



Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802
Tel 479-858-3110

Richard L. Anderson
ANO Site Vice President

10 CFR 50.90

1CAN071701

July 17, 2017

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

SUBJECT: License Amendment Request
Application for Technical Specification Improvement to Revise Actions for
One Steam Supply to Turbine Driven Emergency Feedwater Pump
Inoperable using the Consolidated Line Item Improvement Process
Arkansas Nuclear One, Unit 1
Docket No. 50-313
License No. DPR-51

Dear Sir or Madam:

In accordance with the provisions of 10 CFR 50.90 of Title 10 of the Code of Federal Regulations (10 CFR), Entergy Operations, Inc. (Entergy), is submitting a request for an amendment to the technical specifications (TS) for Arkansas Nuclear One, Unit 1 (ANO-1).

The proposed amendment establishes Conditions, Required Actions, and Completion Times in ANO-1 TS 3.7.5, "Emergency Feedwater (EFW) System," for the Condition where one steam supply to the turbine driven EFW pump is inoperable concurrent with an inoperable motor driven EFW train. In addition, this amendment establishes changes to the TS that establish specific Actions: (1) for when the motor driven EFW train is inoperable at the same time and; (2) for when the turbine driven EFW train is inoperable either (a) due solely to one inoperable steam supply, or (b) due to reasons other than one inoperable steam supply. The change is consistent with NRC-approved Technical Specification Task Force (TSTF) Traveler, TSTF-412, Revision 3, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW Pump Inoperable." The availability of this technical specification improvement was announced in the Federal Register on July 17, 2007 (72 FR 39089), as part of the consolidated line item improvement process (CLIP).

Attachment 1 provides a description of the proposed change and confirmation of applicability. Attachment 2 provides the existing TS pages marked-up to show the proposed change. Attachment 3 provides revised (clean) TS pages. Attachment 4 provides the existing TS Bases pages marked-up to reflect the proposed change, for information only. There are no new regulatory commitments associated with this proposed change.

Entergy requests approval of the proposed license amendment by August 1, 2018, with the amendment being implemented within 90 days.

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

If you have any questions or require additional information, please contact Stephenie Pyle at 479-858-4704.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on July 17, 2017.

Sincerely,

ORIGINAL SIGNED BY RICHARD L. ANDERSON

RLA/dbb

Attachments:

1. Description and Assessment
2. Proposed Technical Specification Changes (Mark-Up)
3. Revised Technical Specification Pages
4. Proposed Technical Specification Bases Changes (Mark-Up) – For Information Only

cc: Mr. Kriss M. Kennedy
Regional Administrator
U. S. Nuclear Regulatory Commission
RGN-IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

NRC Senior Resident Inspector
Arkansas Nuclear One
P. O. Box 310
London, AR 72847

U. S. Nuclear Regulatory Commission
Attn: Mr. Thomas Wengert
MS O-08B1
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Mr. Bernard R. Bevill
Arkansas Department of Health
Radiation Control Section
4815 West Markham Street
Slot #30
Little Rock, AR 72205

