



June 30, 2016  
L-2016-128  
10 CFR 50.90

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

Re: Turkey Point Nuclear Plant, Units 3 and 4  
Docket Nos. 50-250 and 50-251  
Renewed Facility Operating Licenses DPR-31 and DPR-41  
License Amendment Request 245, Change to the Technical Specifications to Address an  
Inoperable Steam Supply for the Auxiliary Feedwater Pumps

Pursuant to 10 CFR 50.90, Florida Power & Light Company (FPL) hereby requests a license amendment to revise the Technical Specifications (TS) for Turkey Point Units 3 and 4. The proposed change revises TS 3.7.1.2, Auxiliary Feedwater (AFW) System, to explicitly require operability of three steam supplies to the AFW system and to provide remedial measures for an inoperable steam supply.

This license amendment request (LAR) is required to correct a non-conservative TS. Currently, plant operations are administratively controlled as described in NRC Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety." In accordance with the guidance in AL 98-10, this LAR is required to resolve a non-conservative TS and is not a voluntary request from a licensee to change its licensing basis. Therefore, this request is not subject to 'forward fit' considerations as described in the letter from S. Burns (NRC) to E. Ginsberg (NEI), dated July 14, 2010 (ADAMS Accession Number ML101960180).

The Enclosure to this letter provides FPL's evaluation of the proposed change. Attachment 1 to the enclosure provides the existing TS pages marked up to show the proposed changes. Attachment 2 provides clean 'camera ready' TS pages showing the proposed changes. Attachment 3 provides existing TS Bases pages marked up to show the proposed changes. The changes to the TS Bases are provided for information only and will be incorporated in accordance with the TS Bases Control Program upon implementation of the approved amendment.

As discussed in the evaluation, the proposed change does not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the change.

The Turkey Point Plant Nuclear Safety Committee has reviewed the proposed license amendment. In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the designee of the State of Florida.

ADD  
NRR

For your information, FPL may elect to supplement this LAR with changes to the proposed TS completion times upon approval of FPL LAR No. 236, Revision to the Technical Specifications to Adopt Risk-Informed Completion Times TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4B", submitted December 23, 2014 (ML 15029A297).

There are no new commitments made in this submission.

FPL requests approval of this amendment request by June 30, 2017 with implementation within 60 days of issuance.

Should you have any questions regarding this submission, please contact Mr. Mitch Guth, Licensing Manager, at 305-246-6698.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 30, 2016

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Summers', with a long horizontal line extending to the right.

Thomas Summers

Site Vice President  
Turkey Point Nuclear Plant

Enclosure

cc: NRC Regional Administrator, Region II  
NRC Senior Resident Inspector  
NRC Project Manager  
Ms. Cindy Becker, Florida Department of Health

ENCLOSURE

Evaluation of the Proposed Change

SUBJECT: License Amendment Request 245, Change to the Technical Specifications to Address an Inoperable Steam Supply for the Auxiliary Feedwater Pumps

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- 2.0 DETAILED DESCRIPTION
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Attachment 1 - Proposed Technical Specification Pages (markup)

Attachment 2 - Proposed Technical Specification Pages (clean copy)

Attachment 3 - Proposed Technical Specification Bases Pages (markup)

## **1.0 SUMMARY DESCRIPTION**

Florida Power & Light Company (FPL) requests license amendments to revise the Technical Specifications (TS) for Turkey Point Units 3 and 4. The proposed change revises TS 3.7.1.2, Auxiliary Feedwater (AFW) System, to explicitly require operability of three steam supplies to the AFW system and to provide remedial measures for an inoperable steam supply.

This license amendment request (LAR) is required to correct a non-conservative TS. Currently, plant operation is administratively controlled as described in NRC Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety." In accordance with the guidance in AL 98-10, this LAR is required to resolve a non-conservative TS and is not a voluntary request from a licensee to change its licensing basis. Therefore, this request is not subject to 'forward fit' considerations as described in the letter from S. Burns (NRC) to E. Ginsberg (NEI) [Reference 1].

## **2.0 DETAILED DESCRIPTION**

### **2.1 AFW System Design and Operation**

The dual train AFW system is shared between Turkey Point Units 3 and 4 and supplies feedwater to the steam generators (SGs) during transients when normal feedwater is not available. Three quick starting steam turbine-driven AFW pumps are provided with each pump capable of delivering approximately 624 gallons per minute to the SGs.

The three AFW pumps are installed such that each supplies auxiliary feedwater to either Unit 3 or 4 or both, with any single pump supplying the total feedwater requirement of either Unit. Two pumps (B and C) are normally aligned to AFW train 2, and the third pump (A) is normally aligned to AFW train 1.

