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Omaha NE 68102-2247

October 13, 2008  
LIC-08-0109

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

- References:
1. Docket No. 50-285
  2. Letter from OPPD (R. P. Clemens) to NRC (Document Control Desk), "Request for Exemption from Requirements of 10 CFR 50, Appendix R, Section III.G.1.b for Fire Area 31 at the Fort Calhoun Station," dated February 4, 2008 (LIC-08-0006)
  3. Email from NRC (A. B. Wang) to OPPD (B. R. Hansher), "FP (Fire Protection) RAI (Request for Additional Information)," dated September 17, 2008

**SUBJECT: Response to Request for Additional Information Concerning Exemption from Requirements of 10 CFR 50, Appendix R, Section III.G.1.b. for Fire Area 31 at the Fort Calhoun Station**

In Reference 2, the Omaha Public Power District (OPPD) requested an exemption, pursuant to 10 CFR 50.12 and 10 CFR 50.48, from the requirements of Appendix R, Section III.G.1.b., which requires that fire protection features be provided for the structures, systems and components important to safe shutdown (raw water pump and valve cables) at Fort Calhoun Station (FCS). In Reference 3, the NRC Project Manager sent OPPD a request for additional information regarding the Reference 2 submittal. In a teleconference on September 25, 2008, the NRC provided additional clarification to the information being sought. OPPD's response to the NRC RAI is attached.

No regulatory commitments are made in this letter. If you should have any further questions, please contact Mr. Bill R. Hansher at (402) 533-6894.

Sincerely,

R. P. Clemens  
Division Manager  
Nuclear Engineering

RPC/MLE/mle

Attachment: Response to NRC RAI

A006  
NRR

Response to NRC Request for Additional Information Concerning Exemption from Requirements of 10 CFR 50, Appendix R, Section III.G.1.b. for Fire Area 31 at the Fort Calhoun Station

By letter dated February 4, 2008, the Omaha Public Power District requested an exemption for the Fort Calhoun Station, Unit 1 from requirements of Section III.G.1.b of Appendix R to Part 50 of Title 10 "Energy" of the *Code of Federal Regulations* (10 CFR 50), and the 72-hour requirement to provide repair procedure(s) and material for cold shutdown capability for redundant cold shutdown components.

The proposed exemption request addresses the power and control cables for the four raw water pumps that are routed from the auxiliary building through outside cable pull boxes 128T and 129T into the underground duct bank and manhole vaults number 5 and 31 into the intake structure building.

The Nuclear Regulatory Commission staff has reviewed the information the licensee provided that supports the proposed changes to their approved fire protection program. In order for the staff to complete its evaluation, the following additional information is requested:

**NRC RAI**

Section II of Appendix R to 10 CFR Part 50, "General Requirements," states that the fire protection program shall extend the concept of defense-in-depth to fire protection in fires areas that are important to safety, with the following objectives:

- Prevent fires from starting.
- Rapidly detect, control, and extinguish those fires that do occur.
- Protect structures, systems, and components that are important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The staff requests that the licensee provide a description of the defense-in-depth features in the underground duct bank and manhole vaults number 5 and 31.

**OPPD Response**

The following is a description of the defense-in-depth features of the Fort Calhoun Station (FCS) fire protection program as it applies to the underground duct bank and manhole vaults No. 5 and 31.

Prevent Fires from Starting

There are no ignition sources in the duct bank and manhole vaults, other than the remote possibility of a self-ignited cable fault. The duct bank and manholes are not occupied locations and are generally inaccessible, which minimizes the potential for

introducing transient ignition sources or combustible materials. The area is classified as a confined space and therefore, entry is not allowed without appropriate permits and controls. Maintenance personnel inspect the manholes annually; however, these activities do not involve ignition sources or transient combustible materials, so there is no added risk of fire initiation. Hot work performed in the duct bank and/or manhole vaults is conducted in accordance with SO-M-9, and FCSG-15-35, which requires the protection of electrical cables located within 35 feet of the welding or cutting location.

### Procedural Guidance

Hot work operations are controlled by Standing Order (SO)-M-9, "Hot Work Operations," and FCS Guideline (FCSG)-15-35, "Guideline Welding, Cutting and Burning." Prior to beginning hot work, form FC-18, "Hot Work Permit" is completed and a copy given to the Operations Control Center (OCC). Form FC-18 contains numerous steps to prevent, detect, and respond to a fire. The steps include protecting areas such as electrical cabling located within 35 feet of the welding or cutting location. A trained individual is designated fire watch both during and for 30 minutes after the hot work is completed. The fire watch monitors the work area, adjacent areas, and above and below the work area. The fire watch is trained to immediately report fires to the control room and is equipped with a fire extinguisher to extinguish small fires if possible.

