



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

August 2, 2012

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION - NRC TRIENNIAL FIRE INSPECTION
REPORT 05000397/2012007

Dear Mr. Reddemann:

On June 28, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Columbia Generating Station. The enclosed inspection report documents the inspection results, which were discussed in a debrief meeting on June 28, 2012, with Mr. A. Javorik, Vice-President Engineering, and other members of your staff. Following additional in-office review, an exit meeting was conducted on July 27, 2012, with Mr. A. Javorik, Vice-President Engineering, 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.

Based on the results of this inspection, the NRC has identified one finding that was evaluated under the risk significance determination process. A violation was associated with the finding. The finding was found to have very low safety significance (Green) and the violation associated with this finding is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Senior Resident Inspector at the Columbia Generating Station. In addition, if you disagree with the characterization of the 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 Senior Resident Inspector at Columbia Generating Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

M. Reddemann

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

Sincerely,

/RA/

Geoffrey B. Miller, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-397
License No. NPF-21

Enclosure:

1. Inspection Report No. 05000397/2012007

Attachment:

1. Supplemental Information

Electronic Distribution: Columbia Generating Station

Electronic distribution by RIV:

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ADAMS Accession No: **ML12215A497**

ADAMS: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		<input checked="" type="checkbox"/> SUNSI Review Complete		Reviewer Initials: GBM	
		<input checked="" type="checkbox"/> Publicly Available		<input checked="" type="checkbox"/> Non-Sensitive	
		<input type="checkbox"/> Non-publicly Available		<input type="checkbox"/> Sensitive	
RIV: DRS/EB2/SRI	DRS/EB2/RI	DRS/EB2/RI	DRS/EB2/RI	DRS/EB2/BC	
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 50-397

License: NPF-21

Report Nos.: 05000397/2012007

Licensee: Energy Northwest

Facility: Columbia Generating Station

Location: P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

Dates: June 11, 2012 thru July 27, 2012

Team Leader: J. Mateychick, Senior Reactor Inspector, Engineering Branch 2

Inspectors: S. Achen, Reactor Inspector, Engineering Branch 2
E. Uribe, Reactor Inspector, Engineering Branch 2
J. Watkins, Reactor Inspector, Engineering Branch 2

Approved By: Geoffrey B. Miller, Chief
Engineering Branch 2
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000397/2012007; 6/11/12 – 7/27/12; Energy Northwest; Columbia Generating Station; Triennial Fire Protection Team Inspection.

The report covered a two-week on-site triennial fire protection team inspection by specialist inspectors from Region IV. One Green finding, which was a non-cited violation (NCV), was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process (SDP) does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation for the failure to ensure that material, parts, and equipment specified met or exceeded the design criteria as required by License Condition 2.C.14, "Fire protection Program (Generic Letter 86-10)." Specifically, prior to implementing engineering change EC 9123, the licensee failed to analyze for all possible failure modes of fire induced circuit failures for transducers installed for ensuring electrical isolation in the event of a fire in the control room for post fire safe shutdown standby service water pump SW-P-1B, residual heat removal pump RHR-P-2B, and circuit breaker E-CB-B/8 as required by FSAR Appendix F, Table F.3-1.

The failure to analyze a modification to post fire safe shutdown circuitry for all possible modes of fire induced circuit failures was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated this deficiency using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process." The performance deficiency affected the fire protection defense-in depth strategies involving post-fire safe shutdown systems.

This finding was evaluated using the process in Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," Attachment 2, "Degradation Rating Guidance Specific to Various Fire Protection Program Elements," and was determined to be of very low safety significance. The finding was assigned a low degradation rating because the capability to achieve safe shutdown in the event of a control room fire would be minimally impacted by the failure to analyze the control circuitry for equipment required for post fire safe shutdown. This was based on the licensee verifying through bench testing that the component in question does provide adequate electrical isolation. Because this finding had a low degradation rating, it screened as having very low safety

significance (Green). The performance deficiency had a cross-cutting aspect in the area of human performance associated with decision making because the licensee did not make risk-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety was maintained and failed to implement the roles and authorities as designed for risk-significant decisions [H.1(a)]. (Section 1R05.06.b)

B. Licensee-Identified Violations

None.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (71111.05T)

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure 71111.05T, "Fire Protection (Triennial)," at the Columbia Generating Station. The inspection team evaluated the implementation of the approved fire protection program in selected risk-significant areas, with an emphasis on the procedures, equipment, fire barriers, and systems that ensure the post-fire capability to safely shutdown the plant.

