licensing staff and a member of the licensee's operations staff that purification of the RWST with a non-seismic system in a mode which required operability of the RWST would be a condition rendering the RWST inoperable. The licensee did not enter the resident's concerns into their CAP and later documented this failure as CR-12-06193. Additionally, the inspectors noted that the licensee issued operations SO 11-22 on October 28, 2011, to cease RWST recirculation on the SF system for samples or purification due to the OE documented in CR-11-03659.

On January 26, 2012, the NRC issued Information Notice 2012-01, “Seismic Considerations – Principally Issues Involving Tanks.” Because this information validated the resident's conclusions, the licensee reconsidered their previous evaluations, determined that they were in error, and prepared LER 05000395/2012-002-00 which was issued on June 14, 2012. Additionally, the licensee initiated CR-12-02439 on the same date for appropriate corrective actions.

The inspectors' review of the LER identified that the following information was not discussed:

- CR-10-03912 and the related evaluation which concluded that the RWST was operable.
- An additional leakage path associated with the SF system return line to the RWST.

The licensee plans to review the LER for possible revision including an extent review regarding the use of the RWST for makeup to other plant components such as accumulators using a non-seismic path. Once this revision is submitted, the resident inspectors will review for any potential, subsequent actions.

The inspectors' review of the LER revealed that the cause of the event was inadequate system descriptions in the FSAR. However, the inspectors determined that the descriptions were adequate. Although the FSAR sections for the SF system do not specifically discuss when alignment of the RWST to the SF system is appropriate with respect to maintaining operability of the RWST, the inspectors noted that previously Chapter 16 of the FSAR was for TS which were subsequently transferred to the licensee's operating license as Appendix A. TS 3.5.4 require that the RWST be operable in Modes 1-4, and if inoperable, then the LCO requires restoration of operability in one hour.

The inspectors noted that 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires in part that measures be established to assure that CAQs are promptly identified and corrected. The inspectors concluded the licensee failed to identify a CAQ because a complete and thorough evaluation was not performed during their review of CR-10-03912 in 2010.

Analysis: The inspectors determined that the failure to promptly identify and correct the CAQ for the alignment of the RWST to the SF system was a performance deficiency (PD). The inspectors reviewed Inspector Manual Chapter (IMC) 0612, Appendix B and determined the PD was more than minor and therefore a finding, because it affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and the respective attribute of configuration control because the alignment of the safety-related RWST to the non-seismic SF system created a CAQ and rendered the RWST inoperable. The inspectors evaluated the finding in accordance with NRC IMC 0609, "Significant Determination Process," Attachment 4 and Appendix A and determined that the finding required a phase 3 evaluation by a senior reactor analyst using the NRC SPAR model. A one year exposure period was used and no recovery credit was assumed in the analysis. The non-seismic RWST purification piping was assumed to fail at the same seismic input as that assumed for a loss of offsite power. The dominant sequence was a seismically induced loss of offsite power leading to a station blackout with failure of the emergency power system and failure to recover offsite power or the EDGs. Subsequent battery depletion and operator failure to control the TDEFW pump would lead to core damage. The risk was mitigated by the low probability of a seismic event. The analysis determined that the risk increase of the performance

Enclosure

deficiency was an increase in core damage frequency less than 1E-6/year a GREEN finding of very low safety significance. The cause of the finding involved the cross-cutting area of problem identification and resolution, the component of corrective action program, and the aspect of complete and thorough evaluation, P.1(c), because the licensee failed to determine that the alignment of the safety-related RWST to the non-seismic SF system was a CAQ.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI states, in part, that measures shall be established to assure that CAQs are promptly identified and corrected. Contrary to the above, on October 4, 2010, the licensee failed to promptly identify and correct a CAQ involving alignment of the safety-related RWST to a non-seismic SF system. Because the finding was of very low safety significance (Green) and was entered into the licensee's CAP as CR-12-06193, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000395/2012005-07, Failure to Promptly Identify and Correct a Condition Adverse to Quality for Alignment of the Safety-Related Refueling Water Storage Tank to a Non-Seismic Spent Fuel Purification system.

