

**ATTACHMENT 4**

**License Amendment Request**

**Callaway Unit No. 1  
Renewed Facility Operating License NPF-30  
NRC Docket No. 50-483**

**Revise Technical Specifications to Adopt Risk-Informed  
Completion Times TSTF-505, Revision 2, "Provide Risk-Informed  
Extended Completion Times – RITSTF Initiative 4b"**

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

This Attachment contains 65 pages.

BASES

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ACTIONS  
(continued)A.1

Condition A applies to all RTS protection Functions. Condition A addresses the situation where one or more required channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.1-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1 and B.2

Condition B applies to the Manual Reactor Trip in MODE 1 or 2. This action addresses the train orientation of the RTS for this Function. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 48 hours **or in accordance with the Risk Informed Completion Time Program**. In this Condition, the remaining OPERABLE channel is adequate to perform the safety function.

The Completion Time of 48 hours is reasonable considering that there are two automatic actuation trains and another manual initiation channel OPERABLE, and the low probability of an event occurring during this interval.

~~If the Manual Reactor Trip Function cannot be restored to OPERABLE status within the allowed 48-hour Completion Time, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 additional hours (54 hours total time). The 6 additional hours to reach MODE 3 is reasonable, based on operating experience, to exit the Applicability from full power operation in an orderly manner and without challenging unit systems. With the unit in MODE 3, Condition C is entered if the Manual Reactor Trip Function has not been restored and the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.~~

C.1, C.2.1, and C.2.2

Condition C applies to the following reactor trip Functions in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted:

- Manual Reactor Trip;
- RTBs;
- RTB Undervoltage and Shunt Trip Mechanisms; and

(continued)

BASES

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ACTIONS  
(continued)C.1, C.2.1, and C.2.2 (continued)

- Automatic Trip Logic.

This action addresses the train orientation of the RTS for these Functions. With one channel or train inoperable, the inoperable channel or train must be restored to OPERABLE status within 48 hours. If the affected Function(s) cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be placed in a MODE in which the requirement does not apply. To achieve this status, action must be initiated within the same 48 hours to fully insert all rods and the Rod Control System must be rendered incapable of rod withdrawal within the next hour (e.g., by de-energizing all CRDMs, by opening the RTBs, or de-energizing the motor generator (MG) sets). The additional hour for the latter provides sufficient time to accomplish the action in an orderly manner. With the rods fully inserted and the Rod Control System incapable of rod withdrawal, these Functions are no longer required.

The Completion Time is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

Risk assessments performed pursuant to LCO 3.0.4.b should consider the desirability of enabling the Rod Control System or allowing one or more rods to be other than fully inserted in MODES 3, 4, or 5 while one train of Function 19 (one RTB train), Function 20 (one trip mechanism for one RTB), or Function 21 (one SSPS logic train) is inoperable and the Reactor Trip System is degraded. The risk assessment should assure that LCO 3.1.9, "RCS Boron Limitations < 500°F," is met prior to enabling the Rod Control System or allowing one or more rods to be other than fully inserted in MODES 3, 4, or 5.

D.1.1, and D.1.2, ~~and D.2~~

Condition D applies to the Power Range Neutron Flux - High trip Function.

With one of the NIS power range detectors inoperable,  $\frac{1}{4}$  of the radial power distribution monitoring capability is lost. Therefore, SR 3.2.4.2 must be performed (Required Action D.1.1) within 12 hours of THERMAL POWER exceeding 75% RTP and once per 12 hours thereafter. If reactor power decreases to  $\leq$  75% RTP, the measurement of both Completion Times for Required Action D.1.1 stops and SR 3.2.4.2 is no longer required. Completion Time tracking recommences upon reactor power

(continued)

BASES

ACTIONS  
(continued)

D.1.1, and D.1.2, and D.2 (continued)

exceeding 75% RTP. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued plant operation at power levels > 75% RTP. At power levels > 75% RTP, operation of the core with radial power distributions beyond the design limits, at a power level where DNB conditions may exist, is prevented.

Required Action D.1.1 has been modified by a Note which only requires SR 3.2.4.2 to be performed if the Power Range Neutron Flux input to QPTR becomes inoperable. Failure of a component in the Power Range Neutron Flux Channel which renders the High Flux Trip Function inoperable may not affect the capability to monitor QPTR. As such, determining QPTR using core power distribution measurement information once per 12 hours may not be necessary.

The NIS power range detectors provide input to the Rod Control System and the SG Water Level Control System and, therefore, have a two-out-of-four trip logic. A known inoperable channel must be placed in the tripped condition. This results in a partial trip condition requiring only one-out-of-three logic for actuation. The 72 hours allowed to place the inoperable channel in the tripped condition is justified in Reference 17. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

~~As an alternative to the above Actions, the plant must be placed in a MODE where this Function is no longer required OPERABLE. Seventy-eight (78) are allowed to place the plant in MODE 3. The 78-hour Completion Time includes 72 hours for channel corrective maintenance, and an additional 6 hours for the MODE reduction as required by Required Action D.2. This is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems. If Required Actions cannot be completed within their allowed Completion Times, LCO 3.0.3 must be entered.~~

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of other channels. The Note also allows placing the inoperable channel in the bypassed condition to allow setpoint adjustments of other channels when required to reduce the setpoint in accordance with other Technical Specifications. The 12-hour time limit is justified in Reference 17.

(continued)

BASES

ACTIONS  
(continued)

E.1 and E.2

Condition E applies to the following reactor trip Functions:

- ~~• Power Range Neutron Flux - Low;~~
- Overtemperature  $\Delta T$ ;
- Overpower  $\Delta T$ ;
- Power Range Neutron Flux - High Positive Rate;
- Pressurizer Pressure - High;
- SG Water Level - Low Low (Adverse Containment Environment);  
and
- SG Water Level - Low Low (Normal Containment Environment).

A known inoperable channel must be placed in the tripped condition within 72 hours **or in accordance with the Risk Informed Completion Time Program**. Placing the channel in the tripped condition results in a partial trip condition requiring only one-out-of-two logic for actuation of the two-out-of-three trips and one-out-of-three logic for actuation of the two-out-of-four trips. The 72 hours allowed to place the inoperable channel in the tripped condition is justified in Reference 17.

~~If the inoperable channel cannot be placed in the tripped condition within the specified Completion Time, the unit must be placed in a MODE where these Functions are not required OPERABLE. An additional 6 hours is allowed to place the unit in MODE 3. Six hours is a reasonable time, based on operating experience, to place the unit in MODE 3 from full power in an orderly manner and without challenging unit systems.~~

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12-hour time limit is justified in Reference 17.

F.1 and F.2

Condition F applies to the Intermediate Range Neutron Flux trip when THERMAL POWER is above the P-6 setpoint and below the P-10 setpoint and one channel is inoperable. Above the P-6 setpoint and below the P-10 setpoint, the NIS intermediate range detectors perform the monitoring and protection functions. If THERMAL POWER is greater

(continued)

## BASES

ACTIONS  
(continued)G.1 and G.2 (continued)

Required Action G.1 is modified by a Note to indicate that normal plant control operations that individually add limited positive reactivity (i.e., temperature or boron concentration fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided the SDM limits specified in the COLR are met and the requirements of LCOs 3.1.5, 3.1.6, and 3.4.2 are met.

~~H.1~~

~~Not used.~~

H.1

Condition ~~H~~ applies to one inoperable Source Range Neutron Flux trip channel when in MODE 2 below the P-6 setpoint. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With one of the two channels inoperable, operations involving positive reactivity additions shall be suspended immediately.

This will preclude any power escalation. With only one source range channel OPERABLE, core protection is severely reduced and any actions that add positive reactivity to the core must be suspended immediately.

Required Action ~~H~~.1 is modified by a Note to indicate that normal plant control operations that individually add limited positive reactivity (i.e., temperature or boron concentration fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided the SDM limits specified in the COLR are met, the requirements of LCOs 3.1.5, 3.1.6, and 3.4.2 are met, and the initial and critical boron concentration assumptions in FSAR Section 15.4.6 (Ref. 16) are satisfied. See LCO 3.3.9, "Boron Dilution Mitigation System," for requirements related to the mitigation of inadvertent boron dilution events.

(continued)

## BASES

ACTIONS  
(continued)~~J.1~~ (continued)

Condition J applies to two inoperable Source Range Neutron Flux trip channels when in MODE 2 below the P-6 setpoint or in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With both source range channels inoperable, the Reactor Trip Breakers (RTBs) must be opened immediately. With the RTBs open, the core is in a more stable condition.

~~KJ.1, KJ.2.1, and KJ.2.2~~

Condition ~~KJ~~ applies to one inoperable source range channel in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With one of the source range channels inoperable, 48 hours is allowed to restore it to an OPERABLE status. If the channel cannot be returned to an OPERABLE status, action must be initiated within the same 48 hours to fully insert all rods. One additional hour is allowed to place the Rod Control System in a condition incapable of rod withdrawal (e.g., by de-energizing all CRDMs, by opening the RTBs, or de-energizing the motor generator (MG) sets). Once these ACTIONS are completed, the core is in a more stable condition. The allowance of 48 hours to restore the channel to OPERABLE status, and the additional hour to place the Rod Control System in a condition incapable of rod withdrawal, are reasonable considering the other source range channel remains OPERABLE to perform the safety function and given the low probability of an event occurring during this interval. Normal plant control operations that individually add limited positive reactivity (i.e., temperature or boron concentration fluctuations associated with RCS inventory management or temperature control) are permitted provided the SDM limits specified in the COLR are met and the initial and critical boron concentration assumptions in FSAR Section 15.4.6 (Ref. 16) are satisfied. See LCO 3.3.9, "Boron Dilution Mitigation System," for requirements related to the mitigation of inadvertent boron dilution events.

~~L.1, L.2, and L.3~~

~~Not used.~~

(continued)

## BASES

ACTIONS  
(continued)MK.1 and M.2

Condition **MK** applies to the following reactor trip Functions:

- Pressurizer Pressure - Low;
- Pressurizer Water Level - High;
- Reactor Coolant Flow - Low;
- Undervoltage RCPs; and
- Underfrequency RCPs.

