



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

August 20, 2013

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Dominion Nuclear
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION – NRC PROBLEM IDENTIFICATION AND
RESOLUTION INSPECTION REPORT 05000280/2013007 AND
05000281/2013007

Dear Mr. Heacock:

On July 25, 2013, the U. S. Nuclear Regulatory Commission (NRC) completed a Problem Identification and Resolution biennial inspection at your Surry Power Station Units 1 and 2. The enclosed report documents the inspection results which were discussed on July 25, 2013, with other members of your staff.

The inspection was an examination of activities conducted under your license as they relate to problem identification and resolution and compliance with the Commission's rules and regulations and the conditions of your license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

Based on the inspection sample, the inspection team concluded that the implementation of the corrective action program and overall performance related to identifying, evaluating, and resolving problems at Surry Power Station Units 1 and 2 was adequate. Licensee identified problems were entered into the corrective action program at a low threshold. Problems were generally prioritized and evaluated commensurate with the safety significance of the problems and corrective actions were generally implemented in a timely manner. Corrective actions were generally implemented in a timely manner commensurate with their importance to safety and addressed the identified causes of problems. Lessons learned from industry operating experience were effectively reviewed and applied when appropriate. Audits and self-assessments were effectively used to identify problems and appropriate actions.

No findings were identified during this inspection.

D. Heacock

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Sincerely,

/RA/

Manuel Crespo, Chief (Acting)
Reactor Projects Branch 7
Division of Reactor Projects

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure: Inspection Report 05000280/2013007 and 05000281/2013007
w/Attachment: Supplemental Information

cc: Distribution via Listserv

D. Heacock

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Letter to David A. Heacock from Manuel Crespo dated Aug 20, 2013

SUBJECT: SURRY POWER STATION – NRC PROBLEM IDENTIFICATION AND
RESOLUTION INSPECTION REPORT 05000280/2013007 AND
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281

License Nos.: DPR-32, DPR-37

Report No.: 05000280/2013007 and 05000281/2013007

Licensee: Virginia Electric and Power Company

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Rd
Surry, VA 23883

Dates: July 8 – 12, 2013
July 22 – 25, 2013

Inspectors: C. Fletcher, Senior Reactor Inspector (Team Leader)
E. Coffman, Resident Inspector (Virgil C. Summer Nuclear
Station)
B. Collins, Reactor Inspector
K. Cotton, Surry Project Manager (HQ)
A. Sengupta, Reactor Inspector

Approved by: M. Crespo, Chief (Acting),
Reactor Projects Branch 7
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000280/2013007, 05000281/2013007; 07/8/2013 – 07/25/2013; Surry Power Station, Units 1 and 2; Biennial Inspection of Problem Identification and Resolution Program.

The inspection was conducted by one senior reactor inspector, two reactor inspectors, one project manager, and a resident inspector (Virgil C. Summer Nuclear Station). No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Identification and Resolution of Problems

The inspection team concluded that, in general, problems were adequately identified, prioritized, and evaluated; and effective corrective actions were implemented. Site management was actively involved in the corrective action program (CAP) and focused appropriate attention on significant plant issues. The team found that employees were encouraged by management to initiate condition reports (CRs) as appropriate to address plant issues.

The licensee was effective at identifying problems and entering them into the CAP for resolution, as evidenced by the relatively few deficiencies identified by the NRC that had not been previously identified by the licensee during the review period. The threshold for initiating CRs was appropriately low, as evidenced by the type of problems identified and large number of CRs entered annually into the CAP. In addition, CRs normally provided complete and accurate characterization of the problem.

Generally, prioritization and evaluation of issues were adequate and consistent with the licensee's CAP guidance. Formal root cause evaluations for significant problems were adequate, and corrective actions specified for problems did address the cause of the problems. The age and extensions for completing evaluations were closely monitored by plant management, both for high priority condition reports, as well as for adverse conditions of less significant priority. Also, the technical adequacy and depth of evaluations (e.g., root cause investigations) were typically adequate.

