

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

December 20, 2012

Mr. William R. Gideon Vice President Progress Energy H. B. Robinson Steam Electric Plant, Unit 2 3581 West Entrance Rd Hartsville, SC 29550

SUBJECT: ROBINSON NUCLEAR PLANT - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000261/2012008

Dear Mr. Gideon:

On October 18, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your H.B. Robinson Steam Electric Plant Unit 2. The enclosed inspection report documents the inspection results, which were discussed with Mr. Glover and other members of your staff. Following completion of additional review in the Region II office, another exit meeting was held by telephone on November 30, 2012, with Mr. Glover and other members of your staff to discuss the final disposition of the inspection results.

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.

The enclosed report documents two NRC-identified findings of very low safety significance (Green) that were also determined to involve a violation of NRC requirements. The NRC is treating these violations as non-cited violations (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest these NCVs, you should provide a 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 DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the H.B. Robinson Steam Electric Plant. In addition, if you disagree with the cross-cutting aspects assigned to the findings 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, RII, and the NRC Senior Resident Inspector at the H.B. Robinson Steam Electric Plant.

You are not required to respond to this letter. In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's 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/

Michael F. King, Chief Engineering Branch 2 Division of Reactor Safety

Docket Nos.: 50-261 License Nos.: DPR-23

Enclosure: Inspection Report 05000261/2012008 w/Attachment: Supplemental Information

cc: (See page 3)

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NAME	RODRIGUEZ	JONES	FANNER	DYMEK	MUSSER		
DATE	12/20/2012	12/12/2012	12/13/2012	12/19/2012	12/20/2012	12/ /2012	12/ /2012
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John W. Flitter Director of Electric & Gas Regulation South Carolina Office of Regulatory Staff Electronic Mail Distribution Letter to William R. Gideon from Michael F. King dated December 20, 2012.

SUBJECT: ROBINSON NUCLEAR PLANT - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000261/2012008 AND NOTICE OF ENFORCEMENT DISCRETION

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-261
License Nos.:	DPR-23
Report Nos.:	05000261/2012008
Licensee:	Carolina Power & Light
Facility:	H.B. Robinson Steam Electric Plant, Unit 2
Location:	Hartsville, South Carolina
Dates:	October 1 – 5, 2012 (Week 1) October 15 – 19, 2012 (Week 2)
Inspectors:	R. Rodriguez, Senior Project Engineer (Lead Inspector)D. Jones, Senior Reactor InspectorR. Fanner, Reactor InspectorJ. Dymek, Reactor Inspector
Approved by:	Michael F. King, Chief Engineering Branch 2 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000261/2012-008; 10/1 - 5/2012 and 10/15 – 19/2012; H.B. Robinson Steam Electric Plant, Unit 2; Triennial Fire Protection Inspection.

This report covers an announced two-week period of inspection by a triennial fire protection team composed of four regional inspectors. Two Green non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after U.S. Nuclear Regulatory Commission (NRC) management review. Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas." 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

<u>Green.</u> The inspectors identified a Green Non-Cited Violation (NCV) of Robinson's License Condition 3. E, "Fire Protection Program", for increasing the amounts of in-situ combustibles in several fire zones within fire area "A" above required limits in NRC approved licensing exemptions. The licensee has entered the finding into the corrective action program as Nuclear Condition Report (NCR) 567284 and established continuous fire watches as well as restricted transient combustibles permits for the fire areas of concern.

The failure to properly evaluate increases in the quantities of in-situ combustibles above those stated as upper limits for anticipated fire severity and duration in HBR2 exemption requests and an associated SER was a performance deficiency. This performance deficiency was determined to be more than minor because the finding was associated with the protection against external events (i.e. fire) attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to external events that prevent undesirable consequences. In seven fire zones upper limits for fire severity were exceeded. Using the guidance contained in the IMC 0609 Appendix F, the inspectors concluded that a Phase 3 analysis was necessary because the noncompliance involved fires leading to main control room abandonment. The Phase 3 analysis concluded that this item would be associated with a finding of very low safety significance (Green) because the fire detection systems, fire brigade, fire barriers, and the Dedicated Shutdown Systems were not affected by increase in fire loading in the affected fire areas. The inspectors identified a cross cutting aspect in the decision making component of the human performance area because the licensee did not use conservative assumptions in decision making to demonstrate the proposed action did not affect the validity of the technical basis for granted exemptions. [H.1(b)] (Section 1R05.02)

<u>Green</u>. The inspectors identified a Green NCV of 10 CFR Part 50.65, Maintenance Rule, for the licensee's failure to identify and correct deficiencies in the emergency lighting system (ELS) preventive maintenance program. The licensee entered the issues into their corrective action program as NCRs 567517 and 567632. The deficiency will be mitigated by the operator's use of flashlights until the deficiencies are corrected.

The licensee's failure to identify and correct deficiencies in the ELS preventive maintenance program 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. Specifically, the high failure rate of battery load test resulted in a lack of reasonable assurance that the ELS would perform its design function of providing illumination for 8 hours during fire events. Utilizing IMC 0609, Appendix F, "Fire Protection Significance Determination Process," the team assigned the performance deficiency to the Post-fire Safe Shutdown category since it affected systems or functions relied upon for post-fire safe shutdown. The finding was then assigned a low degradation rating since the finding minimally impacted the performance and reliability of the fire protection program element. Specifically, the team noted that operators were required to obtain and carry flashlights. Therefore, the finding screened as having very low safety significance (Green). The team identified a cross-cutting aspect in the corrective action program component of the problem identification and resolution area. [P.1(b)] (Section 1R05.08)

B. Licensee Identified Violations

None

REPORT DETAILS

1. **REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R05 Fire Protection

This report presents the results of a triennial fire protection inspection of the H.B. Robinson Steam Electric Plant (HBR2) Unit 2. The inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)," issued October 28, 2011. The objective of the inspection was to review a minimum sample of 3 risk-significant fire areas to verify implementation of the fire protection program (FPP) and to verify site specific implementation of at least one B.5.b mitigating strategy as well as the storage, maintenance, and testing of B.5.b mitigating equipment. The three fire areas (FAs) and associated fire zones (FZs) were selected after reviewing risk information analyzed by a Senior Reactor Analyst from Region II, as well as previous inspection results, plant walk downs of fire areas, relational characteristics of ignition sources to targets, and location of equipment needed to achieve and maintain safe shutdown (SSD) of the reactor. In selecting the B.5.b mitigating strategy sample, the team reviewed licensee submittal letters, safety evaluation reports, licensee commitments, B.5.b implementing procedures, and previous NRC inspection reports. The IP specifies a minimum sample size of three fire areas and one B.5.b implementing strategy for addressing large fires and explosions. This inspection fulfilled the requirements of the procedure. The specific FAs/FZs chosen for review were:

- 1. FA A5, FZ 21 Rod Control Room; second floor of the Auxiliary Building on the 249.50 ft. elevation.
- 2. FA A6, FZ 6 Auxiliary Feedwater Pump Room; ground floor of the Auxiliary Building on the 226 ft. elevation.
- 3. FA B, FZ 4 Charging Pump Room; ground floor of the Auxiliary Building on the 226 ft. elevation.

The team evaluated the licensee's FPP against applicable requirements, including HBR2 Renewed Operating License Condition 3.E, "Fire Protection"; Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix R, "Fire Protection Program For Nuclear Power Facilities Operating Prior To January 1, 1979"; 10 CFR 50.48; commitments to Appendix A of Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1; HBR2 Updated Final Safety Analysis Report (UFSAR); related NRC safety evaluation reports (SERs); and plant Technical Specifications. The review of the B.5.b mitigating strategies was based on the HBR2 B.5.b submittal letters, related NRC SERs, licensee commitments, B.5.b implementing procedures, and previous NRC inspection reports. The team evaluated all areas of this inspection, as documented below, against these requirements. Specific licensing basis documents reviewed are listed in the Attachment.

.01 Protection of Safe Shutdown Capabilities

a. <u>Inspection Scope</u>

For the selected FAs, the inspectors performed physical walk-downs to observe: (1) the material condition of fire protection systems and equipment; (2) the storage of permanent and transient combustibles; (3) the proximity of fire hazards to cables relied upon for SSD; and (4) the licensee's implementation of procedures and processes for limiting fire hazards, housekeeping practices, and compensatory measures for inoperable or degraded fire protection systems and credited fire barriers. The specific documents reviewed are listed in the Attachment.

