



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005**

May 12, 2006

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

**SUBJECT: COLUMBIA GENERATING STATION - NRC INTEGRATED INSPECTION
REPORT 05000397/2006002**

Dear Mr. Parrish:

On March 31, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Columbia Generating Station. The enclosed inspection report documents the inspection findings which were discussed on April 3, 2006, with Mr. W. Oxenford and other members of your staff.

The inspections 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 two NRC identified findings. These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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 DC 20555-0001; with copies to the Regional Administrator, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Columbia Generating Station.

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

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Sincerely,

/RA/

Claude E. Johnson, Chief
Project Branch A
Division of Reactor Projects

Docket: 50-397
License: NPF-21

Enclosure:
NRC Inspection Report
05000397/2006002

cc w/enclosure:
W. Scott Oxenford (Mail Drop PE04)
Vice President, Technical Services
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

Albert E. Mouncer (Mail Drop PE01)
Vice President, Corporate Services/
General Counsel/CFO
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

Chairman
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, WA 98504-3172

Douglas W. Coleman (Mail Drop PE20)
Manager, Regulatory Programs
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

Gregory V. Cullen (Mail Drop PE20)
Supervisor, Licensing
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

Chairman
Benton County Board of Commissioners
P.O. Box 190
Prosser, WA 99350-0190

Dale K. Atkinson (Mail Drop PE08)
Vice President, Nuclear Generation
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

Cheryl M. Whitcomb (Mail Drop PE03)
Vice President, Organizational
Performance & Staffing/CKO
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

William A. Horin, Esq.
Winston & Strawn
1700 K Street, NW
Washington, DC 20006-3817

Matt Steuerwalt
Executive Policy Division
Office of the Governor
P.O. Box 43113
Olympia, WA 98504-3113

Lynn Albin, Radiation Physicist
Washington State Department of Health
P.O. Box 7827
Olympia, WA 98504-7827

Mike Hammond
Radiological Emergency Preparedness Section
Chemical and Nuclear Preparedness Division
Office of Infrastructure Protection
c/o FEMA Region X
Department of Homeland Security
Federal Regional Center
130 228th Street, SW
Bothell, WA 98201-9796

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 RITS Coordinator (**KEG**)
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 Columbia Site Secretary (**LEF1**)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 50-397
License: NPF-21
Report: 05000397/2006002
Licensee: Energy Northwest
Facility: Columbia Generating Station
Location: Richland, Washington
Dates: January 1, 2006, through March 31, 2006
Inspectors: Z. Dunham, Senior Resident Inspector, Project Branch A, DRP
R. Cohen, Resident Inspector, Project Branch A, DRP
T. McKernon, Senior Operations Engineer, Operations Branch
P. Elkmann, Emergency Preparedness Inspector
Approved By: C. E. Johnson, Chief, Project Branch A, Division of Reactor Projects
ATTACHMENT: Supplemental Information

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SUMMARY OF FINDINGS

IR 05000397/2006002; 1/1/06 - 3/31/06; Columbia Generating Station; Operability Evaluations, Other Activities

The report covered a 13-week period of inspection by resident inspectors, a senior operations engineer, and an emergency preparedness inspector. Two Green noncited violations were 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 3, dated July 2000.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," for failure to promptly identify and evaluate conditions adverse to quality associated with the 4160 Vac safety-related breakers. Although Energy Northwest had identified a potential common cause failure of the breakers, the extent of condition inspections of other risk significant breakers were not prioritized properly or promptly inspected until prompted by the inspectors. Subsequent inspections by Energy Northwest identified the onset of degradation in some of the breakers similar to that which prompted the concern for the common cause failure. Energy Northwest entered the issue into the corrective action program for resolution.

This finding is greater than minor because if left uncorrected it could become a greater safety concern. Specifically, the degradation which was identified in the breakers could, if left uncorrected, eventually impact breaker reliability and functionality, complicating accident response. Although the finding affected the mitigating systems cornerstone objectives, the finding was of very low safety significance because a loss of safety function did not occur, the finding was not a design or qualification deficiency, and the finding did not screen as potentially risk significant due to external events. The cause of the finding was related to the crosscutting element of problem identification and resolution because of Energy Northwest's failure to properly prioritize the extent of condition examination of other risk significant breakers, which resulted in the untimely identification of conditions adverse to quality. (Section 1R15)

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a noncited violation of 10 CFR 50.54(q) for the failure to maintain the facility emergency plan commensurate with the standards provided in 10 CFR 50.47(b)(4). Specifically, Energy Northwest failed to establish adequate compensatory actions in response to a planned calibration of a seismic

monitoring system which rendered a key control room annunciator inoperable. This annunciator is used, in part, for establishing the criteria by which the emergency director would declare a notice of unusual event in the event that a seismic event is detected on site. The emergency director could have been significantly delayed in classifying the event because of the inadequate compensatory measure. Energy Northwest took immediate action to establish an adequate compensatory measure and to enter the issue into the corrective action program.

This finding is greater than minor because it is related to the emergency preparedness cornerstone attribute of response organization and affected the cornerstone objective because the inability to implement an emergency action level diminishes the licensee's capability to protect the health and safety of the public. The finding was determined to be of very low risk significance because it did not represent a loss of function or degradation of a risk significant planning standard and did not affect the declaration of an emergency action level above a Notice of Unusual Event. The cause of the finding was related to the crosscutting element of problem identification and resolution because Energy Northwest noted concerns with the identified compensatory measure but failed to take corrective action to address the concerns until prompted by the inspectors.
(Section 4OA2.3)

B. Licensee Identified Violations

One violation of very low significance was identified by the licensee and reviewed by the inspectors. Corrective actions taken or planned by the licensee appeared reasonable. These violations are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status:

The inspection period began with Columbia Generating Station at 100 percent power. Except for scheduled reductions in power to accommodate testing and main condenser tube leak inspections and repairs, the plant was maintained at essentially 100 percent power for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors: (1) walked down portions of the risk important systems listed below and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned; and (2) compared deficiencies identified during the walk down to the licensee's corrective action program to ensure problems were being identified and corrected.

- Control Room Emergency Air Conditioning; February 1, 2006
- Stator Cooling Water; March 3, 2006
- Low Pressure Core Spray; March 5, 2006

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors: (1) reviewed plant procedures, drawings, the Updated Safety Analysis Report, Technical Specifications, and vendor manuals to determine the correct alignment of the system; (2) reviewed outstanding design issues, operator work arounds, and corrective action program documents to determine if open issues affected the functionality of the system; and (3) verified that the licensee was identifying and resolving equipment alignment problems.

