

December 17, 2007

Mr. David J. Bannister  
Site Director  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
Post Office Box 550  
Fort Calhoun, NE 68023-0550

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT RE:  
MODIFY TECHNICAL SPECIFICATION REQUIREMENTS TO SUPPORT  
ADDITION OF SAFETY-RELATED SWING INVERTERS TO 120 VOLT AC  
BUSES (TAC NO. MD6221)

Dear Mr. Bannister:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 251 to Renewed Facility Operating License No. DPR-40 for the Fort Calhoun Station, Unit No. 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 31, 2007.

The amendment revises TS 2.7(1), "Electrical Systems - Minimum Requirements," TS 2.7(2), "Electrical Systems - Modification of Minimum Requirements," and TS 3.7(5), "Emergency Power System Periodic Tests - Required Safety Related Inverters." The licensee is adding two safety-related swing inverters to the 120 Volt alternating current instrument buses. The TS changes reflect modifications made to the plant and are needed to take advantage of the additional operational flexibility the swing inverters will provide.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Alan B. Wang, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures: 1. Amendment No. 251 to DPR-40  
2. Safety Evaluation

cc w/encls: See next page

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cc w/encls: See next page

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Ft. Calhoun Station, Unit 1

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OMAHA PUBLIC POWER DISTRICT

DOCKET NO. 50-285

FORT CALHOUN STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 251  
Renewed License No. DPR-40

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by the Omaha Public Power District (the licensee), dated July 31, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, Renewed Facility Operating License No. DPR-40 is amended by changes as indicated in the attachment to this license amendment, and paragraph 3.B. of Renewed Facility Operating License No. DPR-40 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 251, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Thomas G. Hiltz, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Renewed Facility  
Operating License No. DPR-40  
and Technical Specifications

Date of Issuance: December 17, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 251

RENEWED FACILITY OPERATING LICENSE NO. DPR-40

DOCKET NO. 50-285

Replace the following pages of the Renewed Facility Operating License No. DPR-40 and the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

License Page

REMOVE

3

INSERT

3

Technical Specifications

REMOVE

2.7 - Page 1  
2.7 - Page 2  
2.7 - Page 4  
2.7 - Page 5  
2.7 - Page 6  
2.7 - Page 7  
2.7 - Page 8  
3.7 - Page 3  
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INSERT

2.7 - Page 1  
2.7 - Page 2  
2.7 - Page 4  
2.7 - Page 5  
2.7 - Page 6  
2.7 - Page 7  
2.7 - Page 8  
3.7 - Page 3  
3.7 - Page 4

- (4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material without restriction to chemical or physical form for sample analysis or instrument calibration or when associated with radioactive apparatus or components;
  - (5) Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by operation of the facility.
3. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter 1: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Section 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is, subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
  - A. Maximum Power Level  

Omaha Public Power District is authorized to operate the Fort Calhoun Station, Unit 1, at steady state reactor core power levels not in excess of 1500 megawatts thermal (rate power).
  - B. Technical Specifications  

The Technical Specifications contained in Appendix A, as revised through Amendment No. 251 are hereby incorporated in the license. Omaha Public Power District shall operate the facility in accordance with the Technical Specifications.
  - C. Security and Safeguards Contingency Plans  

The Omaha Public Power District shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Fort Calhoun Station Security Plan, Training and Qualification Plan, Safeguards Contingency Plan," submitted by letter dated May 19, 2006.



SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 251 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-40

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT NO. 1

DOCKET NO. 50-285

1.0 INTRODUCTION

By application dated July 31, 2007 (Agencywide Documents Access and Management System Accession No. ML072150050), Omaha Public Power District (the licensee) requested changes to the Technical Specifications (TS) (Appendix A to Renewed Facility Operating License No. DPR-40) for the Fort Calhoun Station, Unit No. 1 (FCS).

