



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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April 30, 2009

Mr. J. V. Parrish
Chief Executive Officer
Energy Northwest
P.O. Box 968, Mail Drop 1023
Richland, WA 99352-0968

Subject: COLUMBIA GENERATING STATION - NRC INTEGRATED INSPECTION REPORT
05000397/2009002

Dear Mr. Parrish:

On March 28, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Columbia Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 7, 2009, with Mr. T. Lynch, Plant General Manager, 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). One of these findings was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest this violation or the significance of the finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd., Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Columbia Generating Station facility. In addition, if you disagree with the characterization of any finding 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 IV, and the NRC Resident Inspector at the Columbia Generating Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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

Sincerely,

/RA/

Wayne C. Walker, Chief
Project Branch A
Division of Reactor Projects

Docket 50-397
License: NPF-21

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NRC Inspection Report 05000397/2009002
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 50-397

License: NPF-21

Report: 05000397/2009002

Licensee: Energy Northwest

Facility: Columbia Generating Station

Location: Richland, Washington

Dates: January 1, 2009 through March 28, 2009

Inspectors: R. Cohen, Senior Resident Inspector, Project Branch A, DRP
C. Graves, Health Physicist, Plant Support Branch 2, DRS
N. Hernandez, Project Engineer, Project Branch A, DRP

Approved By: W. Walker, Chief, Project Branch A, Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000397/2009002; 01/01/2009 – 03/28/2009; Columbia Generating Station; Equipment Alignments; Event Followup

The report covered a 3-month period of inspection by resident inspectors. One green noncited violation and one green finding was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process 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 Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealing finding for the failure of Energy Northwest to perform an adequate site acceptance test of the digital electro-hydraulic system. Specifically, Energy Northwest failed to verify that the quad voter solenoid valves in the digital electro-hydraulic system could be replaced with the main turbine on-line. Consequently, when an on-line valve replacement was performed, the system experienced a pressure transient which resulted in a fast closure of the main turbine governor valves and a subsequent reactor scram. Energy Northwest entered the issue into the corrective action program and conducted a root cause evaluation.

This finding is greater than minor because it was a human performance error that affected the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was of very low risk significance because the finding did not result in the loss of a safety function of a single train for greater than its technical specification allowed outage time. This finding was determined to have the crosscutting aspect of human performance with a decision making component, because Energy Northwest failed to perform an adequate effectiveness review to identify the possible unintended consequences of on-line replacement of quad voter solenoid valves in the digital electro-hydraulic system [H.1.b]. (Section 4OA3.1)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for Energy Northwest's failure to follow procedure PPM 10.2.53, "Seismic Requirements for Scaffolding, Ladders, Man-Lifts, Tool Gang Boxes, Hoists, Metal Storage Cabinets, and Temporary Shielding Racks," Revision 26. Specifically, the position of equipment is required to meet specific criteria to prevent damage to safety-related equipment during a seismic event. Contrary to this procedure, the inspectors identified that equipment was routinely positioned next to safety-related equipment without a supporting engineering evaluation.

This finding is greater than minor because it was a human performance error which affected the mitigating systems cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. This was determined to be consistent with NRC Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix E, Example 4.a. for being more than minor risk significance because Energy Northwest had routinely failed to perform the requisite engineering evaluation. The finding was determined to be of very low risk significance (Green) because no actual loss of safety function occurred and the finding did not screen as potentially risk significant due to external events. Specifically, the as-found position of the equipment was determined to not adversely affect seismic qualification of the affected safety-related components. A crosscutting aspect in human performance with a work control component was identified in that Energy Northwest failed to appropriately plan work on multiple occasions, resulting in job site conditions which may have impacted plant components [H.3.a]. (Section 1R04).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

The inspection period began with Columbia Generating Station operating at 100 percent power. On January 16, the station reduced power to 65 percent power to perform work on reactor feed water drive turbine 1B speed control system. Following this work, the station returned to 100 percent power on January 18, 2009. On February 8, the station reduced power to 75 percent to facilitate maintenance of the main turbine digital electro-hydraulic system. Later on February 8, the reactor was subsequently shutdown following an automatic reactor scram and entered forced outage 09-01 due to a malfunction of the main turbine digital electro-hydraulic system. The station returned to 100 percent power on February 13, 2009. The facility operated at 100 percent power, with the exception of scheduled reductions in power to support minor maintenance and testing, for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of the licensee's adverse weather procedures for seasonal extremes (e.g., extreme high temperatures, extreme low temperatures, or hurricane season preparations). The inspectors verified that weather-related equipment deficiencies identified during the previous year were corrected prior to the onset of seasonal extremes; and evaluated the implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of, and during, the adverse weather conditions.

