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PR

May 22, 2001

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Waterford 3 SES
Docket No. 50-358
License No. NPF-38
Technical Specification Change Request NPF-38-232
Emergency Feedwater System

Gentlemen:

In accordance with 10CFR50.90, Entergy Operations, Inc. (Entergy) is hereby proposing to amend Operating License NPF-38 for Waterford 3 by requesting the attached changes to the Technical Specifications. This submittal requests a change to Technical Specification 3.7.1.2 and Surveillance Requirement 4.7.1.2 for the Emergency Feedwater System. This technical specification change request expands and clarifies the current specification. A proposed change to Technical Specification Bases 3/4.7.1.2 has been included for information only in support of this change.

This change was previously submitted via letters dated May 28, 1998, January 31, 2000, and July 27, 2000 and withdrawn via letter dated September 20, 2000 (reference TAC No. MA2189). This resubmittal revises previously proposed actions b, c, and d and adds new actions to better address the various combinations of inoperable equipment.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that this change involves no significant hazards considerations. The bases for these determinations are included in the attachment to this submittal.

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Entergy Operations, Inc. requests that the effective date for this Technical Specification change to be within 60 days of approval. Although this request is neither exigent nor emergency, your prompt review is requested.

The proposed change introduces no new commitments. Should you have any questions or comments concerning this request, please contact D. Bryan Miller at (504) 739-6692.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 22, 2001.

Very truly yours,

J. T. Herron
Vice President, Operations
Waterford 3

JTH/dbm/cbh
Attachment

cc: w/Attachment
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N. Kalyanam, NRC-NRR
J. Smith
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NRC Resident Inspectors Office
Louisiana DEQ/Surveillance Division
American Nuclear Insurers

ATTACHMENT

TO

W3F1-2001-0049

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

NPF-38

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

DESCRIPTION OF PROPOSED CHANGES

The proposed change modifies Technical Specification 3.7.1.2 and Surveillance Requirement 4.7.1.2 for the Emergency Feedwater (EFW) System. This change expands and clarifies the Specification by:

- Rewording the Limiting Condition for Operation (LCO) to require "three emergency feedwater (EFW) pumps and two flow paths" OPERABLE and moving specific pump descriptions to the Bases.

- Including new ACTION "a" to address EFW steam supply system inoperability similar to specification 3.7.5, Auxiliary Feedwater (AFW) System in NUREG-1432, Standard Technical Specifications Combustion Engineering Plants.

- Adding a new ACTION "b" to address EFW steam supply system inoperability concurrent with motor-driven EFW pump inoperability. This ACTION covers an inoperable steam supply concurrent with one inoperable motor-driven pump.

- Adding a new ACTION "c" to address EFW steam supply system inoperability concurrent with motor-driven EFW pump inoperability. This ACTION covers an inoperable steam supply concurrent with two inoperable motor-driven pumps.

- Revising old ACTION "a" to new ACTION "d" to address EFW system inoperability. This ACTION covers inoperable flow paths (capable of delivering 100% flow to either steam generator) in addition to inoperable pumps provided the OPERABLE pumping capacity is equal to or greater than 100% of the required EFW flow.

- Revising old ACTION "b" to new ACTION "e" to address EFW system inoperability. This ACTION covers inoperable flow paths (capable of delivering 100% combined flow to the steam generators) in addition to inoperable pumps provided the OPERABLE pumping capacity is equal to or greater than 100% of the required EFW flow.

- Revising old ACTION "c" to new ACTION "f" " to address EFW system inoperability. This ACTION covers inoperable flow paths (unable to provide 100% combined flow) in addition to inoperable pumps when the OPERABLE pumping capacity is less than 100% of the required EFW flow.

- Reformatting and rewording Surveillance Requirement "a" similar to NUREG-1432.

- Revising Surveillance Requirement "b" to remove test specific acceptance criteria, specify EFW pumps be demonstrated OPERABLE pursuant to Specification 4.0.5, and replace the 4.0.4 exception with the applicable exception from NUREG-1432.

- Revising Surveillance Requirement "c" to remove the words "during shutdown," change "...emergency feedwater actuation test signal" to "...actual or simulated actuation signal," and add the applicable exception from NUREG-1432 for turbine-driven EFW pump related testing. These changes are all similar to NUREG-1432.

- Revising and rewording Surveillance Requirement "d" to require performance prior to entering Mode 2 and deleting the Specification 4.0.4 exception similar to NUREG-1432.

Proposed Technical Specification Bases 3/4.7.1.2 changes, using NUREG-1432 as guidance, are included in this submittal for information only.

BACKGROUND

The EFW system automatically supplies feedwater to the steam generators to remove heat from the Reactor Coolant System (RCS) upon loss of the normal feedwater supply. The EFW pumps take suction from a common suction header, which is supplied by two separate and independent lines from the condensate storage pool, and discharge to a common discharge header. From the common discharge header, EFW is supplied to the secondary side of the steam generator via separate and independent connections to the main feedwater piping outside containment. The steam generators function as a heat sink for core decay heat, reactor coolant pump heat, and other residual heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves or atmospheric dump valves. If the main condenser is available, steam may be released via the steam bypass valves.

The EFW system consists of two (50% capacity) motor-driven pumps, one (100% capacity) steam turbine-driven pump, and two diverse flow paths. (Refer to page 14, Figure 1, EFW Simplified Flow Path.) One flow path supplies steam generator 1 and the second flow path supplies steam generator 2. A flow path consists of piping, valves, and components from the common pump discharge header through two parallel legs to the respective steam generator. Each parallel leg contains a flow control valve and an isolation valve in series. Either of the two parallel legs in a steam generator flow path is capable of supplying 100% of the flow required for the heat removal safety function. One flow path supplying one steam generator is capable of cooling the unit to shutdown cooling entry conditions. Two independent suction paths exist between the Condensate

Storage Pool (CSP) and the EFW common pump suction header. Each suction path alone can supply enough flow to assure sufficient net positive suction head for all three EFW pumps.

Each motor-driven EFW pump is powered from an independent Class 1E power supply. The motor-driven EFW pumps supply a common discharge header that is connected to each steam generator flow path. Each motor-driven EFW pump is capable of feeding either steam generator.

The EFW pump-turbine receives steam from both main steam headers upstream of the main steam isolation valves (MSIV). Each of the steam feed lines will supply 100% of the requirements of the EFW pump-turbine. The turbine-driven EFW pump supplies the common discharge header that is connected to each steam generator flow path. The turbine-driven EFW pump is capable of feeding either steam generator.