Attachment 1 to

1CAN071701

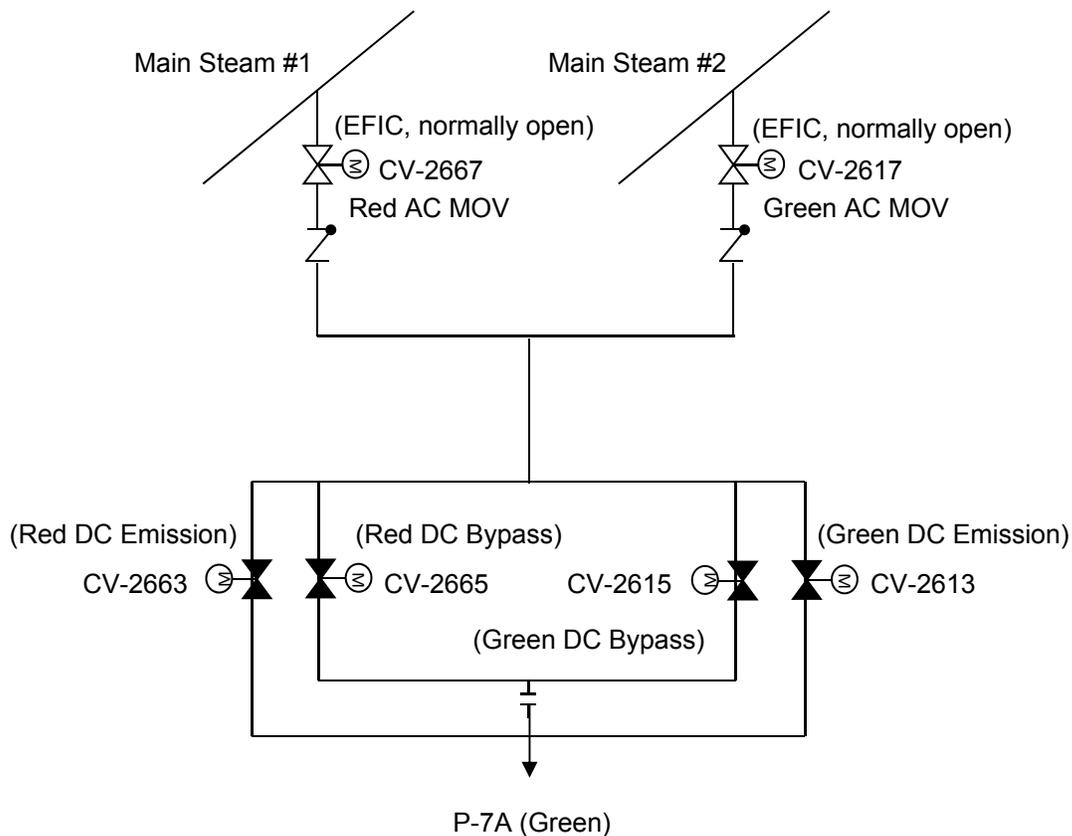
DESCRIPTION AND ASSESSMENT

DESCRIPTION AND ASSESSMENT

1.0 DESCRIPTION

The proposed amendment would modify Technical Specifications (TSs) associated with Arkansas Nuclear One, Unit 1 (ANO-1) Renewed Operating License DPR-51. The proposed change establishes a new Completion Time in ANO-1 TS 3.7.5, "Emergency Feedwater (EFW) System," where one steam supply to the turbine-driven EFW pump is inoperable concurrent with an inoperable motor-driven EFW train. This amendment also establishes specific Conditions and Action requirements: (1) for when the motor-driven EFW train is inoperable at the same time and; (2) for when the turbine-driven EFW train is inoperable either (a) due solely to one inoperable steam supply, or (b) due to reasons other than one inoperable steam supply.

ANO-1 is a Babcock and Wilcox (B&W) design. The ANO-1 EFW system consists of two pumps; one steam turbine-driven (P7A) and one electrically motor-driven (P7B). Each pump has the flow capacity to remove heat load equal to 3½ percent full power operation, and is piped to supply the total required feedwater to either steam generator (SG) from either pump. The turbine-driven EFW pump receives steam to its turbine from either or both SGs. Further system information is contained in the ANO-1 Safety Analysis Report (SAR), Section 10.4.8. A simplified schematic of the steam input to P7A is provided below for information purposes.



Note that all motor-operated valves shown above receive an open command upon receipt of an Emergency Feedwater Initiation and Control (EFIC) signal.

The changes are consistent with NRC approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-412, Revision 3, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW Pump Inoperable." The availability of this technical specification improvement was announced in the Federal Register on July 17, 2007 (72 FR 39089), as part of the consolidated line item improvement process (CLIP).

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

Entergy Operations, Inc. (Entergy), has reviewed the safety evaluation published on July 17, 2007 (72 FR 39091), as part of the CLIP. This verification included a review of the NRC staff's evaluation as well as the information provided to support TSTF-412, Revision 3. Entergy has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to ANO-1, including consideration of related information provided in NRC letter dated October 30, 2015 (Reference 1), and justify this amendment for the incorporation of the changes to the ANO-1 TSs.

2.2 Optional Changes and Variations

Entergy is proposing the following minor variations from the TS changes described in TSTF-412, Revision 3, or the NRC staff's model safety evaluation (SE) published in the Federal Register on July 17, 2007 (72 FR 39091). An explanation of any potential impact with respect to meeting the intent of TSTF-412 or respective NRC SE is included with each variation listed below.

