



444 South 16th Street Mall  
Omaha NE 68102-2247

October 14, 2004  
LIC-04-0109

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

- References:
1. Docket No. 50-285
  2. Letter from D. A. Powers (NRC) to S. K. Gambhir (OPPPO) dated May 9, 2000 (NRC-00-054)
  3. Letter from OPPPO (S. K. Gambhir) to NRC (Document Control Desk) dated June 8, 2000 (LIC-00-0053)
  4. Letter from A. T. Howell III (NRC) to S. K. Gambhir (OPPPO) dated January 31, 2001 (NRC-01-008)

**SUBJECT: Status of Actions Regarding NRC Inspection Report 50-285/00-01 for the Fort Calhoun Station**

The intent of this letter is to provide the NRC with the status of actions being implemented at Fort Calhoun Station (FCS) associated with NRC Inspection Report 50-285/00-01.

In Reference 2, the NRC notified Omaha Public Power District (OPPPO) that a violation of NRC requirements occurred (50-285/0001-01) for 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. In Reference 3, OPPPO denied violation 50-285/00-01. The NRC subsequently reinstated the violation in Reference 4.

Additionally, in Reference 2, the NRC also notified OPPPO that the NRC identified an apparent violation (50-285/0001-02) of 10 CFR Part 50, Appendix R, Section III.G.1, for failure to ensure that one train of systems in Fire Areas 34B and 36B required for safe shutdown is free of fire damage. Since the NRC and industry were working to resolve questions raised by the industry about the adequacy of the existing staff guidance concerning fire-induced circuit failures, the NRC deferred enforcement action relative to this matter until the proposed resolution methodology was adopted and OPPPO had time to implement the resolution methodology, once approved by the NRC. Since NRC and the industry have reached conclusion on the associated circuits issue, OPPPO will also provide a status of action on this item.

The NRC opened and closed item number 50-285/0001-01 in the May 2000 inspection. Item 50-285/0001-02 remains open. OPPPO will continue conduct of the compensatory measures discussed at the exit meeting for inspection 50-285/00-01.

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In the attachment to this letter, OPPD has provided the NRC a description of the actions currently planned for Inspection Report 50-285/00-01 and noted their current schedules.

During the next several weeks, OPPD will continue to explore additional modifications and enhancements for FA-32 that are based upon risk information. The actions noted in this letter are those currently planned. OPPD will continue to keep the NRC apprised of planned modifications and enhancements associated with FA-32.

No regulatory commitments are made in this letter.

If you have any questions or require additional information, please contact Gary R. Cavanaugh at (402) 533-6913.

Sincerely,

Handwritten signature of R. L. Phelps, dated 10-14-04.

R. L. Phelps  
Division Manager  
Nuclear Engineering

RLP/GRC/grc

Attachment

**Discussion on the Corrective Actions Associated With  
NRC Inspection Report 50-285/00-01, Dated May 9, 2000**

**NRC Inspection Report 50-285/00-01, Item 01**

The following is an excerpt from Inspection Report 50-285/00-01:

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 1 R05.5).

(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 1 R05.5).

**OPPD Status of 50-285/0001-01**

In inspection report 50-285/00-01, the NRC opened and closed this inspection item. However, since this is a compliance item, OPPD has maintained compensatory measures in place and the NRC has maintained an awareness on this issue.

## **Background**

Fire Area 32 (FA-32) contains power distribution cabling for both trains of 4kV, 480V and 125Vdc, both trains of instrument and control cabling for various credited equipment, and both trains of auxiliary feedwater pumps and controls.

The configuration in FA-32 is allowed by Appendix R if the room has area-wide suppression and detection, and either; a) one of the trains is enclosed in a 1-hour fire barrier, or b) 20 feet of horizontal separation exists between the trains with no intervening combustibles or fire hazards. FA-32 is equipped with the necessary suppression and detection. However, FA-32 does not include the separation distance or the enclosed fire barriers. Therefore, in 1983 OPPD requested, and in 1985 was granted, an exemption by the NRC to Appendix R requirements for FA-32.

The exemption states that the existing fire protection for FA-32 provides an equivalent level of safety to that achieved by compliance with Appendix R, based upon:

1. Area wide suppression and detection systems
2. Lack of combustibles in the area
3. Some undefined level of physical separation
4. Some undefined protection via partial fire barriers and manual suppression capability

OPPD compliance documents state that for FA-32, one train of equipment necessary to safely shutdown the plant inherently survives the design basis exposure of a fire. OPPD documents containing the compliance and engineering analyses are available for review at FCS.

During the 2000 Fire Protection Inspection, the NRC challenged two elements of the “some level of physical separation” aspect of the exemption for FA-32. Ultimately, OPPD was found to be in violation. Even though allowable separation distances were not prescribed in the corresponding SER, the January 2000 inspection team found examples of redundant power cabling within 10 feet of each other, contrary to the OPPD document requesting exemption. Inspection Report 50-285/00-01 states that this configuration constitutes a violation of the SER. Also, instrument and control cables were not specifically requested in the OPPD exemption request, nor were they described in the corresponding SER. Accordingly, Inspection Report 50-285/00-01 described that these cables are not within the exemption scope and must meet generic 20 feet separation requirements.

