



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

January 30, 2012

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 05000395/2011005

Dear Mr. Gatlin:

On January 25, 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 25, 2012, with you and other members of your staff.

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

No NRC-identified or self-revealing findings were identified during the inspection. However, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating this NCV consistent with Section 2.3.2.a of the Enforcement Policy. If you contest this NCV, 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.

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 05000395/2011005
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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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
(Acting) 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

SCE&G

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Letter to Thomas D. Gatlin from Gerald J. McCoy dated January 30, 2012

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION
REPORT 05000395/2011005

Distribution w/encl:

C. Evans, RII

L. Douglas, RII

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-395

License No.: NPF-12

Report No.: 05000395/2011005

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, 2011 through December 31, 2011

Inspectors: J. Reece, Senior Resident Inspector
E. Coffman, Resident Inspector
M. Speck, Senior Emergency Preparedness Inspector (Section 4OA5)
E. Lea, Senior Operations Engineer (Section 1R11.2)

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

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SUMMARY OF FINDINGS

IR 05000395/2011005; 10/01/2011 - 12/31/2011: Virgil C. Summer Nuclear Station; Routine Integrated Inspection Report.

The report covered a 3 month period of inspection by resident inspectors and reactor inspectors from the region. No NRC-identified or self-revealing findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). 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

None

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. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

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REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at full Rated Thermal Power (RTP) and operated at or near full RTP for the remainder of the quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

Seasonal Weather Susceptibilities

a. Inspection Scope

The inspectors performed one adverse weather inspection for readiness of cold weather. The inspectors verified the licensee had implemented applicable sections of operations administrative procedure (OAP)-109.1, Revision (Rev.) 3A, "Guidelines for Severe Weather." The inspectors reviewed preparations for extreme cold weather and walked down the service water pumphouse and emergency diesel generator (EDG) rooms to assess whether the equipment was adequately protected from cold weather and was functioning as expected. 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.

1R04 Equipment Alignment

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. Documents reviewed are listed in the Attachment.

- 'A' EDG during planned maintenance on 'B' EDG
- 'A' emergency feedwater (EFW) and turbine driven emergency feedwater (TDEFW) while 'B' EFW was out of service for planned maintenance

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b. Findings

No findings were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed review and walkdown of the 'B' EDG and support systems to identify any discrepancies between the current operating system equipment lineup and the designed lineup. This walkdown included accessible areas of the system and the equipment alignment configuration as indicated from valves, pumps, and control room equipment status lights. 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. Other documents reviewed are listed in the attachment to this report.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Protection Tours

a. 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):

- Relay room solid state protection system (SSPS) instrumentation and inverter (fire zones CB-6, CB-10 and CB-12)
- Diesel generator rooms A and B (fire zones DG-1.1/1.2 and DG-2.1/2.2)
- Auxiliary building 397' and 388' elevations (fire zone AB-1.4)
- Intermediate building 436' elevation (fire zones IB 25.5, 25.6.1/2 and 25.7)
- Auxiliary building 463' elevation (fire zones AB-1.21.1 and 1.21.2)

b. Findings

Introduction: An unresolved item (URI) was identified by the inspectors relating to the procurement and use of 1.5" non-collapsible rubber hose used throughout the plant for fire protection.

Description: On November 3, 2011, the inspectors identified that the licensee was using 1.5" Thermoid Mexacon General Purpose (GP) 250 PSI hose at a majority of the Fire Protection Evaluation Report (FPER) and non-FPER interior hose reel stations. The inspectors determined that HBD Thermoid's specification for the hose notes a minimum bend radius of 10.5", conflicting with the 5" radius of the respective hose reels.

On November 18, 2011, inspectors reviewed the engineering evaluation for the Thermoid hose. The engineering evaluation failed to include other fire hoses as part of an extent of condition review. Inspectors questioned the licensee on why 1.5" Gates Duro Flex hose was also being used as non-collapsible hose as it has a minimum bend radius of 12". The licensee initiated CR 11-05852 and found that the Gates Duro Flex hose was installed on fire hose reels with a 5" radius. The licensee took immediate compensatory actions including staging collapsible fire hose at the two affected FPER hose reels. On November 21, 2011, an engineering evaluation for the Gates Duro Flex hose determined that two FPER hoses and four non-FPER hoses were not compatible with the hose reels due to exceeding the minimum bend radius of the hose.

