UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

March 31, 2008

Mr. Dale E. Young
Vice President
Crystal River Nuclear Plant (NA1B)
15760 West Power Line Street
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000302/2008006 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Young:

On February 15, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at your Crystal River Nuclear Plant, Unit 3. The enclosed inspection report documents the inspection results, which were discussed on February 15, 2008, with Mr. J. Franke and other members of your staff. Following completion of additional review in the Region II office, another exit meeting was held by telephone with you and other members of your staff on March 31, 2008, to provide an update on changes to the preliminary inspection findings.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings and one self-revealing finding of very low safety significance (Green) which were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; 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 Crystal River Unit 3 site.

In addition, the enclosed report documents one noncompliance that was identified during the inspection for which the NRC is exercising enforcement discretion. The NRC is not taking any enforcement action for the noncompliance because it meets the criteria of the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," and NRC Inspection Manual Chapter 0305, "Violations in Specified Areas of Interest Qualifying for Enforcement Discretion."

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 component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at: http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Shakur A. Walker, Acting Chief,
Engineering Branch 2
Division of Reactor Safety

Docket No.: 50-302
License No.: DPR-72

Enclosure: Inspection Report 05000302/2008006
w/Attachment; Supplemental Information

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Letter to Dale E. Young from Shakur Walker dated on March 31, 2008

SUBJECT: CRYSTAL RIVER UNIT 3 - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000302/2008006 AND EXERCISE OF ENFORCEMENT DISCRETION

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-302
License No.:	DPR-72
Report No.:	05000302/2008006
Licensee:	Progress Energy Florida (Florida Power Corporation)
Facility:	Crystal River Unit 3
Location:	Crystal River, Florida
Dates:	January 28 – February 1, 2008 (Week 1) February 11-15, 2008 (Week 2)
Inspectors:	L. Bradford, Reactor Inspector P. Fillion, Senior Reactor Inspector B. Melly, Fire Protection Engineer (Consultant) J. Quinones, Reactor Inspector (Week 2 Only) N. Staples, Reactor Inspector M. Thomas, Senior Reactor Inspector (Team Lead)
Approved by:	Shakur Walker, Acting Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000302/2008006; 01/28 - 02/01/2008 and 02/11-15/2008; Crystal River Unit 3; Triennial Fire Protection Inspection.

This report covers an announced two-week triennial fire protection inspection by a team of five regional inspectors and one contract inspector. Three Green non-cited violations 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 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: Initiating Events

- Green: The team identified a non-cited violation of Crystal River Unit 3 Operating License Condition 2.C.(9), for the licensee's failure to properly implement fire protection program procedures for control of transient combustible materials. Specifically, transient combustible materials were left unattended for four days in the 3B 480V ES Switchgear Room after work had been completed, which was a violation of the licensee's administrative procedures for control of transient combustibles. Once identified, the licensee removed the combustible materials and initiated a nuclear condition report to address the issue.

  The finding is more than minor because the transient combustible materials presented a credible fire scenario involving equipment important to safety, which degraded the reactor safety Initiating Events cornerstone objective to limit the likelihood of those events that may upset plant stability and challenge critical safety functions. The amount of unattended transient combustible materials did not violate the licensee's transient combustible control limits for the fire area. Therefore, the finding was assigned a low degradation rating against the combustible controls program. The finding was of very low safety significance (Green) based on the low degradation rating. This finding has a cross-cutting aspect in the Work Practices component of the Human Performance area because the licensee failed to effectively communicate expectations regarding procedural compliance and personnel following procedures (NRC Inspection Manual Chapter 0305, H.4(b)). (Section 1R05.02)

- Green: A self-revealing non-cited violation of 10 CFR 50, Appendix R, Section III.O, was identified for failure of the reactor coolant pump (RCP) oil collection system to collect and drain RCP oil leakage to a vented closed container. Specifically, the licensee found an estimated one to two gallons of oil on the reactor building floor beneath RCP-1B. The licensee initiated a nuclear condition report for this issue.

This finding is more than minor because it is associated with the external factors attribute, i.e., fire, and it degraded the reactor safety Initiating Events cornerstone objective. The team completed a Phase 1 screening of the finding in accordance with IMC 0609, Appendix F, Attachment 1, Step 1.3, Qualitative Screening Approach, and concluded that the finding was of very low safety significance (Green) because the amount of oil identified in 2008 was bounded by the licensee's 2004 analysis (which assumed a 21 gallon oil leak). This finding has a cross-cutting aspect in the Corrective Action Program component of the Problem Identification and Resolution area because the licensee did not take appropriate corrective actions in a timely manner to address the adverse trend related to oil leakage for RCP-1B (NRC Inspection Manual Chapter 0305, P.1(d)). (Section 4OA2)

Cornerstone: Mitigating Systems

- Green: The team identified a non-cited violation of 10 CFR 50, Appendix R, Section III.G.2., for failure to protect cables from fire damage for components required for safe shutdown. Specifically, the Mecatiss MTS-3 fire wrap installed around the cables for valve DHV-42 (suction from the reactor building sump to the Train A decay heat pump) was not installed in accordance with the vendor's tested configuration. The licensee initiated a nuclear condition report and implemented an hourly roving fire watch to address this issue. Additionally, the licensee implemented repairs during the March 2008 forced outage to upgrade the Mecatiss MTS-3 fire wrap to comply with the vendor tested configuration.

  This finding is more than minor because it is associated with the external factors attribute, i.e., fire, and it degraded the reactor safety Mitigating Systems cornerstone objective. The inspectors completed a Phase 1 screening of the finding in accordance with IMC 0609, Appendix F, Attachment 1, Step 1.3, Qualitative Screening Approach, and concluded that the finding, when given credit for the fixed automatic suppression system in the area, was of very low safety significance (Green). (Section 1R05.03)

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 for a plant in transition to National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition." This inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05TTP, "Fire Protection-NFPA 805 Transition Period (Triennial)." The objective of the inspection was to review the Crystal River Unit 3 (CR-3) fire protection program (FPP) for selected risk-significant fire areas. The team selected four fire areas for detailed review to examine the licensee's implementation of the FPP. The four fire areas chosen for review were selected based on risk insights from the licensee's Individual Plant Examination for External Events (IPEEE), information contained in FPP documents, results of prior NRC triennial fire protection inspections, and in-plant tours by the team. Section 71111.05-05 of the IP specifies a minimum sample size of three fire areas. Detailed inspection of these four fire areas fulfills the procedure completion criteria. The four areas chosen were:

- Fire Area AB-119-6 / Fire Zones 6A-North Hallway, 6E-East Hallway, 6J-Central Hallway, 6Q-Hallway
- Fire Area CC-108-110, 3A Inverter Room
- Fire Area CC-124-116, 3B 480V ES Switchgear Room
- Fire Area CC-134-118 / Fire Zone A, Cable Spread Room

The team evaluated the licensee's FPP against applicable requirements, including Operating License Condition 2.C.(9); Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50), Appendix R; 10 CFR 50.48; commitments to Appendix A of Branch Technical Position Auxiliary and Power Conversion Systems Branch 9.5-1; Crystal River Updated Final Safety Analysis Report (UFSAR); related NRC safety evaluation reports; and plant Technical Specifications. The team evaluated each selected fire area (FA) / fire zone (FZ) against these requirements. The specific documents reviewed by the team are listed in the Attachment.

.01 Post-Fire Safe Shutdown From Main Control Room (Normal Shutdown)

a. Inspection Scope

Methodology

The team reviewed the licensee's FPP, Appendix R Fire Study, safe shutdown (SSD) procedures, piping and instrumentation drawings (P&IDs), electrical drawings, the

UFSAR, and other supporting documents to verify that hot and cold shutdown could be achieved and maintained from the main control room (MCR) for postulated fires in FAs AB-119-6, CC-108-110, and CC-124-116. This review also included verification that shutdown from the MCR could be performed both with and without the availability of offsite power. Plant walkdowns were performed to verify that the plant configuration was consistent with that described in the fire hazards analysis (FHA) and the Appendix R Fire Study. The inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation and support systems functions. For postulated fires that utilize shutdown from the MCR, the team performed reviews to verify that the systems and components credited for use during this shutdown method would remain free from fire damage.