The proposed amendment would revise would revise TS 2.7(1), "Electrical Systems - Minimum Requirements," TS 2.7(2), "Electrical Systems - Modification of Minimum Requirements," and TS 3.7(5), "Emergency Power System Periodic Tests - Required Safety Related Inverters." The licensee proposed adding two safety-related swing inverters to the 120 Volt (V) alternating current (ac) instrument buses. Specifically, the proposed changes would revise Limiting Conditions for Operation (LCO) TSs 2.7(1) and 2.7(2) to take advantage of the additional operational flexibility the swing inverters will provide. In addition, editorial changes to correct spelling and formatting errors were made to TS 2.7 and TS 3.7.5.

2.0 REGULATORY EVALUATION

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, which is similar to Appendix A, General Design Criteria for Nuclear Power Plants in Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR), that govern emergency power at FCS are Criterion 24 and Criterion 39 from the FCS Updated Safety Analysis Report. The U.S. Nuclear Regulatory Commission (NRC) staff used the following requirements to review the licensee's amendment request:

Criterion 24 - Emergency Power for Protection Systems

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 volt d-c [direct current] 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 volt d-c batteries is capable of supplying essential station d-c load for eight 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. Diesel units are synchronized to the bus and loaded periodically to ensure readiness for emergency services.

#### Criterion 39 - Emergency Power for Engineered Safety Features

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 [kiloVolt] 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 will be subject to rigorous inspection and maintenance. Periodically, the charger voltage is manually lowered to test batteries capability to assume load at the appropriate bus voltage.

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

### 3.0 TECHNICAL EVALUATION

#### 3.1 Design of FCS Instrument AC System

The ac instrument system is comprised of six separate buses, four of which supply power to safety-related instrumentation. Each instrument bus is supplied by a separate solid-state inverter from the dc system. Instrument buses A, C, and 1 are supplied from dc bus 1, and instrument buses B, D, and 2 are supplied from dc bus 2. The instrument buses provide annunciation in the main control room upon detection of low bus voltage.

Safety-related inverters A, B, C, and D are rated 7.5 kV-amperes (KVA) at 120 V nominal, single phase. Non-safety related inverters 1 and 2 are rated 10 KVA at 120 V nominal, single phase. Each inverter has its own annunciator point in the control room, which is actuated when the inverter is in an off-normal condition.

Instrument buses A and C, supplied from dc bus 1, have a manual bus tie for use only when an inverter is out-of-service for maintenance. Instrument buses B and D, supplied from dc bus 2, are similarly arranged. Each of the instrument inverters, which supply power to the instrument buses, also has a 480 V ac bypass source that supplies power to the bus if there is an inverter failure or if inverter maintenance is necessary. In the event of inverter failure, the load on the inverter is automatically transferred to the bypass source.

Each inverter supplying the instrument buses operates in synchronism with the auxiliary power system to avoid the beat frequencies that can occur in an asynchronous system. This also provides a smooth transfer to and from the bypass source. Each inverter reverts to an internal frequency reference when the system reference synchronization voltage source is lost.

The licensee stated that it will be adding two swing inverters to the 120 V ac instrument buses, as well as replacing the four currently installed safety-related inverters and the two non-safety related inverters installed on dc buses 1 and 2. The installation of an additional safety-related swing inverter on each dc bus would allow one of the other safety-related inverters on the bus to be taken offline for maintenance or repair. Changes to the FCS TSs are needed to take advantage of the additional operational flexibility the swing inverters would provide.

#### 3.2 Evaluation of Proposed Changes

In its letter dated July 31, 2007, the licensee proposed a license amendment to the TSs for FCS. The proposed changes would revise LCOs for TSs 2.7(1), "Electrical Systems - Minimum Requirements," and TS 2.7(2), "Electrical Systems - Modification of Minimum Requirements." In addition, the title for TS 3.7(5), "Emergency Power System Periodic Tests - Required Safety Related Inverters," will be revised.

