

May 29, 2002

Mr. R. T. Ridenoure
Division Manager - Nuclear Operations
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
Post Office Box 550
Fort Calhoun, NE 68023-0550

SUBJECT: FORT CALHOON STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT
(TAC NO. MB4657)

Dear Mr. Ridenoure:

The Commission has issued the enclosed Amendment No. 210 to 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 March 27, 2002, as supplemented by letter dated May 9, 2002. By letter dated May 9, 2002, pursuant to 10 CFR 50.91(a)(6), Omaha Public Power District requested that this amendment be processed as an exigent amendment.

The amendment revises the maximum allowable value of the reactor protective system (RPS) variable high power trip (VHPT) setpoint from 107.0% to 109.0%. Specifically, TS Table 1-1, "RPS Limiting Safety System Settings," in the Trip Setpoints column for Trip Number 1 [High Power Level (A) 4-Pump Operation] has been revised from 107.0% to 109.0%. In addition, TS Section 1.3(1), "Basis," describing the high power trip initiation, has been revised from 107.0% to 109.0%.

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, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures: 1. Amendment No. 210 to DPR-40
2. Safety Evaluation

cc w/encls: See next page

May 29, 2002

Mr. R. T. Ridenoure
Division Manager - Nuclear Operations
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
(TAC NO. MB4657)

Dear Mr. Ridenoure:

The Commission has issued the enclosed Amendment No. 210 to 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 March 27, 2002, as supplemented by letter dated May 9, 2002. By letter dated May 9, 2002, pursuant to 10 CFR 50.91(a)(6), Omaha Public Power District requested that this amendment be processed as an exigent amendment.

The amendment revises the maximum allowable value of the reactor protective system (RPS) variable high power trip (VHPT) setpoint from 107.0% to 109.0%. Specifically, TS Table 1-1, "RPS Limiting Safety System Settings," in the Trip Setpoints column for Trip Number 1 [High Power Level (A) 4-Pump Operation] has been revised from 107.0% to 109.0%. In addition, TS Section 1.3(1), "Basis," describing the high power trip initiation, has been revised from 107.0% to 109.0%.

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, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures: 1. Amendment No. 210 to DPR-40
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC GHill (2)
PDIV-2 Reading LHurley, RIV
RidsNrrDlpmPdiv (LBarnett) DBujol, RIV
RidsNrrPMAWang
RidsNrrLAEPeyton
RidsOgcRp
RidsAcrsAcnwMailCenterr
CMarschall, RIV
WBeckner (RidsNrrDripRtsb)
RDennig
MWaterman

TS: ML 021620011 NRR-100
ACCESSION NO.: ML021500052

PKG.: ML021640374 SE dated 4/23/02
NRR-058 ** See previous
concurrency

OFFICE	PDIV-2/PM	PDIV-2/LA	EEIB	OGC	PDIV-2/SC
NAME	AWang:as	EPeyton	EMarinos*	RHoefling**	SDembek**
DATE	5/22/02	5/24/02	4/23/02	5/20/02	5/21/02

Ft. Calhoun Station, Unit 1

cc:

Winston & Strawn
ATTN: James R. Curtiss, Esq.
1400 L Street, N.W.
Washington, DC 20005-3502

Mr. Jack Jensen, Chairman
Washington County Board
of Supervisors
Blair, NE 68008

Mr. Wayne Walker, Resident Inspector
U.S. Nuclear Regulatory Commission
Post Office Box 309
Fort Calhoun, NE 68023

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

Ms. Julia Schmitt, Section Administrator
Nebraska Health and Human Services
Systems
Division of Public Health Assurance
Consumer Services Section
301 Centennial Mall, South
P. O. Box 95007
Lincoln, Nebraska 68509-5007

Mr. David J. Bannister
Manager - Fort Calhoun Station
Omaha Public Power District
Fort Calhoun Station FC-1-1 Plant
Post Office Box 550
Fort Calhoun, NE 68023-0550

Mr. Mark T. Frans
Manager - Nuclear Licensing
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
Post Office Box 550
Fort Calhoun, NE 68023-0550

Mr. Daniel K. McGhee
Bureau of Radiological Health
Iowa Department of Public Health
401 SW 7th Street
Suite D
Des Moines, IA 50309

OMAHA PUBLIC POWER DISTRICT

DOCKET NO. 50-285

FORT CALHOUN STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 210
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 March 27, 2002, as supplemented by letter dated May 9, 2002, 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, Facility Operating License No. DPR-40 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of 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. 210, 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 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: May 29, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 210

FACILITY OPERATING LICENSE NO. DPR-40

DOCKET NO. 50-285

Replace the following pages of 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.

