

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
OMAHA PUBLIC POWER DISTRICT  
FORT CALHOUN STATION, UNIT NO. 1  
DOCKET NO. 50-285  
EXEMPTION  
[NRC-2008-0670]

1.0 BACKGROUND

Omaha Power Public District (OPPD, the licensee) is the holder of Renewed Facility Operating License No. DPR-40, which authorizes operation of the Fort Calhoun Station (FCS), Unit No. 1. The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a Combustion Engineering pressurized light-water reactor located in Washington County, Nebraska.

2.0 REQUEST/ACTION

FCS, Unit No. 1 was licensed to operate prior to January 1, 1979. As such, the licensee's Fire Protection Program must satisfy the established fire protection features of Title 10, "Energy," of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," per 10 CFR 50.48, "Fire protection," Section (b), regulatory requirements.

By letter dated February 4, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML080360106), OPPD, on behalf of FCS, Unit No. 1, requested an exemption from the provisions of 10 CFR Part 50, Appendix R, Section III.G.1.b

(III.G.1.b), for the 72-hour requirement to provide repair procedures and materials 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 vault numbers 5 and 31 into the intake structure building.

The intake structure building at FCS provides river water to various safety and non-safety-related components throughout the plant. This building is separate from the main body of the plant and is located on the riverbank to the east of the turbine building. Major components located in the intake structure building are three circulating water pumps, four safety-related raw water pumps, and two fire pumps. The redundant safety-related raw water pumps, necessary for cold shutdown functions only, are located in a common fire area in the intake structure building, Fire Area 31.

### 3.0 DISCUSSION

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. One of these special circumstances, described in 10 CFR 50.12(a)(2)(ii), is when application of the regulation in the particular circumstances would not serve the underlying purpose of the rule, or is not necessary to achieve the underlying purpose of the rule.

By letter dated July 3, 1985 (ADAMS Legacy Library Accession No. 850724390), the NRC granted an exemption from the technical requirements of Section III.G.2 of Appendix R to

10 CFR Part 50, for Fire Area 31 (intake structure building) and for the pull box area of the auxiliary building. However, cables in the duct bank and manhole vault numbers 5 and 31 that are routed between the pull boxes and intake structure were not discussed in the OPPD August 30, 1983, exemption request (ADAMS Legacy Library Accession No. 830909011).

The OPPD letter dated February 4, 2008, clarified that the NRC July 3, 1985, safety evaluation report (SER) incorrectly referenced Section III.G.2 and subsequently provided exemption from 10 CFR Part 50, Section III.G. Specifically, the OPPD letter of February 4, 2008, states that "This exemption request thereby provides notification and clarification that the original SER and exemption should have referenced 10 CFR 50, Appendix R, Section III.G.1.b..." Therefore, the NRC staff evaluation in this SER supersedes the reference "Section III.G.2" used in the NRC SER dated July 3, 1985, for Fire Area 31 (intake structure building and pull boxes 128T and 129T outside the auxiliary building). OPPD has identified the duct bank and manhole vault numbers 5 and 31 as part of the Fire Area 31; therefore, the NRC staff evaluation in this SER includes exemption from 10 CFR Part 50, Appendix R, Section III.G.1.b for duct bank and manhole vault numbers 5 and 31.

OPPD justified the exemption in duct bank and manhole vault numbers 5 and 31 based on the limited combustible loading (other than cable and cable insulation) and limited ignition sources. OPPD has determined that there is no credible threat from a fire occurring in the area of the cable duct bank or manhole vaults that would disable all trains of raw water and prevent the safe shutdown of the plant. The raw water system will remain available to achieve post-fire cold shutdown within 72 hours.

The NRC staff's review of the February 4, 2008, OPPD proposed license exemption request identified areas in which additional information was necessary to complete the review.

By email dated September 17, 2008 (ADAMS Accession No. ML083360264), the NRC staff sent a request for additional information (RAI) to OPPD. OPPD responded by letter dated October 13, 2008 (ADAMS Accession No. ML082980018), as discussed below.

The NRC staff requested the licensee to provide a description of the defense-in-depth features in the underground duct bank and manhole vault numbers 5 and 31. The licensee responded that there is no ignition source in the duct bank or manhole vaults, other than the remote possibility of a self-ignited cable fault. The duct bank and manhole vaults are classified as a confined space and, therefore, entry is not allowed without appropriate permits and controls that minimize the potential for introducing transient ignition or combustible materials. Further, hot work performed in the duct bank and manhole vaults is conducted in accordance with Standing Order (SO)-M-9 and FCS Guidance (FCSG)-15-35, which require the protection of electrical cables located within 35 feet of the welding or cutting location. The licensee indicated in its response that there are no means of automatic fire detection or suppression in the duct bank and 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 would 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. 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. OPPD has indicated that 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.