Operational Implementation

The team reviewed the adequacy of procedures utilized for post-fire SSD and performed a walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also 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.

The team reviewed time critical actions, including those for selected components to prevent fire-induced spurious operation for reactor coolant makeup, reactor heat removal, and support systems functions. The team reviewed and/or walked down applicable sections of the fire response procedures listed below for FAs AB-119-6, CC-108-110, and CC-124-116.

- AP-880, Fire Protection
- OP-880A, Appendix R Post-Fire Safe Shutdown Information

The team reviewed local operator manual actions to ensure that the actions could be implemented in accordance with plant procedures in the times necessary to support the SSD method for the applicable FA/FZ and to verify that those actions met the criteria in Enclosure 2 of NRC IP 71111.05TTP. The team reviewed the manual action feasibility section of the licensee's Appendix R Fire Study. The team also reviewed licensee nuclear condition report (NCR) 205333, which was initiated to manage and track the resolution of the operator manual action issue during the transition to NFPA 805.

b. Findings

No findings of significance were identified.

.02 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team performed inspection activity aimed at verifying that cable routing throughout the plant satisfied the physical separation requirements. During plant walkdowns, the team recorded raceway identification codes and the FAs/FZs in which those raceways were located. This information gathered from in-plant walkdowns was then compared with the corresponding information in the licensee's analysis. The comparison provided a check on whether the analysis correctly pinpointed which cables were in a given FA/FZ. Over 300 raceways (conduits and cable trays) containing cables important to SSD were checked in this manner.

For the selected FA/FZs, the team evaluated the potential for fires, the combustible fire load characteristics, and the potential exposure fire severity. The team reviewed the fire protection plan, FHA, UFSAR, 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. This review was performed to ensure that the objectives established by the NRC-approved FPP were satisfied. The team also reviewed selected licensee fire incident reports, combustible tracking logs, maintenance procedures, and general employee training covering control of ignition sources and transient combustibles. These reviews were performed to verify that the licensee had properly evaluated in-situ combustible fire loads, controlled hot-work activities, and limited transient fire hazards in a manner consistent with the plant administrative and fire protection plan procedures. Additionally, the team toured the selected plant FA/FZs to observe whether programmatic procedures for limiting fire hazards, waste collection, housekeeping practices, and cleanliness conditions were being implemented consistent with the updated UFSAR, administrative procedures, and other FPP procedures. The specific documents reviewed are listed in the Attachment.

As described in Section 1R05.03, Passive Fire Protection, an improperly installed fire protection wrap at a conduit penetration was identified. To analyze the significance of that finding, the circuitry for valve DHV-34, suction from the borated water storage tank (BWST) to the Train A decay heat pump, and valve DHV-42, suction from the reactor building (RB) sump to the Train A decay heat pump, were reviewed. The post-fire SSD importance of these valves is that their concurrent opening would result in drain down of the BWST to the RB sump. The review included a complete circuit and cable routing analysis, as well as a shutdown procedure review in relation to these valves.

b. Findings

Failure to Adequately Control Transient Combustibles

Introduction: The team identified a Green non-cited violation (NCV) of CR-3 Operating License Condition 2.C.(9), for the licensee's failure to properly implement FPP procedures for control of transient combustible materials. Specifically, transient combustible materials were left unattended for four days in FA CC-124-116 after work

had been completed, which was contrary to licensee Procedure AI-2200, Guidelines for Handling Use and Control of Transient Combustibles.

Description: During a walkdown of selected FAs/FZs in the control complex (CC) on February 12, 2008, the team observed unattended transient combustible materials in FA CC-124-116 (480V ES Switchgear Room 3B). The unattended transient combustible materials were a plastic maintenance tool cart containing electrical equipment which included digital multimeters, cables, power cords and paper. A work in progress sign was on the cart which indicated work dates of February 4, 2008 to February 8, 2008. Subsequent licensee investigation determined that the work order activities were completed on February 8, 2008 and the cart was not removed as required by Procedure AI-2200. The team noted that the cart and equipment was located beneath some of the cable trays and electrical conduits in the room which contained Train B safety-related SSD cables. The team noted that one of the digital meters was plugged into an electrical outlet in the room, which was considered to be an ignition source.

Section 4.1.3 of Procedure AI-2200 stated that only transient combustibles necessary to keep work in progress, up to the maximum limit allowed by the FHA, were allowed in certain areas; FA CC-124-116 was one of those areas. The procedure further stated that, following completion of work, all unused transient combustibles were to be immediately removed. If Procedure AI-2200 had been followed, all transient combustible materials in the room would have been immediately removed upon completion of the work. The team noted that the cart and equipment had been left unattended for four days following completion of work in that area, which was not consistent with the requirements of Procedure AI-2200. Once identified, licensee personnel removed the cart from FA CC-124-116 and initiated NCR 266152 for this issue.

Analysis: The team determined that failure to properly implement FPP Procedure AI-2200 for control of transient combustible materials was a performance deficiency. The finding is greater than minor because it is associated with the protection against external factors attribute, i.e., fire, and degraded the reactor safety Initiating Events cornerstone objective to limit the likelihood of those events that may upset plant stability and challenge critical safety functions during shutdown as well as power operations. This finding has a cross-cutting aspect in the Work Practices component of the Human Performance area because the licensee failed to effectively communicate expectations regarding procedural compliance and personnel following procedures (NRC Inspection Manual Chapter 0305, H.4(b)). In this instance, licensee personnel did not remove maintenance equipment after completing work activities, which resulted in transient combustible materials being left unattended. The unattended transient combustible materials left underneath the electrical cable trays and conduits presented a credible fire scenario involving equipment important to safety which was contrary to the site administrative procedures.

The team reviewed NRC Inspection Manual Chapter (IMC) 0609, Significance Determination Process, Appendix A, Determining the Significance of Reactor Inspection Findings for At-Power Situations, dated March 23, 2007. The team determined that the finding affected the administrative controls for fire protection, and a significance determination evaluation using IMC 0609, Appendix F, Fire Protection Significance Determination Process, was required. The team completed a significance determination

for this issue using IMC 0609, Appendix F, and its Attachments. The transient combustibles were located within the zone of influence for a 70kW fire for thermoplastic cables (IMC 0609, Appendix F, Table 2.3.3) and presented a credible fire scenario involving equipment important to safety. Considering the nature of the unattended transient combustible materials and the fixed contents of the room, it was determined that the licensee did not violate the transient combustible control limits specified in the FHA. Therefore, the finding was assigned a low degradation against the combustible controls program. IMC 0609, Appendix F, Attachment 1, Task 1.3.1, Qualitative Screening for All Finding Categories, showed that the finding was of very low safety significance (Green) due to the low degradation rating.

Enforcement: CR-3 Operating License Condition 2.C.(9) requires the licensee to implement and maintain in effect all provisions of the approved FPP, as described in the UFSAR for the facility and as approved in the NRC SERs, dated July 27, 1979; January 22, 1981; January 6, 1983; July 18, 1985; and March 16, 1988. The CR-3 FP Plan, Section 3.0, Administrative Controls and Procedures, describes the controls and procedures covering the FPP. Procedure AI-2200, Guidelines for Handling Use and Control of Transient Combustibles, establishes administrative controls over transient combustible materials at CR-3 inside the protected area. Procedure AI-2200, Section 4.1.3, stated that some fire areas had special requirements to maintain combustible loading as low as possible below the level allowed by the FHA. The procedure further stated that only transient combustibles necessary to keep work in progress, up to the maximum limit allowed by the FHA, were allowed in the areas. Following completion of work, all unused transient combustibles were to be immediately removed.

