UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

May 9, 2000

EA 00-106

S. K. Gambhir, Division Manager
Nuclear Operations
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
P.O. Box 399
Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska 68023-0399

SUBJECT: FIRE PROTECTION TRIENNIAL BASELINE INSPECTION REPORT NO. 50-285/00-01

Dear Mr. Gambhir:

On January 24 to 28, and March 10, 2000, the NRC conducted a pilot fire protection triennial baseline inspection of your Fort Calhoun Station reactor facility. The enclosed report presents the results of that inspection. The team leader presented preliminary findings to you and members of your staff in a briefing on January 28, 2000, and in an exit meeting on March 10, 2000, both of which were held at Fort Calhoun Station. Following review of the preliminary findings by the NRC's Significance Determination Process Panel, a re-exit was held by telephone on April 28, 2000, to inform you of changes to the preliminary inspection findings.

Based on the results of this inspection, the NRC has determined that a violation of NRC requirements occurred for failure to comply with License Condition E to your license, relative to maintaining in effect all provisions of your NRC-approved fire protection program. Specifically, the installed configuration of power cables in Fire Area 32 (the air compressor room) conflicts with the description of the fire area provided to the NRC in your exemption request of January 9, 1985. The NRC used this information as a basis for issuing an exemption from 10 CFR Part 50, Appendix R, Section III.G.2 for power cables in Fire Area 32. The other example concerns the failure of the installed configuration of control cables in Fire Area 32 to meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 for ensuring that redundant trains of safe shutdown equipment remain free of fire damage. This violation is being treated as a noncited violation. It is the NRC's understanding that you do not consider the configuration of either the power or control cables to be outside your design basis. Therefore, it is your position that these violations of your License Condition E did not occur. However, as committed in the exit meeting of March 10, and again in the exit meeting of April 28, 2000, your posted compensatory measures for Fire Area 32 will remain in place until you have contacted Region IV management otherwise. In addition, this issue was entered into your corrective action program.

The team also identified a condition where a fire in either Fire Areas 34B (the upper electrical penetration room) or 36B (the west switchgear room) could potentially cause fire-induced circuit failures and result in the reactor coolant gas vent system valves spuriously opening and

establishing a vent path beyond your analyzed makeup capacity. The NRC staff and industry are currently working to resolve questions raised by the industry about the adequacy of the existing staff guidance concerning fire-induced circuit failures. In order to allow the industry to develop an acceptable approach to resolving this issue, the NRC will defer any enforcement action relative to these matters while the staff evaluates the Nuclear Energy Institute's proposed resolution methodology and you have time to implement the resolution methodology, once approved. Therefore, an apparent violation of 10 CFR Part 50, Appendix R, Section III.G.1.a, was identified for failure to ensure that one train of redundant systems necessary for achieving and maintaining hot shutdown, located within the same fire area, would remain free of fire damage. The NRC's Inspection Manual Chapter 0610* defines an apparent violation as "a potential noncompliance with a regulatory requirement that has not yet been formally cited as a violation in a notice of violation or order." It is the NRC's understanding that you do not consider these circuit vulnerabilities to be a violation of NRC requirements; however, as a conservative response to these findings, you posted compensatory measures for Fire Areas 34B and 36B, which will remain in place until this issue is resolved. During the exit meeting on April 28, 2000, you stated that you had recently completed an analysis, which demonstrated that given a fire in either Fire Areas 34B or 36B, your operators could cope with spurious opening of the reactor coolant gas vent system valves.

These violations are described in the subject inspection report and have been entered into your corrective action program. If you contest the nature or severity level of any of these violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, Region IV, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/***RA***/

Dr. Dale A. Powers, Acting Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Docket No.: 50-285
License No: DPR-40

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NRC Inspection Report No. 50-285/00-01

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	50-285
License No.:	DPR-40
Report No.:	50-285/00-01
Licensee:	Omaha Public Power District
Facility:	Fort Calhoun Station
Location:	Fort Calhoun Station FC-2-4 Adm., P.O. Box 399 Hwy. 75 - North of Fort Calhoun Fort Calhoun, Nebraska
Dates:	January 24 to 28 and March 10, 2000
Team Leader:	R. Nease, Senior Reactor Inspector Engineering and Maintenance Branch
Inspectors:	C. Johnson, Senior Reactor Inspector Engineering and Maintenance Branch
	R. Mullikin, Senior Reactor Inspector Engineering and Maintenance Branch
Accompanying Personnel:	P. Madden, Senior Fire Protection Engineer Plant Systems Branch Office of Nuclear Reactor Regulation
	F. Wyant, Contractor Sandia National Laboratories
	J. LaChance, Contractor Sandia National Laboratories
Approved By:	Dr. D. A. Powers, Acting Chief Engineering and Maintenance Branch Division of Reactor Safety

ATTACHMENTS:

1. Supplemental Information

2. Omaha Public Power District Response To the March 10, 2000, Fire Protection Exit Meeting, dated March 24, 2000

3. NRC's Revised Reactor Oversight Process

SUMMARY OF FINDINGS

Fort Calhoun Station
NRC Inspection Report No. 50-285/00-01

The objective of the pilot triennial fire protection team inspection was to evaluate whether the licensee had implemented a fire protection program that: (1) adequately controls combustibles and ignition sources within the plant; (2) provides adequate fire detection and suppression capability; (3) maintains passive fire protection features in good material condition; (4) puts adequate compensatory measures in place for out-of-service, degraded or inoperable fire protection equipment, systems or features; and (5) ensures that procedures, equipment, fire barriers, and systems exist so that the post-fire capability to safely shut down the plant is ensured. The inspection was performed in accordance with the new NRC regulatory oversight process using a risk-informed approach for selection of fire areas and attributes for the inspection focus. Inspection effort included a 2-day information gathering trip to Fort Calhoun Station (January 4 to 5, 2000), 1 week of onsite inspection (January 24 to 28, 2000), and a 1-day close-out inspection (March 10, 2000). Following the onsite inspection visits, the licensee provided additional documentation, which was received in the NRC's Region IV offices on February 9, 29, and March 24, 2000. The team's review of this additional information is considered to be part of the inspection effort.