1. In the Condition column for new Condition C, the first word "One" is not adopted.

TSTF-412 was written to accommodate plants that may have two turbine-driven and/or two motor-driven EFW pumps. ANO-1 has only one turbine-driven and one-motor driven EFW pump (both 100% capacity trains). Therefore, it is unnecessary to include the "One" term in Condition C, which could lead to confusion as Operators attempt to apply the TS specific to the ANO-1 design. The exclusion of this term does not change the intent of the Condition or associated Required Actions. Entergy considers this variation to be administrative in nature.

2. Added "EFW" to new Required Action C.1.

The addition of the "EFW" acronym is simply for consistency with the wording of Required Action C.2 and Condition C. Entergy considers this variation to be administrative in nature.

3. The bracketed portion of the current Condition C (re-labeled by TSTF-412 as Condition D),

[OR Two EFW trains inoperable in MODE 1, 2, or 3 for reasons other than Condition C.]

is not adopted.

Because ANO-1 design consists of two trains and only one pump per train, the condition of having both EFW trains inoperable is addressed by the current Condition D (re-labeled as Condition E by TSTF-412). As noted in the current ANO-1 TS and maintained by TSTF-412, plant maneuvers should be avoided during periods when both EFW trains are inoperable; therefore, the Required Actions of the current Condition D to place the plant in Mode 3 and, thereafter, Mode 4, are inappropriate with respect to the ANO-1 design. The bracketed information is intended to address plants having more than more than two EFW trains. The exclusion of this bracketed statement does not change the intent of the Condition or associated Required Actions with respect to addressing inoperabilities where one EFW train may remain functional. Entergy considers this variation to be required due to the existing ANO-1 EFW system design.

4. Added "ACTIONS (continued)" to top ANO-1 TS Page 3.7.5-2.

This is an administrative change to provide continued consistency with generally formatting established in the Standard Technical Specifications (STS).

5. Moved Surveillance Requirements (SRs) 3.7.5.1 and 3.7.5.2 from ANO-1 TS Page 3.7.5-2 to Page 3.7.5-3.

This is an administrative change to accommodate room needed on Page 3.7.5-2 for the new Condition C adopted in accordance with TSTF-412.

6. Moved SRs 3.7.5.5 and 3.7.5.6 from Page 3.7.5-3 to new Page 3.7.5-4.

This is an administrative change to accommodate the moving of SRs 3.7.5.1 and 3.7.5.2 from Page 3.7.5-2 to Page 3.7.5-3. Because Page 3.7.5-4 is a new page, a revision bar is placed in right margin of the page footer containing the page number.

7. The following Bases information included in TSTF-412 for the new Required Actions C.1 and C.2 is not adopted:

[either due to the analysis requiring flow from two EFW pumps or due to the remaining EFW pump having to feed a faulted SG]

"the availability of the remaining OPERABLE turbine driven EFW pump"

The ANO-1 accident analysis requires flow from only one EFW train in response to accident conditions. Therefore, the above bracketed statement does not apply to the ANO-1 design. In addition, with one steam supply to the turbine-driven EFW pump inoperable, there is no "remaining OPERABLE turbine-driven EFW pump" with respect to the ANO-1 design. Therefore, the later Bases statement above is also not applicable to ANO-1. Entergy considers this variation to be required due to the existing ANO-1 EFW system design.

8. TSTF-412 mark-ups to certain EFW SR Bases that delete the acronym "AFW" are not included in Attachment 4 of this amendment request.

The "AFW" acronym contained in the TSTF-412 Bases mark-up pages does not exist in the ANO-1 EFW TS Bases; therefore, no mark-up of related ANO-1 EFW TS Bases pages are included in Attachment 4 of this letter. Entergy considers this variation to be administrative in nature. Note that the proposed changes to the TS Bases are provided for information only.

With respect to the Completion Times associated with new Required Actions C.1 and C.2, Entergy has chosen a 24-hour Completion Time. These Required Actions accommodate restoration of either the inoperable steam supply to the turbine-driven EFW pump or restoration of the motor-driven EFW pump, such that at least one EFW train is returned to an operable status. TSTF-412, the associated NRC SE, and a Reviewer's Note contained in the TSTF-412 mark-up of the TS Bases for these required actions only permit adoption of a 48-hour Completion Time where plant design includes two full capacity motor-driven EFW pumps. As discussed previously, the ANO-1 design does not include a second motor-driven EFW pump. As stated in TSTF-412 and repeated in an NRC letter to the TSTF dated October 30, 2015, plants meeting the following conditions should adopt the shorter 24-hour Completion Time.