With one channel inoperable, the inoperable channel must be placed in the tripped condition within 72 hours **or in accordance with the Risk Informed Completion Time Program**. For the Pressurizer Pressure - Low, Pressurizer Water Level - High, Undervoltage RCPs, and Underfrequency RCPs trip Functions, placing the channel in the tripped condition when above the P-7 setpoint results in a partial trip condition requiring only one additional channel to initiate a reactor trip. For the Reactor Coolant Flow - Low trip Function, placing the channel in the tripped condition when above the P-8 setpoint results in a partial trip condition requiring only one additional channel in the same loop to initiate a reactor trip. For the Reactor Coolant Flow - Low trip Function, two tripped channels in two RCS loops are required to initiate a reactor trip when below the P-8 setpoint and above the P-7 setpoint. These Functions do not have to be OPERABLE below the P-7 setpoint because there are no loss of flow trips below the P-7 setpoint. There is insufficient heat production to generate DNB conditions below the P-7 setpoint. The 72 hours allowed to place the channel in the tripped condition is justified in Reference 17. ~~An additional 6 hours is allowed to reduce THERMAL POWER to below P-7 if the inoperable channel cannot be restored to OPERABLE status or placed in trip within the specified Completion Time.~~

Allowance of this time interval takes into consideration the redundant capability provided by the remaining redundant OPERABLE channels, and the low probability of occurrence of an event during this period that may require the protection afforded by the Functions associated with Condition **MK**.

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is justified in Reference 17.

(continued)



BASES

ACTIONS  
(continued)

N1 and N2L1

~~Not used.~~ If the Required Action and associated Completion Time of Condition K is not met, 6 hours is allowed to reduce THERMAL POWER to below P-7.

OM.1 and O.2

Condition ~~OM~~ applies to the Turbine Trip - Low Fluid Oil Pressure trip Function. With one channel inoperable, the inoperable channel must be placed in the tripped condition within 72 hours ~~or in accordance with the Risk Informed Completion Time Program~~. If placed in the tripped condition, this results in a partial trip condition requiring only one additional channel to initiate a reactor trip. ~~If the channel cannot be restored to OPERABLE status or placed in the tripped condition, then power must be reduced below the P-9 setpoint within the next 4 hours.~~ The 72 hours allowed to place the inoperable channel in the tripped condition ~~and the 4 hours allowed for reducing power are~~ is justified in the Reference 17.

Required Actions have been modified by a Note that allows placing an inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12-hour time limit is justified in Reference 17.

PN.1 and P.2

Condition ~~PN~~ applies to the Turbine Trip - Turbine Stop Valve Closure trip Function. With one or more channel(s) inoperable, the inoperable channel(s) must be placed in the tripped condition within 72 hours. For the Turbine Trip - Turbine Stop Valve Closure trip Function, four of four channels are required to initiate a reactor trip; hence, more than one channel may be placed in trip. ~~If the channels cannot be restored to OPERABLE status or placed in the tripped condition, then power must be reduced below the P-9 setpoint within the next 4 hours.~~ The 72 hours allowed to place the inoperable channels in the tripped condition ~~and the 4 hours allowed for reducing power are~~ is justified in Reference 17.

O.1

If the Required Action and associated Completion Time of Condition M or N is not met, THERMAL POWER must be reduced below the P-9 setpoint within 4 hours. This places the unit in a MODE where the LCO is no longer applicable.

(continued)

## BASES

ACTIONS  
(continued)QP.1 and Q.2

Condition **QP** applies to the SI Input from ESFAS reactor trip and the RTS Automatic Trip Logic in MODES 1 and 2. These actions address the train orientation of the RTS for these Functions. With one train inoperable, 24 hours are allowed to restore the train to OPERABLE status ~~(Required Action Q.1) or the unit must be placed in MODE 3 within the next 6 hours. Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~ The Completion Time of 24 hours (Required Action P.1) is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function and given the low probability of an event during this interval. The 24 hours allowed to restore the inoperable train to OPERABLE status is justified in Reference 17. ~~The Completion Time of 6 hours (Required Action Q.2) is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems.~~

The Required Actions have been modified by a Note that allows bypassing one train up to 4 hours for surveillance testing, provided the other train is OPERABLE.

Consistent with the requirement in Reference 17 to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a logic train is inoperable for maintenance are included (note that these restrictions do not apply when a logic train is being tested under the 4-hour bypass Note of Condition **QP**). Entry into Condition **QP** is not a typical, pre-planned evolution during power operation, other than for surveillance testing. Since Condition **QP** is typically entered due to equipment failure, it follows that some of the following restrictions may not be met at the time of Condition **QP** entry. If this situation were to occur during the 24-hour Completion Time of Required Action **QP.1**, the Configuration Risk Management Program will assess the emergent condition and direct activities to restore the inoperable logic train and exit Condition **QP** or fully implement these restrictions or perform a plant shutdown, as appropriate from a risk management perspective. The following restrictions will be observed:

- To preserve ATWS mitigation capability, activities that degrade the availability of the auxiliary feedwater system, RCS pressure relief system (pressurizer PORVs and safety valves), AMSAC, or turbine trip should not be scheduled when a logic train is inoperable for maintenance.
- To preserve LOCA mitigation capability, one complete ECCS train that can be actuated automatically must be maintained when a logic train is inoperable for maintenance.

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BASES

ACTIONS  
(continued)

QP.1 and Q.2 (continued)

- To preserve reactor trip and safeguards actuation capability, activities that cause master relays or slave relays in the available train to be unavailable and activities that cause analog channels to be unavailable should not be scheduled when a logic train is inoperable for maintenance.
- Activities on electrical systems (e.g., AC and DC power) and cooling systems (e.g., essential service water and component cooling water) that support the systems or functions listed in the first three bullets should not be scheduled when a logic train is inoperable for maintenance. That is, one complete train of a function that supports a complete train of a function noted above must be available.

RQ.1 and RQ.2

Condition **RQ** applies to the RTBs in MODES 1 and 2. These actions address the train orientation of the RTS for the RTBs. With one train inoperable, 24 hours are allowed for train corrective maintenance to restore the train to OPERABLE status ~~or the unit must. Alternatively, a Completion Time can be placed determined in MODE 3 within the next 6 hours.~~ accordance with the Risk Informed Completion Time Program. The 24-hour Completion Time is justified in Reference 18. ~~The shutdown Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems.~~ Placing the unit in MODE 3 results in Condition C entry if one RTB train is inoperable and the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

The Required Actions have been modified by a Note. The Note allows one train to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. The 4-hour time limit is justified in Reference 18.

Consistent with the requirement in Reference 18 to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a RTB train is inoperable for maintenance are included (note that these restrictions do not apply when a RTB train is being tested under the 4-hour bypass Note of Condition **RQ**). Entry into Condition **RQ** is not a typical, pre-planned evolution during power operation, other than for surveillance testing. Since Condition R is typically entered due to equipment failure, it follows that some of the following restrictions may not be met at the time of

(continued)

## BASES

ACTIONS  
(continued)RQ.1 and RQ.2 (continued)

Condition **RQ** entry. If this situation were to occur during the 24-hour Completion Time of Required Action **RQ.1**, the Configuration Risk Management Program will assess the emergent condition and direct activities to restore the inoperable RTB train and exit Condition **RQ** or fully implement these restrictions or perform a plant shutdown, as appropriate from a risk management perspective. The following restrictions will be observed:

- The probability of failing to trip the reactor on demand will increase when a RTB train is removed from service, therefore, systems designed for mitigating an ATWS event should be maintained available. RCS pressure relief (pressurizer PORVs and safeties), auxiliary feedwater flow (for RCS heat removal), AMSAC, and turbine trip are important to alternate ATWS mitigation. Therefore, activities that degrade the availability of the auxiliary feedwater system, RCS pressure relief system (pressurizer PORVS and safety valves), AMSAC, or turbine trip should not be scheduled when a RTB train is inoperable for maintenance.
- Due to the increased dependence on the available reactor trip train when one logic train or one RTB train is inoperable for maintenance, activities that degrade other components of the RTS, including master relays or slave relays, and activities that cause analog channels to be unavailable, should not be scheduled when a logic train or a RTB train is inoperable for maintenance.
- Activities on electrical systems (e.g., AC and DC power) and cooling systems (e.g., essential service water) that support the systems or functions listed in the first two bullets should not be scheduled when a RTB train is inoperable for maintenance. That is, one complete train of a function that supports a complete train of a function noted above must be available.

SR.1 and S-2

Condition **SR** applies to the P-6 and P-10 interlocks. With one or more required channel(s) inoperable, the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour ~~or the unit must be placed in MODE 3 within the next 6 hours.~~ Verifying the interlock status manually, e.g., by observation of the associated permissive annunciator window, accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the

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## BASES

ACTIONS  
(continued)SR.1 and S.2 (continued)

minimum amount of time allowed for manual operator actions. ~~The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. The 1 hour and 6 hour Completion Times are equal to the time allowed by LCO 3.0.3 for shutdown actions in the event of a complete loss of RTS Function.~~

TS.1 and T.2

Condition ~~TS~~ applies to the P-7, P-8, P-9, and P-13 interlocks. With one or more required channel(s) inoperable, the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour ~~or the unit must be placed in MODE 2 within the next 6 hours.~~ These actions are conservative for the case where power level is being raised. Verifying the interlock status manually, e.g., by observation of the associated permissive annunciator window, accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. ~~The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging unit systems.~~

T.1

If the Required Action and associated Completion Time of Condition S is not met, the unit must be placed in MODE 2 within 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging unit systems.

U.1 and U.2

Condition U applies to the RTB Undervoltage and Shunt Trip Mechanisms, or diverse trip features, in MODES 1 and 2. With one of the diverse trip features inoperable, it must be restored to an OPERABLE status within 48 hours ~~or the unit must be placed in a MODE where the requirement does not apply. This is accomplished by placing the unit in MODE 3 within the next 6 hours (54 hours total time). The Completion Time of 6 hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. or in accordance with the Risk Informed Completion Time Program.~~

With the unit in MODE 3, Condition C is entered if the inoperable trip mechanism has not been restored and the Rod Control System is

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BASES

ACTIONS  
(continued)

U1 and U.2 (continued)

capable of rod withdrawal or one or more rods are not fully inserted. The affected RTB shall not be bypassed while one of the diverse features is inoperable except for the time required to perform maintenance to restore the inoperable trip mechanism to OPERABLE status.

The Completion Time of 48 hours for Required Action U.1 is reasonable considering that in this Condition there is one remaining diverse trip feature for the affected RTB, and one OPERABLE RTB capable of performing the safety function and given the low probability of an event occurring during this interval.

V.1

If the Required Action and associated Completion Time of Condition B, D, E, P, Q, R, or U is not met, the unit must be placed in MODE 3 within 6 hours. The Completion Time of 6 hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. With the unit in MODE 3, ACTION C would apply to any inoperable RTB, RTB trip mechanism, or to any inoperable Manual Reactor Trip Function if the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

∇W.1, ∇W.2.1, ∇W.2.2.1, ∇W.2.2.2, and ∇W.2.3

Condition ~~∇W~~ applies to one inoperable Power Range Neutron Flux - Low channel in MODE 1 below the P-10 setpoint and in MODE 2 with  $k_{eff} \geq 1.0$ . The inoperable channel must be placed in the tripped condition within 72 hours. Placing the channel in the tripped condition results in a partial trip status requiring only a one-out-of-three logic for actuation of this reactor trip function. The 72 hours to place the inoperable channel in the tripped condition is justified in Reference 17.