As stated above, each steam generator flow path contains two parallel flow legs either of which is capable of supplying 100% of the flow required for the heat removal safety function. The flow paths contain DC powered, pneumatic, flow control and isolation valves actuated to provide flow to the appropriate steam generator by the Emergency Feedwater Actuation Signal (EFAS). Each parallel leg contains a flow control valve and an isolation valve in series. These valves are fail-open pneumatic valves. Safety-related nitrogen accumulators serve as a backup to the instrument air system for these valves. Each nitrogen accumulator supplies a pair of EFW valves (a flow control valve in one leg and the isolation valve in the redundant parallel leg of the same flow path).

The EFW system is capable of delivering sufficient flow for heat removal and to reduce the RCS temperature to a point at which shutdown cooling may be placed into service. The EFW System is operated whenever an EFAS is generated or it is manually actuated, during surveillance testing, and infrequently during shutdown conditions to fill the steam generators. The non-safety related auxiliary feedwater system supplies feedwater to the steam generators during normal unit startup, shutdown, and hot standby conditions.

The EFW System is actuated automatically on low steam generator level by the EFAS. The EFAS logic is designed to feed either or both steam generators with low levels. The Main Steam Isolation System (MSIS) in conjunction with EFAS will isolate the EFW System from a steam generator having a significantly lower steam pressure than the other steam generator to ensure EFW is supplied only to an intact steam generator. The EFAS automatically actuates the EFW pumps and associated valves and controls when required to ensure an adequate feedwater supply to the steam generators.

A concern was raised at Waterford 3 over the need to enter Technical Specification ACTION 3.7.1.2.a when a steam supply to the turbine-driven EFW pump is either out of service or inoperable. The current Technical Specification Limiting Condition for Operation (LCO) requires that the pump be "capable of being powered from an OPERABLE steam supply system." Because there are separate steam supplies (one from each steam generator), a literal application of the Technical Specification resulted in not entering the Technical Specification ACTION when only one steam supply was either out of service, or inoperable. The cause of this event was the misleading wording in Technical Specification LCO 3.7.1.2.b. This event was described in Licensee Event Report (LER) 1996-002-00. In LER 1996-002-00, Waterford 3 committed to adopt an EFW Technical Specification similar to that in NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants."

On September 25, 1996, it was identified that testing performed may not have conclusively demonstrated the normal flow path from the condensate storage pool through each EFW pump to each of the steam generators was available, as required by Surveillance Requirement 4.7.1.2.d. Although this condition was deemed not to be reportable, it represented a weakness in the Waterford 3 EFW Technical Specification and Bases.

On November 12, 1996, an issue was raised concerning the EFW flow control and isolation valves. Upcoming testing required the respective nitrogen accumulators be isolated from these valves. Technical Specification 3.7.1.2 did not clearly specify the ACTION to be entered with these EFW valves inoperable. While the Technical Specification discussed pumps and flow paths in the LCO, it only provides ACTIONs for inoperable pumps. The flow paths are not readily associated with individual pumps or trains.

Work was initiated in 1997 to revise the EFW Technical Specification to address the events described above. Due to the unique design of Waterford's EFW system and complexity of the change the submittal was not submitted to the NRC Staff for review until May 1998. Following a late 1999 meeting between Entergy personnel and the NRC Staff to discuss the change request a revised submittal was provided to the Staff in January 2000 addressing concerns raised during the meeting. Following additional reviews and a request for additional information by the NRC Staff in 2000 the Staff recommended the action statements be reworded in more generic (flow capability) terminology. Due to the age of the submittal and the magnitude of the recommended change Entergy withdrew the change request in September 2000.

BASIS FOR PROPOSED CHANGE

The OPERABILITY of EFW ensures that the RCS can be cooled down to shutdown cooling entry conditions from normal operating conditions in the event of a loss of feedwater. The OPERABILITY of EFW also ensures this function is performed in the event of a design basis accident assuming a single active failure.

The design basis of the EFW system is to supply water to the steam generator to remove decay heat, reactor coolant pump heat, and other residual heat by delivering at least the minimum required flow rate to the steam generators at pressures corresponding to the lowest main steam safety valve set pressure plus 3% (1102 psig). The accident analysis requires an EFW flow of 575 gpm be delivered to the intact steam generator at a pressure of 1102 psig within the appropriate time. The two motor-driven pumps combined or the turbine-driven pump alone are capable of supplying 575 gpm (100% of the required EFW flow) to the steam generators at 1102 psig.

Limiting Condition for Operation

The current Waterford 3 Technical Specification LCO requires that three EFW pumps and associated flow paths be OPERABLE. Due to the unique Waterford 3 EFW design, flow paths are not readily associated to a pump or train. This LCO is being revised to require that three pumps and two flow paths be OPERABLE. It is proposed that pump specific details be relocated to the Bases and reworded to eliminate the misleading wording concerning "OPERABLE steam supply system". This will ensure that the EFW system will perform its design safety function to mitigate the consequences of events that assume a loss of feedwater. This will also ensure that EFW will perform its design safety function during design basis accidents assuming a single active failure. This change to the LCO is considered to be administrative. Further, it is proposed that the Bases be expanded to include a definition of the flow paths and an explanation of the LCO, ACTIONs, and Surveillance Requirements similar to that contained in NUREG-1432.

Action Statements

ACTION "a"

New ACTION "a" provides more explicit requirements relative to the steam supplies for the turbine-driven pump and clarifies the need to have both steam supplies OPERABLE. This ACTION allows one of the two steam supplies to be inoperable for up to 7 days in accordance with NUREG-1432. This change is less restrictive in comparison to the implementation of the current Technical

Specification; however, the 7 day completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, the availability of redundant OPERABLE motor-driven EFW pumps, and the low probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

ACTION "b"

New ACTION "b" has been added to address the situation when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with one motor-driven EFW pump being inoperable provided the flow paths are able to deliver at least 100% flow to their respective steam generator. One of the primary bases for allowing a 7 day completion time for an inoperable steam supply for the turbine-driven EFW pump steam turbine is the operability of both motor-driven EFW pumps. While in this ACTION the EFW system is able to support a cooldown of the RCS to SDC entry conditions but may not be able to mitigate all design basis accidents. Due to the seriousness of this condition the completion time will be limited to 24 hours when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with one motor-driven EFW pump being inoperable. This change is less restrictive in comparison to the implementation of the current Technical Specification; however the 24 hour completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, an OPERABLE motor-driven EFW pump, and the low probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

Existing emergency operating procedures (EOP) address the unlikely event of a loss of all feedwater. These EOPs would also be applicable in the unlikely event of an unisolable Main Steam Line Break (MSLB) or Feedwater Line Break on the steam generator associated with the operable steam supply. These procedures call for efforts to first be directed to manually initiating EFW or establishing EFW by manual means to at least one steam generator. If EFW can not be established efforts are made to start a steam generator feedwater pump. If EFW or main feedwater cannot be restored to at least one steam generator efforts are directed to establishing a low pressure source of feedwater via the condensate pumps. This requires the pressure in one steam generator be reduced to below the shutoff head of the condensate pumps. Depressurization is done at the maximum controllable rate in order to regain flow as quickly as possible. During these efforts the operator is directed to operate charging pumps and start high pressure safety injection pumps as necessary to maintain RCS inventory during the cooldown.