Additional information is required for evaluation and finalization of the performance deficiency. The issue is identified as URI 05000395/2011005-01, Fire Protection Program Requirements for Procurement and Use of Fire Hose.

.2 Annual Fire Brigade Drill Observation

a. Inspection Scope

The inspectors observed the performance unannounced fire brigade drill was conducted on October 12, 2011, and an announced fire brigade drill on October 27, 2011. The inspectors evaluated the readiness of licensee personnel to prevent and fight fires including the following aspects:

- Observe whether turnout clothing and self-contained breathing apparatus equipment were properly worn.
- Determine whether fire hose lines were properly laid out and nozzle pattern simulated being tested prior to entering the fire area of concern.
- Verify that the fire area was entered in a controlled manner
- Review if sufficient firefighting equipment was brought to the scene by the fire brigade to properly perform their firefighting duties.
- Verify that the fire brigade leader's fire fighting directions were thorough, clear and effective, and that, if necessary, offsite fire team assistance was requested.
- Verify that radio communications with plant operators and between fire brigade members were efficient and effective.

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- Confirm that fire brigade members checked for fire victims and fire propagation into applicable plant areas.
- Observe if effective smoke removal operations were simulated.
- Verify that the fire fighting pre-plans were properly utilized and were effective.
- Verify that the licensee pre-planned drill scenario was followed, drill objectives met the acceptance criteria, and deficiencies were captured in post drill critiques.

b. Findings

No findings were identified.

1R06 Flood Protection Measures

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed and walked down portions of the intermediate building flood detection 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 in the area such as component cooling water pumps and emergency feedwater pumps would be adequately detected. The related flood design evaluations for the area of interest as documented in the licensee's individual plant evaluation 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.

b. Findings

No findings were identified.

.2 Annual Review of Electrical Manholes

a. Inspection Scope

The inspectors reviewed and observed licensee periodic inspection of two safety-related manholes EMH-001 and EMH-002 (containing 'A' and 'B' 7.2 kV feeds to service water pumps) to assess the condition of electrical cables located inside the underground manholes. The inspectors verified by direct observation and review of the associated inspection documents that the cables, splices, support structures, and sump pumps located within the manholes appeared intact and the cables were not being impacted by water. In addition, the inspectors reviewed several past periodic licensee inspection results for each of the above mentioned manholes to ensure that any degraded conditions identified were appropriately resolved.

b. Findings

No findings were identified.

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1R11 Licensed Operator Requalification Program

.1 Quarterly Resident Inspector Observations

a. Inspection Scope

The inspectors observed an operator requalification simulator scenario occurring on October 24, 2011, which involved the failures of first stage pressure on the main turbine and nuclear instrumentation - N43, a large break RCS loss of coolant, a failure of the reactor to automatically trip and failure of safety injection to automatically initiate, and a failure of the 'A' emergency diesel generator to automatically start. The inspectors observed crew performance in terms of communications; ability to prioritize failures in order to take timely and proper actions; prioritizing, interpreting, and verifying alarms; correct use and implementation of procedures, including the alarm response procedures; timely control board operation and manipulation, including high-risk operator actions; and oversight and direction provided by the shift manager, including the ability to identify and implement appropriate TS actions and when required, emergency action levels as the Site Emergency Manager. The inspectors reviewed the licensee's critique comments to verify that performance deficiencies were captured for appropriate corrective action.

b. Findings

No findings were identified.

.2 Annual Review of Licensee Requalification Examination Results.

a. Inspection Scope

On August 18, 2011, the licensee completed the annual requalification operating tests and written examinations required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). On November 2, 2011, the licensee completed a makeup annual operating and written exam to one individual in accordance with 10 CFR. The inspectors performed an in-office review of the overall pass/fail results of the individual operating tests, the crew simulator operating tests and the written examinations. These results were compared to the thresholds established in Manual Chapter 609 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 structures, systems, and components (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 (MPFFs) or other MR findings existed that the licensee had not identified.

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

- CR-11-05365, refrigerant leak monitor in 'A' chiller room was in alarm.
- CRs 11-02684, 11-02734, 11-03627, 11-04123, SW Function 4 (provide cooling water to reactor building cooling units via service water booster pumps during emergency conditions) placed in (a)(1) status

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the three 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.