Cornerstone: Mitigating Systems

- Green. The team identified two examples of a noncited violation of the Fort Calhoun Station operating license, for failing to maintain in effect all conditions of the NRC-approved fire protection program as described in the Updated Safety Analysis Report and as approved in NRC safety evaluation reports. The licensee does not consider the configuration of either the power or control cables to be outside their design basis; therefore, does not agree that these violations of the Fort Calhoun Station operating license occurred. These violations were entered into the licensee's corrective action program as Condition Report 200000207.

  (1) The licensee failed to maintain 10 feet of horizontal separation between power cables associated with redundant equipment necessary for achieving and maintaining hot shutdown conditions, as described in their exemption request of January 9, 1985, and, which the NRC used as a basis for granting an exemption from 10 CFR Part 50, Appendix R, Section III.G.2 on July 3, 1985. Specifically, the team identified cable trays in Fire Area 32, which contained power cables associated with redundant safe shutdown equipment that were separated horizontally by 3 feet 3 inches. This is one example of a noncited violation of License Condition E. This issue was evaluated using the significance determination process, and was determined to be within the licensee response band (Section 1R05.5).

(2) The licensee failed to meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, to ensure that at least one train of redundant equipment necessary for achieving and maintaining hot shutdown conditions remains free of fire damage. Specifically, the team identified two locations within Fire Area 32, where cable trays containing safe shutdown control cables did not meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, to provide either 20 feet of horizontal separation or to enclose one redundant train in a 1-hour rated fire wrap. This is another example of a noncited violation of License Condition E. This issue was evaluated using the significance determination process, and was determined to be within the licensee response band (Section 1R05.5).

- Green. The team identified a condition where the licensee failed to ensure that one train of redundant systems, necessary for achieving and maintaining hot shutdown, located within the same fire area would remain free of fire damage. In particular, the team identified that a fire in Fire Area 34B (upper electrical penetration room) or Fire Area 36B (west switchgear room) could cause the spurious opening of the reactor coolant system head vent valves due to hot shorts. These spurious actuations could open a vent path from the reactor coolant system that exceeds the capacity to makeup to the reactor coolant system, as analyzed in the licensee's safe shutdown analysis. The licensee subsequently identified alternative means of makeup that would mitigate the effects of the event. The licensee disagrees that postulating multiple fire-induced circuit failures is required by NRC regulations or its operating license. This is an apparent violation of 10 CFR Part 50, Appendix R, Section III.G.1.a. This issue was evaluated using the significance determination process, and was determined to be within the licensee response band (Section 1R05.6).

REPORT DETAILS

1. REACTOR SAFETY

CORNERSTONES: INITIATING EVENTS and MITIGATING SYSTEMS

1R05 Fire Protection

INTRODUCTION

The purpose of this inspection was to review the Fort Calhoun Station fire protection program, for selected risk significant fire areas, with emphasis on verification that the post-fire safe shutdown capability and the fire protection features provided for ensuring that at least one post-fire safe shutdown success path is maintained free of fire damage. The inspection was performed in accordance with the new NRC regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team leader and a Region IV senior reactor analyst used the Fort Calhoun Station Individual Plant Examination External Events to choose several risk-significant areas for detailed inspection and review. The fire areas chosen for review during this inspection were:

Fire Area 6 (auxiliary building lower corridor),
Fire Area 10 (charging pump room),
Fire Area 31 (intake structure),
Fire Area 32 (air compressor room),
Fire Area 34B (upper electrical penetration room), and
Fire Area 36B (west switchgear room).

For each of these fire areas, the team focused their inspection on the fire protection features, and on the systems and equipment necessary for the licensee to achieve and maintain safe shutdown conditions.

.1 Fire Detection and Fixed Fire Suppression Systems

a. Inspection Scope

The team walked down the fire detection and suppression systems in the auxiliary building lower corridor, charging pump room, intake structure, air compressor room, upper electrical penetration room, and the west switchgear room to evaluate the adequacy of the installed configurations. The team also reviewed test results and the licensee's evaluations of the test results for the installed halon systems in the east and west switchgear rooms.

b. Observations and Findings

No findings were identified.

.2 Fire Barriers

a. Inspection Scope

For the selected fire areas, the team evaluated the adequacy of fire area barriers, penetration seals, and fire doors. To do this, the team observed the material condition and configuration of the installed fire barriers, as well as, construction details and supporting fire tests for the installed fire barriers. In addition, the inspectors reviewed the license documentation, such as exemptions and National Fire Protection Association code deviations to verify that the fire barrier installations met license commitments.

b. Observations and Findings

No findings were identified.

.3 Emergency Lighting

a. Inspection Scope

The team reviewed the adequacy of emergency lighting for safe-shutdown activities in the selected fire areas to verify that it was adequate for permitting access to safe shutdown equipment and performing manual actions required to achieve and maintain hot shutdown conditions.

b. Observations and Findings

No findings were identified.

.4 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

To ensure that at least one post-fire safe shutdown success path was available in the event of a fire in each of the selected areas, the team reviewed the functional requirements identified by the licensee as necessary for achieving and maintaining hot shutdown conditions and the list of safe shutdown equipment required to accomplish those functions documented in Calculation FC 06355, “10 CFR 50 Appendix R Functional Requirements and Component Selection,” Revision 5. The team focused on the following functions that must be ensured to achieve and maintain post-fire safe shutdown conditions: (1) reactivity control capable of achieving and maintaining cold shutdown reactivity conditions; (2) reactor coolant makeup capable of maintaining the reactor coolant level within the level indication in the pressurizer; (3) reactor heat

removal capable of achieving and maintaining decay heat removal; (4) process monitoring capable of providing direct readings of the process variables for accomplishing reactivity control, reactor coolant makeup, reactor heat removal; and (5) supporting system capable of providing all other services necessary to permit extended operation of equipment necessary to achieving and maintaining hot shutdown conditions.

The team also verified that Calculation FC 06355 included all equipment necessary for the safe shutdown systems to accomplish the required functions. To do this, the team reviewed the licensee's list of systems selected to accomplish each of the functions necessary for achieving safe shutdown, and the basis for eliminating systems from the list. In addition, the team reviewed system piping and instrumentation drawings to identify the components in each of the safe shutdown systems necessary for system success, including components that could cause flow diversion or system isolation, and valves interfacing with the primary reactor coolant system boundary whose maloperation could result in a loss of coolant accident.

b. Observations and Findings

No findings were identified.