During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Extreme cold weather operations, Transformer Yard and Reactor Recirculation Pumps 1A and 1B, January 28, 2009

These activities constitute completion of one readiness for seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

.2 Readiness for Impending Adverse Weather Conditions

Since extreme cold and high wind conditions were forecast in the vicinity of the facility for February 27, 2009, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On February 27, 2009, the inspectors walked down the reactor building ventilation system because its safety-related functions could be affected or required as a result of the extreme cold conditions forecast for the facility. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management's actions for implementing the station's procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. Specific documents reviewed during this inspection are listed in the attachment.

- High Winds as related to Secondary Containment Delta Pressure High, February 27, 2009

These activities constitute completion of one readiness for impending adverse weather condition sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Division 1 Diesel Generator, February 20, 2009
- Standby Liquid Control System, March 4, 2009

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the

components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

Introduction: The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for Energy Northwest's failure to conduct engineering evaluations in accordance with the station's seismic requirement procedure as it relates to equipment positioned adjacent to safety-related components. A crosscutting aspect in human performance with a work control component was also identified.

Description: On March 5, 2009, during a walkdown of the standby liquid control system, the inspectors noted that an emergency operating procedure equipment storage container had been positioned adjacent to standby liquid control pump 1B. This barrel had been moved in an effort to control radioactive contamination following a steam leak in the reactor water cleanup heat exchanger room the night before. The container consisted of an approximately six foot high steel barrel with emergency operating procedure hoses inside. The inspectors noted that this container was positioned such that it could over turn in an earthquake and potentially impact the safety-related standby liquid control system. The inspectors notified main control room personnel of the condition and operators immediately moved the barrel into a safe position away from the standby liquid control system. This was documented in AR/CR 193537.

The inspectors questioned the Energy Northwest staff if this met the requirements of procedure PPM 10.2.53, "Seismic Requirements For Scaffolding, Ladders, Man-Lifts, Tool Gang Boxes, Hoists, Metal Storage Cabinets, And Temporary Shielding Racks," to properly secure or analyze equipment in close proximity to safety-related equipment to prevent seismically-induced interactions. Step 7.2.2 of PPM 10.2.53 states that transient equipment used in the reactor building is to be stored so it does not over turn in an earthquake and impact safety-related equipment. Tripping could occur if these items impacted adjacent structures such as curbs, pedestals, etc., in their lower 1/3 height. This was a concern because the barrel did not meet this requirement. Energy Northwest staff concluded the damage that could result from an impact of the improperly staged barrels and the standby liquid control system during a seismic event was inconclusive.

During recent inspector walkdowns of safety related equipment, the inspectors identified five instances where scaffolding and transient equipment was staged in the vicinity of safety-related equipment without having an evaluation in accordance with PPM 10.2.53:

- PER 207-0443, Protective Cover Over 125VDC Safety Related Battery, December 3, 2007
- AR/CR 57437, Scaffolding Touching RHR-P-2B, No Engineering Evaluation, December 3, 2007

- AR/CR 187910, Staging Touching MCC Room 250 VDC Electrical Cabinet, No Engineering Evaluation, October 27, 2008
- AR/CR 187808, Clearance Issue Between RHR-P-2C Ventilation Duct Work and Scaffolding, No Engineering Evaluation, October 23, 2008
- AR/CR 193537, Emergency Operating Procedure Barrels Positioned Adjacent to Standby Liquid Control Pump1A, March 5, 2009

Energy Northwest subsequently identified another instance of transient equipment not meeting the requirements of PPM 10.2.53:

- AR/CR194193, Cart with unchecked wheels near safety related equipment, March 23, 2009.

Analysis: The performance deficiency associated with this finding is the failure of Energy Northwest to adhere to procedure PPM 10.2.53 to evaluate if specified items positioned adjacent to safety related equipment is acceptable. There have been six recent occurrences where a supporting engineering evaluation was not performed to assure that seismic qualification of safety related equipment was maintained. This finding was more than minor because it was a human performance error which affected the Mitigating Systems Cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Although Energy Northwest assessed the as-found concerns as acceptable during subsequent analysis, the inspectors concluded that the failure to evaluate each condition in accordance with procedure PPM 10.2.53 was not commensurate with ensuring the reliability and availability of safety-related equipment in the plant. This was determined to be consistent with NRC Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix E, Example 4.a., for being more than minor risk significance because Energy Northwest had routinely failed to perform the requisite engineering evaluations. The finding was determined to be of very low risk significance (Green) because no actual loss of safety function occurred and the finding did not screen as potentially risk significant due to external events. A crosscutting aspect in human performance with a work control component was identified in that Energy Northwest failed to appropriately plan work on multiple occasions, resulting in job site conditions which may have impacted plant components [H.3.a].