- Division 2 Emergency Diesel Generator; February 13, 2006

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors walked down the plant areas listed below to assess the material condition of active and passive fire protection features and their operational lineup and readiness. The inspectors: (1) verified when applicable that transient combustibles and hot work activities were controlled in accordance with plant procedures; (2) observed the condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional; (4) verified that fire extinguishers and hose stations were provided at their designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers, steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified when applicable that adequate compensatory measures were established for degraded or inoperable fire protection features; and (7) reviewed the corrective action program to determine if the licensee identified and corrected fire protection problems.

- Fire Area DG-4; DG 1A diesel oil tank transfer pump room; February 24, 2006
- Fire Area DG-5; DG 1B diesel oil tank transfer pump room; February 27, 2006
- Fire Area DG-6; High Pressure Core Spray diesel oil tank transfer pump room; February 27, 2006
- Fire Area DG-7; High Pressure Core Spray diesel day tank room; February 28, 2006
- Fire Area DG-8; DG 1A diesel day tank room; March 8, 2006
- Fire Area RC-4; Electrical Equipment Room 1; March 11, 2006
- Fire Area RC-7; Electrical Equipment Room 2; March 11, 2006
- Fire Area R-7; Residual Heat Removal Pump C Room; March 11, 2006
- Fire Area DG-9; DG 1B diesel day tank room; March 26, 2006

The inspectors completed nine samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On March 20 and 21, 2006, the inspectors observed testing and training of senior reactor operators and reactor operators to identify deficiencies and discrepancies in the training, to assess operator performance, and to assess the evaluator's critique. The inspectors also observed the ability of the operators to respond to events and verified that the licensee configured the simulator consistent with the control room and plant.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the maintenance activities listed below to: (1) verify the appropriate handling of structure, system, and component (SSC) performance or condition problems; (2) verify the appropriate handling of degraded SSC functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of SSC issues reviewed under the requirements of the maintenance rule, 10 CFR 50 Appendix B, and the Technical Specifications.

- Secondary Containment differential pressure dropped below operability limit during Standby Gas Treatment start; March 1, 2006
- Residual Heat Removal Train A and B; March 14, 2006

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

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

.1 Risk Assessment and Management of Risk

a. Inspection Scope

The inspectors reviewed the risk assessment activities listed below to verify: (1) performance of risk assessments when required by 10 CFR 50.65 (a)(4) and licensee procedures prior to changes in plant configuration for maintenance activities and plant operations; (2) the accuracy, adequacy, and completeness of the information considered in the risk assessment; (3) that the licensee recognizes, and/or enters as applicable, the appropriate licensee-established risk category according to the risk assessment results and licensee procedures, and (4) the licensee identified and corrected problems related to maintenance risk assessments.

- Diesel Generator 2 planned outage with Residual Heat Removal Valve RHR-V-17B out of service; January 10, 2006
- RPS pressure switch RPS-PS-2B replacement while performing scheduled instrumentation and control surveillances; January 19 and 20, 2006
- Personnel entry into Steam Tunnel while performing scheduled instrumentation and control surveillances; February 16, 2006
- Diesel Generator 2 and Service Water Pump 2A planned outage due to 4160 Vac breaker inspections, Diesel Generator No. 1 and Service Water Pump 1A planned outage due to 4160 Vac breaker inspections; February 14 and 22, 2006
- WMA-FN-53B disconnect inspection and test planned surveillance and Transformer yard work; March 6, 2006

The inspectors completed five samples.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events (71111.14)

h. Inspection Scope

The inspectors: (1) reviewed operator logs, plant computer data, and/or strip charts for the below listed evolutions to evaluate operator performance in coping with nonroutine events and transients; (2) verified that the operator response was in accordance with the response required by plant procedures and training; (3) verified that the licensee has identified and implemented appropriate corrective actions associated with personnel performance problems that occurred during the nonroutine evolutions sampled.

- Trip of Feedwater Heater 4C; January 18, 2006
- Deep Down Power to locate main condenser tube leak; February 15, 2006

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors: (1) reviewed plants status documents such as operator shift logs, emergent work documentation, deferred modifications, and standing orders to determine if an operability evaluation was warranted for degraded components; (2) referred to the Updated Safety Analysis Report and design basis documents to review the technical adequacy of licensee operability evaluations; (3) evaluated compensatory measures associated with operability evaluations; (4) determined degraded component impact on any Technical Specifications; (5) used the significance determination process to evaluate the risk significance of degraded or inoperable equipment; and (6) verified that the licensee has identified and implemented appropriate corrective actions associated with degraded components.

- CR-06-00651; DCW-V-3A2 (Immersion Heater DCW-H-1A2 inlet) developed a leak of 60 drops per minute; January 26, 2006
- CR 2-06-00493; Reactor Core Isolation Cooling Valve RCIC-V-26 failed to close during performance of OSP-RCIC/IST-Q702; January 30, 2006
- CR 2-06-00746; HPCS-V-10 has a 60 drop per minute leak; January 31, 2006
- PER 206-002; Circuit Breaker E-CB-DG1/7 failed to indicate close permissive light when racked in; February 9, 2006
- CR-06-01349; DMA-AD-12/2 damper motor shaft and crank arm linkage found separated; February 17, 2006
- CR 2-06-02131; SW-FI-602A calibration is in question; March 20, 2006

The inspectors completed six samples.

b. Findings

Introduction: The inspectors identified a Green noncited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," associated with Energy Northwest's failure to promptly identify and evaluate a condition adverse to quality

associated with the station's safety-related 4160 Vac breakers. A problem identification and resolution crosscutting aspect was identified with the finding.

Description: On January 20, 2006, Energy Northwest documented in CR 2-06-00476 a potential generic failure mechanism associated with the facility's safety-related Cutler-Hammer 4160 Vac electrical breakers. Binding of the shunt trip lever ("push to open" flapper) in Breaker E-CB-DG1/7, the Diesel Generator 1 output breaker, had occurred on December 29, 2005, resulting in inoperability of the breaker. This breaker failure was documented in PER 206-002. Energy Northwest documented in their resolution of the issue that the binding of the shunt trip lever had occurred due to a manufacturing weakness which resulted in the presence of rough or sharp edges in a stamped steel plate which occurred during manufacture of the shunt trip lever. These sharp edges were in contact with a brass spacer in the mechanism. Periodic manipulation of the shunt trip lever, either during remote operation from the control room, automatically, or manually at the breaker itself, resulted in scoring of the brass spacer by the lever and in the case of Breaker E-CB-DG1/7 eventual binding which resulted in the shunt trip lever not spring returning to its normal standby position. Similar to the "push to open" flapper, the issue was equally applicable to the "push to close" flapper, which when manipulated causes the breaker to close. Energy Northwest subsequently replaced Breaker E-CB-DG1/7 with an available spare breaker.