40A5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 (Closed) URI 05000395/2012002-05, Potentially Inadequate Test Criteria for Operability Testing of the Feedwater Isolation Valves

The inspectors opened URI 05000395/2012002-05, "Potentially Inadequate Test Criteria for Operability Testing of the Feedwater Isolation Valves," in NRC integrated inspection report 05000395/2012002. This allowed time for evaluating the adequacy of the FWIVs, following additional testing performed on November 22, 2012 under work orders 1209260-001, 1209261-001 and 1209262-001 to address the inspector identified concerns noted below:

- 1993 post modification test data for all FWIV air operated actuators were lost
- FWIVs were never tested at the minimum accumulator design pressure of 500 psig required for operability
- non-safety related instrument air was never isolated during post modification testing
- discrepancies existed between FWIV surveillance stroke times with the air actuators installed versus original factory actuator stroke times under similar loading

The November 22nd testing confirmed that the valves would pass their surveillance criteria at the minimum accumulator design pressure of 500 psig with instrument air isolated. The testing also showed that there was a delay between when the solenoid clicked to close the FWIV and when the stem started to move. This delay in stem movement varied between .65 and 2.45 seconds. The inspectors reviewed Technical Work Record, "FWIV Closure Time Assessment-PTP-248.001-(FINAL), serial GM94872, which addressed all three FWIVs and noted that the licensee evaluated this delay time and determined that on average it explained the difference between FWIV stroke closure time and factory qualification tests of the actuator.

Since additional testing confirmed the FWIVs operability, the inspectors determined that the failure to maintain sufficient records to furnish evidence of activities affecting quality was a minor violation of 10 CFR Part 50, Appendix B, Criterion XVII, "Quality Assurance Records." The inspectors have completed their review and this URI is closed.

.3 (Closed) Temporary Instruction (TI) 2515/188 – Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns

a. Inspection Scope

The senior resident inspector accompanied the licensee on their seismic walkdowns of the 'A' train EDG and associated support components and verified that the licensee confirmed the seismic features were free of potentially seismic conditions.

- Anchorage was free of bent, broken, missing or loose hardware
- Anchorage was free of corrosion that is more than mild surface oxidation
- Anchorage was free of visible cracks in the concrete near the anchors
- Anchorage configuration was consistent with plant documentation.
- SSCs will not be damaged from impact by nearby equipment or structures.
- Overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls are secure and not likely to collapse onto the equipment.
- Attached lines have adequate flexibility to avoid damage.

From October 22-23, 2012, the inspectors independently performed their walkdown of the Outside Yard and the Intermediate Building including the Emergency Feedwater Room. Specific components included:

- Turbine Drive Emergency Feedwater Pump Discharge Flow Transmitter
- Service Water Pond Level Transmitter
- Emergency Feedwater Pump Turbine Main Steam Throttle Valve

- Emergency Feedwater Turbine Driven Pump
- Emergency Feedwater Pump Turbine Steam Supply Flow Control Valve
- Condensate Storage Tank
- Refueling Water Storage Tank
- Reactor Makeup Water Storage Tank
- Sodium Hydroxide Storage Tank

For the above components, the inspectors verified that the licensee confirmed that the following seismic features were free of potential adverse seismic conditions:

- Anchorage was free of bent, broken, missing or loose hardware
- Anchorage was free of corrosion that is more than mild surface oxidation
- Anchorage was free of visible cracks in the concrete near the anchors
- Anchorage configuration was consistent with plant documentation.
- SSCs will not be damaged from impact by nearby equipment or structures.
- Overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls are secure and not likely to collapse onto the equipment.
- Attached lines have adequate flexibility to avoid damage.
- The area appears to be free of potentially adverse seismic interactions that could cause flooding or spray in the area.
- The area appears to be free of potentially adverse seismic interactions that could cause a fire in the area.
- The area appears to be free of potentially adverse seismic interactions associated with housekeeping practices, storage of portable equipment, and temporary installations (e.g., scaffolding, lead shielding).