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," provides, in part, that activities affecting quality shall be accomplished in accordance with documented instructions appropriate to the circumstances. Contrary to this requirement, on March 5, 2009 and other dates, Energy Northwest failed to adhere to procedure PPM 10.2.53 resulting in the failure to conduct an engineering evaluation to assess the seismic interaction of equipment staged adjacent to safety related components. Because this finding was of very low safety significance and was entered into the licensee's corrective action program as AR/CR 193537, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the Enforcement Policy (NCV 05000397/2007009-01; Failure to Perform Engineering Evaluation to Determine Seismic Qualification of Safety-related Equipment). Energy Northwest implemented corrective actions to assess an adverse trend associated with failure to perform engineering evaluations, AR/CR 193537.

.2 Complete Walkdown

a. Inspection Scope

On January 7, 2009, the inspectors performed a complete system alignment inspection of the Residual Heat Removal System Train C to verify the functional capability of the system. The inspectors selected this system because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- DG-3, Division 2 Emergency Diesel Generator, January 8, 2009
- R-7, Residual Heat Removal System Train C, February 2, 2009
- DG-2/1, Division 1 Diesel Generator Room, February 19, 2009
- RC-6/2, Division 2 Battery Room, February 23, 2009
- R-8/1, Low Pressure Core Spray Pump Room, February 23, 2009
- RC-8/2 Division 2 Switchgear Room, March 17, 2009

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant

transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also walked down the three areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- General floor area, Reactor Building 522' Elevation, March 3, 2009
- MCC Rooms 410 and 411, Reactor Building 522' Elevation, March 3, 2009
- RWCU Pump Rooms 1A and 1B, Reactor Building 522' Elevation, March 3, 2009

These activities constitute completion of one flood protection measures inspection sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

.1 Annual Inspection

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the

Residual Heat Removal Heat Exchanger 1B. The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines;" the licensee properly utilized biofouling controls; the licensee's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and the heat exchanger was correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one heat sink inspection sample as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On March 23, 2009, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- Emergency Diesel Generator Damper Failure, January 23, 2009
- Control Room Normal Outside Air Intake Isolation Valve WOA-V-51C Failed to Close, February 20, 2009

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or (a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Work Order 01159139, Calibrate WMA-TS-54A1, January 22, 2009
- Manitowoc Crane Movement, January 23, 2009
- Work Order 01151521, DG1 Turbocharger Replacement, February 17, 2009
- Work Order 001126536, RRA-FN-2, RHR-P-2A Room Cooling, Maintenance, February 18, 2009
- Work Order 01161641, OSP-SLC/IST-Q701, Standby Liquid Control Pumps Operability Test, March 12, 2009

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- Diesel Generator 2, Fuel Oil Filter Position, January 10, 2009
- Diesel Generator 1, Failed Speed Switch, January 26, 2009
- DMA-M-AD22/1, January 26, 2009
- RWCU-RV-3 Leaking into RWCU Room, AR/CR 193562, March 11, 2009

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Updated Safety Analysis Report to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four operability evaluations inspection samples as defined in Inspection Procedure 71111.15-05

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following temporary modification to verify that the safety functions of important safety systems were not degraded:

- TMR-09-004, Digital Electrical Hydraulic Quad Voter Solenoid Trip Valve Supplemental Cooling, January 23, 2009

The inspectors reviewed the temporary modification and the associated safety evaluation screening against the system design bases documentation, including the Updated Final Safety Analysis Report and the Technical Specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers.

