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Callaway Plant

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December 28, 2007

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
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ULNRC-05466

Ladies and Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
APPLICATION FOR AMENDMENT TO
FACILITY OPERATING LICENSE NPF-30
REVISION OF TECHNICAL SPECIFCATIONS 3.3.2 AND 3.7.2 AND
ADDITION OF NEW TECHNICAL SPECIFICATION 3.7.19
(LICENSE AMENDMENT REQUEST OL-1277)

AmerenUE herewith transmits an application for amendment to Facility Operating License Number NPF-30 for the Callaway Plant.

The proposed changes will revise Technical Specifications (TS) 3.7.2, "Main Steam Isolation Valves (MSIVs)" to add the main steam isolation valve bypass valves (MSIVBVs) to the scope of this TS. The proposed changes include a revision to the APPLICABILITY for this TS and a revision to footnote (i) in Table 3.3.2-1 of TS 3.3.2, "ESFAS Instrumentation," to make it consistent with the revised Applicability of LCO 3.7.2.

The proposed changes also add new TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," to include Limiting Conditions for Operation and Surveillance Requirements for the following secondary system isolation valves: main steam low point drain isolation valves (ABLPDIVs), steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs) and steam generator sample line isolation valves (SGBSSIVs).

The appropriate TS Bases changes for the proposed revisions to TS 3.3.2 and TS 3.7.2 are included for information. Also included for information is a new TS Bases section for TS 3.7.19.

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Attachments 1 through 4 provide the Evaluation, Markup of Technical Specifications, Retyped Technical Specifications, and Proposed Technical Specification Bases changes, respectively, in support of this amendment request. Attachment 4 is provided for information only. Final Bases changes will be processed under the program for updates per TS 5.5.14, "Technical Specifications Bases Control Program," at the time this amendment is implemented. No commitments are contained in this amendment application.

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

The Callaway Onsite Review Committee and a subcommittee of the Nuclear Safety Review Board have reviewed and approved the proposed changes and have approved the submittal of this amendment application.

AmerenUE requests approval of this license amendment request prior to September 1, 2008. AmerenUE further requests that the license amendment be made effective upon NRC issuance, to be implemented within 90 days from the date of issuance.

In accordance with 10 CFR 50.91, a copy of this amendment application is being provided to the designated Missouri State official. If you have any questions on this amendment application, please contact me at (573) 676-8129, or Mr. Scott Maglio at (573) 676-8719.

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

Very truly yours,

Executed on: 12-28-07

Luke H. Graessle

Luke H. Graessle
Manager, Regulatory Affairs

Attachments

1 – Evaluation
2 – Markup of Technical Specifications and New TS 3.7.19
3 – Retyped Technical Specifications and New TS 3.7.19
4 – Proposed Technical Specification Bases Changes and New TS 3.7.19 Bases (for information only)

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ULNRC-05466

ATTACHMENT 1

EVALUATION

EVALUATION

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1.0 DESCRIPTION

The proposed change will revise Technical Specifications (TS) 3.7.2, "Main Steam Isolation Valves (MSIVs)" to add the main steam isolation valve bypass valves (MSIVBVs) to the scope of this TS. The proposed changes include a revision to the LCO APPLICABILITY for this TS. Footnote (i) in Table 3.3.2-1 of Technical Specification 3.3.2, "ESFAS Instrumentation," is revised such that it reflects the actuation circuitry requirements necessary to serve the revised Applicability of LCO 3.7.2.

The proposed changes also add new TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," to include Limiting Conditions for Operation and Surveillance Requirements for the following secondary system isolation valves: main steam low point drain isolation valves (ABLPDIVs), steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs) and steam generator sample line isolation valves (SGBSSIVs).

2.0 PROPOSED CHANGES

This amendment application proposes to revise TS 3.7.2 to incorporate requirements for the MSIVBVs, including revising the APPLICABILITY for this TS. TS 3.7.2 is retitled to "Main Steam Isolation Valves (MSIVs) and Main Steam Isolation Valve Bypass Valves (MSIVBVs)." TS 3.7.2 LCO, APPLICABILITY, ACTIONS, and SURVEILLANCE REQUIREMENTS are specifically revised to incorporate requirements for the main steam isolation valve bypass valves. The APPLICABILITY is revised for the MSIVs to be consistent with Westinghouse Standard Technical Specification 3.7.2. The APPLICABILITY is revised so that Callaway Plant specific valve configurations are addressed.

The proposed changes to TS 3.7.2 include a Note modifying the ACTIONS. The Note allows separate Condition entry for each MSIVBV. Current CONDITION H is revised to CONDITION I, and Required Actions H.1 and H.2 are renumbered to Required Actions I.1 and I.2. Current CONDITION I is revised to CONDITION J, and Required Actions I.1 and I.2 are renumbered J.1 and J.2. CONDITION J now states, "Required Action and Associated Completion Time of Condition H or I not met." New CONDITION H addresses one or more MSIVBVs inoperable, and Required Actions H.1 and H.2 require the inoperable MSIVBV(s) to be closed or isolated in 8 hours and verified closed or isolated once per seven days. Revised SR 3.7.2.2 incorporates "and each required MSIVBV." New TS SR 3.7.2.3 requires that the isolation time for each required MSIVBV to be verified that it is within limits when tested in accordance with the Inservice Testing Program.

The proposed change to TS 3.3.2, ESFAS Instrumentation, Table 3.3.2-1, footnote (i) revises the current statement of footnote (i) "Except when all MSIVs are closed" to the following:

(i) Except when:

1. All MSIVs are closed and de-activated;

AND

2. All MSIVBVs are:

2.a Closed and de-activated, or
2.b Isolated by two closed manual valves.

A new Technical Specification 3.7.19, "Secondary System Isolation Valves (SSIVs)," is proposed with Limiting Condition for operation (LCO) requirements and Surveillance Requirements (SRs) established for the following valves: main steam low point drain isolation valves (ABLPDIVs), steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs) and steam generator sample line isolation valves (SGBSSIVs). The LCO requires SSIVs to be OPERABLE. The LCO is modified by a Note that allows SSIVs to be unisolated under administrative controls.

The proposed APPLICABILITY requires SSIVs to be OPERABLE in MODES 1, 2, and 3, when there is significant mass and energy in the RCS and steam generators. Exceptions to the APPLICABILITY are allowed for cases where the SSIV is assured of performing its specified safety function.

The CONDITIONS and ACTIONS are modified by a Note to allow separate Condition entry for each SSIV. CONDITION A occurs when one or more SSIVs is inoperable. Required Actions A.1 and A.2 require the SSIV is closed or isolated in 7 days and verified closed or isolated once per 7 days. CONDITION B occurs when the required action and associated Completion Time are not met. The unit must be placed in a MODE in which the LCO does not apply. In this case the plant must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours.

Appropriate SRs are proposed for the SSIVs. Proposed SR 3.7.19.1 verifies the proper alignment for required automatic SSIVs in the flow path that are used to isolate the plant's secondary side. The Frequency for SR 3.7.19.1 is 31 days. Proposed SR 3.7.19.2 verifies that the isolation time of each required automatic SSIV is within limits when tested pursuant to the Inservice Testing Program. The Frequency for SR 3.7.19.2 is in accordance with the Inservice Testing Program. Proposed SR 3.7.19.3 verifies that each

required automatic SSIV in the flow path is capable of closure on an actual or simulated actuation signal.

Attachment 2 provides the existing TS pages with the proposed markups and includes the new proposed TS 3.7.19. Attachment 4 provides the existing TS Bases pages marked-up to show the proposed changes and includes the new TS Bases pages for TS 3.7.19. Attachment 4 is provided for information only.

3.0 BACKGROUND

The Main Steam System functions to (1) contain and transport saturated steam from the steam generator to the main turbine and other loads, (2) serve as the main heat sink for the primary system, preventing fuel overheating during transients and accidents, and (3) supply a source of power to the turbine-driven auxiliary feedwater pump (TDAFP) turbine. The Main Steam System starts at the four steam generators and includes the components on each of the four main steam lines. Leaving the steam generator, each main steam line contains an atmospheric steam dump valve and five main steam safety valves. Downstream of the main steam safety valves, are steam supplies to the TDAFP via two of the four steam headers.

Main steam then flows through the main steam isolation valves (MSIVs) or MSIV Bypass valves (MSIVBVs) to the turbine building. The MSIVs and MSIVBVs provide steam generator isolation for steam line break protection. Upstream of the MSIVs, the steam generators act independently of each other when the MSIVs are closed. Normally the MSIVs are open and the MSIVBVs are closed. When the MSIVs are open, main steam flow from each steam generator tie together in a parallel configuration which is distributed to loads in the turbine building. The crosstie header equalizes the pressure in all four steam generators which maintains equal flow on all the generators. On each steam header upstream of the MSIVs is a 12-inch diameter drain standpipe. An air-operated low point drain valve is normally open to allow a steam trap to pass moisture to the main condenser. FSAR Section 10.3 describes the Main Steam Supply system.

The major function of the steam generator blowdown system is to maintain the steam generator secondary chemisty within specifications. It is designed to recover a portion of the heat from the blowdown process and treat the water prior to returning it to the secondary system or discharging it. The blowdown system also provides the means to sample the secondary side of the steam generators, drain the steam generators during outages and re-circulate the steam generator water during wet layup conditions. FSAR Section 10.4.8 describes the Steam Generator Blowdown System.

The Main Feedwater System preheats, pressurizes, and transports feedwater from the condensate system and heater drain pumps to the inlet of the steam generators. Main feedwater isolation valves are installed in each of the four feedwater lines outside of containment and downstream of the feedwater regulating valves. One main feedwater isolation valve and main feedwater regulating valve are located on each main feedwater

line, outside but close to containment. The main feedwater regulating valve bypass valves are located in six-inch lines that bypass flow around the regulating valves when in service during shutdown and startup evolutions. The Main Feedwater System includes a feedwater chemical injection system that allows the maintenance of proper system pH and scavenges oxygen present in the steam generators to minimize corrosion during plant shutdown conditions. The system adds chemicals such as hydrazine and amine mixture to the desired steam generator downstream of the feedwater isolation valve, directly into the feedwater system. Normally this system is used during cold shutdown, when preparing the steam generators for wet lay-up condition. The chemical injection isolation valves are normally closed, unless used during cold shutdown. FSAR Section 10.4.7 describes the Condensate and Feedwater systems.

3.1 MSIV Bypass Valves (MSIVBVs)

The MSIVBVs are air-operated, two-inch bypass valves around the MSIVs. They are provided for warming of downstream steam lines and equalizing the steam pressure across the MSIVs. The MSIVBVs have two redundant solenoid valves which, when de-energized, result in valve closure. Both of the solenoid valves are de-energized on a steamline isolation signal. The MSIVs and bypass valves are controlled from the main control board panel. The bypass valves also have manual handwheels that are normally locked in the neutral position.

3.2 Main Steam Low Point Drain Isolation Valves (ABLPDIVs)

On each of the four main steam lines, upstream of the main steam isolation valves, is a 12-inch diameter low point drain line. Each drain line has a level detection system that consists of a level switch that annunciates on a high level. One air-operated low point drain valve (ABLPDIV) is installed in each drain line. The ABLPDIVs are normally open to allow a steam trap to pass moisture to the main condenser. The ABLPDIVs close upon receipt of an SLIS and function to isolate the plant's secondary side. The ABLPDIVs fail in the closed position.

3.3 Steam Generator Blowdown Isolation Valves (SGBSIVs)

The SGBSIVs are air-operated globe valves which fail closed. For emergency closure, either of two safety-related solenoid valves is de-energized to dump air supplied to the valve actuator. The electrical solenoid valves are energized from separate Class 1E sources and are tripped upon receipt of an SGBSIS (AFAS) signal.

3.4 Steam Generator Blowdown Sample Isolation Valves (SGBSSIVs)

Three SGBSSIVs are installed in each of the sample line flow paths for each steam generator. Two valves are located inside the containment (one from each sample point), and one valve is located outside containment. The SGBSSIVs prevent uncontrolled blowdown from more than one steam generator and isolate the nonsafety-related portions

from the safety-related portions of the system. The SGBSSIVs are solenoid-operated globe valves which fail closed. The inside containment solenoid valves are energized from separate Class 1E sources from the outside containment solenoid valves. These valves are also closed upon receipt of an SGBSIS (AFAS) signal.

3.5 Steam Generator Chemical Injection Isolation Valves (SGCIIVs)

The SGCIIVs are air- operated globe valves, which fail closed on loss of air. The valves automatically close upon receipt of an FWIS signal. When the valves are closed or isolated they function to isolate the plant's secondary side.

3.6 Licensing Basis for Secondary System Isolation Valves

Per the Callaway licensing basis, the automatic isolation valves associated with the main steam, feed water, blow down and sample lines are not containment isolation valves. The specified safety function for these valves is to isolate the plant secondary side in response to certain postulated accidents, thereby limiting the associated blowdown and/or isolating the non-safety portions of the secondary side from the safety-related portion. The SSIVs are being added to TS under the same licensing basis as the current secondary system isolation valves covered in the TS (MSIVs, MFIVs, MFRVs, and MFRVBVs). These valves are not required to meet containment isolation criteria since they are not part of the containment barrier. As described in the Callaway FSAR, the main steam lines and feed lines (including the steam generator blowdown and sample lines) are considered extensions of containment. As noted in FSAR Sections 6.2.4.3, 6.2.6.3, and on Figure 6.2.4-1 and Figure 6.2.4-2, the containment penetrations associated with steam generators are not subject to the 10 CFR 50 Appendix A General Design Criteria that address containment isolation provisions, since the containment barrier integrity is not breached. At Callaway, the boundary or barrier against fission product leakage to the environment is the inside of the steam generator tubes and the outside of the lines emanating from the steam generator shells. The piping itself is an extension of containment and thus treated as the containment barrier.

FSAR Section 3.1.3 provides a discussion of Callaway's commitment to GDC-57, "Closed System Isolation Valves." The FSAR states that "all containment penetrations are considered to be covered by either GDC-55 or GDC-56. There are no penetrations to which GDC-57 is considered applicable."

The purpose of the main steam line and feed line isolation valves is to isolate the plant secondary side, to control steam generator blow down, and to ensure the delivery of required auxiliary feedwater flow during a design basis accident. In this regard, and as further explained below, these valves perform a safety function(s).