Inspection Procedure 71111.05T requires the selection of three to five fire areas for review. The inspection team used the fire hazards analysis section of the Columbia Generating Station Fire Probabilistic Safety Assessment to select the following five risk-significant fire areas (inspection samples) for review:

- Fire Area RC-10 Control Room
- Fire Area RC-14 Division 1 Switchgear Room
- Fire Area TG-1, Fire Zone 12 Turbine Building South Corridors

The inspection team evaluated the licensee's fire protection program using the applicable requirements, which included plant Technical Specifications, Operating License Condition 2.C.14, NRC safety evaluations, 10 CFR 50.48, and Branch Technical Position 9.5-1. The team also reviewed related documents that included the Final Safety Analysis Report (FSAR), Section 9.5; the fire hazards analysis; and the post-fire safe shutdown analysis.

Specific documents reviewed by the team are listed in the attachment. Three inspection samples were completed.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed piping and instrumentation diagrams, safe shutdown equipment list, safe shutdown design basis documents, and the post-fire safe shutdown analysis to verify that the licensee properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for fires in the selected fire areas. The team observed walk-downs of the procedures used for achieving and maintaining safe shutdown in the event of a fire to verify that the procedures properly implemented the safe shutdown analysis provisions.

For each of the selected fire areas, the team reviewed the separation of redundant safe shutdown cables, equipment, and components located within the same fire area. The

team also reviewed the licensee's method for meeting the requirements of 10 CFR 50.48; Branch Technical Position 9.5-1, Appendix A; and 10 CFR Part 50, Appendix R, Section III.G. Specifically, the team evaluated whether at least one post-fire safe shutdown success path remained free of fire damage in the event of a fire. In addition, the team verified that the licensee met applicable license commitments.

b. Findings

No findings were identified.

.02 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe the material condition and configuration of the installed fire area boundaries (including walls, fire doors, and fire dampers) and verify that the electrical raceway fire barriers were appropriate for the fire hazards in the area. The team compared the installed configurations to the approved construction details, supporting fire tests, and applicable license commitments.

The team reviewed installation, repair, and qualification records for a sample of penetration seals to ensure the fill material possessed an appropriate fire rating and that the installation met the engineering design. The team also reviewed similar records for the rated fire wraps to ensure the material possessed an appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings were identified.

.03 Active Fire Protection

a. Inspection Scope

The team reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected fire areas. The team verified the automatic detection systems and the manual and automatic suppression systems were installed, tested, and maintained in accordance with the National Fire Protection Association code of record or approved deviations, and that each suppression system was appropriate for the hazards in the selected fire areas.

The team performed a walkdown of accessible portions of the detection and suppression systems in the selected fire areas. The team also performed a walkdown of major system support equipment in other areas (e.g., fire pumps and Halon supply systems) to assess the material condition of these systems and components.

The team reviewed the electric and diesel fire pump flow and pressure tests to verify that the pumps met their design requirements. The team also reviewed the halon suppression functional tests to verify that the system capability met the design requirements.

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The team also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the team inspected fire brigade equipment to determine operational readiness for fire fighting.

The team observed an unannounced fire drill, conducted on June 27, 2012, in the Radwaste Building 487' Elevation General Area and the subsequent drill critique using the guidance contained in Inspection Procedure 71111.05AQ, "Fire Protection Annual/Quarterly." The team observed fire brigade members fight a simulated fire in the Radwaste Building, located in the radiological controlled area. The team verified that the licensee identified problems, openly discussed them in a self-critical manner at the drill debrief, and identified appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment was brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

b. Findings

No findings were identified.

.04 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The team performed plant walkdowns and document reviews to verify that redundant trains of systems required for safe shutdown, which are located in the same fire area, would not be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team verified that:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat, or hot gases, cause activation of suppression systems that could potentially damage all redundant safe shutdown trains.
- A fire in one of the selected fire areas or the inadvertent actuation or rupture of a fire suppression system would not directly cause damage to all redundant trains (e.g., sprinkler-caused flooding of other than the locally affected train).

Adequate drainage is provided in areas protected by water suppression systems.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. Inspection Scope

Review of Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentation drawings, electrical drawings, the Final Safety Analysis Report, and other supporting documents to verify that safe shutdown could be achieved and maintained from outside the control room for fires that require evacuation of the control room, with or without offsite power available.

Plant walkdowns were conducted to verify that the plant configuration was consistent with the description contained in the safe shutdown and fire hazards analysis. The team focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support system functions.

The team also verified that the systems and components credited for safe shutdown would remain free from fire damage. Finally, the team verified that the transfer of control from the control room to the alternative shutdown location would not be affected by fire induced circuit failures (e.g., by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Review of Operational Implementation

The team verified that the licensed and non licensed operators received training on alternative shutdown procedures. The team also verified that sufficient personnel to perform a safe shutdown are trained and available onsite at all times, exclusive of those assigned as fire brigade members.