These activities constitute completion of one sample for temporary plant modifications as defined in Inspection Procedure 71111.18-05

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Work Order 01158797, OSP-RHR/1ST-Q704, January, 7, 2009
- Work Order 01159045, RCIC-V-59 Stroke Test, January 14, 2009
- Work Order 01163175, RFW-DT-1B Repairs, January 16, 2009
- Work Order 1163292, Perform Pilot Relay Leakage/Isolation Test, January 16, 2009
- Work Order 11630431, OSP-ELEC-M701, EDG-1, February 19, 2009
- Work Order 01160713, OSP-ELEC-M703, HPCS Diesel Generator Monthly Operability Test, February 25, 2009

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the Updated Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six postmaintenance testing inspection sample(s) as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the Forced Outage that occurred from February 8 - 13, 2009, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the forced outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense-in-depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service.
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities.
- Monitoring of decay heat removal processes, systems, and components.
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Controls over activities that could affect reactivity.
- Maintenance of secondary containment as required by the technical specifications.
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, procedure requirements, and technical specifications to ensure that the fifteen surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- Work Order 01159042, OSP-RCIC-IST-Q702, RCIC Valve Operability Test, January 13, 2009
- Work Order 01159045, OSP-RCIC/IST Q701, RCIC Operability Test, January 22, 2009

- Work Order 01159540, OSP-CONT/IST Q702, Reactor Building Ventilation Isolation Valve Operability, January 27, 2009
- OSP-SW-Q101, SW Spray Pond Average Sediment Measurement, March 17, 2009

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four samples including: one inservice test , and three surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on March 9, 2009, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, Emergency Response Facility and the Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

.2 Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on January 13, 2009, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the postevolution critique for the scenario. The focus of the inspectors' activities was to note

any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator for the period from the 1st quarter 2008 through the 4th quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC integrated inspection reports for the period of 1st quarter 2008 through the 4th quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned scrams per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications performance indicator for the period from the 1st quarter 2008 through the 4th quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC integrated inspection reports for the period of 1st quarter 2008 through the 4th quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had

been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned scrams with complications sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Unplanned Power Changes per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Power Changes per 7000 Critical Hours performance indicator for the period from the 1st quarter 2008 through the 4th quarter 2008. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC integrated inspection reports for the period of 1st quarter 2008 through the 4th quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned power changes per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

40A2 Identification and Resolution of Problems (71152)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included: the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic

implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting emergency diesel air dampers operating contrary to design documents, AR/CR 191600, dated February 23, 2009. The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1. The review also included issues documented outside the normal corrective action program in system health reports, corrective maintenance work orders, component status reports, and maintenance rule assessments. The inspectors' review nominally considered the six-month period of October 2008 through March 2009, although some examples expanded beyond those dates when the scope of the trend warranted. Corrective actions associated with identified trends were reviewed for adequacy.

These activities constitute completion of 1 in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153)

.1 February 8, 2009 Automatic Reactor Scram

a. Inspection Scope

On February 8, 2009 the inspectors observed and evaluated Energy Northwest's response to a scram while the reactor was operating at 75 percent power. Specifically, failure to adequately vent the digital electro-hydraulic system following on-line replacement of quad voter solenoid valve DEH-SV-TRIP/B caused the digital electro-hydraulic system header to momentarily depressurize during post maintenance testing, which resulted in fast closure of the main turbine governor valves and a reactor scram. The inspectors responded to the site and verified plant conditions by observing key plant parameters, annunciator status, and observing the current status of safety related mitigating equipment to ensure that the reactor plant was stable. The inspectors also observed reactor operator actions in response to the reactor scram and senior reactor operator's evaluation of plant conditions and oversight of the reactor operators to ensure that operators were adhering to plant procedures. The inspectors also reviewed Energy Northwest's evaluation of the root cause of the scram.

b. Findings

Introduction: A self-revealing Green finding was reviewed for the failure of Energy Northwest to perform an adequate site acceptance test of the digital electro-hydraulic system. Specifically, Energy Northwest failed to verify that the quad voter solenoid valves in the digital electro-hydraulic system could be replaced with the main turbine on line. Consequently, when an on-line valve replacement was performed, the system experienced a pressure transient which resulted in a fast closure of the main turbine governor valves and a subsequent reactor scram.

Description: On February 8, 2009, following on-line replacement of quad voter solenoid valve DEH-SV-TRIP/B, the digital electro-hydraulic system trip header momentarily depressurized during post maintenance testing. This generated a reactor protection system governor valve fast closure trip signal which caused a reactor scram. This condition was documented in AR/CR 191843.