<u>Methodology</u>

For the selected FA and associated FZs, the team evaluated the potential for fires, the combustible fire load characteristics, and the potential exposure fire severity. The team reviewed the HBR2 Fire Protection Manual, procedure OMM-002, the UFSAR, Appendix 9.5.1A, the Fire Hazards Analysis (FHA) and selected plant administrative procedures which established and implemented controls and practices to prevent fires and to control the storage of permanent and transient combustible materials and ignition sources. These evaluations were performed to ensure that the objectives established by the NRC-approved Fire Protection Program (FPP) were satisfied and to ensure that the licensee had properly characterized in-situ combustible fire loads and limited transient fire hazards in a manner consistent with the plant administrative and FPP procedures.

Operational Implementation

The inspectors reviewed dedicated shutdown procedures (DSP)-001, Alternate Shutdown Diagnostic, DSP-002, Hot Shutdown Using the Dedicated / Alternate Shutdown System, and DSP-003, Hot Shutdown from the Control Room with a Fire in the Charging Pump Room to verify that the shutdown methodology properly identified the systems and components necessary to achieve and maintain SSD conditions. The inspectors performed a walk-down of the DSP procedures to ensure the implementation strategy and the human factors adequacy of the procedures. The inspectors verified that licensee personnel credited for the procedures were available in the event a fire occurred. The inspectors also reviewed selected operator actions to verify that the operators could reasonably perform the specific actions within the time required to maintain plant parameters within specified limits.

b. Findings

<u>Introduction:</u> The inspectors identified a Green Non-Cited Violation (NCV) of Robinson's License Condition 3. E, "Fire Protection Program", for increasing the amounts of in-situ combustibles in several fire zones within fire area "A" above required limits in NRC approved licensing exemptions.

<u>Description:</u> Fire area "A" consists of the general auxiliary building and fire area "B", consists of the charging pump room, volume control tank room and non-regenerative heat exchanger room. Thirteen fire zones within fire area "A" and one fire zone within fire

area "B" consisted, in part, of open hallways as well as rooms containing safety injection pumps, auxiliary feed-water pumps, charging pumps, and the battery room.

These fire zones did not comply with the fixed suppression installation requirements of 10 CFR Part 50, Appendix R, III.G.3.

By letter dated February 15, 1985 to the NRC Office of Nuclear Reactor Regulation, the Carolina Power and Light Company requested an exemption from the detection and suppression requirements of 10 CFR 50 Appendix R, Section III.G.3 in fire areas "A" and "B." This letter stated that the technical bases which justify the exemption requests are summarized, in part, by "Combustible loading results in a maximum fire severity of 24 minutes or less in each zone without fixed suppression". The NRC granted an exemption by letter dated September 17, 1986 which allowed an exemption from the fixed suppression installation requirements of 10 CFR Part 50, Appendix R, III.G.3. In the associated Safety Evaluation Report (SER), enclosure 2, to this letter, it was stated, in part, that within FA "A," the fuel load in Fire Zones 3, 6, 7, 8, 11, 12, 13, 15, 16, 17, 18, 21 and 23 is *low* (less than 38,000Btu/Ft²). Similarly, FZ 4 of FA "B," the fuel load is low, less than 19,000 Btu/Ft², representing an expected duration of approximately 13 minutes. Because of the *low* to *moderate* combustible loading the staff does not anticipate a fire of significant magnitude or duration to occur" and "in no case is the fire loading such that a fire severity greater than 30 minutes would result".

During a review of Combustible Loading Calculation CPL025.0200.0001, the inspectors noted that in fire zones 3, 6, 7, 15, 16, 18 and 23, for which exemptions were granted, fire loading had increased such that a fire of greater than 30 minutes duration would result. In fire zone number 7 (auxiliary building hallway) and fire zone number 16 (battery room) the fire loading had increased to between two and four times the originally stated values (37,000 BTU/Ft² to 74,000 BTU/Ft² and 13,000 BTU/Ft² to 59,000 BTU/Ft² respectively). These increased values were a result of a more detailed plant survey performed in 1996 as well as recent updates from plant modifications and configuration changes. These values represent significant increases beyond the maximum value of 38,000 BTU/Ft² in the SER, which was the basis for the assumption that the fires would be less than 30 minutes duration. In section 3.1.34 of the calculation, the fire loading was divided into four categories; negligible, low, moderate and high. These categories were based upon a fire loading methodology described in the National Fire Protection Association (NFPA) Handbook which assigned these categories a range of fuel loading values, which are expressed in BTU/Ft², as follows; "low" ≤ 100,000 BTU/Ft², "moderate" ≥ 100,000 BTU/Ft² and ≤ 200,000 BTU/Ft², "high" ≥ 200,000 BTU/Ft² and ≤ 400,000 BTU/Ft². The calculation methodology drew an equivalency between the SER's use of qualitative terms "low" and "moderate" and the terminology used in the NFPA Handbook, which specifically assigns much higher fuel load values to these terms. The licensee concluded that as long as the fuel loading remained within the ranges stated in the NFPA Handbook methodology they remained within their licensing bases in these fire zones even though they exceed the stated fire duration values in the exemption request and associated SER. Because HBR2 concluded the values stated in the calculation were within the licensing bases, the impact the increased fire loading had on the SER and UFSAR were not reviewed and documented. The licensee has entered the finding into the corrective action program as NCR 567284.

<u>Analysis:</u> The failure to properly evaluate increases in the quantities of in-situ combustibles above those stated as upper limits for anticipated fire severity and duration in HBR2 exemption requests and an associated SER was a performance deficiency.

This performance deficiency was determined to be more than minor because the finding was associated with protection against external events (i.e. fire) attribute of the

mitigating systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to external events that prevent undesirable consequences as described in IMC 0612, Appendix "B", "Issue Screening". In seven fire zones upper limits for fire severity were exceeded. The presence of in-situ combustibles beyond what was approved by the NRC could result in the increased severity of a fire which could challenge safe shutdown.

The inspectors determined the findings significance in accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process." Phase 1 of the Fire Protection SDP was used to assign a finding category. The category of the fire protection program that was impacted by the finding was "Fire Prevention and Administrative Controls". The element of the finding category impacted was the Plant Combustible Material Controls Program and was evaluated with an exposure time of one year. Using the guidance contained in the Appendix, the inspectors concluded that a Phase 3 analysis was necessary because the noncompliance involved fires leading to main control room abandonment. Based upon the following facts, the Phase 3 analysis concluded that this item would be associated with a finding of very low safety significance (Green):

- The configuration and amounts of available fuel sources would not generate large, fast growth fires.
- Each fire zone was equipped with a NFPA code compliant fixed fire detection system.
- Fire Zone 7, which had the highest combustible loading, had a partial sprinkler system installed in areas adjacent to stacked cable trays and postulated ignition sources.
- Fire extinguishers and a standpipe system with properly spaced hose stations was provided throughout or adjacent to each fire zone.
- Robinson had a dedicated and properly equipped fire brigade.
- Robinson had installed a dedicated safe shutdown system that would not be affected by the increased fire loading in these fire zones.

The inspectors identified a cross cutting aspect in the decision making component of the human performance area because the licensee did not use conservative assumptions in decision making to demonstrate the proposed action did not affect the validity of the technical basis for granted exemptions. [H.1(b)] Specifically the methodology used by the licensee allowed numerous periodic increases in combustible loading, including the most recently revised combustible loading calculation performed on February 20, 2012.

<u>Enforcement:</u> Robinson Nuclear Plant License Condition 3.E states, in part, that "Carolina Power and Light Company (CP&L) shall implement and maintain in effect all provisions of the approved fire protection program (FPP) as described in the Final Safety Analysis Report (FSAR) for the facility and as approved in the Fire Protection SERs dated February 28, 1978 and supplements thereto". Section 9.5.1, "Fire Protection System" of the FSAR states, in part, "that HBR2 be evaluated only against Appendix R, provisions III.,G, III.J and III.O" and that "Exemptions to Appendix R granted to HBR2 are noted in the HBR2 Fire Hazards Analysis (FHA), Appendix 9.5.1A". FHA Section 3.0, Fire Area Analysis states, in part that, "An exemption from the detection/automatic suppression requirements of Appendix R, Section III.G.3 in applicable zones within Area A (B&G) was received by CP&L via NRC letter dated September 17, 1986". In section 2.2 of NRC SER, Enclosure 2, dated September 17, 1986 it is stated that "The fire loading for all of these zones would be considered low and in no case is the fire loading such that a fire severity of greater than 30 minutes would result".

