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OPPD
Omaha Public Power District
444 South 16th Street Mall
Omaha, NE 68102-2247

10 CFR 50.90

LIC-14-0025
March 31, 2014

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

Fort Calhoun Station, Unit No. 1
Renewed Facility Operating License No. DPR-40
NRC Docket No. 50-285

SUBJECT: License Amendment Request (LAR) 14-02, Proposed Change to Technical Specification 2.5, Auxiliary Feedwater (AFW) System

Pursuant to 10 CFR 50.90, the Omaha Public Power District (OPPD) hereby requests an amendment to the Renewed Facility Operating License No. DPR-40 for Fort Calhoun Station (FCS), Unit No. 1. The proposed amendment would change Technical Specification 2.5, Auxiliary Feedwater (AFW) System to allow a 7 day Completion Time for the turbine-driven AFW pump if the inoperability occurs following a refueling outage and if MODE 2 had not been entered. This change is based on the approved Technical Specification Task Force (TSTF) Traveler Number 340, Revision 3.

OPPD has determined that this LAR does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment.

The enclosure contains a description of the proposed changes, the supporting technical analyses, and the significant hazards consideration determination. Attachment 1 of the enclosure provides the existing TS pages marked-up to show the proposed changes. Attachment 2 of the enclosure provides the retyped (clean) TS pages.

OPPD requests approval of the proposed amendment by September 30, 2015. Once approved, the amendment shall be implemented within 120 days of issuance.

There are no regulatory commitments associated with this proposed change.

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

If you should have any questions regarding this submittal or require additional information, please contact Mr. Bill R. Hansher at (402) 533-6894.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 31, 2014.

Louis P. Cortopassi
Site Vice President and CNO

LPC/brh

Enclosure: OPPD's Evaluation of the Proposed Change

c: M. L. Dapas, NRC Regional Administrator, Region IV
J. W. Sebrosky, NRC Senior Project Manager
J. C. Kirkland, NRC Senior Resident Inspector
Director of Consumer Health Services, Department of Regulation and Licensure, Nebraska Health and Human Services, State of Nebraska

OPPD's Evaluation of the Proposed Change

License Amendment Request (LAR) 14-02, Proposed Change to Technical Specification 2.5, Auxiliary Feedwater (AFW) System

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ATTACHMENTS:

1. Technical Specification Page Markups
2. Retyped ("Clean") Technical Specifications Pages

1.0 SUMMARY DESCRIPTION

License amendment request (LAR) 14-02 proposes a change to the Renewed Facility Operating License No. DPR-40 for Fort Calhoun Station (FCS), Unit No. 1. The Omaha Public Power District (OPPD) proposes to change Technical Specification 2.5, Auxiliary Feedwater (AFW) System to allow a 7 day Completion Time for the turbine-driven AFW pump if the inoperability occurs following a refueling outage and if MODE 2 had not been entered.

This change is based on the approved Technical Specification Task Force (TSTF) Traveler Number 340, Revision 3.

2.0 DETAILED DESCRIPTION

The proposed TS changes for LAR 14-02 are as follows:

TS 2.5

Revise TS 2.5 Applicability by deleting the note as follows:

~~NOTE: When heating the reactor coolant above 300°F the steam driven auxiliary feedwater (AFW) pump is only required to be OPERABLE prior to making the reactor critical.~~

Revise TS 2.5 (1)A. to add restrictions of TSTF-340 Rev 3 on being applicable after refueling and for a limited time as follows:

A. With one steam supply to the turbine driven AFW pump inoperable, or

---Note---:
Only applicable if MODE 2 has not been entered following refueling

the turbine driven AFW pump inoperable following refueling

restore the ~~steam supply~~ affected equipment to OPERABLE status within 7 days and within 8 days from discovery of failure to meet the LCO.