Energy Northwest concluded in their root cause evaluation that the direct cause of the reactor scram was the instantaneous recompression of an air bubble trapped in the intervalve cavity between the A and B quad voter valves. Collapsing this bubble resulted in backflow of digital electro-hydraulic system fluid from the emergency trip header into the intervalve cavity between the A and B valves when DEH-SV-TRIP/B was reenergized during the post maintenance test. The air bubble had entered the quad voter assembly during on-line replacement of DEH-SV-TRIP/B and was not effectively removed during the venting process. There are no vent valves in the high pressure supply line or trip headers. Therefore, maintenance planning included cycling the A & B quad voter valves two times each to vent as much air as possible out of the lines and into the digital electro-hydraulic system drain header. The sequence of steps established in WO 01166095 was expected to ensure adequate venting based on tests

performed by the vendor. A separate work order, WO 01166172, was generated to perform the weekly surveillance OSP-MT-W701 immediately following valve replacement as a post maintenance test to demonstrate operability of the newly installed valve. The surveillance was performed with the digital electro-hydraulic system in the automatic mode, which tests one solenoid valve approximately every 12 seconds in A-B-C-D sequence. Testing had been completed on quad voter valve DEH-SV-TRIP/B and the valve had just been reenergized when the reactor automatically scrambled on a governor valve fast closure signal. The quad voter solenoid valve trip headers briefly depressurized as evidenced by the first reactor trip signal, which came as a result of governor valve trip header low pressure (pressure less than 1270 psig). This was immediately followed by a reactor protection system trip signal due to throttle valve less than full open when the throttle valves momentarily closed then re-opened. This valve motion was not caused by a turbine trip signal since the main turbine trip did not occur until approximately 1.5 minutes later.

Energy Northwest determined the root cause to be design deficiencies in the on-line serviceable quad voter assembly, which allowed system conditions that resulted in a reactor trip following performance of on-line maintenance activities. During factory acceptance testing, the vendor conducted tests to assess the impact of potential air bubble formation in the quad voter valves, however, differences between the test setup and actual plant configurations may have masked the effect of an air bubble in the system. The vendor and Energy Northwest consequently concluded that air bubble formation and its potential impact on the emergency trip header pressure were not potential vulnerabilities. The corrective action would have been to install check valves to prevent unnecessary pressure transients in the emergency trip header. The licensee determined the corrective action to be unnecessary because the digital electro-hydraulic system would not be subject to air intrusion during normal operation. This resulted in a missed opportunity to correct the design deficiency. In addition, the site acceptance test program did not contain specific test sequences to verify that the trip solenoid valves could be replaced with the main turbine on-line. The inspectors reviewed Energy Northwest's root cause evaluation and could not provide any information to the contrary.

Energy Northwest Procedure DES 2-1, "Plant Design Changes," Revision 27, step 4.3.37 states that, results and conclusions of design verification testing or other design verification activities performed by vendor(s), as well as exceptions and resolutions to deviations to acceptance criteria in vendor design tests shall be evaluated for impact to plant design. Contrary to this, Energy Northwest failed to perform an adequate site acceptance test to verify that maintenance on the digital electro-hydraulic system could be performed with the main turbine on-line.

Analysis: Energy Northwest's failure to perform an adequate site acceptance test is a performance deficiency. Specifically, failure to analyze differences between the vendor's factory acceptance test and actual plant conditions resulted in a failure of the site acceptance test program to identify that the online replacement of the quad voter solenoid valves could result in a pressure transient in the DEH system leading to a plant trip.

The inspectors used NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," to determine that the finding was more than minor because it was a human performance error that affected the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and

challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the finding in accordance with Manual Chapter 0609, Appendix A, "Significance Determination Process," Phase 1 Worksheet. The finding was determined to be of very low safety significance (Green) because the finding did not result in the loss of a safety function of a single train for greater than its Technical Specification allowed outage time. This finding was determined to have a crosscutting aspect of human performance with a decision making component, because Energy Northwest failed to perform an adequate effectiveness review to identify the possible unintended consequences of on-line replacement of quad voter solenoid valves in the digital electro-hydraulic system [H.1.b].

Enforcement: No violations of NRC requirements were identified since the affected component, digital electro-hydraulic system, is non-safety related (FI 05000397/2009002-02; Failure to perform an adequate site acceptance test).

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors performed observations of security force personnel and activities to ensure that the activities were consistent with Columbia Generating Station's 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 of significance were identified.