4.0 TECHNICAL ANALYSIS

Closure of secondary system isolation valves (SSIVs) ensures that the assumptions used in the plant accident and containment analyses remain valid. In accident conditions, SSIVs close to terminate the blowdown from the faulted steam generator and isolate the intact steam generators, as well as to isolate the plant secondary side and prevent possible diversion of auxiliary feedwater flow.

In the event of a design basis accident (main steam line break, feed line break, or steam generator tube rupture), the accident analyses assume that the steam generators are isolated after secondary system isolation valves receive an isolation signal. Following receipt of the steam line isolation signal (SLIS) and auxiliary feedwater actuation signal (AFAS), the intact steam generators are assumed to be isolated, except for the steam supply valves to the turbine-driven auxiliary feedwater pump (governed by Technical Specification 3.7.5, Auxiliary Feedwater System). There are also analysis cases that evaluate the single failure of a main steam or main feedwater isolation valve. In addition to the valves governed by Technical Specification 3.7.2 (Main Steam Isolation Valves and Main Steam Isolation Valve Bypass Valves) and Technical Specification 3.7.3 (Main Feedwater Isolation Valves, Main Feedwater Regulating Valves, and Main Feedwater Regulating Valve Bypass Valves), the analysis assumptions require that the steam generator blowdown and sample line isolation valves, the main steam low point drain isolation valves, and the steam generator chemical injection isolation valves are closed.

When plant accident conditions require delivery of auxiliary feedwater, the normally closed steam supply isolation valves to the turbine-driven auxiliary feedwater pump (TDAFP) open on an AFAS. This ensures availability of the TDAFP. Note that the AFAS signal also closes the steam generator blowdown and sample isolation valves to isolate the plant's secondary side.

When plant accident conditions require feedline isolation, a feedwater isolation signal (FWIS) closes the main feedwater isolation valves, the main feedwater regulating valves, the main feedwater regulating valve bypass valves, and other valves associated with the main feedwater lines. Included are the steam generator chemical injection isolation valves which also close on the FWIS. Closing the chemical injection isolation valves functions to isolate the plant's secondary side.

Portions of the steam generator blowdown system are safety-related and are required to function following a design basis accident. Steam generator blowdown system isolation valves prevent uncontrolled blowdown from more than one steam generator and isolate nonsafety-related portions from the safety-related portions of the system. The valves are closed upon receipt of an SGBSIS (AFAS) signal. The steam generator blowdown system also includes safety-related sample isolation valves. The sample isolation valves also prevent uncontrolled blowdown from more than one steam generator and isolate the nonsafety-related portions from the safety-related portions of the system. The sample isolation valves are also closed upon receipt of an SGBSIS (AFAS) signal.

In the event of a secondary side pipe rupture inside containment, the SSIVs help to limit the quantity of high energy fluid that enters containment through the break. By isolating the plant secondary side, a pressure boundary for the controlled addition of auxiliary feedwater (AFW) to the intact loops is maintained. The secondary system isolation valves function to ensure the primary success path for steamline and feedline isolation and for delivery of required auxiliary feedwater flow.

4.1 Technical Evaluation of Proposed Revisions to TS 3.7.2, "Main Steam Isolation Valves (MSIVs)"

As described previously, the MSIVBVs are normally closed during plant operation, while the MSIVs are open. However, the MSIVBVs are open for warming of the steamlines and equalizing steam pressure across the MSIVs. They may also be opened to support maintenance and testing at power. As such, the open MSIVBVs constitute a flow path similar to the MSIVs such that the MSIVBVs should be subject to the same or similar requirements as the MSIVs.

The proposed LCO ensures that the MSIVs and MSIVBVs will isolate steam flow from the secondary side of the steam generators following a high energy line break. This closure terminates flow from the intact steam generators. The proposed LCO requires that four MSIVs and their associated actuator trains and four MSIVBVs be OPERABLE.

Under the proposed TS change, the MSIVs and their associated actuator trains are required OPERABLE in MODES 1, 2, and 3. However, consistent with the Westinghouse Standard Technical Specifications, exceptions to the LCO requirements are allowed for the MSIVs and their associated actuator trains in MODES 2 and 3. In MODES 2 and 3 when the MSIVs are closed and de-activated, they are assured of performing their specified safety functions. Requiring the MSIVs closed and de-activated provides assurance that the specified safety function is being met.

The MSIVBVs are considered OPERABLE when their isolation times are within limits and they are capable of closing on an isolation actuation signal. All MSIVBVs can be and are normally closed at power.

Similar to the proposed TS for MSIVs, the LCO requirements for the MSIVBVs are applicable in MODES 1, 2, and 3 except in the following cases when the MSIVBVs are assured of performing their specified safety function: (1) one or more MSIVBVs are closed and de-activated or (2) the MSIVBV is isolated by two closed manual valves. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function. When the valve is de-activated, power and air are removed from both actuation solenoid valves and the valve is spring closed. Requiring the MSIVBV to be isolated by two closed manual valves also provides assurance that the specified safety function is being performed.

The CONDITIONS and REQUIRED ACTIONS are modified by a Note indicating that separate Condition entry is allowed for each MSIVBV. CONDITIONS, REQUIRED ACTIONS, and COMPLETION TIMES are established for one or more inoperable MSIVBVs. With one or more MSIVBVs inoperable, the valve(s) must be closed or isolated within 8 hours and it must be verified closed or isolated once per 7 days. The 8 hour Completion Time is consistent with the Completion Time for an inoperable MSIV and is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVBV. For inoperable MSIVBVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVBVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is consistent with the Completion Time for an inoperable, but closed MSIV, and is reasonable based on engineering judgment and other administrative controls to ensure that the MSIVBVs are in the closed position.

The new TS surveillance requirements for the MSIVBVs demonstrate their ability to initiate closure on the same actuation signals as the MSIVs. Proposed TS SR 3.7.2.2 includes verification that each required MSIVBV is capable of closure on an actual or simulated actuation signal. The frequency of MSIVBV testing is every 18 months, the same as currently required for MSIVs. The 18 month Frequency for testing is acceptable from a reliability standpoint and is based on the refueling cycle.

New proposed TS SR 3.7.2.3 verifies that the closure time of each MSIVBV is $\leq$ 15 seconds when tested pursuant to the Inservice Testing Program. This is consistent with the assumptions used in the accident and containment analyses. For the MSIVBVs, this SR is performed routinely during plant operation (or as required for post-maintenance testing), but it may be required to be performed upon returning the unit to operation following a refueling outage. The Frequency for this SR is in accordance with the Inservice Testing Program.

4.2 Technical Evaluation of Proposed Revisions to TS 3.3.2, "ESFAS Instrumentation"

The Westinghouse Standard Technical Specifications link the appropriate footnote in TS 3.3.2, ESFAS Instrumentation, Table 3.3.2-1, to the TS 3.7.2 APPLICABILITY. Consistent with the Standard Technical Specifications, footnote (i) in TS Table 3.3.2-1 is changed to be consistent with the revised TS 3.7.2 APPLICABILITY. The revised footnote (i) reflects the actuation circuitry requirements necessary to serve the actuated components (i.e., the SSIVs) addressed by the Applicability of LCO 3.7.2 as revised. Footnote (i) in Table 3.3.2-1 provides an exception to the TS instrumentation requirements for the Steam Line Isolation Function when all MSIVs are closed and de-activated. When all the MSIVs are closed and de-activated the steam line isolation function is met. The exception also applies when the MSIVBVs are closed and de-activated or when they are isolated by two closed manual valves. In these cases the instrumentation requirements for the Steam Line Isolation Function are met.

4.3 Technical Evaluation of Proposed New TS 3.7.19, Secondary System Isolation Valves

Proposed new Technical Specification TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," provides limiting conditions of operation and surveillance requirements for specified secondary system isolation valves. These valves receive ESFAS signals for automatic isolation. The new Specification addresses the following secondary system isolation valves: main steam low point drain isolation valves (ABLPDIVs), steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs). Secondary system isolation valves specifically include: (1) steam generator blowdown isolation valves (BMHV0001, BMHV0002, BMHV0003, and BMHV0004); (2) steam generator blowdown sample line isolation valves (BMHV0019, BMHV0020, BMHV0021, BMHV0022, BMHV0065, BMHV0066, BMHV0067, BMHV0068, BMHV0035, BMHV0036, BMHV0037, and BMHV0038); (3) main steam low point drain isolation valves (ABLV0007, ABLV0008, ABLV0009, and ABLV0010); and (4) steam generator chemical injection isolation valves (AEFV0043, AEFV0044, AEFV0045, and AEFV0046).

When the SSIVs are closed, they are performing their safety function of isolating the plant secondary side, following a main feedline or main steam line break and ensuring the required flow of auxiliary feedwater to the intact steam generators.

The LCO is modified by a Note that allows an SSIV to be unisolated under administrative controls. The administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the valve can be rapidly isolated when a need for isolation is indicated.

Similar to the MSIVs and MFIVs, the LCO requires SSIVs to be OPERABLE in MODES 1, 2, and 3 when there is significant mass and energy in the RCS and steam generators. Exceptions to the APPLICABILITY are allowed for cases where the SSIV is assured of performing its specified safety function. When the SSIV is closed and de-activated, or is closed and isolated by a closed manual valve, or the SSIV flow path is isolated by the required combination of closed manual valve(s) and closed and de-activated automatic valve(s), the safety function is fulfilled. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function. The combination provides a means of isolation that cannot be adversely affected by a single active failure thus assuring the safety function is met. Requiring the valve to be closed and isolated by a closed manual valve also provides assurance that it is performing its specified safety function. There is also assurance that the specified safety

function is being performed when the SSIV flow path is isolated by two closed valves which can be any combination of closed manual and closed and de-activated automatic valves. When used for the steam generator blowdown system SSIVs, the combinations for isolation must provide assurance that the flow paths associated with the connection between the SG blowdown sample and SG blowdown lines are isolated.

CONDITIONS, REQUIRED ACTIONS, and COMPLETION TIMES are to be established for the SSIVs. The CONDITIONS and REQUIRED ACTIONS are modified by a Note indicating that separate Condition entry is allowed for each SSIV. With one or more SSIVs inoperable, Required Action A.1 must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable valves, within 7 days. When the SSIV is closed or isolated, it is performing its specified safety function. The 7 day Completion Time takes into account the low probability of an event occurring during this period that would require isolation of the plant's secondary side. The 7 day Completion Time is reasonable, based on operating experience. Required Action A.2 requires inoperable SSIVs that are closed or isolated to be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the accident analyses remain valid. The 7 day Completion Time is reasonable based on engineering judgment, in view of valve status indications in the control room, and other administrative controls, to ensure that these valves are in the closed position or isolated. Note that if the SSIVs are closed and de-activated, or closed and isolated by a closed manual valve, or the SSIV flow path is isolated by two closed valves, the LCO does not apply.

If the Required Action and associated Completion Time of Condition A is not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, Required Action B.1 and B.2 require placing the unit in MODE 3 within 6 hours and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, for reaching the required unit conditions in an orderly manner and without challenging unit systems.

New TS SR 3.7.19.1 verifies the proper alignment for required automatic SSIVs in the flow path that are used to isolate the plant's secondary side. The SSIV is allowed to be in the non-accident position (i.e., open) provided the valve will automatically reposition (close) within the proper stroke time. The SR does not require any testing or valve manipulations, but involves verification, through a system walkdown (which may include the use of local or remote indicators), that valves capable of being mispositioned are in the correct position. The 31 day Frequency is based on engineering judgement and is consistent with procedural controls governing valve operation, and ensures correct valve position.

New TS SR 3.7.19.2 verifies that the isolation time of each required automatic SSIV is within limits when tested pursuant to the Inservice Testing Program. The specific limits are documented in the Inservice Testing Program. The SSIV isolation times are less than or equal to those assumed in the accident and containment analyses. The SR is

performed only for required SSIVs. This surveillance does not include verifying a closure time for the steam generator chemical addition injection isolation valves. An exception is made for these normally closed valves, which are not included in the IST program, because the valves are passive (typically not required to actuate to their safety position) and they contain a locked closed manual isolation valve and a check valve in their flow path. The Frequency for this SR is in accordance with the Inservice Testing Program.

New TS SR 3.7.19.3 verifies that each required automatic SSIV in the flow path is capable of closure on an actual or simulated actuation signal. The Frequency for this SR is 18 months and is consistent with that of the MSIVs.

4.4 Additional Justification for SSIV Allowed Outage Times

A probabilistic risk analysis (PRA) was performed to evaluate the risk associated with allowed outage times (AOTs) for inoperable SSIVs. This analysis was not used to establish the proposed AOTs, but was used to gauge the acceptability of the AOTs being proposed, which are based on engineering judgment and consistency with operating experience. In particular, a PRA analysis using Regulatory Guide (RG) 1.174/1.177 metrics was performed to determine the maximum allowed outage times, using conservative assumptions. For example, check valves in the lines containing the SGCIIVs will prevent back flow through these lines, and effectively makes the isolation risk (for failure of an SGCIIV to close) insignificant. Nevertheless, check valves are not credited in the risk analysis for the SGCIIVs. Another example concerns the risk associated with the failure of an SGBSSIV to close. Flow through the SGBSSIVs will be through 3/8" tubing. Because the flow area for the 3/8 inch tubing is less than 1% of the flow area of the auxiliary feedwater piping (4 inch diameter), significant auxiliary feedwater flow diversion is unlikely, and effectively makes these isolation valves risk insignificant. Finally, it is assumed per the risk analysis that the failure to isolate necessarily results in core damage, and no credit is taken for operator actions to provide backup isolation capability.

Results of the analysis are as follows for valve inoperability conditions:

CONDITION*	ALLOWED OUTAGE TIME (AOT)
MSIVBVs inoperable	7 days
ABLPDIVs inoperable	7 days
SGCIIVs inoperable	10 days
SGBSIVs inoperable	10 days
SGBSSIVs inoperable	10 days

*The evaluation assumes no more than one valve is inoperable at a time. This is a reasonable assumption based on the small likelihood that two (or more) SSIVs would be out of service simultaneously.

New TS 3.7.2 Condition H applies to "One or more MSIVBVs inoperable" and Required Action H is to "Close or isolate MSIVBV." Completion Time (CT) is set at 8 hours to be compatible with the CT for an inoperable MSIV (8 hour CT for Condition F) and is less than the evaluated AOT on the Table above for MSIVBVs. Therefore, from a risk analysis perspective, the CT for the MSIVBV is acceptable.

