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U.S. Nuclear Regulatory Commission
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Reference: Docket No. 50-285

**SUBJECT: Fort Calhoun Station Unit No. 1 License Amendment Request,
"Allowance to Perform Recirculation Actuation Logic Channel
Functional Test"**

Pursuant to 10 CFR 50.90, Omaha Public Power District (OPPD) hereby transmits an application for exigent amendment to the Fort Calhoun Station Unit 1 (FCS) Operating License. Attachment 1 provides the No Significant Hazards Evaluation and the technical bases for this requested change to the Technical Specifications. Attachments 2 and 3 contain a marked-up and clean typed version reflecting the requested Technical Specification and Basis changes. The exigency and why it could not have been avoided are addressed in Attachment 4 pursuant to 10 CFR 50.91(a)(6)(vi).

The proposed amendment adds an allowance to perform the surveillance test of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d, and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour. This allowance applies only to the remainder of Cycle 20 and the entirety of Cycle 21.

The proposed license amendment is needed to maintain compliance with TS 2.3(2) during surveillance testing. TS 2.3(2) only permits one of its listed conditions to be true at any one time. Current performance of the surveillance test of Table 3-2, Item 20 requires entry into TS 2.0.1(1) since components in excess of those allowed by Conditions a, b, d, and e of TS 2.3(2) would be inoperable. Entry into TS 2.0.1(1) requires that FCS be placed in at least hot shutdown within 6 hours, in at least subcritical and less than 300°F within the next 6 hours, and in at least cold shutdown within the following 30 hours. If the Recirculation Actuation Logic Channel Functional Test is not performed and the system cannot be restored to meet the minimum requirements of TS 2.3(1) within 24 hours, TS 2.3(2) would require FCS be placed in a hot shutdown condition within 12 hours. If the minimum requirements of TS 2.3(1) are not met within an additional 48 hours, TS 2.3(2) would require FCS be placed in a cold shutdown condition within 24 hours.

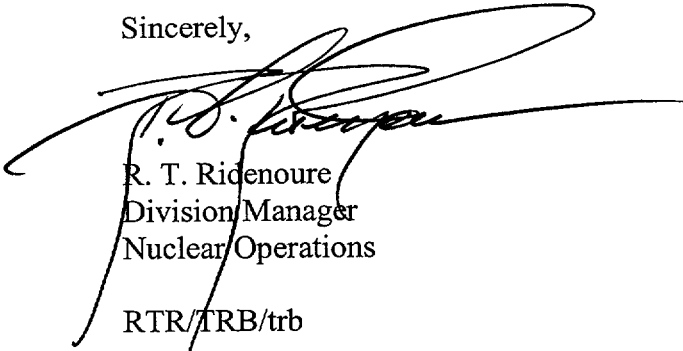
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OPPD requests approval of the proposed license amendment on an exigent basis and issuance of the amendment no later than April 19, 2002.

I declare under penalty of perjury that the forgoing is true and correct. (Executed on April 1, 2002.)

If you have any questions or require additional information, please contact Dr. R. L. Jaworski of my staff at 402-533-6833.

Sincerely,



R. T. Ridenoure
Division Manager
Nuclear Operations

RTR/TRB/trb

Attachments

1. Fort Calhoun Station's Evaluation for Amendment of Operating License
2. Mark-up of Technical Specifications
3. Clean Version of Technical Specifications
4. Explanation of the Exigency and Why the Situation Could Not Have Been Avoided

c: E. W. Merschoff, NRC Regional Administrator, Region IV
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Division Administrator, Public Health Assurance, State of Nebraska
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Attachment 1
Fort Calhoun Station's Evaluation
For
Allowance to Perform Recirculation Actuation Logic Channel Functional Test

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1.0 INTRODUCTION

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

Omaha Public Power District (OPPD) proposes to add an allowance to perform the surveillance testing of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d, and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour. This allowance applies only to the remainder of Cycle 20 and the entirety of Cycle 21. This change is being proposed to allow the performance of the Recirculation Actuation Logic Channel Functional Test without violating Technical Specifications or necessitating a unit shutdown due to inability to perform the test.

2.0 DESCRIPTION OF PROPOSED AMENDMENT

The proposed changes are as follows:

- (1) Add the following item "i" to TS 2.3(2), page 2-21:; "Components in excess of those allowed by Conditions a, b, d, and e may be inoperable provided they are returned to operable status within 1 hour when performing the quarterly recirculation actuation logic channel functional test (Table 3-2 item 20) under administrative controls. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21."
- (2) Add the following to the corresponding Basis text describing actions to be taken due to inoperability of system components: "Components in excess of those allowed by Conditions a, b, d, and e may be inoperable provided they are returned to operable status within 1 hour when performing the quarterly recirculation actuation logic channel functional test (Table 3-2 item 20) under administrative controls. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21. This prevents violating Technical Specifications or necessitating a unit shutdown due to inability to perform the quarterly recirculation actuation logic channel functional test. These administrative controls consist of stationing two dedicated operators at the Engineered Safeguards Features (ESF) panel controls in the control room. In this way, the following actions can be rapidly performed should a valid ESF actuation occur:
 - the appropriate Recirculation Actuation Signal (RAS) lockout relays and initiating signal can be rapidly reset,
 - the appropriate Safety Injection Refueling Water Tank (SIRWT) to Safety Injection (SI) and Containment Spray (CS) pumps suction valve control switch can be maintained in the OPEN position (spring-return switch),