.5 Fire Protection of Safe Shutdown Equipment

a. Inspection Scope

For each of the selected fire areas, the team reviewed the licensee's safe shutdown analysis documented in Engineering Analysis EA-FC-89-055, "10 CFR 50 Appendix R Safe Shutdown Analysis," Revision 9, to ensure that at least one post-fire safe shutdown success path was available in the event of a fire. This included a review of manual actions required in Engineering Analysis EA-FC-89-055 to achieve and maintain hot shutdown conditions. The team also reviewed Procedures SO-G-28, "Station Fire Plan," Revision 45; EOP-00, "Standard Post Trip Activities," Revision 13, and EOP-20, "Functional Recover Procedures," Revision 4, to verify that adequate direction was provided to operators to perform these manual actions. Factors, such as timing, access to the equipment, and the availability of procedures, were considered in the review.

For each of the selected fire areas, the team also reviewed the adequacy of the fire protection features to protect the systems and components necessary for achieving and maintaining safe shutdown. Specifically, the team reviewed the licensee's fire hazards analysis, construction details and test results for installed fire barrier configurations, and the licensing and design basis for each of the fire areas, including exemptions from NRC requirements and license conditions. In addition, the team observed the installed configuration of the fire protection features in each of the fire areas through a walkdown of the areas.

b. Observations and Findings

No findings were identified during this inspection for Fire Areas 06 (auxiliary building lower corridor), 10 (charging pump room), and 31 (intake structure). Observations and findings for the remaining areas are discussed separately by fire area, below.

Fire Area 32 - Air Compressor Room

This fire area contains the turbine- and motor-driven auxiliary feedwater pumps, power distribution cables for both electrical divisions, control and power cables for both low pressure safety injection pumps, all three chemical volume control system pumps, and two of the three high pressure safety injection pumps, and other miscellaneous components. Partial fire barriers have been provided at three locations where trays carrying redundant cables cross over one another, and a barrier between the two auxiliary feedwater pumps has been constructed. This fire area is provided with full area fire detection and suppression in accordance with the National Fire Protection Association codes. Cable tray covers and additional suppression has been installed in some of the cable trays.

Licensing Basis: In License Condition E of the facility operating license, it is stated that the licensee will implement and maintain in effect all provisions of the NRC-approved fire protection program, as described in the Updated Safety Analysis Report for the facility and as approved in NRC safety evaluation reports. In the Fort Calhoun Station Updated Safety Analysis Report, the licensee committed to 10 CFR Part 50, Appendix R, Items III.G, III.J, and III.O. Section III.G.2 of Appendix R to 10 CFR Part 50 describes three methods acceptable for ensuring that at least one train of redundant safe shutdown equipment is free of fire damage: (a) redundant trains be located in different fire areas separated by 3-hour rated fire barriers; (b) redundant trains in the same fire area be separated by 20 feet of horizontal distance with no intervening combustible or fire hazards, and the fire area be equipped with area-wide detection and suppression; or (c) one redundant train be separated from the other redundant trains by enclosing it in a 1-hour fire rated barrier, and the fire area be equipped with area-wide detection and suppression.

Exemptions for Fire Area 32: In a letter dated January 9, 1985, the licensee stated that all 480 V motor control center power feeder cables are in Fire Area 32, and that these cables do not meet the separation criterion of 10 CFR Part 50, Appendix R, Section III.G.2. In this same letter, the licensee requested an exemption from the requirement to provide 1-hour fire rated enclosure. The licensee further stated that for Fire Area 32, the 1-hour fire rated enclosure was unnecessary to assure the capability to safely shut down the plant for the following reasons:

- The principal fire hazard in this area is a cable fire in one redundant train, which could affect the other.

- A fire barrier designed in accordance with Regulatory Guide 1.75, “Physical Independence of Electric Systems,” and IEEE-383, "IEEE Standard for Type Test of Class IE Electrical Cables, Field Splices, and Connections for Nuclear Power Generating Stations,” was provided where these redundant cables cross over each other in cable trays.

- In other cases, cable trays containing redundant trains of power cables have a minimum separation of approximately 10 feet horizontally.

- To protect the auxiliary feedwater pumps, the existing 1-hour rated fire barrier was to be extended in an “L” shaped configuration around one of the auxiliary feedwater pumps.

- An area-wide automatic fire suppression system will be designed and installed in accordance with National Fire Protection Association codes.

- This fire area is provided with adequate fire detection and fire protection systems.

Separation of Redundant Safe Shutdown Equipment: During the walkdown of Fire Area 32, the team identified two locations in the area where it appeared that redundant trains of cables associated with safe shutdown equipment were not provided with either 20 feet of separation or 1-hour fire rated wrap to ensure one train was free of fire damage. In one location, the team identified cable trays containing redundant trains of power and control cables separated by 3 feet 3 inches with no 1-hour fire wrap. In another location, the team identified cable trays containing redundant trains of power cables, which were separated from each other by 10 feet of horizontal distance. Furthermore, cable trays containing redundant control cables were located within that 10 feet of horizontal distance, parallel to the power cables, and separated from each other by just 5 feet.

The NRC based its granting of the exemption described above on information presented in the exemption requests. In their exemption requests, the licensee did not provide any information concerning the physical configuration of cable trays containing control cables for redundant trains of equipment necessary to achieve and maintain hot shutdown. Furthermore, the licensee did not provide information that cable trays containing redundant trains of safe shutdown power cables were separated horizontally by 3 feet 3 inches. By these omissions, the NRC reviewer would have been unaware that Fire Area 32 contained redundant trains of safe shutdown control cables that did not meet one of the fire protection options described 10 CFR Part 50, Appendix R, Section III.G.2. In addition, the reviewer would have relied on the information in the exemption request of January 9, 1985, which stated power cables were separated horizontally by 10 feet. The reviewer, therefore, would also have been unaware that Fire Area 32 contained redundant trains of safe shutdown power cables that were only 3 feet 3 inches apart.

The team concluded that the configuration of the power cables in Fire Area 32 did not meet with the description of the fire area provided to the NRC in the exemption request of January 9, 1985, which NRC relied upon in granting the exemption on July 3, 1985. Therefore, regarding redundant trains of safe shutdown power cables, the licensee does not meet the conditions upon which the exemption was granted. The team found that the failure to maintain in effect all provisions of the NRC-approved fire protection program is an example of a violation of License Condition E, which is being treated as a noncited violation (50-285/0001-01). As a compensatory measure for ensuring that the conditions in the room did not change, the licensee posted an hourly fire watch for this fire area. This issue was entered into the corrective action program as Condition Report 200000207.