A new Condition C is proposed that will require restoring an AFW train to OPERABLE status in 24 hours if one motor driven AFW train is inoperable and the turbine driven AFW train is inoperable due to one steam supply inoperable. This Completion Time is applicable when the condition could result in the inability of the AFW system to provide 100% of the flow required by the safety analysis for the FLB or the MSLB, whichever is most limiting, assuming no additional single failure.

Because the ANO-1 design does not include an additional EFW pump beyond the existing pumps, sufficient EFW flow would not be available if the remaining steam supply to the turbine-driven EFW pump was rendered inoperable with respect to the pre-accident configuration described by Condition C. Therefore, the 24-hour Completion Times proposed by TSTF-412 for Required Actions C.1 and C.2 are applicable to ANO-1.

2.3 Deviations

There are no changes which are considered deviations from the TSTF-412 markups, as noted in Section 2.2 above. However, a deviation from the STS is required. The STS version of the EFW TS was written for plants having three or more EFW pumps. While an attempt was made in the original version of the EFW STS to accommodate two-pump plants, Condition E does not support a two-pump plant as written. This was confirmed with Excel Services Corporation (the keeper of the STS).

Condition E, which was not modified by TSTF-412, describes a plant configuration with no operable EFW train. Condition E is associated with a configuration where the EFW system is unable to deliver 100% of required flow to the SGs, such that immediate action must be taken to restore the ability to provide 100% flow capability as credited in the safety analysis. For two-pump plants, this conflicts with new Condition C, which also describes a configuration consisting of no operable EFW trains, although the turbine-driven train remains available (capable of 100% flow), since one steam supply to the turbine-driven pump remains available.

In the Condition C configuration, it is appropriate to enter Condition D and perform a plant shutdown if one train is not restored to an operable status within 24 hours since the turbine-driven train remains fully capable of removing decay heat following securing of the non-safety related Main Feedwater System post-shutdown. However, Condition E was intended to capture a configuration where neither EFW train remained capable of supply required flow to remove all decay heat loads post-shutdown. In this event, the plant should not be maneuvered until at least one EFW train is restored.

To properly differentiate between the two-pump inoperability configurations described by Conditions C and E, a Note is added to Condition E as follows:

Not applicable when the turbine driven EFW train is inoperable solely due to one inoperable steam supply.

The addition of the above Note permits proper application of Condition C (and Condition D when necessary) while allowing Condition E to address all other circumstances that may have caused inoperability of both EFW trains. While this Note is a deviation from the STS, Entergy believes the Note effectively permits proper application of the intended actions in accordance with the STS. The associated TS Bases are modified accordingly (see Attachment 4 of this letter).

3.0 REGULATORY ANALYSIS

A description of the proposed change and its relationship to applicable regulatory requirements and guidance was provided in the Notice of Availability published on July 17, 2007 (72 FR 39089). Although Arkansas Nuclear One, Unit 1 (ANO-1) is a pre-General Design Criteria (GDC) plant, the ANO-1 Emergency Feedwater (EFW) system design meets the intent of GDCs 34 and 44 as discussed in the NRC's July 17, 2007, model Safety Evaluation (72 FR 39091). The following are excerpts from the ANO-1 Safety Analysis Report (SAR), Section 1.4, with respect to GDCs 34 and 44.

1.4.30 CRITERION 34 – RESIDUAL HEAT REMOVAL

A system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the Reactor Coolant Pressure Boundary are not exceeded.

Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities, shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished assuming a single failure.

Discussion

Reactor decay heat is removed through either one of the two steam generators until the RCS is cooled to where the Decay Heat Removal System becomes operational. Steam generated by decay heat will supply the steam-driven emergency feedwater pump turbine and can also be vented to atmosphere and/or bypassed to the condenser. The steam generators can also

be supplied feedwater from one condensate pump and the auxiliary feedwater pump or by the motor-driven emergency feedwater pump. The steam generators provide a long-term capability for decay heat removal.