- the appropriate SI and CS pumps to SIRWT recirculation minimum flow valve can be rapidly opened,
- the appropriate Containment Sump to SI and CS pumps suction valve control switch can be rapidly returned to the AUTO position, and
- the appropriate LPSI pump RAS Override switch can be rapidly returned to the NORMAL position.

The SIRWT to SI and CS pumps suction valve control switch is held in the OPEN position during the test to enhance the reliability of the appropriate SI and CS pumps by maintaining the SIRWT to SI and CS pumps suction valve open.”

3.0 BACKGROUND

The proposed amendment adds an allowance to perform the surveillance test of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d, and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour. This allowance applies only to the remainder of Cycle 20 and the entirety of Cycle 21.

The proposed license amendment is needed to maintain compliance with TS 2.3(2) during surveillance testing. TS 2.3(2) only permits one of its listed conditions to be true at any one time. Current performance of the surveillance test of Table 3-2, Item 20 requires entry into TS 2.0.1(1) since components in excess of those allowed by Conditions a, b, d, and e of TS 2.3(2) would be inoperable. Entry into TS 2.0.1(1) requires that FCS to be placed in at least hot shutdown within 6 hours, in at least subcritical and less than 300°F within the next 6 hours, and in at least cold shutdown within the following 30 hours. If the Recirculation Actuation Logic Channel Functional Test is not performed and the system cannot be restored to meet the minimum requirements of TS 2.3(1) within 24 hours, TS 2.3(2) would require FCS be placed in a hot shutdown condition within 12 hours. If the minimum requirements of TS 2.3(1) are not met within an additional 48 hours, TS 2.3(2) would require FCS be placed in a cold shutdown condition within 24 hours.

FCS was licensed for full power operation in 1973 by the NRC. The Emergency Core Cooling System (ECCS) was designed with three HPSI pumps and two LPSI pumps that have a common recirculation minimum flow header to the SIRWT. During a Loss Of Coolant Accident (LOCA), or other accidents which generate a Safety Injection Actuation Signal (SIAS), the HPSI and LPSI pumps start and pressurize their injection headers. If Reactor Coolant System (RCS) pressure is higher than the shutoff head of these pumps, a single recirculation minimum flow line provides sufficient flow to allow all five pumps to operate without damage to the pumps.

After an accident that allows injection into the RCS, the recirculation actuation signal (RAS) automatically switches the HPSI and CS pump suction to the containment sump when the water level in the SIRWT falls to a preset level. At this time, the flow path from

the containment sump is opened, the SIRWT flow path is closed, the LPSI pumps are stopped automatically, and water is recirculated from the containment sump by the HPSI and CS pumps.

The recirculation minimum flow line to the SIRWT is isolated by two valves in series to prevent depositing potentially contaminated water into a tank outside of the reactor containment building. These valves are normally open and fail open on loss of air or loss of 125 VDC power. These valves perform a passive safety function in the OPEN position. The valves are designed to provide a recirculation minimum flow path from the SI and CS pumps to the SIRWT to prevent deadheading the pumps during SI and CS. These valves also perform an active safety function in the closed position to isolate the SIRWT on a RAS signal. This effectively prevents depositing potentially radioactive water into a tank outside the containment building. At this stage of the accident, isolation of the recirculation minimum flow path is not a concern with respect to pump operability since reactor coolant pressure would be well below the pump's discharge head and a minimum flow rate would be achieved.

During the Recirculation Actuation Logic Channel Functional Test, a RAS signal is generated and one of the recirculation minimum flow valves closes. Until a recent NRC inspection, OPPD thought that an operator could be used during the test to ensure that in the event of an SIAS the test could be rapidly terminated and the recirculation minimum flow valve opened to allow a minimum flow path for the HPSI and LPSI pumps. The actions required to be performed to allow the recirculation minimum flow valve to open can be rapidly performed by one dedicated operator in less than one minute. During the NRC Safety System Design and Performance Capability (SSDPC) inspection in February 2002, station personnel were informed that manual actions could not be used in lieu of automatic actions to maintain equipment operable without prior NRC approval. A comprehensive review was conducted of plant procedures that used manual actions in place of automatic actions in order to allow equipment to remain operable. The quarterly Recirculation Actuation Logic Channel Functional Test is the only test identified to date in this review requiring a Technical Specification change to perform. This test was due to be performed on March 21, 2002, and will exceed its surveillance frequency and extension on April 21, 2002. The station is currently scheduled to begin a 30 day refueling outage on May 3, 2002.