ACTION "c"

New ACTION "c" has been added to address the situation when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with both motor-driven EFW pumps being inoperable. Due to the seriousness of this condition, the ACTION requires the unit be placed in HOT STANDBY in 6 hours and in HOT SHUTDOWN within the following 6 hours. This change is considered to be more restrictive then the current Technical Specification. The intent of the current Technical Specifications (existing ACTION "c") would prohibit all MODE changes when all three EFW pumps are inoperable. This change is acceptable because the EFW system is capable of cooling the RCS to SDC entry conditions following a loss of normal feedwater assuming no single active failure.

ACTION "d"

The ACTION for one pump inoperable (existing ACTION "a") has been revised (proposed ACTION "d") to specify with the EFW system inoperable for reasons other than those described in new ACTIONs "a", "b", or "c", and able to deliver at least 100% flow to either steam generator. This ACTION now addresses inoperable flow paths (capable of delivering 100% flow to either steam generator) in addition to inoperable pumps (capable of providing 100% flow). This ACTION requires that the ability to provide 100% flow to both steam generators be maintained. This ACTION provides a 72 hour completion time for an inoperable pump or pumps provided the operable pumps or pump can provide 100% of the required EFW flow. This ACTION also allows a 72 hour completion time for inoperable flow paths provided the inoperable flow path or paths are capable of delivering 100% of the required EFW flow to their respective steam generators. The 72 hour completion time is reasonable based on the redundant capabilities afforded by the EFW system, the time needed for repairs, and the low probability of a design basis event occurring during this period. This change is less restrictive in comparison to the current Technical Specification but is acceptable based on the ability of the EFW system to provide 100% of the required EFW flow to either steam generator. While in this ACTION the EFW system is capable of cooling the RCS to SDC entry conditions following a design basis accident assuming no single active failure. This is consistent with NUREG-1432 and other Technical Specifications that allow one train to be inoperable for extended periods.

The risk associated with both motor-driven EFW pumps being inoperable for 72 hours is comparable to the risk associated with having the turbine-driven EFW pump inoperable for 72 hours which is allowed by the current Technical Specifications. In accordance with the Configuration Risk Management Program, the voluntary removal of both motor-driven EFW pumps from service at the same time would require Duty Plant Manager approval and is considered unlikely. As

stated above, even with both motor-driven EFW pumps inoperable the EFW system would be capable of supporting a cooldown of the RCS to SDC entry conditions following a design basis accident assuming no single active failure.

Inoperable Flow Path

A risk analysis has been performed which supports a 72 hour completion time for an inoperable flow path in which one of the two flow legs is incapable of passing any flow and shows it is risk insignificant due to the low probability of having an event requiring the inoperable flow path during this 72 hour period. The change in core damage frequency resulting from a condition where a flow control valve is inoperable and closed for 72 hours is less than 1E-9.

Due to the diverse design of the steam generator flow paths, an inoperable flow path or paths may still be capable of delivering 100% of the required EFW flow to the respective steam generator due to the fail open design of the EFW valves and the redundant parallel legs in each flow path. The capability of one flow path to supply 100% of the required EFW flow remains available with any single flow control or isolation valve inoperable, a nitrogen accumulator inoperable, or a loss of one train of direct current (DC) power in any flow path. The design of the flow control and isolation valves in the flow path is to fail open on a loss of power or motive force (motive force is provided by instrument air and/or nitrogen). If a single valve in the flow path is inoperable (for example, mechanical binding), the valves in the associated parallel leg of the same flow path will ensure 100% flow capability remains available to supply the associated steam generator. The ability of the flow paths to perform their function with either the failure of instrument air or nitrogen to a single valve in either or both flow paths will be maintained in that redundant valves will respond to EFW logic to isolate the faulted steam generator and to supply the intact steam generator. If a flow control valve is inoperable and failed open, operator action may be required to prevent overfilling the intact steam generator.

Inoperable Nitrogen Accumulator with Loss of Off-site Power

An inoperable nitrogen accumulator will result in an isolation valve in one leg and the flow control valve in the parallel leg of a single flow path to lose the availability of nitrogen as the backup motive force for positioning the valves. Under this condition the isolation valve would be closed as required by Technical Specification 3.6.3, "Containment Isolation Valves." If a loss of off-site power occurs during this time the primary motive force (instrument air) for positioning the valves will be unavailable. This results in the flow control valve in the parallel leg with the operable isolation valve failing to the open position. During an emergency feedwater demand event under these conditions both the flow control and isolation valves in one parallel leg of the flow path to a steam generator would

be full open resulting in the potential for overfilling the steam generator. To assess the significance of this condition, an evaluation was performed to determine the time required to fill the steam generator. Instead of attempting to specify certain events and determining the maximum EFW flow rates, the evaluation determined steam generator fill rates over a range of steam generator operating pressures. Therefore, the results are not dependent upon a specific event, but provide conservative and bounding steam generator fill rates based on steam generator pressure.

The results of the evaluation provided steam generator fill rates for a range of steam generator pressures from atmospheric to 1000 psig. The shortest time to fill the steam generator was following an EFAS at a steam generator pressure of 200 psig. For the case of the loss of off-site power, the steam generator pressure would remain near normal operating pressures and therefore steam generator fill would take longer. As determined in accordance with ANSI/ANS-58.8-1984, the range for operator action times for these two cases allow credit for manual operator action during these events.

The range of operator action times were determined in accordance with and evaluated against the recommendations of ANSI/ANS-58.8-1984. The evaluation included the following conservatisms:

- The EFW flow rate to one steam generator was based on three EFW pumps injecting through both parallel flow legs in the flow path instead of just the one open flow leg. With one parallel leg isolated, the actual flow rate would be less.

- The EFW was assumed to be at its minimum temperature and increased to the steam generator saturation temperature.

- No credit was taken for initial steam generator level reducing below the EFAS actuation setpoint which would provide additional volume to fill before reaching the steam generator outlet nozzle.