A simulated walkdown of the post-fire safe shutdown procedure with licensed and non licensed operators was performed to determine the adequacy of the procedure. The team observed that the procedure, as written, does ensure a safe shutdown condition of the plant and does implement the required actions within the time limits specified by analysis. Time critical actions that were observed include a reactor trip, closure of main steam isolation valves, isolating unprotected circuits, restoring electrical power, establishing control at the remote shutdown and local control panels, performing an emergency depressurization, establishing reactor coolant makeup at desired pressure, and establishing decay heat removal.

The team reviewed operator manual actions to ensure that they could be implemented in accordance with plant procedures in the time necessary to support safe shutdown for a

fire in the control room. The team concluded that the licensee procedure does ensure safe shutdown of the plant.

The team also reviewed the periodic testing of the alternative shutdown transfer capability as well as instrumentation and control functions to verify that the tests are adequate to demonstrate the functionality of the alternative shutdown capability.

b. Findings

No findings were identified.

.06 Circuit Analysis

a. Inspection Scope

The team reviewed the post-fire safe shutdown analysis to verify that the licensee identified the circuits that may impact the ability to achieve and maintain safe shutdown. The team verified, on a sample basis, that the licensee properly identified the cables for equipment required to achieve and maintain hot shutdown conditions in the event of a fire in the selected fire areas. The team verified that these cables were either adequately protected from the potentially adverse effects of fire damage or were analyzed to show that fire induced circuit faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent safe shutdown. The team reviewed the circuits associated with the following components:

- MS-V-22A and MS-V-28A, Main Steam Isolation valves
- RHR-53-B, 123-B, Residual Heat Removal High-low Pressure Interface Valves
- RHR-6-B, 16-B, 49, 74-B, 115-B, Residual Heat Removal Valves
- E-CB-B/8, RHR-CB-P2B, SW-CB-P1B, CT Shorting Switch Modification
- Whittaker Mineral Insulated Cables for Instrumentation and Control associated with Post Fire Safe Shutdown

For this sample, the team reviewed electrical elementary and block diagrams and identified power, control, and instrument cables necessary to support their operation. In addition, the team reviewed cable routing information to verify that fire protection features were in place as needed to satisfy the separation requirements specified in the fire protection license basis.

b. Findings

Introduction. The team identified a violation of License Condition 2.C.14, "Fire protection Program (Generic Letter 86-10)" of very low safety significance (Green) for the failure to analyze for all possible modes of fire induced circuit failures introduced by a modification made to post fire safe shutdown circuitry. Specifically, the licensee failed to analyze for all possible failure modes for transducers required for ensuring electrical isolation in the event of a fire in the control room for standby service water pump SW-P-1B, residual heat removal pump RHR-P-2B, and circuit breaker E-CB-B/8. As a result, the licensee

failed to ensure that the local control circuitry would be isolated from the effects of fire damage caused by a control room fire.

Description. In the event of a fire in the control room, the licensee must ensure control circuitry for equipment credited for post fire safe shutdown is electrically isolated to ensure that fire damage would not prevent operation of equipment needed to achieve and maintain safe shutdown conditions. In June 2012, the licensee implemented engineering change EC 9123 to replace the isolation function of current transformer (CT) shorting switches. The shorting switches were replaced with current transducers to isolate control room ammeter circuitry from the control circuitry for service water pump 1B, residual heat removal pump 2B, and circuit breaker B/8 which connects offsite power to the credited class 1E 4160V SM8 bus.

The team reviewed the licensee's engineering change package and evaluations for the modification. The team identified that the evaluation did not contain any analysis of potential circuit failure modes for response of the transducers. The licensee failed to establish the criteria for determining if the component could be impacted by fire induced circuit failures prior to implementing the modification in the plant and issuing a new revision of procedure ABN-CR-EVAC "Control Room Evacuation and Remote Cooldown," Revision 023, which omitted using the manual switching of the CT shorting switches for isolation. In response to the identified deficiency, the licensee was able to implement compensatory measures to reinstate the use of the CT shorting switches which had been left in place, until bench testing on the component could be performed. The licensee entered this deficiency in their corrective action program as Condition Report 00266019.