Engineering staff performed an inspection of all of the facility's 22 safety-related 4160 Vac breakers to determine the status of the "push to open" and "push to close" flappers. A "relaxed" flapper was indicative that it was not bound and could operate freely to close or open the breaker as required. Energy Northwest's inspection consisted of verifying that the affected levers were in the proper position to prove that the breaker would operate properly when next demanded. Energy Northwest also determined that this inspection would need to be performed following every breaker operation to ensure that a flapper did not become bound during breaker operation. Operations' staff implemented Night Order 709 on January 21, 2006, to direct equipment operators to verify the correct position of the "push to close" and "push to open" flappers following breaker operation to verify that the breaker was operable and to log the condition of the flappers in the control room log. Energy Northwest also implemented corrective actions to initiate maintenance work orders (WOs) to fully inspect the shunt trip levers of all of the potentially affected breakers, specifically risk significant breakers, and to implement corrective maintenance if needed.

The inspectors reviewed Energy Northwest's corrective actions as documented in CR 2-06-00476 and PER 206-002 and identified the following concerns:

- Energy Northwest's operability evaluation was inadequate. Specifically, Energy Northwest did not consider the design basis conditions during which the affected breakers may be required to operate. As described in FSAR, Section 8.3, the breakers were designed to accommodate a design basis loss of coolant accident coincident with a loss off site power with the breakers initially closed at the start of the accident. During such a scenario the breakers would be required to automatically open or "load shed" and re-close once the associated diesel generator had started and repowered the associated bus. However, the potential exists that when the breakers automatically open that the associated shunt trip

lever may bind preventing the breaker from automatically reclosing rendering the breaker inoperable. Although the equipment operators were directed in Night Order 709 to verify that the breaker flapper positions were correct after each breaker operation, the operators would not have sufficient time to ensure that the breakers would operate properly within the time analyzed in the accident analysis if a shunt trip lever had become bound.

- Energy Northwest documented in PER CAP 2006-002-02 that 18 of the 22 affected breakers were to be inspected and if necessary repaired by May 26, 2006. These 18 breakers could be inspected while the associated 4160 Vac bus was energized. The other 4 breakers, which could not be inspected without incurring a significant bus outage, were scheduled in PER CAP 2006-002-04 to be inspected during the next refueling outage by June 30, 2007. However, the inspectors noted that although the breakers for Service Water Pumps 1A and 1B were identified in PER CAP 2006-002-02 as requiring an inspection by May 26, 2006, the associated maintenance WOs 01113946 and 01113966 were not scheduled until the next refueling outage R-18 which was to occur in 2007. The inspectors determined that the timeliness of the planned service water pump inspections were untimely. Additionally, the inspectors concluded that given that the operator action as directed in Night Order 709 was inadequate to ensure operability of the affected breakers during a design basis accident that the assigned completion date of May 26, 2006, provided in PER CAP 2006-002-02 was also untimely.
- During a review of operator logs, the inspectors noted that breakers were operated on January 27, 2006, to align 4160 Vac Bus E-SM-7 for diesel Generator 1 testing. Contrary to Night Order 709, the inspectors determined that the breaker “push to close” and “push to open” flappers for the breakers which were operated were not verified in the correct position and logged in the operator logs. Energy Northwest documented the inspector’s observation in PER 206-0041.

Energy Northwest immediately inspected the 4160 Vac breakers which were required to reposition during a design basis accident in response to the inspectors observations and concerns. At the end of the inspection period the following inspections had been completed:

- SW-CB-P1B; February 14, 2006
- E-CB-DG2/8; February 14, 2006
- RHR-CB-P2C; February 15, 2006
- LPCS-CB-P1; February 17, 2006
- RHR-CB-P2A; February 19, 2006
- RHR-CB-P2B; February 19, 2006
- E-CB-7/75/1; March 2, 2006
- SW-CB-P1A; March 7, 2006
- E-CB-DG1/7; March 7, 2006
- E-CB-7/1; March 21, 2006
- E-CB-7/DG1; March 22, 2006
- E-CB-8/85/1; March 28, 2006

Energy Northwest determined that breakers SW-CB-P1B, SW-CB-P1A, E-CB-DG1/7, and E-CB-7/75/1 as found condition was satisfactory with no corrective action needed. However, the remainder of the inspected breakers were determined to have metal to metal contact occurring within the “push to open” flapper assemblies. In particular, E-CB-DG2/8 was noted to have more moderate metal to metal contact and some observed rubbing on the assembly guide bushing. Although metal to metal contact was noted in these breakers, their as found condition was not as severe as that which was observed in E-CB-DG1/7 which had failed on December 29, 2005. Energy Northwest aligned the affected assemblies to ensure that no metal contact occurred.

Energy Northwest plans to inspect the following breakers as scheduling allows:

- E-CB-7/71
- E-CB-7/73
- E-CB-8/81
- E-CB-8/83
- E-CB-8/3
- E-CB-B/7
- E-CB-B/8
- E-CB-8/DG2
- CRD-CB-P1A

Analysis: The performance deficiency associated with this finding was Energy Northwest’s failure to promptly identify and evaluate metal to metal contact on the “push to open” flapper (a condition adverse to quality) on eight of the station’s safety-related 4160 Vac breakers. Although metal to metal contact was noted on some of the breakers as noted above, the as found degradation was not as severe as that noted on Breaker E-CB-DG1/7 which failed on December 29, 2005. Therefore the breakers were considered to be operable. This NRC identified finding was more than minor in accordance with Manual Chapter 0612, Appendix B, in that if left uncorrected the finding would become a more significant safety concern in that continued metal to metal contact between the shunt trip lever and the trip coil bolt spacer could result in eventual binding of the push to close or push to open flapper of the associated breaker rendering it inoperable. Using Manual Chapter 0609, “Significance Determination Process,” Phase 1 worksheet, the inspectors determined that the finding was of very low risk significance (Green) since a loss of safety function did not occur, the finding was not a design or qualification deficiency, and the finding did not screen as potentially risk significant due to external events. The cause of the finding was related to the crosscutting element of problem identification and resolution because of Energy Northwest’s failure to properly prioritize and evaluate the extent of condition examination of other potentially affected breakers, specifically risk significant breakers, which resulted in the untimely identification of conditions adverse to quality.