Additionally, inspectors verified that items that could allow the spent fuel pool to drain down rapidly were added to the Seismic Walkdown Equipment List (SWEL) and these items were walked down by the licensee.

Observations made during the walkdown that could not be determined to be acceptable were entered into the licensee's corrective action program for evaluation. For example, some electrical cabinets associated with items on the SWEL could not be opened due to protected train requirements; however, with the inclusion of these items into the licensee's corrective action program for tracking, the inspectors were given reasonable assurance that the licensee would inspect those items at the first opportune time.

Documents reviewed are listed in the attachment to this report.

The actions required by TI-188 are complete and this procedure is closed.

b. Findings

No findings were identified.

Enclosure

.4 (Discussed) NRC Temporary Instruction (TI) 2515/187, Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns

a. Inspection Scope

Inspectors conducted independent walkdowns to verify that the licensee completed the actions associated with the flood protection feature specified in paragraph 03.02.a.2 of this TI. Inspectors are performing walkdowns at all sites in response to a letter from the NRC to licensees, entitled "Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340).

Enclosure 4 of the letter requested licensees to perform external flooding walkdowns using an NRC-endorsed walkdown methodology (ADAMS Accession No. ML12056A050). Nuclear Energy Industry (NEI) document 12-07 titled, "Guidelines for Performing Verification Walkdowns of Plant Protection Features," (ADAMS Accession No. ML12173A215) provided the NRC-endorsed methodology for assessing external flood protection and mitigation capabilities to verify that plant features, credited in the CLB for protection and mitigation from external flood events, and are available, functional, and properly maintained.

b. Findings

Findings or violations associated with flood related inspections, if any, will be documented in the 1st quarter integrated inspection report of 2013.

.5 Documentation of Inspector Smart Samples

a. Inspection Scope

The inspectors used the following smart samples in their inspections during 2012 inspection calendar year:

- OpESS 2012/01, High Wind Generated Missile Hazards
- OpESS 2012/02, Technical Specification Interpretation and Operability Determination

The inspectors reviewed documents as listed in the attachment in addition to licensee corrective action documents.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On January 28, 2013, the resident inspectors presented the integrated inspection report results to Mr. T. Gatlin and other members of the licensee staff. The licensee acknowledged the results of these inspections. The inspectors confirmed that inspection activities discussed in this report did not contain proprietary material.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy, for disposition as a NCV.

- TS 6.8.1.f requires in part that written procedures shall be implemented covering the activities for the fire protection program. Contrary to the above, on September 25, 2012, the licensee failed to implement fire protection program procedure, FPP-025, "Fire Containment," because required compensatory actions were not established for approximately 138.5 hours for an inoperable door, DRIB/409, with fire protection and steam propagation barrier requirements. This PD is more than minor and therefore a finding because it impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and the attribute of human performance performance because the licensee failed to follow FPP-025 to ensure the appropriate compensatory measures were established for the inoperable door. The inspectors used IMC 0609, Attachment 4 and Appendix A and F, and determined the finding was of very low safety significance or Green, because (1) the configuration of the door and associated corridor presented a low challenge from a turbine building fire and fire detection instrumentation was operable on both sides of the affected door, and (2) the affected door closure mechanism was functional and maintained the door in a closed position which would allow steam pressure from a steam line break in the turbine building to force the door tightly against the seals. This finding has been entered into the licensee's CAP as CR-12-04139.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Archie, Senior Vice President, Nuclear Operations
A. Barbee, Director, Nuclear Training
M. Browne, Manager, Quality Systems
M. Coleman, Manager, Health Physics and Safety Services
G. Douglass, Manager, Nuclear Protection Services
T. Gatlin, Vice President, Nuclear Operations
K. Gore, Manager, Organization Development and Performance
M. Harmon, Manager, Chemistry Services
R. Haselden, General Manager, Organizational / Development Effectiveness
R. Justice, Manager, Nuclear Operations
G. Lippard, General Manager, Nuclear Plant Operations
M. Mosley, Manager, Nuclear Training
M. Roberts, Supervisor, Health Physics II, New Plant, Environmental, Rad Waste
D. Shue, Manager, Maintenance Services
W. Stuart, General Manager, Engineering Services
B. Thompson, Manager, Nuclear Licensing
D. Weir, Manager, Plant Support Engineering
B. Wetmore, Design Engineering
R. Williamson, Manager, Emergency Planning
S. Zarandi, General Manager, Nuclear Support Services