Because (1) the licensee did not describe the configuration of control cables in Fire Area 32, and did not explicitely request an exemption from control cable separation or 1-hour rated fire wrap, and (2) the NRC's safety evaluation and associated exemption did not refer to control cables, the team concluded that the exemption was not applicable to control cables. Therefore, control cables must be either separated by 20 feet of horizontal distance with no intervening combustible or fire hazards or be enclosed in a 1-hour rated fire wrap in order to comply with the requirements of Section III.G.2, of Appendix R to 10 CFR Part 50 for ensuring that one redundant train of equipment required to achieve and maintain hot shutdown conditions remains free of fire damage. The team found that the licensee did not meet these requirements for control cables associated with redundant safe shutdown equipment. This failure to maintain in effect all provisions of the NRC-approved fire protection program is another example of a violation of License Condition E, which is being treated as a noncited violation (50-285/0001-01). As a compensatory measure, the licensee posted an hourly fire watch for this fire area. This issue was entered into the licensee's corrective action program as Condition Report 200000207.

Determination of Risk Significance of Fire Area 32 Fire Protection Features: The team leader and a Region IV senior reactor analyst evaluated the risk significance of this finding using the March 8, 2000, revision of the Fire Protection and Post-Fire Safe Shutdown Inspection Findings Evaluation Guidance. The team leader and the Region IV senior risk analyst considered the following in evaluating the risk.

- A fire ignition frequency (IF) of 5.08×10^{-3} per year for Fire Area 32 was determined from the licensee's individual plant evaluation external events document.

- None of the cable trays containing redundant safe shutdown power cables within 10 feet of each other was protected by fire wrap. In addition, none of the cable trays containing redundant safe shutdown control cables within 20 feet of each other was protected by fire wrap. Therefore, fire barrier degradation (FB) was determined to be high (FB = 0).

- Although a fire brigade drill was not witnessed by the team, no adverse observations were noted by the NRC within the last 3 years; therefore, manual suppression (MS) was considered to be in its normal operating state (MS = -1.0).

- The spacing and placement of detectors and automatic suppression fixtures appeared to meet the National Fire Protection Association codes. In addition in-tray sprinklers were installed in some of the cable trays. Therefore, no degradation was assigned to the automatic suppression term (AS = -1.25).

- A common cause term (CC) of +0.5 was assigned to account for the risk that the motor-driven fire pump may not be available, because its control cables were contained within Fire Area 32 (CC = +0.5).

- A fire mitigation frequency (FMF) was calculated to be $10^{-4.04}$ per year using the formula, FMF = log IF + FB + AS + MS + CC.

- Based on the length of time the condition existed (greater than 30 days), the likelihood for the initiating event occurrence during the degraded period was rated E.

- The inspection findings were assessed using the transient, the stuck-open relief valve, and the loss-of-offsite power worksheets, which were determined to be the applicable initiators for a fire in Fire Area 32. Important mitigating considerations were the automatic start of the diesel-driven fire pump on low fire water header pressure, the availability of the diesel-driven auxiliary feedwater pump, and the probability of the spurious opening of the power-operated relief valves and the failing to close on a loss of power.

- The resulting low fire mitigating frequency combined with the limited core damage capability resulted in a small increase in the core damage frequency.

The team leader and the senior reactor analyst concluded that this finding was determined to be within the licensee response band (Green).

Fire Area 34B - Upper Electrical Penetration Room: The team identified that a fire in this area could cause fire-induced circuit failures of all the of the reactor coolant gas vent system valves (HCV-176, HCV-177, HCV-178, HCV-179, and HCV-180), resulting in a loss of coolant accident beyond the capability of makeup, as analyzed in Engineering Analysis EA-FC-89-055, Revision 9. Engineering Analysis EA-FC-89-055 did not address the potential for a loss-of-coolant accident involving fire-induced spurious opening of the reactor coolant gas vent system valves. The team identified that multiple, concurrent, hot shorts involving a single positive conductor powered from the same bus that powers the reactor coolant gas vent system valves would cause spurious opening of the reactor coolant gas vent system valves. This issue is discussed in detail in Section .6 of this report.

FA 36B - West Switchgear Room

This fire area also contains control cables for reactor coolant gas system vent valves (HCV-177, HCV-179, and HCV -180), and the multiple hot short issue discussed for Fire Area 34B above, is also a concern for this fire area. This issue is discussed in detail in Section .6 of this report.

.6 Post-Fire Safe Shutdown Circuit Analysis

a. Inspection Scope

On a sampling basis, the team reviewed drawings, schematics, wiring diagrams, and cable routing information associated with systems and components required for post-fire safe shutdown to verify that power and control cables associated with post-fire safe shutdown equipment in the selected fire areas had been identified by the licensee and had been analyzed to show that they would not prevent safe shutdown because of fire-induced hot shorts, open circuits, or shorts to ground. Included in this review were pumps and valves for the raw water system, chemical volume and control system, high pressure safety injection, and the auxiliary feedwater system. The team also reviewed drawings, schematics and wiring diagrams for components whose spurious operation could initiate a transient, such as the power operated relief valves, shutdown cooling isolation valves, and the reactor coolant system gas vent valves.

b. Observations and Findings

Fire-Induced Circuit Failure of Cables Associated With Safe Shutdown Equipment

With the exception of Fire Area 32 (air compressor room) discussed above, the team did not identify any findings.

Fire-Induced Spurious Operation of Equipment That Could Initiate a Transient

The team reviewed the cable routing information and identified that power and control cables for the reactor coolant gas system vent valves (HCV-176, HCV-177, HCV-178, HCV-179 and HCV-180) were routed through Fire Areas 34B (upper electrical penetration room) and 36B (west switchgear room). The team identified that for these ungrounded dc circuits, multiple, concurrent, circuit failures could cause spurious opening of the reactor coolant gas vent system valves in Fire Areas 34B and 36B. The licensee did not consider this failure mode in their safe shutdown analysis, because it is their position that simultaneous multiple spurious actuations are not required to be considered in accordance with their licensing basis. This issue is under review by the Office of Nuclear Reactor Regulation.