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” required in part that conditions adverse to quality be promptly identified and evaluated. Contrary to this requirement, on January 20, 2006, Energy Northwest failed to adequately evaluate operability and extent of condition of the issue until prompted by the inspectors on February 3, 2006. This resulted in a failure to promptly identify and evaluate metal to

metal contact between the shunt trip lever and the trip coil bolt spacer in other safety-related 4160 Vac breakers. Because this finding was of very low safety significance and entered into the licensee's corrective action program as PER 206-0063, this violation is being treated as an NCV, consistent with Section VI.A of the Enforcement Policy (NCV 05000397/2006002-01, Failure to Promptly Identify Condition Adverse to Quality in Safety-Related 4160 Vac Breakers). Energy Northwest took immediate corrective actions to inspect the other potentially risk significant affected breakers for the failure mechanism and to implement corrective maintenance where necessary.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the postmaintenance test activities of risk significant systems or components listed below for review. For each item, the inspectors: (1) reviewed the applicable licensing basis and/or design-basis documents to determine the safety functions; (2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly re-aligned, and deficiencies during testing were documented. The inspectors also reviewed the corrective action program to determine if the licensee identified and corrected problems related to postmaintenance testing.

- WO 01106825; Replace Time Delay Relay for RHR-V-64B; January 9, 2006
- WO 01114727; Inspect Shunt Trip Assembly of Circuit Breaker E-CB-DG2/8; February 14, 2006
- WO 01011444; Inspect DMA-AD-12/2 damper control rods; February 22, 2006
- WO 01034271; Repair **DCW-V-3A2** leak (2-inch ball valve on North end of E-DG-2 on outlet of immersion heater); February 23, 2006
- WO 01113536; Replace RPS-PS-2B Primary Containment High Pressure Switch and perform Postmaintenance Test; January 21, 2006
- WO 01108030; E-C1-1B Replace X319 Relay; March 23, 2006

The inspectors completed six samples.

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 surveillance activities listed below demonstrated that the SSCs tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated Technical Specification operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of ASME Code requirements; (12) updating of performance indicator data; (13) engineering evaluations, root causes, and bases for returning tested SSCs not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciators and alarms setpoints. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing.

- OSP-SLC/IST-Q701; Standby Liquid Control Pump Operability Test; Revision 12; March 16, 2006
- **ISP-RSP-Q906; RPS and BOP Isolation Primary Containment Pressure High Channel B - CFT/CC; Revision 4; January 19, 2006**
- TSP-DG1-B502; Standby Diesel Generator DG1 Load Testing; Revision 4; January 26, 2006
- OSP-LPCS/IST-Q702; LPCS SYSTEM Operability Test; Revision 16; March 23, 2006
- ISP-RFW-Q401; Feedwater / Turbine Trip Actuation on Reactor High Level 8 - CFT; Revision 7; March 2, 2006

The inspectors completed five samples which included a review of an in-service pump and valve test.

b. Findings

Introduction: An unresolved item (URI) was identified pending the NRC's evaluation of the regulatory aspects and determination of safety significance, if applicable, of a potential performance issue associated with instrument tubing associated with a flow indicating switch for LPCS-FCV-11 (low pressure core spray minimum flow valve). This instrument tubing appeared to be vibrating excessively while the low pressure core spray system was in operation.

Description: On October 6, 2005, during a low pressure core spray surveillance test, the inspectors observed instrument tubing on the discharge header of the low pressure core spray pump vibrating excessively while the system was in operation. A failure of this

instrument tubing could adversely affect LPCS-FCV-11 which could affect low pressure core spray system operability. Energy Northwest documented this potential deficiency in CR 2-05-07910 and subsequently initiated WO 01107283. This WO, performed on March 22, 2006, was conducted to collect vibration analysis data on the instrument tubing. At the end of the inspection period Energy Northwest had not completed an analysis of the data. A URI was opened pending a completion of the NRC's review of Energy Northwest's evaluation of the vibration analysis to determine the acceptability of the observed instrument line vibrations (URI 05000397/2006002-02, Potential Excessive Vibration of Low Pressure Core Spray Instrument Line).

Analysis: A determination of the safety significance associated with any performance deficiencies will be addressed in the resolution to the URI.

Enforcement: A determination of the enforcement aspects associated with any performance deficiencies will be addressed in the resolution to the URI.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspector performed in-office reviews of the following documents:

- Revision 42 to the Columbia Generating Station Emergency Plan
- Revision 33 to emergency plan implementing procedure 13.1.1, "Classifying the Emergency"
- Revision 34 to emergency plan implementing procedure 13.1.1, "Classifying the Emergency," and
- Revision 16 to emergency plan implementing procedure 13.1.1A, "Classifying the Emergency - Technical Bases"

These revisions:

- Updated titles and made other administrative changes
- Replaced a Technical Specification Limiting Condition of Operation reference in emergency action Level 1.1.U.1 with its value, and added Mode 5 and Defueled as conditions under which the emergency action level applies
- Added detail to 4 emergency action levels to clarify that a release pathway to the environment must exist for the emergency action level to apply
- Clarified wording on 3 emergency action levels associated with failures of the Reactor Protection System

- Added detail to 4 emergency action levels associated with the release of radioactive material to clarify the event is classified based on alarms when dose assessment capability is not available
- Clarified the role of the station Emergency Director with respect to making temporary changes to the site security plan due to radiological emergencies
- Revised the definition of "Release in Progress"
- Implemented definitions and emergency action levels as described in NRC Bulletin 2005-002, "Emergency Preparedness and Response Actions for Security-Based Events"
- Updated descriptions of the plant telephone system

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, to NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 2, to NRC Bulletin 2005-002, and to the requirements of 10 CFR 50.47(b) and 50.54(q) to determine if the licensee adequately implemented 10 CFR 50.54(q). This review was not documented in a Safety Evaluation Report and did not constitute approval of licensee changes, therefore these changes are subject to future inspection in their entirety.

The inspector completed four samples during this inspection.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

For the drill listed below which contributed to the Drill/Exercise Performance and Emergency Response Organization Performance Indicator, the inspectors:

- (1) observed the training evolution to identify any weaknesses and deficiencies in classification, notification, and Protective Action Requirements development activities;
- (2) compared the identified weaknesses and deficiencies against licensee identified findings to determine whether the licensee is properly identifying failures; and
- (3) determined whether licensee performance is in accordance with the guidance of the NEI 99-02 document's acceptance criteria.

- Plant-wide emergency Team C training drill which included a fire in a residual heat removal pump room, a startup transformer lock-out, reactor water cleanup steam leak outside primary containment and a significant radioactive release to the environment; January 10, 2006

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors assessed the accuracy of the licensee submitted performance indicator data for the indicators listed below. The inspectors compared the data with operator logs, maintenance records, and corrective action documents to evaluate the performance indicators for the period of January 1, 2004, through December 31, 2005. The inspectors verified that the licensee calculated the performance indicators in accordance with NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2.