Corrective actions were generally effective, timely, and commensurate with the safety significance of the issues.

The operating experience program was effective in screening operating experience for applicability to the plant, entering items determined to be applicable into the CAP, and taking adequate corrective actions to address the issues. External and internal operating experience was adequately utilized and considered as part of formal root cause evaluations for supporting the development of lessons learned and corrective actions for CAP issues.

The licensee's audits and self-assessments were critical and effective in identifying issues and entering them into the corrective action program. These audits and assessments identified issues similar to those identified by the NRC with respect to the effectiveness of the CAP.

Enclosure

Based on general discussions with licensee employees during the inspection, targeted interviews with plant personnel, and reviews of selected employee concerns records, the inspectors determined that personnel at the site felt free to raise safety concerns to management and use the CAP as well as the employee concerns program to resolve those concerns.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution

a. Assessment of the Corrective Action Program

(1) Inspection Scope

The inspectors reviewed the licensee's corrective action program (CAP) procedures which described the administrative process for initiating and resolving problems primarily through the use of condition reports (CRs). To verify that problems were being properly identified, appropriately characterized, and entered into the CAP, the inspectors reviewed CRs that had been issued between June 2011 and July 2013 including a detailed review of selected CRs associated with the following risk-significant systems: Service Water, Ventilation, Emergency Diesel Generators (EDGs), and Electrical Power. Where possible, the inspectors independently verified that the corrective actions were implemented as intended. The inspectors also reviewed selected common causes and generic concerns associated with root cause evaluations to determine if they had been appropriately addressed. To help ensure that samples were reviewed across all cornerstones of safety identified in the NRC's Reactor Oversight Process, the inspectors selected a representative number of CRs that were identified and assigned to the major plant departments, including operations, engineering, health physics, emergency preparedness, and security. These CRs were reviewed to assess each department's threshold for identifying and documenting plant problems, thoroughness of evaluations, and adequacy of corrective actions. The inspectors reviewed selected CRs, verified corrective actions were implemented, and attended meetings where CRs were screened for significance to determine whether the licensee was identifying, accurately characterizing, and entering problems into the CAP at an appropriate threshold.

The inspectors conducted plant walkdowns of equipment associated with the selected systems and other plant areas to assess the material condition and to look for any deficiencies that had not been previously entered into the CAP. The inspectors reviewed CRs, maintenance history, completed work orders/work requests for the systems, and reviewed associated system health reports. These reviews were performed to verify that problems were being properly identified, appropriately characterized, and entered into the CAP. Items reviewed generally covered a two-year period of time; however, in accordance with the inspection procedure, a five-year review was performed for selected systems for age-dependent issues.

Main control room (MCR) walkdowns were also performed to assess the MCR deficiency list and to ascertain if deficiencies were entered into the CAP. Operator Workarounds and Operator Burden screenings were reviewed, and the inspectors verified compensatory measures for deficient equipment which were being implemented in the field.

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The inspectors conducted a detailed review of selected CRs to assess the adequacy of the root cause and apparent cause evaluations of the problems identified. The inspectors reviewed these evaluations against the descriptions of the problem described in the CRs and the guidance in licensee procedures PI-AA-300-3001, "Root Cause Evaluation," and PI-AA-300-3002, "Apparent Cause Evaluation." The inspectors assessed if the licensee had adequately determined the cause(s) of identified problems, and had adequately addressed operability, reportability, common cause, generic concerns, extent-of-condition, and extent-of-cause. The review also assessed if the licensee had appropriately identified and prioritized corrective actions to prevent recurrence where applicable.

The inspectors reviewed selected industry operating experience items, including NRC generic communications to verify that they had been appropriately evaluated for applicability and that issues identified through these reviews had been entered into the CAP.

The inspectors reviewed site trend reports to determine if the licensee effectively trended identified issues and initiated appropriate corrective actions when adverse trends were identified.

The inspectors attended various plant meetings to observe management oversight functions of the corrective action process. These included CR Review Team (CRT) meetings and Corrective Action Review Board meetings.