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000395/2012005-01	URI	Nonconformance of RCP Motor Oil Collection System with the Fire Protection Program (Section 1R05.1)
05000395/2012005-02	URI	Post-LOCA impact of Replacement Fire Hoses on the ECCS Sump (Section 1R05.2)
05000395/2012005-03	URI	Reactor Vessel Supports Not Included in the Licensee's ASME Section XI ISI Program (Section 1R08)
05000395/2012005-04	URI	Failure to Consider the Risk Impact of Time to Core Boil With Reactor Vessel Upper Internals Installed and Cavity Level is Greater Than Reactor Vessel Flange (Section 1R13)
05000395/2012005-05	URI	Adequacy of Temporary Containment Penetration Design for Shutdown Operations (Section 1R20)

Opened and Closed

05000395/2012005-06	NCV	Resin Shipment in Steel High Integrity Container Noncompliance with 10 CFR 61.56(b)(2) (Section 2RS8)
05000395/2012005-07	NCV	Failure to Promptly Identify and Correct a Condition Adverse to Quality for Alignment of the Safety-Related Refueling Water Storage Tank to a Non-Seismic Spent Fuel Purification system (Section 4OA2.3)

Closed

05000395/2012002-05	URI	Potentially Inadequate Test Criteria for Operability Testing of the Feedwater Isolation Valves (Section 4OA5.2)
05000395/2515/188	TI	Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns (Section 4OA5.3)

Discussed

05000395/2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns (Section 4OA5.4)
-------------------	----	---

LIST OF DOCUMENTS REVIEWED

Section 1R01.2: External Flooding

- TR00310-001, IPE for External Events, External Flood Evaluation, June, 1995
- UFSAR Section 2.4, Hydraulic Engineering
- UFSAR Section 3.4, Water Level (Flood) Design

Section 1R04.2: Equipment Alignment

- Design Basis Document (DBD), Safety Injection System, Rev. 10
- DBD, Chemical and Volume Control System (CVCS), Rev. 8
- UFSAR Section 6.3, Emergency Core Cooling System
- CVCS flow diagrams, E-302-671 through E-302-677
- SOP-102, "Chemical and Volume Control System"
- SOP-118, "Component Cooling Water"
- List of outstanding and closed work orders from 1/1/11 – 9/30/12
- List of CRs from 1/1/11 – 9/30/12

Section 1R06: Flood Protection Measures

- DBD, ND System, Drains, Sumps, and Leak Detection, Rev. 2
- IPE, Internal Flooding Analysis Notebook, April, 1993
- Engineering Design Guideline, ME-15, High Energy Line Break and Moderate Energy Crack Evaluations, Rev. 3
- Design calculation, DC03490-003, Intermediate & Diesel Generator Buildings Flooding Evaluation, Rev. 0
- UFSAR Section 7.6.5, Leakage Detection Systems
- WOs 1006179-001 through 1006184-001 for ILS01950 through ILS01955 respectively for calibrations of intermediate building sump level switches.