The turbine-driven pumps are supplied with steam from the Unit which has lost its normal feedwater supply. Steam can also be supplied from the Unit having normal feedwater supply, from the Unit's auxiliary steam supply, or from an auxiliary steam connection to adjacent fossil-fueled Unit 1. The steam supply valves will automatically open by any one of the following five signals.

1. Safety injection
2. Low-low level in any of the three SGs
3. Loss of both feedwater pumps under normal operating conditions
4. Bus low or degraded voltage

## 5. ATWS mitigating system actuating circuitry

The analyses for loss of normal feedwater and loss of non-emergency AC power conclude that the AFW system provides sufficient heat removal capability to prevent reactor coolant inventory relief through the Pressurizer power-operated relief valves or the code-safety valves. For each event, the worst single active failure is assumed to occur in the AFW system, resulting in the availability of only one AFW pump supplying three steam generators.

Turkey Point also has two non-safety grade standby steam generator feedwater pumps (SSGFP), which are used to supply feedwater to the steam generators during normal start-up, shutdown, and hot standby conditions and are required by TS 3.7.1.6. The pumps take suction from the demineralized water storage tank and discharge into the main feedwater header upstream of the feedwater regulating valves. One pump is motor-driven and the other pump is diesel engine driven. In case of loss of off-site power, the steam turbine-driven AFW pumps provide feedwater to the SGs. However, feedwater can also be supplied by the diesel engine driven standby steam generator feedwater pump.

## 2.2 Current TS Requirements for the AFW System

TS 3.7.1.2, Auxiliary Feedwater System, currently requires operability of two independent AFW trains, including three pumps and associated flow paths, in Modes 1, 2, and 3. The third AFW pump, which receives its steam supply from SG-B, is normally aligned to train 2. However, the third pump is capable of being aligned to either train to maintain one operable AFW pump in each train when one of the train-associated pumps is inoperable.

The AFW pumps' steam supplies include a train 1 supply from SG-C, a train 2 supply from SG-A, and a supply from SG-B that can be aligned to either train. The third steam supply serves to maintain one operable steam supply in each train when one of the train-associated steam supplies is inoperable. However, the Limiting Condition for Operation (LCO) of TS 3.7.1.2 is met with one operable steam supply in each redundant train. Therefore, the TS does not include an action that limits the out of service time for one of the three steam supplies.

## 2.3 Non-conservative Condition the Proposed Change is Intended to Resolve

The AFW pumps are provided with three steam supplies, one from each SG. Normally, SG-C provides steam to AFW pump A (train 1), and SG A provides steam to AFW pumps B and C (train 2). The steam supply from SG-B is normally aligned to train 2 but can be aligned to either train as necessary to maintain an operable steam supply in that train.

TS 3.7.1.2 currently requires two operable AFW steam supplies. Although three steam supplies are provided, TS 3.7.1.2 requires only one steam supply for each AFW train. The third supply is provided to function as an operable steam supply in the event one of the normal steam supplies becomes inoperable. Therefore, with three operable AFW pumps and two operable steam supplies (one in each train), the LCO of TS 3.7.1.2 is met and plant operation may continue. However, operation with only two operable steam supplies results in a non-conservative condition.

The AFW system is required to withstand a single active failure, and the system requires three operable steam supplies to meet this requirement. With one steam supply out of service, a faulted SG in another loop would leave only one AFW steam supply. Then, a single active failure in the one remaining AFW steam supply would result in a loss of the specified AFW safety function. Since TS 3.7.1.2 requires only two operable AFW steam supplies and permits unlimited operation with one of the three steam supplies out of service, the TS is inadequate to ensure safety.

FPL proposes to resolve the non-conservative condition by requiring three operable AFW steam supplies and limiting the duration of plant operation when one steam supply is inoperable. Accordingly, a new TS ACTION is proposed for a single inoperable steam supply. To enhance clarity, FPL proposes to eliminate Table 3.7-3, "Auxiliary Feedwater System Operability", modify Note 1 to explicitly specify the allowable steam supply alignments, apply Notes 1 and 2 to the LCO in lieu of Table 3.7-3, and eliminate Note 3 regarding Control Room communication with the AFW pump area. To further enhance clarity, FPL also proposes to modify the TS Bases document to specify that two independent AFW trains, including three redundant steam supply flowpaths, three pumps (and associated steam turbines, trip and throttle (T&T) valves, and governor valves), and their associated discharge water flowpaths, are required to be operable. The changes to the TS Bases are provided for information only and will be incorporated in accordance with the TS Bases Control Program upon implementation of the approved license amendment.