Revise TS 2.5 Bases to include the following from TSTF-340 Rev 3:

If one of the two steam supplies to the turbine driven AFW pump is inoperable, or if the turbine driven pump is inoperable while the reactor coolant temperature T_{cold} is above 300°F immediately following refueling, action must be taken to restore the inoperable equipment to OPERABLE status within 7 days. The 7 day completion time is reasonable based on the following reasons:

a. For the inoperability of a steam supply to the turbine driven AFW pump, the 7 day completion time is reasonable since there is a redundant steam supply line for the turbine driven pump.

b. For the inoperability of the turbine driven AFW pump while the reactor coolant temperature T_{cold} is above 300°F immediately subsequent to a refueling, the 7 day completion time is reasonable due to the minimal decay heat levels in this situation.

c. For both the inoperability of a steam supply line to the turbine driven pump and an inoperable turbine driven AFW pump while the reactor coolant temperature T_{cold} is above 300°F immediately subsequent to a refueling, the 7 day completion time is reasonable due to the availability of the redundant OPERABLE motor driven AFW pump, and due to the low probability of an event requiring the use of the turbine driven AFW pump.

3.0 TECHNICAL EVALUATION

The Fort Calhoun Station, Unit No. 1 (FCS) has two safety related auxiliary feedwater (AFW) pumps, one motor driven and one turbine driven.

The TS require the AFW system to be operable when the reactor coolant temperature T_{cold} is greater than 300°F. The AFW system is designed to supply feedwater to the steam generators whenever the main feedwater system is not in operation, e.g., during startup, cooldown or emergency conditions resulting in a loss of main feedwater. One AFW pump provides sufficient flow to remove decay heat and cool the unit to shutdown cooling system entry conditions. The specification, however, requires both trains to be operable.

The allowance for the turbine driven AFW pump to be operable prior to making the reactor critical was approved by the NRC in TS Amendment 127 (Reference 6.1). As stated in the safety evaluation report for the Amendment:

> *The 300°F coolant temperature will not provide enough steam for a normal operability test for the steam driven AFW pump. Also, the present TSs do allow either the electrical or steam driven AFW pump to be operable when the reactor coolant temperature is above 300°F for up to 24 hours. This was thought to be sufficient time for the plant to heat up to the point that a normal operability test for the steam driven AFW pump could be run. However, for the steam driven AFW pump, a longer time is required due to the steam generator soak period which affects the steam system's ability to heat up. This issue was resolved and approved by the NRC staff at the Palisades Plant by requiring that the steam driven pump be operable prior to making the reactor critical. This allows sufficient heatup of the plant to be able to perform a normal operability test using non-nuclear heat. Therefore, the staff finds this change acceptable.*

The current TS Note as written resolved the issue of having sufficient time for the plant to heat up in order to test the pump, but does not specifically restrict its applicability to following a refueling or provide an allowed time to be in this condition. Therefore it is proposed to incorporate the guidance approved by the NRC in TSTF 340 Revision 3.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

4.1.1 Regulations

General Design Criteria:
Fort Calhoun Station was licensed for construction prior to May 21, 1971, and at that time committed to the draft General Design Criteria (GDC). The draft GDC are contained in Appendix G of the FCS USAR and are similar to 10 CFR 50, Appendix A, *General Design Criteria for Nuclear Power Plants.*
CRITERION 6 - REACTOR CORE DESIGN

The reactor core shall be designed to function throughout its design lifetime without exceeding acceptable fuel damage limits which have been stipulated and justified. The core design together with reliable process and decay heat removal systems, shall provide for this capability under all expected conditions of normal operation with appropriate margins for uncertainties and for transient situations which can be anticipated, including the effects of the loss of power to recirculation pumps, tripping out of a turbine generator set, isolation of the reactor from its primary heat sink, and loss of all off-site power.

This criterion is met.