4OA6 Meetings

Exit Meeting Summary

On April 7, 2009, the inspectors presented the inspection results to Mr. T Lynch, Plant General Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Parrish, Chief Executive Officer
D. Atkinson, Vice president, Nuclear Generation
G. Cullen, Manager, Regulatory Programs
J. Frisco, General Manager, Engineering
S. Gambhir, Vice President, Technical Services
W. LaFramboise, System Engineering Manager
T. Lynch, Plant General Manager
F. Schill, Licensing
C. Whitcomb, Vice President, Organizational Performance and Staffing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000397/2009002-01	NCV	Failure to Perform Engineering Evaluation to Determine Seismic Qualification of Safety related Equipment (Section 1R04)
05000397/2009002-02	FIN	Failure to Perform an Adequate Site Acceptance Test (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1RO1: Adverse Weather Protection

DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SOP-COLD-WEATHER-OPS	COLD WEATHER OPERATIONS	Revision 10
ABN-WIND	TORNADO/HIGH WINDS	Revision 12

Section 1RO4: Equipment Alignment

DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M521-3	Flow Diagram Residual Heat Removal Loop C	Revision 6
M512-2	Flow Diagram Diesel Oil & Miscellaneous Systems	Revision 33
SOP-SLC-STBY	Placing SLC in Standby Status	Revision 0
M522	Flow Diagram Standby Liquid Control System Reactor Building	Revision 35
SOP-DG1-STBY	Emergency Diesel Generator (Div 1) Standby Lineup	Revision 9

Section 1RO5: Fire ProtectionDOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
FSAR	Columbia Generating Station Final Safety Analysis Report; Appendix F	Amendment 57
NFPA-10	National Fire Protection Association NFPA-10	1984 Revision
TCP-08-0001	Transient Combustible Permit RHR-P-2C Pump Room	January 5, 2009
FPP-1.6	Combustible Loading Calculation Control	Revision 2

Section 1RO6: Flood Protection MeasuresDOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
FSAR	Final Safety Analysis Report; Sections 2.4.2 and 3.4.1.5.1	Amendment 57

Section 1RO7: Heat Sink PerformanceDOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
8.4.42	Thermal Performance Monitoring of RHR-HX-1A and RHR-HX-1B	Revision 9
WO 01161229	Thermal Performance Monitoring of RHR-HX-1A and RHR-HX-1B	January 14, 2009

Section 1R11: Licensed Operator Requalification Program

DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
LR001918	Simulator Crew Evaluation	March 23, 2009
09-02	Crew Evaluation Summary	March 23, 2009

Section 1R12: Maintenance Effectiveness

DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
OSP-WMA-X701	Normal and Remote intake Isolation Check Valve Measurement	Revision 3
AR 191600	DMA Dampers Operating Contrary to Design Documents	January 23, 2009
NRC IN 2007-27	Recurring Events Involving Emergency Diesel Generator Operability	August 6, 2007
AR/CR 191879	Answer NRC Questions Regarding Diesel Engine Damper Root Cause 4-6-09	February 6, 2009
WO 1163186	Inspect DMA-AD-21/1 and 21/2	February 26, 2009
EC 12102-01	Engineering Qualification Record Seismic DMA-AD-21/1 and 21/2	Revision 2
CER 91-0016	Classification Evaluation Record DMA-AD-21/1 and 21/2	Revision 0

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
WO 01159139	Calibrate WMA-TS-54A1	January 22, 2009
CMR	Calculation for Manitowoc Crane Path	May 12, 2008

Section 1R15: Operability Evaluations

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
AR 191890	Emergency Diesel Generator Division 1, Failed Speed Switch	January 29, 2009
WO 01159486	SOP-ELEC-S703; HPCS, DG Semi-Annual Operability	January 29, 2009
FSAR B3.8.1	AC Sources – Operating	Revision 56
EWD-47E-046	Diesel Generator Governor Speed Control	Revision 7
WR 29071895	HPCS-GEN-DG3 Voltage Regulator Failed To Raise Voltage	January 29, 2009
AR/CR 190967	Pinched Wire on DMA-M-AD22/1	January 30, 2009

Section 1R18: Plant Modifications

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
TMR-09-004	Digital Electric Hydraulic Quad Voter Trip Valve Pilot Supplemental Cooling	February 12, 2009

Section 1R19: Postmaintenance TestingDOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
WO 1163292	Perform Pilot Relay Leakage/Isolation Test	January 16, 2009
WO 1160713	OSP-ELEC-M703, HPCS Diesel Generator Monthly Operability Test	February 25, 2009
WO 1159045	RCIC-V-59 Stroke Test; January 14, 2009	January 14,
WO 1151521	PMT DG-ENG-1A1 and DG-ENG-1A2	February 19, 2009
TSP-DG1-B502	Standby Diesel Generator DG1 Load Testing	Revision 8
SOP-DG1- START	Diesel Generator Operating Logs	February 19, 2009