New TS 3.7.19 Condition A applies to "One or more valves inoperable" and Required Action A.1 is to "Close or isolate SSIV." Completion Time A.1 is set at 7 days and is the same as the limiting value of 7 days evaluated in the Table above. Therefore, from a risk analysis perspective, the CT for the SSIVs is acceptable.

It should be noted that the TS changes proposed in this amendment application are not considered to be risk-informed to the extent that this application is a Regulatory Guide 1.174/1.177 submittal. Although a PRA analysis was performed (using the Regulatory Guide 1.1.74/1.177 metrics), that analysis was not used to determine the AOTs proposed. The results of the PRA analysis are presented herein simply to show that the proposed AOTs are less than what a PRA analysis would justify, thus providing a gauge of their acceptability and conservativeness from a risk point of view.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

The proposed change adds the main steam isolation valve bypass valves (MSIVBVs) to the scope of TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and also revises the APPLICABILITY of the TS for the MSIVs. Because the APPLICABILITY for TS 3.7.2 is revised, footnote (i) of Table 3.3.2-1 for TS 3.3.2, "ESFAS Instrumentation," is also changed for consistency. Further, a new Technical Specification, TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," is proposed to establish requirements for the following secondary system isolation valves: main steam low point drain isolation valves (ABLPDIVs), steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs).

AmerenUE has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92(c) as discussed below:

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

   Response: No.

The proposed change adds requirements to the TS to ensure that systems and components are maintained consistent with the safety analysis and licensing basis.

Requirements are incorporated into the TS for secondary system isolation valves. These changes do not involve any design or physical changes to the facility, including the SSIVs themselves. The design and functional performance requirements, operational characteristics, and reliability of the SSIVs are unchanged. There is no impact on the design safety function of MSIVs, MFIVs, MFRVs or MFRVBVs to close (either as an accident mitigator or as a potential transient initiator). Since no failure mode or initiating condition that could cause an accident (including any plant transient) evaluated per the FSAR-described safety analyses is created or affected, the change cannot involve a significant increase in the probability of an accident previously evaluated.

With regard to the consequences of an accident and the equipment required for mitigation of the accident, the proposed changes involve no design or physical changes to components in the main steam supply system or feedwater system. There is no impact on the design safety function of MSIVs, MFIVs, MFRVs, or MFRVBVs or any other equipment required for accident mitigation. Adequate equipment availability would continue to be required by the TS. The consequences of applicable, analyzed accidents (such as a main steam line break of feedline break) are not impacted by the proposed changes.

The change in APPLICABILITY for the MSIVs is consistent with the Westinghouse Standard Technical Specification 3.7.2. The change to footnote (i) in TS Table 3.3.2-1 makes the provisions of that note for the affected instrumentation consistent with the revised APPLICABILITY of TS 3.7.2. These changes involve no physical changes to the facility and do not adversely affect the availability of the safety functions assumed for the MSIVs and SSIVs. Therefore, they do not involve a significant increase in the probability or consequences of an accident previously evaluated.

Based on the above considerations, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

The proposed changes add requirements to the TS that support or ensure the availability of the safety functions assumed or required for the MSIVs and

SSIVs. The changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in controlling parameters. Additional requirements are being imposed, but they are consistent with the assumptions made in the safety analysis and licensing basis. The addition of Conditions, Required Actions and Completion Times to TS for the SSIVs does not involve a change in the design, configuration, or operational characteristics of the plant. Further, the proposed changes do not involve any changes in plant procedures for ensuring that the plant is operated within analyzed limits. As such, no new failure modes or mechanisms that could cause a new or different kind of accident from any previously evaluated are introduced.

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

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

Response: No.

The proposed addition of Conditions, Required Actions and Completion Times for SSIVs, as well as the proposed change to the APPLICABILITY for the MSIV TS (and the corresponding change to the footnote for the ESFAS Instrumentation in TS 3.3.2) does not alter the manner in which safety limits or limiting safety system settings are determined. No changes to instrument/system actuation setpoints are involved. The safety analysis acceptance criteria are not impacted and the proposed change will not permit plant operation in a configuration outside the design basis. The changes are consistent with the safety analysis and licensing basis for the facility.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, AmerenUE concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The proposed change adds requirements for the main steam isolation valve bypass valves (MSIVBVs) to TS 3.7.2, "Main Steam Isolation Valves (MSIVs)." Also included is a revision to the APPLICABILITY of TS 3.7.2 for the MSIVs. Because the APPLICABILITY for TS 3.7.2 is revised, footnote (i) on Table 3.3.2-1 of TS 3.3.2, ESFAS Instrumentation, is being changed to reflect the actuation circuitry requirements necessary to serve the revised Applicability of LCO 3.7.2. A new Technical

Specification, TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," is proposed for specific secondary system isolation valves.

The proposed changes affect the content of the TS, as new components are being added to the scope of the TS. 10 CFR 50.36 is the regulation that provides the requirements regarding the content of Technical Specifications. Specifically, 10 CFR 50.36(c)(2)(ii) states that: "A technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:...." Criterion 3 of 10 CFR 50.36 (c)(2)(ii) requires that a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure or presents a challenge to the integrity of a fission product barrier is included in the TS. Conformance to this criteria is the basis for the TS changes that are incorporating requirements for the SSIVs.

Additional guidance is provided in SECY-93-067, "Final Policy Statement on Technical Specifications Improvements," dated March 17, 1993. The following discussion summarized from SECY-93-067 pertains specifically to Criterion 3:

> An important concept in assuring the adequate protection of the public health and safety is that in the event that a postulated Design Basis Accident or Transient should occur, structures, systems, and components are available to function or to actuate in order to mitigate the consequences of the Design Basis Accident or Transient. Safety sequence analyses or their equivalent have been performed in recent years and provide a method of presenting the plant response to an accident. These can be used to define the primary success paths.
>
> A safety sequence analysis is a systematic examination of the actions required to mitigate the consequences of events considered in the plant's Design Basis Accident and Transient analyses, as presented in Chapters 6 and 15 of the plant's FSAR. Such a safety sequence analysis considers the applicable events, whether explicitly or implicitly presented.
>
> The primary success path of a safety sequence analysis consists of the combination and sequences of equipment needed to operate (including consideration of the single failure criteria), so that the plant response to Design Basis Accidents and Transients limits the consequences of these events to within the appropriate acceptance criteria. It is the intent of Criterion 3 to capture into Technical Specifications only those structures, systems, and components that are part of the primary success path of a safety sequence analysis. Also captured by this criterion are those support and actuation systems that are necessary for items in the primary success path to successfully function.

All of the subject SSIVs addressed in this amendment application have been determined to meet Criterion 3 contained in 10 CFR 50.36(c)(2)(ii), and therefore, limiting condition for operation and surveillance requirements are being established for these valves.

Closure of the SSIVs ensures that the assumptions used in the plant accident and containment analyses remain valid. In the event of a main steam line or feed line break, SSIVs close to terminate the blowdown from the faulted steam generator and isolate the intact steam generators, and to isolate the plant secondary side and thereby prevent possible diversion of auxiliary feedwater flow. The assumed isolation response involves the valves governed by TS 3.7.2 (main steam isolation valves and main steam isolation valve bypass valves) and TS 3.7.3 (main feedwater isolation valves, main feedwater regulating valves, and main feedwater regulating valve bypass valves), but the analyses assumptions also require that the steam generator blowdown and sample line isolation valves, the main steam low point drain isolation valves, and the steam generator chemical injection isolation valves are closed.

The following list provides the regulatory requirements and plant-specific design bases related to the proposed changes.

- GDC-2, "Design Bases for Protection against Natural Phenomena," requires that the safety-related portion of the main steam supply system and the feedwater system be protected fro the effects of natural phenomena, such as earthquakes, tornadoes, hurricanes, floods, and external missiles.

- GDC-3, "Fire Protection," and GDC-4, "Environmental and Dynamic Effects Design Bases," requires that the safety-related portion of the main steam supply system and the feedwater system be designed to remain functional after a safe shutdown earthquake (SSE), and to perform its intended function following postulated hazards of fire, internal missiles, or pipe break.

- GDC-13, "Instrumentation and Control," requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems.

- GDC-34, "Residual Heat Removal," requires ensuring that safety functions of the main steam supply system and the feedwater system can be performed assuming a single active component failure coincident with the loss of offsite power. The Callaway licensing basis provided in the FSAR, requires that compliance with GDC-34 includes that for a main feedwater line break upstream of the main feedwater isolation valves (outside containment), the feedwater system is designed to prevent the blowdown of any one steam generator and to provide a path for the addition of auxiliary feedwater for reactor cooldown under emergency shutdown conditions.

The proposed TS changes are consistent with the existing design for the main steam supply and feedwater systems. In fact, the changes support compliance with the above regulatory requirements and criteria. In addition, there are no changes to ESFAS instrumentation requirements such that compliance with any of the regulatory requirements would come into question. The above evaluations confirm that the plant will continue to comply with all applicable regulatory requirements.

5.3 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

AmerenUE has evaluated the proposed amendment and has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 PRECEDENT

The proposed TS changes are presented without reference to any precedents. However, the addition of TS requirements for the secondary system isolation valves is consistent with the Callaway licensing basis and existing TS requirements for the main steam isolation valves, the main feedwater isolation valves, the main feedwater regulating valves, and the main feedwater regulating valve bypass valves. The proposed change to footnote (i) of Table 3.3.2-1 for TS 3.3.2, "ESFAS Instrumentation," is consistent with the Westinghouse Standard Technical Specifications for TS 3.3.2.

8.0 REFERENCES

8.1 Callaway Plant Technical Specification, 3.3.2, ESFAS Instrumentation.

8.2 Callaway Plant Technical Specification, 3.7.2, Main Steam Isolation Valves (MSIVs).

8.3 Callaway Plant Technical Specification, 3.7.3, Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating Valves (MFRVs) and Main

Feedwater Regulating Valve Bypass Valves (MFRVBVs).

8.4 FSAR Section 10.4.7, Condensate and Feedwater System.

8.5 FSAR Section 10.4.8, Steam Generator Blowdown System

8.6 FSAR Section 10.3, Main Steam Supply System.

8.7 FSAR Section 6.2, Containment Systems.

8.8 FSAR Section 15, Accident Analysis.

8.9 FSAR Section 3.1, Conformance with NRC General Design Criteria.

8.10 FSAR Section 6.2.4, Containment Isolation System.

8.11 FSAR Section 6.2.6, Containment Leakage Testing.

8.12 FSAR Figure 6.2.4-1, Containment Penetrations.

8.13 FSAR Figure 6.2.4-2, Steam Generator and Associated Systems as a Barrier to the Release of Radioactivity Post LOCA.

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ATTACHMENT 2

MARKUP OF TECHNICAL SPECIFICATION PAGES

TABLE 3.3.2-1 (PAGE 3 OF 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
4. Steam Line Isolation					
a. Manual Initiation	1,2[i], 3[i]	2	F	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2[i], 3[i]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Automatic Actuation Logic and Actuation Relays (MSFIS)	1, 2[i],3[i]	2 trains[o]	S	SR 3.3.2.3	NA
d. Containment Pressure - High 2	1,2[i], 3[i]	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.3 psig
e. Steam Line Pressure					
(1). Low	1,2 [i], 3[b][i]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 610 psig[c][s]
(2). Negative Rate - High	3[g][i]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 124 psi[h]

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on low steam line pressure is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) ~~Except when all MSIVs are closed.~~ INSERT X
(o) Each train requires a minimum of two programmable logic controllers to be OPERABLE.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The nNominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

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INSERT X

(i) Except when:

1. All MSIVs are closed and de-activated;

AND

2. All MSIVBVs are:

    2.a Closed and de-activated, or
    2.b Isolated by two closed manual valves.

3.7 PLANT SYSTEMS

INSERT B

3.7.2 Main Steam Isolation Valves (MSIVs)

INSERT C

LCO 3.7.2 Four MSIVs ~~and their associated actuator trains~~ shall be OPERABLE.

INSERT D

APPLICABILITY: ~~MODES 1, 2, and 3.~~

INSERT D1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One MSIV actuator train inoperable.	A.1	Restore MSIV actuator train to OPERABLE status.	72 hours
B. Two MSIV actuator trains inoperable for different MSIVs when the inoperable actuator trains are not in the same separation group.	B.1	Restore one MSIV actuator train to OPERABLE status.	24 hours
C. Two MSIV actuator trains inoperable when the inoperable actuator trains are in the same separation group.	C.1	Restore one MSIV actuator train to OPERABLE status.	4 hours
D. Two actuator trains for one MSIV inoperable.	D.1	Declare the affected MSIV inoperable.	Immediately

(continued)

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INSERT A

MSIVs and MSIV Bypass Valves

INSERT B

and Main Steam Isolation Valve Bypass Valves (MSIVBVs)

INSERT C

, eight MSIV actuator trains, and four MSIVBVs,

INSERT D

For the MSIVs and their associated actuator trains:

MODE 1,
MODES 2 and 3 except when all MSIVs are closed and de-activated.

For the MSIVBVs:

MODES 1, 2, and 3 except when:
a. MSIVBV is closed and de-activated; or
b. MSIVBV is isolated by two closed manual valves.

INSERT D1

Separate Condition entry is allowed for each MSIVBV.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Three or more actuator trains inoperable. OR Required Action and associated Completion Time of Condition A, B, or C not met.	E.1	Declare each affected MSIV inoperable.	Immediately
F. One MSIV inoperable in MODE 1.	F.1	Restore MSIV to OPERABLE status.	8 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1	Be in MODE 2.	6 hours
INSERT E I. ~~H.~~ ---------- NOTE ---------- Separate Condition entry is allowed for each MSIV. ---------- One or more MSIVs inoperable in MODE 2 or 3.	I.1 ~~H.1~~ AND ~~H.2~~ I.2	Close MSIV. Verify MSIV is closed.	8 hours Once per 7 days
J. ~~I.~~ Required Action and associated Completion Time of Condition H or I not met.	~~I.1~~ J.1 AND ~~I.2~~ J.2	Be in MODE 3. Be in MODE 4.	6 hours 12 hours

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INSERT E

H. One or more MSIVBVs inoperable.	H.1 Close or isolate MSIVBV. AND H.2 Verify MSIVBV is closed or isolated.	8 hours Once per 7 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	18 months

INSERT G

INSERT F

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INSERT F

and each required MSIVBV

INSERT G

SR 3.7.2.3 Verify isolation time of each required MSIVBV is within limits.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.19 Secondary System Isolation Valves (SSIVs)

LCO 3.7.19 SSIVs shall be OPERABLE.