FCS has previously credited the use of dedicated operators to allow the tested equipment to remain operable. In upgrading the procedure to eliminate this practice, this channel functional test was identified as a procedure that could not be performed without seeking NRC approval for some change to the testing methodology. A number of possible solutions have been proposed, but in the short term this proposed amendment was determined to be the most viable approach. This amendment would allow the continued testing of the logic channels using the existing methodology for a limited time to allow careful consideration of the appropriate approach to any permanent changes to the Technical Specifications or the plant.

The one hour completion time is considered sufficient time to perform the quarterly Recirculation Actuation Logic Channel Functional Test. Additionally, the one hour completion time ensures that prompt action is taken to restore the required ECCS capacity. The one hour completion time allowed to satisfy ECCS requirements is acceptable based on the small probability of an event occurring during this time interval that the test is performed and the desire to minimize plant shutdown transients.

OPPD requests that this allowance be in place for the remainder of Cycle 20 and all of Cycle 21. A modification to the plant may not be desirable. A permanent change to the technical specifications may be the best solution. A permanent change will require additional technical work and the necessary time for review by the NRC staff. This review and comment period generally takes several months. OPPD plans to advise the NRC of the permanent resolution and/or submit an appropriate License Amendment Request no later than January 31, 2003.

4.0 REGULATORY REQUIREMENTS AND GUIDANCE

FCS was licensed for construction prior to May 21, 1971, and at that time committed to the preliminary General Design Criteria (GDC). These preliminary design criteria are contained in the FCS Updated Safety Analysis Report (USAR) Appendix G.

This activity complies with FCS Design Criterion 44, "Emergency Core Cooling Systems Capability," which is similar to 10 CFR 50 Appendix A GDC 35, "Emergency Core Cooling." FCS Design Criterion 44 states that at least two emergency core cooling systems, preferably of different design principles, each with a capability for accomplishing abundant emergency core cooling, shall be provided. Each emergency core cooling system and the core shall be designed to prevent fuel and clad damage that would interfere with the emergency core cooling function and to limit the clad metal-water reaction to negligible amounts for all sizes of breaks in the reactor coolant pressure boundary, including the double-ended rupture of the largest pipe. The performance of each emergency core cooling system shall be evaluated conservatively in each area of uncertainty. The systems shall not share active components and shall not share other features or components unless it can be demonstrated that (a) the capability of the shared feature or component to perform its required function can be readily ascertained during reactor operation, (b) failure of the shared feature or component does not initiate a loss-of-coolant accident, and (c) capability of the shared feature or component to perform its required function is not impaired by the effects of a loss-of-coolant accident and is not lost during the entire period this function is required following the accident.

This activity also complies with FCS Design Criterion 46, "Testing of Emergency Core Cooling Systems Components," which states that design provisions shall be made so that active components of the emergency core cooling systems, such as pumps and valves, can be tested periodically for operability and required functional performance. This activity also complies with FCS Design Criterion 47, "Testing of Emergency Core Cooling Systems," which states that a capability shall be provided to test periodically the delivery

capability of the emergency core cooling systems at a location as close to the core as practical. This activity also complies with FCS Design Criterion 48, "Testing of Operational Sequence of Emergency Core Cooling Systems," which states that a capability shall be provided to test under conditions as close to design as practical the full operational sequence that would bring the emergency core cooling systems into action, including the transfer to alternate power sources. These FCS Design Criteria are similar to 10 CFR 50 Appendix A GDC 37, "Testing of Emergency Core Cooling System."

This activity also complies with FCS Design Criterion 52, "Containment Heat Removal Systems," which is similar to 10 CFR 50 Appendix A GDC 38, "Containment Heat Removal." FCS Design Criterion 52 states that where active heat removal systems are needed under accident conditions to prevent exceeding containment design pressure, at least two systems, preferably of different principles, each with full capacity, shall be provided.

This activity also complies with FCS Design Criterion 59, "Testing of Containment Pressure-Reducing Systems Components," which states that the containment pressure reducing systems shall be designed so that active components, such as pumps and valves, can be tested periodically for operability and required functional performance. This activity also complies with FCS Design Criterion 60, "Testing of Containment Spray Systems," which states that a capability shall be provided to test periodically the delivery capability of the containment spray system at a position as close to the spray nozzles as is practical. This activity also complies with FCS Design Criterion 61, "Testing of Operational Sequence of Containment Pressure-Reducing Systems," which states that a capability shall be provided to test under conditions as close to the design as practical the full operational sequence that would bring the containment pressure-reducing systems into action, including the transfer to alternate power sources. These FCS Design Criteria are similar to 10 CFR 50 Appendix A GDC 40, "Testing of Containment Heat Removal System."

All of these FCS Design Criteria will continue to be satisfied after the change to provide the allowance to perform the quarterly surveillance test of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d, and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21.