Section 1R20: Refueling and Other Outage ActivitiesDOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
ABN-RHR-SDC- ALT	Residual Heat Removal Alternate Shutdown Cooling	Revision 5
AR/CR 192567	Control Room Estimate Time To 200 Degrees Calculated Non-conservatively	February 12, 2009
NUMARC 91-06	Guidelines for Industry Actions to Assess Shutdown Management	December 1991
PPM 1.20.1	Refueling Outage Preparation and Milestones	Revision 2
PTL 126834	Plant Tracking Log Residual Heat Removal	July 1995
N/A	Reactivity Control Plan	February 11, 2009

Section 1R20: Refueling and Other Outage Activities

DOCUMENTS

FO-09-01	Forced Outage FO-09-01 Shutdown Safety Plan	Revision 0
FO-09-01	Forced Outage Schedule	February 9, 2009

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
OSP-RCIC-IST-Q702	RCIC Valve Operability Test	January 13, 2009
OSP-SW-Q101	SW Spray Pond Ave Sediment Measurement	October 03, 2007

Section 1EP6: Drill Evaluation

DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	2009 ERO Team D Training Drill	January 13, 2009
LR001484	Columbia Generating Station Simulator Training	Revision 2

Section 4OA1: Performance Indicator Verification

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Operator Logs	
	ENW and NRC Performance Indicator Data	
NEI 99-02	Regulatory assessment Performance Indicator Guideline	Revision 4

Section 4OA2: Identification and Resolution of Problems

AR/CR 00190552	AR/CR 00190544	AR/CR 00190568	AR/CR 00190573
AR/CR 00190560	AR/CR 00190848	AR/CR 00190717	AR/CR 00190722
AR/CR 00190568	AR/CR 00190559	AR/CR 00190558	AR/CR 00190557
AR/CR 00190576	AR/CR 00190582	AR/CR 00190633	AR/CR 00190624
AR/CR 00190628	AR/CR 00190632	AR/CR 00190633	AR/CR 00190636
AR/CR 00190637	AR/CR 00190638	AR/CR 00190639	AR/CR 00190641
AR/CR 00190644	AR/CR 00190695	AR/CR 00190700	AR/CR 00190708
AR/CR 00190645	AR/CR 00190647	AR/CR 00190907	AR/CR 00190829
AR/CR00190821	AR/CR 00190847	AR/CR 00191183	AR/CR 00191183
AR/CR 00190679	AR/CR 00191076	AR/CR 00191030	AR/CR 00190951
AR/CR 00191048	AR/CR 00191451	AR/CR 00191272	AR/CR 00191282
AR/CR 00191209	AR/CR 00190549	AR/CR 00190545	AR/CR 00190544
AR/CR 00191281	AR/CR 00191582	AR/CR 00191408	AR/CR 00191423
AR/CR 00191296	AR/CR 00191544	AR/CR 00191574	AR/CR 00191577
AR/CR 00191432	AR/CR 00191601	AR/CR 00191606	AR/CR 00191606
AR/CR 00191581	AR/CR 00191686	AR/CR 00191689	AR/CR 00191558
AR/CR 00191624	AR/CR 00191626	AR/CR 00191630	AR/CR 00191683
AR/CR 00191684	AR/CR 00193105	AR/CR 00193106	AR/CR 00193166
AR/CR 00191774	AR/CR 00191739	AR/CR 00191626	AR/CR 00192078
AR/CR 00191806	AR/CR 00191824	AR/CR 00191828	AR/CR 00191831
AR/CR 00191983	AR/CR 00191990	AR/CR 00191924	AR/CR 00191926
AR/CR 00192130	AR/CR 00192131	AR/CR 00192136	AR/CR 00192138
AR/CR 00192130	AR/CR 00192131	AR/CR 00192155	AR/CR 00192129
AR/CR 00192156	AR/CR 00192161	AR/CR 00192166	AR/CR 00192143
AR/CR 00192159	AR/CR 00192183	AR/CR 00192175	AR/CR 00192191
AR/CR 00192195	AR/CR 00192403	AR/CR 00192398	AR/CR 00192390
AR/CR 00192249	AR/CR 00192250	AR/CR 00192251	AR/CR 00192341
AR/CR 00192251	AR/CR 00192254	AR/CR 00192257	AR/CR 00192276
AR/CR 00192257	AR/CR 00192259	AR/CR 00192128	AR/CR 00192219
AR/CR 00192284	AR/CR 00192293	AR/CR 00192296	AR/CR 00192299
AR/CR 00192311	AR/CR 00192313	AR/CR 00192314	AR/CR 00192315
AR/CR 00192316	AR/CR 00192317	AR/CR 00192318	AR/CR 00192321
AR/CR 00192324	AR/CR 00192325	AR/CR 00192326	AR/CR 00192328
AR/CR 00192329	AR/CR 00192330	AR/CR 00192331	AR/CR 00192332
AR/CR 00192333	AR/CR 00192335	AR/CR 00192336	AR/CR 00192337
AR/CR 00192338	AR/CR 00192339	AR/CR 00192340	AR/CR 00192248
AR/CR 00192342	AR/CR 00192344	AR/CR 00192345	AR/CR 00192349
AR/CR 00192352	AR/CR 00192212	AR/CR 00192240	AR/CR 00192254
AR/CR 00192352	AR/CR 00192349	AR/CR 00192345	AR/CR 00192344
AR/CR 00192436	AR/CR 00192441	AR/CR 00192454	AR/CR 00192455
AR/CR 00192458	AR/CR 00192509	AR/CR 00192509	AR/CR 00192510
AR/CR 00192530	AR/CR 00192532	AR/CR 00192555	AR/CR 00192581
AR/CR 00192582	AR/CR 00192513	AR/CR 00192517	AR/CR 00192432
AR/CR 00192714	AR/CR 00192723	AR/CR 00192567	AR/CR 00192521
AR/CR 00192774	AR/CR 00138030	AR/CR 00194239	AR/CR 00194198
AR/CR 00192827	AR/CR 00192849	AR/CR 00192852	AR/CR 00192865
AR/CR 00192871	AR/CR 00192872	AR/CR 00192874	AR/CR 00192877
AR/CR 00192929	AR/CR 00192940	AR/CR 00192947	AR/CR 00192959
AR/CR 00192987	AR/CR 00193027	AR/CR 00192852	AR/CR 00192872
AR/CR 00193178	AR/CR 00193046	AR/CR 00192844	AR/CR 00192567