Contrary to the above, on February 12, 2008, the team observed a plastic maintenance tool cart and equipment located in FA CC-124-116, which had been left unattended for four days following completion of work on February 8, 2008. Licensee personnel removed the cart and equipment on February 12, 2008, and initiated NCR 266152 to address this issue. Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. This finding is identified as NCV 05000302/2008006-01, Failure to Control Transient Combustibles.

.03 Passive Fire Protection

a. Inspection Scope

The team inspected the material condition of the fire barriers surrounding and within the FAs selected for review. Barriers in use included walls, ceilings, floors, mechanical and electrical penetration seals, doors, dampers, Mecatiss MTS-3 and Thermo-Lag 330-1 electrical raceway fire barrier systems (ERFBS). Construction details and fire endurance test data which established the ratings of these fire barriers and ERFBS were reviewed by the team. Engineering evaluations related to the fire barriers were reviewed. The team performed in-plant inspections to confirm that as-built ERFBS being relied upon to protect cables for components credited in SSD procedures were properly installed and adequately addressed in a surveillance program.

Where applicable, the team examined installed barriers to compare the configuration of the barrier to the rated configuration. The reviews were performed to verify that the passive fire barriers had the capability to contain fires for one hour or three hours as applicable. In addition, the team reviewed licensing basis documentation, such as NRC SERs and deviations from NRC regulations, to verify that passive fire protection features met licensing commitments.

b. Findings

Inadequate Protection of Cables

Introduction: The team identified a Green NCV of 10 CFR 50, Appendix R, Section III.G.2, for the licensee's failure to adequately protect cables important to SSD from fire damage. Specifically, the 3-hour rated Mecatiss MTS-3 fire wrap installed around the control cables for valve DHV-42 (suction from the RB sump to Train A decay heat pump) was determined to be degraded, in that, it was not installed in accordance with the vendor's tested configuration. The licensee initiated NCR 264138 and implemented an hourly roving fire watch as a compensatory measure to address this issue.

Description: During in-plant inspections of selected ERFBS, the team identified a problem with the Mecatiss MTS-3 fire wrap protecting the cable for valve DHV-42 in the north hallway of the auxiliary building (FZ AB-119-6A). The cable in question was routed in conduit DHC206. The team identified that the Mecatiss MTS-3 ERFBS was not installed in accordance with the Mecatiss tested configuration. In the Underwriters Laboratories (UL) test series conducted for CR-3, when an electrical raceway passed through a silicone foam penetration seal, the seal itself was completely covered with Mecatiss fire wrap. The team found that the silicone foam penetration seal (as installed) was not completely covered with Mecatiss fire wrap in accordance with the UL Mecatiss test series. The Mecatiss MTS-3 fire wrap was installed around conduit DHC206 during refueling outage (RFO) 14 in the fall of 2005. When informed of the problem, the licensee initially provided the team with incorrect installation instructions, which were instructions intended for Mecatiss interfacing concrete instead of the instructions for the Mecatiss MTS-3. The team asked the licensee to review the Mecatiss Test Program again and confirm that the installation was backed by testing. Based on the questions raised by the team regarding the Mecatiss MTS-3 installation configuration, the licensee confirmed that the ERFBS was installed in an untested configuration and the licensee had not performed an engineering analysis to justify the untested installation configuration. The licensee concluded that the Mecatiss MTS-3 fire wrap around conduit DHC206 was degraded and may not meet the intended fire barrier rating for the cables in question.

The team reviewed the circuitry for the normally closed valve DHV-42, and the normally open valve DHV-34, suction from the BWST to the Train A decay heat pump. The post-fire SSD importance of these valves is that their concurrent opening would result in drain down of the BWST to the RB sump. In the event of an Appendix R fire, the cables for valve DHV-42 could be damaged due to the degraded Mecatiss fire wrap. If valve DHV-42 were to spuriously open due to fire damage, this could potentially cause the BWST inventory to be drained to the RB sump. This would result in a loss of BWST water to support reactor coolant system makeup and boration. Upon confirmation of this

nonconforming fire barrier configuration, the licensee initiated NCR 264138 to address this issue and implemented an hourly roving fire watch in accordance with the CR-3 Fire Protection Plan, Chapter 6, Table 6.7.a. The licensee also implemented repairs during the March 2008 forced outage to upgrade the Mecatiss MTS-3 fire wrap around conduit DHC206 to comply with the vendor tested configuration.

Analysis: This finding is more than minor because it is associated with the external factors attribute of the reactor safety Mitigating Systems cornerstone, i.e., fire, and the degradation of fire protection features. The team completed a Phase 1 screening of the finding in accordance with IMC 0609, Appendix F, Attachment 1, Step 1.3, Qualitative Screening Approach, and concluded that the finding, when given credit for the fixed automatic suppression system in the area, was of very low safety significance (Green).

Enforcement: 10 CFR 50, Appendix R, Section III.G.2. states in part that one of the following means shall be provided to ensure that one of the redundant trains is free of fire damage: 1) separation of cables and equipment by a 3-hour rated fire barrier; 2) separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles, and with fire detection and an automatic fire suppression system; or 3) enclosure of cables and equipment in a fire barrier having a 1-hour rating with fire detection and an automatic fire suppression system.

Contrary to the above, on January 30, 2008, the team identified that the cables routed in conduit DHC206 for valve DHV-42 were not ensured to be free of fire damage for a fire in FZ AB-119-6A. Specifically, the Mecatiss MTS-3 fire wrap around conduit DHC206 was not installed in accordance with the vendor tested configuration. As a result, a fire-induced spurious opening of valve DHV-42 could potentially drain the BWST inventory to the RB sump. This could result in a loss of BWST water to support reactor coolant system makeup and boration. This condition existed since the fall of 2005 when the Mecatiss MTS-3 fire wrap was installed. The licensee initiated NCR 264138 to address this issue and implemented an hourly roving fire watch in accordance with the CR-3 Fire Protection Plan. The licensee also implemented repairs during the March 2008 forced outage to upgrade the Mecatiss MTS-3 fire wrap around conduit DHC206 to comply with the vendor tested configuration. Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. This finding is identified as NCV 05000302/2008006-02, Failure to Adequately Protect Cables for Valve DHV-42.

.04 Active Fire Protection

a. Inspection Scope

Through in-plant observation of systems, design document review and reference to the applicable NFPA codes and standards, the team evaluated the material condition and operational lineup of fire detection and suppression systems. The detection and suppression methods for the category of fire hazards in the selected areas were evaluated. The overall criterion applied to this portion of the inspection was that the fixed automatic and fire brigade fire suppression had the capacity and capability to suppress credible fires in the selected FAs.

The team compared sprinkler layout drawings and hydraulic calculations to ensure that the calculations demonstrated that design density required could be provided by the as-installed sprinkler system. The sprinkler systems in FZs AB-119-6A, 6E, and 6J were inspected and evaluated. The systems were evaluated from source to discharge device including hydraulic calculations performed by the licensee to demonstrate adequate flow, pressure and water distribution.

The Halon 1301 gaseous suppression system in the cable spreading room (CSR), FZ CC-134-118A, was inspected and evaluated. The team walked down the Halon 1301 system to ensure that the installed configuration and room volume agreed with the engineering calculations that addressed this system. The team reviewed the system design calculations, Halon 1301 surveillance procedures and Halon 1301 preoperational discharge test results. Also, a recent engineering analysis of the CSR Halon 1301 system was reviewed. The licensee's program of surveillances to ensure system readiness was reviewed. Additionally, a review was made of the reliability of the power supply for the Halon mixing fans in the CSR.