- **Unplanned scrams per 7000 critical hours**
- **Unplanned scrams with loss of normal heat removal**
- **Unplanned transients per 7000 critical hours**

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Cross-References to PI&R Findings Documented Elsewhere

Section 1R15 describes a finding for the failure to promptly identify conditions adverse to quality associated with safety-related breakers.

Section 4OA2.3 describes a finding for the failure to take corrective action for an identified inadequate compensatory measure associated with an emergency plan action level.

.2 Annual Sample - Control of Seismic Restraints in 480 Vac Switch Gear

a. Inspection Scope

The inspectors reviewed PER 205-0199 for a followup of identified and completed corrective actions. Energy Northwest initiated PER 205-0199, on March 28, 2005, to document a condition in which ten 480 Vac bucket assemblies were identified with their

seismic restraints not fully engaged. These discrepancies were found in response to questions raised by the NRC during the 2005 Problem Identification and Resolution inspection. Subsequently, Energy Northwest identified several issues related to 480 Vac seismic restraints, but none that involved 480 Vac bucket assemblies with their seismic restraints not fully engaged. The inspectors evaluated Energy Northwest's root cause of the issue and assessed the adequacy of corrective actions to correct the root cause.

The inspectors completed one sample.

b. Findings and Observations

No significant findings or observations were identified.

.3 Annual Sample - Compensatory Measures for Inoperable Seismic Monitoring System

a. Inspection Scope

The inspectors assessed compensatory measures that Energy Northwest had implemented in response to out-of-service seismic monitoring equipment which was used to support the classification of emergencies in accordance with the site emergency plan. The inspectors reviewed the Columbia Generating Station Emergency Plan and implementing procedures and interviewed plant personnel to determine the adequacy of the compensatory measures.

The inspector completed one sample.

b. Findings

Introduction: The inspectors identified a Green NCV associated with Energy Northwest's failure to establish adequate compensatory measures to ensure the prompt implementation of the Columbia Generating Station Emergency Plan as required by 10 CFR 50.54(q). A problem identification and resolution crosscutting element was identified with the finding.

Description: On December 28, 2005, Energy Northwest removed triaxial acceleration seismic trigger, SEIS-ST-1, from service for channel calibration. On January 12, 2006, the inspectors noted that the calibration of SEIS-ST-1 was still in progress and that since December 28 control room annunciator H13-P851-S1-2.5, Minimum Seismic Earthquake Exceeded, was inoperable. Seismic activity which results in greater than .01g ground acceleration as detected by SEIS-ST-1 at the 422' elevation of the Reactor Building activates this annunciator. Energy Northwest's Emergency Plan, Revision 42, Table 4-1, Section 9.4, and Emergency Plan Implement Procedure 13.1.1, "Classifying the Emergency," Emergency Action Level 9.4.U.1, required that a notice of unusual event be declared if the Minimum Seismic Earthquake Exceeded annunciator is received and the control room receives a report from plant personnel who have felt an earthquake.

The inspectors interviewed control room staff to determine what compensatory measures had been established to accurately and promptly declare an unusual event per the Emergency Plan with SEIS-ST-1 inoperable. The inspectors identified that if plant personnel reported feeling an earthquake on site to the control room that control room staff had been directed to reference Abnormal Condition Procedure, ABN-EARTHQUAKE, "Earthquake," Revision 0, to call the Earthquake Information Line which is maintained and updated by the United States Geological Survey agency. The Earthquake Information Line provides recorded information regarding recent seismic activity within the United States. Operations' staff were to use the recorded information to help determine if the criteria had been met to declare an unusual event per the Emergency Plan and EAL 9.4.U.1.

The inspectors noted that some control room staff exhibited reservations regarding the adequacy of utilizing the recorded information provided on the Earthquake Information Line. Specifically, the recorded information was not updated on a frequent enough basis to support making an event declaration and reported seismic activity was provided in terms of the Richter scale. Although control room staff had expressed these concerns to the inspectors, the inspectors noted that no action had been taken by the control room staff to address the concern.

The inspectors concluded that the compensatory measure was inadequate to assure that senior reactor operators would be able to promptly declare an unusual event in accordance with the Emergency Plan given the potential untimeliness of the updated recorded earthquake information and the terms in which the recorded information would be provided (i.e Richter vs. local ground acceleration that the Minimum Seismic Earthquake Exceeded annunciator is based). Energy Northwest provided that other seismic instrumentation was available that would permit an accurate classification, although this required the availability of maintenance technicians to retrieve information from triaxial response-spectrum recorders located in the reactor building. Depending on when an earthquake occurred, the retrieval of this information could be substantially delayed and prevent a timely classification.

Energy Northwest documented the issue in CR 2-06-00304 and issued Operations' Night Order 706 which directed control room staff to declare an unusual event if reports from plant personnel that an earthquake had been felt on site are validated by information provided on the United States Geological Survey earthquake website that seismic activity had occurred in the vicinity of Columbia Generating Station. The inspectors noted that the information provided on the website was updated automatically following a recorded seismic event and therefore could support verification of seismic activity near the facility in accordance with Night Order 706.

Analysis: The failure to provide adequate compensatory actions to support the timely and accurate declaration of an unusual event per the facility emergency plan was a performance deficiency because appropriate emergency classification may not have been made, or would have been significantly delayed. Specifically, risk significant planning standard 10 CFR 50.47(b)(4) requires that a standard scheme of emergency classification and action levels is in use. The finding is of more than minor risk significance because it was related to the cornerstone attribute of response organization performance and affected the Emergency Preparedness cornerstone objective because

inability to implement an emergency action level diminishes the licensee's capability to protect the health and safety of the public. Utilizing the "Failure to Comply" flowchart of Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued March 6, 2003, the finding was determined to be of very low risk significance (Green) because the finding did not represent a loss of function or degradation of a Risk Significant Planning Standard in that other seismic recording instruments were available which would permit Energy Northwest to make an accurate classification of the event, although the classification would most likely be substantially delayed beyond 15 minutes from the occurrence of an earthquake. The result was consistent with Section 4.4 of MC 0609, Appendix B, which provided examples where a finding would be of very low risk significance for changes to equipment which creates a condition where an existing EAL would not be declared for any alert or notification of unusual event. This finding has problem identification and resolution aspects in that Energy Northwest operators identified concerns with the identified compensatory measure but failed to take corrective action to address the concerns until prompted by the inspectors.