This comparison is based on one operator action in the control room to close the open isolation valve. An equipment process delay time of 30 seconds for the isolation valve to close is conservatively used. Plant Condition 3 was chosen as a reasonable value to provide this comparison. Although Plant Conditions in ANSI/ANS-58.8-1984 are based upon the frequency of occurrence, allowance can be made for operator familiarity. The frequency of occurrence for the conditions evaluated in this response are considered very low, especially when postulating a loss of off-site power, feedwater line break, or main steam line break concurrent with operation within the 72 hour action statement of the proposed Technical Specification. Adequate training and procedural guidance is

provided to plant operators to ensure that an overfill event does not occur. Additionally, several alarms and indications are available to the operator in addition to the credited High Steam Generator Level pre-trip alarm to alert the control room operator to excess flow to a steam generator. These include Steam Generator Level alarms (EFAS), EFW high flow alarms, and steam generator level indications. Further, in the events discussed, the operator would be aware of the system degradation (i.e., inoperable accumulator) and would be able to anticipate the potential level control problem on the loss of instrument air.

In addition to overfill of the steam generator, the potential impact on core reactivity during a MSLB with maximum EFW flow to a single steam generator was evaluated. Maximum EFW flow is assumed to be delivered to the intact steam generator during a MSLB to maximize the RCS cooldown. The resultant total positive reactivity addition (assuming a negative moderator temperature coefficient) attributed to the maximum EFW flow concurrent with the MSLB event was negligible as compared to the positive reactivity which would be added by blowdown of the steam generator.

The effect on structural integrity of a cooldown due to maximum EFW flow on reactor coolant system components would be bounded by the cooldown attributed to a MSLB. In either event an engineering evaluation to determine the effects of the excessive cooldown on the structural integrity of the reactor coolant system is required prior to exceeding 200°F and 500 psia on a startup after the event. This requirement is located in the Technical Specification 3.4.8.1, "Reactor Coolant System Pressure/Temperature Limits."

ACTION "e"

The ACTION for two pumps inoperable (existing ACTION "b"), has been revised (proposed ACTION "e") to specify with the EFW system inoperable for reasons other than those described in new ACTIONs "a", "b", or "c" and able to deliver at least 100% flow to the steam generators. This ACTION primarily addresses flow path inoperability when the system no longer has the ability to provide 100% of the required EFW flow to one or both steam generators. For example, with one flow path inoperable and not able to provide 100% flow to its respective steam generator this ACTION would be entered. Similarly, if both flow paths were inoperable and one of the inoperable flow paths could provide 100% of the required EFW flow to its respective steam generator this ACTION would be entered. Also, if both flow paths were inoperable and neither could provide 100% of the required EFW flow to its respective steam generator but together they could provide 100% of the required EFW flow to the steam generators (e.g., 50% to one and 50% to the other (or some combination equaling 100%)) this ACTION would be entered. While in this ACTION the EFW system is able to support a cooldown of the RCS to SDC entry conditions but may not be able to mitigate a

main steam line break or feedwater line break accident. Due to the seriousness of this condition, the ACTION requires the unit be placed in HOT STANDBY in 6 hours and in HOT SHUTDOWN within the following 6 hours. This change is considered to be more restrictive due to the immediate shutdown requirement for the inoperable flow path that is not able to provide 100% flow.

ACTION "f"

The ACTION for three pumps inoperable (existing ACTION "c") has been revised (proposed ACTION "f") to specify with the EFW system inoperable and unable to deliver 100% flow to the steam generators. With only one 50% capacity motor-driven EFW pump OPERABLE or two flow paths inoperable such that they are not capable of delivering 100% combined flow to the steam generators the unit is in a seriously degraded condition. While in this ACTION the EFW system would be unable to provide the required flow to the steam generators to cool the RCS to SDC entry conditions if called upon. This ACTION requires immediate action be taken to restore the ability to provide 100% of the required EFW flow to the steam generators. Also, it is proposed to clarify that Technical Specification ACTIONs requiring MODE changes are suspended, until the EFW system is capable of delivering 100% flow to the steam generators combined, which is similar to a note in NUREG-1432. This change is consistent with the intent of the current EFW Technical Specification and is considered to be an administrative change.

Surveillance Requirements

The Surveillance Requirements were revised, in most cases, to be more consistent with NUREG-1432, allowing flexibility in testing, and clarifying the applicable modes by which the specified Surveillance Requirement must be performed.

Surveillance Requirement "a"

Existing Surveillance Requirement "a" is being reworded and reformatted to be consistent with NUREG-1432. The intent of proposed Surveillance Requirement "a" continues to be to verify all valves not locked, sealed, or otherwise secured in position are in their correct position once per 31 days. This is considered to be an administrative change.

Surveillance Requirement "b"

Existing Surveillance Requirement "b" requires that a single flow point be verified for each EFW pump to ensure pump performance has not degraded below the point where it is capable of performing its safety function. Proposed Surveillance

Requirement "b" is revised to test the EFW pumps pursuant to Specification 4.0.5. Specification 4.0.5 invokes the Inservice Test Program in accordance with Section XI of the ASME Boiler and Pressure Vessel Code. Specific pump acceptance criteria will also be deleted from the Surveillance Requirement in accordance with NUREG-1432. This is considered to be an administrative change and is acceptable because testing pursuant to the Inservice Test Program will continue to ensure pump performance has not degraded below the point where it is capable of performing its safety function.

Proposed Surveillance Requirement "b" has also been modified by the removal of the exception from Technical Specification 4.0.4 provisions and the addition of the applicable exception for this Specification extracted from NUREG-1432. The current exception from the provisions of Specification 4.0.4 allows entry into the mode of applicability (MODE 3) without completion of the Surveillance Requirement. This exception is necessary because some post maintenance activities which may need to be completed prior to performing this Surveillance Requirement can not be completed until the unit is heated up sufficiently to establish the required steam generator pressure or suitable test conditions. The addition of the requirement to have the Surveillance Requirement completed within 24 hours after reaching a steam generator pressure of 750 psig clarifies the existing exception so that future interpretation of these requirements will no longer be necessary. Twenty-four (24) hours is considered to be adequate time for completing post maintenance activities (such as the dynamic calibration of the speed control unit) and the surveillance test on the turbine-driven EFW pump. Additional clarification of the proposed 24 hour grace period has been added to the Bases. The Bases clarifies that this grace period is applicable for both Section XI testing and any other required post maintenance activities on the turbine-driven pump which require steam generator pressures achievable only after entering MODE 3. This is considered to be an administrative change since this clarification is consistent with the current Waterford 3 interpretation of this Surveillance Requirement and the 4.0.4 exception.