- Work Week 2011-41: risk assessments for 'B' EDG scheduled maintenance and Bus 2 switchyard work resulting in an overall Yellow risk condition

- Work Week 2011-42: risk assessment for Bus 2 switchyard work resulting in an overall Yellow risk condition
- Work Week 2011-43: risk assessments for 'A' service water pump removal for offsite refurbishments

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed five 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. Also, the inspectors verified that the operability evaluations were performed in accordance with SAP-209, Rev. 0E, "Operability Determination Process," and SAP-999, Rev. 5, "Corrective Action Program."

- CR-11-05225, 'A' chiller tripped due to apparent lightning strike
- CR-11-05578, exceeding the minimum bend radius of 1.5 inch fire hose installed on hose reels
- CR-11-01087, 2B component cooling water (CCW) heat exchanger has degraded below design basis limit due to fouling
- CR-11-03505, historical operability evaluation for 'A' feedwater isolation valve (FWIV) exhaust port air leakage
- CR-11-05852, exceeding the bend radius of 1.5" Gates Duro Flex hose used on fire hose reels

b. Findings

The aspects relating to CR-11-05225 and CRs 11-05852, 11-05578 are discussed in sections 4OA2.3(1) and 1R05.1, respectively, of this report.

1R19 Post Maintenance Testing

a. Inspection Scope

For the six 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

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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. 5A, "Post Maintenance Testing Guideline."

- WO 1115240-001, Replace pressurizer level transmitter, ILT00460-001
- WO 1001881-001, 'B' chiller post maintenance test
- WO 1109181-001, Stroke test of service water pond return isolation valve following valve replacement
- WO 1113183-001, Post maintenance run of 'A' SW pump following motor reinstall
- WO 1117175-001, Replace power supply for fuel handling and reactor building radiological monitor control room annunciator
- WO 1116975-001, 'A' chiller adjust refrigerant charge as necessary and measure superheat and sub-cooling for proper operation

b. Findings

No findings were identified.

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-220.002, Turbine Driven Emergency Feedwater Pump and Valve Test, Rev. 7
- STP-120.004, Emergency Feedwater Valve Operability Test, Rev. 16
- STP-205.003, Charging/Safety Injection Pump and Valve Test, Rev. 7

Other Surveillance Tests:

- STP-123.001, Service Water System Valve Lineup Verification, Rev. 7D

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b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) VerificationCornerstone Mitigating Systemsa. Inspection Scope

The inspectors verified the accuracy of the licensee's PI submittals listed below for the period October 1, 2010 through September 30, 2011. 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. 1, "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. Also, the inspectors discussed the PI data with the licensee personnel associated with the performance indicator data collection and evaluation.

- 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 Programa. 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.

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.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 2011 through December 2011.

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 with their CAP. However, the inspectors noted an increased number of problems relating to fire doors. Specifically, the inspectors identified the following CRs:

CR-11-04003, Door locking mechanism sticking
 CR-11-04063, Gasket for door is loose and can come out of place
 CR-11-04205, Door has to be closed manually
 CR-11-04238, Unsecure door due to faulty latch
 CR-11-04354, Unsecure door due to locking mechanism sticking
 CR-11-04442, Door has to be closed manually
 CR-11-04450, Door will not close each time when taken to the full open position
 CR-11-04477, Latching mechanism for door is not functioning properly

The licensee initiated CR-11-04579 to document the trend and perform an evaluation for any necessary corrective actions.

.3 Annual Sample Review

1) Lightning Induced Trips of Safety-Related Chillers

a. Inspection Scope

The inspectors reviewed CR-11-03187, "'C' chiller tripped while operating on 'A' train during a lightning storm," and CR-11-05225, "A chiller tripped due to an apparent lightning strike," in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues. The inspectors 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

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appropriate and timely corrective actions. Also, the inspectors verified the issues were processed in accordance with procedure SAP-999, Rev. 5, "Corrective Action Program."

b. Findings

Introduction: A URI was identified by the inspectors for safety-related chiller trips due to lightning.