The Required Action is modified by a Note. The Note allows placing an inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is justified in Reference 17.

If the inoperable channel can not be placed in the tripped condition within the specified 72-hour Completion Time, the plant must be placed in MODE 2 with  $k_{eff} < 1.0$  within 78 hours. In addition, within 78 hours action must be initiated to either fully insert all rods and make the Rod Control System incapable of rod withdrawal (e.g., by de-energizing all CRDMs, by opening the RTBs, or de-energizing the motor generator (MG) sets) or to initiate

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## BASES

ACTIONS  
(continued)W.1, W.2.1, W.2.2.1, W.2.2.2, and W.2.3 (continued)

boration of the RCS to greater than the all-rods-out (ARO) critical boron concentration. Required Actions VW.2.2.1 and VW.2.2.2 would preclude an uncontrolled RCCA bank withdrawal accident from occurring. Required Action VW.2.3 would provide sufficient SHUTDOWN MARGIN if an uncontrolled RCCA bank withdrawal event were to occur.

W.1 and W.2

~~Not used.~~

## X.1 and X.2

Condition X applies to the Environmental Allowance Modifier (EAM) circuitry for the SG Water Level - Low Low trip Function in MODES 1 and 2. With one or more EAM channel(s) inoperable, they must be placed in the tripped condition within 72 hours. Placing an EAM channel in trip automatically enables the SG Water Level - Low Low (Adverse Containment Environment) bistable for that protection channel, with its higher SG level Trip Setpoint (a higher trip setpoint means a reactor trip would occur sooner). The Completion Time of 72 hours is based on Reference 17. If the inoperable channel cannot be placed in the tripped condition within the specified Completion Time, the unit must be placed in a MODE where this Function is not required to be OPERABLE. An additional six hours is allowed to place the unit in MODE 3.

## Y.1

Condition Y applies to one inoperable Power Range Neutron Flux – Low channel in MODE 2 with  $k_{eff} < 1.0$ , and all RCS cold leg temperatures  $\geq 500^{\circ}\text{F}$ , and the RCS boron concentration less than or equal to the all-rods-out (ARO) critical boron concentration, and the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. Condition Y also applies to one inoperable Power Range Neutron Flux - Low channel in MODE 3 with all RCS cold leg temperatures  $\geq 500^{\circ}\text{F}$ , and the RCS boron concentration less than or equal to the ARO critical boron concentration, and the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. The inoperable channel must be placed in the tripped condition within 72 hours. Placing the channel in the tripped condition results in a partial trip status requiring only a one-out-of-three logic for actuation of this reactor trip function. The 72 hours to place the inoperable channel in the tripped condition is justified in Reference 17.

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## BASES

## ACTIONS

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed on Table 3.3.2-1.

In the event a channel's Trip Setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected. When the Required Channels in Table 3.3.2-1 are specified on a per steam line, per SG, per pump, etc., basis, then the Condition may be entered separately for each steam line, SG, pump, etc., as appropriate.

When the number of inoperable channels in a trip function exceed those specified in one or other related Conditions associated with a trip function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

A.1

Condition A applies to all ESFAS protection functions.

Condition A addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.2-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1, ~~B.2.1,~~ and ~~B.2.2~~

Condition B applies to manual initiation of:

- SI;
- Containment Spray;
- Phase A Isolation; and
- Phase B Isolation.

This action addresses the train orientation of the SSPS for the functions listed above. If a channel or train is inoperable, 48 hours are allowed to return it to an OPERABLE status. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time**

(continued)



## BASES

ACTIONS  
(continued)B.1, B.2.1, and B.2.2 (continued)

**Program.** Note that for containment spray and Phase B isolation, failure of one or both channels in one train renders the train inoperable. Condition B, therefore, encompasses both situations. The specified Completion Time is reasonable considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each Function, and the low probability of an event occurring during this interval. ~~If the channel or train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (54 hours total time) and in MODE 5 within an additional 30 hours (84 hours total time). The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.~~

C.1, C.2, C.3.1, and C.3.2

Condition C applies to the automatic actuation logic and actuation relays for the following functions:

- SI;
- Containment Spray;
- Phase A Isolation;
- Phase B Isolation; and
- Automatic Switchover to Containment Sump.

This action addresses the train orientation of the SSPS and the master and slave relays. Containment Isolation Phase A is the primary signal to ensure closing of the containment purge supply and exhaust valves. If one Phase A train is inoperable, operation may continue as long as the Required Action to place and maintain containment purge supply and exhaust valves in their closed position is met. Required Action C.1 is modified by a Note that this Action is only required if Containment Phase A Isolation (Function 3.a.(2)) is inoperable. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. ~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~ The 24 hours allowed for restoring the inoperable train to OPERABLE status is justified in Reference 18. The specified Completion Time is reasonable considering

(continued)

## BASES

ACTIONS  
(continued)C 1, C.2, ~~C.3.1, and C.3.2~~ (continued)

that there is another train OPERABLE, and the low probability of an event occurring during this interval. ~~If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (30 hours total time) and in MODE 5 within an additional 30 hours (60 hours total time). The Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.~~

The Required Actions are modified by a Note that allows one train to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. This allowance is based on the reliability analysis assumption of Reference 8 that 4 hours is the average time required to perform train surveillance.

Consistent with the requirement in Reference 18 to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a logic train is inoperable for maintenance are included (note that these restrictions do not apply when a logic train is being tested under the 4-hour bypass Note of Condition C). Entry into Condition C is not a typical, pre-planned evolution during power operation, other than for surveillance testing. Since Condition C is typically entered due to equipment failure, it follows that some of the following restrictions may not be met at the time of Condition C entry. If this situation were to occur during the 24-hour Completion Time of Required Action C.2, the Configuration Risk Management Program will assess the emergent condition and direct activities to restore the inoperable logic train and exit Condition C or fully implement these restrictions or perform a plant shutdown, as appropriate from a risk management perspective. The following restrictions will be observed:

- To preserve ATWS mitigation capability, activities that degrade the availability of the auxiliary feedwater system, RCS pressure relief system (pressurizer PORVs and safety valves), AMSAC, or turbine trip should not be scheduled when a logic train is inoperable for maintenance.
- To preserve LOCA mitigation capability, one complete ECCS train that can be actuated automatically must be maintained when a logic train is inoperable for maintenance.

(continued)

## BASES

ACTIONS  
(continued)C 1, C.2, ~~C.3.1, and C.3.2~~ (continued)

- To preserve reactor trip and safeguards actuation capability, activities that cause master relays or slave relays in the available train to be unavailable and activities that cause analog channels to be unavailable should not be scheduled when a logic train is inoperable for maintenance.
- Activities on electrical systems (e.g., AC and DC power) and cooling systems (e.g., essential service water and component cooling water) that support the systems or functions listed in the first three bullets should not be scheduled when a logic train is inoperable for maintenance. That is, one complete train of a function that supports a complete train of a function noted above must be available.

D.1, ~~D.2.1, and D.2.2~~

Condition D applies to:

- Containment Pressure - High 1;
- Pressurizer Pressure - Low;
- Steam Line Pressure - Low;
- Containment Pressure - High 2;
- Steam Line Pressure - Negative Rate - High;
- SG Water Level – Low Low (Adverse Containment Environment);
- SG Water Level - Low Low (Normal Containment Environment);  
and
- Pressurizer Pressure – High.

If one channel is inoperable, 72 hours are allowed to restore the channel to OPERABLE status or to place it in the tripped condition. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program, except for Function 9.b, Pressurizer Pressure – High.** Generally this Condition applies to functions that operate on two-out-of-three logic (excluding Pressurizer Pressure – Low, Pressurizer Pressure – High, and SG Water Level - Low Low (Adverse and Normal

(continued)

## BASES

ACTIONS  
(continued)~~D.1, D.2.1, and D.2.2 (continued)~~

Containment Environment)). Therefore, failure of one channel (i.e., with the bistable not tripped) places the Function in a two-out-of-two configuration. The inoperable channel must be tripped to place the Function in a one-out-of-two configuration that satisfies redundancy requirements. The 72 hours allowed to restore the channel to OPERABLE status or to place it in the tripped condition is justified in Reference 18.

~~Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 72 hours requires the unit be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 hours.~~

~~The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.~~

The Required Actions are modified by a Note that allows the inoperable channel to be bypassed for up to 12 hours for surveillance testing of other channels. The 12 hours allowed for testing are justified in Reference 18.

~~E.1, E.2.1, and E.2.2~~

Condition E applies to:

- Containment Spray Containment Pressure - High 3; and
- Containment Phase B Isolation Containment Pressure - High 3.

None of these signals has input to a control function. Thus, two-out-of-three logic is necessary to meet acceptable protective requirements. However, a two-out-of-three design would require tripping a failed channel. This is undesirable because a single failure would then cause spurious containment spray initiation. Spurious spray actuation is undesirable because of the cleanup problems presented. Therefore, these channels are designed with two-out-of-four logic so that a failed channel may be bypassed rather than tripped. Note that one channel may be bypassed and still satisfy the single failure criterion. Furthermore, with one channel bypassed, a single instrumentation channel failure will not spuriously initiate containment spray.

(continued)

## BASES

ACTIONS  
(continued)~~E.1, E.2.1, and E.2.2~~ (continued)

To avoid the inadvertent actuation of containment spray and Phase B containment isolation, the inoperable channel should not be placed in the tripped condition. Instead it is bypassed. Restoring the channel to OPERABLE status, or placing the inoperable channel in the bypassed condition within 72 hours, is sufficient to assure that the Function remains OPERABLE and minimizes the time that the Function may be in a partial trip condition (assuming the inoperable channel has failed high). The Completion Time is further justified based on the low probability of an event occurring during this interval. ~~Failure to restore the inoperable channel to OPERABLE status, or place it in the bypassed condition within 72 hours, requires the unit be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.~~

The Required Actions are modified by a Note that allows one additional channel to be bypassed for up to 12 hours for surveillance testing. Placing a second channel in the bypassed condition for up to 12 hours for testing purposes is acceptable based on the results of Reference 18.

~~F.1, F.2.1, and F.2.2~~

Condition F applies to:

- Manual Initiation of Steam Line Isolation; and
- P-4 Interlock.