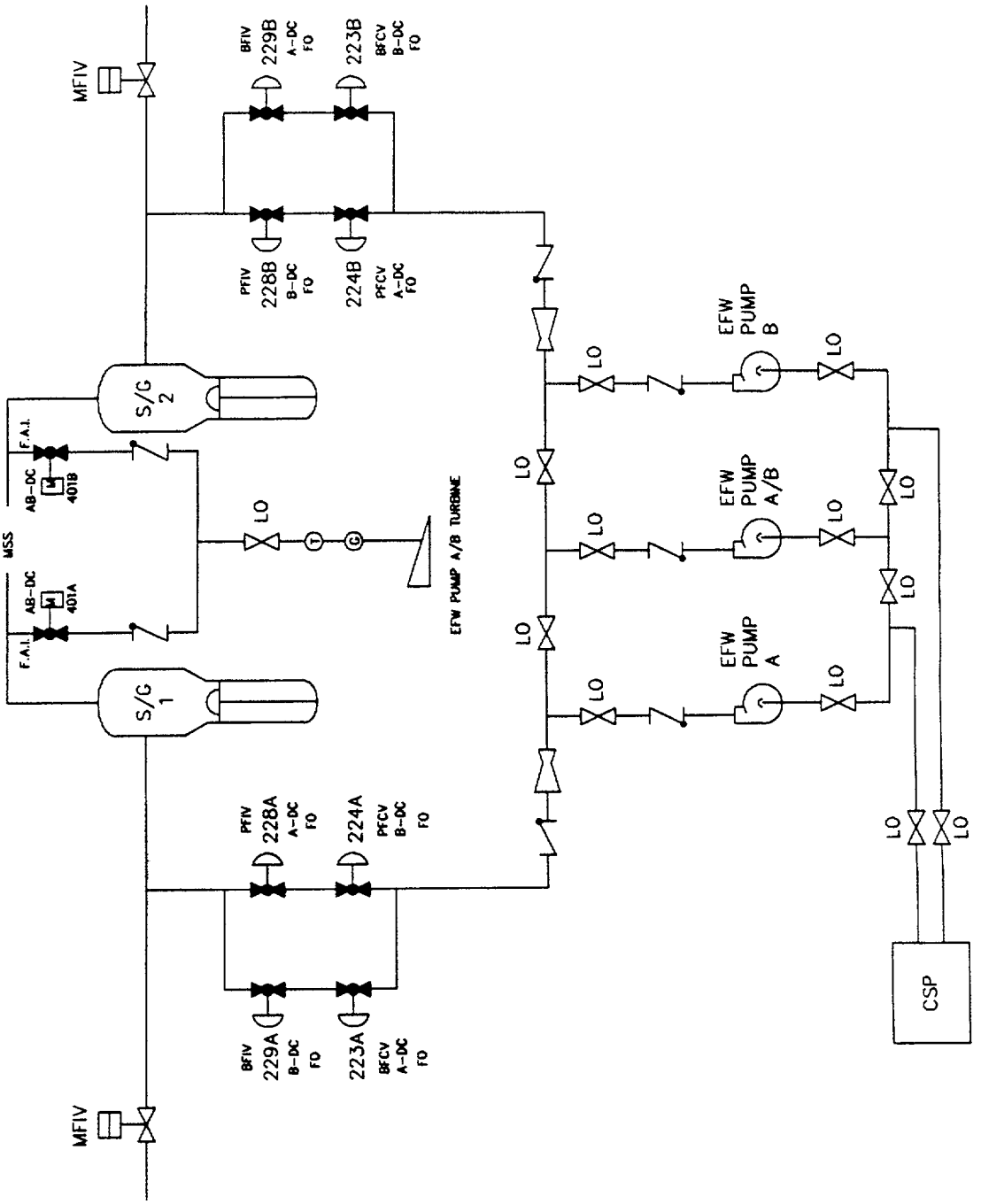
Surveillance Requirement "c"

Existing Surveillance Requirement "c" has been revised to be consistent with NUREG-1432. The provision to perform the Surveillance Requirement only while shutdown has been deleted to allow performance during any MODE. The applicable exception from NUREG-1432 has been added to permit the unit to transition from MODE 4 to MODE 3 prior to completing the required testing related to the turbine-driven pump. Additionally, a note has been added clarifying that testing must be completed within 24 hours of reaching 750 psig. The wording in items 1 and 2 has been changed from, "... upon receipt of an emergency feedwater actuation test signal" to "... upon receipt of an actual or

simulated actuation signal." These changes provided increased flexibility and clarify the MODEs by which testing must be completed. While less restrictive in comparison to the current Technical Specification, these changes are acceptable because testing in accordance with the proposed Surveillance Requirement will continue to ensure the EFW system will respond appropriately upon receipt of an actual actuation signal.

Surveillance Requirement "d"

Existing Surveillance Requirement "d" has also been revised to be consistent with NUREG-1432. The proposed Surveillance Requirement continues to verify EFW system alignment following extended outages or whenever feedwater cleaning through the EFW line has been performed. The proposed Surveillance Requirement requires this verification to be completed prior to entry into MODE 2. While this is less restrictive in comparison to the current Technical Specification, it is acceptable because EFW system alignment will continue to be verified before sufficient core heat is generated.



EFW SIMPLIFIED FLOW PATH
(FIGURE 1)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Energy Operations, Inc. is proposing that the Waterford 3 Operating License be amended to revise Technical Specification 3/4.7.1.2, Emergency Feedwater System. Revisions include clarification of the LCO, a 7 day allowed outage time for an inoperable steam supply, revised ACTION requirements to cover inoperable flow path(s) in addition to inoperable pumps, a requirement to test the pumps pursuant to Specification 4.0.5, and rewording of numerous Surveillance Requirements consistent with NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants."

An evaluation of the proposed change has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR50.92(c). A discussion of these standards as they relate to this amendment request follows:

1. **Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The administrative and more restrictive changes will not affect the assumptions, design parameters, or results of any accident previously evaluated. The accident mitigation features of the plant are not affected by these proposed changes. The proposed changes do not add or modify any existing equipment. The administrative change to test EFW pumps pursuant to the Inservice Test Program will ensure the EFW pumps are tested against the more restrictive of the data points required by either the safety analysis or the Inservice Test Program. Therefore, the proposed administrative changes do not involve a significant increase in the probability or consequences of any accident previously evaluated.

   The less restrictive changes (allowing 7 days for an inoperable pump due to an inoperable steam supply, allowing 24 hours for an inoperable steam supply and one inoperable motor driven EFW pump, allowing 72 hours for two inoperable motor driven EFW pumps, performing Surveillance Requirements during other than shutdown conditions, allowing the use of actual actuation signals in addition to test signals, and delaying the requirement to complete Surveillance Requirement "d" to just prior to Mode 2) will not affect the assumptions, design parameters, or results of any accident previously evaluated. The accident mitigation features of the plant are not affected by these proposed changes. The proposed changes do not add or modify any existing equipment. Therefore, the proposed less restrictive changes do not involve a significant increase in the probability or consequences of any accident previously evaluated.

Therefore, this change does not involve a significant increase in the probability of consequences of any accident previously evaluated.