If power to the reactor coolant pumps is lost, natural circulation of the reactor coolant following pump coastdown will be sufficient to transfer core decay heat to the main steam system without fuel damage. If the main condenser and the feedwater system are still functioning after the loss of the pumps, the energy transferred to the main steam system can be dissipated by bypassing steam to the main condenser and if necessary, the atmospheric dump valve. If there is a complete loss of off-site power and the main condenser is not available as a heat sink, steam from the main steam system can be dumped to the atmosphere through the safety valves or the atmospheric dump valve. In this case, the auxiliary feedwater pumps supply water to the shell side of the steam generators from an on-site storage tank. Power for this pump is available from a diesel generator and sufficient stored water is available to bring the core to and maintain it in a safe condition.

CRITERION 11 - CONTROL ROOM

[The facility shall be provided with a control room from which actions to maintain safe operational status of the plant can be controlled. Adequate radiation protection shall be provided to permit access, even under accident conditions, to equipment in the control room or other areas as necessary to shutdown and maintain safe control of the facility without radiation exposures of personnel in excess of 10 CFR 20 limits. It shall be possible to shut the reactor down and maintain it in a safe condition if access to the control room is lost due to fire or other cause.](1)

This criterion is met.

If for any reason the control room is evacuated without first initiating a reactor shutdown, a safe shutdown can be initiated and the shutdown condition monitored from various equipment within the plant.

Reactor shutdown can be initiated from the following locations among others:

1. The turbine can be tripped from the trip device on the turbine front standard; this will cause a reactor trip.

2. Reactor clutch power supplies can be de-energized from the electrical equipment load center.

Continuation of a safe shutdown condition can be achieved with removal of heat from the steam generators by the turbine dump and bypass valves or safety valves and operation of a feedwater pump(s) to maintain level in the steam generators. These operations can be initiated, controlled and monitored external to the control room.

The proposed change does not impact the ability to comply with USAR Appendix G, Criterion 6 or Criterion 11. The plant will continue to be able to reach safe shutdown and be maintained in a safe shutdown condition.

4.2 Precedent

4.2.1 Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-340, Revision 3, "Allow 7 Day Completion Time for a Turbine-driven AFW Pump Inoperable" March 2000 (Reference 6.2)

4.2.2 NRC Letter dated March 29, 2001, Amendment Nos. 134 to Facility Operational License Nos. NPF-41, NPF-51, and NPF-71 for the Palo Verde Nuclear Generating Station (Reference 6.3)

4.2.3 NRC Letter dated June 30, 2010, Amendments 223 to Facility Operating License No. NPF-10 and Amendment No. 216 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station (SONGS), Units 2 and 3 (Reference 6.4)

4.3 Significant Hazards Consideration

The proposed change would change Technical Specification 2.5, Auxiliary Feedwater (AFW) System to allow a 7 day Completion Time for the turbine-driven AFW pump if the inoperability occurs following a refueling outage and if MODE 2 had not been entered.

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

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

   Response: No.

   The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change to Technical Specification (TS) 2.5 would allow a seven day Completion Time for the turbine-driven Auxiliary Feedwater (AFW) pump if the inoperability occurs following a refueling outage, and if MODE 2 had not been entered. The note currently in TS 2.5 Applicability addresses the issue of allowing additional time to perform necessary testing to prove the operability of the turbine driven AFW pump following refueling as approved by the NRC in TS Amendment 127. This note does not specifically state that it is only allowed following refueling and does not restrict the time the plant can be in this condition. The proposed change will be more restrictive than the current TS since it will specifically state when it is allowed (following refueling) and for how long it is allowed.

   The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated because: 1) the proposed amendment does not represent a change to the system design, 2) the proposed amendment does not prevent the safety function of the AFW system from being performed, since the other fully redundant essential train is required to be operable, 3) the proposed amendment does not alter, degrade, or prevent action described or assumed in any accident Updated Safety Analysis Report (USAR) from being performed since the other train of AFW is required to be operable, 4) the proposed amendment does not alter any assumptions previously made in evaluating radiological consequences, and 5) the proposed amendment does not affect the integrity of any fission product barrier. No other safety related equipment is affected by the proposed change.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No.