For the Manual Initiation and the P-4 Interlock Functions, this action addresses the train orientation of the SSPS. If a channel or train is inoperable, 48 hours are allowed to return it to OPERABLE status. The specified Completion Time is reasonable considering the nature of these Functions, the available redundancy, and the low probability of an event occurring during this interval. ~~Alternatively (not applicable to Function 8.a, Reactor Trip, P-4), a Completion Time can be determined in accordance with the Risk Informed Completion Time Program. If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without~~

(continued)

## BASES

ACTIONS  
(continued)F.1 (continued)

~~challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.~~

G.1, G.2.1, and G.2.2

Condition G applies to the automatic actuation logic and actuation relays (SSPS) for the Steam Line Isolation, Turbine Trip and Feedwater Isolation, and AFW actuation Functions.

The action addresses the train orientation of the actuation logic for these functions. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. ~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~ The 24 hours allowed for restoring the inoperable train to OPERABLE status is justified in Reference 18. The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. ~~If the train cannot be returned to OPERABLE status, the unit must be brought to MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of the protection channels and actuation functions. In this MODE, the unit does not have analyzed transients or conditions that require the explicit use of the protection functions noted above.~~

The Required Actions are modified by a Note that allows one train to be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. This allowance is based on the reliability analysis (Reference 8) assumption that 4 hours is the average time required to perform train surveillance.

Consistent with the requirement in Reference 18 to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a logic train is inoperable for maintenance are included (note that these restrictions do not apply when a logic train is being tested under the 4-hour bypass Note of Condition G). Entry into Condition G is not a typical, pre-planned evolution during power operation, other than for surveillance testing. Since Condition G is typically entered due to equipment failure, it follows

(continued)

## BASES

ACTIONS  
(continued)G.1, G.2.1, and G.2.2 (continued)

that some of the following restrictions may not be met at the time of Condition G entry. If this situation were to occur during the 24-hour Completion Time of Required Action G.1, the Configuration Risk Management Program will assess the emergent condition and direct activities to restore the inoperable logic train and exit Condition G or fully implement these restrictions or perform a plant shutdown, as appropriate from a risk management perspective. The following restrictions will be observed:

- To preserve ATWS mitigation capability, activities that degrade the availability of the auxiliary feedwater system, RCS pressure relief system (pressurizer PORVs and safety valves), AMSAC, or turbine trip should not be scheduled when a logic train is inoperable for maintenance.
- To preserve LOCA mitigation capability, one complete ECCS train that can be actuated automatically must be maintained when a logic train is inoperable for maintenance.
- To preserve reactor trip and safeguards actuation capability, activities that cause master relays or slave relays in the available train to be unavailable and activities that cause analog channels to be unavailable should not be scheduled when a logic train is inoperable for maintenance.
- Activities on electrical systems (e.g., AC and DC power) and cooling systems (e.g., essential service water and component cooling water) that support the systems or functions listed in the first three bullets should not be scheduled when a logic train is inoperable for maintenance. That is, one complete train of a function that supports a complete train of a function noted above must be available.

H.1

Condition H applies to the automatic logic and actuation relays (SSPS) for the Automatic Pressurizer PORV Actuation Function.

The Required Action addresses the impact on the ability to mitigate an inadvertent ECCS actuation at power event that requires the availability of at least one pressurizer PORV for automatic pressure relief. With one or more automatic actuation logic trains inoperable, the associated pressurizer PORV(s) must be declared inoperable immediately. This

(continued)

## BASES

ACTIONS  
(continued)H.1 (continued)

requires that Condition B or E of LCO 3.4.11, "Pressurizer PORVs," be entered immediately depending on the number of PORVs inoperable.

The Required Action is modified by a Note that allows one train to be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. This allowance is based on the reliability analysis (Refs. 8 and 13) assumption that 4 hours is the average time required to perform channel surveillance.

I.1 and I.2

Condition I applies to:

- SG Water Level - High High (P-14).

If one channel is inoperable, 72 hours are allowed to restore the channel to OPERABLE status or to place it in the tripped condition. ~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~ If placed in the tripped condition, the Function is then in a partial trip condition where one-out-of-three logic will result in actuation. The 72 hour Completion Time is justified in Reference 18. ~~Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 72 hours requires the unit to be placed in MODE 3 within the following 6 hours. The allowed Completion Time of Required Action I.2 is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, this Function is no longer required OPERABLE.~~

The Required Actions are modified by a Note that allows the inoperable channel to be bypassed for up to 12 hours for surveillance testing of other channels. The 72 hours allowed to place the inoperable channel in the tripped condition, and the 12 hours allowed for an inoperable channel to be in the bypassed condition for testing, are justified in Reference 18.

J.1 and J.2

Condition J applies to the AFW pump start on trip of all MFW pumps (PAE01A and PAE01B).

(continued)



## BASES

ACTIONS  
(continued)J.1 and J.2 (continued)

This action addresses the train orientation of the BOP ESFAS for the auto start function of the AFW System on loss of all MFW pumps (PAE01A and PAE01B). The OPERABILITY of the AFW System must be assured by providing automatic start of the AFW System pumps.

Condition J applies if one channel is inoperable. If Condition J is entered, 24 hours are allowed to place the inoperable channel in the tripped condition. This Completion Time is consistent with Reference 23. ~~If the channel cannot be tripped within 24 hours, 6 additional hours are allowed to place the unit in MODE 3. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, the unit does not have any analyzed transients or conditions that require the explicit use of the protection function noted above.~~ Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program. The Required Actions are modified by a Note that allows one inoperable channel to be bypassed for up to 2 hours for surveillance testing of other channels.

K.1, K.2.1, and K.2.2

Condition K applies to:

- RWST Level - Low Low Coincident with Safety Injection.

RWST Level - Low Low Coincident With SI provides actuation of switchover to the containment recirculation sumps. Note that this Function requires the bistables to energize to perform their required action. The failure of up to two channels will not prevent the operation of this Function. This Action Statement limits the duration that an RWST level channel could be inoperable in the tripped condition in order to limit the probability for automatic switchover to an empty containment sump upon receipt of an inadvertent safety injection signal (SIS), coincident with a single failure of another RWST level channel, or for premature switchover to the sump after a valid SIS. This sequence of events would start the RHR pumps, open the containment sump RHR suction valves and, after meeting the sump suction valve open position interlock, the RWST RHR suction valves would close. The 72 hour restoration time for an inoperable channel is consistent with that given in other Technical Specifications affecting RHR operability, e.g., for one ECCS train inoperable and for one diesel generator inoperable.

(continued)

## BASES

ACTIONS  
(continued)K.1 (continued)

The Completion Times are justified in References 8 and 18. ~~Alternatively, a Completion\_Time can be determined in accordance with the Risk Informed Completion Time Program. If the channel cannot be returned to OPERABLE status within 72 hours, the unit must be brought to MODE 3 within the following 6 hours and MODE 5 within the next 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 5, the unit does not have any analyzed transients or conditions that require the explicit use of the protection function noted above.~~ The Required Actions are modified by a Note that allows placing an inoperable channel in the bypassed condition for up to 12 hours for surveillance testing of other channels. This bypass allowance is justified in Reference 18.

L.1, L.2.1, and L.2.2

Condition L applies to the P-11 interlock.

With one or more required channel(s) inoperable, the operator must verify that the interlock is in the required state for the existing unit condition by observation of the associated permissive annunciator window. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. ~~If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of this interlock.~~

M.1 and M.2

Condition M applies to the AFW pump start on trip of all MFW pumps (PAE01A and PAE01B).

This action addresses the train orientation of the BOP ESFAS for the auto start function of the AFW System on loss of all MFW pumps (PAE01A and PAE01B). The OPERABILITY of the AFW System must be assured by providing automatic start of the AFW System pumps.

(continued)

## BASES

ACTIONS  
(continued)M.1 and M.2 (continued)

Condition M applies if two channels are inoperable and the motor-driven AFW actuation function is maintained from one actuation train, i.e., if two channels out of the four total channels are inoperable but are in the same separation group. If Condition M is entered, 24 hours are allowed to place the inoperable channels in the tripped condition.

If one channel per MFW pump is inoperable, but the Condition is limited to the same separation group, the actuation function remains available. As shown on FSAR Figure 7.3-1, sheet 2 (Ref. 2), satisfying the trip logic requires the presence of a low oil pressure signal in the same separation group on each MFW pump. For example, an inoperable separation group 1 channel on one MFW pump coincident with an inoperable separation group 1 on the other MFW pump would leave the separation group 4 channels available to perform the actuation function. Therefore, Condition M covers either of the following situations:

- Channels FCP-0025 and FCP-0125 inoperable or
- Channels FCP-0026 and FCP-0126 inoperable.

The wording of Condition M and the 24-hour Completion Time are consistent with Reference 23.

~~If the channels cannot be tripped in 24 hours, 6 additional hours are allowed to place the unit in MODE 3. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, the unit does not have any analyzed transients or conditions that require the explicit use of the protection function noted above.~~

N.1, N.2.1, and N.2.2

Condition N applies to the Environmental Allowance Modifier (EAM) circuitry for the SG Water Level - Low Low trip Functions in MODES 1, 2, and 3. With one or more EAM channel(s) inoperable, they must be placed in the tripped condition within 72 hours. Placing an EAM channel in trip automatically enables the SG Water Level - Low Low (Adverse Containment Environment) bistable for that protection channel, with its higher SG level Trip Setpoint (a higher trip setpoint means a feedwater isolation or an AFW actuation would occur sooner). The Completion Time of 72 hours is based on Reference 18. ~~If the inoperable channel cannot be placed in the tripped condition within the specified Completion Time,~~

(continued)

## BASES

ACTIONS  
(continued)N.1-(continued)

~~the unit must be placed in a MODE where this Function is not required to be OPERABLE. The unit must be placed in MODE 3 within an additional six hours and in MODE 4 within the following six hours.~~

O.1 and O.2

Condition O applies to the Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low trip Function. The Condensate Storage Tank is the highly reliable and preferred suction source for the AFW pumps. This function has a two-out-of-three trip logic. Therefore, continued operation is allowed with one inoperable channel until the performance of the next COT on one of the other channels, as long as the inoperable channel is placed in trip within 24 hours.

P.1 and P.2

Condition P applies to the Auxiliary Feedwater Manual Initiation trip Function and the Steam Generator Blowdown and Sample Line Isolation Valve Actuation Function 10.a. The associated auxiliary feedwater pump(s) and the associated steam generator blowdown and sample line isolation valve(s) must be declared inoperable immediately when one or more channel(s) or train(s) is inoperable. Refer to LCO 3.7.5, "Auxiliary Feedwater (AFW) System," and to LCO 3.7.19, "Secondary Side Isolation Valves."

Q.1, ~~Q.2.1, and Q.2.2~~

Condition Q applies to the Auxiliary Feedwater and Steam Generator Blowdown and Sample Line Isolation Valve Actuation Function 10.b Balance of Plant ESFAS automatic actuation logic and actuation relays. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. The 24-hour Completion Time for restoring the inoperable train to OPERABLE status is justified in Reference 23. ~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program. The specified Completion Time is reasonable considering that there is another OPERABLE train and the low probability of an event occurring during this interval. If the inoperable train cannot be restored to OPERABLE status within 24 hours, the unit must be brought to MODE 3 within 30 hours and MODE 4 within 36 hours (Example 1.3-1 explains the independence of these Completion Times).~~ The Required Actions are modified by a Note that allows one train to be bypassed for up to 2 hours for surveillance testing provided the other train is OPERABLE.