REMOVE

1-6
1-10

INSERT

1-6
1-10

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 210 TO 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 March 27, 2002, as supplemented by letter dated May 9, 2002, Omaha Public Power District (OPPD/the licensee) requested changes to the Technical Specifications (TSs Appendix A to Facility Operating License No. DPR-40) for the Fort Calhoun Station, Unit No. 1 (FCS). The requested changes would revise the maximum allowable value (AV) of the reactor protective system (RPS) variable high power trip (VHPT) setpoint from 107.0% to 109.0%. Specifically, the proposed changes would revise TS Table 1-1, "RPS Limiting Safety System Settings," in the Trip Setpoints column for Trip Number 1 [High Power Level (A) 4-Pump Operation] from 107.0% to 109.0% and the text describing the high power trip initiation in TS Section 1.3(1), "Basis," from 107.0% to 109.0%. By letter dated May 9, 2002, pursuant to 10 CFR 50.91(a)(6), Omaha Public Power District requested that this amendment be processed as an exigent.

2.0 BACKGROUND

As a result of the September 1989 flow streaming event at FCS, the reactor designer (Combustion Engineering) prepared a report for the licensee describing the reactor coolant flow streaming phenomenon. The 1989 flow streaming event and subsequent events during Cycle 20, which occurred June 14, November 29, and December 30 in 2001, and January 25, February 11, and February 26 in 2002, correlate with flow streaming events observed during the initial startup of Arkansas Nuclear One, Unit 2 and San Onofre Nuclear Generating Station, Unit 3, and during the Cycle 5 startup of St. Lucie and the Cycle 10 startup of Millstone Nuclear Power Station, Unit 2.

The report summarized that measured temperature shifts at the hot leg resistance temperature detector (RTD) locations may be caused by a coolant flow pattern rotation or change. The reactor designer determined that temperatures in the hot leg pipe are not uniform because complete mixing does not take place in the reactor vessel upper guide structure. In general, the reactor coolant in the central portion of the reactor core, which usually contains the higher power fuel bundles, exits the reactor core, flows through the upper guide structure out of the

reactor vessel into the top portion of the hot leg piping, while relatively cooler reactor coolant from the reactor core periphery exits the reactor vessel along the bottom of the hot leg piping. Consequently, the reactor coolant temperature distribution in the hot leg piping is a function of the reactor core radial power distribution. The hot leg flow streaming anomalies, which have been observed in FCS, have resulted in an indicated power increase on two of the RPS channels without a corresponding increase in actual core power.

3.0 EVALUATION

3.1 Regulatory Requirements

OPPD cited 10 CFR Part 50, Appendix A, Criterion 10, "Reactor design," and Criterion 20, "Protection system functions," as the regulations that govern the high power trip.

Criterion 10 states:

The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

Criterion 20 states:

The protection system shall be designed: (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

The staff agrees that Section 4.0 of OPPD's March 27, 2002, submittal identified the applicable regulatory requirements for the VHPT setpoint. However, in addition to those cited regulations, another regulatory requirement for which the staff based its acceptance is 10 CFR 50.36(c)(1)(ii)(A), "Technical specifications," which states in part,

Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded.