The main feedwater pumps supply water from the condensate pumps and the condenser hotwell to the steam generators. The emergency feedwater pumps take suction from either the Condensate Storage Tank or the Service Water System. During normal operations, the Condensate Storage Tank is sufficient to provide for decay heat removal after reactor shutdown with the condenser isolated for several hours until additional condensate grade water can be made available. The condenser is normally available so that water inventory is not depleted. During emergency operations, the safety grade Condensate Storage Tank has a 30 minute (minimum) supply of emergency feedwater protected by a tornado missile shield wall, giving operators ample time to align the emergency feedwater pump suctions to the Service Water System. The Reactor Coolant Pumps are provided with sufficient inertia to maintain adequate flow to prevent fuel damage if power to all pumps is lost. Natural circulation coolant flow will provide adequate core cooling after the pump energy has been dissipated. The Decay Heat Removal System will remove the decay heat until the RCS temperature is at a level at which refueling or maintenance may be safely performed. If leakage occurs during system operation, provisions are made for isolation. The Decay Heat Removal System serves as an engineered safeguards system for emergency core cooling; consequently, it is capable of operation from either onsite or offsite power supplies.

1.4.40 CRITERION 44 - COOLING WATER

A system to transfer heat from structures, systems, and components important to safety to an ultimate heat sink shall be provided. The system safety function shall be to transfer the combined heat load of these structures, systems, and components under normal operating and accident conditions.

Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities, shall be provided to assure that for onsite electrical power system operation (assuming offsite power is not available) and for offsite electrical power system operation (assuming onsite power is not available) the system safety function can be accomplished assuming a single failure.

Discussion

Structures, systems, and components important to safety are cooled by the Service Water System. The Service Water System is redundant with two 100 percent capacity trains and three 100 percent capacity pumps which can be operated either from offsite power or from onsite emergency power. Two sources of cooling water are available for reactor equipment to use as an ultimate heat sink, the Emergency Cooling Pond and the Dardanelle Reservoir.

Note that while the ANO-1 EFW pumps normally take suction from a Condensate Storage Tank, the assured suction source for EFW is the Service Water System. Based on the above, the ANO-1 design meets the intent of the subject GDCs.

3.1 No Significant Hazards Consideration Determination

Entergy Operation, Inc., (Entergy) has reviewed the proposed no significant hazards consideration determination published on July 17, 2007, as part of the consolidated line item improvement process (CLIP). Entergy has concluded that the proposed determination presented in the notice is applicable to Arkansas Nuclear One, Unit 1 (ANO-1) and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

3.2 Verification and Commitments

There are no new regulatory commitments associated with this proposed change.

3.3 Precedent

TSTF-412 was approved for the Point Beach station on March 25, 2011 (Reference 2). Waterford 3 nuclear station adopted essentially the allowances of TSTF-340 and TSTF-412 in TS Amendment 173 dated October 4, 2001, although TSTF-412 was not yet generically approved for the industry (Reference 3).

4.0 ENVIRONMENTAL CONSIDERATION

Entergy Operation, Inc., (Entergy) has reviewed the environmental evaluation included in the model safety evaluation published in the Federal Register on July 17, 2007 (72 FR 39091), as part of the consolidated line item improvement process (CLIP). Entergy has concluded that the NRC staff's findings presented in that evaluation are applicable to Arkansas Nuclear One, Unit 1 (ANO-1), and the evaluation is hereby incorporated by reference for this application.

5.0 REFERENCES

1. NRC letter to Technical Specifications Task Force dated October 30, 2015, *Traveler TSTF-412, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW Pump Inoperable" Provision for 24 Hours Completion for An Inoperable Motor-Driven Auxiliary Feedwater Pump Coincident with One Inoperable Steam Supply to the Steam-Driven Auxiliary Feedwater Pump*
2. NRC Safety Evaluation dated March 25, 2011, *Point Beach Nuclear Plant (PBNP), Units 1 and 2 – Issuance of License Amendments RE: Auxiliary Feedwater System Modification* (TAC Nos. ME1081 and ME1082) (ML110230016)
3. NRC Safety Evaluation dated October 4, 2001, *Waterford Steam Electric Station, Unit 3 – Issuance Of Amendment RE: Emergency Feedwater System* (TAC No. MB2010) (ML012840538)

Attachment 2 to

1CAN071701

Proposed Technical Specification Changes (Mark-Up)

3.7 PLANT SYSTEMS

3.7.5 Emergency Feedwater (EFW) System

LCO 3.7.5 Two EFW trains shall be OPERABLE.