## 2.4 Description of the Proposed Changes

The proposed changes to TS 3.7.1.2 are shown below:

### Change to Limiting Condition for Operation

#### LIMITING CONDITION FOR OPERATION

3.7.1.2 Two independent auxiliary feedwater trains including **3 steam supply flowpaths**, 3 pumps ~~as specified in Table 3.7-3~~ and associated **discharge water** flowpaths shall be OPERABLE<sup>(1)(2)</sup>

Addition of New Action 4

4. *With a single steam supply flowpath inoperable, within 4 hours verify OPERABILITY of two independent steam supply flowpaths or follow ACTION statement 1 or 2 above as applicable. Upon verification of OPERABILITY of two steam supply flowpaths, restore the inoperable steam supply flowpath to OPERABLE status within 7 days of discovery, or place the operating Unit(s) in at least HOT STANDBY within 6 hours\* and in HOT SHUTDOWN within the following 6 hours.*

Elimination of Table 3.7-3

<u>UNI</u> <u>F</u>	<u>TRAI</u> <u>N</u>	<u>STEAM SUPPLY</u> <u>FLOWPATH</u> <sup>(3)</sup>	<u>PUMP</u>	<u>DISCHARGE WATER</u> <u>FLOWPATH</u> <sup>(3)</sup>
3	1	<del>SG 3C via MOV 3-1405</del> <del>or SG 3B via MOV 3-1404<sup>(4)</sup></del>	<del>A or C<sup>(2)</sup></del>	<del>SG 3A via CV 3-2816</del> <del>SG 3B via CV 3-2817</del> <del>SG 3C via CV 3-2818</del>
3	2	<del>SG 3A via MOV 3-1403</del> <del>or SG 3B via MOV 3-1404<sup>(4)</sup></del>	<del>B or C<sup>(2)</sup></del>	<del>SG 3A via CV 3-2831</del> <del>SG 3B via CV 3-2832</del> <del>SG 3C via CV 3-2833</del>
4	1	<del>SG 4C via MOV 4-1405</del> <del>or SG 4B via MOV 4-1404<sup>(4)</sup></del>	<del>A or C<sup>(2)</sup></del>	<del>SG 4A via CV 4-2816</del> <del>SG 4B via CV 4-2817</del> <del>SG 4C via CV 4-2818</del>
4	2	<del>SG 4A via MOV 4-1403</del> <del>or SG 4B via MOV 4-1404<sup>(4)</sup></del>	<del>B or C<sup>(2)</sup></del>	<del>SG 4A via CV 4-2831</del> <del>SG 4B via CV 4-2832</del> <del>SG 4C via CV 4-2833</del>

Change to Note 1

<sup>(1)</sup> *One steam supply flowpath shall be OPERABLE in each AFW train and the third steam supply flowpath (via MOV-3-1404 for Unit 3 and MOV-4-1404 for Unit 4) shall be OPERABLE and aligned to either AFW train but not both simultaneously.*

<sup>(4)</sup> ~~Steam admission valves MOV 3-1404 and MOV 4-1404 can be aligned to either train (but not both) to restore OPERABILITY in the event MOV 3-1403 or MOV 3-1405, or MOV 4-1403 or MOV 4-1405 are inoperable.~~

Elimination of Note 3

<sup>(3)</sup> ~~If any local manual realignment of valves is required when operating the auxiliary feedwater pumps, a dedicated individual, who is in communication with~~

~~*the control room, shall be stationed at the auxiliary feedwater pump area. Upon instructions from the control room, this operator would realign the valves in the AFW system train to its normal operational alignment.*~~

### 3.0 TECHNICAL EVALUATION

#### 3.1 **Change to LCO 3.7.1.2**

LCO 3.7.1.2 is revised to require that three AFW steam supplies must be operable. This change is appropriate because three steam supplies are needed to ensure that the AFW system can perform its specified function for all postulated events in the presence of a single failure. With three steam supplies available, at least one steam supply would remain available in the event of a loss of one steam supply following an accident involving a faulted SG and loss of a second steam supply due to a single failure. This proposed change adds a more restrictive requirement than currently exists because the LCO can no longer be met with only two AFW steam supplies operable.

#### 3.2 **Addition of New Action 4**

New Action 4 in TS 3.7.1.2 is proposed to limit the duration of plant operation with one of the three AFW steam supply flowpaths inoperable. This new Action, similar to Action 3 for an inoperable AFW pump, first verifies operability of two independent steam supply flowpaths. If this condition is not met, the Action directs complying with the more limiting requirements of Action 1 or 2, as applicable. Otherwise, Action 4 provides a completion time of seven days to restore the inoperable steam supply flowpath to operable status before a plant shutdown is required.