3.2 Evaluation

Hot leg streaming refers to a temperature non-uniformity caused by coolant stratification in the reactor hot leg piping. The result of the hot leg streaming is a difference between a hot leg RTD measurement and the hot leg average fluid temperature. This effect was initially observed at FCS in September 1989 and has only recently reoccurred six times during the current cycle (Cycle 20). As noted earlier, the hot leg flow streaming anomalies have resulted in an indicated

power increase on two of the RPS channels without a corresponding increase in actual core power. OPPD states that the proposed change in the VHPT setpoint will lessen the possibility of an invalid trip due to an observed increase in indicated power on two of the RPS channels due to hot leg flow streaming anomalies.

The following discussion uses the terms analytical limit (AL) and AV. The AL is the limit of a measured or calculated variable established by the safety analysis to ensure that a safety limit is not exceeded. This limit will not be affected by this proposed amendment. The AV is the limiting value that a trip setpoint may have when tested periodically, beyond which appropriate action shall be taken. This is the limit specified in the licensee's TS.

The licensee has been operating FCS with an AL of 112.0% on the VHPT since the beginning of plant operation in 1973. The VHPT uncertainty in the original Updated Safety Analysis Report (USAR) was listed as 5.5%, necessitating a VHPT AV setpoint of 106.5% (112.0% - 5.5%). The current setpoint for the VHPT AV is 107.0%, with a calculated uncertainty of 2.32%. The difference between the AL and this AV results in an available margin of 2.68% (112.0% - [107.0%+2.32%.]) The licensee used the 2.68% margin as the bounding transient allowance between the actual and measured core power levels, which is termed transient power decalibration (TPD).

TPD is caused by density-induced changes in the reactor vessel downcomer shadowing the power-range excore detectors during heatup and cooldown transients. The nuclear power level indicated by the excore detectors will be lower than the actual reactor power level when the coolant entering the reactor pressure vessel is cooler than the normal full power temperature (and higher when the inlet coolant is warmer than the normal full power coolant temperature.) This lower than actual indicated power level can delay the time of the reactor trip during cooldown transients, and, therefore, must be addressed either in the applicable safety analyses or in the VHPT AV.

Originally, the TPD was explicitly included in the VHPT AV by decreasing the VHPT AV by the TPD margin. However, advances in transient analysis codes and technology have allowed a direct modeling of the TPD in safety analyses so that it can be included as a transient-specific effect, and not as an allowance that must be used for all licensing basis events. Changes in the measured core power as an input to a simulated reactor trip are now included in the licensee's transient analysis models, which are described in Framatome ANP (FANP) Topical Report (TR) EMF-2310(P)(A), Rev. 0, "SRP Chapter 15 Non-LOCA Methodology for Pressurized Water Reactors." The transient analysis results are used in the Framatome statistical setpoint methodology to produce (or verify) the trip setpoints. The setpoint methodology used by the licensee is described in FANP TR EMF-1961(P)(A), Rev. 0, "Statistical Setpoint/Transient Methodology for Combustion Engineering Type Reactors." The methodology for determining AVs was approved by the NRC for use at FCS by letter dated March 4, 2002. EMF-2310(P)(A), Rev. 0 and EMF-1961(P)(A) Rev. 0 are referenced in TS 5.9.5, Core Operating Limits Report.

To raise the VHPT setpoint to 109.0%, the licensee proposed using 2% of the available 2.68% TPD margin that is no longer required to account for TPD uncertainty. The AL used in the licensee's licensing basis analysis will continue to be 112.0%, with the TPD calculated as part of the licensee's simulation of the licensing basis transients.

The staff finds that using 2.0% of the available 2.68% TPD margin is acceptable because the difference between the VHPT AV and the AL is such that sufficient margin exists (the existing 2.32% instrumentation margin plus the 0.68% margin remaining from the current 2.68% TPD margin) to ensure that instrumentation and analytical uncertainties are appropriately addressed. The staff concludes, therefore, that operating the reactor at the VHPT AV limit of 109% will not exceed the licensing basis of the plant. This change will, however, improve the ability of the plant to respond to conditions caused by "flow streaming anomalies," which affect the measurement of reactor power by the Delta-T method; and prevent unnecessary and invalid safety system challenges. Based on the above, the staff concludes that the licensee's proposed TS changes are acceptable.