The team also reviewed fire brigade staffing, fire brigade response strategy, fire fighting pre-plans, fire brigade training, and the fire brigade drill program procedures. Particular attention was given to location and capacity of hose stations and approach routes to the FAs. Fire brigade equipment lockers were inspected by the team. Documentation reviews were supplemented by discussion with persons responsible for fire brigade performance to assess the readiness of the fire brigade to suppress any and all fires that may occur.

b. Findings:

Introduction: The team identified an unresolved item (URI) related to the licensee's compliance with the CR-3 operating license condition 2.C.(9) and the approved FPP when the access hatch from the MCR floor to the CSR was opened on more than one occasion for maintenance troubleshooting activities.

Description: The team reviewed NCR 264494 which the licensee initiated in response to questions from the NRC resident inspectors who observed the access hatch from the MCR floor to the CSR was open and there did not appear to be any compensatory measures in place. The NCR stated that the licensee opened the access hatch between the MCR floor and the CSR to perform battery ground troubleshooting activities. The team questioned if this activity potentially degraded the CSR Halon suppression system. With the hatch open, the team questioned the capability of the Halon suppression system to meet the licensing basis requirement to maintain a 5% Halon concentration for 10 minutes in the event of an Appendix R fire in the CSR. The team also questioned if the licensee performed an evaluation to determine the impact of the hatch being open on the CSR Halon suppression system and to determine if compensatory measures were needed. As a result of questions raised by the team during the inspection, the licensee initiated NCR 266356 to evaluate the impact on the operability of the CSR Halon suppression system with the MCR access door hatch open.

The team requested additional information from the licensee regarding the amount of thermoplastic cables in the CSR, how many times and the duration each time the hatch was opened for maintenance troubleshooting in the past year. The licensee provided the requested information to the team and the information is currently being reviewed. The team informed the licensee that this issue will be identified as an URI pending further NRC review of the requested information. This item will be tracked as URI 05000302/2008006-03, Evaluate Opening Access Hatch to Cable Spread Room.

.05 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

Through a combination of in-plant inspection and drawing reviews, the team evaluated the selected FAs from the viewpoint of whether redundant trains of systems required for post-fire safe shutdown could be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. The team considered the effects of water, drainage, heat, hot gasses, and smoke that could potentially damage redundant trains.

b. Findings

No findings of significance were identified.

.06 Post-Fire Safe Shutdown From Outside the Main Control Room (Alternative Shutdown)

a. Inspection Scope

Methodology

The team reviewed the licensee's FP Plan, the Appendix R Fire Study, post-fire SSD procedures, P&IDs, electrical drawings, and other supporting documents for postulated fires in FZ CC-134-118A. The reviews focused on ensuring that the required functions for post-fire SSD and the corresponding equipment necessary to perform those functions were included in the procedures. The review included assessing whether hot and cold shutdown from outside the MCR could be implemented, that transfer of control from the MCR to the remote shutdown panel (RSP) could be accomplished, and that adequate instrumentation was available for use. This review also included verification that shutdown from outside the MCR could be performed both with and without the availability of offsite power.

Plant walkdowns were performed to verify that the plant configuration was consistent with that described in the Appendix R Fire Study. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation, and support systems functions. The team reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage.

The team inspected a sample of instrumentation loops and control circuits for the attribute that they incorporated isolation/transfer devices as necessary to make them

independent of the fire areas of concern and available to the operators at the RSP. Copies of the last two surveillance tests on the isolation/transfer devices were reviewed to confirm that they had been performed according to schedule and that any noted anomalies were satisfactorily addressed.

Operational Implementation

The team reviewed the shift turnover logs and shift manning to verify that personnel required for SSD using the alternative shutdown systems and procedures were available on-site, exclusive of those assigned as fire brigade members.

The team reviewed the adequacy of procedures utilized for post-fire SSD and performed a walk-through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also reviewed selected operator actions to verify that operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

Time critical actions reviewed included establishing control at the RSP, establishing reactor coolant makeup, and establishing decay heat removal. The team reviewed and walked down applicable sections of the following fire response procedures:

- AP-880, Fire Protection
- AP-990, Shutdown From Outside the Control Room

The team also reviewed the periodic test procedures and test records of the alternative shutdown transfer capability, and instrumentation and control functions, to ensure the tests were adequate to verify the functionality of the alternative shutdown capability. Electrical schematics were reviewed to verify that circuits for SSD equipment, which could be damaged due to fire, were isolated by disconnect switches and by swapping power supplies for selected motor control centers. In addition, the team reviewed wiring diagrams for instrumentation located on the RSP to verify that necessary process monitoring was available as required by 10 CFR 50, Appendix R, Section III.L.

b. Findings

No findings of significance were identified.

.07 Circuit Analyses

a. Inspection Scope

This segment is suspended for plants in transition because a more detailed review of cable routing and circuit analysis will be conducted as part of the FPP transition to NFPA 805. However, a review of the licensee's preliminary cable routing information was used by the team to assess the adequacy of the licensee's fire response procedures in the selected fire areas. The routing information was based upon a list of safe shutdown components submitted by the team.

b. Findings

No findings of significance were identified.

.08 Communications

a. Inspection Scope

The team reviewed plant communications capabilities to evaluate the availability of the communication systems to support plant personnel in the performance of operator manual actions to achieve and maintain SSD conditions. During this review, the team considered the effects of ambient noise levels, clarity of reception, reliability, and coverage patterns. The team reviewed the use of the fixed plant public address system for emergency fire notification and/or personnel instructions. The team also reviewed the communications available at different locations. Portable (handheld radios) communication systems and repeaters were reviewed for the impact of fire damage in the selected FAs/FZs. A review was performed to verify the availability of the portable radios for use during the SSD procedures in the event of a loss of offsite power.

The team reviewed the plant communications systems that would be relied upon to support fire event notification and fire brigade fire fighting activities to verify their availability. The team also reviewed recent NCRs and completed surveillance test procedures for the last two months of weekly surveillance procedure SP-804, Surveillance of Plant Fire Brigade Equipment, to assess proper operation and effectiveness of the communications system and identify any history of operational or performance problems with radio communications.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team reviewed maintenance and design aspects of the emergency lighting units (ELUs) required by 10 CFR 50, Appendix R, Section III.J. Copies of the last three quarterly surveillance procedures performed on the ELUs were reviewed. This quarterly procedure was a functional test and check of the lamp alignment. Record of the last performed semi-annual inspection of the ELU batteries was reviewed. This inspection included a cleaning of the battery terminals. The team reviewed the work order which carried out the last biennial battery replacement for the ELUs to confirm that battery replacement had taken place according to the licensee's program. Manufacturer's published engineering data for the ELUs was reviewed, paying particular attention to the capacity of the batteries as compared to the load demand of the lamps and stated service life of the batteries. The team evaluated any failures or anomalies noted in the above mentioned surveillances and work records. In addition, a search of work orders covering the period from May 2005 to February 2008 was made to ascertain the number of failures that may have occurred on the ELUs. Requirements for the ELUs are

contained in 10 CFR 50, Appendix R, Section III.J; Amendment 23 to the Operating License and the NRC SER transmitted on July 27, 1979; and the Fire Protection Plan, Revision 25, Sections 5.2, 6.9, and Tables 6.10.a and 6.10.b.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed the licensee's Appendix R Fire Study to determine if any repairs were necessary to achieve cold shutdown. The need and provisions for post-fire repairs to transition from hot shutdown to a cold shutdown condition were evaluated by the team in relation to the selected FAs / FZs. SSD procedures OP-880A and AP-990 describe methods for repairing fire damaged equipment needed to bring the Unit from hot standby to cold shutdown.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team reviewed the administrative controls for out-of-service, degraded, and/or inoperable fire protection features (e.g., detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing SSD functions or capabilities). The team reviewed selected items on the fire protection impairment log and compared them with the FAs/FZs selected for inspection. The compensatory measures that had been established in these areas/zones were compared to those specified for the applicable fire protection feature to verify that the risk associated with removing the fire protection feature from service was properly assessed and adequate compensatory measures were implemented in accordance with the approved fire protection plan. Additionally, the team reviewed the licensee's short term compensatory measures (e.g., hourly roving fire watch established for the degraded Mecatiss MTS-3 fire wrap) to verify that they were adequate to compensate for a 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 of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed selected NCRs related to the CR-3 FPP to verify that items related to fire protection and SSD were appropriately entered into the licensee's correction action program (CAP) in accordance with the licensee's quality assurance program and procedural requirements. This review was conducted to assess the frequency of fire incidents and effectiveness of the fire prevention program and any maintenance-related or material condition problems related to fire incidents.