Enforcement: 10 CFR 50.54(q) requires in part that a licensee follow and maintain in effect emergency plans which meet the standards of 10 CFR 50.47(b). 10 CFR 50.47(b)(4) requires in part that a standard emergency classification and action level scheme be in use and Energy Northwest's Emergency Plan, Revision 42, Table 4-1, Section 9.4, required that an unusual event be declared if the Minimum Seismic Earthquake Exceeded annunciator is received and the control room receives a report from plant personnel who have felt an earthquake. Contrary to 10 CFR 50.54(q), from December 28, 2005, through January 12, 2006, Energy Northwest failed to implement adequate compensatory measures to address the out-of-service SEIS-ST-1, therefore preventing the prompt assessment and classification of an unusual event following an earthquake. Because Energy Northwest's failure to establish adequate compensatory measures to ensure prompt assessment and implementation of the facility emergency plan is of very low safety significance and has been entered into the corrective action program as CR 2-06-00304, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000397/2006002-03, Failure to Establish Adequate Compensatory Measure to Ensure Prompt Implementation of the Columbia Generating Station Emergency Plan).

40A3 Event Followup (71153)

.1 (Closed) LER 05000397/2004-008-00: Reactor Core Isolation Cooling Due to Inadvertent Closure of Containment Isolation Valve

On November 22, 2004, the reactor core isolation cooling system was declared inoperable after one of its steam supply containment isolation valves, RCIC-V-63, was inadvertently closed during the performance of a channel functional test/channel calibration procedure. The licensee identified that a personnel error by one of the technicians performing the procedure resulted in the inadvertent valve closure. The licensee stopped the performance of the procedure, restored the reactor core isolation cooling system to a normal standby lineup, and declared the system operable two hours later. The licensee documented the issue in corrective action document PER 204-1200. A self-revealing noncited violation of regulatory requirements with crosscutting aspects

of human performance was identified and documented in a previous inspection report (IR 05000397/2004005, Section 1R22). The LER was reviewed by the inspectors and no other violations of regulatory requirements were identified. This LER is closed.

.2 (Closed) LER 05000397/2005-001-00: Potential Breach of Secondary Containment Following Seismic Event

On February 24, 2005, during a system design review of the plant service water system (non-safety-related), Energy Northwest identified that seismic category II plant service water system piping in the turbine building and radwaste building could rupture and drain during a seismic event. Draining of an existing loop seal in the piping would result in an inoperable secondary containment due to the location of two high point vent valves located within secondary containment. These vent valves would automatically open resulting in direct communication between secondary containment atmosphere and the turbine building and radwaste building atmospheres. Energy Northwest noted in the LER that the facility's safety analysis did not postulate a release of radioactive material in excess of Part 100 limits for a safe shutdown earthquake that causes secondary containment to become inoperable. Additionally, Energy Northwest noted that the combination of a safe shutdown earthquake coincident with a loss of coolant accident was beyond design and licensing basis and therefore was not a credible event therefore ensuring that secondary containment, although inoperable following a safe shutdown earthquake, was not needed to mitigate the consequences of a loss of coolant accident since a loss of coolant accident was not presumed to occur concurrently. Energy Northwest took immediate corrective actions to close and deactivate one of the two high point vents to ensure that leakage out of the secondary containment would remain within allowable limits and documented the issue in their corrective action program in PER 205-0122. Energy Northwest reported in the LER that secondary containment was inoperable for a period of time greater than that allowed by technical specifications. The failure to comply with TS 3.6.4.1.A constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. No new findings or violations of regulatory requirements were identified by the inspectors during their review of the LER. This LER is closed.

.3 (Closed) LER 05000397/2005-002-00: High Pressure Core Spray System Inoperability Due to Cracks in the Pump Motor's Upper Air Deflector

On March 16, 2005, during an inspection of the high pressure core spray pump motor to identify the source of potential oil leak, Energy Northwest discovered cracks in the pump motor upper air deflector and subsequently declared the pump inoperable. The licensee identified during a root cause analysis of the issue that critical dimensions were not maintained during motor reassembly which occurred in 1992. The motor air deflector was subsequently replaced and the high pressure core spray system returned to an operable condition. Energy Northwest documented the issue in their corrective action program in PER 205-0175. A licensee identified violation of regulatory requirements was identified and documented in a previous supplemental inspection report (IR 05000397/2005010, Section 4OA7). The LER was reviewed by the inspectors and no other violations of regulatory requirements were identified. This LER is closed.

.4 (Closed) LER 05000397/2005-003-00: Reactor Trip due to Digital Electrohydraulic (DEH) Control System Failure

On June 15, 2005, the reactor tripped from 100 percent power. The reactor trip resulted from a reactor protection system actuation due to a failure in the DEH system that caused the four turbine throttle valves to spuriously stroke from full open to full closed. The licensee replaced the three circuit cards providing control signals to the four turbine throttle valves. The licensee identified this issue as a single point vulnerability and is evaluating the replacement of the DEH control system. The licensee documented the issue in corrective action document PER 205-0424. The LER was reviewed by the inspectors and no violations of regulatory requirements were identified. This LER is closed.

.5 (Closed) LER 05000397/2005-004-00: Reactor Scram during Plant Startup due to Reactor Feedwater Pump Trip

On June 23, 2005, the reactor tripped from 23 percent power during plant startup. The reactor tripped from a low reactor vessel water level which was caused by an inadvertent loss of reactor feedwater Pump RFW-P-1B due to a false low suction pressure signal caused by human error during a planned maintenance activity. Plant systems responded as expected with the exception of the reactor core isolation cooling system. As corrective actions, the licensee planned to install time delays on the low suction pressure trip signals to the feedwater pumps to prevent spurious reactor feedwater pump trips. The licensee also added a time delay to the reactor core isolation cooling system low suction pressure trip logic and evaluated changes to the system operating procedure to resolve the condition. The licensee documented these issues in corrective action documents PERs 205-0428 and 205-0429. Violations of NRC regulatory requirements associated with the inadvertent loss of RFW-P-1B (See IR 05000397/2005003, Section 4OA3.4) and the failure of the reactor core isolation cooling system to function properly during the scram (See IR 05000397/2005005, Section 4OA5.2) were previously identified. The LER was reviewed by the inspectors and no other violations of regulatory requirements were identified. This LER is closed.