----------NOTE----------
SSIVs may be unisolated under administrative controls.

APPLICABILITY: MODES 1, 2, and 3 except when:

a. SSIV is closed and de-activated; or
b. SSIV is closed and isolated by a closed manual valve; or
c. SSIV flow path is isolated by required combination of closed manual valve(s) and closed de-activated automatic valve(s).

ACTIONS

Separate Condition entry is allowed for each SSIV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SSIVs inoperable.	A.1 Close or isolate SSIV. AND A.2 Verify SSIV is closed or isolated.	7 days Once per 7 days
B. Required Action and Associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.19.1	Verify each required automatic SSIV in the flow path is in the correct position.	31 days
SR 3.7.19.2	Verify the isolation time of each required automatic SSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.19.3	Verify each required automatic SSIV in the flow path actuates to the isolation position on an actual or simulated actuation signal.	18 months

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ATTACHMENT 3

RETYPED TECHNICAL SPECIFICATION PAGES

TABLE OF CONTENTS

Table 3.3.2-1 (page 1 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
1. Safety Injection					
a. Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.13	NA
c. Containment Pressure - High 1	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 4.5 psig
d. Pressurizer Pressure - Low	1,2,3[b]	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 1834 psig
e. Steam Line Pressure - Low	1,2,3[b]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 610 psig[c][s]
2. Containment Spray					
a. Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 2 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
2. Containment Spray					
c. Containment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.13	NA
(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
b. Phase B Isolation					
(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
(3) Containment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

Table 3.3.2-1 (page 3 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
4. Steam Line Isolation					
a. Manual Initiation	1,2[i], 3[i]	2	F	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2[i], 3[i]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Automatic Actuation Logic and Actuation Relays (MSFIS)	1, 2[i],3[i]	2 trains[o]	S	SR 3.3.2.3	NA
d. Containment Pressure - High 2	1,2[i], 3[i]	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.3 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(i) Except when:
1. All MSIVs are closed and de-activated;
AND
2. All MSIVBVs are:
2.a Closed and de-activated, or
2.b Isolated by two closed manual valves.

(o) Each train requires a minimum of two programmable logic controllers to be OPERABLE.

Table 3.3.2-1 (page 4 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
4. Steam Line Isolation					
e. Steam Line Pressure					
(1) Low	1,2 [i], 3[b][i]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 610 psig[c][s]
(2) Negative Rate - High	3[g][i]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 124 psi[h]

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on low steam line pressure is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) Except when:
1. All MSIVs are closed and deactivated;
AND
2. All MSIVBVs are:
2.a Closed and de-activated, or
2.b Isolated by two closed manual valves.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 5 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2[j], 3[j]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.14	NA
b. Automatic Actuation Logic and Actuation Relays (MSFIS)	1, 2[j], 3[j]	2 trains[o]	S	SR 3.3.2.3	NA
c. SG Water Level - High High (P-14)	1,2[j]	4 per SG	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 91.4%[s] of Narrow Range Instrument Span
d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(j) Except when all MFIVs are closed.
(o) Each train requires a minimum of two programmable logic controllers to be OPERABLE.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 6 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Turbine Trip and Feedwater Isolation					
e. Steam Generator Water Level Low-Low[q]					
(1) Steam Generator Water Level Low-Low (Adverse Containment Environment)	1, 2[j], 3[j]	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 20.6%[s] of Narrow Range Instrument Span
(2) Steam Generator Water Level Low-Low (Normal Containment Environment)	1[r], 2[j,r], 3[j,r]	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 16.6%[s] of Narrow Range Instrument Span
(3) Not used.					
(4) Containment Pressure - Environmental Allowance Modifier	1, 2[j], 3[j]	4	N	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 2.0 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(j) Except when all MFIVs are closed.
(k) Not used.
(l) Not used.
(q) Feedwater isolation only.
(r) Except when the Containment Pressure – Environmental Allowance Modifier channels in the same protection sets are tripped.
(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 7 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
6. Auxiliary Feedwater					
a. Manual Initiation	1, 2, 3	1/pump	P	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1,2,3	2 trains	Q	SR 3.3.2.3	NA
d. SG Water Level Low-Low					
(1) Steam Generator Water Level Low-Low (Adverse Containment Environment)	1, 2, 3	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 20.6%[s] of Narrow Range Instrument Span
(2) Steam Generator Water Level Low-Low (Normal Containment Environment)	1[r], 2[r], 3[r]	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 16.6%[s] of Narrow Range Instrument Span

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

(r) Except when the Containment Pressure – Environmental Allowance Modifier channels in the same protection sets are tripped.

(s) 1. If the as-found instrument channel setpoint is conservative with respect to the Allowable Value, but outside its as-found test acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. If the as-found instrument channel setpoint is not conservative with respect to the Allowable Value, the channel shall be declared inoperable.
2. The instrument channel setpoint shall be reset to a value that is within the as-left setpoint tolerance band on either side of the Nominal Trip Setpoint, or to a value that is more conservative than the Nominal Trip Setpoint; otherwise, the channel shall be declared inoperable. The Nominal Trip Setpoints and the methodology used to determine the as-found test acceptance criteria band and the as-left setpoint tolerance band shall be specified in the Bases.

Table 3.3.2-1 (page 8 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
6. Auxiliary Feedwater					
d. SG Water Level Low-Low					
(3) Not used.					
(4) Containment Pressure - Environmental Allowance Modifier	1, 2, 3	4	N	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 2.0 psig
e. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
f. Loss of Offsite Power	1,2,3	2 trains	R	SR 3.3.2.7 SR 3.3.2.10	NA
g. Trip of all Main Feedwater Pumps	1,2[n]	2 per pump	J	SR 3.3.2.8	NA
h. Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	3	O	SR 3.3.2.1 SR 3.3.2.9 SR 3.3.2.10 SR 3.3.2.12	≥ 20.64 psia

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.
(k) Not used.
(l) Not used.
(n) Trip function may be blocked just before shutdown of the last operating main feedwater pump and restored just after the first main feedwater pump is put into service following performance of its startup trip test.

Table 3.3.2-1 (page 9 of 9)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
7. Automatic Switchover to Containment Sump					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.13	NA
b. Refueling Water Storage Tank (RWST) Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 35.2%
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	2 per train, 2 trains	F	SR 3.3.2.11	NA
b. Pressurizer Pressure, P-11	1,2,3	3	L	SR 3.3.2.5 SR 3.3.2.9	≤ 1981 psig
9. Automatic Pressurizer PORV Actuation					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2,3	2 trains	H	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.14	NA
b. Pressurizer Pressure – High	1,2,3	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤2350 psig

(a) The Allowable Value defines the limiting safety system setting except for Functions 1.e, 4.e.(1), 5.c, 5.e.(1), 5.e.(2), 6.d.(1), and 6.d.(2) (the Nominal Trip Setpoint defines the limiting safety system setting for these Functions). See the Bases for the Nominal Trip Setpoints.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ---------- NOTE ---------- Not applicable to hydrogen analyzer channels. ---------- One or more Functions with two or more required channels inoperable.	C.1	Restore all but one channel to OPERABLE status.	7 days
D. Two hydrogen analyzer channels inoperable.	D.1	Restore one hydrogen analyzer channel to OPERABLE status.	72 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
F. As required by Required Action E.1 and referenced in Table 3.3.3-1.	F.1	Be in MODE 3.	6 hours
	AND		
	F.2	Be in MODE 4.	12 hours
G. As required by Required Action E.1 and referenced in Table 3.3.3-1.	G.1	Initiate action in accordance with Specification 5.6.8.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.3.2	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	18 months

Table 3.3.3-1 (page 1 of 2)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION E.1
1.	Neutron Flux	2	F
2.	Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	2	F
3.	RCS Cold Leg Temperature (Wide Range)	2	F
4.	RCS Pressure (Wide Range)	2	F
5.	Reactor Vessel Level Indicating System (RVLIS)	2	G
6.	Containment Normal Sump Water Level	2	F
7.	Containment Pressure (Normal Range)	2	F
8.	Steam Line Pressure	2 per steam generator	F
9.	Containment Radiation Level (High Range)	2	G
10.	Containment Hydrogen Analyzers	2	F
11.	Pressurizer Water Level	2	F
12.	Steam Generator Water Level (Wide Range)	4	F
13.	Steam Generator Water Level (Narrow Range)	2 per steam generator	F

(continued)

Table 3.3.3-1 (page 2 of 2)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION E.1
14.	Core Exit Temperature - Quadrant 1	2[(a)]	F
15.	Core Exit Temperature - Quadrant 2	2[(a)]	F
16.	Core Exit Temperature - Quadrant 3	2[(a)]	F
17.	Core Exit Temperature - Quadrant 4	2[(a)]	F
18.	Auxiliary Feedwater Flow Rate	4	F
19.	Refueling Water Storage Tank Level	2	F

(a) A channel consists of two core exit thermocouples (CETs).

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System Functions in Table 3.3.4-1 and the required auxiliary shutdown panel (ASP) controls shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function and required ASP control.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required Functions inoperable. OR One or more required ASP controls inoperable.	A.1	Restore required Function and required ASP controls to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.4.2	---------- NOTE ---------- Only required to be performed in MODES 1 and 2 for the turbine-driven AFW pump. ---------- Verify each required auxiliary shutdown panel control circuit and transfer switch is capable of performing the intended function.	18 months
SR 3.3.4.3	---------- NOTE ---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor trip breaker and RCP breaker position indications are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	18 months

Table 3.3.4-1 (page 1 of 1)
Remote Shutdown System Functions

FUNCTION	REQUIRED CHANNELS
1. Source Range Neutron Flux[(a)]	1
2. Reactor Trip Breaker Position	1 per trip breaker
3. Pressurizer Pressure	1
4. RCS Wide Range Pressure	1
5. RCS Hot Leg Temperature	1
6. RCS Cold Leg Temperature	1
7. SG Pressure	1 per SG
8. SG Level	1 per SG
9. AFW Flow Rate	1
10. RCP Breaker Position	1 per pump
11. AFW Suction Pressure	1
12. Pressurizer Level	1

(a) Not required OPERABLE in MODE 1 or in MODE 2 above the P-6 setpoint.

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 Four channels per 4.16-kV NB bus of the loss of voltage Function and four channels per 4.16-kV NB bus of the degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one channel per bus inoperable.	A.1	---------- NOTE ---------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ---------- Place channel in trip.	 6 hours
B. One or more Functions with two or more channels per bus inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	B.1	Declare associated load shedder and emergency load sequencer (LSELS) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	Tie breakers between 480 Vac buses NG01 and NG03 and between 480 Vac buses NG02 and NG04 shall be verified open.	7 days
SR 3.3.5.2	---------- NOTE ---------- Verification of time delays is not required. ---------- Perform TADOT.	 31 days
SR 3.3.5.3	Perform CHANNEL CALIBRATION with nominal Trip Setpoint and Allowable Value as follows: a. Loss of voltage Allowable Value 83 +0, -8.3V (120V Bus) with a time delay of 1.0 + 0.2, -0.5 sec. Loss of voltage nominal Trip Setpoint 83V (120V Bus) with a time delay of 1.0 sec. b. Degraded voltage Allowable Value 107.47 ± 0.38V (120V Bus) with a time delay of 119 ± 11.6 sec. Degraded voltage nominal Trip Setpoint 107.47V (120V Bus) with a time delay of 119 sec.	18 months
SR 3.3.5.4	Verify LOP DG Start ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS

3.3 INSTRUMENTATION

3.3.6 Containment Purge Isolation Instrumentation

LCO 3.3.6 The Containment Purge Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One radiation monitoring channel inoperable.	A.1 Restore the affected channel to OPERABLE status.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------- NOTE ---------- Only applicable in MODE 1, 2, 3, or 4. ---------- One or more Functions with one or more manual channels or automatic actuation trains inoperable. <u>OR</u> Both radiation monitoring channels inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	B.1 Place and maintain containment purge supply and exhaust valves in closed position.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ---------- NOTE ---------- Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ----------	C.1	Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
	OR		
One or more manual channels inoperable.	C.2	Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust valves made inoperable by isolation instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Purge Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.2	---------- NOTE ---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.6.3	Perform COT.	92 days
SR 3.3.6.4	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	18 months
SR 3.3.6.5	Perform CHANNEL CALIBRATION.	18 months
SR 3.3.6.6	Verify Containment Purge Isolation ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS

TABLE 3.3.6-1 (PAGE 1 OF 1)
Containment Purge Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, (a), (b)	2	SR 3.3.6.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4	2 trains	SR 3.3.6.2 SR 3.3.6.6	NA
3.	Containment Purge Exhaust Radiation - Gaseous	1, 2, 3, 4	2	SR 3.3.6.1 SR 3.3.6.3 SR 3.3.6.5	(c)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) Set to ensure ODCM limits are not exceeded.

3.3 INSTRUMENTATION

3.3.7 Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation

LCO 3.3.7 The CREVS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ---------- NOTE ---------- Not applicable to Function 3. ----------	B.1.1	Place one CREVS train in CRVIS mode.	Immediately
	AND		
One or more Functions with two channels or two trains inoperable.	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)", for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.	Immediately
	OR		
	B.2	Place both trains in CRVIS mode.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.	Immediately
	AND		
	C.1.2	Place one CREVS train in CRVIS mode.	1 hour
	OR		
	C.2	Place both trains in CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions A, B, or C not met in MODE 1, 2, 3, or 4.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Conditions A, B, or C not met in MODE 5 or 6, or during CORE ALTERATIONS, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.7-1 to determine which SRs apply for each CREVS Actuation Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2	Perform COT.	92 days
SR 3.3.7.3	---------- NOTE ---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.7.4	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	18 months
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	18 months
SR 3.3.7.6	---------- NOTE ---------- Radiation monitor detectors are excluded from response time testing. ---------- Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits	18 months on a STAGGERED TEST BASIS

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, 5, 6, (a), and (c)	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, 5, 6, (a), and (c)	2 trains	SR 3.3.7.3	NA
		(a)	2 trains	SR 3.3.7.6	NA
3.	Control Room Radiation - Control Room Air Intakes	1, 2, 3, 4, 5, 6, and (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.5	(b)
		(a)	2	SR 3.3.7.6	(b)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			
5.	Fuel Building Exhaust Radiation-Gaseous	Refer to LCO 3.3.8, "EES Actuation Instrumentation," for all initiation functions and requirements.			