The team also reviewed other CAP documents, including completed corrective actions documented in selected NCRs, and operating experience program (OEP) documents to verify that industry-identified fire protection issues potentially or actually affecting CR-3 were appropriately entered into, and resolved by, the CAP process. Items included in the OEP effectiveness review were NRC regulatory issue summaries, information notices, generic letters, industry or vendor generated reports of noncompliances and defects under 10 CFR Part 21, and vendor information letters. The team reviewed NCR 264879 and the corrective actions related to the reactor coolant pump (RCP) 1B lube oil collection system (LOCS) leakage problems. Additionally, the team reviewed a sample of other identified issues. The documents reviewed are listed in the Attachment.

b. Findings

RCP-1B Lube Oil Collection System

Introduction: A self-revealing Green NCV of 10 CFR 50, Appendix R, Section III.O, was identified for failure of RCP-1B LOCS to collect and drain RCP-1B oil leakage to a vented closed container. Specifically, the licensee found an estimated one to two gallons of oil on the RB floor beneath RCP-1B. The licensee initiated NCR 264879 to address the leakage problem during the March 2008 forced outage.

Description: During a licensee inspection of the RB on February 4, 2008, specifically the "A" D-Ring, to identify the source of a feedwater/steam leak, an estimated 20 square foot oil puddle was noted below RCP-1B. Based on the discovery, the integrity of the RCP-1B LOCS was questioned. Further inspection during the March 2008 forced outage revealed that approximately one gallon of oil had accumulated outside the LOCS under RCP-1B. This did not meet 10 CFR 50, Appendix R, Section III.O, which requires the RCP LOCS to be leak tight.

Historically, the RCP motors at CR-3 have had oil leakage during the operating cycle, and some of the oil was not collected within the RCP LOCS. A licensee identified violation (LIV) was issued in 2004 related to RCP oil leakage outside the LOCS on the RB floor, which included RCP-1B. When the licensee identified the LOCS leakage in September 2004, an analysis was performed (calculation M04-0014) to assess the risk significance of the oil leakage. Calculation M04-0014 conservatively assumed a 21 gallon lube oil leak outside the LOCS onto the RB floor. The calculation showed that the

flame height from a 21 gallon oil pool fire would not damage cables and equipment required for SSD. The LIV was determined to be of very low safety significance (Green).

Licensee personnel indicated that RCP-1B was the only RCP which still had the "old style" LOCS installed while RCPs 1A, 1C, and 1D had been upgraded to the new LOCS. The "old style" LOCS on RCP-1B is scheduled to be replaced during the next CR-3 RFO in the fall of 2009. The licensee indicated that a primary contributor to the oil getting outside the "old style" LOCS was believed to be the oil demisters, which are vents located at the upper portion of each RCP motor. These vents allow oil vapor to escape the motor housing, condense on cooler materials in the area, and drip to the floor. Other potential sources of LOCS leakage include joints in the RCP oil system and the associated LOCS. Historical data has shown that the CR-3 LOCS did not meet regulatory requirements on more than one occasion since the LIV was issued in 2004. Five NCRs were written since September 2004 which documented RCP oil leakage outside the LOCS. RCP-1B was included in all five of the NCRs.

Maintenance Procedure MP-115B, RCP Motor Lube Oil Enclosure Maintenance, provided guidance for removal, installation, and post maintenance reinstallation walk down of the RCP lube oil enclosures on the "old style" LOCS. The team noted that a procedure revision request (PRR) was initiated in the fall of 2005 to enhance the guidance in Procedure MP-115B. This enhancement provided more rigorous guidance for leak checking the RCP lube oil enclosures for each RCP with the "old style" LOCS during each RFO. The team noted that although the PRR was initiated in 2005, the revision to Procedure MP-115B was issued in November 2007 during RFO15. The team concluded that the oil leakage outside the RCP-1B LOCS may have been preventable if the more rigorous leak check guidance in Procedure MP-115B had been implemented during RFO15.

Analysis: This finding is more than minor because it is associated with the external factors attribute, i.e., fire, and it degraded the reactor safety Initiating Events cornerstone objective. If left uncorrected, the oil could further collect and contribute to a fire within the RB which would be a more significant safety concern. This finding has a cross-cutting aspect in the Corrective Action Program component of the Problem Identification and Resolution area because the licensee did not take appropriate corrective actions in a timely manner to address the adverse trend related to oil leakage for RCP-1B (NRC Inspection Manual Chapter 0305, P.1(d)).

The team completed a Phase 1 screening of the finding in accordance with IMC 0609, Appendix F, Attachment 1, Step 1.3, Qualitative Screening Approach, and concluded that the finding had a very low safety significance (Green) because the amount of oil identified in 2008 was less than the amount assumed in the licensee's 2004 bounding analysis.

Enforcement: 10 CFR 50, Appendix R, Section III.O, requires that the reactor coolant pump shall be equipped with an oil collection system and that leakage (of oil) shall be collected and drained to a vented closed container.

Contrary to the above, on February 4, 2008, and on prior occasions, varying amounts of RCP-1B lube oil were not collected by the LOCS and had been found on the RB floor

below the RCP-1B LOCS. The most recent condition existed from February 4, 2008, until maintenance was performed on RCP-1B LOCS during the March 2008 forced outage to address the oil leakage problem. Because this finding is of very low safety significance and has been entered in the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. This finding is identified as NCV 05000302/2008006-04, Reactor Coolant Pump 1B Lube Oil Collection System Leakage.

4OA3 Event Followup

.01 (Closed) LER 05000302/2007001-00: Design Oversight Results in 10 CFR 50, Appendix R, Cable Separation Criteria Not Met

a. Inspection Scope

The team completed a review and characterization of LER 05000302/2007001-00 including evaluation of the risk significance.

b. Findings

Introduction: The licensee identified a violation of 10 CFR 50, Appendix R, Section III.G.2, for failing to protect cables for valves DHV-3 and DHV-4. These valves are inside reactor containment and provide isolation between the high pressure reactor coolant system and lower pressure decay heat system piping which extends outside containment. The violation meets the criteria of NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)" for enforcement discretion.

Description: Valves DHV-3 and DHV-4 are in series inside reactor containment and provide redundant isolation between the high pressure reactor coolant system and lower pressure decay heat system piping which extends outside containment. Their function during the early stages of post-fire safe shutdown is to remain closed. The circuit breaker for DHV-3 is maintained open to help preclude spurious operation. Nevertheless, a power cable to power cable short-circuit could provide motive force to open the valve. The licensee intended to preclude the power cable to power cable short-circuit by routing the power cable to DHV-3 by itself in conduit. A modification was implemented to do this, but a short section of cable near the containment penetration remained routed in tray with other power cables, thus partially defeating the purpose of the modification. This problem was identified during a re-validation of the safe shutdown circuit analysis performed for transition to 10 CFR 50.48 (c). To get spurious opening of both DHV-3 and DHV-4 as result of a fire in the containment penetration area of the intermediate building, it would take a three phase cable to three phase cable short-circuit of correct polarity on the power cable to DHV-3 at the point where the cable is run in tray plus a short-circuit on wires within the control cable for DHV-4. This is a very low probability event.