Analysis. The failure to analyze a modification to post fire safe shutdown circuitry for all possible modes of fire induced circuit failures was a performance deficiency. Specifically, the licensee failed to ensure that control circuitry for equipment required for post fire safe shutdown would be isolated from the control room in the event of a fire. The performance deficiency was more than minor because it was associated with the protection of external events attribute (fire) of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," because it affected fire protection defense in depth strategies involving post fire safe shutdown. Using Appendix F, Attachment 2, "Degradation Rating Guidance Specific to Various Fire Protection Program Elements," the team assigned a low degradation rating to the finding because the capability to achieve safe shutdown in the event of a control room fire would be minimally impacted by the failure to analyze the control circuitry for equipment required for post fire safe shutdown. This was based on the licensee verifying through bench testing that the component in question does provide adequate electrical isolation. Because this finding had a low degradation rating, it screened as having very low safety significance (Green). The performance deficiency had a cross-cutting aspect in the area of human performance associated with decision making because the licensee did not make risk-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety was maintained and failed to implement the roles and authorities as designed for risk-significant decisions [H.1(a)].

Enforcement. Fire Protection License Condition 2.C.14, "Fire protection Program (Generic Letter 86-10)," specifies that the licensee shall implement and maintain in effect all provisions of the approved Fire Protection Program. Final Safety Analysis Report, Table F.3-1, "Comparison with BTP 9.5-1 Appendix A," Section C, "Quality Assurance Program," requires in part, that "the established engineering procedures require the design changes to be reviewed by cognizant personnel to ensure material, parts, and equipment specified will meet or exceed the design criteria."

Contrary to the above, during a plant modification in June 2012, the licensee failed to review design changes to ensure material, parts, and equipment specified met or exceeded the design criteria. Specifically, the licensee failed to analyze all circuit failure modes for transducers installed in post fire safe shutdown circuitry to ensure electrical isolation for a control room fire. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program (Condition Report 00266019), this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000397/2012007-001, Failure to Analyze Post Fire Safe Shutdown Circuitry for Isolation for a Control Room Fire.

.07 Communications

a. Inspection Scope

The inspectors reviewed the adequacy of the communication system to support plant personnel in the performance of alternative post-fire safe shutdown functions and fire brigade duties. The review verified that the licensee established and maintained in working order primary and backup communications. Further, the inspectors evaluated the environmental impacts such as ambient noise levels, coverage patterns, and clarity of reception. The inspectors reviewed that the electrical power supplies, PBX battery system, PBX phones, sound powered phones and cable routing for the phone system would allow them to remain functional following a fire in the control room and other fire areas.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The inspectors reviewed the emergency lighting system required to support plant personnel in the performance of post-fire safe shutdown functions to verify it was adequate to support the performance of manual actions required to achieve and maintain safe shutdown conditions, and for illuminating access and egress routes to the areas where manual actions are required. The review verified that the licensee relied on fixed emergency lights with an 8-hour battery capacity, diesel backed fluorescent lights, and 8-hour portable lanterns for selected post-fire safe shutdown manual actions. The licensee maintained the emergency light batteries in accordance with manufacturer

recommendations, and tested and performed maintenance in accordance with plant procedures and industry practices. The inspectors evaluated the locations and positioning of fixed emergency lights and the four pre-staged locations for the storage of the 8-hour portable lanterns (five 8-hour portable lanterns at each location) during a walkthrough of the control room evacuation procedure and during review of manual actions performed for fires in areas outside of the control room. The approved 8-hour portable lanterns are used exclusively for selected post-fire safe shutdown manual actions and there are adequate lanterns pre-staged at each of the four locations to supply the control room staff of five. The portable 8-hour lanterns are maintained and tested annually.

b. Findings

No findings were identified.

.09 Cold Shutdown Repairs

a. Inspection Scope

The team verified that the licensee does not perform or credit any repairs to achieve post-fire safe shutdown.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection Scope

The team verified that compensatory measures were implemented for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g., detection and suppression systems and equipment; passive fire barriers; or pumps, valves, or electrical devices providing safe shutdown functions). The team also verified that the short-term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that the licensee was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings were identified.

.11 B.5.b Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's implementation of guidance and strategies intended to maintain or restore core, containment, and spent fuel pool cooling

capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire as required by Section B.5.b of the Interim Compensatory Measures Order, EA-02-026, dated February 25, 2002, and 10 CFR 50.54(hh)(2).

The inspectors reviewed the strategies to verify that they continued to maintain and implement procedures, maintain and test equipment necessary to properly implement the strategies, and ensure station personnel are knowledgeable, trained, and capable of implementing the procedures. The inspectors visually inspected the fire truck with remote controlled extension ladder mounted spray nozzle, B.5.b equipment storage trailer, storage lockers strategically located within the plant that contained materials and equipment necessary to implement B.5.b strategies, and other equipment used to implement the strategies to ensure the availability and material readiness of the equipment. The inspectors evaluated the adequacy of the trailer hitch attachments and verified the availability of on-site vehicles capable of towing the B.5.b equipment storage trailer. The licensee implemented their strategies in accordance with Procedure OCAG-1, "Operational Contingency Action Guideline," Revision 20. The inspectors selected the following two specific strategies for this inspection sample:

- RCIC Start Without AC and DC Power
- Spent Fuel Pool Makeup From Stairwell Fire Header

The inspectors completed two samples.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems

Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team selected a sample of condition reports associated with the licensee's fire protection program to verify that the licensee had an appropriate threshold for identifying deficiencies. The team reviewed the corrective actions proposed and implemented to verify that they were effective in correcting identified deficiencies. The team evaluated the quality of recent engineering evaluations through a review of condition reports, calculations, and other documents during the inspection.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

The team presented the inspection results to Mr. A. Javorik, Vice-President Engineering, and other members of the licensee staff at debrief meeting on June 28, 2012.

Following additional in-office review, an exit meeting was conducted on July 27, 2012, with Mr. A. Javorik, Vice-President Engineering, and other members of your staff. The licensee acknowledged the findings presented. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

40A7 Licensee-Identified Violations

None

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Adami, Technical Services Engineering Manager
M. Baird, Shift Manager
C. Blake, System Engineer
M. Boddy, Security Supervisor
D. Brown, Operations Manager
B. Burke, Design Architect
S. Clizbe, Safeguards and Compliance
M. Da Re, Quality Assessor
M. Davis, Radiological Services Manager
E. Dumlao, System Engineer
Z. Dunham, Licensing Supervisor
C. England, Organizational Effectiveness Manager
E. Gilmour, Information Services Manager
G. Gordon, Equipment Operator
Don Gregoire, Regulatory Affairs Manager
W. Harper, Fire Protection Engineer
R. Hermann, System Engineer
W. Hettel, Vice-President Operations
A. Javorik, Vice-President Engineering
M. Kellett, Document and Data Services Manager
C. King, Assistant Plant General Manager
J. Lomax, Electrical Designer
R. Olson, Fire Protection System Engineer
B. Mackissock, Plant General Manager
D. Mand, Design Engineering Manager
C. Moon, Training Manager
T. Morales, Mechanical Design Authority
J. Noah, Fire Marshall
C. Noedhaus, Operations Work Control Shift Manager
R. Olson, Fire Protection Systems Engineer
T. Parmelee, Post-Fire Safe Shutdown Engineer
J. Peterson, Fire Protection Engineer
J. Rhoads, Senior Engineer
J. Sims, Long Range Planning Manager
I. Singh, Systems Engineer
C. Sonoda, Licensing Engineer
G. Strong, Electrical/I&C Design Engineering Supervisor
J. Twomey, Acting Regulatory Affairs Manager
L. Williams, Licensing Engineer
R. Wolfgramm, Plant Programs Supervisor

NRC personnel

M. Hayes, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

05000397/2012007-001	NCV	Failure to Analyze Post Fire Safe Shutdown Circuitry for Isolation for a Control Room Fire
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Closed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AR	action Request
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
FPIP	Fire Protection Impairment Permits
FSAR	Final Safety Analysis Report
NCV	Non-cited Violation
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
PAR	Publicly Available Records
SDP	Significance Determination Process

LIST OF DOCUMENTS REVIEWED

CALCULATIONS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ENW-CALC-023	RCIC Black Start Room Flooding Evaluation	0
ENW-CALC-024	RCIC Black Start Oil Cooler Evaluation	0
MSE-EJJ-10-01	Columbia Generating Station Expert Panel Identification and Review of Multiple Spurious Operation Scenarios	4/23/10
NE-02-85-19	Calculation for Post Fire Safe Shutdown (PFSS) Analysis	6
NE 02-85-19	Spurious Cable Analysis (Il1c)	4
NE-02-85-19	Spurious Cable Analysis (Il1c)	5
NE-02-85-19	Control Cable Voltage Drop Calc (Io2)	4
NE-02-85-19	Voltage Drop Calculations During a DBF for Power Whittaker Cables (Io3)	5
NE-02-85-19	Electrical Component Analysis (Ia1)	6
NE-02-85-19	Voltage Drop and Ampacity Calc. Text (Io1)	4
NE-02-94-19	Hi/Lo Analysis (Id1)	5
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EWD-9E-003	Residual Heat Removal System Pump RHR-P-2B	19
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EWD-46E-049	4.16kV & 6.9kV Switchgear Circuit Breaker Details	006
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EWD-9E-057	Residual Heat Removal System MOV RHR-FCV-64B	018
EWD-9E-071	Residual Heat Removal System MOV RHR-V-123B (E12-F099B)	15
EWD-9E-099	Residual Heat Removal System Miscellaneous Relay Circuits (Div 2)	9
EWD-15E-047	Reactor Protection System Power Panel RPS-PP-C72/P001	8
EWD-46E-094	AC Electrical Distribution Systems Aux Power XFMR E-TR-B BRKR E-CB-B/8 Sheet 1	21
EWD-46E-240A	AC Electrical Distribution System Power Panel E-PP-7AF Circuit Details	2
EWD-9E-093	Miscellaneous Relay Circuits (DIV 1)	19
EWD-9E-064	Residual Heat Removal System MOV RHR-V-74B (E12-F074B)	12
EWD-50E-008A	DC Electrical Distribution System Distribution Panel E-DP-S1/2A Circuit Details	5
EWD-9E-069	Residual Heat Removal System MOV RHR-V-115 (E12-F094) & Valve RHR-V-182 (E12-F097)	15
EWD-46E-419	Electrical Wiring Diagram AC Electrical Distribution System Radwaste Building Lighting Elevation 437' Lighting Panel E-LP-5DA	1