(a) During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.
(b) Nominal Trip Setpoint concentration value ($\mu Ci/cm^3$) shall be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.
(c) During movement of irradiated fuel assemblies in the fuel building

3.3 INSTRUMENTATION

3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

LCO 3.3.8 The EES actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1	Place one EES train in the Fuel Building Ventilation Isolation Signal (FBVIS) mode.	7 days
	AND		
	A.2	Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ---------- NOTE ---------- Not applicable to Function 3. ----------	B.1.1	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	Immediately
One or more Functions with two channels or two trains inoperable.	AND		
	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable and enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately
	OR		
	B.2	Place both EES trains in the FBVIS mode and both CREVS trains in the CRVIS mode.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable and enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately
	AND		
	C.1.2	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	1 hour
	OR		
	C.2	Place both EES trains in the FBVIS mode and both CREVS trains in the CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions A, B, or C not met during movement of irradiated fuel assemblies in the fuel building.	D.1	Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------
Refer to Table 3.3.8-1 to determine which SRs apply for each EES Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.8.2	Perform COT.	92 days
SR 3.3.8.3	---------- NOTE ---------- The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.8.4	---------- NOTE ---------- Verification of setpoint is not required. --- Perform TADOT.	18 months
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.8-1 (page 1 of 1)
EES Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	(a)	2	SR 3.3.8.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	(a)	2 trains	SR 3.3.8.3	NA
3.	Fuel Building Exhaust Radiation - Gaseous	(a)	2	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.5	(b)

(a) During movement of irradiated fuel assemblies in the fuel building.
(b) Nominal Trip Setpoint concentration value ($\mu Ci/cm^3$) shall be established such that the actual submersion dose rate would not exceed 4 mR/hr in the fuel building.

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Mitigation System (BDMS)

LCO 3.3.9 Two trains of the BDMS shall be OPERABLE and one RCS loop shall be in operation.

APPLICABILITY: MODES 2 (below P-6 (Intermediate Range Neutron Flux) interlock), 3, 4, and 5.

---------- NOTE ----------
The boron dilution flux multiplication signal may be blocked in MODES 2 (below P-6 (Intermediate Range Neutron Flux) interlock) and 3 during reactor startup.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One train inoperable.	A.1	Restore train to OPERABLE status.	72 hours
B. Two trains inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1	---------- NOTE ---------- Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. ---------- Suspend operations involving positive reactivity additions.	Immediately
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Perform SR 3.1.1.1.	1 hour AND Once per 12 hours thereafter
	AND		
	B.3.1	Close and secure unborated water source isolation valves.	4 hours
	AND		
	B.3.2	Verify unborated water source isolation valves are closed and secured.	Once per 31 days
C. No RCS loop in operation.	C.1	Close and secure unborated water source isolation valves.	4 hours
	AND		
	C.2	Verify unborated water source isolation valves are closed and secured.	Once per 31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.2	---------- NOTE ---------- Only required to be performed in MODE 5. ---------- Verify BGV0178 is secured in the closed position.	31 days
SR 3.3.9.3	---------- NOTE ---------- Not required to be performed until 4 hours after reducing power below P-6 interlock. ---------- Perform COT and verify nominal flux multiplication setpoint of 1.7.	184 days
SR 3.3.9.4	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.9.5	Verify the centrifugal charging pump suction valves from the RWST open and the CVCS volume control tank discharge valves close in less than or equal to 30 seconds on a simulated or actual actuation signal.	18 months
SR 3.3.9.6	Verify one RCS loop is in operation.	12 hours

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs) and Main Steam Isolation Valve Bypass Valves (MSIVBVs)

LCO 3.7.2 Four MSIVs, eight MSIV actuator trains, and four MSIVBVs, shall be OPERABLE.

APPLICABILITY: For the MSIVs and their associated actuator trains:
MODE 1,
MODES 2 and 3 except when all MSIVs are closed and de-activated.

For the MSIVBVs:
MODES I , 2, and 3 except when:
a. MSIVBV is closed and de-activated; or
b. MSIVBV is isolated by two closed manual valves.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each MSIVBV.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One MSIV actuator train inoperable.	A.1	Restore MSIV actuator train to OPERABLE status.	72 hours
B. Two MSIV actuator trains inoperable for different MSIVs when the inoperable actuator trains are not in the same separation group.	B.1	Restore one MSIV actuator train to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Two MSIV actuator trains inoperable when the inoperable actuator trains are in the same separation group.	C.1	Restore one MSIV actuator train to OPERABLE status.	4 hours
D. Two actuator trains for one MSIV inoperable.	D.1	Declare the affected MSIV inoperable.	Immediately
E. Three or more actuator trains inoperable. OR Required Action and associated Completion Time of Condition A, B, or C not met.	E.1	Declare each affected MSIV inoperable.	Immediately
F. One MSIV inoperable in MODE 1.	F.1	Restore MSIV to OPERABLE status.	8 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1	Be in MODE 2.	6 hours
H. One or more MSIVBVs inoperable	H.1 AND H.2	Close or isolate MSIVBV. Verify MSIVBV is closed or isolated	8 hours Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
I. ---------- NOTE ---------- Separate Condition entry is allowed for each MSIV. ----------	I.1	Close MSIV.	8 hours
	AND		
One or more MSIVs inoperable in MODE 2 or 3.	I.2	Verify MSIV is closed.	Once per 7 days
J. Required Action and associated Completion Time of Condition H or I not met.	J.1	Be in MODE 3.	6 hours
	AND		
	J.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify each MSIV and each required MSIVBV actuates to the isolation position on an actual or simulated actuation signal.	18 months
SR 3.7.2.3	Verify isolation time of each required MSIVBV is within limits.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating Valves (MFRVs) and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)

LCO 3.7.3 Four MFIVs, four MFRVs, and four MFRVBVs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 except when:

a. MFIV is closed and de-activated; or
b. MFRV is closed and de-activated or closed and isolated by a closed manual valve; or
c. MFRVBV is closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each valve.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more MFIVs inoperable.	A.1	Close MFIV.	72 hours
	AND		
	A.2	Verify MFIV is closed.	Once per 7 days
B. One or more MFRVs inoperable.	B.1	Close or isolate MFRV.	72 hours
	AND		
	B.2	Verify MFRV is closed or isolated.	Once per 7 days
C. One or more MFRVBVs inoperable.	C.1	Close or isolate bypass valve.	72 hours
	AND		
	C.2	Verify bypass valve is closed or isolated.	Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two valves in the same flow path inoperable.	D.1	Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify the closure time of each MFRV and MFRVBV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.3.2	---------- NOTE ---------- For the MFRVs and MFRVBVs, only required to be performed in MODES 1 and 2. ---------- Verify each MFIV, MFRV and MFRVBV actuates to the isolation position on an actual or simulated actuation signal.	18 months
SR 3.7.3.3	Verify the closure time of each MFIV is within limits.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.4 Atmospheric Steam Dump Valves (ASDs)

LCO 3.7.4 Four ASD lines shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required ASD line inoperable for reasons other than excessive ASD seat leakage.	A.1	Restore required ASD line to OPERABLE status.	7 days
B. Two required ASD lines inoperable for reasons other than excessive ASD seat leakage.	B.1	Restore all but one required ASD line to OPERABLE status.	72 hours
C. Three or more required ASD lines inoperable for reasons other than excessive ASD seat leakage.	C.1	Restore all but two required ASD lines to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. With one or more of the required ASD(s) inoperable because of excessive seat leakage.	D.1	Initiate action to close the Associated manual isolation valve(s).	Immediately
	AND		
	D.2	Restore ASD(s) to OPERABLE status.	30 days
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify one complete cycle of each ASD.	In accordance with the Inservice Testing Program
SR 3.7.4.2	Verify one complete cycle of each ASD manual isolation valve.	In accordance with the Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable.	A.1 Restore steam supply to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO
B. One ESW supply to turbine driven AFW pump inoperable.	B.1 Restore ESW supply to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One AFW train inoperable for reasons other than Condition A or B.	C.1	Restore AFW train to OPERABLE status.	72 hours* AND 10 days from discovery of failure to meet the LCO
D. Required Action and associated Completion Time for Condition A, B or C not met. OR Two AFW trains inoperable.	D.1 AND D.2	Be in MODE 3. Be in MODE 4.	6 hours 12 hours
E. Three AFW trains inoperable.	E.1	---------- NOTE ---------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. ---------- Initiate action to restore one AFW train to OPERABLE status.	 Immediately

*With the exception that the Completion Time associated with the Condition C entry on 2/3/04 for the turbine driven auxiliary feedwater pump has been extended on a one-time only basis to 144 hours. At the time a formal cause of the inoperability is determined, Condition D will be entered immediately.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	---------- NOTE ---------- Only required to be performed for the AFW flow control valves when the system is placed in automatic control or when THERMAL POWER is > 10% RTP. ---------- Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.5.2	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator. ---------- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Test Program
SR 3.7.5.3	Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.4	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator. ---------- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.7.5.5	Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5 or 6 for > 30 days

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

LCO 3.7.6 The CST contained water volume shall be ≥ 281,000 gal.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. CST contained water volume not within limit.	A.1	Verify by administrative means OPERABILITY of backup water supply.	4 hours AND Once per 12 hours thereafter
	AND		
	A.2	Restore CST contained water volume to within limit.	7 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST contained water volume is ≥ 281,000 gal.	12 hours

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	---------- NOTE ---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops – MODE 4," for residual heat removal loops made inoperable by CCW. ---------- Restore CCW train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	---------- NOTE ---------- Isolation of CCW flow to individual components does not render the CCW System inoperable. ---------- Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	18 months

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water System (ESW)

LCO 3.7.8 Two ESW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable.	A.1 ---------- NOTE ---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," for emergency diesel generator made inoperable by ESW. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ESW. ---------- Restore ESW train to OPERABLE status.	 72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	---------- NOTE ---------- Isolation of ESW flow to individual components does not render the ESW inoperable. ---------- Verify each ESW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.8.2	Verify each ESW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.7.8.3	Verify each ESW pump starts automatically on an actual or simulated actuation signal.	18 months

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One cooling tower train inoperable.	A.1	Restore cooling tower train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> UHS inoperable for reasons other than Condition A.	B.1 <u>AND</u> B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of UHS is ≥ 831.25 ft mean sea level.	24 hours
SR 3.7.9.2	Verify average water temperature of UHS is ≤ 90°F.	24 hours
SR 3.7.9.3	Operate each cooling tower fan for ≥ 15 minutes in both the fast and slow speed.	31 days

3.7 PLANT SYSTEMS

3.7.10 Control Room Emergency Ventilation System (CREVS)

LCO 3.7.10 Two CREVS trains shall be OPERABLE.

---------- NOTE ----------
The control room boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREVS train inoperable.	A.1	Restore CREVS train to OPERABLE status.	7 days
B. Two CREVS trains inoperable due to inoperable control room boundary in MODES 1, 2, 3, and 4.	B.1	Restore control room boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1	Place OPERABLE CREVS train in CRVIS mode.	Immediately
	OR		
	D.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREVS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately
F. Two CREVS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREVS train pressurization filter unit for ≥ 10 continuous hours with the heaters operating and each CREVS train filtration filter unit for ≥ 15 minutes.	31 days
SR 3.7.10.2	Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.10.3	Verify each CREVS train actuates on an actual or simulated actuation signal.	18 months
SR 3.7.10.4	Verify one CREVS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the outside atmosphere during the CRVIS mode of operation.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.11 Control Room Air Conditioning System (CRACS)

LCO 3.7.11 Two CRACS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CRACS train inoperable.	A.1	Restore CRACS train to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	C.1	Place OPERABLE CRACS train in operation.	Immediately
	OR		
	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	C.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CRACS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2	Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CRACS trains inoperable in MODE 1, 2, 3, or 4.	E.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CRACS train has the capability to remove the assumed heat load.	18 months

3.7 PLANT SYSTEMS

3.7.12 Not Used.

3.7 PLANT SYSTEMS

3.7.13 Emergency Exhaust System (EES)

LCO 3.7.13 Two EES trains shall be OPERABLE.

---------- NOTE ----------
The auxiliary or fuel building boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of irradiated fuel assemblies in the fuel building.

---------- NOTE ----------
The SIS mode of operation is required only in MODES 1, 2, 3 and 4. The FBVIS mode of operation is required only during movement of irradiated fuel assemblies in the fuel building.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One EES train inoperable.	A.1	Restore EES train to OPERABLE status.	7 days
B. Two EES trains inoperable due to inoperable auxiliary building boundary in MODE 1, 2, 3 or 4.	B.1	Restore auxiliary building boundary to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. OR Two EES trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the fuel building.	D.1	Place OPERABLE EES train in the FBVIS mode.	Immediately
	OR		
	D.2	Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately
E. Two EES trains inoperable during movement of irradiated fuel assemblies in the fuel building.	E.1	Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each EES train for ≥ 10 continuous hours with the heaters operating.	31 days
SR 3.7.13.2	Perform required EES filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	Verify each EES train actuates on an actual or simulated actuation signal.	18 months
SR 3.7.13.4	Verify one EES train can maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure in the auxiliary building during the SIS mode of operation.	18 months on a STAGGERED TEST BASIS
SR 3.7.13.5	Verify one EES train can maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure in the fuel building during the FBVIS mode of operation.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.14 Not Used.

3.7 PLANT SYSTEMS

3.7.15 Fuel Storage Pool Water Level

LCO 3.7.15 The fuel storage pool water level shall be ≥ 23 ft over the top of the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 ---------- NOTE ---------- LCO 3.0.3 is not applicable. ---------- Suspend movement of irradiated fuel assemblies in the fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the fuel storage pool water level is ≥ 23 ft above the storage racks.	7 days

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Boron Concentration

LCO 3.7.16 The fuel storage pool boron concentration shall be ≥ 2165 ppm.