AR/CR 00193459	AR/CR 00193484	AR/CR 00193488	AR/CR 00193491
AR/CR 00193469	AR/CR 00193484	AR/CR 00193488	AR/CR 00193547
AR/CR 00193526	AR/CR 00193537	AR/CR 00193547	AR/CR 00193548
AR/CR 00193549	AR/CR 00193000	AR/CR 00193332	AR/CR 00193363
AR/CR 00193562	AR/CR 00193395	AR/CR 00194239	AR/CR 00194307
AR/CR 00193595	AR/CR 00193627	AR/CR 00193629	AR/CR 00193652
AR/CR 00193656	AR/CR 00193657	AR/CR 00193660	AR/CR 00193671
AR/CR 00193677	AR/CR 00193689	AR/CR 00193716	AR/CR 00193467
AR/CR 00193902	AR/CR 00193908	AR/CR 00193912	AR/CR 00193588
AR/CR 00193919	AR/CR 00193888	AR/CR 00193902	AR/CR 00193899
AR/CR 00194057	AR/CR 00194061	AR/CR 00194063	AR/CR 00194065
AR/CR 00194069	AR/CR 00194077	AR/CR 00194081	AR/CR 00194090
AR/CR 00194094	AR/CR 00194095	AR/CR 00194046	AR/CR 00193971
AR/CR 00194118	AR/CR 00194121	AR/CR 00194135	AR/CR 00194136
AR/CR 00194157	AR/CR 00194160	AR/CR 00194055	AR/CR 00194056
AR/CR 00194206	AR/CR 00194234	AR/CR 00194171	AR/CR 00194173
AR/CR 00194334	AR/CR 00194335	AR/CR 00194355	AR/CR 00194364
AR/CR 00194425	AR/CR 00193420	AR/CR 00193435	AR/CR 00193455
AR/CR 00193392			

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Section 4OA3: Event Follow-Up

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
ISP-RPS-Q901	RPS (Channel A1) and EOC Recirc Pump Trip – TGV Fast Closure RPS-PS-5A	Revision 4
N/A	Control Room Alarm Printout	February 8, 2009
EN 44839	Event Notification	
EC 7809	Engineering Evaluation of Reactor Scram Due to DEH System Malfunction	Revision 0
WO 1157289	DEH-SV-Trip/B Failed Weekly Quadvoter Test	August 24, 2008
EN 320931	DEH Quadvoter Hydraulic Trip Block Factor Acceptance Test Report Houston, Texas	January 2007