Contrary to the above, since 1996, the licensee failed to implement all provisions of the HBR2 approved FPP in that subsequent increases in fire loading in fire zones 3, 6, 7, 15, 16, 18 and 23 resulted in a calculated fire severity of greater than 30 minutes. The licensee has committed to adopt NFPA 805 and change their fire protection licensing bases to comply with 10CFR50.48(c). Enforcement discretion may be considered in accordance with NRC Enforcement Policy, Section 9.1 "Enforcement Discretion for Certain Fire Protection Issues (10CFR50.48)" and Inspection Manual Chapter 0305, Operating Reactor Assessment Program. However, because the licensee did not take compensatory measures within a reasonable time commensurate with the risk significance of the issue following identification, the NRC is not exercising enforcement discretion for this violation. Specifically, completed corrective actions associated with the implementation of compensatory measures did not include the establishment of fire watches or an analysis of alternative compensatory measures such as the establishment of additional controls for combustible material in the affected areas. The licensee claimed credit for normal operator rounds performed once per shift, however, no guidance was provided to operations staff on the specific fire impairments to be monitored. Several weeks later, following subsequent discussions with the inspection team, the licensee re-evaluated their compensatory measures and established continuous fire watches as well as restricted transient combustibles permits for the FAs of concern.

This violation is being treated as an NCV, consistent with section 2.3.2 of the NRC Enforcement Policy because it was of very low safety significance and was entered into the licensee's corrective action program as NCR 567284. (NCV 05000261/2012008-01, "Failure to Maintain Fire Load Limits in Fire Area A)"

.02 Passive Fire Protection

a. Inspection Scope

For the selected FAs, the inspectors evaluated the adequacy of fire barrier walls, ceilings, floors, mechanical and electrical penetration seals, fire doors, and fire dampers. The inspectors walked down accessible portions of the selected FAs to observe material condition of the passive barriers and to identify any potential degradation or nonconformance. The inspectors compared the installed configurations to the approved construction details and supporting fire endurance test data to assure that the respective fire barriers met the requirements of 10CFR50, Appendix R, Section III.G and Appendix A to BTP APCSB 9.5-1. In addition, the inspectors reviewed licensing bases documentation to verify that passive fire protection features met license commitments. A sample of completed surveillance and maintenance procedures for selected fire doors, fire dampers, and penetration seals were reviewed to ensure that these passive fire

barriers were being properly inspected and maintained. Specific barriers reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.03 Active Fire Suppression

a. <u>Inspection Scope</u>

For the selected FA's, the inspectors performed in-plant observations of the material condition and operational lineup of the fire water intake structure, the diesel and electric motor driven fire pumps and fire protection water supply distribution piping, including manual fire hose and standpipe systems, sprinklers and permanently installed fire extinguishers. Using operating and valve alignment procedures as well as engineering drawings, the inspectors examined the fire pumps and accessible portions of the fire suppression piping system to evaluate operational status, consistency of as-built configurations with engineering drawings, and to verify correct system valve lineups. Fire hose stations and permanently installed fire extinguishers that were inspected are listed in the attachment.

Internal standpipe and hose stations, and heat and smoke detection systems in proximity to the charging pump room (FZ 4), the auxiliary feedwater pump room (FZ 6) and the rod control room (FZ 21) were reviewed against specifications, drawings and engineering calculations to determine whether the fire detection and suppression methods were appropriate for the types of fire hazards that exist in the selected FAs.

The inspectors compared the fire detection and fire suppression systems to the applicable NFPA Standard(s) by reviewing design documents and observing their asinstalled configurations as part of performing the in plant walkdowns. The inspectors reviewed completed periodic surveillance, testing, and maintenance program procedures for the fire detection and suppression systems and compared them to the testing and maintenance requirements of the licensee's FPP and Fire Protection Manual (FPM). This review was to assess whether the test program was sufficient to validate proper operation of the fire detection and suppression systems in accordance with their design requirements.

For the selected FAs, the inspectors compared fire fighting pre-plan strategies to existing plant layout and equipment configuration and to fire response procedures. The inspectors also assessed the condition of fire fighting and smoke control equipment by inspecting equipment located at fire brigade staging and dress out areas. In addition, the inspectors evaluated fire brigade staffing, qualification and training. "Letters of Agreement" with off-site emergency responders were also reviewed.

b. Findings

No findings were identified.

.04 Protection from Damage from Fire Suppression Activities

a. Inspection Scope

The inspectors evaluated whether manual water-based fire fighting activities or heat and smoke migration from fires within the selected FAs could adversely affect equipment credited for SSD, inhibit access to alternate shutdown equipment, or adversely affect local operator actions required for SSD. The inspectors reviewed HBR2 evaluations addressing concerns identified in Information Notice 1998-31, "Fire Protection System Design Deficiencies and Common Mode Flooding of Emergency Core Cooling System Rooms at Washington Nuclear Project Unit 2". Fire Strategies (Pre-Fire Plans); Fire Brigade Training Procedures; heating, ventilating and air conditioning drawings; and, Fire Abnormal Operating Procedures were also reviewed to verify that inter-area migration of water or ventilation of heat and smoke was addressed and would not adversely affect SSD equipment or the performance of operator manual actions.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. <u>Inspection Scope</u>

The inspectors reviewed the licensee's UFSAR, the Fire Protection Manual, licensee staff training materials and other applicable information to gain an understanding the licensee's Alternative Shutdown Methodology. The inspectors reviewed applicable process and instrumentation diagrams (P&IDs), Control Wiring Diagrams and Appendix R drawings to gain an understanding of credited equipment's flowpath and function. The inspectors reviewed applicable licensee calculations to ensure the alternative shutdown methodology properly identified systems and components to achieve and maintain safe-shutdown for the FAs selected for review. The inspectors assessed the licensee's ability to meet the strategy's intent with or without the assistance of off-site power available. The inspectors assessed the licensee's ability to use equipment from an alternate location.

The team assessed the timeliness of the operators in identifying and assessing the initial plant conditions, response to suspected fire, and subsequent actions credited afterwards. The inspectors verified that licensee personnel credited for procedure implementation had procedures available, were trained on implementation, and were available in the event a fire occurred. Reviews included verification that alternative shutdown could be accomplished with or without offsite power.

Operational Implementation

The inspectors reviewed procedure DSP-002, Hot Shutdown Using the Dedicated / Alternate Shutdown System, to verify the adequacy of this procedure to mitigate a fire in the rod control room. The inspectors performed a walk-down of the procedure steps with operations personnel to assess the implementation strategy and human factors adequacy of the procedure. During the walk-down, the inspectors assessed the expected ambient conditions, relative difficulty and operator familiarization associated with each operator manual action. The inspectors reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage. The inspectors reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits. Additionally, the inspectors reviewed operator training materials and attendance rosters to verify the adequacy of training.

The inspectors reviewed completed surveillance test procedures provided by the licensee, which tested the transfer function capability of credited systems and components. The inspectors assessed the licensee's ability to operate systems or components from an alternate location as well as the steps performed by the licensee to ensure erroneous indication would not be present at the primary location. The inspectors reviewed the licensee post-fire SSD analysis for the credited FAs. The inspectors reviewed licensee P&IDs and Appendix R drawings to determine if flow diversions, loss of coolant, or other scenarios could adversely affect the nuclear power plants capability to achieve and maintain hot shutdown from the dedicated shutdown components and systems. The inspectors reviewed applicable control wiring diagrams provided by the licensee to verify the licensee's ability to operate systems or components from an alternate location in response to a fire event if required by the analysis.

b. Findings

No findings were identified.

- .06 Circuit Analyses
- a. <u>Inspection Scope</u>

The inspectors reviewed the licensee's post-fire SSD analysis to ensure the analysis was adequately translated into procedures. The inspectors reviewed the UFSAR, P&IDs, Appendix R drawings, calculations, training material, and other documentation to gain insights on the credited analysis. The inspectors verified the licensee identified and documented the applicable components and systems needed for the FAs chosen. The inspectors also reviewed these materials to determine if the licensee adequately identified any potential adverse condition such as flow diversion and circuit failures which could impact the safe shutdown strategy. The inspectors verified for a sample of components that fire induced circuit damage would not degrade the safe shutdown function due to inadequate circuit coordination. In addition, the inspectors selected conduits containing cables within the selected FAs to determine if fire damage to these cables had an impact to the safe shutdown strategy. In instances where potential circuit failures or coordination concerns arose, the inspectors performed and additional review of the associated calculations and performed interviews of licensee staff to verify that no adverse effect existed in achieving SSD.

The inspectors reviewed a sample of components to determine if circuit breaker coordination and fuse protection were analyzed and capable of protecting the credited power sources. The inspectors reviewed licensee calculations and interviewed licensee staff to ensure the licensee properly analyzed and protected equipment consistent with the credited analysis.

b. <u>Findings</u>

No findings were identified.