Seven days is a reasonable completion time to restore an inoperable AFW steam supply flowpath. Action 1 in TS 3.7.1.2 provides a 72-hour completion time for the condition in which one train of AFW is inoperable. However, for proposed Action 4, the seven-day completion time applies when one steam supply flowpath is inoperable but both trains of AFW are operable. The condition addressed in Action 4 is less severe than inoperability of an AFW train; therefore, a completion time longer than 72 hours is reasonable. On the other hand, Action 3 provides 30 days to restore an inoperable AFW pump when both AFW trains remain operable. Nevertheless, the consequences of an inoperable steam supply flowpath are more severe than those for an inoperable pump, so a 30-day completion time for the proposed action is not justifiable from a deterministic perspective.

However with one steam supply flow path inoperable, the single failure criterion would not be met during the 7 day AOT. The AFW system is required to withstand a single active failure and the system requires three operable steam supply flowpaths to meet this requirement. With one steam supply flowpath out of service, a single

active failure in another steam supply loop would leave only one AFW steam supply flowpath. A faulted SG in the one remaining AFW steam supply flowpath would result in a loss of the specified safety function.

The proposed completion time is consistent with the seven-day completion time in standard TS 3.7.5 in NUREG-1431 [Reference 2] for one inoperable turbine driven AFW pump steam supply flowpath. The basis for the completion time in the standard TS is the availability of a redundant steam supply line for the turbine driven pump and that the turbine driven train is still capable of performing its specified function for most postulated events. The Turkey Point AFW system includes three turbine-driven AFW pumps and is different from the AFW system considered in the standard TS, which includes both turbine-driven and motor driven pumps. Nonetheless, the basis for the seven-day completion time is applicable to Turkey Point where the system remains capable of performing its specified function for most postulated events with one steam supply flowpath unavailable. At the same time, two trains of two steam supplies would be available to the AFW pumps.

### **3.2 Elimination of Table 3.7-3**

Table 3.7-3 describes the allowable plant configurations which satisfy the current LCO requirement of three operable AFW pumps and associated flow paths. As currently written, the Table adequately describes the allowable pump configurations but does not align with the new requirement for three independent AFW steam supply flowpaths. The proposed change to Note 1 (see below) fulfills this function and, by attaching Note 1 to the LCO in lieu of Table 3.7-3, facilitates the elimination of Table 3.7-3.

### **3.3 Change to Note 1**

Note 1, currently associated with Table 3.7-3, is revised to explicitly require that all three AFW steam supply flowpaths are operable. This proposed change adds a more restrictive requirement than currently exists because the LCO can no longer be met with only two AFW steam supply flowpaths operable. This change is appropriate because three steam supply flowpaths are needed to ensure that the AFW system can perform its specified function for all postulated events in the presence of a single failure. With three steam supply flowpaths available, at least one steam supply flowpath would remain available in the event of a loss of one steam supply flowpath following an accident involving a faulted SG and loss of a second steam supply flowpath due to a single failure. This proposed change adds a more restrictive requirement than currently exists because the LCO can no longer be met with only two AFW steam supply flowpaths operable.

### **3.4 Apply Notes 1 and 2 to the LCO (in lieu of Table 3.7-3)**

Notes 1 and 2, both currently associated with Table 3.7-3, describe the allowable plant configurations which satisfy the LCO requirement for three operable AFW pumps and associated flow paths. The proposed change to Note 1 (see above) describes the allowable plant configurations for three operable AFW steam supplies. Applying Notes 1 and 2 to the LCO facilitates the elimination of Table 3.7-3 as described above.

### **3.5 Elimination of Note 3**

Note 3 describes the procedure to be implemented in the event manual realignment of the AFW system is required when operating the AFW pumps. A dedicated individual in communication with the Control Room must be stationed in the AFW pump area during these times. Further review reveals that this configuration control mechanism is more aptly suited for plant procedures.

## **4.0 REGULATORY EVALUATION**

### **4.1 Applicable Regulatory Requirements/Criteria**

- 10 CFR 50.36 Technical specifications - requires in part that limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.
- NRC Administrative Letter 98-10, Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety, discusses that an improper or inadequate TS value or required action is considered a degraded or nonconforming condition, and imposing administrative controls in response to an improper or inadequate TS is considered an acceptable short-term corrective action. The staff expects that, following the imposition of administrative controls, an amendment to the TS, with appropriate justification and schedule, will be submitted in a timely fashion

This license amendment request is consistent with the above requirements.