(continued)

## BASES

ACTIONS  
(continued)R.1, R.2.1, and R.2.2

Condition R applies to the Auxiliary Feedwater Loss of Offsite Power trip Function and the Steam Generator Blowdown and Sample Line Isolation Valve Actuation Function 10.d. With the inoperability of one or both train(s), 48 hours are allowed to return the train(s) to OPERABLE status. ~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~ The specified Completion Time is reasonable considering this Function is associated with the turbine driven auxiliary feedwater pump (TDAFP) and the ESFAS Function 10 valves, the available redundancy provided by the motor driven auxiliary feedwater pumps and other isolation valves, and the low probability of an event occurring during this interval. ~~If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within 6 hours and in MODE 4 within 12 hours (Example 1.3-1 explains the independence of these Completion Times). The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require this equipment for mitigation.~~

This Condition has been modified by a NOTE to require that application of the Risk Informed Completion Time Program is not applicable when both trains are inoperable. The PRA Success Criterion is one of two trains. As previously described in the Bases, with one or both train(s) inoperable, action must be taken to restore the train(s) to OPERABLE status within 48 hours.

S.1, S.2.1, and S.2.2

Condition S applies to the MSFIS automatic logic and actuation relays.

The action addresses the train orientation of the actuation logic for these functions. If one train is inoperable, 6 hours are allowed to restore the train to OPERABLE status ~~or in accordance with the Risk Informed Completion Time Program.~~ The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. ~~If the train cannot be returned to OPERABLE status, the unit must be brought to MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of the protective function. In this MODE, the unit does not have analyzed transients or~~

(continued)

BASES

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ACTIONS  
(continued)S.1, S.2.1, and S.2.2 (continued)

~~conditions that require the explicit use of the protection function noted above.~~

The Required Actions are modified by a Note that allows one train to be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. This allowance is based on the reliability analysis (Reference 13) assumption that 4 hours is the average time required to perform channel surveillance.

T.1

If the Required Action and associated Completion Time of Condition B, C, or K is not met, the unit must be placed in a MODE in which the LCO does not apply. This is accomplished by placing the unit in MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.

U.1

If the Required Action and associated Completion Time of Condition D, E, F, G, L, N, Q, R, or S is not met, the unit must be placed in MODE 3 within 6 hours and MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.

V.1

If the Required Action and associated Completion Time of Condition I, J, or M is not met, the unit must be placed in MODE 3 within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, these Functions are no longer required OPERABLE.

(continued)

## BASES

ACTIONS  
(continued)A.1

Condition A applies to the LOP DG start Functions with one loss of voltage or one degraded voltage channel per bus inoperable.

If one channel is inoperable, Required Action A.1 requires that channel to be placed in trip within 6 hours **or in accordance with the Risk Informed Completion Time Program**. With a channel in trip, the LSELS is configured to provide a one-out-of-three logic to initiate a trip of the incoming offsite power, shed ESF bus loads, and generate an LOP DG start signal.

A Note is added to allow bypassing an inoperable channel for up to 4 hours for surveillance testing of other channels. This allowance is made where bypassing the channel does not cause an actuation and where at least two other channels are monitoring that parameter.

The specified Completion Time and time allowed for bypassing one channel are reasonable considering the Function remains fully OPERABLE on every bus and the low probability of an event occurring during these intervals.

B.1

Condition B applies when more than one loss of voltage or more than one degraded voltage channel per bus are inoperable. The associated load shedder and emergency load sequencer (LSELS) must be declared inoperable immediately when:

- a. More than one loss of voltage or more than one degraded voltage channel per bus are inoperable; or
- b. The Required Action and associated Completion Time of Condition A are not met.

Once in this Condition the affected instrument function (loss of voltage or degraded voltage) may no longer be single failure proof or may no longer be functional for the affected bus. In this case, operation in the MODE of Applicability must be limited. Condition B requires that the associated load shedder and emergency load sequencer (LSELS) be immediately declared inoperable. This action is appropriate because the affected instrument channels (loss of voltage or degraded voltage) are inputs to the LSELS and rely on LSELS circuits to perform their required actuations. Since the actuation logic and actuation relays for the loss of power instruments (turbine driven AFW pump start via the BOP ESFAS,

(continued)

## BASES (Continued)

## APPLICABILITY

The need for pressure control is most pertinent when core heat can cause the greatest effect on RCS temperature, resulting in the greatest effect on pressurizer level and RCS pressure control. Thus, applicability has been designated for MODES 1 and 2. The applicability is also provided for MODE 3. The purpose is to prevent solid water RCS operation during heatup and cooldown to avoid rapid pressure rises caused by normal operational perturbation, such as reactor coolant pump startup.

In MODES 1, 2, and 3, there is the need to maintain the availability of pressurizer heaters, capable of being powered from either the offsite power source or the emergency power supply. In the event of a loss of offsite power, the initial conditions of these MODES give the greatest demand for maintaining the RCS in a hot pressurized condition with loop subcooling for an extended period. For MODE 4, 5, or 6, it is not necessary to control pressure (by heaters) to ensure loop subcooling for heat transfer when the Residual Heat Removal (RHR) System is in service, and therefore, the LCO is not applicable.

## ACTIONS

A.1, A.2, A.3, and A.4

Pressurizer water level control malfunctions or other plant evolutions may result in a pressurizer water level above the LCO limit, even with the plant at steady state conditions. Normally the plant will trip in this event since the LCO limit is the same as the Pressurizer Water Level - High Trip.

If the pressurizer water level is not within the limit, action must be taken to bring the plant to a MODE in which the LCO does not apply. To achieve this status, within 6 hours the unit must be brought to MODE 3, with all rods fully inserted and incapable of withdrawal (e.g., by de-energizing all CRDMs, by opening the RTBs, or de-energizing the motor generator (MG) sets). Additionally, the unit must be brought to MODE 4 within 12 hours. This takes the unit out of the applicable MODES.

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

B.1

If one required group of backup pressurizer heaters is inoperable, restoration is required within 72 hours **or in accordance with the Risk Informed Completion Time Program**. The Completion Time of 72 hours is reasonable considering the anticipation that a demand caused by loss



## BASES

ACTIONS  
(continued)A.1 (continued)

PORV inoperability solely due to excessive seat leakage does not prevent automatic and manual use and does not create a possibility for a small break LOCA. Closure of the block valve(s) establishes reactor coolant pressure boundary (RCPB) integrity for a PORV(s) with excessive seat leakage. RCPB integrity takes priority over the capability of the PORV(s) to mitigate an overpressure event. For these reasons, the block valve may be closed but the Action requires power be maintained to the valve. This Condition is only intended to permit operation of the plant for a limited period of time not to exceed the next refueling outage (MODE 6) so that maintenance can be performed on the PORVs to eliminate the problem condition. Normally, the PORVs should be available for automatic mitigation of overpressure events and should be returned to OPERABLE and automatic actuation status prior to entering startup (MODE 2).

Quick access to the PORV for pressure control can be made when power remains on the closed block valve. The Completion Time of 1 hour is based on plant operating experience that has shown that minor problems can be corrected or closure accomplished in this time period.

B.1, B.2, and B.3

If one PORV is inoperable for reasons other than excessive seat leakage (i.e., not capable of automatic pressure relief or not capable of being manually cycled), it must be either restored or isolated by closing the associated block valve and removing the power to the associated block valve. The Completion Times for Required Actions B.1 and B.2 of 1 hour are reasonable, based on challenges to the PORVs during this time period, and provide the operator adequate time to correct the situation. If the inoperable PORV cannot be restored to OPERABLE status, it must be isolated within the specified time of 1 hour. Because there is at least one PORV that remains OPERABLE, an additional 72 hours is provided to restore the inoperable PORV to OPERABLE status. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.** If the PORV cannot be restored within this additional time, the plant must be brought to MODE 4, as required by Condition D.

C.1 and C.2

(continued)

## BASES

ACTIONS  
(continued)C.1 and C.2 ~~(continued)~~

If one block valve is inoperable, then it is necessary to either restore the block valve to OPERABLE status within the Completion Time of 1 hour or place the associated PORV in manual control. The prime importance for the capability to close the block valve is to isolate a stuck open PORV. Therefore, if the block valve cannot be restored to OPERABLE status within 1 hour, the Required Action is to place the PORV in manual control to preclude its automatic opening for an overpressure event and to avoid the potential for a stuck open PORV at a time that the block valve is inoperable. The Completion Time of 1 hour is reasonable, based on the small potential for challenges to the system during this time period, and provides the operator time to correct the situation. Because at least one PORV remains OPERABLE, the operator is permitted a Completion Time of 72 hours to restore the inoperable block valve to OPERABLE status. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.** The time allowed to restore the block valve is based upon the Completion Time for restoring an inoperable PORV in Condition B, since the PORVs may not be capable of mitigating an event if the inoperable block valve is not fully open. If the block valve is restored within the Completion Time of 72 hours, the PORV may be restored to automatic operation. If it cannot be restored within this additional time, the plant must be brought to MODE 4, as required by Condition D.

The Required Actions are modified by a Note stating that the Required Actions do not apply if the sole reason for the block valve being declared inoperable is as a result of power being removed to comply with other Required Actions. In this event, the Required Actions for inoperable PORV(s) (which require the block valve power to be removed once it is closed) are adequate to address the condition. While it may be desirable to also place the PORV(s) in manual control, this may not be possible for all causes of Condition B or E entry with PORV(s) inoperable and not capable of automatic pressure relief or not capable of being manually cycled (e.g., as a result of failed control power fuse(s) or control switch malfunction(s)).

D.1 and D.2

If the Required Action of Condition A, B, or C is not met, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full

(continued)

## BASES

## APPLICABILITY

In MODES 1, 2, and 3, the ECCS OPERABILITY requirements for the limiting Design Basis Accident, a large break LOCA, are based on full power operation. Although reduced power would not require the same level of performance, the accident analysis does not provide for reduced cooling requirements in the lower MODES. The ECCS centrifugal charging pump performance is based on a small break LOCA, which establishes the pump performance curve and has less dependence on power (minimum ECCS large break LOCA assumes the same CCP flow rates as the small break LOCA analysis). The SI pump performance requirements are based on a small break LOCA. MODE 2 and MODE 3 requirements are bounded by the MODE 1 analysis.