5.0 TECHNICAL ANALYSIS

Evaluation

Operating any centrifugal pump at shutoff head with the recirculation minimum flow path isolated will eventually cause overheating, cavitation, and excessive pump vibration. All of these can cause damage and failure of the pump.

Functional testing of the recirculation actuation logic per the Recirculation Actuation Logic Channel Functional Test automatically closes the recirculation minimum flow valves when the RAS relays are tripped. The test procedure requires the use of a dedicated operator who is briefed on the actions required to maintain SIRWT suction alignment to the SI pumps during the RAS testing. A second dedicated operator is also assigned and briefed on the actions required to align recirculation minimum flow to the SIRWT if any HPSI or LPSI pump starts during RAS testing. The procedure directs this operator to implement the appropriate restorative actions if a HPSI or LPSI pump starts. The appropriate steps within the Recirculation Actuation Logic Channel Functional Test procedure provide directions for the operator to reset three lockout relays and then open the safety injection recirculation isolation valve.

In order to assess the adequacy of operator action as a substitute for an automatic operation function when performing the Recirculation Actuation Logic Channel Functional Test, the following factors were evaluated:

- a reasonable length of time for an operator to complete the manual actions,
- a conservative length of time within which manual actions must be completed to ensure equipment availability, and
- an evaluation of the risk associated with performing the manual actions. This includes assessment of the complexity of tasks and the probability of failure.

Time Required to Perform Manual Actions

On March 25, 2002, a test was conducted on the FCS Control Room simulator. The test was performed to determine what would be considered to be a reasonable length of time for a single dedicated operator to perform the appropriate procedure steps of the Recirculation Actuation Logic Channel Functional Test.

The simulator was set up for performance of the test. A dedicated operator was assigned and briefed on his duties. The RAS portion of the surveillance test was run. During the conduct of the test, an SI pump was started unannounced. The assigned dedicated operator acknowledged the pump start and was able to complete the appropriate procedure steps in approximately 15 seconds. It should be noted that the individual assigned as the dedicated operator had never previously performed these actions. This individual's performance and operation background have both been evaluated by Operations and Training management to assure that his response time of less than one minute would be typical for all FCS operators.

Based on the fact that the prompt (a HPSI or LPSI pump starting) is very clear for initiating the appropriate procedure steps, and all of the controls are grouped together in the same area the test is being performed, it is reasonable to conclude that any dedicated operator would be capable of completing these appropriate procedure steps in less than one minute.

Time Before Potential Pump Damage with Recirculation Minimum Flow Isolated

Operating a pump at shutoff head without recirculation minimum flow will result in an increase in the temperature of the fluid contained in the pump case. While elevated fluid temperature is typically the primary basis for pump operability, other factors can affect the severity of pump damage and cause of ultimate failure. Under low flow or no flow conditions, a centrifugal pump can demonstrate a flow condition referred to as hydraulic instability or impeller recirculation. This condition can cause pump vibration, cavitation, and excessive forces on the impeller. Significant damage to the pump seals and bearings can result. Catastrophic failure is also possible from the hydraulic instability.

The following is an assessment of the effects upon CS, LPSI and HPSI pumps under no flow conditions.

CS Pumps

CS pumps are not exposed to operation at shutoff head conditions since they do not receive a start signal until a Containment Spray Actuation Signal (CSAS) is received. At that time, the CS discharge valves open providing a flow path to the reactor containment.

LPSI Pumps

The LPSI pumps are single-stage, double suction, overhung impeller motor-driven pumps furnished by Ingersoll-Rand. They operate at a nominal speed of 3600 rpm and are provided with an initial suction of water at ambient conditions.

FCS had previously requested a pump consultant evaluate the operability of the CS pumps under no flow conditions. Since the CS and LPSI pumps are the same type of pump (same manufacturer and model number), it is appropriate to apply the results and conclusions of the previous evaluation to the LPSI pumps. (The pump consultant who prepared the original evaluation agreed that the results and conclusions were appropriate for use with the LPSI pumps). The evaluation concluded that the CS/LPSI pumps would be capable of operating under a no flow condition for up to 30 minutes without compromising pump operability. This conclusion was based on years of testing and operating experience with similar type and application of pumps.

HPSI Pumps

The HPSI pumps are ten-stage impeller motor-driven pumps furnished by Bingham (Type 3x4x8.75A - MSC-10). They operate at a nominal speed of 3560 rpm and are provided with an initial suction of water at ambient conditions.

A pump consultant was requested to assess the operability of the HPSI pumps under no flow conditions. The consultant concluded the HPSI pumps would be capable of operating under a no-flow condition for up to three minutes with no permanent change to the hydraulic performance or mechanical reliability of the pump. If the transient is limited to three minutes, the condition may be treated as a transient event with no measurable impact on wearing rings, seals, or bearings. Actual tolerable running times are very likely to exceed three minutes and are influenced by pump or system conditions. This conclusion is based on the pumps being maintained in nearly new mechanical condition, the transient being a one-time event, and the event commencing from ambient conditions of approximately 80°F.