-----NOTE-----
Only one EFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

-----NOTE-----
LCO 3.0.4.b is not applicable when entering Mode 1.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One steam supply to Turbine driven EFW train pump inoperable due to one inoperable steam supply.</p> <p><u>OR</u></p> <p>-----NOTE----- Only applicable if MODE 2 has not been entered following refueling. -----</p> <p>Turbine driven EFW pump inoperable in MODE 3 following refueling.</p>	<p>A.1 Restore affected equipment to OPERABLE status.</p>	<p>7 days</p> <p><u>AND</u></p> <p>10 days from discovery of failure to meet the LCO</p>
<p>B. One EFW train inoperable in MODE 1, 2, or 3 for reasons other than Condition A in MODE 1, 2, or 3.</p>	<p>B.1 Restore EFW train to OPERABLE status.</p>	<p>72 hours</p> <p><u>AND</u></p> <p>10 days from discovery of failure to meet the LCO</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. Turbine driven EFW train inoperable due to one inoperable steam supply.</p> <p><u>AND</u></p> <p>Motor driven EFW train inoperable.</p>	<p>C.1 Restore the steam supply to the turbine driven EFW train to OPERABLE status.</p> <p><u>OR</u></p> <p>C.2 Restore the motor driven EFW train to OPERABLE status.</p>	<p>24 hours</p> <p>24 hours</p>
<p>DG. Required Action and associated Completion Time of Condition A, or B, or C not met.</p>	<p>DG.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>DG.2 Be in MODE 4.</p>	<p>6 hours</p> <p>18 hours</p>
<p>ED. -----NOTE----- Not applicable when the turbine driven EFW train is inoperable solely due to one inoperable steam supply. -----</p> <p>Two EFW trains inoperable in MODE 1, 2, or 3.</p>	<p>ED.1 -----NOTE----- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one EFW train is restored to OPERABLE status. -----</p> <p>Initiate action to restore one EFW train to OPERABLE status.</p>	<p>Immediately</p>
<p>FE. Required EFW train inoperable in MODE 4.</p>	<p>FE.1 Initiate action to restore EFW train to OPERABLE status.</p>	<p>Immediately</p>

SRs 3.7.5.1 and 3.7.5.2 moved to next page

SURVEILLANCE REQUIREMENTS

Moved from previous page

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each EFW manual, power operated, and automatic valve in each water flow path and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.5.2	<p>-----NOTE-----</p> <p>Not required to be performed for the turbine driven EFW pump, until 24 hours after reaching ≥ 750 psig in the steam generators.</p> <p>-----</p> <p>Verify the developed head of each EFW pump at the flow test point is greater than or equal to the required developed head.</p>	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.5.3	<p>-----NOTE-----</p> <p>Not required to be met in MODE 4 when steam generator is relied upon for heat removal.</p> <p>-----</p> <p>Verify each EFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.</p>	18 months
SR 3.7.5.4	<p>-----NOTE-----</p> <p>Not required to be met in MODE 4 when steam generator is relied upon for heat removal.</p> <p>-----</p> <p>Verify each EFW pump starts automatically on an actual or simulated actuation signal.</p>	18 months

SRs 3.7.5.5 and 3.7.5.6 moved to new Page 3.7.5-4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.5	Verify proper alignment of the required EFW flow paths by verifying manual valve alignment from the "Q" condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever the unit has been in MODE 5, MODE 6, or defueled for a cumulative period of > 30 days
SR 3.7.5.6	Verify that feedwater is delivered to each steam generator using the motor-driven EFW pump.	18 months

These SRs moved from Page 3.7.5-3



Attachment 3 to

1CAN071701

Revised Technical Specification Pages

3.7 PLANT SYSTEMS

3.7.5 Emergency Feedwater (EFW) System

LCO 3.7.5 Two EFW trains shall be OPERABLE.