.6 Unusual Event due to Range Fire Located Near the Protected Area

a. Inspection Scope

On March 28, 2006, at 1:45 p.m., control room staff received notification of a fire near the sewage treatment facility. The sewage treatment facility is located on owner controlled property outside of the protected area. Control room staff entered Procedure ABN-FIRE, "Fire," Revision 12, for a fire outside of the protected area. An unusual event was subsequently declared by the control room staff at 1:57 p.m. in accordance with Emergency Plan Implementing Procedure 13.1.1, "Classifying the Emergency," Revision 34, Emergency Action Level 9.4.U.3, which provided that an unusual event be declared for range fires near the plant which threaten to reduce the level of safety. The control room staff conservatively declared the unusual event because of the proximity of the fire to the protected area boundary. The Hanford fire department responded and arrived at the scene of the fire at 2:09 p.m. The fire was reported to control room staff as contained at 2:40 p.m. Columbia Generating Station terminated the unusual event at

4:40 p.m. due to the reduction in threat from the fire to impact plant safety. The fire was subsequently reported as out at approximately 5:05 p.m. No personnel were injured and plant safety was not compromised during the event. The inspectors responded to the control room to assess the licensee response to the range fire in accordance with the actions provided in Procedure ABN-FIRE. Additionally, the inspectors evaluated Energy Northwest's assessment of the fire and application of the site emergency plan which led to the unusual event declaration.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 (Closed) URI 05000397/2005005-03; Application of WD-40 to Service Water Pump Shaft Components

The inspectors completed an evaluation of the risk significance and assessment of applicable regulatory requirements associated with the circumstances of the application of WD-40 penetrating oil to the standby service water pumps. WD-40 was applied to the pump shaft coupling sleeves to lubricate and aid in assembly of the shaft coupling components. The inspectors interviewed plant personnel, reviewed applicable corrective action documents, and discussed the overall impact of the application of WD-40 on the service water pump shafts with other NRC staff to determine the acceptability of applying WD-40 to the pump shafts.

As described in IR 5000397/2005005, Section 4OA5.3, on December 14, 2005, Energy Northwest identified and documented in CR 2-05-09690 that WD-40 was applied to service water pump, SW-P-1B, stainless steel shaft coupling sleeves and shaft segments. This was done to lubricate the components to aid in assembly during a replacement of SW-P-1B. This was of concern because WD-40 typically contains chlorine and sulfates which are known initiators and contributors to intergranular stress corrosion cracking. SW-P-1B was replaced because of pump shaft degradation which occurred as a result of intergranular stress corrosion cracking (IGSCC). Energy Northwest also identified that WD-40 was applied to SW-P-1A shaft components during a replacement of that pump in June 2005. SW-P-1A was also replaced because of shaft coupling degradation as a result of IGSCC.

Energy Northwest concluded that Procedure PPM 10.16.1, "Standby Service Water Pump Overhaul," Revisions 11 and 12, which provided the instructions for the assembly and overhaul of the service water pumps was inadequate in that it did not specify the type of lubricant to use in assembling the shaft components nor did it caution against the use of WD-40 on stainless steel components. Energy Northwest also acknowledged that the application of WD-40 was undesirable and should not have been applied, but that IGSCC of the pump shaft couplings would be very unlikely because:

- WD-40 would be flushed out with water after the pump shafts were wetted and the pump had been operated, therefore no WD-40 would remain in contact with any stainless steel surfaces. Supporting this conclusion was that some fluid flow

was noted to occur in the couplings of the replaced service water pumps based on the existence of silting inside the couplings which was identified during pump disassembly.

- Testing indicated that the WD-40 chloride and sulfate concentrations for the WD-40 which was applied were 130 ppm and 320 ppm, respectively. These concentrations were not considered to be high enough to aid in the development of stress corrosion cracking. As a comparison, limits for use on primary system stainless steel as defined in NEDE-31735P are 700 ppm maximum sulfur and 500 ppm maximum chloride.
- WD-40 has a low viscosity which provides good penetrating and wetting ability, but conversely a low surface tension. Under full flow conditions of the service water pump (10,500 gpm) the oil is easily removed from all exposed shaft surfaces.
- Both of the replaced degraded SW-P-1A and 1B pump shafts were manufactured at a heat treatment temperature of 970EF which is conducive to tempering embrittlement. Tempering embrittlement was what initiated the stress corrosion cracking of the stainless steel shaft components. Conversely, the replacement shafts for SW-P-1A and 1B were tempered at a minimum temperature of 1100EF which provides for increased resistance to pitting and stress corrosion cracking (10 times more resistant to the replaced pump shafts). This is supported by the observed condition of other TP410 creviced components under the same conditions with no observed pitting attack.

Energy Northwest also provided that although stress corrosion cracking was highly unlikely given the data as provided above that if any stress corrosion cracking were to occur that it would be a long term degradation issue only. Additionally, Energy Northwest planned to inspect both service water pumps in 2013 which would identify the onset of pitting or stress corrosion cracking. Applicable corrective actions would be taken at that time should any corrosion be noted.

The inspectors and other NRC staff expressed concerns regarding the adequacy of Energy Northwest's plans to not inspect the pump shafts until the next 8 years. Additionally, the inspectors determined that although the licensee had concluded that IGSCC was not probable or at worst was a long term degradation issue, that IGSCC, although unlikely, could occur due to the application of the WD-40. In response to the NRC's concerns, Energy Northwest implemented work Request 29052915 to inspect the upper shaft coupling of SW-P-1A during a scheduled replacement of the motor during the next refueling outage in May 2007 to determine the as found condition of the coupling and to determine the concentration of any residual chlorides and sulfates.

See Section 4OA7.1 for a description of enforcement and significance of a licensee identified violation associated with this issue.

40A6 Meetings, Including Exit

On March 13, 2006, the inspector conducted a telephonic exit meeting to present the inspection results to Mr. M. Reis, Supervisor, Emergency Preparedness, who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On April 3, 2006, the resident inspectors presented the inspection results to Mr. W. Oxenford, Vice President, Technical Services, and other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

On April 24, 2006, C. Johnson, NRC RIV Branch Chief, communicated to Doug Coleman, Manager, Performance Assessment and Regulatory Programs, the conclusions of inspection reports 05000397/2006009 and 05000397/2006010. These inspection reports documented the implementation and results of IP 95001, "Inspection For One Or Two White Inputs In A Strategic Performance Area." These inspections were performed in response to a White PI for Unplanned Scrams per 7000 Critical Hours and reportability issues.

40A7 Licensee Identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy for being dispositioned as a NCV.