A similar situation existed at certain points inside containment. Immediate and interim compensatory measures for these problems were put in place as described in the subject LER.

Analysis: The problem described in the LER is a performance deficiency because the licensee failed to protect cables important to safe shutdown as required. The problem is more than minor because it was associated with the external factors attribute, i.e. fire, of the Mitigating Systems cornerstone and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. When the probability of fire starting in the penetration area or inside containment is multiplied by the probability of the multiple cable damage states described above the result indicates the postulated event is lower than high safety significance (Red) and indicative of having very low safety significance.

Enforcement: 10 CFR 50, Appendix R, Section III.G.2, requires that cables important to safe shutdown be protected from fire damage. Contrary to this requirement, on January 11 and January 23, 2007, the licensee identified that cables for high/low pressure interface valves DHV-3 and DHV-4 were not protected against spurious opening. Spurious opening of both these valves could adversely affect safe shutdown. However, the Commission's Enforcement Policy and NRC Manual Chapter 0305, "Operating Reactor Assessment", state that, under certain conditions fire protection findings at nuclear power plants that transition their licensing basis to 10 CFR 50.48 (c) are eligible for enforcement and ROP discretion. The conditions for discretion were met as follows. The licensee identified the violation during their formal transition period to 10 CFR 50.48 (c). The problem was entered into their corrective action program as NCR 218852 and adequate interim compensatory measures were put in place. The violation was not willful nor was it of high safety significance. Other criteria in the Enforcement Policy and Manual Chapter were met. Therefore, discretion was granted, and the LER is closed.

4OA5 Other Activities

.01 (Open) URI 05000302/2004009-003: Unapproved Local Manual Operator Actions Instead of Required Physical Protection or Separation of Cables to Preclude Fire Damage

Inspection Scope

The team reviewed the licensee's actions to address the subject URI.

Findings

The team reviewed the status and progress of licensee actions to address the issue of unapproved local manual operator actions. The team noted that the licensee is addressing the unapproved local operator manual actions as part of their transition to NFPA 805. The licensee performed a manual action feasibility review of the operator manual actions identified in the Appendix R Fire Study to assess the acceptability of the operator manual actions as compensatory measures during the NFPA 805 transition process. The team reviewed the manual action feasibility section of the licensee's Appendix R Fire Study. The team also reviewed NCR 205333, which was initiated to manage and track the resolution of the operator manual action issue during the transition

to NFPA 805. This URI remains open pending further NRC review during the licensee's NFPA 805 transition process.

.02 (Open) URI 05000302/2004009-005: Motor Operated Valves Not Protected From Hot Shorts that Could Bypass Torque Switches

a. Inspection Scope

The team reviewed the licensee's evaluations for the subject URI.

b. Findings

The issue that short-circuits between wires in control cables for motor operated valves could lead to spurious operation of the valve and at the same time bypass the torque and limit switches had been partially resolved by the licensee. It was partially resolved by rewiring the control circuits such that bypassing the torque and limit switches would be impossible. The exception was for the case of the postulated short-circuit occurs inside the motor control center. In that case, bypassing the torque and limit switch would still be possible. During this inspection, the team reviewed the licensee's evaluations to address the case of short-circuit occurs inside the motor control center. These evaluations were able to show that a relatively large percentage of the valves on the safe shutdown equipment list could be eliminated from further torque switch bypass concern. A number of valves remain in the potential concern category, and torque calculations indicate that damage to these valves could be possible if their torque switch were bypassed. The licensee was continuing to analyze the situation under NCR 148225 as part of the work of transitioning to 10 CFR 50.48 (c). Therefore the URI remains open pending further NRC review.

4OA6 Meetings, Including Exit

On February 15, 2008, the lead inspector presented the inspection results to Mr. J. Franke, Director of Site Operations, and other members of the licensee's staff. The licensee acknowledged the findings. Proprietary information is not included in this report. Following completion of additional reviews in the Region II office, another exit meeting was held by telephone with Mr. D. Young, CR-3 Site Vice President, and other members of the licensee's staff on March 31, 2008, to provide an update on changes to the preliminary inspection findings. The licensee acknowledged the findings.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
M. Annacone, Plant General Manager
J. Curham, Fire Protection Program Manager
J. Ertman, Supervisor, Corporate Fire Protection
B. Foster, Acting Manager, Engineering
J. Franke, Director of Site Operations
P. Gerardin, Acting Manager, Nuclear Assurance Section
D. Herrin, Acting Supervisor, Licensing and Regulatory Programs
A. Holder, Senior Engineering Technical Support Specialist, Corporate Engineering Support
R. Hons, Training Manager
C. Kish, Appendix R/Safe Shutdown Program Manager
R. Marckese, Supervisor, Rapid Response
H. Oates, Superintendent, Design Engineering
R. Tyrie, Senior Reactor Operator/Operations Fire Protection Coordinator
K. Williams, Fire Protection Program Engineer
B. Wunderly, Superintendent, Technical Services
D. Young, Vice President, Crystal River Nuclear Plant

NRC Personnel
T. Morrissey, Senior Resident Inspector
R. Reyes, Resident Inspector
S. Walker, Acting Chief, Engineering Branch 2, Division of Reactor Safety, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000302/2008006-03	URI	Evaluate Opening Access Hatch to Cable Spread Room (Section 1R05.04)

Opened/Closed

05000302/2008006-01	NCV	Failure to Control Transient Combustibles (Section 1R05.02)
05000302/2008006-02	NCV	Failure to Adequately Protect Cables for Valve DHV-42 (Section 1R05.03)
05000302/2008006-04	NCV	Reactor Coolant Pump 1B Lube Oil Collection System Leakage (Section 4OA2)

Closed

05000302/2007001-00	LER	Design Oversight Results in 10 CFR 50, Appendix R Cable Separation Criteria Not Being Met (Section 4OA3)

Discussed

05000302/2004009-003	URI	Unapproved Local Manual Operator Actions Instead of Required Physical Protection or Separation of Cables to Preclude Fire Damage (Section 4OA5.01)
05000302/2004009-005	URI	Motor Operated Valves Not Protected From Hot Shorts That Could Bypass Torque Switches (Section 4OA5.02)

LIST OF DOCUMENTS REVIEWED

Procedures

AI 500, Conduct of Operations Depart Organization and Administration, Rev. 140
AI 1000, Housekeeping/Material Condition Program, Rev. 41
AI-2200, Guidelines for Handling Use and Control of Transient Combustibles, Rev. 11
AI-2205A, Pre Fire Plan – Control Complex, Rev. 3
AI-2205C, Pre Fire Plan – Auxiliary Building, Rev. 1
AP 880, Fire Protection, Rev. 25
AP 990, Shutdown from Outside the Control Room, Rev. 25
AR-803, Fire Detection Main Control Panel, FSCP-1 Annunciator Response, Rev. 0
FIR-NGGC-0004, Determination of Combustible Loading and Equivalent Fire Severity, Rev. 2
MP-807, Installation of T.S.I Fire Barriers, Rev. 7
MP-808, Repair of Mecatiss Fire Barriers, Rev. 4
OP-700E, 125/250 Volt DC Distribution Panels (DPDPS), Rev. 46
OP 880A, Appendix R Post-Fire Safe Shutdown Information, Rev.11
PT-315, Remote Shutdown Relay Operability, Rev. 12
SP-190A, Functional Test of Aux Bldg and Rx Bldg Purge fire Detection Instrumentation, Rev. 13
SP-190D, Control Complex Fire Detection Systems Test, Rev. 17
SP-190J, Cable Spreading Room Fire Detection System Test, Rev. 13
SP-338, Remote Shutdown and Post Accident Monitoring Channel Check, Rev. 53
SP-501A, Halon ASC Weight and Pressure Check, Rev. 10
SP-501B, Halon System Functional Check, Rev. 15
SP-805, Monthly Surveillance of Plant Fire Doors, Rev. 31
SP-807, Mounted Emergency Battery Powered Light Units, Rev. 24
SP-810, TSI Fire Barrier Check, Rev. 8
SP-820, Mecatiss Fire Barrier Inspection, Rev. 5