Description: On October 13, 2011, following a lightning strike at the station the 'A' train safety-related chiller tripped on overcurrent when the 250 amp limit for circuit 1 of the two circuit chiller was exceeded. The 'B' train of chilled water system was also inoperable which required the licensee to enter TS 3.0.3. The 'B' train chiller was returned to an operable status to allow exiting TS 3.0.3. The licensee entered the problem into their CAP as CR-11-05225 and performed an operability evaluation. The evaluation also referenced CR-11-03187 that documented a similar, previous trip of the 'C' chiller while aligned to 'A' train power on June 5, 2011, during a lightning storm. The inspectors continue to evaluate the regulatory aspects of these events. This issue is identified as URI 05000395/2011005-02, Lightning Induced Trips of Safety-Related Chillers.

2) CR-09-03980, Concern identified for potential flashing at the suction of the RHR pumps

a. Inspection Scope

The inspectors reviewed CR-09-03980, "Concern identified for potential flashing at the suction of the RHR pumps," in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues. The inspectors 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, Rev. 5, "Corrective Action Program."

b. Findings

A licensee identified finding associated with this event is discussed in section 4OA7 of this report. On March 5, 1993, the licensee completed and approved calculation DC09650-002 which determined the specific temperature that can result in flashing at the suction of the RHR pumps when aligned to the reactor water storage tank (RWST) following a loss of cooling accident (LOCA) occurring in Modes 3 or 4. On October 13, 2009, after discussions with Westinghouse personnel regarding the impending issuance of NSAL-09-8, "Presence of Vapor in Emergency Core Cooling System/Residual Heat Removal System in Modes 3/4 Loss-of-Coolant Accident Conditions," the licensee initiated CR-09-03980 due to their discovery that DC09650-002 was too narrow in scope in that flashing was only analyzed for the pump suction as opposed to all of the suction piping. The CR was assigned a Category 3 priority with an associated apparent cause evaluation (ACE). Subsequently, the licensee discovered that the calculation was also

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nonconservative because the temperature limits previously established were too high and would still allow flashing in the RHR suction lines under the conditions noted above. Consequently, the licensee issued a licensee event report (LER) on January 19, 2010, documenting the unanalyzed condition.

The inspectors identified the following additional weaknesses in the licensee's corrective action process.

- Based on the conclusion that the RHR system was operated in an unanalyzed condition, CR-09-03980 should have been a Category 2 priority with a consequent root cause evaluation (RCE) assigned given the requirements of the licensee's CAP. A RCE would have provided more insight and into the causes and barriers to the event. The licensee initiated CR-11-06252 for this PD.
- The ACE stated that no OE had been issued other than the applicable Westinghouse NSALs. The inspectors determined that OE had been issued by the Wolf Creek nuclear plant and reviewed by the licensee on October 21, 2008, with a conclusion that existing plant procedures provided adequate temperature limits to ensure at least one train of RHR remains operable. The inspectors noted that the OE was coded as 'B3' for which the quality related station administrative procedure, SAP-1351, "Operating Experience Program," Revision 5, defines in step 6.2.1.B.3, "VCSNS procedures adequately cover the issue. Log the work document and procedure number or the PM number and the date of last performance, if possible. This type screening requires a concurrence from the subject matter expert." The inspectors concluded that the plant subject matter expert was not consulted to review the OE as required by procedure. The inspectors noted that this OE and similar OE from two other nuclear plants were the basis for the issuance of NSAL-09-8. The licensee initiated CR-11-04542 for the failure to identify the OE in the ACE and the PD regarding a failure to follow procedure SAP-1351.
- The inspectors noted that the ACE historical section discussed a previous Westinghouse document, NSAL-93-004 to alert licensees of the potential for flashing of water in the RHR system pump suction line upon the generation of a safety injection signal in Mode 3 under certain conditions. NSAL-93-004 was referenced in TWR-15517 which was performed by a licensee engineer different from the originator and verifier of DC09650-002 and who incorrectly assumed that DC09650-002 was applicable for all of the RHR pump suction piping. The conclusions of the TWR were consequently nonconservative and were used to make changes to procedures used for RHR operation. The inspectors also identified that REE-95-033M was noted incorrectly in the ACE as REE-95-003M. Additionally, the inspectors determined that the TWR-15517 associated with REE-95-033M was not listed as one of the causes or as a barrier to the event. The inspectors concluded that use of the TWR/REE to make procedure changes for RHR operation was contrary to 10 CFR 50, Appendix B, Criterion III requirements for measures to ensure that the licensing basis is correctly translated into procedures and was therefore a PD. The inspectors considered that the failure to identify this PD as a cause and an important barrier was a weakness in the ACE and may have been correctly identified in a more robust RCE.

