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LIC-05-0113  
December 19, 2005

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

Reference: Docket No. 50-285

**SUBJECT: Fort Calhoun Station, Unit No. 1, License Amendment Request, "Change to Diesel Generator Surveillance Testing"**

In accordance with the provisions of Section 50.90 of Title 10 of the Code of Federal Regulations (10 CFR), the Omaha Public Power District (OPPD) is submitting a request for an amendment to the Fort Calhoun Station, Unit No. 1 (FCS) Technical Specifications (TSs). The proposed amendment requests a change to surveillance testing of the FCS diesel generators (DG) to support a modification to the DG start circuitry.

The modification (EC 33661) will be installed during an upcoming refueling outage scheduled to begin in September 2006. Modification EC 33661 will remove the anticipatory (idle-speed) DG start signals and allow only full speed DG starting on an under voltage condition. To ensure that the surveillance test accurately reflects the modification to the DG start circuitry, a change to TS 3.7(1)c.i is required. A footnote regarding a one-time surveillance interval extension for DG No. 1 is deleted as it is historical in nature and no longer necessary.

OPPD concludes that the proposed amendment presents no significant hazards considerations under the standards set forth in 10 CFR 50.92(c).

Attachment 1 provides a description of the proposed changes and confirmation of applicability. Attachment 2 provides the existing TS pages marked-up to show the proposed changes. Attachment 3 provides the proposed TS pages.

OPPD requests NRC approval by September 1, 2006 with an implementation period of no later than the end of the 2006 Refueling Outage currently scheduled to begin September 9, 2006.

No commitments to the NRC are made in this letter.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated State of Nebraska Official.

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I declare under penalty of perjury that the foregoing is true and correct (Executed on December 19, 2005).

If you should have any questions regarding this submittal, please contact Tom Matthews at (402) 533-6938.

Sincerely,

A handwritten signature in black ink, appearing to read "R. T. Ridenoure", written over a horizontal line.

R. T. Ridenoure  
Vice President

RTR/mle

- Attachments:
1. OPPD's Evaluation
  2. Markup of Technical Specification Pages
  3. Proposed Technical Specification Pages

cc: Division Administrator - Public Health Assurance, State of Nebraska

**Omaha Public Power District's Evaluation  
For  
Amendment of Operating License**

- 1.0 DESCRIPTION
- 2.0 PROPOSED CHANGE
- 3.0 BACKGROUND
- 4.0 TECHNICAL ANALYSIS
- 5.0 REGULATORY SAFETY ANALYSIS
- 6.0 ENVIRONMENTAL EVALUATION
- 7.0 REFERENCES

## **1.0 DESCRIPTION**

This letter is a request to amend Operating License DPR-40 for Fort Calhoun Station, Unit No. 1 (FCS).

During the 2006 refueling outage (RFO), Modification EC 33661 to the diesel generator (DG) starting circuitry will require a change to TS 3.7(1)c.i concerning DG surveillance testing requirements.

Modification EC 33661 (Reference 7.2) will remove the anticipatory (idle-speed) DG start signals and allow only full speed DG starting on an under voltage condition. This modification requires a change to TS 3.7(1)c.i to ensure proper DG testing. Installation of the proposed modification will make FCS consistent with the rest of the industry and start the DGs only at full speed on under voltage conditions.

OPPD also proposes to remove a footnote to a one-time extension of the surveillance interval for DG No. 1 granted by Amendment 112 (Reference 7.3). This one-time extension permitted the due date of the surveillance test to be extended from April 1988 to October 1988. This allowed the surveillance to be performed during a RFO since the performance of the surveillance during power operations could have resulted in the plant entering a limiting condition for operation (LCO) requiring a plant shutdown. This footnote is no longer pertinent and should be deleted.

For consistency with TS 3.7(1)c.i and 3.7(1)c.ii, a period is added immediately following TS 3.7(1)c.iii.