- .07 <u>Communications</u>
- a. Inspection Scope

The team inspected the contents of designated emergency storage lockers and reviewed the alternate shutdown procedures to verify that dedicated alternative shutdown communications system was available, operable, and adequate for the performance of designated activities. The team also reviewed the communication systems available at different locations within the plant that would be relied upon to support fire event notification and fire brigade fire fighting activities to verify their availability. During this review the team considered the effects of ambient noise levels, clarity of reception, reliability and coverage patterns. In addition, the team reviewed the electrical power supplies and cable routing for the communication systems to verify that the plant telephones, portable radios, and mini-cell phones would be available to support the operators in the conduct and coordination of their required duties during a fire.

b. Findings

No findings were identified.

- .08 Emergency Lighting
- a. Inspection Scope

The inspectors performed plant walk downs to verify that 8-hour emergency lights were appropriately located to illuminate access and egress pathways and to illuminate post fire safe shutdown equipment and instrumentation. The inspectors reviewed surveillance records to verify that the licensee periodically confirmed the functionality of

the lights to meet their eight hour mission time as required by the FPP. Additionally, the inspectors reviewed completed 8-hour discharge test records to verify the adequacy of the licensee's five year battery replacement schedule. The team validated that the emergency lighting system was scoped into the licensee's Maintenance Rule Program. Specific documents reviewed by the team are listed in the Attachment.

b. <u>Findings</u>

<u>Introduction</u>: The inspectors identified a Green non-cited violation (NCV) of 10 CFR Part 50.65, Maintenance Rule, for the licensee's failure to identify and correct deficiencies in the emergency lighting system (ELS) preventive maintenance program.

<u>Description</u>: The emergency direct current lighting system consists of self-contained units with each unit containing a battery, lamps, and related electronics for unit operation and monitoring. Emergency lights provide illumination of equipment and pathways used in fire protection safe shutdown procedures. One hundred and twenty-seven emergency lights are scoped into the licensee's maintenance rule program because they are required by the fire protection program. The licensee's maintenance rule program defined a function failure for the ELS as "unplanned unavailability of greater than 10% of individual units during testing or actual demand."

The team identified an adverse trend in ELS failures during the review of testing records and condition reports. Additionally, the team determined that the performance monitoring criteria in the maintenance rule program was inadequate to provide reasonable assurance that appropriate preventive maintenance was being adequately performed. The team determined that a high number of battery load tests failures could occur without a functional failure being recorded in the maintenance rule program. The licensee's subsequent evaluation documented the following deficiencies:

- a high failure rate of five-year battery load tests; 58% in 2010 and 46% in 2011
- five-year battery load tests were not performed on every battery as required
- batteries were not replaced as required during a 2006 2008 time period
- a high rate of degradations were identified during the semi-annual functional test
- multiple examples of five year battery load tests and semi-annual functional test failures were not entered into the corrective action program.
- inadequate trending of ELS deficiencies
- maintenance rule criteria was inadequate because it failed to track failures associated with the two different types of testing

<u>Analysis</u>. The licensee's failure to identify and correct deficiencies in the ELS preventive maintenance program 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. Specifically, the high failure rate of battery load test resulted in a lack of reasonable assurance that the ELS would perform its design function of providing illumination for 8 hours during fire events.

The significance of this finding was evaluated using IMC 0609, Appendix F, "Fire Protection Significance Determination Process," because the performance deficiency affected fire protection defense-in-depth strategies involving post-fire safe shutdown systems. The team assigned the performance deficiency to the Post-fire Safe Shutdown category since it affected systems or functions relied upon for post-fire safe shutdown. The finding was evaluated with an exposure time of one year and was assigned a low degradation rating since the finding minimally impacted the performance and reliability of the fire protection program element. Specifically, the team noted that operators were required to obtain and carry flashlights. Therefore, the finding screened as having very low safety significance (Green).

The team identified a cross-cutting aspect in the corrective action program component of the problem identification and resolution area because the licensee did not adequately trend and assess information to identify programmatic and common cause problems. Specifically, the licensee's maintenance and engineering personnel failed to identify the adverse trend of ELS load tests failures that occurred in 2010 and 2011. [P.1(b)]

<u>Enforcement</u>. Title 10 of the Code of Federal Regulations, Part 50, Section 65,(a)(1), requires, in part, that licensees shall monitor the performance or conditions of structures, systems, or components (SSCs) within the scope of the maintenance rule as defined by 10 CFR 50.65 (b), against licensee established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions. Title 10 of the Code of Federal Regulations, Part 50, Section 65, Paragraph (a)(2) states, in part, that monitoring as specified in 10 CFR 50.65 (a)(1) is not required where it has been demonstrated that the performance or condition of a SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

Contrary to the above, since 2010, the licensee failed to demonstrate that the performance of the ELS was being effectively controlled through the performance of appropriate preventive maintenance, which resulted in from the failure to establish goals in a manner sufficient to provide reasonable assurance that the ELS was capable of fulfilling its intended functions. Specifically, the licensee failed to identify the high failure rate of ELS batteries which resulted in a failure to monitor the system as required by the maintenance rule. This deficiency will be mitigated by the operator's use of flashlights until the deficiencies are corrected. This violation is being treated as an NCV, consistent with section 2.3.2 of the NRC Enforcement Policy because it was of very low safety significance and was entered into the licensee's corrective action program as NCRs 567517 and 567632. (NCV 05000261/2012008-01, "Failure to Identify and Correct Deficiencies in the Emergency Lighting System Preventive Maintenance Program)"

09. Cold Shutdown Repairs

a. Inspection Scope

The inspectors reviewed the licensee procedures, equipment, and materials credited for repairing components required for cold shutdown. The inspectors reviewed and verified that repair equipment, components, tools, and materials (e.g., pre-cut cable connectors with prepared attachment lugs) were available and accessible on site to plant personnel.

The inspectors reviewed the completed surveillances OST-922, "Dedicated Shutdown Equipment Identification Audit," Rev. 29 to verify that the licensee periodically assesses the availability of cold shutdown equipment. The inspectors reviewed the physical storage of credited cold shutdown equipment specified in OST-922. The inspectors reviewed the applicable dedicated shutdown procedures credited by the licensee for implementation of the actual repairs utilizing the equipment specified in OST-922.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. <u>Inspection Scope</u>

The team reviewed the administrative controls for out-of-service, degraded and/or inoperable fire protection features (e.g. detection and suppression systems and passive fire barriers) as well as hot work from cutting, welding and grinding activities. The team reviewed selected items from unavailability data auto log lists for each major fire system, assessing the adequacy of the components being returned to service within time frames commensurate with their importance. The team also observed performance of a fire protection work activity which returned a failed smoke detector in the work controls center to service. At the time of the inspection there were no scheduled work activities or impairments requiring the use of either continuous or roving fire watch personnel that would allow the team to observe that programmatic requirements were being complied with. The inspectors also reviewed the operator compensatory actions log (dated October 17, 2012) to identify FPP compensatory measures and to verify that the adequacy of the interim measures.

b. <u>Findings</u>

No findings were identified.

.11 Review and Documentation of Fire Protection Program Changes

a. Inspection scope

The inspectors reviewed the 2010 and 2011 Annual Reviews of the Fire Protection Program to verify that changes were in accordance with the fire protection license condition and had no adverse affect on the ability to achieve SSD.

b. Findings

No findings were identified

12. <u>Control of Combustibles and Ignition Sources</u>

a. <u>Inspection Scope</u>

The inspectors conducted walkdowns of numerous plant areas that were important to reactor safety, including the selected FAs, to verify the licensee's implementation of fire protection requirements as described in procedures FP-003, "Control of Transient Combustibles", FIR NGGC-0003, "Hot Work Permit", FIR NGGC-0004, "Determination of Combustible Loading and Equivalent Fire Severity" and EGR-NGGC-0102, "Safe Shutdown / Fire Protection Review". The inspectors verified that the licensee had properly evaluated limited transient fire hazards, controlled hot-work activities, and maintained general housekeeping consistent with administrative control procedures and the fire hazards analysis (FHA). For the selected FAs, the inspectors evaluated the potential for fires and explosions, and potential fire severity. There were no hot work activities ongoing during the inspection so direct observations of hot work related activities could not be performed.

b. <u>Findings</u>

No findings were identified.