Enclosure

These issues were determined to be of minor significance. In the aggregate, the inspectors concluded that the ACE, while containing much technical information, was not very thorough in regards to the identification of barriers which could have allowed the licensee to identify the deficiency earlier.

3) Annual Operator Work Around Review

a. Inspection Scope

The inspectors reviewed the licensee's list of identified operator workarounds, burdens, and challenges associated with mitigating system equipment to determine whether any new items since the previous review conducted in 2010 would adversely affect any mitigating system function or affect the operators' ability to implement abnormal or emergency operating procedures. In addition, the inspectors performed an independent review of outstanding control board WOs and known problems with mitigating system equipment to identify any potential workarounds that had not been formally identified and evaluated by the licensee.

b. Findings

No findings were identified.

4OA3 Event Followup

(Closed) LER 05000395/2009-003-00: Potential Loss of Residual Heat Removal System Safety Function in Mode 4 Due to an Unanalyzed Condition

On January 19, 2010, the licensee issued a LER based on their discovery of an inadequate calculation after discussions with Westinghouse personnel regarding the potential for operating the residual heat removal (RHR) system in an unanalyzed condition due to flashing under certain conditions in the suction piping while in Mode 4. The licensee issued CR-09-03980 to evaluate the circumstances leading to this event. The inspectors completed a review of this LER and the related cause evaluation conducted by the licensee. The licensee's cause evaluation is discussed in section 4OA2.3(2), and the enforcement aspects are discussed in section 4OA7 of this report. This LER is closed.

4OA5 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.

Enclosure

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 05000395/2011501-01, Adequacy of Procedures to Assess and Monitor Radiological Releases

a. Inspection Scope

As a result of the NRC's inspection of licensee performance during a biennial emergency preparedness exercise under inspection procedure 71114.01 (NRC Inspection Report 05000395/2011501), the inspectors opened a URI to evaluate the adequacy of licensee procedure EPP-007, Environmental Monitoring, Rev. 11, in terms of its ability to effectively locate radioactive release plume boundaries in order to support protective action recommendations.

The inspectors conducted inspection activities to review additional information on this issue and determine if a performance deficiency existed, if the performance deficiency was more than minor, or if the issue of concern constituted a violation of NRC requirements. Specifically, the inspectors reviewed licensee procedures EPP-001.4, General Emergency, Rev. 8, EPP-007, Environmental Monitoring, Rev. 11, EPP-005, Offsite Dose Calculation, Rev. 20, Attachment I-H (Offsite Radiological Monitoring Coordinator tasks) of EPP-051, Emergency Operations Facility, Rev. 8 and the administrative procedure SAP-0127, Emergency Preparedness, Rev. 2. Additionally inspectors observed a demonstration of the plume tracking tools used by station personnel, reviewed Health Physics Training documents EPT-10, Activation and Implementation of the Emergency Plan, Rev. 6 and EPT-34, EOF Radiological Support Personnel, Rev. 10, reviewed corrective action documents CR-11-04977 and CR-11-0493, and discussed the licensee's perspectives on the personnel training and procedural interrelationships pertaining to the concern. The inspectors determined that the procedures were adequate to evaluate the extent of a radioactive release plume and evaluate its impact on protective action recommendations and no performance deficiency existed. This URI is closed.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On January 25, 2012, the resident inspectors presented the integrated inspection 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.

Enclosure

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 meets the criteria of Section 2.3.2 of the NRC Enforcement Policy, for being dispositioned as an NCV.