## **2.0 PROPOSED CHANGE**

TS 3.7(1)c.i currently requires the initiation of a simulated auto-start signal to verify that the DG starts followed by the requirements of TS 3.7(1)c.ii for initiation of a simulated simultaneous loss of 4.16 KV supplies to Buses 1A3 and 1A4.

TS 3.7(1)c.i is revised to delete the words "followed by." Thus, TS 3.7(1)c will still require the initiation of a simulated auto-start signal to verify that the DG starts, but this will be concurrent with, not followed by, the simulated loss of 4.16 KV supplies to Buses 1A3 and 1A4 as required by TS 3.7(1)c.ii.

The change to TS 3.7(1)c.i is necessary to ensure verbatim compliance with TS 3.7(1)c during surveillance testing following installation of the modification. The proposed change will not affect current DG surveillance testing since the surveillance is performed at a refueling frequency and thus will not be performed until after the modification is installed during the 2006 RFO.

The footnote of TS 3.7(1)e is deleted in its entirety. The footnote pertains to a one-time extension of the surveillance interval for DG No. 1 granted by Amendment 112 (Reference 7.3). This footnote is no longer pertinent and should be deleted.

For consistency with TS 3.7(1)c.i and 3.7(1)c.ii, a period is added immediately following TS 3.7(1)c.iii.

### **3.0 BACKGROUND**

The safety related DGs are required to perform their intended design function upon a loss of normal power to their respective 4.16 KV buses. The DGs are designed to automatically start, accelerate to rated speed, voltage and frequency and close on their respective bus as an emergency power source upon the loss of normal power.

Each DG is physically aligned to a 4.16 KV bus. DG-1 is aligned with Bus 1A3 and DG-2 is aligned with Bus 1A4. Normal power is from the 161 KV off-site power system transformed to 4.16 KV by Transformers T1A-3 and T1A-4 and supplied to Buses 1A3 and 1A4, respectively. In the event of an under voltage condition on either bus, the aligned DG automatically starts and provides emergency power. (Reference 7.1)

The original DG starting circuitry provided full speed DG starting on an under voltage condition and also provided several other anticipatory (idle speed) DG start signals. For example, an anticipatory (idle speed) start signal initiated by a reactor trip would start the DGs and accelerate them to idle speed in anticipation of a potential loss of power to the bus. Anticipatory (idle speed) DG starts were also provided for containment pressure high signal (CPHS) and pressurizer pressure low signal (PPLS).

The design basis for the anticipatory (idle speed) DG start is not definitively stated in FCS licensing or design basis documents. It is apparently a precautionary step to ensure that the DGs are already running (at idle speed) following a design basis accident (DBA) in the event that a subsequent loss of offsite power should occur. However, there is no design criterion or regulatory requirement for the DGs to be operating at idle speed following a DBA nor does any Updated Safety Analysis Report (USAR) accident analysis take credit for the anticipatory (idle speed) DG start following a DBA.

Modification EC 33661 removes the anticipatory (idle speed) DG start signals such that the DGs start and accelerate to full speed and then only on an under voltage condition. Removal of the anticipatory (idle speed) DG start signals does not change the function of the DGs as they still provide emergency power to their respective buses when required.

The proposed amendment to TS 3.7(1)c.i is necessary to accurately reflect actual surveillance testing of the DGs following removal of the anticipatory (idle speed) start signals. Due to the elimination of anticipatory (idle speed) starts, the initiation of a simulated simultaneous loss of 4.16 KV supplies to Bus 1A3 (or Bus 1A4 depending on which DG is being tested) will now occur simultaneously with the simulated auto-start signal. Prior to Modification EC 33661, the simulated auto-start signal verifying that the DG starts (to idle speed) was followed by the simulated simultaneous loss of 4.16 KV power to the bus whose DG was being tested (Bus 1A3 or 1A4).