Although they did not agree that this scenario was required to be addressed, the licensee established an hourly fire watch for Fire Areas 34B and 36B as a compensatory measure to ensure the conditions of the rooms do not change. In addition, licensee representatives were able to describe a method of coping with the events in Fire Area 34B, as well as, in 36B. This included, for a fire in Fire Area 34B, manually starting one charging pump from the control room and either manually aligning a second charging pump from outside the control room or manually establishing an injection path

using a high pressure safety injection pump discharging to the chemical volume control charging header. For a fire in Fire Area 36B, mitigation actions included manually starting one charging pump from the control room and manually establishing an injection path using a high pressure injection pump discharging to the chemical volume control charging header. These manual actions were described in procedures and were considered by the team to be reasonable and within the capabilities of licensed operators to perform in a timely manner. Although not formally analyzed by the licensee in their safe shutdown analysis, EA-FC-89-055, the team considered this described method to be feasible for mitigating and coping with the postulated event. The failure to ensure that, for a fire in Fire Areas 34B and 36B, one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage is an apparent violation of 10 CFR Part 50, Appendix R, Section III.G.1.a (50-285/00-02).

Determination of Risk Significance of Fire-Induced Spurious Operation of the Reactor Coolant Gas Vent System Valves

The team leader evaluated the risk significance of this finding using the March 8, 2000, revision of the Fire Protection and Post-Fire Safe Shutdown Inspection Findings Evaluation Guidance.

The following was considered in evaluating the risk for Fire Area 34B:

- A fire ignition frequency (IF) of 4.85×10^{-3} per year was determined from the licensee's individual plant evaluation external events document.

- Fire barrier degradation (FB) was determined to be high (FB = 0).

- Although a fire brigade drill was not witnessed by the team, no adverse observations were noted by the NRC within the last 3 years; therefore, manual suppression (MS) was considered to be in its normal operating state (MS =-1.0).

- Automatic suppression was determined to be within its normal operating state (AS = 1.25).

- A common cause term (CC) of +0.25 was used, which takes into account the relationship between the sprinkler system and manual fire fighting hose systems (CC = +0.25).

- A fire mitigation frequency (FMF) was calculated to be $10^{-4.3}$ per year using the formula, FMF = log IF + FB + AS + MS + CC.

- Based on the length of time the condition existed (greater than 30 days), the likelihood for the initiating event occurrence during the degraded period was rated E.

- Remaining mitigation capability included two charging pumps or high pressure safety injection pumps which were available plus operator actions to ensure the flowpath through the chemical volume control system.

The team leader concluded that the findings for Fire Area 34B were determined to be within the licensee response band (Green).

The following was considered in evaluating the risk for Fire Area 36B:

- A fire ignition frequency (IF) of 8.29×10^{-3} per year was determined from the licensee's individual plant evaluation external events document.

- Fire barrier degradation (FB) was determined to be high (FB = 0).

- Although a fire brigade drill was not witnessed by the team, no adverse observations were noted by the NRC within the last three years; therefore, manual suppression (MS) was considered to be in its normal operating state (MS = -1.0).

- Automatic suppression was determined to be within its normal operating state (AS = 1.25).

- A common cause term (CC) of +0.25 was used, which takes into account the relationship between the sprinkler system and manual fire fighting hose systems (CC = +0.25).

- A fire mitigation frequency (FMF) was calculated to be $10^{-4.1}$ per year using the formula, FMF = log IF + FB + AS + MS + CC.

- Based on the length of time the condition existed (greater than 30 days), the likelihood for the initiating event occurrence during the degraded period was rated E.

- Remaining mitigation capability included one charging pump and operator actions to establish flow from one high pressure safety injection pumps which were available through the chemical volume control system.

The team leader concluded that the findings for Fire Area 36B were determined to be within the licensee response band (Green).

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b. Observations and Findings

No findings were identified.

4 OTHER ACTIVITIES

4OA5 Management Meetings

.1 Briefings and Exit Meeting Summaries

Preliminary findings were presented to licensee management and staff by the team leader in a debrief on January 28, 2000, and in an exit meeting on March 10, 2000, both of which were held at Fort Calhoun Station. At each of these meetings, licensee management stated that they disagreed with the team's conclusions that the configuration of power cables did not meet the conditions upon which the exemption for Fire Area 32 was granted. Furthermore, licensee management maintained that for Fire Area 32, the NRC granted an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, to enclose all safe shutdown cables (both power and control) in a 1-hour fire wrap.

Licensee management also disagreed that NRC regulations require that the reactor coolant gas vent system valves be protected against multiple fire-induced circuit failures that result in spurious opening; therefore, did not agree with the apparent violation associated with this issue.

The team leader held a re-exit by telephone on April 28, 2000, to inform licensee management and staff of changes to the inspection findings following the NRC's Significant Determination Process Panel. Licensee management reiterated their position that for Fire Area 32, the NRC granted an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, to enclose all safe shutdown cables (both power and control) in a 1-hour fire wrap. Therefore, licensee management disagreed with the noncited violation of License Condition E.

In the exit meeting on April 28, 2000, licensee management also provided additional information that licensee engineers had recently completed an analysis, which demonstrated that given a fire in either Fire Areas 34B or 36B, operators could cope with spurious opening of the reactor coolant gas vent system valves. They further stated that it was their intention not to dispute the apparent violation, and to ask for enforcement discretion in accordance with Enforcement Guidance Memorandum EGM 98-002, Revision 2.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Brown, Operations Engineer
G. Cavenaugh, Acting Supervisor, Station Licensing
J. Chase, Division Manager, Nuclear Assessments
J. Connolley, Senior Electrical Engineer, Nuclear Engineering Department
M. Core, Manager, System Engineering
K. Erdman, Fire Protection Design Engineer
M. Frans, Licensing Manager
S. Gambhir, Division Manager, Nuclear Operations
B. Hansher, Supervisor, Station Licensing
R. Jaworski, Manager, Revised Reactor Oversight Process Implementation
J. Matthew, Fire Protection System Engineer
J. McManis, Supervisor, Engineering Mechanical Division
T. Peterson, Nuclear Design Engineer, Nuclear Engineering Department
R. Phelps, Division Manager, Nuclear Assessments
C. Sterba, System Engineer

NRC

C. Osterholtz, Resident Inspector
W. Walker, Senior Resident Inspector

INSPECTION PROCEDURES USED

71111.05	Fire Protection

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-285/00-02	APV	Apparent violation of 10 CFR Part 50, Appendix R, Section III.G.1.a for failure to ensure that one train of systems in Fire Areas 34B and 36B required for safe shutdown is free of fire damage (1RO5.6).