The NRC staff requested the licensee to clarify if, in FCS, Unit No. 1 abnormal operating procedures (AOPs), post-fire safe shutdown analysis assumes all equipment available during a postulated fire. In addition, the NRC staff requested that the licensee confirm that the post-fire safe shutdown analysis emergency operating procedures (EOPs) do not rely solely on “feed and bleed” as the means of protecting the core. The licensee responded that the FCS, Unit No. 1, 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 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. FCS, Unit No. 1, does not have a specific EOP for post-fire safe shutdown. For a fire within the protected area, FCS implements 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.

The NRC staff requested the licensee to 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 the OPPD license exemption request dated August 30, 1983. Further, the NRC staff requested that, if there has been 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, then OPPD should provide details and a basis for why the change remains acceptable. In addition, the NRC staff asked the licensee to 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. The licensee responded that 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 in the combustible loading calculation (FC05814), which is the controlled design calculation that maintains an accounting of combustible load for fire areas at FCS, Unit No. 1. Further, the licensee has indicated that the review of previous revisions of this calculation confirms that total combustible loading has remained classified as low and no significant changes in total loading have occurred. Therefore, the basis for this reference remains valid. The pyrocrete enclosure remains in place to protect cables associated with pumps 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.

Based on the above, the consequences of postulated accidents are not increased, because there is no credible fire hazard in the area of the cable duct bank or manhole vaults that would disable all the raw water pumps and prevent the cold shutdown capability. Furthermore, if all raw water pumps are lost, due to any condition, the AOP directs the operator to trip the reactor and enter emergency procedures based on observed plant conditions.

Therefore, there is no undue risk to public health and safety, since neither the probability nor the consequences have been increased.

On the basis of its review and evaluation of the information provided in the licensee's exemption request and response to NRC staff RAI questions, the NRC staff concludes that OPPD's request for exemption from the technical requirements of Section III.G.1.b of Appendix R to 10 CFR Part 50 has provided a thorough description of the proposed change and an adequate safety assessment which address the issue.

#### Authorized by Law

This exemption would allow FCS, Unit No. 1, not to provide fire protection features for structures, systems, and components (SSCs) important to achieve and maintain cold shutdown or having the capability of repairing these components within 72 hours (i.e., technical requirements of 10 CFR Part 50, Appendix R, Section III.G.1.b). As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

#### No Undue Risk to Public Health and Safety

One of the underlying purposes of 10 CFR Part 50, Appendix R, Section III.G.1.b, is to protect safe shutdown capability. Section III.G.1.b contains a requirement for performing repairs for maintaining plant cold shutdown following a fire in any one of certain plant areas. This is done by ensuring that systems necessary to achieve and maintain cold shutdown conditions from either the control room or emergency control stations(s) can be repaired within 72 hours. Based on the above, no new accident precursors are created by granting exemption for the 72-hour requirement to provide repair procedures and materials for cold shutdown components,

thus, the probability of postulated accidents is not increased. Also based on the above the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety (since risk is probability x consequences).

#### Consistent with Common Defense and Security

The proposed exemption would allow FCS, Unit No. 1, to not meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.1.b for certain specified areas; thus, procedures and materials for the repair of redundant cold shutdown components within 72 hours in those areas would not be needed. This change to the operation of the plant has no relation to security issues. Therefore, the common defense and security is not impacted by this exemption.

#### Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. Part of the underlying purpose of 10 CFR 50, Appendix R, Section III.G, is to assure safe shutdown capability. OPPD states that, in the unlikely event all raw water pumps are lost for any reason, OPPD maintains an AOP for loss of the raw water system. If all raw water pumps are lost, due to any condition, the AOP directs the operators to trip the reactor and enter EOPs based on observed plant condition. Since these procedures help to assure safe shutdown capability, strict application of the requirements of 10 CFR Part 50, Appendix R, Section III.G.1.b, is not necessary to achieve the underlying purpose of the rule and the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption exist.

#### 4.0 CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety,



and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants OPPD an exemption from the requirements of Section III.G.1.b of 10 CFR Part 50, Appendix R, which is required by 10 CFR 50.48(b) for plants that were licensed to operate before January 1, 1979, to FCS, Unit No. 1.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (73 FR 80441; December 31, 2008).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 6<sup>th</sup> day of February 2009.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

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