APPLICABILITY: When fuel assemblies are stored in the fuel storage pool and a fuel storage pool verification has not been performed since the last movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Fuel storage pool boron concentration not within limit.	---------- NOTE ---------- LCO 3.0.3 is not applicable. ----------		
	A.1	Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND		
	A.2.1	Initiate action to restore fuel storage pool boron concentration to within limit.	Immediately
	OR		
	A.2.2	Verify by administrative means that a non-Region 1 fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	7 days

3.7 PLANT SYSTEMS

3.7.17 Spent Fuel Assembly Storage

LCO 3.7.17 The combination of initial enrichment and burnup of each spent fuel assembly stored in Region 2 or 3 shall be within the Acceptable Domain of Figure 3.7.17-1 or in accordance with Specification 4.3.1.1.

APPLICABILITY: Whenever any fuel assembly is stored in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 ---------- NOTE ---------- LCO 3.0.3 is not applicable. ---------- Initiate action to move the noncomplying fuel assembly to Region 1.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.17.1	Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.17-1 or Specification 4.3.1.1.	Prior to storing the fuel assembly in Region 2 or 3

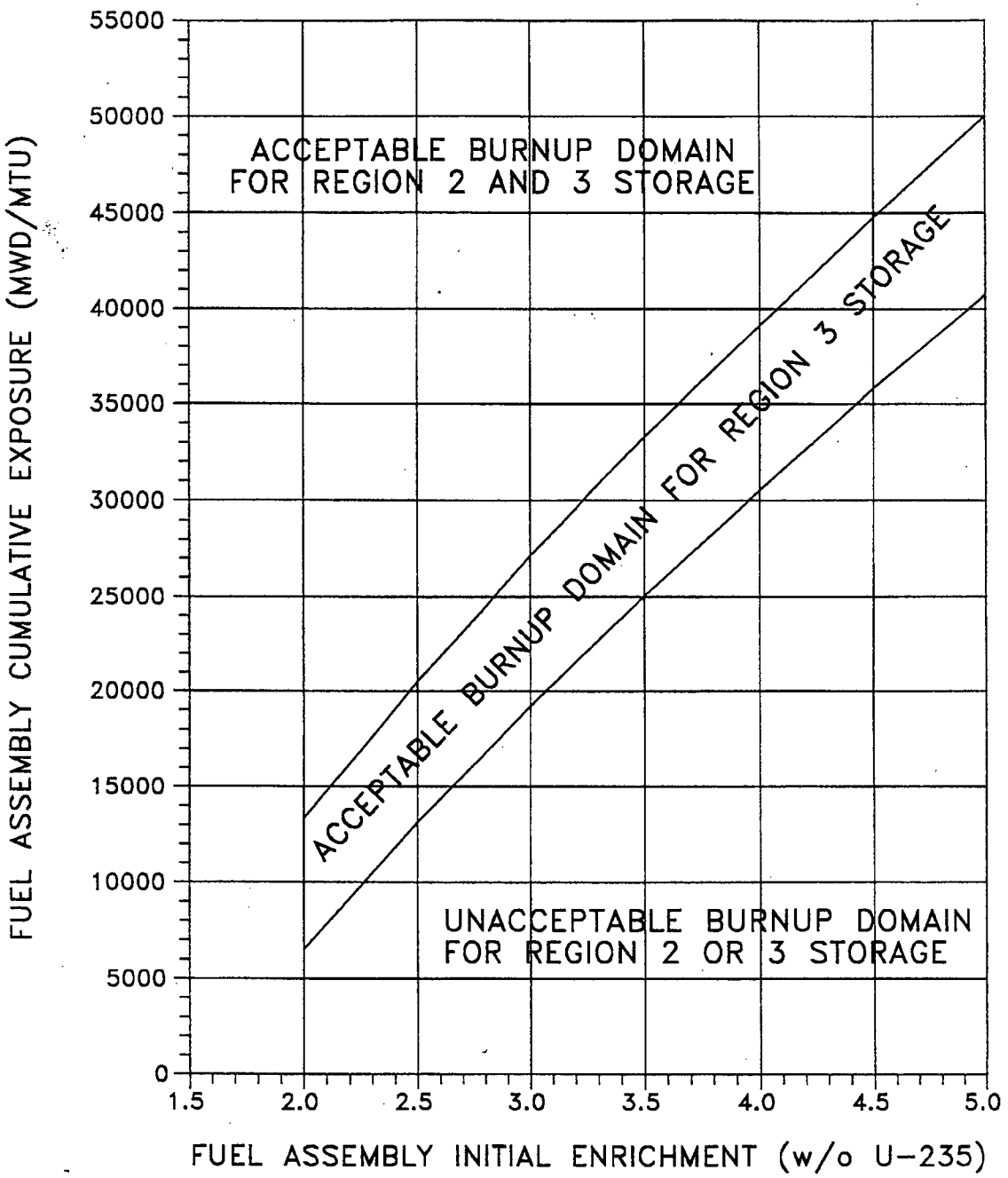

Figure 3.7.17-1 (page 1 of 1)
MINIMUM REQUIRED FUEL ASSEMBLY BURNUP AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGIONS 2 AND 3

3.7 PLANT SYSTEMS

3.7.18 Secondary Specific Activity

LCO 3.7.18 The specific activity of the secondary coolant shall be ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Specific activity not within limit.	A.1	Be in MODE 3.	6 hours
	AND		
	A.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1	Verify the specific activity of the secondary coolant is ≤ 0.10 Ci/gm DOSE EQUIVALENT I-131.	31 days

3.7 PLANT SYSTEMS

3.7.19 Secondary System Isolation Valves (SSIVs)

LCO 3.7.19 SSIVs shall be OPERABLE.

---------- NOTE ----------
SSIVs may be unisolated under administrative controls.

APPLICABILITY: MODES 1, 2, and 3 except when:

a. SSIV is closed and de-activated; or
b. SSIV is closed and isolated by a closed manual valve; or
c. SSIV flow path is isolated by required combination of closed manual valve(s) and closed de-activated automatic valve(s).

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each SSIV.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more SSIVs inoperable.	A.1	Close or isolate SSIV.	7 days
	AND		
	A.2	Verify SSIV is closed or isolated.	Once per 7 days
B. Required Action and Associated Completion Time not meet.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.19.1	Verify each required automatic SSIV in the flow path is in the correct position.	31 days
SR 3.7.19.2	Verify the isolation time of each required automatic SSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.19.3	Verify each required automatic SSIV in the flow path actuates to the isolation position on an actual or simulated actuation signal.	18 months

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ATTACHMENT 4

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES

(for information only)

For Information Only

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BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

4. Steam Line Isolation (continued)

from one SG, at most. For an SLB upstream of the main steam isolation valves (MSIVs), inside or outside of containment, closure of the MSIVs limits the accident to the blowdown from only the affected SG. For an SLB downstream of the MSIVs, closure of the MSIVs terminates the accident as soon as the steam lines depressurize. Steam Line Isolation also mitigates the effects of a feed line break and ensures a source of steam for the turbine - driven AFW pump during a feed line break.

a. Steam Line Isolation - Manual Initiation

Manual initiation of Steam Line Isolation can be accomplished from the control room. There are two pushbuttons in the control room and either pushbutton can initiate action to immediately close all MSIVs. The LCO requires two channels to be OPERABLE.

b. Steam Line Isolation - Automatic Actuation Logic and Actuation Relays (SSPS)

Automatic actuation logic and actuation relays in the SSPS consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

c. Steam Line Isolation - Automatic Actuation Logic and Actuation Relays (MSFIS)

As discussed in Reference 13, the Main Steam and Feedwater Isolation System (MSFIS) includes three redundant programmable logic controllers (PLCs) per logic train, arranged in a two-out-of-three voting configuration for each train. The three PLCs in each train operate in parallel, each receiving all of the input signals. Each of the outputs from each PLC drives a relay. The relay contacts are arranged in a two-out-of-three voting scheme, requiring that at least two PLCs agree upon the output before that train can initiate an isolation function. Each train requires a minimum of two PLCs to be OPERABLE.

Manual and automatic initiation of steam line isolation must be OPERABLE in MODES 1, 2, and 3 when there is sufficient energy in the RCS and SGs to have an SLB or other accident. This could result in the release of significant quantities of energy and cause a cooldown of the primary system. The Steam Line Isolation

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

4. Steam Line Isolation (continued)

INSERT X

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Function is required in MODES 2 and 3 unless all MSIVs are closed. In MODES 4, 5, and 6, there is insufficient energy in the RCS and SGs to experience an SLB or other accident releasing significant quantities of energy.

d. Steam Line Isolation - Containment Pressure - High 2

This Function actuates closure of the MSIVs in the event of a LOCA or an SLB inside containment to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. The transmitters (d/p cells) are located outside containment with the sensing line (high pressure side of the transmitter) located inside containment. Containment Pressure - High 2 provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy protective requirements with two-out-of-three logic. The transmitters and electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions, and the Trip Setpoint reflects only steady state instrument uncertainties. The Trip Setpoint is ≤ 17.0 psig.

INSERT Y

Containment Pressure - High 2 must be OPERABLE in MODES 1, 2, and 3, when there is sufficient energy in the primary and secondary side to pressurize the containment following a pipe break. This would cause a significant increase in the containment pressure, thus allowing detection and closure of the MSIVs. The Steam Line Isolation Function is required to be OPERABLE in MODES 2 and 3 unless all MSIVs are closed. In MODE 4, the increase in containment pressure following a pipe break would occur over a relatively long time period such that manual action could reasonably be expected to provide protection and ESFAS Function 4.d need not be OPERABLE. In MODES 5 and 6, there is not enough energy in the primary and secondary sides to pressurize the containment ~~to the~~ Containment Pressure - High 2 setpoint.

(continued)

INSERT X

and de-activated and all MSIVBVs are closed and de-activated or isolated by two closed manual valves.

When all of these valves are in the above configuration, there is no requirement to have an OPERABLE actuation signal since all the valves are already performing their specified safety function.

INSERT Y

and de-activated and all MSIVBVs are closed and de-activated or isolated by two closed manual valves.

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

4. Steam Line Isolation (continued)

e. Steam Line Isolation - Steam Line Pressure

(1) Steam Line Pressure - Low

Steam Line Pressure - Low provides closure of the MSIVs in the event of an SLB to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. This Function provides closure of the MSIVs in the event of a feed line break to ensure a supply of steam for the turbine driven AFW pump. Steam Line Pressure - Low was discussed previously under SI Function 1.e and the Trip Setpoint is the same.

Steam Line Pressure - Low Function must be OPERABLE in MODES 1, 2, and 3 (above P-11 and below P-11 unless safety injection on low steam line pressure is blocked), with any main steam isolation valve open, when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This signal may be manually blocked by the operator below the P-11 setpoint. If not blocked below P-11, the function must be OPERABLE. When blocked, an inside containment SLB will be terminated by automatic actuation via Containment Pressure - High 2. Stuck valve transients and outside containment SLBs will be terminated by the Steam Line Pressure - Negative Rate - High signal for Steam Line Isolation below P-11 when SI has been manually blocked. The Steam Line Isolation Function is required in MODES 2 and 3 unless all MSIVs are closed. This Function is not required to be OPERABLE in MODES 4, 5, and 6 because there is insufficient energy in the secondary side of the unit to have a significant effect on required plant equipment.

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INSERT Z

(2) Steam Line Pressure - Negative Rate - High

Steam Line Pressure - Negative Rate – High provides closure of the MSIVs for an SLB when

(continued)

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INSERT Z

and de-activated and all MSIVBVs are closed and de-activated or isolated by two closed manual valves.

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

(2) Steam Line Pressure - Negative Rate – High (continued)

less than the P-11 setpoint, to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment.

When the operator manually blocks the Steam Line Pressure - Low main steam isolation signal when less than the P-11 setpoint, the Steam Line Pressure - Negative Rate - High signal is automatically enabled. Steam Line Pressure - Negative Rate - High provides no input to any control functions. Thus, three OPERABLE channels on each steam line are sufficient to satisfy requirements with a two-out-of-three logic.

Steam Line Pressure - Negative Rate - High must be OPERABLE in MODE 3 when less than the P-11 setpoint (may be blocked below P-11 when safety injection on low steam line pressure is not blocked), when a secondary side break or stuck open valve could result in the rapid depressurization of the steam line(s). In MODES 1 and 2, and in MODE 3, when above the P-11 setpoint, this signal is automatically disabled and the Steam Line Pressure - Low signal is automatically enabled. The Steam Line Isolation Function ~~is required~~ to be OPERABLE in ~~MODES 2~~ and 3 unless all MSIVs are closed. In MODES 4, 5, and 6, there is insufficient energy in the primary and secondary sides to have an SLB or other accident that would result in a release of significant enough quantities of energy to cause a cooldown of the RCS.

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INSERT Z

While the transmitters may experience elevated ambient temperatures due to an SLB, the trip function is based on rate of change, not the absolute accuracy of the indicated steam pressure. Therefore, the Trip Setpoint reflects only steady state instrument uncertainties. The Trip Setpoint is ≤ 100 psi with a rate/lag controller time constant ≥ 50 seconds.

(continued)

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INSERT Z

and de-activated and all MSIVBVs are closed and de-activated or isolated by two closed manual valves.

B 3.7 PLANT SYSTEMS

B 3.7.2 Main Steam Isolation Valves (MSIVs) INSERT B

BASES

BACKGROUND

The MSIVs isolate steam flow from the secondary side of the steam generators following a high energy line break (HELB). MSIV closure terminates flow from the unaffected (intact) steam generators.

One MSIV is located in each main steam line outside, but close to, containment. The MSIVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSIV closure. Closing the MSIVs isolates each steam generator from the others, and isolates the turbine, Condenser Steam Dump System, and other auxiliary steam supplies from the steam generators.

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The MSIV is a 28-inch gate valve with a system-medium actuator. Since the MSIV actuators are system-medium actuators, the MSIV isolation time is a function of steam generator steam pressure. The assumed single active failure of one of the redundant MSIV actuation trains will not prevent the MSIV from closing.

The MSIV actuators consist of two separate system-medium actuation trains. For each MSIV, one actuator train is associated with separation group 4 ("yellow"), and one actuator train is associated with separation group 1 ("red"). A single active failure in one power train would not prevent the other power train from functioning. The MSIVs provide the primary success path for events requiring steam isolation and isolation of non-safety-related portions from the safety-related portion of the system.

The MSIVs close on a main steam isolation signal generated by low steam line pressure, high steam line negative pressure rate or High-2 containment pressure. The MSIVs fail as is on loss of control signal. The MSIVs fail closed on loss of actuation power.