Opened and Closed

50-285/00-01	NCV	Two examples of a noncited violation of License Condition E to the Fort Calhoun Station operating license for failure to maintain in effect all provisions of the NRC-approved fire protection program in Fire Area 32 (1R05.5)

LIST OF DOCUMENTS REVIEWED

PROCEDURES

NUMBER	DESCRIPTION	REVISION
EOP-00	Standard Post Trip Activities	13
EOP-20	Functional Recovery Procedures	4
GM-RM-FP-0500	Fire Damper Periodic Cycling	3
GM-ST-FP-0006	Fire Damper Eighteen Month Inspection	1
SE-PM-FP-0500	Fire Barrier Inspection in Non-Safety Related Areas	2
SE-ST-FP-0005	Fire Barrier and Penetration Seals Eighteen Month Inspection	12
SE-ST-FP-0011	Fire Barrier and Penetration Seals Outage Inspection	0
SO-G-28	Station Fire Plan	45
SO-G-58	Control of Fire Protection System Impairments	27

CALCULATIONS

NUMBER	DESCRIPTION	REVISION
FC 05123	Halon Calculation - Switchgear Room A	0
FC 05124	Halon Calculation - Switchgear Room B	0
FC 06355	10 CFR Part 50, Appendix R Functional Requirements and Component Selection	5

ENGINEERING ANALYSES

NUMBER	TITLE	REVISION
EA-FC-89-055	10 CFR Part 50 Appendix R Safe Shutdown Analysis	9
EA-FC-89-050	Updated Associated Circuits Analysis	7
EA-FC-91-084	Breaker/Fuse Coordination Study	2
EA-FC-92-017	Evaluation of Sprinkler System and Water Supply for Room 19	3

NUMBER	TITLE	REVISION
EA-FC-93-033	Evaluation of Fire Barriers to GL 92-08 and Evaluation of Additional Miscellaneous Fire Barriers	2
EA-FC-97-001	Fire Hazards Analysis	11
EA-FC-97-001	Updated Fire Hazards Analysis	3
EA-FC-97-044	10 CFR Part 50 Appendix R Cable Identification	1
EA-FC-98-001	Fire Barrier Evaluation for HVAC Penetrations	1
EA-FC-98-002	Fire Barrier Evaluation for 86-10 6" Foam Penetrations	2
EA-FC-98-003	Fire Barrier Evaluation for 86-10 9" Foam Penetrations	5
EA-FC-98-004	Fire Barrier Evaluation for 86-10 Conduit Seals	1
EA-FC-98-005	Fire Barrier Evaluation for 86-10 Miscellaneous Penetrations	2
EA-FC-98-028	Fire Barrier Evaluation for Unmonitored Block Walls (86-10)	0

AUDITS/SURVEILLANCES

NUMBER	TITLE	DATE
97-SARC-017	SARC Audit Report 25A, "Fire Protection/Loss Prevention"	April 4, 1997
98-SARC-042	SARC Audit Reports 25 and 25A, "Fire Protection/Loss Prevention"	November 11, 1998
99-SARC-032	SARC Audit Reports 25/25A/25B, "Fire Protection/Loss Prevention (Triennial)"	October 11, 1999
99-QA/QC-023	Emergent Quality Assurance Surveillance Report F-99-1, "Fire Protection Program"	February 12, 1999
99-QA/QC-086	Emergent Quality Assurance Surveillance Report F-99-3, "Fire Brigade"	August 30, 1999
99-QA/QC-092	Emergent Quality Assurance Surveillance Report F-99-4, "Fire Protection Program Corrective Actions"	September 14, 1999

99-QA/QC-113	Emergent Quality Assurance Surveillance Report F-99-5, "Refueling Outage Fire Protection Activities"	November 11, 1999

DRAWINGS

NUMBER	DESCRIPTION	REVISION
11405-A-5	Primary Plant Ground Floor Elevation Piping and Instrumentation Drawing	37
11405-A-6	Primary Plant Ground Floor Elevation Piping and Instrumentation Drawing	71
11405-A-7	Primary Plant Intermediate & Operating Floor Plans	29
11405-A-8	Primary Plant Operating Floor Plan Piping and Instrumentation Drawing	42
11405-A-13	Primary Plant Section A-A Piping and Instrumentation Drawing	11
11405-A-14	Primary Plant Section B-B Piping and Instrumentation Drawing	12
11405-E-3	4.16 kV Auxiliary Power One Line Diagram P&ID	19
11405-E-4	480 Volt Auxiliary Power One Line Diagram - Sh. 1	29
11405-E-5	480 Volt Auxiliary Power One Line Diagram - Sh. 2	28
11405-E-6	480 Volt Primary Plant Motor Control Center One Line Diagram - Sh. 1	61
11405-E-7, Sh. 1	480 Volt Primary Plant Motor Control Center One Line Diagram Sheet 2A	47
11405-E-7, Sh. 2	480 Volt Primary Plant Motor Control Center One Line Diagram Sheet 2B	13
11405-E-8, Sh. 1	125 Volt DC Misc Power Distribution Diagram	55
11405-E-26, Sh. 5	Feedwater System Schematic Diagram for HCV-1105 & HCV-1106	22
11405-E-26, Sh. 6	Feedwater System Wiring Diagram for HCV-1105 & HCV-1106	21
11405-E-28, Sh. 3	Feedwater & Main Steam System Schematic, Control, & Instrumentation	40