Documents reviewed are listed in the Attachment.

(2) Assessment

Identification of Issues

The inspectors determined that the licensee was generally effective in identifying problems and entering them into the CAP and there was a low threshold for entering issues into the CAP. This conclusion was based on the type of problems entered into the CAP; the review of licensee requirements for initiating CRs as described in licensee procedure ADM-PI-AA-200, "Corrective Action;" the management expectation that employees were encouraged to initiate CRs for any issue that is not meeting performance expectations regardless of whether it is a potential, suspect, or actual problem; a review of system health reports; and inspectors' observations during plant walkdowns. Trending was generally effective in monitoring equipment performance. Site management was actively involved in the CAP and focused appropriate attention on significant plant issues.

Based on reviews and walkdowns of accessible portions of the selected systems, the inspectors determined that system deficiencies were being identified and placed in the CAP.

However, the inspectors identified one issue that had not been identified in the CAP. This issue was screened in accordance with Manual Chapter 0612, "Issue Screening,"

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and determined to be of minor significance and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

- The inspectors identified that a 10 CFR Part 21 screening was not performed for a #2 EDG air start relay failure occurring on January 21, 2013, requiring a manual swap to the other air start train in order to manually start the #2 EDG. Specifically, a substantial safety hazard evaluation was not performed by the technical lead as required by the licensee's procedure LI-AA-301, "Implementation of 10 CFR 21, Reporting of Defects and Noncompliance," Revision 0. Further, the relay's failure analysis was completed on June 7, 2013 by the relay's manufacturer, but the relay was not evaluated for Part 21 applicability by the manufacturer or the licensee. LI-AA-301 requires in part that the licensee determine within 45 days whether a defect or noncompliance is potentially reportable in accordance with 10 CFR Part 21. Had the manufacturer identified a defect, this 45 day limit would not have been met. In addition, the licensee later determined that the manufacturer did not currently have an approved 10 CFR 50 Appendix B quality assurance program, and that the relay should have been sent to the vendor that provided the relay. This issue was documented in the licensee's CAP as CR 5215757.

Prioritization and Evaluation of Issues

Based on the review of CRs sampled by the inspection team during the onsite period, the inspectors concluded that problems were generally prioritized and evaluated in accordance with the licensee's CAP procedure as described in the CR severity level determination guidance in ADM-PI-AA-200, "Corrective Action." The inspectors determined that overall, each CR was assigned an adequate severity level at the CRT meetings, and adequate consideration was given to system or component operability and associated plant risk.

However, the inspectors identified a potential weakness in the licensee's CAP Procedure, PI-AA-200, Attachment 4. This issue was screened in accordance with Manual Chapter 0612, "Issue Screening," and determined to be of minor significance and not subject to enforcement action in accordance with the NRC's Enforcement Policy.

- The inspectors identified a weakness in the licensee's CAP Procedure, PI-AA-200, Attachment 4, in the CR significance screening row for "Equipment Issues" and the screening column for CR Significance Level 2. Specifically, the licensee uses "Abnormal failure frequency of equipment important to safety or reliability" as one of the screening criteria to differentiate between a CR significance level 2 and a level 3 issue. The inspectors identified that "Abnormal failure frequency" is not clearly defined by the licensee's CAP procedure and found several examples where subjectivity could allow deficient conditions to exist for long periods of time, specifically when these conditions have already been identified on a repetitive basis. While the licensee took corrective actions to address the conditions identified, the licensee's CAP procedure did not provide clear

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guidance when repetitive CRs should prompt a more thorough review of the issue (e.g. escalate the issue from CR significance level 3 to level 2) to aide in establishing measures to promptly correct conditions adverse to quality.