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EWD-47E-007	Standby AC Power System Diesel Generator 2 Breaker E-CB-DG2/8	19
EWD-47E-008B	Standby AC Power System Diesel Generator 2 Breaker E-CB-DG/8	2
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M519	Flow Diagram Reactor Core Isolation Cooling System	92
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PFSS-2	Appendix R – Post Fire Safe Shutdown (PFSS) Division 2 Boundaries	010
PFSS-3	Appendix R – Post Fire Safe Shutdown (PFSS) Remote Shutdown Boundaries	009

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PFSS-4	Appendix R – Post Fire Safe Shutdown (PFSS) RHR & ADS System Alternate Shutdown Cooling Piping and Instrument Diagram	003
PFSS-6	Appendix R – Post Fire Safe Shutdown (PFSS) Standby Service Water System Piping and Instrument Diagram	002
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ENGINEERING EVALUATIONS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
95-048	10 CFR 50.59 Safety Evaluation Control Room Evacuation and Remote Cooldown	May 1995
95-058	10CFR50.59 Safety Evaluation Control Room Evacuation and Remote Cooldown	May 1995

FIRE IMPAIRMENTS

09-0356	11-0235	11-0279	12-0073	12-0177	12-0183
10-0232	10-0362	11-0014	11-0146	11-0272	

PREVENTIVE MAINTENANCE TASKS

01174145	01176270
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PROBLEM IDENTIFICATION REPORTS (Action Requests ARs)

00216894	00215102	00228113	00258333	00256220
00216882	00216841	00216872	00216883	00216887
00226804	00226807	00221950	00222306	00236202
00229278	00224299	00262993	00244786	00247759
00266011*	00265861*	00264160*	00265322*	00265305*
00265306*	00265924*	00265205*	00265934*	00265870*
00265271*	00265267*	00265269*	00265270*	00265854*
00265861*	00265956*	002266020*	00266019*	00266011*
00265061*	00265204*	00265206*	00265207*	00265208*
00265211*	00265212*	00265267*	00265212*	00265964*

*Issued as a result of inspection activities.

PROCEDURES

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AB-EDMG	Extensive Damage Mitigation Guidelines	5/23/12
ABN-CR-EVAC	Control Room Evacuation and Remote Cooldown	22
ABN-FIRE	Fire	025
ABN-FIRE-CR	Control Room Fire	005
ABN-FIRE-OG	Offgas Charcoal Adsorber Fire	003
ABN-LIGHTING-CR	Loss Of Control Room AC Lighting	001
ABN-RCIC-START	RCIC Start Without Ac And Dc Power	005
ABN-TSG-001	Spent Fuel Pool Makeup From Stairwell Fire Header	004
DES-2-1	Plant Design Changes	045
DES-3-2	Special Design Verification Analysis	3
FPP 15.1.8	Plant Fire Hose Station Operability Demonstration	7
FPP 15.2.2	Function and Sensitivity Check of Ionization Detectors	16
FPP 15.2.5	Zone 66 Ionization detector Visual Inspections, Function and Sensitivity Tests	005
FPP 15.2.14	Functional Check, Sensitivity Check and Cleaning of Photoelectric Detectors	008
FPP 15.2.36	PGCC Halon System U679 Through U894 –Sensitivity Check, Actuation Test and CFT	007
FPP 15.2.39	Emergency Lighting 8-Hour EBU And Essential Fluorescent Lighting Inspection - Monthly	003
FPP 15.2.40	Emergency Lighting 8 – Hour EBU Discharge - Annual	003
FPP 15.2.40	Emergency Lighting 8 – Hour EBU Discharge	004
FPP 15.2.40	Emergency Lighting 8 – Hour EBU Discharge	005
FPP 15.2.41	Annual Surveillance Of 8-Hour Portable Lanterns	005
FPP 15.2.42	24 Month Operability Test Of Lighting Transfer Switches, E-RMS-7FDA And E-RMS-8FDA	000
FPP 15.2.43	PBX Battery E-BO-PBX Monthly Testing	003
FPP 15.2.44	PBX Battery E-BO-PBX Quarterly Testing	002