### **4.2 Significant Hazards Consideration**

The proposed change revises TS 3.7.1.2, Auxiliary Feedwater (AFW) System, to explicitly require operability of three steam supplies to the AFW system and to provide remedial measures for an inoperable steam supply. As required by 10 CFR

50.91(a), Florida Power & Light Company has evaluated the proposed changes using the criteria in 10 CFR 50.92 and has determined that the proposed changes do not involve a significant hazards consideration. An analysis of the issue of no significant hazards consideration is presented below:

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

Response: No

The proposed change requires that three AFW steam supplies must be operable. The AFW system is not an initiator of any accident previously evaluated; therefore, the probability of occurrence of an accident is not significantly affected by the proposed changes. The change does not involve a significant increase in the consequences of an accident because three steam supplies are needed to ensure that the AFW system can perform its specified function for all postulated events in the presence of a single failure. The proposed changes do not adversely impact the ability of the AFW system to mitigate the consequences of accidents previously evaluated because the proposed change reduces the allowable out of service time for a single inoperable steam supply.

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 requires that three steam supplies are available to ensure that the AFW system can perform its specified function in the presence of a single failure. As such, the proposed change adds a more restrictive requirement than currently exists because the LCO can no longer be met with only two AFW steam supplies operable.

The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed). The proposed change does not create any new failure modes for existing equipment or any new limiting single failures. Additionally, the proposed change does not involve a change in the methods governing normal plant operation, and all safety functions will continue to perform as previously assumed in the accident analyses. Thus, the proposed change does not adversely affect the design function or operation of any plant structures, systems, or components.

No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. The proposed change does not challenge the performance or integrity of any safety-related system.

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 change adds a more restrictive requirement than currently exists because the LCO can no longer be met with only two AFW steam supplies operable. The proposed change will not adversely affect the operation of plant equipment or the function of equipment assumed in the accident analysis. The proposed amendment does not involve changes to any safety analyses assumptions, safety limits, or limiting safety system settings. The change does not adversely impact plant operating margins or the reliability of equipment credited in the safety analyses.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above analysis, FPL concludes that the proposed amendment does not involve a significant hazards consideration, under the standards set forth in 10 CFR 50.92(c), "Issuance of Amendment," 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 CONSIDERATIONS**

The proposed amendment changes recordkeeping, reporting, or administrative procedures or requirements. 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 effluents 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)(10). 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**

1. NRC letter from S. Burns to E. Ginsberg (NEI) Regarding Forward Fit, July 14, 2010 (ML101960180).
2. NUREG-1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0 (ML12100A222)

**Attachment 1**

**Proposed Technical Specification Pages (markup)**

(3 pages follow)

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DELETED

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 Two independent auxiliary feedwater trains including 3 pumps ~~as specified in Table 3.7-3~~ and associated flowpaths shall be OPERABLE <sup>(1)(2)</sup>

APPLICABILITY: MODES 1, 2 and 3

ACTION:

discharge water

3 steam supply flowpaths,

- 1) With one of the two required independent auxiliary feedwater trains inoperable, either restore the inoperable train to an OPERABLE status within 72 hours, or place the affected unit(s) in at least HOT STANDBY within the next 6 hours\* and in HOT SHUTDOWN within the following 6 hours.
- 2) With both required auxiliary feedwater trains inoperable, within 2 hours either restore both trains to an OPERABLE status, or restore one train to an OPERABLE status and follow ACTION statement 1 above for the other train. If neither train can be restored to an OPERABLE status within 2 hours, verify the OPERABILITY of both standby feed-water pumps and place the affected unit(s) in at least HOT STANDBY within the next 6 hours\* and in HOT SHUTDOWN within the following 6 hours. Otherwise, initiate corrective action to restore at least one auxiliary feedwater train to an OPERABLE status as soon as possible and follow ACTION statement 1 above for the other train.
- 3) With a single auxiliary feedwater pump inoperable, within 4 hours, verify OPERABILITY of two independent auxiliary feedwater trains, or follow ACTION statements 1 or 2 above as applicable. Upon verification of the OPERABILITY of two independent auxiliary feedwater trains, restore the inoperable auxiliary feedwater pump to an OPERABLE status within 30 days, or place the operating unit(s) in at least HOT STANDBY within 6 hours\* and in HOT SHUTDOWN within the following 6 hours. The provisions of Specification 3.0.4 are not applicable during the 30 day period for the inoperable auxiliary feedwater pump.

SURVEILLANCE REQUIREMENTS

4.7.1.2.1 The required independent auxiliary feedwater trains shall be demonstrated OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by:
  - 1) Verifying by control panel indication and visual observation of equipment that each steam turbine-driven pump operates for 15 minutes or greater and develops a flow of greater

4) With a single steam supply flowpath inoperable, within 4 hours verify OPERABILITY of two independent steam supply flowpaths or follow ACTION statement 1 or 2 above as applicable. Upon verification of the OPERABILITY of two independent steam supply flowpaths, restore the inoperable steam supply flowpath to OPERABLE status within 7 days of discovery, or place the affected Unit(s) in at least HOT STANDBY within 6 hours\* and in HOT SHUTDOWN within the following 6 hours.