.12 <u>B.5.b Inspection Activities</u>

a. <u>Inspection Scope</u>

The inspectors reviewed, on a sample basis, the licensee's steam generator control and makeup from alternative water supply mitigation guidelines for large fires and explosions to verify that the guidelines were feasible, personnel were trained to implement the strategy, and equipment was properly staged and maintained. The inspectors requested and reviewed inventory and maintenance records of required equipment. Through discussions with plant staff, review of documentation, and plant walk-downs, the inspectors verified the engineering basis to establish reasonable assurance that the makeup capacity could be provided using the specified equipment and water sources. The inspectors reviewed the licensee's capability to provide a reliable and available water source and the ability to provide the minimum fuel supply to the portable pumping equipment. The inspectors performed a walk-down of the storage and staging areas for the B.5.b equipment to verify that equipment identified for use in the current procedures were available, calibrated and maintained. In the presence of licensee staff, the inspectors conducted an independent audit and inventory of required equipment and a visual inspection of the dedicated credited power and water sources. The inspectors reviewed training records of the licensee's staff to verify that operator training/familiarity with the strategy objectives and implementing guidelines were accomplished according to the established training procedures. The inspectors verified, by review of records and physical inspection, that B.5.b equipment was currently being properly stored. maintained, and tested in accordance with the licensee's B.5.b program procedures.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. <u>Inspection Scope</u>

The inspectors reviewed recent independent licensee audits for thoroughness, completeness and conformance to FPP requirements. Specifically, fire protection system health reports and HBR2 Nuclear Oversight Fire Protection Quality Assurance Program audit reports were reviewed. In addition, other corrective action program (CAP) documents, including completed corrective actions documented in selected NCRs were reviewed to verify that identified fire protection problems potentially or actually affecting the plant were appropriately entered into, and resolved by, the CAP process. The NCRs were reviewed with regard to the attributes of timeliness and apparent cause determination to ensure that proposed corrective actions addressed the apparent cause, reportability and operability determination.

b. <u>Findings</u>

No findings were identified.

4OA6 Meetings, Including Exit

On October 18, 2012, the inspection team leader presented the preliminary inspection results to Mr. M. Glover and other members of the licensee's staff. The licensee acknowledged the results. A re-exit was conducted with the licensee's staff on November 30, 2012, to discuss the final disposition of the inspection results. The licensee also confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

- S. Thompson, Fire Protection System Engineer
- F. Modlin, RES
- C. Chan, Fleet Safe Shutdown Analyst
- J. Kronz, Operations
- J. Ertman, Corporate Fire Protection Supervisor
- S. Connelly, Regulatory Affairs
- D. Martrano, Supervisor of Engineering Programs
- R. Hightower, Supervisor of Regulatory Affairs
- M. Glover, Director of Site Operations
- A. Holder, Corporate Fire Protection
- W. Farmer, Manager of Recovery Support
- C. Thompson, Emergency Preparedness

NRC personnel

- C. Scott, Resident Inspector, H.B. Robinson Steam Electric Plant
- J. Hickey, Senior Resident Inspector, H.B. Robinson Steam Electric Plant
- M. King, Chief, Engineering Branch 2, Division of Reactor Safety, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed		
05000261/2012008-01	NCV	Failure to Maintain Fire Load Limits in Fire Area A (Section 4OA5.02)
05000261/2012008-02	NCV	Failure to Identify and Correct Deficiencies in the Emergency Lighting System Preventive Maintenance Program (Section 4OA5.08)

Discussed

None

LIST OF DOCUMENTS REVIEWED

LIST OF FIRE BARRIER FEATURES INSPECTED (Refer Report Section 1R05.02 and 1R05.03)

Fire Barriers Floors/Walls/Ceiling Identification	<u>Description</u>
Poured concrete wall	FZ 7 to FZ 2
Concrete ceiling	FZ 16 to FZ 34
Fire Damper Identification FD-16 FD-22 FD-23 FD-24 FD-25 FD-51 FD-51 FD-52 FD-80	$\begin{array}{c} \underline{\text{Description}} \\ FZ \ 4 \ \text{to} \ FZ \ 7 \\ FZ \ 21 \ \text{to} \ FZ \ 9 \\ FZ \ 21 \ \text{to} \ FZ \ 9 \\ FZ \ 21 \ \text{to} \ FZ \ 9 \\ FZ \ 21 \ \text{to} \ FZ \ 10 \\ FZ \ 21 \ \text{to} \ FZ \ 10 \\ FZ \ 21 \ \text{to} \ FZ \ 21 \ \text{to} \ FZ \ 21 \\ FZ \ 21 \ \text{to} \ 41 \ \text{to} \$
FD-109 <u>Fire Door Identification</u> FDR-2 FDR-5 FDR-16 FDR-26	Description FZ 4 to FZ 12 FZ 6 to FZ 25 FZ 20 to FZ 21 FZ 6 to FZ 7
Fire Barrier Penetration Seal Identification FB-04-08-D	Description FZ 4 to FZ 12
<u>Wall, Ceiling, Floor Identifications</u> FZ 4 FZ 6 FZ 21	<u>Description</u> Charging Pump Room Auxiliary Feedwater Pump Room Rod Control Room
Fire Extinguishers Inspected No. 282 No. 282 No. 289	Description Within FZ 4 Adjacent to FZ 6 Within FZ 21
Fire Hose Stations Inspected Station No. 78 Station No. 29 Station No. 35	<u>Description</u> Entrance to FZ 4 Entrance to FZ 6 Entrance to FZ 21

LIST OF COMPONENTS REVIEWED (Refer to Report Sections 1R05.05- and 1R05-.06)

Components Sampled CC-716B, Component Cooling Water Inlet Valve CHG-PMP-A, "A" Centrifugal Charging Pump CHG-PMP-B, "B" Centrifugal Charging Pump CVC-200A, Letdown Orifice Isolation CVC-200B, Letdown Orifice Isolation CVC-200C, Letdown Orifice Isolation FCV-6416, SDAFW Pump Discharge Flow Control Valve LCV-460A, Letdown Line Stop LCV-460B, Letdown Line Stop SI-862A, RHR Loop to RWST Isolation SI-862B, RHR Loop to RWST Isolation SI-864B, RWST Discharge SI-878A, SI Pump Discharge Hdr Cross-Conn SI-878B, SI Pump Discharge Hdr Cross-Conn SW-PMP-D, Service Water Pump Delta AFW-V2-14A, SDAFW Pump FW Disch to SG "A" AFW-V2-14B, SDAFW Pump FW Disch to SG "B" AFW-V2-14C, SDAFW Pump FW Disch to SG "C" V6-12D, North Service Water Header Supply

Instruments

LT-475, CH2 SG 1 Narrow Range Level Indicator LT-476, CH3 SG 1 Narrow Range Level Indicator LT-477, WR 'A' Steam Generator Level LT-485, CH2 SG 2 Narrow Range Level Indicator LT-486, CH3 SG 2 Narrow Range Level Indicator LT-487, WR 'B' Steam Generator Level LT-495, CH 3 SG 3 Narrow Range Level Indicator LT-496, CH 3 SG 3 Narrow Range Level Indicator LT-497, WR 'C' Steam Generator Level TI-423, DSD Loop "B" T Hot TI-433, DSD Loop "C" T Hot

Transfer Switches

CCP-A, Charging Pump "A" local control switch CCP-B, Charging Pump "B" local control switch CVC-200A, Letdown Orifice Isolation local control switch CVC-200B, Letdown Orifice Isolation local control switch CVC-200C, Letdown Orifice Isolation local control switch