The inspectors determined that station personnel had conducted root cause and apparent cause analyses in compliance with the licensee's CAP procedures and assigned cause determinations were appropriate, considering the significance of the issues being evaluated. A variety of causal-analysis techniques were used depending on the type and complexity of the issue consistent with licensee procedures PI-AA-300, "Cause Evaluation;" PI-AA-300-3001, "Root Cause Evaluation;" PI-AA-300-3002, "Apparent Cause Evaluation;" PI-AA-300-3003, "Common Cause Evaluation;" and PI-AA-300-3004, "Cause Evaluation Methods." The inspectors determined that the licensee had performed evaluations that were technically accurate and of sufficient depth.

Effectiveness of Corrective Actions

Based on a review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the inspectors determined that overall, corrective actions were timely, commensurate with the safety significance of the issues, and effective, in that conditions adverse to quality were corrected. For significant conditions adverse to quality, the corrective actions directly addressed the cause and effectively prevented recurrence in that a review of performance indicators, CRs, and effectiveness reviews demonstrated that the significant conditions adverse to quality had not recurred. Effectiveness reviews for corrective actions to prevent recurrence were sufficient to ensure corrective actions were properly implemented and were effective.

(3) Findings

No findings of significance were identified.

b. Assessment of the Use of Operating Experience (OE)

(1) Inspection Scope

The inspectors examined licensee programs for reviewing industry operating experience, reviewed licensee procedure PI-AA-100-1007, "Operating Experience Program," and reviewed the licensee's operating experience database to assess the effectiveness of how external and internal operating experience data was handled at the plant. In addition, the inspectors selected operating experience documents (e.g., NRC generic communications, 10 CFR Part 21 reports, licensee event reports, vendor notifications, and plant internal operating experience items, etc.), which had been issued since May 2009 to verify whether the licensee had appropriately evaluated each notification for applicability to the Surry plant, and whether issues identified through these reviews were entered into the CAP. Procedure PI-AA-100-1007, "Operating Experience Program," was reviewed to verify that the requirements delineated in the program were being implemented at the station. Documents reviewed are listed in the Attachment.

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(2) Assessment

Based on a review of documentation related to the review of operating experience issues, the inspectors determined that the licensee was generally effective in screening operating experience for applicability to the plant. Industry OE was evaluated by plant OE Coordinators and relevant information was then forwarded to the applicable department for further action or informational purposes. OE issues requiring action were entered into the CAP for tracking and closure. In addition, operating experience was included in all root cause evaluations in accordance with licensee procedure PI-AA-300, "Cause Evaluation," PI-AA-300-3001, "Root Cause Evaluation," and PI-AA-300-3002, "Apparent Cause Evaluation."

(3) Findings

No findings were identified.

c. Assessment of Self-Assessments and Audits

(1) Inspection Scope

The inspectors reviewed audit reports and self-assessment reports, including those which focused on problem identification and resolution, to assess the thoroughness and self-criticism of the licensee's audits and self assessments. The inspectors also verified that problems identified through those activities were appropriately prioritized and entered into the CAP for resolution in accordance with licensee procedures PI-AA-100-1004, "Formal Self-Assessments," and PI-AA-100-1005, "Informal Self-Assessments."

(2) Assessment

The inspectors determined that the scopes of assessments and audits were adequate. Self-assessments were generally detailed and critical, as evidenced by findings consistent with the inspector's independent review. The inspectors verified that CRs were created to document all areas for improvement and findings resulting from the self-assessments, and verified that actions had been completed consistent with those recommendations. Generally, the licensee performed evaluations that were technically accurate. Site trend reports were thorough and a low threshold was established for evaluation of potential trends, as evidenced by the CRs reviewed that identified adverse trends.

(3) Findings

No findings were identified.

d. Assessment of Safety-Conscious Work Environment

(1) Inspection Scope

The inspectors randomly interviewed 8 on-site workers regarding their knowledge of the corrective action program at Surry and their willingness to write CRs or raise safety concerns. During technical discussions with members of the plant staff, the inspectors conducted interviews to develop a general perspective of the safety-conscious work environment at the site. The interviews were also conducted to determine if any conditions existed that would cause employees to be reluctant to raise safety concerns. The inspectors reviewed the licensee's Employee Concerns Program (ECP) and interviewed the ECP manager. Additionally, the inspectors reviewed a sample of ECP issues to verify that concerns were being properly reviewed and identified deficiencies were being resolved and entered into the CAP when appropriate.