The footnote to TS 3.7(1)e was placed into the FCS TSs by Amendment 112 (Reference 7.3) to permit a one-time extension of the surveillance interval for DG No. 1. Diesel generators are tested at 18-month intervals to be consistent with the maximum anticipated interval between refueling outages. The selection of an 18 month interval was based on engineering judgment to achieve the dual goals of the need to conduct periodic surveillance tests but not interfere substantially with unit availability.

OPPD requested and was granted a one-time extension of the surveillance test interval from April 1988 to October 1988 to coincide with the 1988 RFO. The extension was granted (Reference 7.3) because performance of the surveillance in April 1988 would have been during power operations that could have resulted in the plant entering a LCO requiring a plant shutdown. Since the footnote is historical in nature, it is unnecessary and should be deleted.

The addition of a period following TS 3.7(1)c.iii is an administrative change to achieve consistent punctuation.

#### 4.0 TECHNICAL ANALYSIS

Currently, TS 3.7(1)c.i has a provision to test the DGs using a simulated auto-start signal to verify that the diesel starts. An anticipatory start signal simulates this function and starts the DG at idle speed. TS 3.7(1)c.i states that this is followed by the initiation of a simulated simultaneous loss of 4.16 KV power to Bus 1A3 or Bus 1A4 (depending on which DG is being tested) the purpose of which is to de-energize the bus and verify DG emergency loading.

The proposed amendment to TS 3.7(1)c.i removing the words "followed by" is necessary to accurately reflect actual surveillance testing of the DGs following removal of the anticipatory (idle speed) start signals. The design basis for the anticipatory (idle speed) DG start is concluded to be a precautionary step to ensure that the DGs are already running (at idle speed) following a design basis accident (DBA) in the event that a subsequent loss of offsite power should occur. However, there is no design criterion or regulatory requirement for the DGs to be

operating at idle speed following a DBA nor does any USAR accident analysis take credit for the anticipatory (idle speed) DG start following a DBA.

Due to the elimination of anticipatory (idle speed) starts, the initiation of a simulated simultaneous loss of 4.16 KV power to Bus 1A3 (or Bus 1A4 depending on which DG is being tested) will now occur simultaneously with the simulated auto-start signal. Prior to Modification EC 33661, the simulated auto-start signal verifying that the DG starts (to idle speed) was followed by the simulated simultaneous loss of 4.16 KV power to the bus whose DG was being tested (Bus 1A3 or 1A4).

The Basis of TS 3.7 explains that automatic starting on loss of off-site power and automatic load shedding, diesel connection, and loading will be verified on a refueling frequency. Modification EC 33661 does not affect the basis of TS 3.7, which is still accurate in this regard.

Deletion of the TS 3.7(1)e footnote is an administrative change that removes a surveillance interval extension that is historical in nature and no longer serves a purpose in the FCS TSs.

The addition of a period following TS 3.7(1)c.iii is an administrative change to achieve consistent punctuation.

In summary, the proposed changes do not alter, degrade, or prevent actions described or assumed in any accident analysis. The proposed changes do not revise any previous assumptions evaluating radiological consequences or affecting any fission product barriers, nor do they increase any challenges to safety systems. Therefore, the proposed changes do not increase or have any impact on the consequences of events described and evaluated in Chapter 14 of the FCS Updated Safety Analysis Report (USAR).

## **5.0 REGULATORY SAFETY ANALYSIS**

### **5.1 No Significant Hazards Consideration**

OPPD has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR 50.92, "Issuance of amendment," as discussed below:

- 1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

Response: No.

The removal of the anticipatory (idle speed) diesel generator (DG) start signals does not adversely affect the design function of the DGs and thus is not an initiator of any previously evaluated accidents. No Updated Safety Analysis Report (USAR) accident analyses take credit for the anticipatory (idle speed) DG start following a design basis accident (DBA). The DGs provide emergency power to their respective 4.16 KV buses and will continue to do so after the proposed modification is installed. Upon the occurrence of an under voltage condition on the bus, the modification provides a full speed DG start to achieve rated voltage and frequency. The safety function of the DGs is not altered by the installation of this modification. The associated TS change allows surveillance testing to reflect the way that the DGs start and load onto their respective buses following the modification.