Completed Surveillance Test Procedures and Test Records

SP-807, Mounted Emergency Battery Powered Light Units, Rev. 20, completed 11/16/2005, WO 00557780-12
SP-807, Mounted Emergency Battery Powered Light Units, Rev. 21, completed 12/22/2005, WO 00770472-01
SP-807, Mounted Emergency Battery Powered Light Units, Rev.22, completed 03/15/2006, WO 00798218-01
SP-807, Mounted Emergency Battery Powered Light Units, Rev.24, completed 08/01/2007, WO 01046769-01
SP-807, Mounted Emergency Battery Powered Light Units, Rev.24, completed 10/24/2007, WO 01087907-01
SP-807, Mounted Emergency Battery Powered Light Units, Rev.24, completed 01/16/2008, WO 01129022-01
Six-month preventive maint on mounted emergency light batteries, completed 09/27/2007, WO 01053211-01
Bi-annual emergency light battery replacement, completed 05/16/2005, WO 00442757-01

Bi-annual emergency light battery replacement, completed 08/16/2007, WO 00722061-01
PT-315, Remote Shutdown Relay Operability, Rev. 12, completed 11/18/2005
PT-315, Remote Shutdown Relay Operability, Rev. 12, completed 11/15/2007
SP-338, Remote Shutdown and Post Accident Monitoring Check – Communications Check (Enclosure 2) p. 22 and 23 of 36, Completed 12/3/2007
SP-804, Surveillance of Plant Fire Brigade Equipment, completed 12/4/2007, and 01/22/2008

Drawings

B-208-019, Decay Heat Closed Cycle Cool Water PP 3A, Pg. DC-01, Rev. 26
B-208-019, Decay Heat Closed Cycle Cool Water PP 3B, Pg. DC-02, Rev. 26
B-208-039, Main Steam Supply Isolation to EFP-2 Turbine Drive MSV-56, Rev. 23
B-208-041, Letdown Cooler Isolation Valve MUV-49, Rev. 22
B-208-056, Reactor Bldg Fan Assembly Transfer Vlv SWV-354, Pg. SW-01, Rev. 16
B-208-056, Emergency Nuclear Service CC Cooling Pmp 3A, Pg. SW-02, Rev. 16
E-201-331, Remote Shutdown Panel ESG Assembly Actuations A, A-B, B, Rev. 18
E-215-032, Electrical Conduit Layout Control Complex Elevation 124' – 0", Sheet 2, Rev. 62
E-214-033, Electrical Cable Trays Control Complex Sections and Details, Rev. 7
E-214-043, Electrical Cable Trays Auxiliary Building Above Elevation 119' – 0" North, Rev. 11
EC-209-031, Electrical Interconnection Wiring Diag. Fire Service Freon Sys., Sheet 33, Rev. 7
EC-209-031, Electrical Interconnection Diagram Fire Detection System, Sheet 40, Rev. 7
EC-209-031, Electrical Interconnection Wiring Diagram Fire Service Plant Area Products of Combustion Control Cabinet, Sheet 16, Rev. 11
C-7-10, Elementary Diagram Cable Spreading Room Fans FSF-1&2, Rev.3
EC-206-11, Electrical One Line Diagram Composite, Rev. 64
EC-206-054, Electrical One-Line MCC E.S. 3A1-AUX. BLDG. – 95' – 0" MTMC3, Rev. 62
C-7-8, Elem Diag. DH Suction from BWST to DHP 3A Valve DHV-34, Sht. DH-11, Rev.17
SS-211-021, Elect Blk Diag. DH Suct from BWST to DHP 3A Valve DHV-34, Sht. DH-11, Rev. 8
C-7-8, Elem Diag. DH Suction from RB Sump to DHP 3A Valve DHV-42, Sheet DH-14, Rev.18
SS-211-021, Elect Blk Diag. DH Suction RB Sump to DHP 3A Valve DHV-42, Sht. DH-14, Rev. 7
EC-209-014, Elect Interconnection Wiring Diag. Communications System UHF Repeater, Rev. 5
CM-65 55-211-014, Electrical Block Diagram, Communications, UHF Repeaters, Rev. 5
P&ID FD-302-231, Sheet 1 of 5, Fire Water System, Rev. 66
P&ID FD-302-231, Sheet 2 of 6, Fire Water System, Rev. 51
P&ID FD-302-231, Sheet 3 of 7, Fire Water System, Rev. 49,
P-304-788, Sheet 2 of 2, Fire Service Sprinkler, El. 95', Rev. 05
P-304-789, Sheet 1 of 2, Fire Service Sprinkler, El. 95', Rev. 03
P-304-789, Sheet 2 of 2, Fire Service Sprinkler, El. 95', Rev. 02
P-304-791, Sheet 1 of 2, Fire Service Sprinkler, El. 119', Rev. 02
P-304-791, Sheet 2 of 2, Fire Service Sprinkler, El. 119', Rev. 05
Control Complex Ventilation, 302-753-SH-003-SH000, Rev. 18

Engineering Documents, Calculations, Design Changes, etc.

Calculation M-97-0016, R2, NFPA-13 Sprinkler Analysis, Aux Bldg, Elev. 119', March 26, 1999
Eng Evaluation EEM 00-011, Cable Spreading Room Halon Calculation, Rev. 0, November 2000

Fenwal Instruction Manual, Publication No. 48, Procedure for Determining Weight of Contents – Fenwal Halon 1301 Agent Storage Containers, Issued October 30, 1974
NUREG/CR-2607; SAND82-0431 RP, Fire Protection Research Program for the U.S. Nuclear Regulatory Commission, 1975-1981, D. Dube
NUREG/CR-3656; SAND 83-2664, Evaluation of Suppression Methods for Electrical Cable Fires, J. M. Chavez and L. D. Lambert
Crystal River 10CFR50 Appendix R Fire Study, Rev. 12
Engineering Study to Develop Options to Resolve Issues/Problems Associated with the Control Room Complex HVAC System, October 26, 2006
REA 980553, MUP Gear Drive Lubrication Pump Operating Concern
Crystal Letter 3F0903-03, Manual Operator Actions for Fire Protection
M88-1026, RCP N-9000 Seal Appendix R Evaluation

Work Orders (WO)

WO 796818-02, Preventive Maintenance for RCP-1B with procedure MP-115B RCP Motor Lube Oil Enclosure Maintenance, Rev. 4 and MP-183 RCP Oil System, Rev 4, 11/02/2007
WO 1181853-03, RCP-1B Inspect Motor for Oil Leakage using MP-115B RCP Motor Lube Oil Enclosure Maintenance, Rev. 5, 02/29/2008

Applicable Codes and Standards

NFPA 12A-1970, Standard for Halogenated Systems
NFPA 13-1969, Standard for the Installation of Sprinkler Systems
NFPA 13-1983, Standard for the Installation of Sprinkler Systems
NFPA 13-1994, Standard for the Installation of Sprinkler Systems
NFPA 14-1971, Standard for the Installation of Standpipe and Hose Systems
NFPA 72D-1967, Standard for the Installation, Maintenance and Use of Proprietary Protective Signaling Systems for Watchman, Fire Alarm, and Supervisory Services

Technical Manuals and Vendor Information

Motorola HT750 ™ Portable Two Way Radio Specification Overview
Motorola HT750 ™ Portable Two Way Radio User Guide
Motorola HT1000 Synthesized FM Portable Radio Specification Overview