LIST OF DOCUMENTS REVIEWED

Procedures

- AOP-041, Response to Fire Event, Rev. 7
- APP-044, Fire Alarm Console, Rev. 20
- CM-620, Fire Door Installation, Rev. 20CM-621, Structural Mechanical and Electrical Penetration Fire Barriers, Rev. 34
- CM-621, Structural, Mechanical and Electrical Penetration Fire Barriers, Rev. 34
- DSP-001, Alternate Shutdown Diagnostic, Rev. 12
- DSP-001, Alternate Shutdown Diagnostic, Rev. 13
- DSP-002, Hot Shutdown Using the Dedicated / Alternate Shutdown System, Rev. 45
- DSP-002, Hot Shutdown Using the Dedicated / Alternate Shutdown System, Rev. 46
- DSP-003, Hot Shutdown from the Control Room With A Fire In the Charging Pump Room, Rev. 20
- DSP-003, Hot Shutdown from the Control Room with a Fire in the Charging Pump Room, Rev. 21
- DSP-007, Cold Shutdown Using the Dedicated/Alternate Shutdown System, Rev. 28
- DSP-008, "RHR Pump Power Repair Procedure," Rev. 9
- DSP-009, "RHR System Flow Indication Repair Procedure," Rev. 4
- DSP-011, "RHR System Temperature Indication Repair Procedure," Rev. 2
- DSP-012, "Pressurizer PORV Control/Power Repair Procedure," Rev. 12
- DSP-013, "RHR Flow Control Valves Repair Procedure," Rev. 5
- EDGM-004, Steam Generators, Rev. 8
- EDGM-010, Emergency Diesel Make-up Pump Setup and Operation, Rev. 4
- EPP-21, Energizing Pressurizer Heaters from Emergency Busses, Rev. 18
- FIR-NGGC-0003, Hot Work Permit, Rev. 5FIR-NGGC-0004, Determination of Combustible Loading and Equivalent Fire Severity, Rev. 2
- FP-003. Control of Transient Combustibles. Rev. 27
- FP-004, Duties of a Fire Watch, Rev. 14
- FP-006, Handling of Flammable Liquids and Gases, Rev. 4
- FP-010, Housekeeping Controls, Rev. 30
- FP-012, Fire Protection Systems Minimum Equipment and Compensatory Actions, Rev. 17
- FP-013, Fire Protection Systems Surveillance Requirements, Rev. 10
- FP-014, Control of Fire Barrier Penetrations, Rev. 10
- OMM-002, Fire Protection Manual, Rev. 10
- OMM-003, Fire Protection Pre-Plans Unit 2, Rev. 58
- OMM-003, Fire Protection Pre-Plans/Unit No. 2, Rev. 59
- OP-801, Fire Water System, Rev. 56
- OP-802, Low Voltage Fire Detection and Actuation System, Rev. 15
- OST-602, Unit 2 Fire Water System Flow-path Verification and Valve Cycling, Rev. 50
- OST-603, Motor Driven Fire Water Pump and Engine Driven Fire Water Pump Test, Rev. 33
- OST-609, Inspection and Flushing of the Interior Fire Hose Stations, Rev. 29
- OST-610, Unit 2 Portable Fire Extinguishers, Fire Hose Stations & Houses, Rev. 54
- OST-611-2, Low Voltage Fire Detection and Actuation System Zones 3, 4 & 5, Rev. 3
- OST-611-3, Low Voltage Fire Detection and Actuation System Zones 6 & 7, Rev. 5
- OST-611-9, Low Voltage Fire Detection and Actuation System Zones 15 & 21, Rev. 5
- OST-622, Fire Suppression Water System Motor Driven Fire Pump Test, Rev. 25
- OST-623, Fire Barrier Penetration Seal Inspection, Rev. 24
- OST-624, Fire Damper Inspection, Rev. 22
- OST-625, Fire Door Inspection, Rev. 32
- OST-632, Unit 2 Fire Suppression Water System Flow Test, Rev. 20

OST-639, Fire Equipment Inventory, Rev. 31

OST-646, Fire Suppression Water System Engine Driven Fire Pump Test, Rev.28

OST-647, Exterior Hose Station and Hose House Hydrostatic Testing, Flushing and Valve Cycling, Rev. 26

OST-648, CCW Pump Room One-hour Fire Barrier Wrap Inspection, Rev. 5

OST-906, "Emergency Control Station Test (Refueling)," Rev. 22

OST-906, "Emergency Control Station Test (Refueling)," Rev. 28

OST-918, "Dedicated Shutdown Equipment and Instrumentation Check (Monthly)," Rev.16

OST-922, "Dedicated Shutdown Equipment Identification Audit," Rev. 298

OST-922, "Dedicated Shutdown Equipment Identification Audit," Rev. 29

TPP-219, Fire Protection Training Program, Rev. 22

Fire Protection Pre-Plans and Fire Drill Critiques

Fire Drill Critique 10-3Q-05U, dated 08/27/2012

Fire Drill Critique 10-4Q-04U, dated 12/08/10

OMM-003, Fire Protection Pre-Plans – Unit 2, Section 8.43, Auxiliary Feedwater Pump Room, Rev. 58

OMM-003, Fire Protection Pre-Plans – Unit 2, Section 8.27, Rod Control Room, Rev. 58 OMM-003, Fire Protection Pre-Plans – Unit 2, Section 8.6, Charging Pump Room, Rev. 58

Completed Surveillances

EPPRO-02, Monthly B.5.b Emergency Key Box Surveillance, dated 10/17/2012 OST-609, Inspection and Flushing of the Interior Fire Hose Stations, 5/26/2012 OST-610, Unit 2 Portable Fire Extinguishers, Fire Hose Stations & Houses, 9/21/2012 OST-611-2, Low Voltage Fire Detection and Actuation System Zones 3, 4 & 5, 9/7/2012 OST-611-3, Low Voltage Fire Detection and Actuation System Zones 6 & 7, 9/16/2012 OST-611-9, Low Voltage Fire Detection and Actuation System Zones 15 & 21, 6/23/2012 OST-622, Fire Suppression Water System Motor Driven Fire Pump Test, 5/15/2012 OST-623, Fire Barrier Penetration Seal Inspection, 5/23/2012 OST-624, Fire Damper Inspection, 1/07/2010 OST-624, Fire Damper Inspection, 6/18/2011 OST-625. Fire Door Inspection. 1/12/2011 OST-625, Fire Door Inspection, 12/13/2011 OST-625, Fire Door Inspection, 5/21/2012 OST-625, Fire Door Inspection, 6/20/2011 OST-632, Unit 2 Fire Suppression Water System Flow Test, 4/14/2011 OST-646, Fire Suppression Water System Engine Driven Fire Pump Test, 9/19/2012 OST-647, Exterior Hose Station and Hose House Hydrostatic Testing, Flushing and Valve Cvcling, 5/14/2012 OST-648, CCW Pump Room One-hour Fire Barrier Wrap Inspection, 3/2/2012 (WO 2047808) OST-648, CCW Pump Room One-hour Fire Barrier Wrap Inspection, 7/22/2011 OST-681, EOF/TSC Building Fire Detection FDAP C1 Zones (Witnessed) 10/04/2012

OST-906, Emergency Control Station Test, dated 3/20/2012

Audits and Self Assessment Reports

2010 Annual Review of the Fire Protection Program

2011 Annual Review of the Fire Protection Program

R-FP-10-01 Nuclear Oversight, Assessment of Fire Protection Program, 4/1/2010 R-FP-12-01 Nuclear Oversight, Assessment of Fire Protection Program, 4/4/2012 Self Assessment (SA) 508608-03, HBR2 Fire Protection / Safe Shutdown Program Effectiveness

Work Orders

00534211-01, Test Distribution Panel "B" Breakers 00431547-01, Kirk Key Breaker for Alternate Feed, 7/16/ 2003 00767039-01, PM for Kirk Key Breaker 52/CB-3, 4/23/07 01647327-01, N-51 Online Channel Calibration, 7/01/2011 01647326-01, N-52 Online Channel Calibration, 7/29/2011

Engineering Changes

EC 79037, Revalidation of the HBR2 Fire Safe Shutdown Analysis and Development of the Fire Safe Shutdown Program Manager Database (FSSPMD) and Safe Shutdown (SSD) fault tree logic (CAFTA), Rev. 0

Calculations and Evaluations

Apparent Cause Evaluation Report for NCR 505997, Inadvertent Actuation of Halon System in Room E1/E2

Combustible Loading Calculation CPL025.0200.0001, Rev. 31

DP-027AFW, Design Basis Differential Pressure Report for the Motor Operated Valves (MOVs) in the Auxiliary Feedwater System (AFW), Rev. 1

EC 0000079037, Progress Energy – Robinson Plant Safe Shutdown Validation Project, Rev. 0 EGR-NGGC-0102, "Safe Shutdown/Fire Protection Review, Rev. 7

FNP-HBR2-300, Section 5.1.4.4, "Time Critical Actions," Rev.