Section 1R08: Inservice Inspection Activities

Procedures

- QSP-501, Solvent Removable Liquid Penetrant, Rev. 5
- SAP-1100, Boric Acid Corrosion Control Program, Rev. 2
- WDI-STD-1040, Procedure for Ultrasonic Examination of Reactor Vessel Head Penetrations, Rev. 8
- WDI-STD-1041, Reactor Vessel Head Penetration Ultrasonic Examination Analysis Guidelines, Rev. 7
- WDI-STD-1042, Procedure for Eddy Current Examination of Reactor Vessel Head Penetrations, Rev. 2

Calculations

- DC04010-001, Reactor Vessel Head Effective Degradation Years, Rev. 6

Corrective Action Documents

- CR-12-04775, Indications found during reactor pressure vessel upper head UT inspection
- CR-12-04861, Hardened material discovered on surfaces or Reactor Vessel head studs and Reactor Vessel Flange
- CR-11-03471, boric acid leak was identified on XVTO8100-CS
- CR-12-04418, boric acid leakage on SI Accumulator B Discharge header valve
- CR-11-03834, boric acid diaphragm leak from FCV00113B

Drawings

- CBI Contract # 71-2631, 157 PWR CRDM Housing Installation DWG# 40, Rev. 6
- CBI Contract # 71-2631, 157 PWR CRDM Housing Installation DWG# 42, Rev. 6
- CBI Contract # 71-2631, 157 PWR CRDM Housing Installation DWG# 43, Rev. 3
- CBI Contract # 71-2631, 157 PWR CRDM Housing Installation DWG# 44, Rev. 3
- CBI Contract # 71-2631, 157 Top Head Assembly DWG# 35, Rev. 2
- DWG E-411-517, Reactor Building Basement Floor- El. 412' 0" Sections and Details, Rev. 08

Other Documents

- 9034694-000, VC Summer RF16 – Reactor Head Penetration Inspection Report, Rev. 0
- Automated Ultrasonic Examination Calibration Data Sheets: VCS-R20-OH01-CAL-01Y-103684, VCS-R20-CP02-CAL-01R-4151, VCS-R20-CP02-CAL-01R-4159, VCS-R20-CP02-CAL-01R-4160
- BMV-01, VC Summer RPVH Bare Metal Visual Examination Summary Sheet (RF19)
- Chemical Test Report for SpotCheck Cleaner/Remover Batch No. 03-J4
- Chemical Test Report for SpotCheck Developer Batch No. 017-H6
- Chemical Test Report for SpotCheck Penetrant Batch No. 018-A47
- Examiner Qualification Records for: G. Brauer, P. Divalerio, G. Johnston, P. Lancaster, T. Majoros, J. Rollo, K. Sheriff, T. Sledge, C. Wyffels, P. Davis, M. Parker
- Technical Work Record, Percent Coverage for N-729-1 VE/BMV
- Ultrasonic Report Data Sheet Report Nos.: VCS-R20-CP02-19-01, VCS-R20-CP02-31-01, VCS-R20-CP02-37-01, VCS-R20-CP02-52-01
- WCAP-15987-NP, Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations, Rev. 2
- WCAP-17645-P, Structural Integrity Evaluation of Reactor Vessel Upper Head Penetrations to Support Continued Operation: V.C. Summer Unit 1, Rev. 0
- Certificate of Qualification for Mahoney, P. dated 8-8-2012
- Visual Acuity Exam Record for Mahoney, P. dated 2-12-2012
- Certificate of Qualification for Blecha, P. dated 7-3-2012
- Visual Acuity Exam Record for Blecha, P. dated 2/8/2012
- Certificate of Qualification for Smith, K dated 1-3-11
- Visual Acuity Exam Record for Smith, K. dated 1/2/12
- Ultrasonic Linearity Instrument Record for Krautkramer 52R Serial No. 101939 dated 10/13/2012
- Ultrasonic Examination Report for SG-C /RC dated 10/25/2012
- Ultrasonic Examination Report for Reactor Vessel Studs dated 10/25/2012