A calculation was performed by OPPD (Reference 10.7) to address closure of the recirculation minimum flow valves during normal plant operation surveillance testing. The calculation concluded that approximately four minutes were available for the operators to take action to protect the pumps. It should be noted that the results and conclusions were based on the calculated temperature increase rate of the liquid in the HPSI pumps in a shutoff head mode.

Risk Evaluation

In accordance with 10 CFR 50.65(a)(4), an evaluation was performed on the risk associated with performing the Recirculation Actuation Logic Channel Functional Test with dedicated operators performing manual actions in lieu of automatic actions.

A failure probability of 0.01 was assigned for the dedicated operator performing the steps necessary to open the appropriate recirculation minimum flow valve upon the initiating prompt of a LPSI or HPSI pump starting. The actions of resetting the relays and opening the valve were judged to be simple tasks with all indications and controls grouped together in the same area in which the test is performed.

No credit was taken for the dedicated operator holding the safety injection suction isolation valve open (i.e., one train of CS, HPSI and LPSI are assumed to be unavailable).

The bounding risk for the test is an Incremental Core Damage Probability (ICDP) of approximately 1.2E-08 for the one hour during which the RAS portion of the test is performed. This ICDP is within the "Yellow" band of the FCS procedure used for evaluating maintenance under 10 CFR 50.65(a)(4).

Conclusion

Crediting a dedicated operator to perform manual actions as a substitute for automatic operations during the performance of the Recirculation Actuation Logic Channel Functional Test is considered acceptable. This conclusion is based on the following:

- Operator response time to complete the appropriate procedure steps of the Recirculation Actuation Logic Channel Functional Test is conservatively estimated at less than one minute. This has been demonstrated on the control room simulator with the dedicated operator completing the actions in approximately 15 seconds.
- The most limiting component (HPSI pump) can be operated under no-flow condition for up to three minutes without any permanent change to the hydraulic performance or mechanical reliability of the pump. Therefore, adequate margin exists between the operator response time and the response time of the most limiting component.
- A risk assessment concluded the risk of performance of the Recirculation Actuation Logic Channel Functional Test using dedicated operators is small due to the short duration of the test.

USAR Chapter 14 Accident Analysis Review

An evaluation was performed on the impact of manual operator actions as compensation for automatic operations on the USAR Chapter 14 safety analysis.

Performance of the Recirculation Actuation Logic Channel Functional Test requires the use of a dedicated operator to hold open the SIRWT to SI and CS pumps suction valve control switch until the RAS relays have been reset. If it is postulated the operator fails to hold the valve open, then one train of HPSI, LPSI, and CS is rendered inoperable. Loss of one train of HPSI, LPSI, and CS is equivalent to loss of off-site power and the failure of one diesel to start. This scenario has been previously evaluated and meets the ECCS design basis. One train of HPSI, LPSI, and CS will remain available and satisfy their design function. USAR Chapter 14 safety analyses in the most limiting cases only assumes one train of HPSI, LPSI, and CS.

The other dedicated operator's responsibilities are to reestablish recirculation minimum flow to the SIRWT. The performance of this activity has no affect on any accident scenario. This is because realignment of recirculation minimum flow has no impact on the injection flow paths into the reactor coolant system (RCS). If the RCS pressure is below the HPSI and LPSI pumps shutoff head pressure, then injection will not be affected. CS is not affected since CS pump start is initiated by a containment spray actuation signal (CSAS) and delivery into containment will occur with a containment pressure lower than the CS pump shutoff head pressure.

6.0 REGULATORY ANALYSIS

The proposed amendment gives an allowance to perform the quarterly surveillance test of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d,

and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour. This complies with the regulatory requirements in FCS Design Criteria 44, 46, 47, 48, 52, 59, 60, and 61 by continuing to prevent fuel and clad damage and prevent containment overpressurization, while allowing for proper surveillance testing of Emergency Core Cooling Systems and Containment Heat Removal and Pressure-Reducing Systems. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21. Crediting a dedicated operator to perform manual actions as a substitute for automatic operations during the performance of the Recirculation Actuation Logic Channel Functional Test is considered acceptable. The one hour completion time is considered sufficient time to perform the quarterly Recirculation Actuation Logic Channel Functional Test. Additionally, the one hour completion time ensures that prompt action is taken to restore the required ECCS capacity. The one hour completion time allowed to satisfy ECCS requirements is acceptable based on the small probability of an event occurring during this time interval that the test is performed, and the desire to minimize plant shutdown transients.

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 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.

7.0 NO SIGNIFICANT HAZARDS CONSIDERATION

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

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

Response: No.