   The proposed change does not alter the physical design, safety limits, or safety analysis assumptions associated with the operation of the plant. Hence, the proposed change does not introduce any new accident initiators, nor does it reduce or adversely affect the capabilities of any plant structure or system in the performance of their safety function.

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

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

   Response: No.

   The proposed changes do not involve a significant reduction in a margin of safety.

   The proposed change to TS 2.5 would restrict for the turbine-driven AFW pump inoperability to a seven day Completion Time if the inoperability occurs following a refueling outage and prior to MODE 2 being entered. The current Note in TS 2.5 Applicability does not require the turbine driven AFW pump to be operable until prior to entering MODE 2; therefore, the proposed change is more restrictive than current TS. The proposed change does not involve a significant reduction in a margin of safety because: 1) during a return to power operations following a refueling outage, decay heat is at its lowest levels, 2) the other AFW train is required to be operable, and 3) the motor-driven AFW train can provide sufficient flow to remove decay heat and cool the unit to shutdown cooling system entry conditions from power operations. This change does not alter any safety margins.

   Therefore, the proposed change does 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.

4.4 Conclusions

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.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

6.1 Letter from NRC (A. Bournia) to OPPD (W. G. Gates), *Fort Calhoun Station Unit No. 1 – Amendment 127 to Facility Operating License No. DPR-40 (TAC NO. 75984),* dated April 9, 1990

6.2 Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-340, Revision 3, "Allow 7 Day Completion Time for a Turbine-driven AFW Pump Inoperable" March 2000

6.3 Letter from NRC NRC Letter dated March 29, 2001, Amendment Nos. 134 to Facility Operational License Nos. NPF-41, NPF-51, and NPF-71 for the Palo Verde Nuclear Generating Station.

6.4 Letter from NRC (J. R. Hall) to Southern California Edison Company (R. T. Ridenoure), *San Onofre Nuclear Generating Station, Units 2 and 3 Issuance of Amendments Revising Technical Specification 3.7.5, "Auxiliary Feedwater (AFW) System" (TAC NOS. ME2133 AND ME2134)*, dated June 30, 2010

Technical Specification Page Markups

[Word-processor mark-ups using "double underline/~~strikeout~~" feature for "new text/deleted text" respectively.]

2.0 LIMITING CONDITIONS FOR OPERATION

2.5 Steam and Feedwater Systems

Applicability

When steam generators are relied upon for reactor coolant system heat removal.

~~NOTE: When heating the reactor coolant above 300°F the steam driven auxiliary feedwater (AFW) pump is only required to be OPERABLE prior to making the reactor critical.~~

Objective

To define certain conditions for the steam and feedwater system necessary to assure adequate decay heat removal.

Specifications

(1) Two AFW trains shall be OPERABLE when T_{cold} is above 300°F.

A. With one steam supply to the turbine driven AFW pump inoperable, or

---Note---:
Only applicable if MODE 2 has not been entered following refueling

the turbine driven AFW pump inoperable following refueling

restore the ~~steam supply~~ affected equipment to OPERABLE status within 7 days and within 8 days from discovery of failure to meet the LCO.

B. With one AFW train inoperable for reasons other than condition A, restore the AFW train to OPERABLE status within 24 hours.

C. If the required action and associated completion times of condition A or B are not met, then the unit shall be placed in MODE 2 in 6 hours, in MODE 3 in the next 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.

D. With both AFW trains inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specification (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

(2) The motor driven train is required to be OPERABLE when T_{cold} is below 300°F and the steam generators are relied upon for heat removal. With the motor driven AFW train inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specifications (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

(3) A minimum of 55,000 gallons of water in the emergency feedwater storage tank

(EFWST) and a backup water supply to the emergency feedwater storage tank shall be available. With the EFWST inoperable, verify operability of the backup water supply within four hours and once per 12 hours thereafter, and restore the EFWST

2.0 **LIMITING CONDITIONS FOR OPERATION**

2.5 Steam and Feedwater Systems

to OPERABLE status within 24 hours. If these action requirements cannot be satisfied, then the unit shall be placed in at least MODE 3 within 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.