- WO 1103681-49 Install 3" AIR TRAP suction vent line and new vent valve
- WO 1203743-41 Shaw Mechanical Field Install Tubing & Components for Normal and Alternate Seal Injection Flow Transmitters
- Welding Procedure Specification (WPS) 1F-200, Rev. 07
- WPS 7F-8B, Rev. 8
- Welder Performance Qualification Record (PQR) for Morgan, C. dated 6-20-2012
- Welder/Brazer Performance Continuity Record for Morgan, C. for 2012 Calendar Year
- Welder PQR for Sharpe, S. dated 1-19-12
- Welder/Brazer Performance Continuity Record for Sharpe, S. for 2012 Calendar Year
- Welder PQR for Bodiford, S. dated 4-23-11
- Welder/Brazer Performance Continuity Record for Bodiford, S. for 2012 Calendar Year

Section 1R20: Refueling Outage and Other Outage Activities

Procedures, Calculations and other Guidance Documents

- AOP-115.1.04A, RHR Pump Vortexing
- AOP-115.03.03B, Loss of RHR With the RCS Intact
- AOP-115.04.02A, Loss of RHR While Refueling
- AOP-115.5.05A, Loss of RHR With the RCS Not Intact (Mode 5 and 6)
- EO-6, RHR Operations
- OAP-108.4, Operations Outage Control of Containment Penetration
- SAP-0152, Fatigue Management and Work Hour Limits
- SAP-1013, Fitness For Duty Program
- SAP-1313, Station Access and Departure
- Design Calculation, DC00020-006, Containment Temperature Rise Following a Loss of RHR

Condition Reports

- CR-12-04599, Pen 602 foam cure time issue
- CR-12-04810, GL 88-17 Noncompliance Issues of Concern
- CR-12-04871, Issues identified with tagouts
- CR-12-05734, CRDM Missile shield bolts not tight
- CR-12-04757, Time to Boil does not consider upper internals installed or removed with cavity greater than 23 feet

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Change Packages

EPP-001, "Activation and Implementation of Emergency Plan," Revision 30

EPP-005, "Offsite Dose Calculation," Revision 30

Radiation Emergency Plan, Revision 60

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

- HPP-0157, Personnel Monitoring for Contamination, Revision 12
- HPP-0158, Contamination Control for Equipment and Materials, Revision 15
- HPP-0160, Control and Posting of Radiation Control Zones, Revision 13
- HPP-0245, Radiological Controls for Failed Fuel, Revision 1
- HPP-0401.001, Planning And Maintaining RWPs, Revision 0
- HPP-0401.002, Creating, Revising and Terminating RWPs Utilizing Sentinel, Revision 0
- HPP-0401.003, Performing RWP Pre Job Briefings, Revision 0
- HPP-0402, Radiological Survey Requirements and Controls for Reactor Building and Incore Pit Entries, Revision 12
- HPP-0403, Radiological Controls for Nuclear Work Activities, Revision 11
- HPP-0410, Health Physics Routine Surveys, Revision 9
- HPP-0413, Diving Operations, Revision 3
- HPP-0416.001, Radiological Controls for Use of Vacuum Cleaners, Revision 0
- HPP-0416.002, Radiological Controls for Use of Portable HEPA Ventilation Equipment, Revision 0
- HPP-0419, Electronic Dosimeter Alarm Set Point Determination and Alarm Response Actions, Revision 2
- SAP-0999, Corrective Action Program, Revision 10

Records and Data

- National Source Tracking System Annual Inventory Reconciliation Report NPF-12, 1/10/12
- National Source Tracking System Annual Inventory Reconciliation Report SCDHEC 1269-325, 1/10/12

Corrective Action Documents

- QA-AUD-201208, Station Radiation Control, 6/21/12
- SA12-HP-02, Field Operations and Radioactive Material Control Self-Assessment, 6/4-8/12
- CR-12-04475
- CR-12-04507
- CR-11-01814
- CR-11-02026
- CR-11-02649
- CR-11-02656
- CR-11-04302
- CR-11-05979
- CR-12-01196
- CR-12-01586
- CR-12-02384
- CR-12-02624

Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Procedures

- PCP-001, Process Control Program, Rev. 11

Corrective Action Documents

- CR-12-04279
- Apparent Cause Analysis for CR 12-04279

Records and Data

- South Carolina Department of Health and Environmental Control letter notifying V.C. Summer of infraction involving a shipment to Energy Solutions Disposal Facility in Barnwell, South Carolina.
- South Carolina Department of Health and Environmental Control Radioactive Material License 97 with amendments 47 through 55. (Chem-Nuclear Systems, LLC. Barnwell Waste Management Facility)
- EnergySolutions Condition Report BW-CR12-060
- Uniform Low-Level Radioactive Waste Manifest Shipment Number 0912-14101, 9/25/12

Section 4OA5.2: Other Activities

- TWR Serial GM94872, "FWIV Closure Time Assessment-PTP-248.001-(FINAL)"
- TWR Serial 239-02-7834, "MRF 20724 Replace FWIV Actuators," 3/21/1991
- Qualification Report No. 312-15779-00, 7/26/1988
- CR-12-00899, NRC identified: FWIVs test data did not match factory qualification data
- CR-12-01645, NRC identified: FWIVs are not tested with non-safety related instrument air isolated
- CR-12-02418, NRC Identified: Documentation of the post modification tests for the Feed Water Isolation Valve actuator replacement (MRF-20724) is not in Records.

Section 4OA5.3: Temporary Instruction (TI) 2515/188 – Inspection of Near-Term Task Force Recommendation 2.3 seismic Walkdowns

Drawings

04-4461-B-809-488, Service Water Pond Level LT-4418 & LT-4458, Rev. 1

1MS-50-105, Emergency Feedwater Pump Turbine Control Valve, Rev. 9

B-809-488, Service Water Pond Level LT-4418 & LT-4458, Rev. 1

D-8647, Emergency Feedwater Pump, Rev. 1

D-8649, Emergency Feedwater Pump, Rev. 1G

E1, 40' ϕ x 58'-0 Refueling Water Storage Tank Virgil C. Summer Nuclear Station – Unit #1
Anchor Bolt Plan, Rev. B2

E1, 47' ϕ x 41'-0 Condensate Storage Tank, Rev. A2

E2, 26' ϕ x 27'-9 Reactor Make-Up Water Tank Virgil C. Summer Nuclear Station – Unit #1
General Arrangement, Rev. B3

E3, 26' ϕ x 27'-9 Reactor Make-Up Water Tank Virgil C. Summer Nuclear Station – Unit #1 Tank
Sections, Rev. D

E3, 47' ϕ x 41'-0 Condensate Storage Tank Virgil C. Summer Nuclear Station – Unit #1 Anchor Bold Layout, Rev. 0
 E-304-011, Main Steam (Nuclear) – Reactor Building Plan & Sections Above Elev. 436'-0", Rev. 10
 E-304-016, Main Steam (Nuclear) – Intermediate Building Plan Below Elev. 436'-0" & Sections, Rev. 15
 E-304-089, Emergency Feedwater Intermediate Building Plans Below El. 436'-5, Rev. 25
 E4, 47' ϕ x 41'-0 Condensate Storage Tank Virgil C. Summer Nuclear Station – Unit #1 General Arrangement, Rev. A3
 E-412-303, Auxiliary Building Basement Floor – Elevation 412'-0" – Southwest, Rev. 14
 E-412-318, Auxiliary Building Basement Floor – Elevation 412'-0" – Sections, Rev. 12
 E-413-068, Intermediate Building Basement Floor Elevation 412'-0 Sections, Rev. 5
 E5, 26' ϕ x 27'-9 Reactor Make-Up Water Tank Virgil C. Summer Nuclear Station – Unit #1 Shell Rollout – Erection, Rev. A
 E5, 47' ϕ x 41'-0 Condensate Storage Tank Virgil C. Summer Nuclear Station – Unit #1 Bottom Center Line & Anchor Bracket Erection, Rev. A
 H34388-9102, Component IFT03525 Turbine DR EF Pump Discharge Flow XMTR, Rev. C
 N-SHST-2723, 3300 Gallon Sodium Hydroxide Storage Tank, Rev. 2
 P-4975, Trip Throttle Valve with Hard Packing, Rev. 1G