Deletion of a footnote containing historical information pertaining to a one-time surveillance interval extension and the punctuation correction are administrative changes that do not increase the probability or consequences of any accident previously evaluated.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. **Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The removal of the anticipatory (idle speed) diesel generator (DG) start signals does not adversely affect the design function of the DGs and thus does not create the possibility of a new or different kind of accident. No USAR accident analyses take credit for the anticipatory (idle speed) DG start following a DBA. The DGs provide emergency power to their respective 4.16 KV buses and will continue to do so after the proposed modification is installed. Upon the occurrence of an under voltage condition on the bus, the modification provides a full speed DG start to achieve rated voltage and frequency. The safety function of the DGs is not altered by the installation of this modification. The associated TS change allows surveillance testing to reflect the way that the DGs start and load onto their respective buses following the modification.

Deletion of a footnote containing historical information pertaining to a one-time surveillance interval extension and the punctuation correction are administrative changes that do not create the possibility of a new or different kind of accident from any previously evaluated.



Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

3. **Does the proposed amendment involve a significant reduction in a margin of safety?**

Response: No.

The removal of the anticipatory (idle speed) diesel generator (DG) start signals does not adversely affect the design function of the DGs and thus does not involve a significant reduction in a margin of safety. No USAR accident analyses take credit for the anticipatory (idle speed) DG start following a DBA. The DGs provide emergency power to their respective 4.16 KV buses and will continue to do so after installation of the proposed modification. Upon the occurrence of an under voltage condition on the bus, the modification provides a full speed DG start to achieve rated voltage and frequency. The safety function of the DGs is not altered by the installation of this modification. The associated TS change allows surveillance testing to reflect the way that the DGs will start and load onto their respective buses following the modification.

Deletion of a footnote containing historical information pertaining to a one-time surveillance interval extension and the punctuation correction are administrative changes that do not reduce a margin of safety.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, OPPD concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

## **5.2 Applicable Regulatory Requirements/Criteria**

FCS was licensed for construction prior to May 21, 1971, and at that time committed to the draft General Design Criteria (GDC). The draft GDC are contained in Appendix G of the FCS USAR and are similar to 10 CFR 50 Appendix A, General Design Criteria for Nuclear Power Plants. The draft GDC that govern emergency power are Criterion 24 and Criterion 39 from USAR Appendix G.

Criterion 24 – Emergency power for Protection Systems, states:

“In the event of loss of all offsite power, sufficient alternate sources of power shall be provided to permit the required functioning of the protection systems.”

This criterion is met. Emergency power is available from two completely independent diesel generator (DG) sets and from two completely independent 125 V d-c systems for essential d-c loads.

The independent diesel generator supply systems are located in the plant and are connected to separate buses. Both generator sets independently start automatically upon loss of auxiliary power and are ready to accept load within 10 seconds of loss of normal supply power. Starting power is self-contained within each DG. Each DG has sufficient capacity to start in sequence the loads required for the engineered safeguards equipment for the maximum hypothetical accident concurrent with loss of outside power. This capacity is adequate to provide a safe and orderly plant shutdown and maintain the plant in a safe condition.

Each of the two 125 V d-c batteries is capable of supplying essential station d-c loads for 8 hours and may be charged by the generator power supply.

Facilities are included to permit periodic starting and running of the DGs without interrupting plant operation. The DGs are synchronized to the bus and loaded periodically to ensure readiness for emergency services.

Criterion 39 – Emergency Power For Engineered Safety Features states:

“Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity and testability to permit the functioning required of the engineered safety features. As a minimum, the onsite power system and the offsite power system shall each independently provide this capacity assuming a failure of a single active component in each power system.”