Allowing performance of the quarterly surveillance test of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d, and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour will not affect the probability of any accident since the performance of the Recirculation Actuation Logic Channel Functional Test is not identified as the initiator of any analyzed event. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21. The proposed change will still require that the surveillance test be performed and the required ECCS systems to be available. The one hour completion time is considered sufficient time to perform the quarterly Recirculation Actuation Logic Channel Functional Test. Additionally, the one hour completion time ensures that prompt action is taken to restore the required

ECCS capacity. The administrative controls in place will ensure that all required ECCS components remain available with compensatory dedicated operators. Closure of a recirculation minimum flow valve during testing could adversely affect all HPSI and LPSI pumps. However, manual operator actions serve to minimize the probability of this occurring and risk analysis concludes that the risk of this is small. This change will not alter assumptions relative to the mitigation of an accident or transient event. The performance of this activity has no effect on any accident scenario. Therefore, the proposed change does not involve a significant increase in the consequences of an accident previously evaluated.

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

Response: No.

These proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing plant operation. The proposed change does not involve any physical changes to plant systems, structures or components (SSCs) or the manner in which these SSCs are operated, maintained, modified or inspected. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The most risk significant portion of the Recirculation Actuation Logic Channel Functional Test is the opening of the recirculation minimum flow valve within three minutes of the receipt of an ESF actuation, should one occur, in order to prevent damage to the HPSI pumps. The manual actions are not complicated, have a distinct prompt, and are easily capable of being performed within the allowable time period. Therefore, the proposed manual actions do not result in a significant reduction in any margin of safety. Operator response time to complete the appropriate procedure steps of the Recirculation Actuation Logic Channel Functional Test is conservatively estimated at less than one minute. The bounding risk for the test is an Incremental Core Damage Probability (ICDP) of approximately $1.2E-08$ for the one hour during which the RAS portion of the test is performed. The proposed change does not affect the frequency of the Recirculation Actuation Logic Channel Functional Test. The administrative controls in place will ensure that all required ECCS components remain available. The minimum numbers of ECCS components required by the FCS accident analyses remain available with compensatory dedicated operators. The proposed change will not significantly impact the availability or reliability of the plants systems or their ability to respond to plant transients and accidents. The one hour completion time allowed to satisfy ECCS requirements is acceptable based on the small probability of an event occurring during this time interval that the test is performed, and the desire

to minimize plant shutdown transients. The performance of this activity has no affect on any accident scenario. 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.

8.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment adds an allowance to perform the surveillance testing of Table 3-2, Item 20 (Recirculation Actuation Logic Channel Functional Test) under administrative controls while components in excess of those allowed by Conditions a, b, d, and e of Technical Specification (TS) 2.3(2) are inoperable provided they are returned to operable status within one hour. This allowance applies only to the remainder of Cycle 20 and the entirety of Cycle 21. The changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) for the following reasons:

- As demonstrated in Section 7.0, the proposed amendment does not involve a significant hazards consideration.
- The proposed amendment does not result in a significant change in the types or increase in the amounts of any effluents that may be released off-site. Also, the TS change does not introduce any new effluents or significantly increase the quantities of existing effluents. As such, the change cannot significantly affect the types or amounts of any effluents that may be released off-site.
- The proposed amendment does not result in a significant increase in individual or cumulative occupational radiation exposure. The proposed change does not result in any physical plant changes. No new surveillance requirements are anticipated as a result of these changes that would require additional personnel entry into radiation controlled areas. Therefore, the amendment has no significant affect on either 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.

9.0 PRECEDENCE

NRC issuance of an amendment to the Indian Point Unit 2 Facility Operating License to specify operator actions for performance of degraded voltage and undervoltage trip surveillance tests, dated December 28, 2000 (TAC No. MA6236).

10.0 REFERENCES

- 10.1 Fort Calhoun Station Updated Safety Analysis Report, Section 14.15.1
- 10.2 Fort Calhoun Station Updated Safety Analysis Report, Section 6.2.3.1
- 10.3 Fort Calhoun Station Updated Safety Analysis Report, Section 14.15.3
- 10.4 Fort Calhoun Station Updated Safety Analysis Report, Appendix K
- 10.5 Letter, James J. Healy, dated March 28, 2002, "OPPD-Ft. Calhoun HPSI Pump - Bingham Type 3x4x8.75 - MSC-10 Operation at Shutoff"
- 10.6 Evaluation, Stone & Webster, JO 16472.8037, "Evaluation of Containment Spray Pumps"
- 10.7 FCS Calculation FC05372, "Allowable Time for Operating HPSI and LPSI pumps in a Dead-Head Mode"

Attachment 2
Markup of
Technical Specification Pages
&
Bases Pages

TECHNICAL SPECIFICATIONS

2.0 **LIMITING CONDITIONS FOR OPERATION**

2.3 Emergency Core Cooling System (Continued)

(2) Modification of Minimum Requirements

During power operation, the Minimum Requirements may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within the time period specified below, the reactor shall be placed in a hot shutdown condition within 12 hours. If the minimum requirements are not met within an additional 48 hours the reactor shall be placed in a cold shutdown condition within 24 hours.