\*If this ACTION applies to both units simultaneously, be in at least HOT STANDBY within the next 12 hours and in HOT SHUTDOWN within the following 6 hours.

TABLE 3.7-3

AUXILIARY FEEDWATER SYSTEM OPERABILITY

<u>UNIT</u>	<u>TRAIN</u>	<u>STEAM SUPPLY FLOWPATH<sup>(3)</sup></u>	<u>PUMP</u>	<u>DISCHARGE WATER FLOWPATH<sup>(3)</sup></u>
3	4	<del>SG 3C via MOV 3-1405 or SG 3B via MOV 3-1404<sup>(4)</sup></del>	A or C <sup>(2)</sup>	<del>SG 3A via CV 3-2816 SG 3B via CV 3-2817 SG 3C via CV 3-2818</del>
3	2	<del>SG 3A via MOV 3-1403 or SG 3B via MOV 3-1404<sup>(4)</sup></del>	B or C <sup>(2)</sup>	<del>SG 3A via CV 3-2834 SG 3B via CV 3-2832 SG 3C via CV 3-2833</del>
4	4	<del>SG 4C via MOV 4-1405 or SG 4B via MOV 4-1404<sup>(4)</sup></del>	A or C <sup>(2)</sup>	<del>SG 4A via CV 4-2816 SG 4B via CV 4-2817 SG 4C via CV 4-2818</del>
4	2	<del>SG 4A via MOV 4-1403 or SG 4B via MOV 4-1404<sup>(4)</sup></del>	B or C <sup>(2)</sup>	<del>SG 4A via CV 4-2834 SG 4B via CV 4-2832 SG 4C via CV 4-2833</del>

NOTES:

(1) One steam supply flowpath shall be OPERABLE in each AFW train and the third steam supply flowpath (via MOV-3-1404 for Unit 3 and MOV-4-1404 for Unit 4) shall be OPERABLE and aligned to either AFW train but not both simultaneously.

~~<sup>(4)</sup> Steam admission valves MOV 3-1404 and MOV 4-1404 can be aligned to either train (but not both) to restore OPERABILITY in the event MOV 3-1403 or MOV 3-1405, or MOV 4-1403 or MOV 4-1405 are inoperable.~~

~~<sup>(2)</sup> During single and two unit operation, one pump shall be OPERABLE in each train and the third auxiliary feedwater pump shall be OPERABLE and capable of being powered from, and supplying water to either train, except as noted in ACTION 3 of Technical Specification 3.7.1.2. The third auxiliary feedwater pump (normally the "C" pump) can be aligned to either train to restore OPERABILITY in the event one of the required pumps is inoperable.~~

~~<sup>(3)</sup> If any local manual realignment of valves is required when operating the auxiliary feedwater pumps, a dedicated individual, who is in communication with the control room, shall be stationed at the auxiliary feedwater pump area. Upon instructions from the control room, this operator would realign the valves in the AFW system train to its normal operational alignment.~~

**Attachment 2**

**Proposed Technical Specification Pages (clean copy)**  
(4 pages follow)

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### LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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## PLANT SYSTEMS

### AUXILIARY FEEDWATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.7.1.2 Two independent auxiliary feedwater trains including 3 steam supply flowpaths, 3 pumps and associated discharge water flowpaths shall be OPERABLE<sup>(1)(2)</sup>

APPLICABILITY: MODES 1, 2 and 3

ACTION:

- 1) With one of the two required independent auxiliary feedwater trains inoperable, either restore the inoperable train to an OPERABLE status within 72 hours, or place the affected unit(s) in at least HOT STANDBY within the next 6 hours\* and in HOT SHUTDOWN within the following 6 hours.
- 2) With both required auxiliary feedwater trains inoperable, within 2 hours either restore both trains to an OPERABLE status, or restore one train to an OPERABLE status and follow ACTION statement 1 above for the other train. If neither train can be restored to an OPERABLE status within 2 hours, verify the OPERABILITY of both standby feed-water pumps and place the affected unit(s) in at least HOT STANDBY within the next 6 hours\* and in HOT SHUTDOWN within the following 6 hours. Otherwise, initiate corrective action to restore at least one auxiliary feedwater train to an OPERABLE status as soon as possible and follow ACTION statement 1 above for the other train.
- 3) With a single auxiliary feedwater pump inoperable, within 4 hours, verify OPERABILITY of two independent auxiliary feedwater trains, or follow ACTION statements 1 or 2 above as applicable. Upon verification of the OPERABILITY of two independent auxiliary feedwater trains, restore the inoperable auxiliary feedwater pump to an OPERABLE status within 30 days, or place the operating unit(s) in at least HOT STANDBY within 6 hours\* and in HOT SHUTDOWN within the following 6 hours. The provisions of Specification 3.0.4 are not applicable during the 30 day period for the inoperable auxiliary feedwater pump.
- 4) With a single steam supply flowpath inoperable, within 4 hours verify OPERABILITY of two independent steam supply flowpaths or follow ACTION statement 1 or 2 above as applicable. Upon verification of the OPERABILITY of two independent steam supply flowpaths, restore the inoperable steam supply flowpath to OPERABLE status within 7 days of discovery, or place the affected Unit(s) in at least HOT STANDBY within 6 hours\* and in HOT SHUTDOWN within the following 6 hours.