This LCO is only applicable in MODE 3 and above. The SI signals on low pressurizer pressure and low steam line pressure may be blocked manually in MODE 3 below the P-11 interlock (pressurizer pressure below 1970 psig). There are no blocks of the safety injection signal on containment pressure - High 1, and this signal is required throughout MODE 3. The manual safety injection signal and automatic actuation logic and relays in the SSPS cabinets are required to be OPERABLE during MODES 1-4. Below MODE 3, manual action is sufficient to mitigate a loss of coolant, and the emergency core cooling system functional requirements are relaxed as described in LCO 3.5.3, "ECCS - Shutdown."

In MODES 5 and 6, plant conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level," and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level."

## ACTIONS

A.1

With one or more trains inoperable and at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available (Refs. 8 and 9), the inoperable components must be returned to OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. The 72 hour Completion Time is based on an NRC reliability evaluation (Ref. 5) and is a reasonable time for repair of many ECCS components.

(continued)

BASES

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ACTIONS  
(continued)

B.1, B.2, and B.3 (continued)

Required Action B.3 is modified by a Note that applies to air lock doors located in high radiation areas and allows these doors to be verified locked closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of the door, once it has been verified to be in the proper position, is small.

C.1, C.2, and C.3

With one or more air locks inoperable for reasons other than those described in Condition A or B, Required Action C.1 requires action to be initiated immediately to evaluate previous combined leakage rates using current air lock test results. An evaluation is acceptable, since it is overly conservative to immediately declare the containment inoperable if both doors in an air lock have failed a seal test or if the overall air lock leakage is not within the limits as specified in the Containment Leakage Rate Testing Program. In many instances (e.g., only one seal per door has failed), containment remains OPERABLE, yet only 1 hour (per LCO 3.6.1) would be provided to restore the air lock door to OPERABLE status prior to requiring a plant shutdown. In addition, even with both doors failing the seal test, the overall containment leakage rate can still be within limits.

Required Action C.2 requires that one door in the affected containment air lock must be verified to be closed within the 1 hour Completion Time. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires that containment be restored to OPERABLE status within 1 hour.

Additionally, the affected air lock(s) must be restored to OPERABLE status within the 24 hour Completion Time **or in accordance with the Risk Informed Completion Time Program**. The specified time period is considered reasonable for restoring an inoperable air lock to OPERABLE status, assuming that at least one door is maintained closed in each affected air lock.

D.1 and D.2

If the inoperable containment air lock cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based

(continued)

BASES

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ACTIONS  
(continued)

A.1 and A.2 (continued)

activated automatic valve (which may be de-activated locally or by use of a main control board power isolate switch when available), a closed manual valve, a blind flange, or a check valve with flow through the valve secured. Securing flow through a check valve may be effected, for example, by administrative control of a pump and discharge line to preclude flow through the check valve or by closing another valve immediately upstream or downstream of the check valve in order to secure flow through the check valve. For a penetration flow path isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available one to containment.

Required Action A.1 must be completed within 4 hours **or in accordance with the Risk Informed Completion Time Program**. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4.

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour Completion Time and that have been isolated in accordance with Required Action A.1, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that containment penetrations required to be isolated following an accident and no longer capable of being automatically isolated will be in the isolation position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown (which may include the use of local or remote indicators), that those isolation devices outside containment and capable of being mispositioned are in the correct position.

The Completion Time of "once per 31 days **following isolation** for isolation devices outside containment" is appropriate considering the fact that the devices are operated under administrative controls and the probability of their misalignment is low. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and the use of administrative controls that ensure isolation device misalignment is an unlikely possibility.

Condition A has been modified by a Note indicating that this Condition is only applicable to those penetration flow paths with two containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides the appropriate actions.

(continued)

BASES

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ACTIONS  
(continued)

A.1 and A.2 (continued)

Required Action A.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently repositioned. Therefore, the probability of misalignment of these devices once they have been verified to be in the proper position, is small.

A second Note has been added to Required Action A.2 to provide clarification that the action to periodically verify the affected penetration flow path is isolated may be verified administratively for blind flanges and closed manual valves that are locked, sealed, or otherwise secured. This is acceptable since these were verified to be in the correct position prior to locking, sealing, or securing.

B.1

With two containment isolation valves in one or more penetration flow paths inoperable, the affected penetration flow path must be isolated within 1 hour. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. (For penetrations and their associated containment isolation valves that are Type C tested in accordance with 10 CFR 50 Appendix J, the method of isolation must include the use of at least one Type C tested isolation barrier that cannot be adversely affected by a single active failure.) Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve (this includes power operated valves with power removed), and a blind flange. (A remote manual valve's Main Control Board power isolate switch may be used to deactivate the valve.) The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1. In the event the affected penetration is isolated in accordance with Required Action B.1, the affected penetration must be verified to be isolated on a periodic basis per Required Action A.2, which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days for verifying each affected penetration flow path is isolated is appropriate considering the

(continued)

BASES

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ACTIONS  
(continued)

B.1 (continued)

fact that the valves are operated under administrative control and the probability of their misalignment is low.

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two containment isolation valves. Condition A of this LCO addresses the condition of one containment isolation valve inoperable in this type of penetration flow path.

C.1 and C.2

When one or more penetration flow paths with one containment isolation valve inoperable, the inoperable valve flow path must be restored to OPERABLE status or the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. A check valve may not be used to isolate the affected penetration flow path.

Required Action C.1 must be completed within the 72 hour Completion Time **or in accordance with the Risk Informed Completion Time Program**. The specified time period is reasonable considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of maintaining containment OPERABILITY during MODES 1, 2, 3, and 4. The closed system must meet the requirements of Reference 2. The Containment Spray System and the ECCS are closed ESF-grade systems outside containment, which meet the requirements of Reference 2, and serve as the second containment isolation barrier (Ref. 7). This applies to those specific penetrations for which a single containment isolation valve is credited per flow path, i.e., penetrations P-13 and P-16 for the containment spray system, and penetrations P-14, P-15, P-52 and P-79 for the ECCS.

In the event the affected penetration flow path is isolated in accordance with Required Action C.1, the affected penetration flow path must be verified to be isolated on a periodic basis. This periodic verification is necessary to assure that containment penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days **following isolation** for verifying that each affected penetration flow path is isolated is appropriate because the valves are operated under administrative controls and the probability of their misalignment is low.

Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths with only one containment

(continued)

## BASES

LCO  
(continued)

containment atmosphere and retain volatile iodine species in the sumps, consistent with the safety analysis. To ensure that these requirements are met, two containment spray trains and two containment cooling trains must be OPERABLE. Therefore, in the event of an accident, at least one train in each system operates, assuming the worst case single active failure occurs.

A Containment Spray train typically includes a spray pump, spray headers, nozzles, valves, piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST upon an ESF actuation signal and manually transferring to the containment sump. In addition, management of gas voids is important to Containment Spray System OPERABILITY. The containment Spray System is OPERABLE when it is sufficiently filled with water to perform its specified safety function.

A Containment Cooling train typically includes cooling coils, dampers, two fans, instruments, and controls to ensure an OPERABLE flow path.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment and an increase in containment pressure and temperature requiring the operation of the containment spray trains and containment cooling trains.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the Containment Spray System and the Containment Cooling System are not required to be OPERABLE in MODES 5 and 6.

ACTIONS

A.1

With one containment spray train inoperable, the inoperable containment spray train must be restored to OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. In this Condition, the remaining OPERABLE spray and cooling trains are adequate to perform the iodine removal and containment cooling functions. The 72 hour Completion Time takes into account the redundant temperature and pressure reducing capability afforded by the Containment Spray System, reasonable time for repairs, and low probability of a DBA occurring during this period.

~~The 10 day portion of the Completion Time for Required Action A.1 is based upon engineering judgment. It takes into account the low~~

(continued)



## BASES

ACTIONS  
(continued)A.1 (continued)

~~probability of coincident entry into two Conditions in this Specification coupled with the low probability of an accident occurring during this time.~~

~~Refer to Section 1.3, "Completion Times," for a more detailed discussion of the purpose of the "from discovery of failure to meet the LCO" portion of the Completion Time.~~

B.1 and B.2

If the inoperable containment spray train cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows additional time for attempting restoration of the containment spray train and is reasonable when considering the driving force for a release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

C.1

With one of the containment cooling trains inoperable, the inoperable containment cooling train must be restored to OPERABLE status within 7 days ~~or in accordance with the Risk Informed Completion Time Program~~. The remaining OPERABLE containment spray and cooling components provide iodine removal capabilities and are capable of providing at least 100% of the heat removal needs. The 7 day Completion Time was developed taking into account the complementary heat removal capabilities afforded by combinations of the Containment Spray System and Containment Cooling System and the low probability of DBA occurring during this period.

~~The 10 day portion of the Completion Time for Required Action C.1 is based upon engineering judgment. It takes into account the low probability of coincident entry into two Conditions in this Specification coupled with the low probability of an accident occurring during this time. Refer to Section 1.3 for a more detailed discussion of the purpose of the "from discovery of failure to meet the LCO" portion of the Completion Time.~~

(continued)

BASES

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ACTIONS  
(continued)

than one MSIV inoperable during MODE 1, LCO 3.0.3 applies. During MODE 2 or 3, with one MSIV itself or two or more MSIVs themselves inoperable, Condition J applies so that Required Actions J.1 and J.2 are required to be entered. Condition K subsequently applies if the Required Action and associated Completion Time of Condition J cannot be met.

Condition H addresses inoperability of the MSIVBVs. With one or more MSIVBVs inoperable, Condition H (i.e., Required Actions H.1 and H.2) applies. Condition K subsequently applies if the Required Action and associated Completion Time of Condition H cannot be met.

Condition I addresses inoperability of the MSLPDIVs. With one or more MSLPDIVs inoperable, Condition I (i.e., Required Action I.1 and I.2) applies. Condition K subsequently applies if the Required Action and associated Completion Time of Condition I cannot be met.

A.1

With only a single actuator train inoperable on one MSIV, action must be taken to restore the inoperable actuator train to OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. The 72-hour Completion Time is reasonable in light of the dual-redundant actuator train design such that with one actuator train inoperable, the affected MSIV is still be capable of closing on demand via the remaining operable actuator train. The 72-hour Completion Time takes into account the design redundancy, reasonable time for repairs, and the low probability of a design basis accident occurring during this period.

B.1

With an actuator train on one MSIV inoperable and an actuator train on another MSIV inoperable, such that the inoperable actuator trains are not in the same separation group, action must be taken to restore one of the inoperable actuator trains to OPERABLE status within 24 hours **or in accordance with the Risk Informed Completion Time Program**. With two actuator trains inoperable on two MSIVs, there is an increased likelihood that an additional failure (such as the failure of an actuation logic train) could cause one MSIV to fail to close. The 24-hour Completion Time is reasonable, however, since the dual-redundant actuator train design ensures that with only one actuator train on each of two affected MSIVs inoperable, each MSIV is still capable of closing on demand.