FPP-HBR2-100, 10 CFR 50 Appendix R Long-Term Compliance Safe Shutdown Component Index, Rev. 11

FPP-HBR2-150, 10 CFR 50 Appendix R Long-Term Compliance Safe Shutdown Cable Schedule, Rev. 11

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RN107-È-20-F, Breaker Coordination Study for 4160-Volt Bus 5; 480-Volt Bus 5; and MCCs 15 & 17, Rev. 0

HBR2-8.005, 208V Motor Control Center 9 and 10 Coordination 10 CFR 50 Appendix R Associated Circuit, Common Power Supply Analysis, Rev. 2

HBR2-E/ELEC-1216, The Fire Safe Shutdown Analysis for H.B. Robinson Nuclear Plant, Rev. 0

HBR2-E-1.025, 120 VAC Instrument Bus Coordination (Instrument Buses 1, 2, 3, 4, 7A, 7B, 9A, 9B), Rev. 4

HBR2-E-2.009, Overcurrent Protection Emergency Bus E1 and E2 Emergency Supply, Rev. 3

HBR2-E-2.010, Overcurrent Protection Emergency Bus E1 and E2 Normal Supply, Rev. 3

HBR2-E-2.015, 208V Motor Control Center 9 and 10 Coordination 10 CFR 50 Appendix R Associated Circuit, Common Power Supply Analysis, Rev. 2

HBR2-E-6.005, Overcurrent Protection and Coordination of the 125 VDC Distribution System (Trains A and B), Rev. 1

HBR2-E-8.005, 10 CFR 50 Appendix R Associated Circuit, Common Power Supply Analysis, Rev. 4

HBR2-E-8.050, Appendix R Transient Analysis and Timeline Evaluation, Rev. 2

HBR2-M/BMRK-1010, Code Compliance Evaluation NFPA 14 – Standpipe and Hose Systems, Rev. 6

HBR2-M/MECH-1683, Evaluation of Non-Standard Fire Barrier Penetration Seals in Fire Zone 12, Operating Experience Evaluation, Fire System Water Hammer Resulting in Flooding of Emergency Core Cooling Equipment, OE-9077, 11/05/1998

Licensing Basis Documents

CP&L letter, NLS-84-516, Fire Protection Rule – Alternate Safe Shutdown Capability – Sections III.G.3 and III.L

CP&L letter, NLS-85-140, Appendix R – Alternate Shutdown Capability Open Item Resolution and Additional Clarification, dated 6/18/1985

Exemption Request from Certain Requirements of 10CFR50 Appendix R, Sections III.G.2 and III.G.3, H. B. Robinson Steam Electric Plant Unit No. 2, September 17, 1986

H.B. Robinson Steam Electric Plant, Unit No. 2 Docket No. 50-261/License No. DPR-23, Appendix R Exemption Request, 2/13/1985

H.B. Robinson Steam Electric Plant, Unit No. 2 Operating License No. 50-261, Request for License Amendment, Fire Protection License Condition and Technical Specifications, 2/21/1992 H.B. Robinson Steam Electric Plant, Unit No. 2 UFSAR Section 9.5-1, Fire Protection Systems Letter from Carolina Power & Light Company (CPL) dated February 1, 1980 titled Response to

Questions Regarding Safe Shutdown Capability

OMM-002, Fire Protection Manual, Rev. 45

Safety Evaluation by the Office of Nuclear Reactor Regulation, H.B. Robinson Steam Electric Plant Unit No. 2, September 17, 1986

Updated Final Safety Analysis Report (UFSAR), Rev. 15

Drawings

5137C5507, Sh. 1, Fire Wall Elevations Sections and Details at Safety Injection and Charging Pump Rooms, Rev. 2

- 5379-1082, Safety Injection System Flow Diagram, Sh. 1, Rev. 44
- 5379-1082, Safety Injection System Flow Diagram, Sh. 2, Rev. 49
- 5379-1082, Safety Injection System Flow Diagram, Sh. 3, Rev. 26
- 5379-1082, Safety Injection System Flow Diagram, Sh. 4, Rev. 31
- 5379-1082, Safety Injection System Flow Diagram, Sh. 5, Rev. 39
- 5379-1484, Residual Heat Removal System Flow Diagram, Sh. 1, Rev 45
- 5379-1971, Reactor Coolant System Flow Diagram, Sh. 1, Rev. 39
- 5379-1971, Reactor Coolant System Flow Diagram, Sh. 2, Rev. 51
- 5379-3513, S.G. 'A' Protection CH II & II, Rev. 22
- 5379-3516, S.G. 'B' Protection CH 1 & Wide Range Level, Rev. 21
- 5379-3517, S.G. 'C' Protection CH 1 & Wide Range Level, Rev. 23
- 5379-3518, S.G. 'A' Protection CH 1 & Wide Range Level, Rev. 23
- 5379-376, Component Cooling Water System Flow Diagram, Sh. 1, Rev. 43
- 5379-376, Component Cooling Water System Flow Diagram, Sh. 2, Rev. 33
- 5379-376, Component Cooling Water System Flow Diagram, Sh. 3, Rev. 27
- 5379-376, Component Cooling Water System Flow Diagram, Sh. 4, Rev. 35
- 5379-4642, 4KV Fast Transfer Logic Diagram, Sh. 1, Rev. 4
- 5379-5374, 480V One Line Diagram, Sh. 1, Rev. 27
- 5379-685, Chemical & Volume Control System Purification & Make-up Flow Diagram, Sh. 1, Rev. 53
- 5379-685, Chemical & Volume Control System Purification and Make-up Flow Diagram, Sh. 2, Rev. 60
- 5379-685, Chemical & Volume Control System Purification and Make-up Flow Diagram, Sh. 3, Rev. 34
- 5379-685, Chemical and Volume Control System, Sh. 1, Rev. 53
- 5379-685, Chemical and Volume Control System, Sh. 2, Rev. 60
- 5379-685, Chemical and Volume Control System, Sh. 3, Rev. 34
- 5379-920, Liquid Waste Disposal System Flow Diagram, Sh. 4, Rev. 38
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B-190628, Waste Condensate Pump D, Sh. 1028, Rev. 6 B-190628, Waste Condensate Recirculation Pump, Sh. 1029, Rev. 5 B-190628, Westinghouse Switch Development (Gemco Replacements), Sh. 37A, Rev. 2 G-190197, Feedwater Condensate & Air Evacuation System Flow Diagram, Sh. 1, Rev. 81 G-190197, Feedwater Condensate & Air Evacuation System Flow Diagram, Sh. 2, Rev. 71 G-190197, Feedwater Condensate & Air Evacuation System Flow Diagram, Sh. 3, Rev. 51 G-190197, Feedwater Condensate & Air Evacuation System Flow Diagram, Sh. 4, Rev. 63 G-190199, Service & Cooling Water System Flow Diagram, Sh. 1, Rev. 75 G-190199, Service & Cooling Water System Flow Diagram, Sh. 10, Rev. 46 G-190199, Service & Cooling Water System Flow Diagram, Sh. 11, Rev. 62 G-190199, Service & Cooling Water System Flow Diagram, Sh. 12, Rev. 47 G-190199, Service & Cooling Water System Flow Diagram, Sh. 13, Rev. 17 G-190199, Service & Cooling Water System Flow Diagram, Sh. 2, Rev. 65 G-190199, Service & Cooling Water System Flow Diagram, Sh. 3, Rev. 30 G-190199, Service & Cooling Water System Flow Diagram, Sh. 4, Rev. 50 G-190199, Service & Cooling Water System Flow Diagram, Sh. 5, Rev. 47 G-190199, Service & Cooling Water System Flow Diagram, Sh. 6, Rev. 48 G-190199, Service & Cooling Water System Flow Diagram, Sh. 7, Rev. 38 G-190199, Service & Cooling Water System Flow Diagram, Sh. 8, Rev. 33 G-190199, Service & Cooling Water System Flow Diagram, Sh. 9, Rev. 59 G-190199, Service and Cooling Water System Flow Diagram, Sh. 2, Rev. 65 G-190234, Steam Generator Blowdown and Wet Layup System Flow Diagram, Sh. 1, Rev. 39 G-190234, Steam Generator Blowdown and Wet Layup System Flow Diagram, Sh. 2, Rev. 42 G190400 Reactor Auxiliary Building Plan-Masonry Sh. No. 1, Rev 27 G190400 Reactor Auxiliary Building Plan-Masonry Sh. No. 20 G190400 Reactor Auxiliary Building Sect-Mas Sh. No. 1, Rev. 22 G-190626, 125 VDC & 120 V Vital AC One Line Diagram, Sh. 3, Rev. 18 G-190626, 480 & 120/208 Volt One Line Diagram, Sh. 2, Rev. 23 G-190626, Main & 4160 Volt One Line Diagram, Sh. 1, Rev. 8 G-190626, Main & Extraction Steam System Flow Diagram, Sh. 1, Rev. 60 G-190626, Main & Extraction Steam System Flow Diagram, Sh. 2, Rev. 37 G-190626, Main & Extraction Steam System Flow Diagram, Sh. 3, Rev. 45 G-190626, Main & Extraction Steam System Flow Diagram, Sh. 4, Rev. 21 HBR2-11937, Sh. 21, Fire Pre-Plan, Auxiliary Building Second Level (General Layout), Rev. 2 HBR2-11937, Sh. 30, Fire Pre-Plan, Emergency Switchgear (E1/E2) Room, Rev. 2 HBR2-11937, Sh. 31, Fire Pre-Plan, Rod Control Room, Rev. 0 HBR2-11937, Sh. 47, Fire Pre-Plan, Auxiliary Feedwater Pump Room, Rev. 1 HBR2-11937, Sh. 7, Fire Pre-Plan, Charging Pump Room, Rev. 1 HBR2-7706, Single Line Diagram Dedicated Shutdown Bus DS, Rev. 16 HBR2-7791, "Emergency Lighting (Local Battery Units) and Communications," Rev. 22 HBR2-8255, Sh. 1, Fire Protection System Intake Structure Flow Diagram, Rev. 15 HBR2-8319, Sh. 1, Fire Damper Locations, Rev. 1 HBR2-8319, Sh. 2, Fire Damper Locations, Rev. 1 HBR2-8319, Sh. 3, Fire Damper Locations, Rev. 1 HBR2-9716, Sh. 52, Fire Barrier Penetrations, Rev. 0 HBR2-9717, Fire Area/Zone Locations, Sh. 3, Rev. 4 HRB2-9717, Sh. 1, Fire Area/Zone Locations, Rev. 3 OST-611-2, Low Voltage Fire Detection and Actuation System Zones 3, 4 & 5, Attachment 10.1, Detector and Pull Station Locations for SI Pump, Charging Pump and CCW HX Rooms,