(2) Assessment

Based on the interviews conducted and the CRs reviewed, the inspectors determined that licensee management emphasized the need for all employees to identify and report problems using the appropriate methods established within the administrative programs, including the CAP and ECP. These methods were readily accessible to all employees. Based on discussions conducted with a sample of plant employees from various departments, the inspectors determined that employees felt free to raise issues, and that management encouraged employees to place issues into the CAP for resolution. The inspectors did not identify any reluctance on the part of the licensee staff to report safety concerns.

(3) Findings

No findings were identified.

4OA6 Meetings, Including Exit

On July 25, 2013, the inspectors presented the inspection results to Mr. D. Lawrence and other members of the site staff. The inspectors confirmed that all proprietary information examined during the inspection had been returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

G. Bischof, Site Vice President
D. Lawrence, Director of Nuclear Safety and Licensing
A. Harrow, Manager Organizational Effectiveness
J. Rosenberger, Manager Engineering Programs
J. Pollard, Licensing Engineering
B. Garber, Licensing Supervisor
D. Herring, Supervisor Nuclear Engineering
J. Holloway, Supervisor Engineering Coordination
T. Sadler, Corrective Action Coordinator
W. Belcher, ECP Coordinator
C. Bruce, Supervisor Mechanical and Civil Design Engineering

NRC

J. Nadel, Resident Inspector
R. Cureton, Senior Resident Inspector

LIST OF REPORT ITEMS

Opened and Closed

None

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Procedures

2-ECM-1415-06, Relay Room Emergency Supply Fan 2-VS-F-42, Disconnect, Rework, and Connect
 2-OP-EG-001A, EDG 2 System Alignment, Rev. 12
 2-OPT-EG-001, Number 2 Emergency Diesel Generator Monthly Start Exercise Test, Rev. 64
 ADM-PI-AA-200, Corrective Action, Rev. 21
 ECP-GL-1 ECP Program Guidelines, Rev. 11
 ER-AA-MRL-10, Maintenance Rule Program, Rev. 4
 ER-AA-MRL-100, Rev 5, Implementing Maintenance Rule
 ER-AA-SYS-1001, System Health Report, Rev 6
 ER-AA-SYS-1004, System Engineering Handbook, Rev 2
 LI-AA-301, Implementation of 10 CFR 21, Reporting of Defects and Noncompliance, Rev. 0
 MS-AA-OBS-1001, Rev 0, Equipment Obsolescence Program
 O-ECM-0306-02, Rev 54, Motor Control Center Maintenance
 O-ECM-1801-01, Rev 28, Electrical Corrective Maintenance
 OP-AA-102, Operability Determination, Rev. 10.
 OP-AA-1700, Operations Aggregate Impact, Rev. 6
 PI-AA-100-1004, Formal Self-Assessments, Rev. 10
 PI-AA-100-1004, Self-Assessments, Rev. 10
 PI-AA-100-1007, Operating Experience Program, Rev. 10
 PI-AA-200-2002, Effectiveness Reviews, Rev. 5
 PI-AA-300-3001, Root Cause Evaluation, Rev. 7
 PI-AA-300-3002, Apparent Cause Evaluation, Rev. 5
 PI-AA-300-3003, Common Cause Evaluation, Rev. 0
 PI-AA-300-3004, Cause Evaluation Methods, Rev. 3
 RM-AA-101, Rev 9, Record Creation, Transmittal and Retrieval
 WM-AA-100, Rev 21, Work Management
 WM-AA-100-1003, Rev 0, Work Order Closeout
 WM-AA-101, Rev 1, Work Order Planning

Condition Reports Reviewed

115127	316171	322815
360736	366256	366253
360736	333363	501550
421073	429032	429238
422522	435109	435109
439432	449898	450609
439777	428789	428788
445207	452157	453902
454673	454653	450609
455255	455316	455629
456318	456968	459435
458304	458326	444646
459487	460245	461276
464576	470014	470345
480107	499257	501356