NUMBER	DESCRIPTION	REVISION
11405-E-28, Sh. 4	Feedwater & Main Steam System Schematic, Control, & Instrumentation	35
11405-E-28, Sh. 5	Feedwater & Main Steam System Schematic, Control, & Instrumentation	35
11405-E-29, SHh 4	Safety Injection Valves Wiring Diagrams	21
11405-E-30, SH. 6	Stored Energy System & Miscellaneous Systems S.C. & I.	20
11405-E-32, Sh. 2	Pressurizer & Reactor Coolant System, I&C, MOV Elementary, Terminal Block	24
11405-E-42, Sh. 3	Safety Injection and Chemical Volume Control Systems SC&I	22
11405-E-42, Sh. 7	Safety Injection and Chemical Volume Control Systems SC&I	19
11405-E-42, Sh. 9	Safety Injection and Chemical Volume Control Systems SC&I	20
11405-E-45, Sh. 3	Aux Feedwater Control Valves to RC-2A & RC-2B	32
11405-E-45, Sh. 4	Aux Feedwater Control Valves to RC-2A & RC-2B	29
11405-E-51, SH. 2	Shutdown Cooling Isolation Valve HCV-347, HCV-348 Schematic Diagram	33
11405-E-51, SH. 3	Pressurizer RC-4, Relief Isolation Valves HCV-150 & HCV-151 Schematic Diagrams	30
11405-E-51, SH. 4	VCT Outlet Isolation Valve, LCV-218-2	29
11405-E-52, SH. 5	Misc HPSI Valves Schematic Diagram	18
11405-E-72	Air Compressor Bay & Electrical Penetration Area-Tray & Conduit Layout-Basement Fl. El. 989'-0"	52
11405-E-72, Sh.1	Schematic, Wiring Diagram & Switch Developments for Control Valve YCV-1045, to Steam Driven Aux. Feed Water Pump FW-10.	20
11404-E-72, Sh. 2	Air Compressor Bay & Electrical Penetration Area Tray & Conduit Layout Plan Elevation 989'-0"	16

NUMBER	DESCRIPTION	REVISION
11405-E-138	Schematic, Wiring Diagram and Switch Developments for Aux. Feedwater Control Valves HCV-1107A & B to Steam Generator RC-2A	14
11405-E-139	Schematic, Wiring Diagram, and Switch Developments for Aux. Feedwater Control Valves HCV-1108A and B to Steam Generator RC-2B	13
11405-E-142, Sh. 1	480V SWGR 1B3A, BKR 1B3A-1 (Unit 103B) Schematic-SI-2A	17
11405-E-142, Sh. 2	480V SWGR 1B4C, BKR 1B4C-5 (Unit 601B) Schematic-SI-2B	2
11405-E-142, Sh. 3	480V SWGR 1B3A-4A, BKR 1B3A-4A-4 (Unit 105C) Schematic-SI-2C	2
11405-E-143, Sh. 4	480V SWGR 1B3A, BKR 1B3A-4 (Unit 103C) Schematic-CH-1A	4
B-4250, Sh. 28	Cable Block Diagram FW-6	1
B-4250, Sh. 190	Cable Block Diagram PCV-102-1	1
B-4250, Sh. 191	Cable Block Diagram PCV-102-2	1
B-23866-414-353	Elementary Wiring Diagram - Motor-Operated Valves	8
D-4094, Sh. 1	Fire detection System Ground Floor Plan	6
D-4094, Sh. 2	Fire Detection System Basement Floor Plan Elevation 995'-6"	2
D-4094, Sh. 8	Fire Protection System in the Technical Support Center & Intake Structure	3
D-4159	Schematic Diagram Solenoid Operated Valves	6
D-4330, Sh. 1	HCV-239 Schematic and Wiring Diagram	2
E-4047	Schematics & Elementaries Long Term Core Cooling	10
E-4047, Sh. 2	Wiring Diagrams Long Term Core Cooling	5
E-4134	Schematic/Wiring Diagram SC&I & Feedwater Systems	4

CONDITION REPORTS

NUMBER	DESCRIPTION	DATE
199902709	Fire impairments not being tracked by the corrective action system	December 16, 1999
200000207	Compliance with licensing basis for Fire Area 32	January 27, 2000

MISCELLANEOUS DOCUMENTS

NUMBER	DESCRIPTION	REVISION/DATE
OI-EE-2	Operating Instruction - 480 Volt AC System Normal Operation	November 3, 1999
OI-OI-SC-2	Termination of Shutdown Cooling	December 22, 1999
LIC-95-0130	Individual Plant Examination of External Events for Fort Calhoun Station	June 30, 1995
NFPA 12A	Halon 1301 Fire Extinguishing	1992 Edition
6944	Fire Protection Impairment Permit for Room 19	January 28, 2000
6970	Fire Protection Impairment Permit for Fire Areas 34B and 36B	March 9, 2000
License No. DPR-40	Omaha Public Power District (Fort Calhoun Station, Unit 1), Docket No. 50-285 Facility Operating License	Amendment 1
	Section 9.11 of the Fort Calhoun Station Updated Final Safety Analysis Report	May 14, 1999
	OPPD Response to NRC Preliminary Results of Pilot Fire Protection Inspection	February 9, 2000
	Omaha Public Power District Response to the March 10, 2000, Fire Protection Exit Meeting	March 24, 2000
LIC-78-0145	Letter to Director of Nuclear Reactor Regulation, ATTN: Mr. Robert W. Reid, Chief, Operating Reactors Branch No. 4, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from T. E. Short, Division Manager, Production Operations	September 29, 1978
LIC-81-0042	Letter to Mr. Robert A. Clark, Chief, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations	March 27, 1981

NUMBER	DESCRIPTION	REVISION/DATE
LIC-83-219	Letter to Mr. Robert A. Clark, Chief, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: Request for Exemptions from Various Requirements of 10 CFR 50, Appendix R, Fire Protection Program for Nuclear Power Facilities	August 30, 1983
LIC-84-338	Letter to Mr. James R. Miller, Chief, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from R. L. Andrews, Division Manager, Production Operations; Subject: 10 CFR 50, Appendix R Exemption Request Revisions	January 9, 1985
	Letter to Mr. R. L. Andrews, Division Manager, Nuclear Production, Omaha Public Power District; Subject: Exemption Requests for the Fort Calhoun Station, Unit 1, 10 CFR Part 50, Appendix R, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979.	July 3, 1985

ATTACHMENT 2

March 24, 2000
Omaha Public Power District Response
To the March 10, 2000 Fire Protection Exit Meeting

Reference Documents:

1. Letter from W. C. Jones (OPPD) to R. A. Clark (NRC) dated August 30, 1983

2. Letter from R. L. Andrews (OPPD) to J. R. Miller (NRC) dated January 9, 1985

3. Letter from E. J. Butcher (NRC) to R. L Andrews (OPPD) dated July 3, 1985

The Fire Protection Inspection at Fort Calhoun Station (FCS) was completed in January 2000. Approximately one week following the inspection, Omaha Public Power District (OPPD) submitted a white paper discussing the 10 CFR 50, Appendix R, Section III.G.2 issues noted by the NRC.