2. **Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed changes do not alter the design or configuration of the plant. There has been no physical change to plant systems, structures, or components. The proposed changes will not reduce the ability of any of the safety-related equipment required to mitigate Anticipated Operational Occurrences or accidents.

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

3. **Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?**

   The proposed change to the LCO requiring three pumps and two flow paths be OPERABLE maintains the functionality of the EFW such that it is capable of performing its design function as assumed in the Final Safety Analysis Report. If the functionality of the system is not maintained, Technical Specifications require ACTIONs be taken, within specified time limitations, to restore EFW to OPERABLE status or shutdown the reactor. This action is consistent with the existing Technical Specification and NUREG-1432.

   The allowed outage time for one inoperable steam supply has been increased from 72 hours to 7 days in accordance with NUREG-1432. This is acceptable due to the redundant OPERABLE steam supply, the availability of redundant OPERABLE motor-driven EFW pumps, and the low probability of an event requiring the inoperable steam supply. This change is consistent with NUREG-1432 and has therefore been previously approved by the NRC.

   The ACTION for an inoperable steam supply to the turbine-driven EFW pump steam turbine concurrent with one motor-driven EFW pump being inoperable will allow a 24 hour completion time. This change is acceptable based on the ability of the system to cool the reactor coolant system to shutdown cooling entry conditions following a loss of normal feedwater. The 24 hour completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, the OPERABLE motor-driven EFW pump, and the low

probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

The ACTION for an inoperable steam supply to the turbine-driven EFW pump steam turbine concurrent with both motor-driven EFW pumps being inoperable as proposed requires a unit shutdown be initiated immediately. This change is appropriate due to the seriousness of the condition and is acceptable due to the ability of the EFW system to support the unit shut down.

The ACTION for the EFW system inoperable for reasons other than those described in ACTION (a), (b), or (c) and able to deliver at least 100% flow to either steam generator as proposed will allow a 72 hour completion time. This change is acceptable based on the ability of the system to cool the RCS to SDC entry conditions following a design basis accident assuming no single active failure.

The ACTION for the EFW system inoperable for reasons other than those described in ACTION (a), (b), or (c) and able to deliver at least 100% combined flow to the steam generators as proposed requires a unit shutdown be initiated immediately. This change is appropriate due to the seriousness of the condition and is acceptable due to the ability of the EFW system to support the unit shut down.

The ACTION for the EFW system inoperable and unable to deliver at least 100% flow to the steam generators as proposed requires immediate action be taken to restore the ability to deliver at least 100% flow to the steam generators. The unit is in a seriously degraded condition in that the EFW system is unable to support a unit shutdown. This change is consistent with the intent of the current EFW Technical Specification and NUREG-1432.

Testing pursuant to Specification 4.0.5 (Inservice Testing Program) as proposed for Surveillance Requirement 'b' will ensure the EFW pumps are tested against the more restrictive of the data points required by either the safety analysis or ASME Section XI.

The remaining changes to the EFW Technical Specification are consistent (other than format) with NUREG-1432 and have therefore been previously approved by the NRC.

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

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, Entergy Operations has determined that the requested change does not involve a significant hazards consideration.

ENVIRONMENTAL IMPACT EVALUATION

Pursuant to 10CFR51.22(b), an evaluation of the proposed amendment has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10CFR 51.22 (c) (9) of the regulations. The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.

2. This change does not result in a significant change or significant increase in the radiological doses for any Design Basis Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.

3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because this change does not modify the system or the manner in which the system is operated.

MARKUP OF CURRENT TECHNICAL SPECIFICATIONS

PLANT SYSTEMS

EMERGENCY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

(EFW)

3.7.1.2 At least three ~~independent steam generator~~ emergency feedwater pumps and ~~associated~~ flow paths shall be OPERABLE ~~with~~:

two

a. Two feedwater pumps, each capable of being powered from separate OPERABLE emergency busses, and

b. One feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

INSERT TS 3.7.1.2 ACTIONS

a. With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two emergency feedwater pumps inoperable be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three emergency feedwater pumps inoperable, immediately initiate corrective action to restore at least one emergency feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 The emergency feedwater system shall be demonstrated OPERABLE:

a. At least once per 31 days by ← INSERT SR 4.7.1.2.a

1. Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 92 days on a STAGGERED TEST BASIS by ← INSERT SR 4.7.1.2.b

1. Verifying that each motor-driven pump develops a discharge pressure of greater than or equal to 1298 psig on recirculation flow.

2. Verifying that the turbine-driven pump develops a discharge pressure of greater than or equal to 1342 psig on recirculation flow when the steam generator pressure is greater than 750 psig. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

PLANT SYSTEMS

INSERT 4.7.1.2.c NOTE

SURVEILLANCE REQUIREMENTS (Continued)

c. At least once per 18 months during shutdown by:

1. Verifying that each automatic valve in the flow path actuates to its correct position upon receipt of an emergency feedwater actuation test signal. (EFW) actual or simulated

2. Verifying that each pump starts automatically upon receipt of an emergency feedwater actuation test signal.

d. Following any cold shutdown of 30 days or longer or whenever feedwater line cleaning through the emergency feedwater line has been performed, by verifying, by means of a flow test, the normal flow path from the condensate storage pool through each emergency feedwater ump to each of the steam generators. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 for the turbine-driven pump.

INSERT 4.7.1.2.d

INSERT TS 3.7.1.2 ACTIONs

a. With one steam supply to the turbine-driven EFW pump inoperable, restore the steam supply to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one steam supply to the turbine-driven EFW pump and one motor-driven EFW pump inoperable and the EFW flow paths able to deliver at least 100% flow to their respective steam generators, restore the steam supply or motor-driven EFW pump to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With one steam supply to the turbine-driven EFW pump and both motor-driven EFW pumps inoperable and the EFW flow paths able to deliver at least 100% flow to their respective steam generators, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. With the EFW system inoperable for reasons other than those described in ACTION (a), (b), or (c), and able to deliver at least 100% flow to either steam generator, restore the EFW system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

e. With the EFW system inoperable for reasons other than those described in ACTION (a), (b), or (c), and able to deliver at least 100% combined flow to the steam generators, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

f. With the EFW system inoperable and unable to deliver at least 100% combined flow to the steam generators, immediately initiate action to restore the ability to deliver at least 100% combined flow to the steam generators. LCO 3.0.3 and all other LCO ACTIONs requiring MODE changes are suspended until the EFW system is capable of delivering at least 100% combined flow to the steam generators.

INSERT SR 4.7.1.2.a

verifying that each manual, power-operated, and automatic valve in each water flow path and in both steam supply flow paths to the turbine-driven EFW pump steam turbine, that is not locked, sealed, or otherwise secured in position, is in its correct position.