(4) The main steam stop valves are OPERABLE when T_{cold} is above 300°F and capable of closing in four seconds or less under no-flow conditions.

Basis

A reactor shutdown from power requires a removal of core decay heat. Immediate decay heat removal requirements are normally satisfied by the steam bypass to the condenser. Therefore, core decay heat can be continuously dissipated via the steam bypass to the condenser as long as feedwater to the steam generator is available. Normally, the capability to supply feedwater to the steam generators is provided by operation of the turbine cycle feedwater system. In the unlikely event of complete loss of electrical power to the station, decay heat removal is by steam discharge to the atmosphere via the main steam safety and atmospheric dump valves. Either auxiliary feed pump can supply sufficient feedwater for removal of decay heat from the plant. Technical Specification 2.1.1 establishes when the steam generators are required for heat removal. Each train includes the pump, piping, instruments, and controls to ensure the availability of an OPERABLE flow path capable of taking suction from the EFWST and delivering water to the steam generators.

If one of the two steam supplies to the turbine driven AFW pump is inoperable, or if the turbine driven pump is inoperable while the reactor coolant temperature T_{cold} is above 300°F immediately following refueling, action must be taken to restore the inoperable equipment to OPERABLE status within 7 days. The 7 day completion time is reasonable based on the following reasons:

a. For the inoperability of a steam supply to the turbine driven AFW pump, the 7 day completion time is reasonable since there is a redundant steam supply line for the turbine driven pump.

b. For the inoperability of the turbine driven AFW pump while the reactor coolant temperature T_{cold} is above 300°F immediately subsequent to a refueling, the 7 day completion time is reasonable due to the minimal decay heat levels in this situation.

c. For both the inoperability of a steam supply line to the turbine driven pump and an inoperable turbine driven AFW pump while the reactor coolant temperature T_{cold} is above 300°F immediately subsequent to a refueling, the 7 day completion time is reasonable due to the availability of the redundant OPERABLE motor driven AFW pump, and due to the low probability of an event requiring the use of the turbine driven AFW pump.

The eight day completion time for 2.5(1)A provides a limit in the maximum time allowed for any combination to be inoperable during any continuous failure to meet the LCO. With one of the required AFW trains inoperable, actions must be taken to restore OPERABLE status within 24 hours. With no AFW trains OPERABLE the unit is in a seriously degraded condition with no safety related means for conducting a cooldown,

and only limited means for conducting cooldown with nonsafety grade equipment. In such a condition the unit should not be perturbed by any action, including a power change, that might result in a trip.

The minimum amount of water in the emergency feedwater storage tank is the amount needed for 8 hours of such operation. The tank can be resupplied with water from the raw water system.(1)

A closure time of 4 seconds for the main steam stop valves is considered adequate time and was selected as being consistent with expected response time for instrumentation as detailed in the steam line break analysis.(2)(3)

References

(1) USAR, Section 9.4.6

(2) USAR, Section 10.3

(3) USAR, Section 14.12

Retyped ("Clean") Technical Specification Pages

2.0 LIMITING CONDITIONS FOR OPERATION

2.5 Steam and Feedwater Systems

Applicability

When steam generators are relied upon for reactor coolant system heat removal.

Objective

To define certain conditions for the steam and feedwater system necessary to assure adequate decay heat removal.

Specifications

(1) Two AFW trains shall be OPERABLE when T_{cold} is above 300°F.

A. With one steam supply to the turbine driven AFW pump inoperable, or
----------Note----------:
Only applicable if MODE 2 has not been entered following refueling
---
the turbine driven AFW pump inoperable following refueling,

restore the affected equipment to OPERABLE status within 7 days and within 8 days from discovery of failure to meet the LCO.