INSERT D

~~Each MSIV has an MSIV bypass valve. Although these bypass valves are normally closed, they receive the same emergency closure signal as do their associated MSIVs.~~

A description of the MSIVs and MSIVBVs is found in the FSAR, Section 10.3 (Ref. 1).

(continued)

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INSERT A

MSIVs and MSIV Bypass Valves

INSERT B

and Main Steam Isolation Valve Bypass Valves (MSIVBVs)

INSERT D

Each MSIV has an MSIV bypass valve (MSIVBV). Although the bypass valves are normally closed, they receive the same emergency closure signals as the associated MSIVs. The MSIVBVs are open when the MSIVs are closed, to permit warming of the main steam lines prior to startup. MSIVBVs are air-operated globe valves. For emergency closure of each MSIV, either of two separate solenoid valves, when de-energized, will result in valve closure. The two electrical solenoid valves are energized from separate Class 1E sources.

and MSIVBVs

BASES (Continued)

APPLICABLE SAFETY ANALYSES

The design basis of the MSIVs is established by the containment analysis for the large steam line break (SLB) inside containment, discussed in the FSAR, Section 6.2.1.4 (Ref. 2). It is also affected by the accident analysis of the SLB events presented in the FSAR, Section 15.1.5 (Ref. 3). The design precludes the blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV or MSIVBV to close on demand).

The limiting case for the containment pressure analysis is the double-ended hot leg LOCA, with initial reactor power at 102%, with loss of offsite power and the failure of one train of containment cooling (one containment spray pump and two containment fan coolers).

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At lower powers, the steam generator inventory and temperature are at their maximum, generally maximizing the analyzed mass and energy release to the containment. With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System (Ref. 3).

The accident analysis compares several different SLB events against different acceptance criteria. The large SLB outside containment upstream of the MSIV is limiting for offsite dose, although a break in this short section of main steam header has a very low probability. The large SLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing the Reactor Coolant System cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSIV to close.

INSERT D1

The MSIVs serve only a safety function and remain open during power operation. These valves operate under the following situations:

a. An HELB inside containment. In order to maximize the mass and energy release into containment, the analysis assumes that the MSIV in the affected steam generator remains open. For this accident scenario, steam is discharged into containment from all steam generators until the remaining MSIVs close. After MSIV closure, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header downstream of the closed MSIVs and MSIVBV in the unaffected

and MSIVBV

and MSIVBVs

(continued)

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INSERT D1

The MSIVBVs are typically used for turbine warming and pressure equalization during startup, and are normally closed during power operation, but may be opened, for example, for testing or maintenance.

BASES

APPLICABLE SAFETY ANALYSES (continued)

loops. Closure of the MSIVs isolates the break from the unaffected steam generators.

b. A break outside of containment and upstream from the MSIVs is not a containment pressurization concern. The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive reactivity addition. Closure of the MSIVs (and MSIVBVs) isolates the break and limits the blowdown to a single steam generator.

c. A break downstream of the MSIVs will be isolated by ~~the~~ closure of the MSIVs and the closed MSIVBVs.

d. Following a steam generator tube rupture, closure of the MSIVs isolates the ruptured steam generator from the intact steam generators to minimize radiological releases.

e. The MSIVs are also utilized during other less limiting events such as a feedwater line break. ~~This event is less limiting as far as MSIV OPERABILITY is concerned.~~

Figure B 3.7.2-1 is a curve of the MSIV isolation time as function of steam generator pressure. Meeting the MSIV isolation times in Figure B 3.7.2-1 ensures that the evaluation performed in Reference 8 remains valid.

The MSIVs and MSIVBVs satisfy Criterion 3 of 10 CFR 50.36 (c)(2)(ii). INSERT E

LCO

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This LCO requires that all four MSIVs, ~~and~~ their associated actuator trains be OPERABLE. The MSIVs are considered OPERABLE when the isolation times are within the limits of Figure B 3.7.2-1 and they are capable of closing on an isolation actuation signal. An MSIV actuator train is considered OPERABLE when it is capable of closing its associated MSIV on an isolation actuation signal. INSERT F

This LCO provides assurance that the MSIVs and MSIVBVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits or the NRC staff approved licensing basis.

(continued)

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INSERT E

, and all four MSIVBVs

INSERT F

The MSIVBVs are considered OPERABLE when their isolation times are within limits and they are capable of closing on an isolation actuation signal.

BASES (Continued)

APPLICABILITY

The MSIVs must be OPERABLE in MODES 1, 2 and 3, when there is significant mass and energy in the RCS and steam generators. When the MSIVs are closed, they are performing the safety function.

and MSIVBVs

INSERT G1

In MODE 4, 5 or 6, the steam generator energy is low. Therefore, the MSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

ACTIONS

On the basis that the LCO specifies operability requirements for the MSIVs as well as for their associated actuator trains, the Conditions and Actions specified for TS 3.7.2 separately address inoperability of the MSIV actuator trains and inoperability of the MSIVs themselves.

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With respect to the MSIV actuator trains, Conditions A, B, and C (i.e., Required Actions A.1, B.1, and C.1) address the condition of when only one MSIV actuator train is inoperable per MSIV, for up to two MSIVs. Condition D (Required Action D.1) addresses the condition of having both actuator trains inoperable for a single MSIV, and Condition E (Required Action E.1) addresses the condition of having three or more actuator trains inoperable in any combination or when the Required Action and associated Completion Time of Condition A, B, or C cannot be met. The acceptability of the Required Actions and associated Completion Times for addressing inoperable MSIV actuator trains is documented in the NRC Safety Evaluation for License Amendment 172 (Reference 7).

INSERT G

~~Conditions F and H address inoperability of the MSIVs themselves. During Mode 1 with one MSIV itself inoperable, Condition F (i.e., Required Action F.1) applies. Condition G subsequently applies if the Required Action and associated Completion Time of Condition F cannot be met. With more 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 H applies so that Required Action H.1 is required to be entered. Condition I subsequently applies if the Required Action and associated Completion Time of Condition H is not 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. 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

(continued)

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INSERT G1

Exceptions to the APPLICABILITY in MODES 2 and 3 for the MSIVs and their associated actuator trains, as well as in MODES 1, 2, and 3 for the MSIVBVs, are allowed for the following cases where the valve(s) is assured of performing its specified safety function:

a. When all MSIVs are closed and de-activated, they are performing the specified safety function. Requiring all MSIVs to be closed and de-activated provides assurance that the MSIVs are performing the specified safety function. Closing and de-activating provides a means of isolation that cannot be adversely affected by a single active failure, thus assuring the MSIV is performing the specified safety function. The MSIV is a system-medium actuated valve, opened by system pressure acting on the lower piston chamber, closed by the weight of the valve internals and system pressure acting on the upper piston chamber. To de-activate the MSIVs all electrical power sources must be removed from the actuation solenoids on all four MSIVs and a drain or vent path must be available from the lower piston chamber.

b. When one or more MSIVBVs are closed and de-activated or isolated by two closed manual valves, they are performing the specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function. Closing and de-activating provides a means of isolation that cannot be adversely affected by a single active failure, thus assuring the MSIVBV is performing the specified safety function. When the valve is de-activated, power and air are removed from both actuation solenoid valves and the valve is spring closed. Requiring the MSIVBV to be isolated by two closed manual valves also provides dual assurance that the specified safety function is being performed.

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INSERT G

Conditions F and I address inoperability of the MSIVs themselves. During Mode 1 with one MSIV itself inoperable, Condition F (i.e., Required Action F.1) applies. Condition G subsequently applies if the Required Action and Completion Time of Condition F cannot be met. With more 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 I applies so that Required Action I.1 is required to be entered. Condition J subsequently applies if the Required Action and associated Completion Time of Condition I are not met.

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

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each MSIVBV.

ACTIONS

A.1 (continued)

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. 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.

C.1

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With an actuator train on one MSIV inoperable and an actuator train on another MSIV inoperable, but with both inoperable actuator trains in the same separation group, action must be taken to restore one of the inoperable actuator trains to OPERABLE status within 4 hours. A reasonable amount of time for restoring at least one actuator train is permitted since the dual-redundant actuator train design for each MSIV ensures that a single inoperable actuator train cannot prevent the affected MSIV(s) from closing on demand. Wtih two actuator trains inoperable in the same separation group, however, an additional failure (such as the failure of an actuation logic train in the other separation group) could cause both affected MSIVs to fail to close on demand. The 4-hour Completion Time takes into account the low probability of occurrence of an event that would require MSIV closure during such an interval.

D.1

With both (two) actuator trains for a single MSIV inoperable, the affected MSIV must immediately be declared inoperable. This is appropriate since such a condition renders the affected MSIV incapable of closing on demand.

E.1 → ~~E.1~~

With three or more MSIV actuator trains inoperable, or with the Required Action and associated Completion Time of Condition A, B, or C not met,

(continued)

ACTIONS

E.1 (continued)

the affected MSIVs must immediately be declared inoperable. Having three actuator trains inoperable could involve two inoperable actuator trains on one MSIV and one inoperable actuator train on another MSIV, or an inoperable actuator train on each of three MSIVs, for which the inoperable actuator trains could all be in the same separation group or be staggered among the two separation groups.

Depending on which of these conditions or combinations is in effect, the condition or combination could mean that all of the affected MSIVs remain capable of closing on demand (due to the dual-redundant actuator train design), or that at least one MSIV is inoperable, or that with an additional single failure up to all three MSIVs could be incapable of closing on demand. Therefore, in some cases, immediately declaring the affected MSIVs inoperable is conservative (when some or all of the affected MSIVs may still be capable of closing on demand even with a single additional failure), while in other cases it is appropriate (when at least one of the MSIVs would be inoperable, or up to all three could be rendered inoperable by an additional single failure). Since Condition E addresses all of these conditions or combinations, Required 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.

Such as

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F.1

With one MSIV inoperable in MODE 1, action must be taken to restore OPERABLE status within 8 hours. 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.

~~The 8 hour Completion Time is greater than that normally allowed for containment isolation valves because the MSIVs are valves that isolate a closed system penetrating containment. This time is reasonable due to the relative stability of the closed system which provides an additional passive means for containment isolation.~~

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

(continued)

BASES

ACTIONS

F.1 (continued)

required. (Entry into Condition F for an inoperable MSIV actuator train is only required if the Required Action and associated Completion Time of Required Action A.1 cannot be ~~me.)~~ met.)

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.

INSERT H

~~H.1 and H.2~~ I.1 and I.2

Condition I

~~Condition H~~ is modified by a Note indicating that, when two or more MSIVs are inoperable in Mode 2 or 3, separate Condition entry is allowed for each MSIV.

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Since the MSIVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSIVs may either be restored to OPERABLE status or closed. When closed, the MSIVs are already in the position required by the assumptions in the safety analysis.

The 8 hour Completion Time is consistent with that allowed in Condition F.

For inoperable MSIVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position.

~~I.1 and I.2~~ J.1 and J.2

INSERT I

~~If the MSIVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time,~~ the unit must be placed in a

(continued)

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INSERT H

H.1 and H.2

With one or more MSIVBVs inoperable, action must be taken to restore each MSIVBV to OPERABLE status within 8 hours 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 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 MSIVBVs.

For inoperable MSIVBVs that cannot be restored to OPERABLE status within 8 hours, but are closed or isolated, the inoperable MSIVBVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of valve status indications available in the control room, and other administrative controls to ensure that these valves are in the closed position or isolated.

If the MSIVBVs are closed and de-activated or isolated by two closed manual valves, this LCO does not apply as discussed in the Applicability section of these Bases.

INSERT I

If the Required Action and associated Completion Time of Conditions H or I are not met,

J.1 and J.2

BASES

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

MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

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This SR verifies that the closure time of each MSIV is within the limits of Figure B 3.7.2-1 from each actuator train when tested pursuant to the Inservice Test Program. The MSIV isolation time is assumed in the accident and containment analyses. Figure B 3.7.2-1 is a curve of the MSIV isolation time as a function of steam generator pressure, since there is no pressure indication available at the MSIVs. The acceptance curve for the MSIV stroke time is conservative enough to account for potential pressure differential between the steam generator pressure indication and pressure at the MSIVs. Meeting the MSIV isolation times in Figure B 3.7.2-1 ensures that the evaluation performed in Reference 8 remains valid. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power.

The Frequency is in accordance with the Inservice Testing Program.

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR.

INSERT J

For the MSIVs

SR 3.7.2.2

This SR verifies that each MSIV is capable of closure on an actual or simulated actuation signal. The manual fast close handswitch in the Control Room provides an acceptable actuation signal. Each actuation train must be tested separately. This Surveillance is normally performed upon returning the unit to operation following a refueling outage in conjunction with SR 3.7.2.1. However, it is acceptable to perform this surveillance individually. The frequency of MSIV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. This Frequency is acceptable from a reliability standpoint. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR.

INSERT K

and MSIVBV

(continued)

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INSERT J

and each required MSIVBV

INSERT K

SR 3.7.2.3

This SR verifies that the closure time of each MSIVBV is $\leq$ 15 seconds when tested pursuant to the Inservice Testing Program. This is consistent with the assumptions used in the accident and containment analyses.

For the MSIVBVs, this Surveillance is performed routinely during plant operation (or as required for post-maintenance testing), but it may also be required to be performed upon returning the unit to operation following a refueling outage.

The Frequency for this SR is in accordance with the Inservice Testing Program.

BASES (Continued)

REFERENCES

1. FSAR, Section 10.3, Main Steam Supply System.

2. FSAR, Section 6.2, Containment Systems.

3. FSAR, Section 15.1.5, Steam System Piping Failure.

4. 10 CFR 100.11.

5. ASME, Boiler and Pressure Vessel Code, Section XI.

6. FSAR 6.2.1.4.3.3, Containment Pressure - Temperature Results.

7. Amendment 172 to Facility Operating License No. NPF-30, (NRC Safety Evaluation included), Callaway Unit 1, dated June 16, 2006.