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FPP 15.3.6	Control Room Halon Pressure Check, Weight Check, Flow Test and PGCC Barrier Inspection	005
FPP 15.4.2	Fire Main Hydraulic Data Acquisition	8
FPP 15.4.8	Fire Protection System Annual Functional Test	014
FPP 15.5.9	Essential PBX Phone Functional Test	003
OPS-INST-M101	Remote and Alt Remote Shutdown Panel Channel Check	10
OPS-INST-B704	ADS Solenoid Remote Shutdown System Transfer Switch Check	2
OPS-INST-B703	Fire Remote Transfer Switch Operability	9
OPS-INST-B701	Remote Shutdown Panel Operability	14
PFP-RB-422	Reactor 422	4
PFP-RW-467	Radwaste 467	4
PFP-RW-467	Pre-Fire Plan Radwaste 467	004
PFP-RW-501-507	Pre-Fire Plan Radwaste 501-507	004
PPM 1.3.10	Plant Fire Protection Program Implementation	031
PPM 1.3.10A	Control of Ignition Sources	015
PPM 1.3.10B	Active Fire System Operability and Impairment Control	014
PPM 1.3.10C	Control of Transient Combustibles	014
PPM 1.3.57	Barrier Impairment	027
PPM 1.3.68	Work Management Process	025
PPM 1.5.13	Preventive Maintenance Optimization Living Program	025
PPM 15.1.1	Fire Suppression Sprinkler System Inspection	017
PPM 15.1.8	Plant Fire Hose Station Operability Demonstration	011
PPM 15.1.15	Wet Pipe Sprinkler Flow Switch Functional Test	021
PPM 15.1.18	Fire Suppression Systems Valve Alignment	017
PPM 15.1.22	Plant Fire Extinguisher and Foam Cart Inspections	036
PPM 15.1.27	Smoke Removal Fan Operability Surveillance	004
PPM 15.3.15	Fire Protection Sprinkler System Internal Inspection	019

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SWP-CAP-01	Corrective Action Program	024
SWP-DES-01	Plant Modifications and Configuration Control	015
SWP-FPP-01	Nuclear Fire Protection Program	007
SWP-LIC-02	Licensing Basis Impact Determinations	011

MISCELLANEOUS DOCUMENTS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
BWROG-TP-11-011	BWROG Assessments of Generic Multiple Spurious Operations (MSOs) in Post-Fire Safe Shutdown Circuit Analysis for the Operating BWR Plants	0
C11-0005	Component Classification Evaluation Record (SW-ATD-P1B, RHR-ATD-P2B, E-ATD-TRB/SM8)	0
CVI 999-00,76	Dual-Lite Instruction Manual For Self Contained Emergency Lighting Units	002
Design Basis Document B 1.10.7	Essential Lighting	58
Design Basis Document B 1.10.8	Essential Communication	62
Design Specification For Division 200 Section 209	Post Fire Safe shutdown (PFSS) Analysis Requirements	4
Design Specification For Division 300 Section 307	Main Steam System	6
D104-C1-001	PFSS Fire Wrap Commodity Data	10/09/1999
D104-C1-001.01	PFSS Fire Wrap Commodity Data	10/09/1999
D104-C1-001.03	PFSS Fire Wrap Commodity Data	10/09/1999
D207-5003	Penetration Seal Data Form	10/06/1999
ERIN Letter C106110003-9696	Resolution of CGS MSO Issues Using MAAP (Final Draft)	1/27/11
FPF 1.1, Item No. 13	Penetration Seal Limiting Design Parameters	3
FPF 1.1, Item No. 59	Technical Justification For Minor Deviations From Limiting Design Parameters	7