\* If this ACTION applies to both units simultaneously, be in at least HOT STANDBY within the next 12 hours and in HOT SHUTDOWN within the following 6 hours.

- <sup>(1)</sup> One steam supply flowpath shall be OPERABLE in each AFW train and the third steam supply flowpath (via MOV-3-1404 for Unit 3 and MOV-4-1404 for Unit 4) shall be OPERABLE and aligned to either AFW train but not both simultaneously.
- <sup>(2)</sup> During single and two unit operation, one pump shall be OPERABLE in each train and the third auxiliary feedwater pump shall be OPERABLE and capable of being powered from, and supplying water to either train, except as noted in ACTION 3 of Technical Specification 3.7.1.2. The third auxiliary feedwater pump (normally the "C" pump) can be aligned to either train to restore OPERABILITY in the event one of the required pumps is inoperable.

## PLANT SYSTEMS

### AUXILIARY FEEDWATER SYSTEM

#### SURVEILLANCE REQUIREMENTS

---

4.7.1.2.1 The required independent auxiliary feedwater trains shall be demonstrated OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by:
  - 1) Verifying by control panel indication and visual observation of equipment that each steam turbine-driven pump operates for 15 minutes or greater and develops a flow of greater than or equal to 373 gpm to the entrance of the steam generators. The provisions of Specification 4.0.4 are not applicable for entry into MODES 2 and 3;
  - 2) Verifying by control panel indication and visual observation of equipment that the auxiliary feedwater discharge valves and the steam supply and turbine pressure valves operate as required to deliver the required flow during the pump performance test above;
  - 3) Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position; and
  - 4) Verifying that power is available to those components which require power for flow path operability.
- b. In accordance with the Surveillance Frequency Control Program by:
  - 1) Verifying that each automatic valve in the flow path actuates to its correct position upon receipt of each Auxiliary Feedwater Actuation test signal, and
  - 2) Verifying that each auxiliary feedwater pump receives a start signal as designed automatically upon receipt of each Auxiliary Feedwater Actuation test signal.

4.7.1.2.2 An auxiliary feedwater flow path to each steam generator shall be demonstrated OPERABLE following each COLD SHUTDOWN of greater than 30 days prior to entering MODE 1 by verifying normal flow to each steam generator.

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

TABLE 3.7-3 DELETED

|

**Attachment 3**

**Proposed Technical Specification Bases (markup)**

(3 pages follow)

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**ATTACHMENT 2**  
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3/4.7.1.2 Auxiliary Feedwater System

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total Loss-Of-Offsite Power. Steam can be supplied to the pump turbines from either or both units through redundant steam headers. Two D.C. motor operated valves and one A.C. motor operated valve on each unit isolate the three main steam lines from these headers. Both the D.C. and A.C. motor operated valves are powered from safety-related sources. Auxiliary feedwater can be supplied through redundant lines to the safety-related portions of the main feedwater lines to each of the steam generators. Air operated fail closed flow control valves are provided to modulate the flow to each steam generator. Each Steam Driven Auxiliary Feedwater Pump has sufficient capacity for single and two unit operation to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

INSERT A →

ACTION statement 2 describes the actions to be taken when both Auxiliary Feedwater Trains are inoperable. The requirement to verify the availability of both Standby Feedwater Pumps is to be accomplished by verifying that both pumps have successfully passed their surveillance tests within the last surveillance interval. The requirement to complete this action before beginning a unit shutdown is to ensure that an alternate feedwater train is available before putting the affected unit through a transient. If **NO** alternate feedwater trains are available, the affected unit is to stay at the same condition until an auxiliary feedwater train is returned to service, and then invoke ACTION statement 1 for the other train. If both Standby Feedwater Pumps are made available before one Auxiliary Feedwater Train is returned to an OPERABLE status, then the affected units shall be placed in at least HOT STANDBY within 6 hours and HOT SHUTDOWN within the following 6 hours.