The following is a timeline of the actions regarding FA-32:

- January 2000 - FCS Fire Protection Triennial Inspection
- May 2000 - Fire Protection Inspection Report noting an NCV for an Appendix R non-compliance with a July 1985 SER
- June 2000 - FCS denied the May 2000 NCV and provided various documentation

- January 2001 - NRC reinstated the May 2000 NCV, Appendix R non-compliance
- February 2002 - FCS unsuccessfully submitted a request to supplement the existing SER
- June 2002 - Meeting in Rockville, MD with FP & Projects Branch to discuss the FCS intention to proceed
- November 2002 - FCS submitted an exemption request for FA-32
- April 2003 - FCS submitted answers to NRC request for additional information
- October 2003 - FCS withdrew exemption request
- January 2004 - NRC (NRR) reviewer attended a meeting at FCS

#### **Actions to Address Violation Issues:**

To address the violations, OPPD has established the optimum approach to resolve issues associated with Appendix R and with the current SER for FA-32. This approach includes modifications for cable reroutes, using feasible operator manual actions for certain credited equipment, and implementing other modifications to enhance the risk-informed fire insights of FA-32 as follows:

1. **Engineering Change – reroute selected cables for credited equipment.** This action is in progress and currently scheduled to be completed during the Spring 2005 Refueling Outage.
2. **Proceduralize operator manual actions -** OPPD began these changes in anticipation of the proposed rule change for Appendix R. OPPD intends to use feasible manual operator actions rather than reroute certain cables as a compliance method for FA-32. OPPD is using the latest available manual action criteria from the NRC to ensure feasibility of the actions. Proceduralized manual actions are being developed. Completion of draft procedure changes are due November 2004. A verification/validation process will be performed and training completed. The procedure changes are currently scheduled to be completed by the first quarter of 2005.
3. **Develop a cold-shutdown repair procedure for LPSI pump power cable.** As an additional option, FCS is considering a cable wrap for this power cable, depending on the feasibility of the repair procedure. This procedure is currently expected to be completed by the end of 2004.
4. **Engineering Change - Containment pans around plant equipment to minimize the diameter of a postulated lube oil pool fire and avoid damage to overhead targets (cable trays, etc.).** This is a risk-informed fire recommendation. The engineering change is currently planned to be completed in the second quarter of 2005.
5. **Engineering Change - Additional sprinkler heads are being considered for installation to suppress a fire at FW-10 to mitigate the effects of a postulated lube oil fire.** This could provide additional fire-suppression capability around the steam-driven auxiliary feedwater pump. This is a risk-informed fire recommendation. This engineering change is in progress and is being further evaluated.
6. **Add FW-54 (diesel driven auxiliary feedwater pump) to the Safe Shutdown Analysis (SSA) - revise and reissue the SSA and supporting documents.** This is currently planned to be completed during the first quarter of 2005.

**NRC Inspection Report 50-285/00-01, Item 02**

The following is an excerpt from Inspection Report 50-285/00-01:

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 1 R05.6).

**OPPD Status of 50-285/0001-02**

In inspection report 50-285/00-01, the NRC opened this inspection item. However, since the NRC and industry were working to resolve questions raised by the industry about the adequacy of the existing staff guidance concerning fire-induced circuit failures, the NRC deferred enforcement action relative to this matter until the proposed resolution methodology was adopted and OPPD had time to implement the resolution methodology, once approved by the NRC. Since NRC and industry have reached conclusion on the associated-circuits issue, OPPD is providing a status of corrective action on this item.

**Background**

The Reactor Coolant Gas Vent System (RCGVS) consists of six (6) valves that function to vent non-condensable gases from the reactor head space above the hot and cold legs, or from the pressurizer steam space. The RCGVS valves can vent non-condensable gases to either the pressurizer quench tank or the containment atmosphere. The valves are 125 VDC solenoid operated valves that are operated remotely from the main control room. The valves are normally key-switch locked closed and fail closed upon loss of battery (DC) power. There are no automatic functions associated with the control or positioning of these valves.

To preclude the possibility that placing the RCGVS in service could itself cause a LOCA, the system piping was designed with flow orifices installed in each vent path. The 7/32" diameter orifice is sized to limit flow through the vent line to less than the makeup capability of one charging pump.

The RCGVS is not considered a reactor coolant system high/low pressure interface. The boundary valves are designed to close under full RCS differential pressure. The flow orifices restrict the reactor coolant flow to within the makeup capability of one charging pump to preclude LOCA conditions. To establish a vent path through the RCGVS, two valves in series must be opened, depending on the desired vent origin and destination. A single open valve in the RCGVS will not establish a vent path.

Control cables for each of the six valves are routed from the control room thru the cable spreading room, through the west switchgear room, the upper electrical penetration room, into the containment building, and terminating at the respective valves. The safe shutdown analysis addresses each of these fire areas and documents whether the RCGVS is credited or lost to the postulated fire event.

OPPD has an analysis that documents the inventory loss thru the RCGVS valves and shows that this loss is within the makeup capability of an available charging pump. A charging pump is protected/available for each of the fire areas covered by the RCGVS valve control cables. These valves are not required to open for post fire safe shutdown, but rather to remain closed, so the safe shutdown analysis only addresses spurious operation of these valves.

Additional detail is available from OPPD regarding the design and analysis of the RCGVS, upon request.

**Actions to Address Violation Issues:**

1. **The safe shutdown analysis will be re-verified.** This will be completed with respect to spurious operation of RCGVS valves, to ensure compliance with Appendix R. This activity will include use of guidance contained in RIS-2004-03, Risk-Informed Approach for Post-Fire Safe Shutdown Associated Circuit Inspections, dated, March 2, 2004 to evaluate the potential for spurious operation of these valves and circuits. This activity will be completed by end of 2004.
2. **Procedures will include steps to ensure spurious operation of the RCGVS valves is mitigated.** - Post-fire safe shutdown procedures, currently being developed for all fire areas, will include steps to avoid any challenges to the reactor coolant system inventory during post-fire safe shutdown. This activity will be completed by the first quarter of 2005.