B. With one AFW train inoperable for reasons other than condition A, restore the AFW train to OPERABLE status within 24 hours.

C. If the required action and associated completion times of condition A or B are not met, then the unit shall be placed in MODE 2 in 6 hours, in MODE 3 in the next 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.

D. With both AFW trains inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specification (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

(2) The motor driven train is required to be OPERABLE when T_{cold} is below 300°F and the steam generators are relied upon for heat removal. With the motor driven AFW train inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specifications (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

2.0 LIMITING CONDITIONS FOR OPERATION

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(3) A minimum of 55,000 gallons of water in the emergency feedwater storage tank (EFWST) and a backup water supply to the emergency feedwater storage tank shall be available. With the EFWST inoperable, verify operability of the backup water supply within four hours and once per 12 hours thereafter, and restore the EFWST

to OPERABLE status within 24 hours. If these action requirements cannot be satisfied, then the unit shall be placed in at least MODE 3 within 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.

(4) The main steam stop valves are OPERABLE when T_{cold} is above 300°F and capable of closing in four seconds or less under no-flow conditions.

Basis

A reactor shutdown from power requires a removal of core decay heat. Immediate decay heat removal requirements are normally satisfied by the steam bypass to the condenser. Therefore, core decay heat can be continuously dissipated via the steam bypass to the condenser as long as feedwater to the steam generator is available. Normally, the capability to supply feedwater to the steam generators is provided by operation of the turbine cycle feedwater system. In the unlikely event of complete loss of electrical power to the station, decay heat removal is by steam discharge to the atmosphere via the main steam safety and atmospheric dump valves. Either auxiliary feed pump can supply sufficient feedwater for removal of decay heat from the plant. Technical Specification 2.1.1 establishes when the steam generators are required for heat removal. Each train includes the pump, piping, instruments, and controls to ensure the availability of an OPERABLE flow path capable of taking suction from the EFWST and delivering water to the steam generators.

If one of the two steam supplies to the turbine driven AFW pump is inoperable, or if the turbine driven pump is inoperable while the reactor coolant temperature T_{cold} is above 300°F immediately following refueling, action must be taken to restore the inoperable equipment to OPERABLE status within 7 days. The 7 day completion time is reasonable based on the following reasons:

a. For the inoperability of a steam supply to the turbine driven AFW pump, the 7 day completion time is reasonable since there is a redundant steam supply line for the turbine driven pump.

b. For the inoperability of the turbine driven AFW pump while the reactor coolant temperature T_{cold} is above 300°F immediately subsequent to a refueling, the 7 day completion time is reasonable due to the minimal decay heat levels in this situation.

2.0 LIMITING CONDITIONS FOR OPERATION

2.5 Steam and Feedwater Systems

Basis (Continued)

c. For both the inoperability of a steam supply line to the turbine driven pump and an inoperable turbine driven AFW pump while the reactor coolant temperature T_{cold} is above 300°F immediately subsequent to a refueling, the 7 day completion time is reasonable due to the availability of the redundant OPERABLE motor driven AFW pump, and due to the low probability of an event requiring the use of the turbine driven AFW pump.

The eight day completion time for 2.5(1)A provides a limit in the maximum time allowed for any combination to be inoperable during any continuous failure to meet the LCO. With one of the required AFW trains inoperable, actions must be taken to restore OPERABLE status within 24 hours. With no AFW trains OPERABLE the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting cooldown with nonsafety grade equipment. In such a condition the unit should not be perturbed by any action, including a power change, that might result in a trip.

The minimum amount of water in the emergency feedwater storage tank is the amount needed for 8 hours of such operation. The tank can be resupplied with water from the raw water system.(1)

A closure time of 4 seconds for the main steam stop valves is considered adequate time and was selected as being consistent with expected response time for instrumentation as detailed in the steam line break analysis.(2)(3)

References

(1) USAR, Section 9.4.6

(2) USAR, Section 10.3

(3) USAR, Section 14.12