Rev. 3

OST-611-3, Low Voltage Fire Detection and Actuation System Zones 6 & 7, Att. 10.1, Detector and Pull Station Locations for the RCA Access Areas and AFW Pump Room, Rev. 5

OST-611-9, Low Voltage Fire Detection and Actuation System Zones 15 & 21, Attachment 10.1, Detector and Pull Station Locations for the Rod Control Room, Rev. 5

Miscellaneous Documents

10CFR50 Appendix R, Section III.H – Fire Brigade

728-144-37, Air Circuit Breakers DB-50, DBF-16, DB-75, DB-100, DBF, DBF-40, DBF-50, DH 350, Rev. 20

Acknowledgement of Agreement – Darlington County Fire Department, 2/20/2012

Acknowledgement of Agreement – Hartsville Fire Department, 4/16/2012

Active Equipment Log, dated 10/01/2012

DSP-001-BD, Basis Document, Alternate Shutdown Diagnostic, Rev. 13

DSP-002, In-Plant Walk Through Validation Checklist, Rev. 46

DSP-002-BD, Basis Document, Rev.46

DSP-003-BD, Basis Document, Rev. 21

EL303R, DB Breakers

Fire Protection System Health Report, 6175, 6180, 6181, 6185, 6195 and 6205, Q4-2011 Fire Protection System Health Report, 6175, 6180, 6181, 6185, 6195 and 6205, Q1-2012 Fire Protection System Health Report, 6175, 6180, 6181, 6185, 6195 and 6205, Q2-2012 Fire Protection System Health Report, 6175, 6180, 6181, 6185, 6195 and 6205, Q3-2012 FP-003, Control of Transient Combustibles, Rev. 25, Summary of Changes, PRR 343749 FP-003, Control of Transient Combustibles, Rev. 26, Summary of Changes, PRR 389125 FP-003, Control of Transient Combustibles, Rev. 27, Summary of Changes, PRR 514968 License Renewal Commitment No. 18, Selective Sections of Fire Protection Pipe Materials

Analyzed by E & E Center Metallurgical Services

License Renewal Commitment No. 35, Selective Leaching-Site Fire Protection, Work Order Notebook, Corrosion and Rust Tubercles

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Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance, June 20, 1977

Operations Training Presentation, Hot Shutdown Using the Dedicated /Alternate Shutdown System, dated 9/8/2011

Operator compensatory Actions, 10/17/2012

Personnel Qualification Data, Shift Fire Brigade 10/03/2012, 0700-1900

REG-NGGC-0010, Attachment 6 – Fire Protection Program Evaluation (FP-003), Rev 12

REG-NGGC-0010, Attachment 6 – Fire Protection Program Evaluation (FP-003), Rev 15

REG-NGGC-0010, Attachment 6 – Fire Protection Program Evaluation (FP-003), Rev 17

Robinson Nuclear Plant - NRC Triennial Fire Protection Inspection Report 05000261/2010007, August 11, 2010

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SD-010, Nuclear Instrumentation System, Rev. 10

SD-016, 480/120 VAC Electrical Systems, Rev. 14

SD-039, 230/4 KVAC Electrical System, Rev. 19

SD-042, Auxiliary Feedwater System, Rev. 11

SD-048, Steam Generator System, Rev. 6

Unavailability Data from Auto-logs, System 6175, Water Based Systems, beginning 8/31/2011

Unavailability Data from Auto-logs, System 6180, Fire Detection, beginning 1/10/2012

Unavailability Data from Auto-logs, System 6181, Fire Alarm Computer, beginning 2/14/2012

Unavailability Data from Auto-logs, System 6185, CO2, beginning 5/16/2012

Unavailability Data from Auto-logs, System 6205, Halon, beginning 1/16/2012 Watch Station Matrix, Shift Fire Brigade 10/03/2012, 0700-1900

Corrective Action Program Documents (AR, NCRs)

Action Request (AR) 00563137, Fire Area F (Containment) Fire Induced Circuit Failures AR 00494070, "B" SI Pump E-2 (52/29B) Breaker Failed to Close in Test AR 00517630, Section 8.29 of Procedure PM-163 Not Performed AR 00517991, 52/2B Had No Indication on RTGB When Breaker Is Closed AR 00556074, Fire Area A3 (RAB Lower Hall) Fire Induced Circuit Failures AR 00563120, Fire Area A5 (RAB Lower Hall) Fire Induced Circuit Failures AR 00563192, Manual Operator Actions RIS 2006-010 Update NCR 407601, Replace Fire Doors for FDR-23 and FDR-24 to the EDG Rooms NCR 489973, EDFP Turbocharger 60 DPM Oil Leak Making EDFP OOS NCR 491437, EDFP Not Returned to Service Within 7 days NCR 501613, Missed Inspections on Some Penetration Seals NCR 505977, Inadvertent Actuation of Halon System in Room E1/E2 NCR 505986, Fire Dampers for Zone 20 Did Not Operate Properly NCR 506701, Fire Damper Inspection Methodology NCR 509113, Drill 12-1Q-06A Critical Objective "Q" Unsatisfactory NCR 564753, EC 79037 has Identified a New Fire Induced Circuit Failure

List of NCRs Generated as a Result of this Inspection

564710, Ladders in Charging Pump Room

564768, Missing Condulet Covers for LB-2141LI and LB-2144-SB in the Rod Control Room

564907, DSP-12 & its Db on Affected Documents List on EC when not needed

565012, Enhancement on EDMG-004 & B.5.b EP Surveillance

565044, Inclusion of Credited Available Instruments Needs to be in DSPs

565236, Determine which Plant Areas may Require Additional Fire Brigade Drills

565260, DSP-001 Att.1 Does not Direct DSP-002 for Fire in The Rod Control Room

565379, Drawing Errors on B-190628 Sh. 839C

565382, Resources Listed in EDMG-004 not Adequately Maintain by EP

565473, Lack of Kirk Key Interlock Module Documentation

567284, FP Triennial Inspection Combustible Loading Concern

567419, OMM-003 Step for Radio Usage and Ability to Communicate

567517, Maintenance Rule Criteria for Emergency Lights

567590, NE-51 Kirk key Transfer Switch Functional Check

567631, Emergency Lighting PM Deferral

567632, Lack of CR Initiation for Failure Rate of Emergency Lights

567711, EPPRO-02 Monthly Surveillance not Conducted for 9 Months

567715, B.5.b Surveillances for EDMP Equipment Missing for 2012

567824, Combustible Loading Calculation

567912, Lack of Surveillance Showing Cycling of Kirk Keys for MCC4 to Ds Bus 7 Full Range Neutron Flux Detector

Procedure Revision Requests (PRR) Initiated During the Inspection

565675, DSP-002 – Main Body Step 2

567759, DSP-002 – Attachment 1

LIST OF ACRONYMS AND ABBREVIATIONS

APCSB	Auxiliary and Power Conversion Systems Branch
AR	Action Request
BTP	Branch Technical Position
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DC	Direct Current
DSP	Dedicated Shutdown Procedure
ELS	Emergency Lighting System
FA	Fire Area
FHA	Fire Hazards Analysis
FPM	Fire Protection manual
FPP	Fire Protection Program
FZ	Fire Zone
HBR2	H.B. Robinson Steam Electric Plant
HVAC	Heating, Ventilation, and Air Condition
IMC	Inspection Manual Chapter
IP	NRC Inspection Procedure
NCR	Nuclear Condition Report
NCV	Non Cited Violation
NFPA	National Fire Protection Association
NRC	United States Nuclear Regulatory Commission
P&IDs	Piping and Instrumentation Diagrams
Rev	Revision
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SER	Safety Evaluation Report
SSC	Systems, Structures and Components
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report