8. Westinghouse Letter, SCP-07-26, dated March 6, 2007.

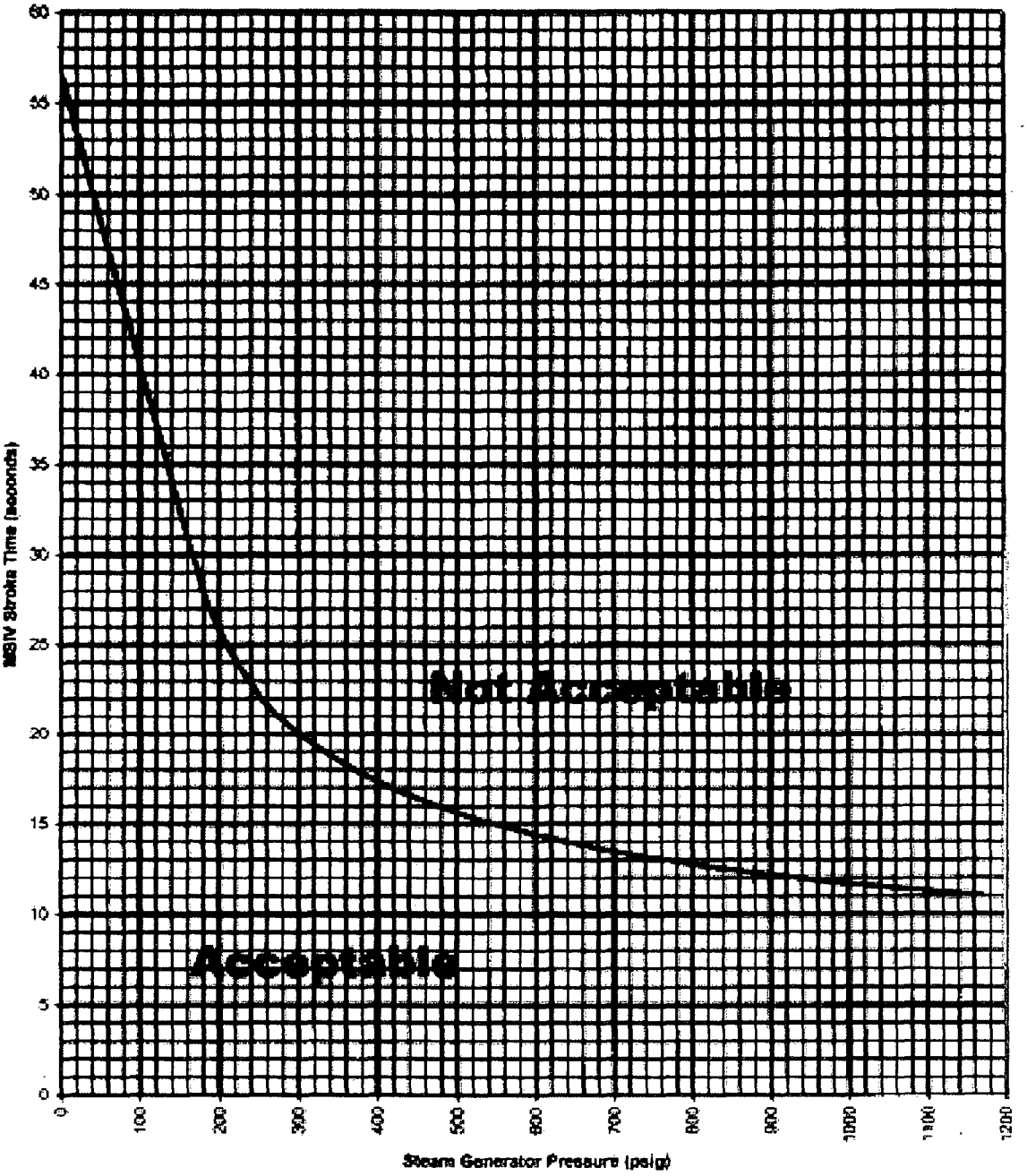

Figure B 3.7.2-1 (page 1 of 1)
MSIV Stroke Time Limit vs Steam Generator Pressure

B 3.7 PLANT SYSTEMS

B 3.7.19 Secondary System Isolation Valves (SSIVs)

BASES

BACKGROUND

Closure of secondary system isolation valves (SSIVs) ensures that the assumptions used in the plant accident and containment analyses remain valid. In accident conditions, SSIVs close to terminate the blowdown from the faulted steam generator and isolate the intact steam generators, and to isolate the plant secondary side in order to prevent possible diversion of auxiliary feedwater flow.

The accident analyses assume that the steam generators are isolated after receiving an isolation signal. Following receipt of the steam line isolation signal (SLIS) and auxiliary feedwater actuation signal (AFAS), the intact steam generators are assumed to be isolated, except for the steam supply valves to the turbine-driven auxiliary feedwater pump (governed by Technical Specification 3.7.5, Auxiliary Feedwater System). There are also analysis cases that evaluate the single failure of a main steam or main feedwater isolation valve. In addition to the valves governed by Technical Specification 3.7.2 (Main Steam Isolation Valves and Main Steam Isolation Valve Bypass Valves) and Technical Specification 3.7.3 (Main Feedwater Isolation Valves, Main Feedwater Regulating Valves, and Main Feedwater Regulating Valve Bypass Valves), the analysis assumptions require that the steam generator blowdown and sample line isolation valves, the main steam low point drain isolation valves, and the steam generator chemical injection isolation valves are closed.

When plant accident conditions require delivery of auxiliary feedwater, the normally closed steam supply isolation valves to the turbine-driven auxiliary feedwater pump (TDAFP) open on an AFAS. This ensures availability of the TDAFP. The AFAS signal also closes the steam generator blowdown and sample isolation valves in order to isolate the plant's secondary side.

When plant accident conditions require feedline isolation, a feedwater isolation signal (FWIS) closes the main feedwater isolation valves, the main feedwater regulating valves, the main feedwater regulating valve bypass valves, and other valves associated with the main feedwater lines. Included are the steam generator chemical injection isolation valves which also close on the FWIS. Closing the chemical injection isolation valves functions to isolate the plant's secondary side.

BASES

BACKGROUND
(continued)

The steam generator blowdown system (SGBS) helps to maintain the steam generator secondary side water within chemical specifications. Heat is recovered from the blowdown and returned to the feedwater system. Portions of the SGBS are safety-related and are required to function following a design basis accident. One blowdown isolation valve (SGBSIV) is installed in each of the four blowdown lines outside the containment.

These valves prevent uncontrolled blowdown from more than one steam generator and isolate nonsafety-related portions from the safety-related portions of the system. These valves are air-operated globe valves which fail closed. For emergency closure, either of two safety-related solenoid valves is de-energized to dump air supplied to the valve actuator. The electrical solenoid valves are energized from separate Class 1E sources and are tripped upon receipt of an SGBSIS (AFAS) signal.

The SGBS also includes safety-related sample isolation valves (SGBSSIVs). Three SGBSSIVs are installed in each of the sample line flow paths for each steam generator. Two valves are located inside the containment (one from each sample point), and one valve is located outside containment. The SGBSSIVs prevent uncontrolled blowdown from more than one steam generator and isolate the nonsafety-related portions from the safety-related portions of the system. The SGBSSIVs are solenoid-operated globe valves which fail closed. The inside containment solenoid valves are energized from separate Class 1E sources from the outside containment solenoid valves. These valves are also closed upon receipt of an SGBSIS (AFAS) signal.

On each of the four main steam lines, upstream of the main steam isolation valves, is a 12-inch diameter low point drain line. Each drain line has a level detection system that consists of a level switch that annunciates on a high level. One air-operated low point drain isolation valve (ABLPDIV) is installed in each drain line. The ABLPDIVs are normally open to allow a steam trap to pass moisture to the main condenser. The ABLPDIVs close upon receipt of an SLIS and function to isolate the plant's secondary side. The ABLPDIVs fail in the closed position.

A steam generator chemical injection system maintains proper system pH and scavenges oxygen present in the steam generators to minimize corrosion during plant shutdown conditions. The system is normally not in use during normal plant operation, but it is used when the plant is in hot standby or cold layup. The system adds hydrazine and amine mixture to the steam generator downstream of the main feedwater isolation valve. The addition is directly into the feedwater system via the steam generator chemical injection isolation valve (SGCIIV). The valves are normally closed, unless used during

BASES

BACKGROUND
(continued)

cold shutdown. The steam generator chemical injection isolation valves are air- operated globe valves, which fail closed on loss of air. The valves automatically close upon receipt of an FWIS signal. When the valves are closed or isolated they function to isolate the plant's secondary side.

The main steam and related secondary side lines are automatically isolated upon receipt of an SLIS or FWIS. The diverse parameters sensed to initiate an SLIS are low steam line pressure, high negative steam pressure rate, and high containment pressure (Hi-2).

An FWIS is generated by an SIS, reactor trip with low Tave, SG water level high-high, or SG water level low-low. The diverse parameters sensed to initiate an SIS are low steam line pressure, low pressurizer pressure, and high containment pressure (Hi-1).

Descriptions of SSIVs are found in the FSAR, Section 10.4.7 (Ref.1), Section 10.4.8 (Ref. 2), and Section 10.3 (Ref. 3).

APPLICABLE
SAFETY
ANALYSES

The accident analyses assume that the steam generators are isolated after receiving an isolation signal as discussed in the Background section. Further discussion can be found in the FSAR, Chapters 6 and 15.

The secondary system isolation valves function to ensure the primary success path for steamline and feedline isolation and for delivery of required auxiliary feedwater flow and, therefore, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO ensures that secondary system isolation valves will isolate the plant's secondary side, following a main feedline or main steam line break and ensures the required flow of auxiliary feedwater to the intact steam generators. Secondary system isolation valves are considered OPERABLE when their isolation times are within limits upon receipt of an isolation actuation signal, and they are capable of closing on an isolation actuation signal.

BASES

LCO
(continued)

Secondary system isolation valves include: (1) steam generator blowdown isolation valves (BMHV0001, BMHV0002, BMHV0003, and BMHV0004); (2) steam generator blowdown sample line isolation valves (BMHV0019, BMHV0020, BMHV0021, BMHV0022, BMHV0065, BMHV0066, BMHV0067, BMHV0068, BMHV0035, BMHV0036, BMHV0037, and BMHV0038); (3) main steam low point drain isolation valves (ABLV0007, ABLV0008, ABLV0009, and ABLV0010); and (4) steam generator chemical injection isolation valves (AEFV0043, AEFV0044, AEFV0045, and AEFV0046).

The LCO is modified by a NOTE to allow an SSIV to be unisolated under administrative controls. The administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the valve can be rapidly isolated when a need for isolation is indicated.

APPLICABILITY

The SSIVs must be OPERABLE in MODES 1, 2, and 3, when there is significant mass and energy in the RCS and steam generators. When the SSIVs are closed or isolated, they are performing the specified safety function of isolating the plant's secondary side.

Exceptions to the APPLICABILITY are allowed for cases where the SSIV is assured of performing its specified safety function. When the SSIV is closed and de-activated, or is closed and isolated by a closed manual valve, or the SSIV flow path is isolated by the required combination of closed manual valve(s) and closed and de-activated automatic valve(s), it is performing its specified safety function. Requiring the valve to be closed and de-activated provides dual assurance that it is performing its specified safety function. When an air-operated SSIV is de-activated, power and air are removed from the associated actuation solenoid valves (single solenoid valve powered from a safety-related separation group for AEFV0043, AEFV0044, AEFV0045, and AEFV0046; dual solenoid valves powered from different safety-related separation groups for ABLV0007, ABLV0008, ABLV0009, ABLV0010 and BMHV0001, BMHV0002, BMHV0003, BMHV0004). When a solenoid-operated SSIV is de-activated, power is removed from the solenoid valve. Requiring the valve to be closed and isolated by a closed manual valve also provides dual assurance that it is performing its specified safety function. Finally, there is dual assurance that the specified safety function is being performed when the SSIV flow path is isolated by two closed valves which can be any combination of

BASES

APPLICABILITY
(continued)

closed manual and closed and de-activated automatic valves. When used for the SGBSIVs and SGBSSIVs, this final option must provide dual isolation assurance that accounts for the connection between the SG blowdown sample and SG blowdown lines.

In MODE 4, 5, or 6, the steam generator energy is low. Therefore, the SSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each SSIV.

A.1 and A.2

With one or more SSIVs inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable valves within 7 days. When these valves are closed or isolated, they are performing their specified safety function.

The 7 day Completion Time takes into account the low probability of an event occurring during this time period that would require isolation of the plant's secondary side. The 7 day Completion Time is reasonable, based on operating experience.

Inoperable SSIVs that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the accident analyses remain valid. The 7 day Completion Time is reasonable based on engineering judgment, in view of valve status indications in the control room, and other administrative controls, to ensure that these valves are in the closed position or isolated.

If the SSIVs are closed and de-activated, or closed and isolated by a closed manual valve, or the SSIV flow path is isolated by two closed valves, this LCO does not apply as discussed in the APPLICABILITY section of these Bases.

B.1 and B.2

If the Required Action and associated Completion Time of Condition A is not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status,

BASES

ACTIONS
(continued)

the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE
REQUIREMENTS

SR 3.7.19.1

This SR verifies the proper alignment for required automatic SSIVs in the flow path that are used to isolate the plant's secondary side. The SSIV is allowed to be in a non-accident position provided the valve will automatically reposition within the proper stroke time. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown (which may include the use of local or remote indicators), that valves capable of being mispositioned are in the correct position.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.19.2

This SR verifies that the isolation time of each required automatic SSIV is within limits when tested pursuant to the Inservice Testing Program (IST). The specific limits are documented in the Inservice Testing Program. The SSIV isolation times are less than or equal to those assumed in the accident and containment analyses. The SR is performed only for required SSIVs. An exception is made for the steam generator chemical addition injection isolation valves which are not included in the IST program. These valves are passive, with multiple isolation valves in their flow path.

For the required SSIVs, performance of this surveillance is routinely done during plant operation (or as required for post-maintenance testing), but it may also be required to be performed upon returning the unit to operation following a refueling outage.

The Frequency for this SR is in accordance with the Inservice Testing Program.

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.7.19.3

This SR verifies that each required automatic SSIV in the flow path is capable of closure on an actual or simulated actuation signal. This surveillance is routinely performed during plant operation, but may also be performed upon returning the unit to operation following a refueling outage.

The Frequency for this SR is 18 months.

BASES

REFERENCES

1. FSAR, Section 10.4.7, Condensate and Feedwater System
2. FSAR, Section 10.4.8, Steam Generator Blowdown System
3. FSAR, Section 10.3, Main Steam Supply System