**Two independent AFW trains, including three redundant steam supply flowpaths, three pumps (and associated steam turbines, trip and throttle (T&T) valves and governor valves) and their associated discharge water flowpaths, are required to be OPERABLE.**

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3/4.7.1.2 (Continued)

**one OPERABLE AFW pump is aligned to each AFW train and that all three steam supply flowpaths are OPERABLE.**

ACTION statement 3 describes the actions to be taken when a single Auxiliary Feedwater Pump is inoperable. The requirement to verify that two independent Auxiliary Feedwater Trains are OPERABLE is to be accomplished by verifying that ~~the requirements for Table 3.7-3 have been successfully met for each train within the last surveillance interval.~~ The provisions of Specification 3.0.4 are **NOT** applicable to the third auxiliary feedwater pump provided it has **NOT** been inoperable for longer than 30 days. This means that a units can change OPERATIONAL MODES during a unit's heatup with a single Auxiliary Feedwater Pump inoperable as long as the requirements of ACTION Statement 3 are satisfied.

**INSERT B** →

The specified flow rate acceptance criteria conservatively bounds the limiting AFW flow rate modeled in the single unit Loss of Normal Feedwater analysis. Dual unit events such as a two unit Loss of Offsite Power require a higher pump flow rate, but it is **NOT** practical to test both units simultaneously. The flow surveillance test specified in 4.7.1.2.1a.1 is considered to be a general performance test for the AFW system and does **NOT** represent the limiting flow requirement for AFW. Check valves in the AFW system that require full stroke testing under limiting flow conditions are tested under Technical Specification 4.0.5.

The testing of the Auxiliary Feedwater Pumps will verify their OPERABILITY. Proper functioning of the turbine admission valve and the operation of the pumps will demonstrate the integrity of the system. Verification of correct operation will be made both from instrumentation within the Control Room and direct visual observation of the pumps.

The frequencies of surveillance requirements 4.7.1.2.1a and 4.7.1.2.1b are controlled under the Surveillance Frequency Control Program.

## **INSERT A**

Note 1 describes the AFW system alignment(s) which ensure that three AFW steam supply flowpaths are OPERABLE. This is typically accomplished by aligning the SG/C steam supply flowpath (via MOV-3/4-1405) to train #1, the SG/A steam supply flowpath (via MOV-3/4-1403) to train #2, and the SG/B steam supply flowpath (via MOV-3/4-1404) to either train 1 or 2, but not both simultaneously.

Note 2 describes the AFW system alignment(s) which ensure that three AFW pumps are OPERABLE. This is typically accomplished by aligning the 'A' AFW pump to train 1, the 'B' AFW pump to train 2, and the 'C' AFW pump aligned to either train 1 or 2. The alignment applies during both single and dual Unit operation. The steam turbine, trip and throttle valve, and governor valve are support components for each AFW pump.

ACTION statement 1 describes the actions to be taken when one of the two required independent AFW trains is inoperable. Two redundant AFW trains must be OPERABLE in order to satisfy the design basis requirement that the AFW System meet the single failure criterion in response to a MSLB. The 72-hour ACTION statement for an inoperable AFW train is reasonable based on the redundant capabilities afforded by the AFW system, the time needed for repairs, and the low probability of a DBA occurring during this time period. Additionally, the 72-hour ACTION statement is consistent with the 72-hour completion time specified in TS 3.7.5 of NUREG-1431, Revision 4, for one inoperable AFW train.

## **INSERT B**

ACTION statement 4 describes the actions to be taken when a single steam supply flowpath is inoperable. Three AFW steam supply flowpaths must be operable in order to satisfy the design basis requirement that the AFW System meet the single failure criterion in response to a MSLB. Consistent with ACTION statement 3, four hours are available to verify the OPERABILITY of two independent steam supply flowpaths or otherwise ACTION statements 1 or 2 apply. Upon verification of the OPERABILITY of two steam supply flowpaths, seven days is allotted to restore the inoperable steam supply flowpath to OPERABLE status from the time of discovery. The seven day ACTION statement is less restrictive than the 72-hour ACTION statement for an inoperable AFW train but more restrictive than the 30-days allotted for an inoperable AFW pump. The consequences of an inoperable steam supply flowpath are more severe than for an inoperable AFW pump. With a MSLB with one AFW steam supply flowpath out of service not associated with the faulted loop, failure of the remaining operable steam supply flowpath would cause a loss of AFW System function. Additionally, the seven day ACTION statement is consistent with the 7-day completion time specified in TS 3.7.5 of NUREG-1431, Revision 4, for one inoperable turbine driven AFW pump steam supply flowpath.