- a. One low-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.
- b. One high-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.
- c. One shutdown heat exchanger may be inoperable for a period of no more than 24 hours.
- d. Any valves, interlocks or piping directly associated with one of the above components and required to function during accident conditions shall be deemed to be part of that component and shall meet the same requirements as listed for that component.
- e. Any valve, interlock or piping associated with the safety injection and shutdown cooling system which is not covered under d. above but which is required to function during accident conditions may be inoperable for a period of no more than 24 hours.
- f. One safety injection tank may be inoperable for reasons other than g. or h. below for a period of no more than 24 hours.
- g. Level and/or pressure instrumentation on one safety injection tank may be inoperable for a period of 72 hours.
- h. One safety injection tank may be inoperable due to boron concentration not within limits for a period of no more than 72 hours.

i. Components in excess of those allowed by Conditions a, b, d, and e may be inoperable provided they are returned to operable status within 1 hour when performing the quarterly recirculation actuation logic channel functional test (Table 3-2 item 20) under administrative controls. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21.

TECHNICAL SPECIFICATIONS

2.0 **LIMITING CONDITIONS FOR OPERATION**

2.3 Emergency Core Cooling System (Continued)

Components in excess of those allowed by Conditions a, b, d, and e may be inoperable provided they are returned to operable status within 1 hour when performing the quarterly recirculation actuation logic channel functional test (Table 3-2 item 20) under administrative controls. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21. This prevents violating Technical Specifications or necessitating a unit shutdown due to inability to perform the quarterly recirculation actuation logic channel functional test. These administrative controls consist of stationing two dedicated operators at the Engineered Safeguards Features (ESF) panel controls in the control room. In this way, the following actions can be rapidly performed should a valid ESF actuation occur:

- the appropriate Recirculation Actuation Signal (RAS) lockout relays and initiating signal can be rapidly reset,
- the appropriate Safety Injection Refueling Water Tank (SIRWT) to Safety Injection (SI) and Containment Spray (CS) pumps suction valve control switch can be maintained in the OPEN position (spring-return switch),
- the appropriate SI and CS pumps to SIRWT recirculation minimum flow valve can be rapidly opened,
- the appropriate Containment Sump to SI and CS pumps suction valve control switch can be rapidly returned to the AUTO position, and
- the appropriate LPSI pump RAS Override switch can be rapidly returned to the NORMAL position.

The SIRWT to SI and CS pumps suction valve control switch is held in the OPEN position during the test to enhance the reliability of the appropriate SI and CS pumps by maintaining the SIRWT to SI and CS pumps suction valve open.

References

- (1) USAR, Section 14.15.1
- (2) USAR, Section 6.2.3.1
- (3) USAR, Section 14.15.3
- (4) USAR, Appendix K
- (5) Omaha Public Power District's Submittal, December 1, 1976
- (6) Technical Specification 2.1.2, Figure 2-1B
- (7) USAR, Section 4.4.3

Attachment 3
Retyped
Technical Specification Pages
&
Bases Pages

TECHNICAL SPECIFICATIONS

2.0 **LIMITING CONDITIONS FOR OPERATION**

2.3 **Emergency Core Cooling System (Continued)**

(2) **Modification of Minimum Requirements**

During power operation, the Minimum Requirements may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within the time period specified below, the reactor shall be placed in a hot shutdown condition within 12 hours. If the minimum requirements are not met within an additional 48 hours the reactor shall be placed in a cold shutdown condition within 24 hours.

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- c. One shutdown heat exchanger may be inoperable for a period of no more than 24 hours.
- d. Any valves, interlocks or piping directly associated with one of the above components and required to function during accident conditions shall be deemed to be part of that component and shall meet the same requirements as listed for that component.
- e. Any valve, interlock or piping associated with the safety injection and shutdown cooling system which is not covered under d. above but which is required to function during accident conditions may be inoperable for a period of no more than 24 hours.
- f. One safety injection tank may be inoperable for reasons other than g. or h. below for a period of no more than 24 hours.
- g. Level and/or pressure instrumentation on one safety injection tank may be inoperable for a period of 72 hours.
- h. One safety injection tank may be inoperable due to boron concentration not within limits for a period of no more than 72 hours.
- i. Components in excess of those allowed by Conditions a, b, d, and e may be inoperable provided they are returned to operable status within 1 hour when performing the quarterly recirculation actuation logic channel functional test (Table 3-2 item 20) under administrative controls. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21.