The NRC staff reviewed and evaluated each of the proposed changes to the FCS TS as follows:

3.2.1 The licensee proposed the following change to TS 2.7(1)j:

Revise 2.7(1)j to require two inverters on dc bus No. 1 and two inverters on dc bus No. 2 to be operable in the following combinations:

125 V dc Bus No. 1

Inverter A and inverter C; or inverter A and associated swing inverter; or inverter C and associated swing inverter; AND

125 V dc Bus No. 2

Inverter B and inverter D; or inverter B and associated swing inverter; or inverter D and associated swing inverter.

Evaluation of TS 2.7(1)j

The proposed change to TS 2.7(1)j addresses acceptable combinations of swing and non-swing inverters to ensure operability of the instrument buses. The proposed change to TS 2.7(1)j takes advantage of the operational flexibility gained by the addition of two swing inverters but does not reduce the requirement to have a total of four inverters operable. The minimum requirement for operability of each instrument bus is to be connected to two safety-related inverters.

The licensee proposed using the term 'required' since the proposed change to TS 2.7(1)j allows operability to be achieved with various combinations of inverters. The licensee stated that the term 'required' is also needed to distinguish that an out-of-service inverter may be inoperable indefinitely with no effect on TS 2.7(1)j operability. The indefinite period presumes that the conditions of TS 2.7(1)j are met (i.e., the appropriate combination of safety-related inverters are connected to each instrument bus). The NRC staff finds the use of the term 'required' acceptable as this change would not decrease either the number of inverters required to be operable or their ability to supply power to the instrument buses.

The NRC staff finds that the proposed changes are conservative and maintain the requirement for independence and redundancy between buses. Based on this information, the NRC staff concludes that there is a reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.2.2 The licensee proposed the following change to LCO 2.7(2)o:

Revise TS 2.7(2)o to indicate that one of the required inverters may be inoperable for up to 24 hours.

Evaluation of LCO 2.7(2)o

The proposed change to TS 2.7(2) would allow one of the four required inverters to be inoperable for up to 24 hours provided the reactor protective system and engineered safeguards systems instrument channels supplied by the remaining three required inverters are all operable and the 120 V ac instrument bus associated with the inoperable inverter is powered from its associated inverter bypass source. This change would maintain the current TS allowance for one of the required inverters to be inoperable for up to 24 hours provided all current TS requirements for operability are met.

While continued operation for up to 24 hours with one required inverter inoperable would be allowed, the addition of the two safety-related inverters is expected to decrease the amount of time that FCS would operate with less than four inverters since the design would allow the inoperable inverter to be replaced by its associated swing (or non-swing) inverter.

Based on the above, the NRC staff concludes that there is a reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.2.3 The licensee proposed several editorial changes to TS 2.7(2):

Correct spelling and formatting errors in TS 2.7(2).

#### Evaluation of TS 2.7(2)

The NRC staff finds that the proposed changes do not change any requirements, and are administrative in nature and therefore, are acceptable.

3.2.4. The licensee proposed to change the heading in LCO 3.7(5):

Revise 3.7(5) to replace the heading of "Inverters A, B, C, and D" with "Required Safety Related Inverters."

#### Evaluation of LCO 3.7(5) Change (1)

The proposed change would revise the title of TS 3.7(5). This change would not alter the requirement to monitor the output parameters (voltage, frequency, and bus alignment) of all required safety-related inverters on a weekly basis. However, the licensee stated that weekly surveillance testing of out-of-service inverters will not be performed. The licensee further noted that voltage, frequency, and bus alignment of an out-of-service inverter will be verified prior to declaring it operable and placing it in-service.

Based on the above, the NRC staff concludes that this is an editorial change in nature and there is a reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment. The State official had no comments.

## 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (72 FR 49582 dated August 28, 2007). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

## 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (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 regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Delza Mas-Penaranda  
Matthew McConnell

Date: December 17, 2007