INSERT SR 4.7.1.2.b

testing the EFW pumps pursuant to Specification 4.0.5. This surveillance requirement is not required to be performed for the turbine-driven EFW pump until 24 hours after exceeding 750 psig in the steam generators.

INSERT SR 4.7.1.2.c NOTE

NOTE: This surveillance requirement is not required to be performed for the turbine-driven EFW pump until 24 hours after exceeding 750 psig in the steam generators.

INSERT SR 4.7.1.2.d

Prior to entering MODE 2, whenever the plant has been in MODE 4, 5, 6 or defueled, for 30 days or longer, or whenever feedwater line cleaning through the emergency feedwater line has been performed, by verifying flow from the condensate storage pool through both parallel flow legs to each steam generator.

MARKUP OF TECHNICAL SPECIFICATION BASES

FOR INFORMATION ONLY

Insert Bases

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM

The OPERABILITY of the emergency 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.

The two electric-driven emergency feedwater pumps combined are capable of delivering a total feedwater flow of 575 gpm at a pressure of 1102 psig to the entrance of the steam generator(s). The steam-driven emergency feedwater pump is capable of delivering a total feedwater flow of 575 gpm at a pressure of 1102 psig to the entrance of the steam generator(s). This capacity is sufficient 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 shutdown cooling system may be placed into operation.

The surveillance requirement to verify the minimum pump discharge pressure on recirculation flow ensures that the pump performance curve has not degraded below that used to show that the pumps meet the above flow requirements and is consistent with the requirements of ASME Section XI.

3/4.7.1.3 CONDENSATE STORAGE POOL

The OPERABILITY of the condensate storage pool (CSP) with the minimum water volume of 173,500 gallons (170,000 gallons for EFW system usage and 3,500 gallons for CCW makeup system usage), plus makeup from one Wet Cooling Tower (WCT) basin, ensures that sufficient water is available to cool the Reactor Coolant System to shutdown cooling entry conditions following any design basis accident. This makeup water includes the capability to maintain HOT STANDBY for at least an additional 2 hours prior to initiating shutdown cooling.

The combined capacity (CSP and one WCT) provides sufficient cooling for 24 hours until shutdown cooling is initiated in the event the ultimate heat sink sustains tornado damage concurrent with the tornado event.

If natural circulation is required, the combined capacity (CSP and one WCT) is sufficient to maintain the plant at HOT STANDBY for 4 hours, followed by a cooldown to shutdown cooling entry conditions assuming the availability of only onsite or only offsite power, and the worst single failure (loss of a diesel generator or atmospheric dump valve). This requires approximately 303,000 gallons of EFW and complies with BTP RSB 5-1.

BASES INSERT

The OPERABILITY of the emergency feedwater (EFW) system ensures the Reactor Coolant System (RCS) can be cooled down to shutdown cooling (SDC) system entry conditions from normal operating conditions.

The EFW system consists of two (50% capacity) motor-driven pumps (A and B), one (100% capacity) steam turbine-driven pump (AB) and two diverse flow paths. One flow path supplies steam generator #1 and the second flow path supplies steam generator #2. A flow path consists of the piping, valves and components from the common pump discharge header through two parallel legs to the respective steam generator. Each parallel leg contains an isolation valve and a flow control valve. One flow path supplying one steam generator is capable of cooling the unit to SDC entry conditions. Either of the two parallel legs in a steam generator flow path is capable of supplying 100% of the flow required for the heat removal safety function. Both parallel legs in a flow path are required for OPERABILITY of a flow path. Two independent suction paths exist between the Condensate Storage Pool (CSP) and the EFW common pump suction header. Each suction path alone can supply enough flow to assure sufficient net positive suction head for all three EFW pumps. Both suction paths from the CSP are required for EFW system OPERABILITY. Both steam supplies are required for OPERABILITY of the turbine-driven EFW pump. The turbine-driven EFW pump with one OPERABLE steam supply is considered to be able to supply 100% OPERABLE pumping capacity. A turbine-driven EFW pump inoperable for other reasons is considered to supply 0% capacity. Inoperable motor-driven EFW pumps are considered to supply 0% capacity.

The accident analysis requires an EFW flow of 575 gpm be delivered to the intact steam generator at a pressure of 1102 psig (lowest main steam safety valve set pressure plus 3%) within the time required by TRM Table 3.3-5. The two motor-driven EFW pumps combined are capable of delivering 575 gpm at a pressure of 1102 psig to the entrance of the steam generators and the turbine-driven EFW pump is capable of delivering 575 gpm at a pressure of 1102 psig to the entrance of the steam generators. The EFW system is operated whenever an EFAS is generated or the system is manually actuated, during surveillance testing, and infrequently during shutdown conditions to fill the steam generators.

The flow control and isolation valves in the parallel flow legs are fail open pneumatic valves. Safety-related nitrogen accumulators serve as a backup to the instrument air system for these pneumatic valves. Each nitrogen accumulator supplies a pair of EFW valves (one flow control valve and one isolation valve in separate parallel flow legs to the same steam generator). With a nitrogen accumulator inoperable, for example, the associated flow path would be considered inoperable (but still capable of delivering 100% of the required

EFW flow) and therefore ACTION "d" would be implemented and would provide an allowed outage time of 72 hours for this condition. Specification 3.6.3 would also be implemented for the affected isolation valve. ACTION "d" would also apply if both flow paths were inoperable but capable of delivering 100% of the required EFW flow to their respective steam generator.

Limiting Conditions for Operation

The LCO requires three EFW pumps and two flow paths be OPERABLE to ensure the EFW system will perform the design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant system pressure boundary. Three independent EFW pumps, utilizing two flow paths, ensure availability of residual heat removal capability for all events. This is accomplished by powering two pumps from independent emergency busses. The third EFW pump is powered by a steam-driven turbine supplied with steam from a source not isolated by the closure of the MSIVs.

ACTIONs

a. If one of the two steam supplies to the turbine-driven EFW pump steam turbine is inoperable, action must be taken to restore OPERABLE status within 7 days. The 7 day completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, the availability of redundant OPERABLE motor-driven EFW pumps, two OPERABLE flow paths, and the low probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

b. ACTION (b) addresses the situation when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with one motor-driven EFW pump being inoperable provided the flow paths are able to deliver at least 100% flow to their respective steam generators. One of the primary bases for allowing a 7 day completion time for an inoperable steam supply for the turbine-driven EFW pump steam turbine is the operability of both motor-driven EFW pumps. While in this ACTION the EFW system is able to support a cooldown of the RCS to SDC entry conditions but may not be able to mitigate a main steam line break or feedwater line break accident. Due to the seriousness of this condition the completion time will be limited to 24 hours when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with one motor-driven EFW pump being inoperable. The 24 hour completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, an OPERABLE motor-driven pump, and the low probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

c. ACTION (c) addresses the situation when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with both motor-driven EFW pumps being inoperable provided the flow paths are able to deliver at least 100% flow to their respective steam generators. Due to the seriousness of this condition, the ACTION requires the unit be placed in HOT STANDBY in 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. By maintaining OPERABLE pumping capacity capable of delivering 100% of the required EFW flow and flow paths capable of delivering 100% of the required EFW flow to either (i.e., their respective) steam generator the EFW system is capable of performing its design function of residual heat removal for all events assuming no single active failure. While discussed separately below, this ACTION addresses concurrent pump and flow path inoperabilities.