3.3 Change to the Bases Section

TS Section 1.3(1), "Basis," describing the high power trip initiation, has been revised to reflect the proposed TS change. The staff has reviewed this Bases change and has no objections to it.

4.0 EXIGENT CIRCUMSTANCES

The Commission's regulations, 10 CFR 50.91, contain provisions for issuance of amendments when the usual 30-day public notice period cannot be met. One type of special exception is an exigency. An exigency is a case where the staff and licensee need to act promptly. The exigency case usually represents an amendment involving a safety enhancement to the plant. Pursuant to 10 CFR 50.91(a)(6), the licensee requested the proposed amendment on an exigent basis.

Under such circumstances, the Commission notifies the public in one of two ways: by issuing a *Federal Register* notice providing an opportunity for hearing and allowing at least two weeks for prior public comments, or by issuing a press release discussing the proposed changes, using local media. In this case, the Commission used the first approach.

On March 27, 2002, OPPD requested an amendment to change the high power trip setpoint. OPPD informed the NRC that the revised setpoint for the high power trip needed to be approved prior to exceeding 95% rated power to avoid a potential plant trip due to a hot leg flow streaming anomaly. OPPD requested that the amendment be approved by May 31, 2002, to provide them sufficient time to implement the change. FCS began its Spring refueling outage on May 3, 2002. The outage is scheduled to be completed and power operation is scheduled to resume on May 31, 2002. FCS is currently scheduled to exceed 95% power on June 5, 2002. On May 2, 2002, OPPD was notified by the NRC that it had missed the deadline for publication of the no significant hazards consideration notice in the April 30, 2002, *Federal Register*. Publication in the *Federal Register* was needed by April 30, 2002, to allow the NRC to issue the amendment by May 31, 2002. The NRC informed OPPD that the *Federal Register* notice would be issued on May 14, 2002. Therefore, the comment period will not end until June 13, 2002, and the amendment cannot be issued until June 14, 2002. After reviewing the options available for issuing the amendment by May 31, 2002, OPPD concluded that the amendment request needed to be processed on an exigent basis. Therefore, pursuant to

10 CFR 50.91(a)(6), OPPD has requested an exigent TS change for approval of this license amendment request to allow the plant to attain 100% power after startup.

There were no public comments in response to the notice published in the *Federal Register*.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards considerations if operation of the facility in accordance with the amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in margin of safety.

Operation of the facility in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident evaluated. The change does not result in a high power trip setpoint that will cause the analysis value of 112.0% to be exceeded. There is no change in the analysis value of 112.0% for the high power trip setpoint used in the evaluation of the transients and accidents. All of the evaluated transients and accidents currently show acceptable results and will not be affected by this change. Changing the high power trip setpoint will not affect the probability of an accident, since that circuit is not a transient or accident initiator. The change to the setpoint will not change the failure possibilities for this circuit. The effect of the proposed change is the reduction in the probability of an undesired safety system challenge initiated by an erroneous high power trip during a flow streaming event.

Operation of the facility in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated. The change to the RPS high power trip setpoint does not provide the possibility of the creation of a new or different type of accident. Changing the setpoint does not change the method of operation of the high power trip circuit or its expected response once the setpoint is reached. The trip will occur within previously analyzed limits.

Operation of the facility in accordance with the amendment will not involve a significant reduction in the margin of safety. The proposed setpoint change does not constitute a significant reduction in the margin of safety due to the fact that the transient and accident analyses contained in the Updated Safety Analysis Report have been evaluated using an analysis trip setpoint of 112.0% with the event initiated from the appropriate power level and have been shown to produce acceptable results.

The acceptance criteria used in the analysis have been developed for the purpose of use in design basis accident analyses such that meeting these limits demonstrates adequate protection of public health and safety. An acceptable margin of safety is inherent in these licensing limits. Therefore, the proposed changes do not involve a reduction in a margin of safety.

Based upon the above considerations, the staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the staff has made a final determination that the proposed amendment does not involve a significant hazards consideration.

6.0 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.

7.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to 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 made a final finding that the amendment involves no significant hazards consideration. 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.

8.0 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 Contributor: M. Waterman

Date: May 29, 2002