-----NOTE-----
Only one EFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS
-----NOTE-----
LCO 3.0.4.b is not applicable when entering Mode 1.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. Turbine driven EFW train inoperable due to one inoperable steam supply.</p> <p><u>OR</u></p> <p>-----NOTE----- Only applicable if MODE 2 has not been entered following refueling. -----</p> <p>Turbine driven EFW pump inoperable in MODE 3 following refueling.</p>	<p>A.1 Restore affected equipment to OPERABLE status.</p>	<p>7 days</p> <p><u>AND</u></p> <p>10 days from discovery of failure to meet the LCO</p>
<p>B. One EFW train inoperable in MODE 1, 2, or 3 for reasons other than Condition A.</p>	<p>B.1 Restore EFW train to OPERABLE status.</p>	<p>72 hours</p> <p><u>AND</u></p> <p>10 days from discovery of failure to meet the LCO</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. Turbine driven EFW train inoperable due to one inoperable steam supply.</p> <p><u>AND</u></p> <p>Motor driven EFW train inoperable.</p>	<p>C.1 Restore the steam supply to the turbine driven EFW train to OPERABLE status.</p> <p><u>OR</u></p> <p>C.2 Restore the motor driven EFW train to OPERABLE status.</p>	<p>24 hours</p> <p>24 hours</p>
<p>D. Required Action and associated Completion Time of Condition A, B, or C not met.</p>	<p>D.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>D.2 Be in MODE 4.</p>	<p>6 hours</p> <p>18 hours</p>
<p>E. -----NOTE----- Not applicable when the turbine driven EFW train is inoperable solely due to one inoperable steam supply. ----- Two EFW trains inoperable in MODE 1, 2, or 3.</p>	<p>E.1 -----NOTE----- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one EFW train is restored to OPERABLE status. ----- Initiate action to restore one EFW train to OPERABLE status.</p>	<p>Immediately</p>
<p>F. Required EFW train inoperable in MODE 4.</p>	<p>F.1 Initiate action to restore EFW train to OPERABLE status.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each EFW manual, power operated, and automatic valve in each water flow path and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.5.2	<p>-----NOTE-----</p> <p>Not required to be performed for the turbine driven EFW pump, until 24 hours after reaching ≥ 750 psig in the steam generators.</p> <p>-----</p> <p>Verify the developed head of each EFW pump at the flow test point is greater than or equal to the required developed head.</p>	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.5.3	<p>-----NOTE-----</p> <p>Not required to be met in MODE 4 when steam generator is relied upon for heat removal.</p> <p>-----</p> <p>Verify each EFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.</p>	18 months
SR 3.7.5.4	<p>-----NOTE-----</p> <p>Not required to be met in MODE 4 when steam generator is relied upon for heat removal.</p> <p>-----</p> <p>Verify each EFW pump starts automatically on an actual or simulated actuation signal.</p>	18 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.5	Verify proper alignment of the required EFW flow paths by verifying manual valve alignment from the "Q" condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever the unit has been in MODE 5, MODE 6, or defueled for a cumulative period of > 30 days
SR 3.7.5.6	Verify that feedwater is delivered to each steam generator using the motor-driven EFW pump.	18 months

Attachment 4 to

1CAN071701

**Proposed Technical Specification Bases Changes (Mark-Up)
For Information Only**

APPLICABILITY (continued)

In MODE 4, the EFW system must be OPERABLE when the steam generators are relied upon for decay heat removal since EFW is the safety related source of feedwater to the steam generators. In MODE 4, the steam generators are normally used for heat removal until the DHR system is in operation.

In MODES 5 and 6, the steam generators are not used for DHR and the EFW system is not required.

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable EFW train when entering MODE 1. There is an increased risk associated with entering MODE 1 with EFW inoperable and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

With ~~one of the two steam supplies to~~ the turbine driven EFW pump inoperable ~~due to one inoperable steam supply~~, or if the turbine driven EFW pump is inoperable ~~for any reason while~~ in MODE 3 immediately following refueling, action must be taken to restore the steam supply 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 EFW pump ~~due to one inoperable steam supply~~, the 7-day Completion Time is reasonable since there is a redundant steam line for the turbine driven pump ~~and the turbine driven train is still capable of performing its specified safety function for most postulated events~~.
- b. For the inoperability of the turbine driven EFW pump while in MODE 3 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 ~~due to one inoperable steam supply~~ and an inoperable turbine driven EFW pump while in MODE 3 immediately following a refueling, the 7-day Completion Time is reasonable due to the availability of the redundant OPERABLE ~~motor driven~~ EFW pump, and due to the low probability of an event requiring the use of the ~~inoperable~~ turbine driven EFW pump.