Licensing Basis Documents

Fire Hazards Analysis, Rev. 11
Fire Protection Plan, Rev. 25

Nuclear Condition Reports (NCR) Generated as a Result of This Inspection

NCR 263934, Drawing Error
NCR 264138, Mecatiss fire wrap on conduit DHC206 not installed per vendor test configuration
NCR 264340, Pump data results transposed in results and conclusion section of calc M97-0016
NCR 264248, Procedure AR-803 error related to number smoke detectors used to monitor CSR

NCR 264285, OP-880A procedural discrepancy and enhancement
NCR 264288, Appendix R emergency light MEL-83 did not function
NCR 264293, Makeup valve MUV-53 is missing green EOP valve tag
NCR 264296, PPO office is not on distribution list for a controlled copy of OP-880A
NCR 264300, MUV-257 MOV dial indicator does not accurately reflect the position of the valve
NCR 264477, Emergency light MEL-147A was found not aimed correctly per SP-807
NCR 264503, Transient combustibles found during plant walkdown
NCR 264505, Procedure AP-880 manual valve HYV-34 accessibility is difficult
NCR 264529, EG-143-PI indicates off scale (should be at zero)
NCR 264546, Commitment 3 in FHA does not agree with NRC SER
NCR 264666, AB-119 dress out area plastic and wood benches not captured in FPDS
NCR 264750, Valve SWV-356 not discussed in the Appendix R Fire Study
NCR 265448, Incorrect reference in engineering evaluation EEM00-0011 for Halon concentration
NCR 265650, Fire door D204 did not close (one time) after passage
NCR 265670, Appendix R lighting coverage questions
NCR 265672, Four foot ladder left in “A” EFIC room
NCR 265674, ES 4160V breaker local trip pushbutton label
NCR 265986, Failure of same MELs in SP-807
NCR 266002, Electrical arc flash suit hood material deficiencies
NCR 266060, Model WO instructions for batteries no longer valid
NCR 266149, DPDP-4B not addressed in Appendix R Fire Study
NCR 266152, Transient combustible materials remaining in fire area after work completed
NCR 266312, Sprinkler head obstruction
NCR 266354, Evaluate best method to ensure MEL batteries can perform for eight hours
NCR 266356, Control room floor hatch impacts cable spreading room Halon system
NCR 266575, Performance of SP-807, Mounted Emergency Battery-Powered Light Units
NCR 266586, DHV-35 may not have sufficient lighting for manual operation

Other NCRs and Action Request (AR) Reviewed During The Inspection

AR 227800, OE24436, Kerite FR Cable Discrepancy Discovered
AR 227230, RNP AR207175, Appendix R Pathways
AR 233389, NRC Information Notice 2007-17, Fire at NPP’s
AR 235535, NRC Information Notice 2007-19, Fire Protection Recalls and Counterfeit Notices
AR 238008, NRC Integrated Inspection Report for Calvert Cliff
AR 242228, OE 25204, 35% Aqueous Hydrazine
AR 243083, NRC Information Notice 2007-26, Epoxy Coating Combustibility
AR 243319, NRC Information Notice 2007-23, Inadvertent Discharge of Halon
AR 254028, OE 25476, Unexpected Actuation of Fire Water Deluge System
AR 254054, OE 35741. Fire Dampers Found Not Installed per Vendor Instructions
AR 261705, RAI on Jockey Fire Pump
NCR 205333, Manual Operator Actions in Response to a Fire, RIS 2006-010
NCR 218852, Appendix R Separation Criteria Not Met for DHV-3
NCR 220021, Appendix R Separation Criteria Not Met for DHV-3 and DHV-4
NCR 227418, Alternate Comp Measure Specified for Appendix R Adverse Condition in RB
NCR 233877, Fire Study Re-Validation Identified Spurious Opening of MUVs
NCR 208697, SSA Project Identified Missing Conduit in Fire Area Database

NCR 208455, Fire Dampers 39 & 41 Close when Smoke Detector is Energized
NCR 229371, NAS Assessment C-FP-07-01 Weakness 1
NCR 190453 Fire Brigade Radios Fail During Drill
NCR 195303 SP-804 Weekly Testing Indicates Radio Repeater Problems
NCR 207908 Two Radios Failed During a Fire on 9/30/06
NCR 208600 New Radios Marked as Radioactive Material
NCR 218850 Communication Bleedover Between Radio Channels 11 & 13
NCR 264494, Evaluate access door to cable spreading room
NCR 264879, Oil Leak noted below RCP-1B in 'A' D-Ring
NCR 223479, RCP Lube Oil identified during Mode 3 Walkdown
NCR 203750, RCP Lube Oil identified during Mode 3 Walkdown (FW Leak Outage)
NCR 174970, MP-115B (Rev 3), RCP Lube Oil Enclosure Maintenance
NCR 174502, Lube Oil Identified Outside the Collection System
NCR 137006, RCP Lube Oil Identified Outside Collection System
NCR 136775, Oil Puddles found in RB 95' Elevation
NCR 124391, Appendix R Cable Separation within D-Rings
NCR 105940, Oil found in RB near TSP Boxes
OPEX Response – NRC Information Notice 1989-52, Fire Damper Closure Under Airflow

Components Selected

EF-099-LI1, Emergency Feedwater Storage Tank Level Indicator
FW-367-FI, Auxiliary Feedwater Flow Rate Indication for SG 3B
FW-368-FI, Auxiliary Feedwater Flow Rate Indication for SG 3A
RC-4A-TI3-2, Wide Range T Hot
RC-4B-TI4-2, Wide Range T Hot
RC-5A-TI2-2, Wide Range T Cold
RC-5B-TI4-2, Wide Range T Cold
DH-7-LI1-1, BWST Level
SP-21-LI-2, OTSG "B" Operate Level
SP-22-LI-2, OTSG "B" Operate Level
SP-1A-LI1, SG RCSG-1A Full Range Level Indication
SP-1B-LI1, SG RCSG-1B Full Range Level Indication
EFV-14, EFP-1 Discharge Isolation Valve
EFV-33, EFP-1 Discharge Isolation Valve
DHV-34, DHP-1A Suction from Borated Water Storage Tank
DHV-35, DHP-1B Suction from Borated Water Storage Tank
MUV-23, Makeup Pump 1B Injection Control to Reactor Inlet Lines Loop A Valve
MUV-24, High Pressure Injection Control to Reactor Inlet Lines Loop A Valve
MUV-25, Makeup Pump 1B/1C Injection to Reactor Coolant Loop B Valve
MUV-26, High Pressure Boundary Valve Injection Control to Reactor Inlet Lines Loop B
MUV-53, MUP Recirculation Isolation
MUV-596, Reactor Coolant Seal/Normal Makeup Isolation Valve
SWV-353-SV2, RB Fan Cooling Supply Isolation Valve
SWV-354-SV2, RB Fan Cooling Return Isolation Valve

LIST OF ACRONYMS

BWST	Borated Water Storage Tank
CAP	Corrective Action Program
CC	Control Complex
CFR	Code of Federal Regulation
CSR	Cable Spreading Room
ELU	Emergency Lighting Unit
ERFBS	Electrical Raceway Fire Barrier System
FA	Fire Area
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
FZ	Fire Zone
GL	Generic Letter
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IPEEE	Individual Plant Examination for External Events
LIV	Licensee Identified Violation
LOCS	Lube Oil Collection System
MCC	Motor Control Center
MCR	Main Control Room
NCR	Nuclear Condition Report
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	U. S. Nuclear Regulatory Commission
OEP	Operating Experience Program
OSHA	Occupational Safety and Health Administration
P&IDs	Piping and Instrumentation Drawings
PRR	Procedure Revision Request
RB	Reactor Building
RCP	Reactor Coolant Pump
RFO	Refueling Outage
RIS	Regulatory Issue Summary
ROP	Reactor Oversight Process
RSP	Remote Shutdown Panel
SDP	Significance Determination Process
SER	Safety Evaluation Report
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report
UL	Underwriters Laboratories
URI	Unresolved Item
WO	Work Order