This criterion is met. Offsite power to the plant is available via the 161 kV line and after the unit is tripped, via backfeed from the 345 kV system through the main and unit auxiliary transformers.

When the unit is tripped and the 161 kV supply is not available, the motor-operated disconnect switch in the generator main leads is opened and the supply to the unit auxiliary transformers is re-established. Switch operation is accomplished by a motor operator supplied from the station battery. Onsite power is provided by two diesel generator sets. Each independent diesel generator set is adequate for supplying the minimum engineered safeguards equipment for the maximum hypothetical accident concurrent with loss of outside power.

Station batteries provide onsite power for instrument and control systems. These batteries are subject to rigorous inspection and maintenance. Periodically, the charger voltage is manually lowered to test the batteries capability to assume load at the appropriate bus voltage.

The diesel generator facilities permit periodic starting and running during normal plant operations.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulation, and (3) the issuance of amendment will not be inimical to the common defense and security or to the health and safety of the public.

## **6.0 ENVIRONMENTAL CONSIDERATION**

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amount of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## **7.0 REFERENCES**

7.1 USAR Sections 7.3.4.2, 8.4.1, 8.3.4 & 8.4.2

7.2 Modification EC 33661 "Diesel Generator DG-1 & DG-2 Governor Change"

7.3 Letter from NRC (A. Bournia ) to OPPD (R. L. Andrews ) dated April 19, 1988, "Fort Calhoun Station, Unit No. 1 - Amendment No. 112 to Facility Operating License No. DPR-40 (TAC No. 67466)

**MARKUP OF TECHNICAL SPECIFICATION PAGE**

## TECHNICAL SPECIFICATIONS

### 3.0 SURVEILLANCE REQUIREMENTS

#### 3.7 Emergency Power System Periodic Tests (Continued)

- i. Initiation of a simulated auto-start signal to verify that the diesel starts, followed by,
- ii. Initiation of a simulated simultaneous loss of 4.16 KV supplies to bus 1A3 (1A4). Proper operation will be verified by observation of:
  - (1) De-energization of bus 1A3 (1A4).
  - (2) Load shedding from bus (both 4160 V and 480 V).
  - (3) Energization of bus 1A3 (1A4).
  - (4) Automatic sequence start of emergency load, and
  - (5) Operation of  $\geq 5$  minutes while its generator is loaded with the emergency load.
- iii. Verification that emergency loads do not exceed the 2000-HR KW rating of the engine.<sup>(2)</sup>
- d. Manual control of diesel generators and breakers shall also be verified during refueling shutdowns.
- e. Each diesel generator shall be given a thorough inspection on a refueling (R) frequency in accordance with the manufacturer's recommendations for this class of standby service.\*
- f. The fuel oil transfer pumps shall be verified to be operable each month.

#### (2) Station Batteries

- a. Every month the voltage of each cell (to the nearest 0.01 volt), the specific gravity, and temperature of a pilot cell in each battery shall be measured and recorded.<sup>(3)(4)</sup>
- b. Every three months the specific gravity of each cell, the temperature reading of every fifth cell, and the amount of water added shall be measured and recorded. During the first refueling outage and every third refueling outage thereafter the batteries shall be subjected to a rated load discharge test.
- c. At monthly intervals the third battery charger, which is capable of being connected to either of the two D.C. distribution buses, shall be paralleled in turn to each D.C. bus. In each case, load shall be transferred to this reserve battery charger by switching out the normal charger. The reserve charger shall be run on load for 30 minutes on each bus and the system shall finally be returned to normal.

\*A one time extension has been granted for this surveillance requirement, allowing the April 1988 surveillance for Diesel Generator No. 1 to be completed in October 1988.

**PROPOSED TECHNICAL SPECIFICATION PAGE**

## TECHNICAL SPECIFICATIONS

### 3.0 SURVEILLANCE REQUIREMENTS

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