The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of required EFW components to be inoperable during any continuous failure to meet this LCO.

ACTIONS (continued)

A.1 (continued)

The 10-day Completion Time provides a limitation on the time allowed in this specified Condition after discovery of failure to meet the LCO. ~~This limit is considered reasonable for situations in which Conditions A and B are entered concurrently.~~ The AND connector between 7 days and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.

Condition A is modified by a Note which limits the applicability of the Condition [for an inoperable turbine driven EFW pump in MODE 3](#) to when the unit has not entered MODE 2 following a refueling. Condition A allows one EFW train to be inoperable for 7 days vice the 72-hour Completion Time in Condition B. This longer Completion Time is based on the reduced decay heat following refueling and prior to the reactor being critical.

B.1

When one of the required EFW trains (pump or flow path) is inoperable [in MODE 1, 2, or 3 for reasons other than Condition A](#), action must be taken to restore the train to OPERABLE status within 72 hours. This Condition includes the loss of two steam supply lines to the turbine driven EFW pump. The 72-hour Completion Time is reasonable, based on the redundant capabilities afforded by the EFW system, time needed for repairs, and the low probability of an event requiring EFW occurring during this time period. The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of required EFW components to be inoperable during any continuous failure to meet this LCO.

The 10-day Completion Time provides a limitation on the time allowed in this specified Condition after discovery of failure to meet the LCO. ~~This limit is considered reasonable for situations in which Conditions A and B are entered concurrently.~~ The AND connector between 72 hours and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.

C.1 and C.2

[With the required motor driven EFW train \(pump or flow path\) inoperable and one of the turbine driven EFW trains inoperable due to one inoperable steam supply, action must be taken to restore the affected equipment to OPERABLE status within 24 hours. Assuming no single active failures when in this condition, the accident \(a FWLB or MSLB\) could result in the loss of the remaining steam supply to the inoperable turbine driven EFW pump due to the faulted SG. In this condition, the EFW system may no longer be able to meet the required flow to the SGs assumed in the safety analysis.](#)

[The 24-hour Completion Time is reasonable based on the remaining OPERABLE steam supply to the affected turbine driven EFW pump and the low probability of an event occurring that would require the inoperable steam supply to be available for the affected turbine driven EFW pump.](#)

ACTIONS (continued)

D.1 and D.2

When ~~with the~~ Required Action ~~A.1, B.1, C.1, or C.2 cannot be met within the required and associated Completion Time of Condition A or B not met~~, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 4 within 18 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

In MODE 4, with two EFW trains inoperable, operation is allowed to continue because only one motor driven EFW train is required in accordance with the Note that modifies the LCO. Although not required, the unit may continue to cool down and initiate DHR.

ED.1

Condition E is modified by a Note to clarify that this condition is not applicable when the turbine driven EFW train is inoperable solely due to an inoperable steam supply. This Note is necessary to differentiate between the inoperable configurations described in Condition C as compared to the configuration intended to be encompassed by Condition E. With one steam supply available to the turbine driven EFW pump, and assuming that Required Action C.1 or C.2 are not met within 24 hours, the EFW system can still support a plant shutdown as required by Condition D. Condition E is intended to address configurations where insufficient EFW flow is available to support necessary decay removal following a plant shutdown and, therefore, maintains the plant in a stable steady-state condition until sufficient EFW capacity is restored. The Condition E Note aids in identifying which condition (Condition C or Condition E) is applicable for the current plant configuration.

Required Action ED.1 is ~~also~~ modified by a Note indicating that all required MODE changes ~~or power reductions~~ are suspended until at least one EFW train is restored to OPERABLE status.

With both EFW trains inoperable in MODE 1, 2, or 3, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a 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 seriousness of this condition requires that action be started immediately to restore at least one EFW train to OPERABLE status. LCO 3.0.3 is not applicable, as it could force the unit into a less safe condition.

FE.1

In MODE 4, either the steam generator loops or the DHR loops can be used to provide heat removal, which is addressed in LCO 3.4.6, "RCS Loops - MODE 4." With the required EFW train inoperable, action must be taken to immediately restore the inoperable train to OPERABLE status.