480788	392097	520020
480788	476347	519980
485696	503893	421749
501550	428780	484546
501909	476719	476661
503229	490969	491063
508737	519939	520013
514106	489898	450609
519980	476347	360804
520072	499318	503099
520075	520039	091454
521241	521258	521259
521276	521278	521282
<u>Condition Reports Generated</u>		
521378	521382	521385
521381	521386	521506
521507	521575	
<u>Root Cause Evaluation</u>		
000223	001093	001086
<u>Apparent Cause Evaluation</u>		
018690	018716	019019
018998	018868	018690
019033	019364	019426
019375	019373	019148
<u>Maintenance Rule Evaluation</u>		
013803	013801	014669
014906		
<u>Work Orders</u>		
38103162970	38103107540	38102556623
38103205455	38103236900	38103332966
38103236900	38103332966	38102731195
38103332966		
38103374296	38103376191	38103162944
38192731197	38103374077	38103372520
<u>Self-Assessments</u>		
SAR001333, Surry Power Station Human Performance Program, 11/14/2011		
SAR001766, Corrective Action Program Biennial Self-Assessment, 10/04/2012		
SAR002161, Problem Identification and Resolution (Pre-PI&R) at Surry Power Station, 03/15/2013		

Other Documents

Calculations#MSE-SMT-95-120, Evaluation of the effects of insurge/outsurge transients on the integrity of the pressurizer, March 1995

DCP 02-030, Emergency Diesel Generator Air Start System Improvements/Surry/Units 1 & 2, dated August 1, 2002

DCP 04-004, EDG Start Circuit Modification/Surry/Unit 1 & 2, dated October 19, 2000

Drawing 11548-ESK-7J, Rev 15, Consequence Limiting Safeguards Train 1B

ETE-SU-2011-0073, Rev 0, Evaluation of Surry Unit 2 pressurizer transient, May 2011

LER 2013-001-00, Lack of Established Method Results in Detached Lead and Inoperable Emergency Diesel Generator

LER05000281/2011-002-00 Spurious Safety Injection Results in Exceeding Pressurizer Heat Up Rate

LTR000468 Long term reportability to licensing

NCV 0500280/2012005-01, Submerged Cables Identified in Safety-Related Manhole

NCV2011004-01 Failure to follow scaffolding procedure requirements-completed

NCV2011005-01 Inadequate corrective actions to address rainwater intrusion into the unit 1 RPS relay

NCV2011011-04 Failure to monitor or perform effective preventive maintenance on the AAC Diesel Ventilation Supply Dampers and Exhaust Fans Louvers

OE 304808R20130403-Emer Switchgear was rendered non functional due to a reference tube leak-reviewed

OE 34205-Switchgear room ventilation fan screen failure-Byron-reviewed

OE 34306-Fire in SG room results in slugging and failure of AC compressors (fort Calhoun)-reviewed

OE 34373-480 V AC SG cubicle fire (Fort C)-reviewed

OE 34568-SG ventilation exhaust damper unexpectedly failed closed (salem)-reviewed

OE 35002-division 22 ESF SG room vent fan tripped (Byron)-reviewed

OE NN000814 Spurious Single Train Safety Injection at Intermediate Shut Down during Surveillance Testing

Pocket Guide to INPO 12-012, Traits of a Healthy Nuclear Safety Culture

Surry Power Station Self-Evaluation Meeting PowerPoint, 0709/2013

System Health Report Ventilation Vs1 Q4 2012

System Health Report Ventilation Vs2 Q1 2013

Westinghouse WCAP-14717, rev. 1, Evaluation of the Effects of insurge/outsurge out-of-limit transients on the integrity of the pressurizer, March 1995

Westinghouse WOG-99-224, Transmittal of Supplement 1 to WCAP-14777, rev 1, Evaluation of the Effects of insurge/outsurge out-of-limit transients on the integrity of the pressurizer