(continued)

BASES

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ACTIONS  
(continued)

E.1 (continued)

Action E.1 is conservatively based on the worst-case condition and therefore requires immediately declaring all of the affected MSIVs inoperable. It may be noted that declaring two or more MSIVs inoperable during Mode 1 requires entry into Specification 3.0.3.

F.1

With one MSIV inoperable in MODE 1, action must be taken to restore OPERABLE status within 8 hours or in accordance with the Risk Informed Completion Time Program. Some repairs to the MSIV can be made with the unit hot. The 8 hour Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVs.

Required Action F.1 is entered when one MSIV is inoperable during MODE 1, including when both actuator trains for a single, affected MSIV are inoperable. When only a single MSIV actuator train is inoperable (for one MSIV), Condition A applies and entry only into Required Action A.1 is required.

G.1

If the MSIV cannot be restored to OPERABLE status within 8 hours, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in MODE 2 within 6 hours and Condition H would be entered. The Completion Times are reasonable, based on operating experience, to reach MODE 2 and to close the MSIVs in an orderly manner and without challenging unit systems.

H.1 and H.2

Condition H is modified by a Note indicating that, when one or more MSIVBVs are inoperable, separate Condition entry is allowed for each main steam line.

With one or more MSIVBVs inoperable, action must be taken to restore each MSIVBV to OPERABLE status within 7 days or the inoperable MSIVBV must be closed or isolated. When closed or isolated, the MSIVBV is already in the position required by the assumptions in the safety analysis. The 7 day Completion Time is reasonable, considering

(continued)

BASES

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LCO  
(continued)

and closing on demand and not experiencing excessive seat leakage. Excessive seat leakage, although not associated with a specific acceptance criterion, exists when conditions dictate closure of the manual isolation valve to limit leakage.

Each nitrogen accumulator tank supplies one TDAFP control valve and one steam generator ASD. The tanks must be maintained at a pressure sufficient to support an RCS cooldown to RHR entry conditions following an accident coincident with loss of offsite power in order for the ASDs and the TDAFP flow control valves to be considered OPERABLE.

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APPLICABILITY

In MODES 1, 2, and 3, the ASD lines are required to be OPERABLE.

In MODE 4, the pressure and temperature limitations are such that the probability of a SGTR event requiring ASD operation is low. In addition, the RHR system is available to provide the decay heat removal function in MODE 4. Therefore, the ASD lines are not required to be OPERABLE in MODE 4.

In MODE 5 or 6, an SGTR is not a credible event.

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ACTIONS

A.1

With one required ASD line inoperable for reasons other than excessive ASD seat leakage, action must be taken to restore the ASD line to OPERABLE status within 7 days **or in accordance with the Risk Informed Completion Time Program (unless more than 2 ASD lines are inoperable for any reason)**. The 7 day Completion Time allows for the redundant capability afforded by the remaining OPERABLE ASD lines, a nonsafety grade backup in the Condenser Steam Dump System, and MSSVs.

B.1

With two required ASD lines inoperable for reasons other than excessive ASD seat leakage, action must be taken to restore all but one required ASD line to OPERABLE status. Since the manual isolation valve can be closed to isolate an ASD, some repairs may be possible with the unit at power. The 72-hour Completion Time is reasonable to repair inoperable ASD lines, based on the availability of the Condenser Steam Dump System and/or MSSVs, and the low probability of an event occurring during the restoration period that would require the ASD lines. **Alternatively, unless more than 2 ASD lines are inoperable for any reason, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

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BASES

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LCO  
(continued)                      Although the AFW system can be used in MODE 4 to remove decay heat, the LCO does not require the AFW system to be OPERABLE in MODE 4 since the RHR system is available for decay heat removal.

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APPLICABILITY                      In MODES 1, 2, and 3, the AFW System is required to be OPERABLE in the event that it is called upon to function when the MFW is lost. In addition, the AFW System is required to supply enough makeup water to replace the steam generator secondary inventory, lost as the unit cools to MODE 4 conditions.

In MODES 4 and 5, the AFW System may be used for heat removal via the steam generators but is not required since the RHR System is available in these MODES.

In MODE 6, the steam generators are not normally used for heat removal, and the AFW System is not required.

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

A.1

If one of the two steam supplies to the turbine-driven AFW train is inoperable, action must be taken to restore OPERABLE status within 7 days **or in accordance with the Risk Informed Completion Time Program**. The 7 day Completion Time is reasonable, based on the following reasons:

- a. The redundant OPERABLE steam supply to the turbine-driven AFW pump;
- b. The availability of redundant OPERABLE motor-driven AFW pumps; and
- c. The low probability of an event occurring that requires the inoperable steam supply to the turbine-driven AFW pump

(continued)

BASES

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ACTIONS  
(continued)

A.1 (continued)

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

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

B.1

With one of the two Essential Service Water supply lines in the turbine-driven AFW train inoperable, action must be taken to restore the inoperable ESW supply line to OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. One inoperable ESW supply line in the turbine-driven AFW train does not render the TDAFP inoperable since the turbine-driven AFW train is provided with redundant ESW supply lines. The 72 hour Completion Time is reasonable, based on the following reasons:

- a. The redundant OPERABLE Essential Service Water supply line in the turbine-driven AFW train;
- b. The availability of the preferred non-safety grade Condensate Storage Tank supply;
- c. The availability of at least one OPERABLE motor-driven AFW pump. When an ESW train inoperability renders a TDAFP supply line inoperable and a motor-driven AFW pump supply line inoperable, then one motor-driven AFW pump is OPERABLE and the second motor-driven AFW pump is available with water supplied from the non-safety grade Condensate Storage Tank;
- d. The low probability of an event occurring that will require the inoperable Essential Service Water supply line to the turbine-driven AFW pump; and
- e. The 72 hour Completion Time is consistent with the allowed Completion Time for one train of ESW inoperable (see Ref. 4).

(continued)

BASES

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ACTIONS  
(continued)B.1 (continued)

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

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

C.1

With one of the required AFW trains (pump or flow path) inoperable for reasons other than Condition A or Condition B, action must be taken to restore OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. This Condition includes the loss of two steam supply lines or two ESW supply lines to the turbine-driven AFW pump. The 72 hour Completion Time is reasonable, based on redundant capabilities afforded by the AFW System, time needed for repairs, and the low probability of a DBA occurring during this time period. ~~License Amendment 158 approved a one-time only Completion Time extension to 144 hours for the Condition C entry on 2/3/04 for the turbine-driven auxiliary feedwater pump. Condition C was entered at 0756 hours Central Standard Time on 2/3/04 when the turbine-driven auxiliary feedwater pump was declared inoperable. This one-time Completion Time extension for Required Action C.1 expires at 0756 hours Central Standard Time on 2/9/04, after which Condition D must be entered. At the time a formal cause of the inoperability is determined, Condition D will be entered immediately.~~

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

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

(continued)

BASES

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LCO  
(continued)

A CCW train is rendered inoperable when one or more associated ESW emergency makeup valves are closed, inoperable and not capable of being remotely opened from the Control Room. CCW Train 'A' emergency makeup valves include EGHV0011 and EGHV0013. CCW Train 'B' emergency makeup valves include EGHV0012 and EGHV0014.

The isolation of CCW flow to other components or systems not required for safety may render those components or systems non-functional, but does not affect the OPERABILITY of the CCW System. Further, non-functionality of the CCW surge tank level channels (driven by transmitters EGLT0001 and EGLT0002) does not affect OPERABILITY of the CCW system.

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APPLICABILITY

In MODES 1, 2, 3, and 4, the CCW system is a normally operating system, which must be prepared to perform its post-accident safety functions, primarily RCS heat removal, which is achieved by cooling the RHR heat exchanger.

In MODES 5 and 6, requirements for the CCW system are determined by the systems it supports.

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ACTIONS

A.1

If one CCW train is inoperable, action must be taken to restore OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. In this Condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function.

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," shall be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

B.1 and B.2

If the CCW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which

(continued)



BASES

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LCO  
(continued)

An ESW system train is considered OPERABLE during MODES 1, 2, 3, and 4 when:

- a. The pump is OPERABLE;
- b. The required piping, valves, and instrumentation and controls needed to perform safety-related functions necessary to mitigate DBAs and transients analyzed in FSAR Chapters 6 and 15 are OPERABLE (Ref. 4); and
- c. The pump room supply fan is OPERABLE.

The prelube storage tanks, TEF01A and TEF01B, are not required for OPERABILITY of the ESW pumps. The ESW pumps will start and run satisfactorily with dry bearings in an emergency should prelube water supply from the prelube storage tank not be present. Once the pump starts, lube water will be supplied by the pump.

The isolation of ESW flow to the Service Air (KA) system air compressors may render them non-functional, but does not affect the OPERABILITY of the ESW system. Further, non-functionality of the ESW differential pressure channel in either (or both) ESW train (driven by transmitters EFPDT0043 and EFPDT0044) does not affect OPERABILITY of the ESW system.

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APPLICABILITY

In MODES 1, 2, 3, and 4, the ESW system is a standby system that is required to support the OPERABILITY of the equipment serviced by the ESW system and required to be OPERABLE in these MODES.

In MODES 5 and 6, requirements for the ESW system are determined by the systems it supports.

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ACTIONS

A.1

If one ESW train is inoperable, action must be taken to restore OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program**. In this Condition, the remaining OPERABLE ESW system train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ESW system train could result in loss of ESW function.

Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC

(continued)

BASES

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ACTIONS  
(continued)

A.1 (continued)

Sources - Operating," shall be entered if an inoperable ESW train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," shall be entered if an inoperable ESW system train results in an inoperable residual heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

The 72 hour Completion Time is reasonable based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period. ~~The Completion Time is modified by a Note that allows a one-time Completion Time of 14 days to support the planned replacement of ESW 'B' train piping prior to April 30, 2009.~~

B.1 and B.2

If the ESW system train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

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

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of ESW flow to individual components or systems may render those components inoperable or non-functional, but does not affect the OPERABILITY of the ESW system.

Verifying the correct alignment for manual, power operated, and automatic valves in the ESW system flow path servicing safety-related components provides assurance that the proper flow paths exist for ESW system operation.

This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will

(continued)

BASES

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LCO  
(continued)

condition, the UHS retention pond temperature should not exceed 89 F and the level should not fall below 16.0 feet from the bottom of the pond (834.0 ft mean sea level) during normal unit operation.

An inoperable UHS cooling tower electrical room supply fan renders its associated UHS cooling tower train inoperable. The UHS is not inoperable if a UHS sump heater is inoperable unless ice formation blocks the return line to the UHS pond.