- .1 TS 5.4.1.a required, in part, that written procedures shall be established that cover the applicable procedures recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Section 9.a, required in part that maintenance that can affect the performance of safety-related equipment be performed in accordance with procedures appropriate to the circumstances. Contrary to this requirement in June and December 2005 during the replacement of SW-P-1A and SW-P-1B respectively, Procedure PPM 10.16.1, "Standby Service Water Pump Overhaul," Revisions 11 and 12, used for the assembly of the replacement pumps was inadequate. Specifically, it did not specify the type of lubricant to use in assembly of the service water pumps and did not provide precautions against the use of WD-40 on stainless steel components. This finding was more than minor in accordance with MC 0612, Appendix B, because the finding was a procedure quality issue which affected the mitigating systems cornerstone objective to ensure the reliability of systems that respond to initiating events. Specifically, the application of WD-40 to the service water pump shaft components, which contained chlorides and sulfates and is a known contributor to IGSCC of stainless steel components, does not ensure the reliability of the service water pumps because long-term degradation of the shaft couplings could potentially contribute to stress corrosion cracking. The finding was of very low safety significance because it was not a design or qualification deficiency, did not represent a loss of a safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. Energy Northwest implemented corrective actions to revise service

water pump overhaul procedures as well as applicable maintenance procedures associated with other safety significant systems that contain stainless steel components.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Energy Northwest

D. Atkinson, Vice President, Nuclear Generation
S. Belcher, Manager, Operations
D. Coleman, Manager, Performance Assessment and Regulatory Programs
G. Cullen, Licensing Supervisor, Regulatory Programs
A. Khanpour, General Manager, Engineering
W. LaFramboise, Manager, Technical Engineering
T. Lynch, Plant General Manager
W. Oxenford, Vice President, Technical Services
J. Parrish, Chief Executive Officer
M. Reis, Supervisor, Emergency Preparedness
F. Schill, Engineer, Licensing
C. Whitcomb, Vice President, Organizational Performance and Staffing

NRC Personnel

R. Cohen, Resident Inspector
Z. Dunham, Senior Resident Inspector

ITEMS OPENED AND CLOSED

Items Opened, Closed, and Discussed During this Inspection

Opened

| | | |
|---------------------|-----|---|
| 05000397/2006002-02 | URI | Potential Excessive Vibration of Low Pressure Core Spray Instrument Line (Section 1R22) |
|---------------------|-----|---|

Opened and Closed

| | | |
|---------------------|-----|---|
| 05000397/2006002-01 | NCV | Failure to Promptly Identify and Evaluate Condition Adverse to Quality in Safety-Related 4160 Vac Breakers (Section 1R15) |
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| | | |
|---------------------|-----|---|
| 05000397/2006002-03 | NCV | Failure to Establish Adequate Compensatory Measure to Ensure Prompt Implementation of the Columbia Generating Station Emergency Plan (Section 4OA2.3) |
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Closed

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|----------------------|-----|---|
| 05000397/2004-008-00 | LER | Reactor Core Isolation Cooling Due to Inadvertent Closure of Containment Isolation Valve (Section 4OA3.1) |
|----------------------|-----|---|

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|----------------------|-----|--|
| 05000397/2005-001-00 | LER | Potential Breach of Secondary Containment Following Seismic Event (Section 4OA3.2) |
| 05000397/2005-002-00 | LER | High Pressure Core Spray System Inoperability Due to Cracks in the Pump Motor's Upper Air Deflector (Section 4OA3.3) |
| 05000397/2005-003-00 | LER | Reactor Trip due to Digital Electro-Hydraulic (DEH) Control System Failure (Section 4OA3.4) |
| 05000397/2005-004-00 | LER | Reactor Scram during Plant Startup due to Reactor Feedwater Pump Trip (Section 4OA3.5) |
| 0500397/2005005-03 | URI | Application of WD-40 to Service Water Pump Shaft Components (Section 4OA5.1) |

Discussed

None.

PARTIAL LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

PPM 2.5.5; Stator Coil Cooling System; Revision 28
Drawing M958; Flow Diagram - Stator Coil Water Turbine Generator Building; Revision 18
CCER 93-0721
ABN-HVAC; HVAC Trouble; Revision 3
PPM 2.10.3; Control, Cable, and Critical Switchgear Rooms HVAC; Revision 42
CCER 94-0319
Drawing M520; Flow Diagram - LPCS; Revision 94
Drawing M512-1; Flow Diagram - Diesel Oil and Miscellaneous Systems; Revision 37
Drawing M587; Diesel Generator Building; Revision 30
SOP-LPCS-STBY; Placing LPCS in Standby Status; Revision 1
SOP-DG2-STBY; Emergency DG Div 2 Standby Lineup; Revision 4
OSP-ELEC-M702; Diesel Generator 2 Monthly Operability Test; Revision 23

Section 1R05: Fire Protection

Columbia Generating Station Pre-Fire Plan, Revision 2
National Fire Protection Association NFPA-10, 1984 Revision
FSAR, Appendix F

Section 1R12: Maintenance Effectiveness

PER 205-0594

CR 2-06-01971

PER 205-0086

CR 2-06-00056

Columbia Generating Station Maintenance Rule Scoping Matrix; Revision 11

PPM 1.5.11; Maintenance Rule Program; Revision 7

PPM 1.5.14; Risk Assessment and Management for Maintenance/Surveillance Activities;
Revision 11

TI 4.22; Maintenance Rule Program; Revision 13

PER-205-200

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Section 1R13: Maintenance Risk Assessments and Emergent Work Control

LCO Log No. 9917

LCO Log No. 7920

PPM 1.3.76; Integrated Risk Management; Revision 5

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PPM SOP-ENTRY-STMTNL; Personnel Entry into Steam Tunnel; Revision 3

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Drawing E519; Motor Valve & Misc. Control Elementary Diagram; Revision 11

Section 1R15: Operability Evaluations

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CVI 47A-00, 131; Eaton Cutler-Hammer Breaker Manual

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Calculation ME-02-93-05; Calculation for RHR Heat Exchanger Performance Under Various
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WR 29053127

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USGS WEB Site; <http://earthquake.usgs.gov/recenteqsUS/Quakes/uw01081022.htm>

Section 1R19: Postmaintenance Testing

WO 01106825

Calculation E/I-02-92-1156

Drawing EWD-9E-004B; Electrical Wiring Diagram Residual Heat Removal System RHR-P-2B Breaker RHR-CB-P2B; Revision 3

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Drawing EWD-9E-057; Electrical Wiring Diagram Residual Heat Removal System MOV RHR-FCV-64B; Revision 18

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WO 01114727

Section 1R22: Surveillance Testing

ISP-RFW-Q401; Feedwater / Turbine Trip Actuation on Reactor High Level 8 - CFT; Revision 7

TSP-DG1-B502; Standby Diesel Generator DG1 Load Testing; Revision 4

OSP-SLC/IST-Q701; Standby Liquid Control Pumps Operability Test; Revision 12

ISP-RPS-Q906; RPS and BOP Isolation Primary Containment Pressure High Channel B - CFT/CC; Revision 4

Section 1EP6: Drill Evaluation

2006 Team C Drill Report; January 10, 2006

Section 4OA1: Performance Indicator Verification

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Operator Logs

NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 2

Section 4OA2: Identification and Resolution of Problems

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PPM 10.25.187; Motor Control Center Starter (Bucket) Maintenance; Revision 8