On March 10, 2000, the NRC noted three potential violations in an exit meeting at FCS. One of the potential violations noted two examples of a non-compliance to 10 CFR 50, Appendix R, Section III.G.2. The items discussed were:

1) In Fire Area 32, power cables were found to be closer that 10 feet.
2) In Fire Area 32, control cables were found to be closer that 20 feet.

Potential Violation Discussion

Background

Per the March 20, 2000 conversation between Dr. Dale Powers (NRC) and Mr. Gary R. Cavanaugh (FCS), this paper is being submitted as a clarification of the issues.

In the early 1980s, OPPD was in pursuit of compliance to Appendix R issues at the FCS. With respect to Fire Area 32 at FCS, a request for exemption was submitted on August 30, 1983 (Reference 1). The request was revised and again submitted on January 9, 1985 (Reference 2). For Fire Area 32, the Reference 2 exemption request specifically superceded the Reference 1 exemption request. It is the Reference 2 exemption request and subsequent SER from the NRC (Reference 3), which this paper will clarify.

In initial discussions between FCS and the NRC inspectors during the January 2000 inspection, the phrase in Reference 3, “Granted In-Part,” for Fire Area 32 was extensively discussed. In an effort to clarify the issue, this discussion will explore from **what** did OPPD actually request an exemption.

In 10 CFR 50, Appendix R, Section III.G.2, the code states:

> Except as provided in paragraph G.3. of this section, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside

> of primary containment, **one** of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:
>
> a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a **3-hour rating**. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier.
>
> b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than **20 feet** with no intervening combustible or fire hazards. In addition, **fire detectors and an automatic fire suppression system** shall be installed in the fire area; or
>
> c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a **1-hour rating**. In addition, **fire detectors and an automatic fire suppression system** shall be installed in the fire area . . . . .

It is important to note that Section III.G.2 states that only "one" must be met. To clarify, FCS only needed to choose to comply with "a", "b" or "c." Due to original station construction, options III.G.2.a and III.G.2.b were not considered. FCS was aware that a 20-foot cable separation did not exist in Fire Area 32. FCS also knew that it could not fully comply with Section III.G.2.c and that an exemption request would be necessary. In both References 1 and 2, FCS clearly and soley requested an exemption from 10 CFR 50, Appendix R, Section III.G.2.c. This was noted and repeated in the cover letter on Reference 3 as stated below:

> . . . III.G.2, request for an exemption from the requirement that systems associated with redundant shutdown divisions be completely separated by a continuous 1-hour fire-rated barrier and that fire area containing these systems be protected by an area-wide automatic fire suppression system. . . .

At first glance, the Reference 3 statement that the exemption is granted "In-Part" may be confusing. Please note that there are two parts to 10 CFR 50, Appendix R, Section III.G.2.c (i.e., 1-hour rated barrier **and** fire detectors and automatic fire suppression). Also, please note that in Reference 1, OPPD initially requested an exemption from the 1-hour fire rated barrier and the suppression/detection system. In Reference 2, OPPD revised the request and committed to install a fire suppression and detection system. Therefore, the exemption granted "In-Part" took into consideration that only part of Section III.G.2.c would be exempted (i.e., need for the 1-hour fire rated barrier). Since it is clear that OPPD chose and requested an exemption only from Section III.G.2.c, a violation discussing distance between cables (as would be discussed had an exemption been requested from Section III.G.2.b) is not appropriate. Therefore, OPPD did not need, nor request, exemption from Section III.G.2.b.

Potential Violation Discussion

Regarding Reference 2, a discussion of 10-foot separation for power cables in Fire Area 32 between FCS personnel and the NRC staff has been ongoing. The Reference 2 correspondence was prepared with discussion on the configuration at that time. The discussion on 10-foot cable separation was included as defense-in-depth for high-energy cables (i.e., power cables).

In retrospect, the “10-foot” statement was not necessary to support the exemption request for Section III.G.2.c and should not have been included. Please also note that the original reviewers of this exemption request did not give OPPD any credit for this statement because it is not included in the SER. The configuration that exists today is the same that existed at the time of the Reference 2 exemption request. That is, power cables required for hot shutdown are typically separated by 10-feet, but do have some intervening combustibles (i.e., control cables). In the “pinch point” area where less that a 4-foot separation exists (north end of Fire Area 32), there are redundant power cables that supply power to MCCs containing equipment required for hot shutdown. However, manual actions can be credited and do exist in the plant procedures to mitigate fire induced faults.

Finally, concerning control cables in Fire Area 32, OPPD reiterates the same response. Since it is clear that OPPD chose to meet (with exemption) criteria III.G.2.c, a violation discussing “20 feet” (Section III.G.2.b) is not appropriate. OPPD did not need, nor request, exemption from Section III.G.2.b.

After reviewing References 1, 2 and 3 with this fresh perspective, it becomes quite clear why:

32. Some power cables in Fire Area 32 are less that 10 feet apart,

33. The control cables are never addressed, and

34. The exemption was granted “In-Part.”

Summary

Potential violation discussed by the NRC, example one:

> *In Fire Area 32, power cables were found to be closer that 10 feet*

OPPD Response:

> Although a 10-foot separation for power cables was included as a defense-in-depth statement in the exemption request, the NRC did not included it in the SER. Therefore, no credit was allowed for this separation.

Potential violation discussed by the NRC, example two:

> *In Fire Area 32, control cables were found to be closer that 20 feet*

OPPD Response:

> A 20-foot separation for control cables is not a licensing basis for FCS. Per the SER issued for the OPPD exemption request, FCS is committed only to 10 CFR 50, Appendix R, Section III.G.2.c. This does not require a 20-foot cable separation.

ATTACHMENT 3

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection Findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN Findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE Findings indicate issues that are of low to moderate safety significance. YELLOW Findings are issues that are of substantial safety significance. RED Findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner, which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.