If hot work were to be performed in a confined space like the duct bank and/or manhole vaults, FCSG-15-35 has additional controls that apply when welding is suspended for a substantial period of time such as for lunch or overnight. In these circumstances, electrodes are removed from holders, the holders carefully located so that accidental contact cannot occur, and the welding machine disconnected from its power source. When gas welding or cutting is performed, the torch valves are closed to eliminate the possibility of gas escaping through leaks or improperly closed valves, the gas supply is shutoff at the source, the regulator pressure is bled off and the torch and hose are removed from the confined space.

### Rapidly Detect, Control And Extinguish Those Fires That Do Occur

There are no means of automatic fire detection or suppression in the duct bank or manhole vaults. However, if a fire did occur, operators in the control room would have indications of equipment faults (e.g., tripping of operating pumps, off-normal valve indication lights, etc.) and rapidly begin to investigate the cause and location of the fault. The duct bank and manhole vaults are located inside the protected area in close proximity to the power block, which would facilitate rapid detection and extinguishment of the fire. A fire in the duct bank and/or manhole vaults involving cable insulation would produce significant amounts of smoke through the manhole covers, providing another indication of the location of the fire to operators and/or fire brigade personnel. The fire brigade using manual fire suppression equipment including portable fire extinguishers and/or fire hoses would extinguish the fire. Should a fire occur as a result of hot work in the duct bank and/or manhole vaults, the craft or fire watch would

immediately contact the control room, and the fire brigade would be dispatched to extinguish the fire.

### Protect Structures, Systems, and Components that are Important to Safety

As stated in Reference 2, there is no credible threat from a fire involving the duct bank and manhole vaults that would disable all trains of raw water and prevent safe shutdown of the plant. Therefore, FCS has adequately protected the structures, systems, and components (SSCs) important to safety necessary to meet this level of defense-in-depth for fire protection.

### **NRC RAI**

Your letter dated February 4, 2008 Attachment 1, Page 6, states that, "...In the unlikely event that all raw water pumps are lost for any reason, OPPD maintains an abnormal operating procedure (AOP) for loss of the raw water system. If all raw water pumps are lost, due to any condition, the procedure directs the operators to trip the reactor and enter emergency operating procedures (EOPs) based on observed plant conditions..." AOPs often do not assume damage to collateral equipment in a fire area or cable tunnel.

Please confirm that the post-fire safe-shutdown analysis assumes that the FCS Unit 1 AOPs have all equipment available during a postulated fire. Without a heat sink (loss of raw water), for a pressurized water reactor, EOPs often result in going to a "feed and bleed" means of protecting the core. Confirm that the post-fire safe shutdown analysis EOPs do not rely solely on feed and bleed as the means of protecting the core.

### **OPPD Response**

The FCS Post-Fire Safe Shutdown Analysis (Engineering Analysis (EA)-FC-89-055) assumes all equipment credited for a given fire area is available during a postulated fire.

FCS does not rely solely on once through cooling (or "feed and bleed") as a means of heat removal to protect the reactor core in a post-fire safe shutdown scenario. Options for reactor coolant system (RCS) heat removal in FCS Emergency Operating Procedure (EOP)-20 "Functional Recovery Procedure" include:

1. RCS and core heat removal via steam generators with no safety injection,
2. RCS and Core Heat Removal via steam generators with safety injection operating,
3. Shutdown cooling operation, and
4. Feed and bleed (or once through cooling).

Although feed and bleed is one of the EOP-20 options, it is the least desirable and would only be utilized if other means are unavailable or have failed for the given plant conditions.

Please note that FCS does not have a specific EOP for post-fire safe shutdown. For a fire within the protected area, FCS implements Abnormal Operating Procedure (AOP)-06, "Fire Emergency." Based on the extent of fire damage, location of the fire and plant response to the fire, control room operators have the option to implement EOPs to achieve safe shutdown conditions.

### **NRC RAI**

Clarify and confirm that the types of combustibles have not changed and total combustible loading in the intake structure building has not increased, and that there is no change in active and passive fire protection features as last described in your letter dated August 30, 1983. If there is a change in the types of combustibles or there is an increase in combustible load or change in fire protection features in the intake structure building, the staff requests that the OPPD provide details and a basis for why the change remains acceptable. Also confirm that the pyrocrete enclosure is in place to protect the cables for raw water pumps AC-10A and AC-10B from fire in the intake structure building.

### **OPPD Response**

The type of combustible material in the duct bank and manhole vaults is limited to cable insulation. This has not changed since original plant construction. Any change in the total combustible loading since August 30, 1983 for the duct bank, manhole vaults, and/or intake structure would have been evaluated for impact on the combustible loading calculation (FC05814), which is the controlled design calculation that maintains an accounting of combustible load for fire areas at FCS. A review of previous revisions of this calculation confirms that total combustible loading has remained classified as low and no significant changes in total loading has occurred. Therefore, the basis for this reference remains valid.

The pyrocrete enclosure remains in place to protect cables associated with AC-10A and AC-10B from a fire in the intake structure. This enclosure is inspected by a fire barrier surveillance test on an 18-month interval.