With the EFW pumps inoperable for reasons other than those described in ACTION (a), (b), or (c), action must be taken to restore OPERABLE status within 72 hours. This condition includes:

- An inoperable turbine-driven EFW pump including the loss of both steam supplies, or
- one or two inoperable motor-driven EFW pumps,

With one or both flow paths inoperable, but each still capable of delivering 100% of the required EFW flow to either (i.e., their respective) steam generator, action must be taken to restore the flow path(s) to OPERABLE status within 72 hours. This condition includes:

- an inoperable valve not capable of opening (e.g., flow isolation valve required to be gagged closed to comply with Technical Specification 3.6.3) in one flow leg of one or both flow paths, or
- the loss of one train of DC power to the valves in one or both flow paths, or
- the loss of a single nitrogen accumulator in one or both flow paths, or
- any combination of inoperable valves in one or both flow paths provided that the valves in at least one flow leg of each flow path can open to deliver 100% flow and one valve in that flow leg remains OPERABLE to prevent steam generator overfill.

ACTION "d" would also be entered for an inoperable suction path from the CSP to the common pump suction header or for one steam supply inoperable concurrent with inoperable flow paths able to deliver 100% flow to their respective steam generators.

The 72 hour completion time is reasonable based on the redundant capabilities afforded by the EFW system, the time needed for repairs, and the low probability of a design basis event occurring during this period.

e. By maintaining OPERABLE pumping capacity capable of supplying 100% of the required EFW flow and flow paths capable of delivering 100% of the required EFW flow to the steam generators the EFW system is capable of supporting a unit cooldown but may not be capable of performing its design function of residual heat removal for all events. Due to the seriousness of this condition, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within the following 6 hours. The allowed completion time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

This ACTION primarily addresses flow path inoperability when the system no longer has the ability to deliver 100% of the required EFW flow to one or both steam generators. For example, with one flow path inoperable and not able to provide 100% flow to its respective steam generator this ACTION would be entered. Similarly, if both flow paths were inoperable and only one of the inoperable flow paths could provide 100% of the required EFW flow to its respective steam generator this ACTION would be entered. Also, if both flow paths were inoperable and neither could provide 100% of the required EFW flow to its respective steam generator but together both flow paths could provide 100% of the required EFW flow to the steam generators (e.g., 50% to one and 50% to the other (or some combination equaling 100%)) this ACTION would be entered.

f. ACTION (f) indicates that all required MODE changes or power reductions are suspended until the EFW system is capable of delivering 100% of the required EFW flow to the steam generators.

With pumping capacity unable to supply 100% of the required EFW flow and/or two flow paths not capable of delivering 100% of the required EFW flow to the steam generators in MODEs 1, 2, and 3, the unit is in a seriously degraded condition with no safety-related means for conducting a cooldown. 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 the ability to deliver at least 100% of the required EFW flow to the steam generators combined as soon as possible. This ACTION is modified to indicate that all MODE changes or power reductions are suspended until the ability to deliver 100% of the required flow to the steam generators

combined can be restored because they could force the unit into a less than safe condition.

Surveillance Requirements

a. Verifying the correct alignment for manual, power operated, and automatic valves in the EFW water and steam supply flow paths provides assurance that the proper flow paths exist for EFW operation. This Surveillance Requirement (SR) does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

b. The SR to verify pump OPERABILITY pursuant to Specification 4.0.5 ensures that the requirements of ASME Code Section XI are met and provides reasonable assurance that the pumps are capable of satisfying the design basis accident flow requirements. Because it is undesirable to introduce cold EFW into the steam generators while they are operating, testing is typically performed on recirculation flow. Such in-service tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance.

   This SR is modified to indicate the SR should be deferred until suitable test conditions have been established. This deferral is required because there is an insufficient steam pressure to perform post maintenance activities which may need to be completed prior to performing the required turbine-driven pump SR. This deferral allows the unit to transition from MODE 4 to MODE 3 prior to the performance of the SR and provides a 24 hour period once a steam generator pressure of 750 psig is reached to complete the required post maintenance activities and SR. If this SR is not completed within the 24 hour period or fails, then the appropriate ACTION must be entered. The twenty-five percent grace period allowed by TS 4.0.2 can not be applied to the 24 hour period.

c. The SR for actuation testing ensures that EFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates EFAS and/or MSIS signals, by demonstrating that each automatic valve in the flow path actuates to its correct position and that the EFW pumps will start on an actual or simulated actuation signal. This Surveillance covers the automatic flow control valves, automatic isolation valves, and steam admission valves but is not required for valves that are

locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month frequency is acceptable, based on the design reliability and operating experience of the equipment.

This SR is modified to indicate that the SR should be deferred until suitable test conditions have been established. This deferral is required because there is an insufficient steam pressure to perform post maintenance activities which may need to be completed prior to performing the required turbine-driven pump SR. This deferral allows the unit to transition from MODE 4 to MODE 3 prior to the performance of the SR and provides a 24 hour period once a steam generator pressure of 750 psig is reached to complete the required post maintenance activities and SR. If this SR is not completed within the 24 hour period or fails, then the appropriate ACTION must be entered. The twenty-five percent grace period allowed by TS 4.0.2 can not be applied to the 24 hour period.

d. The SR for flow testing ensures that the EFW system is aligned properly by verifying the flow paths from the condensate storage pool (CSP) to each steam generator before entering MODE 2 operation after being in MODE 4, 5, 6, or defueled, for 30 days or longer, or whenever feedwater line cleaning through the emergency feedwater line has been performed. Various combinations of pumps and valves may be used such that all flow paths (and flow legs) are tested at least once during the Surveillance. OPERABILITY of EFW flow paths must be verified before sufficient core heat is generated that would require the operation of the EFW System during a subsequent shutdown. The frequency is reasonable, based on engineering judgment, and other administrative controls to ensure that flow paths remain OPERABLE. To further ensure EFW system alignment, the OPERABILITY of the flow paths is verified following extended outages to determine that no misalignment of valves has occurred. This SR ensures that the flow paths from the CSP to the steam generators are properly aligned.