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APPLICABILITY

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the ESW system and required to be OPERABLE in these MODES.

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ACTIONS

A.1

If one cooling tower train is inoperable, action must be taken to restore the inoperable cooling tower train to OPERABLE status within 72 hours **or in accordance with the Risk Informed Completion Time Program.**

The 72 hour Completion Time is reasonable based on the low probability of an accident occurring during the 72 hours that one cooling tower train is inoperable, the number of available systems, and the time required to reasonably complete the Required Action.

B.1 and B.2

If the cooling tower train cannot be restored to OPERABLE status within the associated Completion Time, or if the UHS is inoperable for reasons other than Condition A, such as when both cooling tower trains are inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

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

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the ESW system pumps. This SR verifies that the

(continued)

BASES

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ACTIONS  
(continued)

A.2 (continued)

- b. A required feature on the other train is inoperable.

If at any time during the existence of Condition A (one offsite circuit inoperable) a redundant required feature subsequently becomes inoperable coincident with no offsite power to one train of the onsite Class 1E Electrical Power Distribution System, this Completion Time begins to be tracked.

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

Required Action A.2 is no longer applicable when the train of onsite Class 1E Electrical Power Distribution System is connected to the remaining OPERABLE offsite circuit. In this case, Required Actions A.1 and A.3 continue to apply.

The remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.** With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

(continued)

ACTIONS  
(continued)A.3 (continued)

~~The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 144 hours, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 72 hours (for a total of 9 days) allowed prior to complete restoration of the LCO. The 6 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 6 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.~~

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition A was entered.

B.1

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps and the turbine-driven auxiliary feedwater pump which must be available for mitigation of a feedwater line break. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG.

(continued)

BASES

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ACTIONS  
(continued)B.3.1 and B.3.2

Required Action B.3.1 provides an allowance to avoid unnecessary testing of the OPERABLE DG. If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG, SR 3.8.1.2 does not have to be performed. If the DG was declared inoperable for preplanned preventive maintenance, testing, or maintenance to correct a condition which, if left uncorrected, would not affect the OPERABILITY of the DG, or for an inoperable Support System, or for an independently testable component, SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on the other DG, the other DG would be declared inoperable upon discovery and Condition E of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.3.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG, performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of that DG. Required Action B.3.2 is modified by a Note stating that it is satisfied by the automatic start and sequence loading of the DG.

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.4

~~Both Completion Times of Required Action B.4 are modified by a Note that allows a one-time Completion Time of 14 days to support the planned replacement of ESW 'B' train piping prior to April 30, 2009.~~

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours.

In Condition B, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

(continued)

ACTIONS  
(continued)

B.4 (continued)

~~The second Completion Time for Required Action B.4 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours.~~

~~This could lead to a total of 144 hours, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 9 days) allowed prior to complete restoration of the LCO. The 6 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72-hour and 6 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.~~

As in Required Action B.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

C.1 and C.2

Required Action C.1, which applies when two offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. This includes motor driven auxiliary feedwater pumps and the turbine driven auxiliary feedwater pump which must be available for mitigation of a feedwater line break. Single train features, other than the turbine driven auxiliary feedwater pump, are not included in this Condition.

(continued)

BASES

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ACTIONS  
(continued)

C.1 and C.2 (continued)

A Note is added to this Required Action stating that in MODES 1, 2, and 3, the turbine driven auxiliary feedwater pump is considered a required redundant feature. The reason for the Note is to confirm the OPERABILITY of the turbine driven auxiliary feedwater pump in this Condition, since one motor driven auxiliary feedwater pump is not by itself capable of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.

The Completion Time for Required Action C.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

- a. All required offsite circuits are inoperable; and
- b. A required feature is inoperable.

If at any time during the existence of Condition C (two offsite circuits inoperable) a required feature becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 24 hours. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.** This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

- a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and
- b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

(continued)



BASES

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ACTIONS  
(continued)

C.1 and C.2 (continued)

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

D.1 and D.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition D are modified by a Note to indicate that when Condition D is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems-Operating," must be immediately entered. This allows Condition D to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition D for a period that should not exceed 12 hours. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

In Condition D, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition C (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

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BASES

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ACTIONS  
(continued)

F.2 (continued)

provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.** This time period also ensures that the probability of an accident (requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.

G.1 and G.2

If the inoperable AC electrical power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

H.1

Condition H corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

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SURVEILLANCE  
REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10), as addressed in the FSAR. The SR frequencies for required tests are controlled under the Surveillance Frequency Control Program (SFCP) described in Technical Specification 5.5.18, as approved by the NRC via Amendment 202 to the Callaway Operating License.

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BASES (Continued)

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ACTIONS

A.1

Condition A represents one train with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected train. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system train. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

If one of the required DC electrical power subsystems is inoperable (e.g., inoperable battery, inoperable battery charger(s), or inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure would, however, result in the complete loss of the remaining 125 VDC electrical power subsystems with attendant loss of ESF functions, continued power operation should not exceed 2 hours.

The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 8) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

B.1 and B.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 8).

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the

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BASES (Continued)

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ACTIONS

A.1

With a required (normal source) inverter inoperable, its associated AC vital bus also becomes inoperable until the bus is re-energized to proper voltage from the inoperable inverter's internal AC source (BCVT) or from a swing inverter powered from the associated 125-VDC battery or via the swing inverter's associated alternate AC source (BCVT).

To ensure prompt action is taken in response to de-energization of an AC vital bus due to inverter inoperability, a Note is included in Condition A requiring entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," with any vital bus de-energized. This ensures that the vital bus is re-energized within 2 hours.

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.** The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the AC vital bus is powered from its bypass source (via the bypass constant voltage transformer associated with either the normal source inverter or the swing inverter) it is relying upon interruptible AC electrical power sources (offsite or onsite). The uninterruptible inverter source to the AC vital bus (i.e., normal source inverter or swing inverter, as connected to the associated 125-VDC battery) is the required source for powering instrumentation trip setpoint devices. Vital AC power source requirements are covered in LCO 3.8.7; the vital AC power distribution requirements are covered in LCO 3.8.9.

B.1 and B.2

If the inoperable devices or components cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

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BASES

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LCO  
(continued)

however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.

Closure of the tie breaker 52NG0116 between NG01 and NG03 or tie breaker 52NG0216 between NG02 and NG04 will render all four degraded voltage channels for the associated 4.16 kV bus inoperable. Refer to LCO 3.3.5, "LOP DG Start Instrumentation." The 480 V load center transformer load and voltage drop increase when one transformer is supplying both 480 V buses. Since the degraded voltage is sensed on the 4.16 kV bus, the actual 480 V bus voltage will be lower (lower than assumed during a degraded voltage condition) when the protection setpoint is reached. In this case, adequate protection is not provided for the 480 V bus loads.

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APPLICABILITY

The electrical power distribution subsystems are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

- a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and
- b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Electrical power distribution subsystem requirements for MODES 5 and 6 and during movement of irradiated fuel assemblies are covered in LCO 3.8.10, "Distribution Systems - Shutdown."

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ACTIONS

A.1

With one or more required AC buses or load centers, except AC vital buses, in one train inoperable, the remaining AC electrical power distribution subsystem in the other train is capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, and load centers must be restored to OPERABLE status within 8 hours or in accordance with the Risk Informed Completion Time Program.

Condition A worst scenario is one train without AC power (i.e., no offsite power to the train and the associated DG inoperable). In this Condition,

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ACTIONS  
(continued)

A.1 (continued)

the unit is more vulnerable to a complete loss of AC power. It is, therefore, imperative that the unit operator's attention be focused on minimizing the potential for loss of power to the remaining train by stabilizing the unit, and on restoring power to the affected train. This 8 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate AC power. Taking exception to LCO 3.0.2 for components without adequate AC power, that would have the Required Action Completion Times shorter than 8 hours if declared inoperable, is acceptable because of:

- a. The potential for decreased safety if the unit operator's attention is diverted from the evaluations and actions necessary to restore power to the affected train, to the actions associated with taking the unit to shutdown within this time limit; and
- b. The potential for an event in conjunction with a single failure of a redundant component in the train with AC power.

~~The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DC bus is inoperable and subsequently restored OPERABLE, the LCO may already have been not met for up to 2 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the AC distribution system. At this time, a DC circuit could again become inoperable, and AC distribution restored OPERABLE. This could continue indefinitely.~~

~~The Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time the LCO was initially not met, instead of the time Condition A was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.~~

B.1

With one AC vital bus inoperable, the remaining OPERABLE AC vital buses are capable of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the required AC vital bus must be restored to OPERABLE

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BASES  
BASES

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ACTIONS  
(continued)

B.1 (continued)

status within 2 hours by powering the bus from the associated normal source inverter or swing inverter, via inverted DC voltage or the alternate AC source (i.e., bypass constant voltage transformer). **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

Condition B represents one AC vital bus without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining vital buses and restoring power to the affected vital bus.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate vital AC power. Taking exception to LCO 3.0.2 for components without adequate vital AC power, that would have the Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

- a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue;
- b. The potential for decreased safety by requiring entry into numerous Applicable Conditions and Required Actions for components without adequate vital AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train; and
- c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time takes into account the importance to safety of restoring the AC vital bus to OPERABLE status, the redundant capability afforded by the other OPERABLE vital buses, and the low probability of a DBA occurring during this period.

~~The second Completion Time for Required Action B.1 establishes a limit on the maximum allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This could lead to a~~

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BASES

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ACTIONS  
(continued)

~~B.1 (continued)~~

~~total of 10 hours, since initial failure of the LCO, to restore the vital bus distribution system. At this time, an AC train could again become inoperable, and vital bus distribution restored OPERABLE. This could continue indefinitely.~~

~~This Completion Time allows for an exception to the normal "time-zero" for beginning the allowed outage time "clock." This will result in establishing the "time-zero" at the time the LCO was initially not met, instead of the time Condition B was entered. The 16-hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.~~

C.1

With DC bus(es) in one train inoperable, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the required DC buses must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger. **Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.**

Condition C represents one train without adequate DC power; potentially both with the battery significantly degraded and the associated charger nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that would be without power. Taking exception to LCO 3.0.2 for components without adequate DC power, which would have Required Action Completion Times shorter than 2 hours, is acceptable because of:

- a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) while allowing stable operations to continue;

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ACTIONS  
(continued)

C.1 (continued)

- b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without DC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train; and
- c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time for DC buses is consistent with Regulatory Guide 1.93 (Ref. 3).

~~The second Completion Time for Required Action C.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition C is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the DC distribution system. At this time, an AC train could again become inoperable, and DC distribution restored OPERABLE. This could continue indefinitely.~~

~~This Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time the LCO was initially not met, instead of the time Condition C was entered. The 16-hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.~~

D.1 and D.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

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