TECHNICAL SPECIFICATIONS

2.0 **LIMITING CONDITIONS FOR OPERATION**

2.3 **Emergency Core Cooling System (Continued)**

Components in excess of those allowed by Conditions a, b, d, and e may be inoperable provided they are returned to operable status within 1 hour when performing the quarterly recirculation actuation logic channel functional test (Table 3-2 item 20) under administrative controls. This allowance applies only to the remaining portion of Cycle 20 and all of Cycle 21. This prevents violating Technical Specifications or necessitating a unit shutdown due to inability to perform the quarterly recirculation actuation logic channel functional test. These administrative controls consist of stationing two dedicated operators at the Engineered Safeguards Features (ESF) panel controls in the control room. In this way, the following actions can be rapidly performed should a valid ESF actuation occur:

- the appropriate Recirculation Actuation Signal (RAS) lockout relays and initiating signal can be rapidly reset,
- the appropriate Safety Injection Refueling Water Tank (SIRWT) to Safety Injection (SI) and Containment Spray (CS) pumps suction valve control switch can be maintained in the OPEN position (spring-return switch),
- the appropriate SI and CS pumps to SIRWT recirculation minimum flow valve can be rapidly opened,
- the appropriate Containment Sump to SI and CS pumps suction valve control switch can be rapidly returned to the AUTO position, and
- the appropriate LPSI pump RAS Override switch can be rapidly returned to the NORMAL position.

The SIRWT to SI and CS pumps suction valve control switch is held in the OPEN position during the test to enhance the reliability of the appropriate SI and CS pumps by maintaining the SIRWT to SI and CS pumps suction valve open.

References

- (1) USAR, Section 14.15.1
- (2) USAR, Section 6.2.3.1
- (3) USAR, Section 14.15.3
- (4) USAR, Appendix K
- (5) Omaha Public Power District's Submittal, December 1, 1976
- (6) Technical Specification 2.1.2, Figure 2-1B
- (7) USAR, Section 4.4.3

Attachment 4

Explanation of the Exigency and Why the Situation Could Not Have Been Avoided

Fort Calhoun Station (FCS) was licensed for full power operation in 1973 by the NRC. The Emergency Core Cooling System (ECCS) was designed with three High Pressure Safety Injection (HPSI) pumps and two Low Pressure Safety Injection (LPSI) pumps that have a common recirculation minimum flow header. During a Loss Of Coolant Accident (LOCA), or other accidents that generate a Safety Injection Actuation Signal (SIAS), the HPSI and LPSI pumps start and pressurize their injection headers. If Reactor Coolant System (RCS) pressure is higher than the shutoff head of these pumps, a single recirculation minimum flow line provides sufficient flow to allow all five pumps to operate without damage to the pumps.

After an accident that allows injection into the RCS, the recirculation actuation signal (RAS) automatically switches the HPSI pump suction to the containment sump when the water level in the Safety Injection Refueling Water Tank (SIRWT) falls to a preset level. At this time, the flow path from the containment sump is opened, the SIRWT flow path is closed, LPSI pumps are stopped automatically, and water is recirculated from the containment sump by the HPSI pumps. The recirculation minimum flow line to the SIRWT is isolated by two valves in series to prevent depositing potentially contaminated water into a tank outside of the containment building.

During the Recirculation Actuation Logic Channel Functional Test, a RAS signal is generated and one of the recirculation minimum flow valves closes. Until a recent NRC inspection, it was thought that an operator could be used during the test to ensure that in the event of an ESF actuation the test could be rapidly terminated and the recirculation minimum flow valve opened to allow a minimum flow path for the HPSI and LPSI pumps. The actions required to be performed to allow the recirculation minimum flow valves to open can be rapidly performed by one dedicated operator in less than one minute. During the NRC Safety System Design and Performance Capability (SSDPC) inspection in February 2002, station personnel were informed that manual operator actions could not be used in lieu of automatic actions to maintain equipment operable without prior NRC approval. A comprehensive review was conducted of plant procedures that used manual actions in place of automatic actions in order to allow equipment to remain operable. The quarterly Recirculation Actuation Logic Channel Functional Test is the only test identified to date in this review requiring a Technical Specification change to perform. This test was due to be performed on March 21, 2002, and will exceed its surveillance frequency and extension on April 21, 2002. On March 26, 2002, the need for an exigent Technical Specification change was identified. The station is currently scheduled to begin a 30 day refueling outage on May 3, 2002.

FCS has been actively working to correct those procedures that are affected by the inspection finding. There is not an acceptable corrective action identified at this point that will not require prior NRC permission to implement for the quarterly Recirculation Actuation Logic Channel Functional Test. Generally, modifications to the RAS circuits may only be completed during a refueling outage.

Modifications to ECCS actuation circuits (RAS) or modifications to ECCS systems are only made after careful consideration of the full implications of the modification evaluation of alternatives and complete understanding of the effects upon the station. With less than six weeks available prior to the start of the next refueling outage, insufficient time is available to design, evaluate, and complete any modifications to the system. Moreover, a modification to the plant may not be desirable. A permanent change to the technical specifications may be the best solution. A permanent change will require additional technical work and the necessary time for review by the NRC staff. This review and comment period generally takes several months.

Additionally, this test was due to be performed on March 21, 2002, and will exceed its surveillance frequency and extension on April 21, 2002. If the test cannot be performed by April 21, 2002, this will necessitate a unit shutdown.

OPPD will continue to actively pursue a permanent solution to this issue until a final resolution is reached.