- 10 CFR 50, Appendix B, Criterion III, "Design Control" states, in part, that measures are established to ensure applicable regulatory requirements and design basis are correctly translated into procedures. Contrary to this, October 13, 2009, the licensee identified that they failed to have adequate measures in place to ensure that correct design bases were translated into procedures for RHR system operation. This issue is more than minor 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 procedure quality. The SDP screening determined that the PD affected both short term and long term core decay heat removal during shutdown and was evaluated with NRC Inspection Manual Chapter procedure 0609 Appendix G "Shutdown Operations Significance Determination Process". Since the PD affected both trains of the Residual Heat Removal (RHR) System, the finding increased the likelihood that a loss of decay heat removal would occur during shutdown and a phase 3 SDP evaluation was performed by a regional SRA. A bounding analysis was performed assuming a conditional core damage probability of 1.0 for any loss of coolant (LOCA) or steam generator tube rupture (SGTR) initiators occurring during the exposure period. The analysis assumed a reduction in LOCA and SGTR pipe rupture frequencies of 10% of nominal for the exposure at shutdown conditions due to the reduced pressures. The exposure period was 4.8 hours over a three year period. No recovery was assumed in the bounding analysis. The dominant sequence would be a LOCA or SGTR at Modes 3/4 with a loss of both RHR pumps due to flashing at the suction leading to core damage due to a loss of core heat removal. The risk was mitigated by the short exposure period. The result of the phase 3 SDP analysis was an increase in core damage frequency $< 1\text{E-}6$ a Green finding of very low safety significance. This issue is in the licensee's CAP as CR-09-03980.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Archie, Senior Vice President, Nuclear Operations
A. Barbee, Director, Nuclear Training
L. Bennett, Manager, Plant Support Engineering
L. Blue, Manager, 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
M. Harmon, Manager, Chemistry Services
R. Haselden, General Manager, Organizational / Development Effectiveness
R. Justice, Manager, Nuclear Operations
G. Lippard, General Manager, Nuclear Plant Operations
D. Shue, Manager, Maintenance Services
W. Stuart, Acting General Manager, Engineering Services
B. Thompson, Manager, Nuclear Licensing
R. Williamson, Manager, Emergency Planning
S. Zarandi, General Manager, Nuclear Support Services

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000395/2011005-01	URI	Fire Protection Program Requirements for Procurement and Use of Fire Hose (Section 1R05.1)
05000395/2011005-02	URI	Lightning Induced Trips of Safety-Related Chillers (Section 4OA2.3)

Closed

05000395/2009-003-00	LER	Potential Loss of Residual Heat Removal System Safety Function in Mode 4 Due to an Unanalyzed Condition (Section 4OA3)
05000395/2011501-01	URI	Adequacy of Procedures to Assess and Monitor Radiological Releases (Section 4OA5.2)

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

- System Operating Procedure, SOP-306, "Emergency Diesel Generator," Rev. 18F
- System Flow Diagram, D-302-351, "Diesel Generator – Fuel Oil," Rev. 15
- System Flow Diagram, D-302-353, "Diesel Generator Miscellaneous Services," Rev. 16

LIST OF ACRONYMS

AB	Auxiliary Building
ACE	Apparent Cause Evaluation
ADAMS	Agency Document Access and Management System
ANI	American Nuclear Insurer
AV	Apparent Violation
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CB	Control Building
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
DG	Diesel Generator
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
EMH	Electrical Manhole
EPP	Emergency Plan Procedure
ES	Engineering Services Procedure
FPER	Fire Protection Evaluation Report
FPP	Fire Protection Program
FSAR	Final Safety Analysis Report
GP	General Purpose
GTP	General Test Procedure
IB	Intermediate Building
IMC	Inspection Manual Chapter
IR	Inspection Report
JPMs	Job Performance Measures
LER	Licensee Event Report
LOCA	Loss of Cooling Accident
MPFF	Maintenance Preventable Functional Failure
MR	Maintenance Rule
MSPI	Mitigating System Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulatory
OAP	Operations Administrative Procedure
OE	Operating Experience
OOS	Out of Service

PARS	Publicly Available Records
PD	Performance Deficiency
PI	Performance Indicator
PMT	Post-Maintenance Testing
PTR	Procurement Technical Requirement
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
REV.	Revision
RHR	Residual Heat Removal
RTP	Rated Thermal Power
RWST	Reactor Water Storage Tank
SAP	Station Administrative Procedure
SCE&G	South Carolina Electric and Gas
SDP	Significance Determination Process
SFP	Spent Fuel Pit
SG	Steam Generator
SOP	System Operating Procedure
SSC	System, Structures, and Components
SSPS	Solid State Protection System
STP	Surveillance Test Procedure
SW	Service Water
TB	Turbine Building
TDEFW	Turbine Driven Emergency Feedwater
TS	Technical Specification
TWR	Technical Work Record
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation
WO	Work Order