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FPF 1.11, Item No. 2	Qualification of Whittaker MI Cable as a 3-Hour Raceway Fire Barrier	2
FPF 2.1, Item No. 34	Compliance With NFPA 72E-1974 Smoke Detector Placement	0
FPF 2.10, Item No. 7	Columbia Smoke Removal Analysis	0
FPF 2.10, Item No. 30	Control Room Habitability Smoke Intrusion Analysis	0
FPF 2.12, Item No. 15	Availability of Fire Brigade Communications by Fire Area	0
FPF 3.18, Item No. 6	NFPA 20 Code Conformance Review	0
FPF 3.18, Item No. 7	NFPA 14 Code Conformance Evaluation	0
FPF 4.1 Item 2	Normal Shutdown Manual Action Feasibility Review	0
FPSA-1-RE-0001	Fire Probabilistic Safety Results – Quantification and Results	2
FSAR, Amendment 60, Section F.2.2.2	Raceway Fire Barriers	December 2009
FSAR, Amendment 61, Section F.4	Fire Hazards Analysis	December 2011
FTCR/94/0060	Test Report for a 1 Hour Fire Hose Stream Tests on Darmatt KM1 Fire Protection System for Electrical Circuits Systems to ASTM E119 NRC GL 86/10 Supplement 1	B
FTCR/94/0130	Test Report for a 1 Hour Fire Hose Stream Tests on Darmatt KM1 Fire Protection System for End Penetration Seals at Braidwood and Byron NPS – Repeat Test	A
FTCR/95/0025	Report on the One Hour fire test/Five Minute Water Hose Test on Darmatt KM1 Board and Pre-Moulded Systems for Intervening Thermal Shorts Test Date 7 March 1995	B
GEF-3481C	General Electric Control Switches	
GO2-95-013	WNP-2, Operating License NPF-21 Revision To Procedures For Control Room Fires	1/25/95

<u>Number</u>	<u>Title</u>	<u>Revision</u>
LE-06-005	Licensing Basis Impact Evaluation For LCDN-FSAR-06-012 Regarding 8-Hour Portable Lanterns Used For Post Fire Safe Shutdown Manual Actions	0
Licensee Controlled Specification 1.10	Fire Protection	67
Memorandum From J. Harmon, Maintenance Manager To R. Webring, Plant Technical Manager-WPSS	Self Contained Battery Powered Emergency Lighting Periodic Test Requirements	4/29/92
Memorandum From A. Hosler, Manager, WNP-2 Licensing To Distribution	Record Of Telecon – Proposed Use Of Portable Lighting For Fire Protection	5/15/92
NEDO-10466-A	Licensing Topical Report, Power Generation Control Complex, Design Criteria and Safety Evaluation	February 1979
NEDO-33638	BWROG Assessments of Generic Multiple spurious Operations (MSOs) in Post-Fire Safe Shutdown Circuit Analysis for the Operating BWR Plants	0
NRC Letter LI2-87-025	WNP-2 FSAR Amendment 37 (TAC No. 63528)	11/11/87
NRC Letter GI2-89-048	Approved Fire Protection Program at WNP-2 (TAC 63528)	5/22/89
PER 292-287	Problem Evaluation Request For Potential Deficiencies In Appendix R Calculation NE-02-85-19	4/6/1992
PFP-TG-441-456	Pre-Fire Plan Turbine Generator 441-456	006
PFP-RW-467	Pre-Fire Plan Radwaste 467	004
PFP-RW-484-487	Power Block Pre-Fire Plan: Radwaste 484-487	004
PFP-RW-501-507	Pre-Fire Plan Radwaste 501-507	004
SD000177	System Description, Fire Protection	15
SD000204	System Description, Standby Service Water	17
SD000210	System Description, Remote Shutdown	8
SPEC 209	Post Fire Safe Shutdown Analysis Spec 209	

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SPEC 307	Design Specification for Division 300 Section 307 Main Steam System	6
Technical Memorandum TM-2160	B.5.b Implementation	2
Technical Memorandum TM-2181	BWROG Position Paper on fire-Induced Water Hammer	0
TPD-22	Fire Brigade Training Program Description	000
23A1900	Residual Heat Removal System	004
	Emergency Plan	57
	Scientific Columbus Exceltronic AC Current or Voltage Transducers	

MODIFICATIONS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 10365	Appendix R Mod for RHR Valves	1
EC 9123	SM-8 CT Shorting Switches Isolate Overcurrent Relay CKT for CR Ammeter CKT SW-P-1B, RHR-P-2B AND E-CB-B/8 Breaker Cubicles	1
EC 4558	RHR PFSS Valve Protection From Multiple Spurious Hot Shorts	0
EC-6583	Install B5b Cabinets In Reactor Building Stairways To Support New ABN-TSG Procedures	5/6/2009

WORK ORDERS

01135538	01200249	02008609	02008616	01138150
02000723	01185703	02000176	01126331	02004430
01194863	02012584	01175543	01194865	01135538
01200249	01126939	01189016	01169277	01196157
02002569	02010793	02009843	02005239	01169277
02012888	02012919	02013524	01166302	011837786
01183267	01198372	02002660	01188504	02007545
01191924	01189394	0223960	1176830	01166429
01183786	29083270	02012864	02008509	02012293

01180383	02013094	02014565	02014567	02012425
02012930	02014571	02014572	02014575	02014576
0118758	02001957			