Corrective Action Documents

CR-12-04805
 CR-12-04831

Other Documents

Completed Area Walk-By Checklists (AWC) for components: XTK0060, XVT02865-MS, ILT04418, XPP0008, IFV02030-MS, IFT03525, XTK0008, XTK0025, XTK0039
 Completed Seismic Walkdown Checklists (SWC) for components: XTK0060, XVT02865-MS, ILT04418, XPP0008, IFV02030-MS, IFT03525, XTK0008, XTK0025, XTK0039

Section 40A5.4: Documentation of Inspector Smart Samples

Condition Reports

- CR-12-01315, Smart Sample 2012-01 requires evaluation for any appropriate actions
- CR-12-01320, Smart Sample 2012-02 requires evaluation for any appropriate actions
- CR-12-01715, ES-120 not performed for nonconforming SW pipe support
- CR-12-02013, Nuclear Licensing review of URI 05000395/2012002-04

Procedures

- ES-0120, "Operability Recommendation and JCO Development"
- ES-509, "Disposition of Site Nonconformances"
- SAP-209, "Operability Determination Process"
- OAP-109.1, "Guidelines for Severe Weather"
- EPP-015, "Natural Emergency"

Miscellaneous Documents

- ML060800002, 03-22-06 Memo to Casto re TIA 2005-04
- UFSAR Section 3.5, "Missile Protection"

LIST OF ACRONYMS

AB	Auxiliary Building
ADAMS	Agency Document Access and Management System
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
BDMG	Basis Mitigating Guideline
BMV	Bare Metal Visual
BPVC	Boiler and Pressure Vessel Code
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CP	Chemistry Procedure
CR	Condition Report
DE	Design Engineering
ECCS	Emergency Core Cooling System
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
ES	Engineering Services Procedure
FPP	Fire Protection Program
FWIV	Feedwater Isolation Valve
GTP	General Test Procedure
HIC	High Integrity Container
HRA	High Radiation Area
HRE	High Risk Evolution
IB	Intermediate Building
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LHRA	Locked High Radiation Area
LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
MR	Maintenance Rule
MSPI	Mitigating System Performance Index
NaOH	Sodium Hydroxide
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NPF	Nuclear Power Facility
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulatory
OAP	Operations Administrative Procedure

ODCM	Offsite Dose Calculation Manual
OE	Operating Experience
OOS	Out of Service
PARS	Publicly Available Records
PCP	Process Control Program
PD	Performance Deficiency
PI	Performance Indicator
PMT	Post-Maintenance Testing
PWR	Pressurized-Water Reactor
RB	Reactor Building
RCA	Radiologically Controlled Area
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
REV	Revision
RF20	Refueling Outage Number 20
RHR	Residual Heat Removal
RP	Radiation Protection
RPT	Radiation Protection Technician
RS	Radiation Safety
RTP	Rated Thermal Power
RWP	Radiation Work Permit
RWST	Refueling Water Storage Tank
SAP	Station Administrative Procedure
SCE&G	South Carolina Electric and Gas
SDP	Significance Determination Process
SF	Spent Fuel
SL	Severity Level
SO	Special Order
SOP	System Operating Procedure
SRI	Senior Resident Inspector
SSC	System, Structures, and Components
STP	Surveillance Test Procedure
SW	Service Water
SWEL	Seismic Walkdown Equipment List
TDEFW	Turbine Driven Emergency Feedwater
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
UT	Ultrasonic
VCSNS	V.C. Summer Nuclear Station
VHRA	Very High Radiation Area
VUHP	Vessel Upper Head Penetration
WANO	World Association of Nuclear Operators
WO	Work Order