AmerenUE
Callaway Plant

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May 4, 2009

ULNRC-05566

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
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10 CFR 50.90

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 REVISED)

Reference: (1) AmerenUE Letter ULNRC-05466, Transmittal of License Amendment Request OL-1277, dated December 28, 2007
(2) AmerenUE Letter ULNRC-05573, Withdrawal of License Amendment Request OL-1277 dated December 10, 2008

AmerenUE herewith transmits an application for amendment to Facility Operating License Number NPF-30 for the Callaway Plant. This transmittal submits a replacement to the application for amendment transmitted via the letter Reference (1) above. Reference (1) was under review by the NRC staff as license amendment request OL-1277 (TAC No. MD7787). By letter Reference (2), AmerenUE withdrew the license amendment request. AmerenUE is now submitting license amendment request OL-1277 Revised. OL-1277 Revised completely replaces Reference (1).

The current submittal proposes revisions to Technical Specification (TS) 3.7.2, "Main Steam Isolation Valves (MSIVs)," to add the main steam isolation valve bypass valves (MSIVBVs) and main steam low point drain isolation valves (MSLPDIVs) to the scope of TS 3.7.2. In minor changes, the title of TS 3.7.2 and the header on each page of TS 3.7.2 are revised. The proposed changes also revise

exception footnote (i) in TS Table 3.3.2-1 of TS 3.3.2, "ESFAS Instrumentation," to remove the MSIVs from the footnote such that the footnote only addresses the MSIVBVs and MSLPDIVs. The MSIVs are addressed in new exception footnote (k) added to TS Table 3.3.2-1.

In addition, a new Technical Specification is proposed to be added. Proposed new TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," provides a Limiting Condition for Operation and Surveillance Requirements for the following secondary system isolation valves: steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs). Correspondingly, new Function 10, "Steam Generator Blowdown System and Sample Line Isolation Valve Actuation," is proposed to be added to TS Table 3.3.2-1 of TS 3.3.2. The SGBSIVs and SGBSSIVs are addressed in new exception footnote (t) added to Table 3.3.2-1 for Function 10.

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

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.

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. Further, no commitments are contained in this amendment application.

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 May 5, 2010. 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: 5/4/09

Scott Sandbothe
Manager, Regulatory Affairs

DJW/nls

Attachments: 1 – Evaluation
2 – Markup of Technical Specification pages and New TS 3.7.19
3 – Retyped Technical Specification pages 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-05566

ATTACHMENT 1

EVALUATION

Attachment 1
to ULNRC-05556

EVALUATION

EVALUATION

1.0 DESCRIPTION

The most significant isolation valves within the secondary system at Callaway Plant are addressed in the plant Technical Specifications due to the credited safety functions performed by these valves. The main steam isolation valves (MSIVs), for example, are addressed in TS 3.7.2, "Main Steam Isolation Valves (MSIVs)." The main feedwater isolation valves (MFIVs), along with the main feedwater regulating valves (MFRVs) and MFRV bypass valves (MFRVBVs), are addressed in TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating Valves (MFRVs) and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)." It is recognized, however, that there are other isolation valves in the secondary system that, although much smaller in size than the MSIVs or MFIVs, nevertheless perform safety functions explicitly or implicitly credited in the accident analyses, but which are not currently addressed in the Technical Specifications. Changes to the Technical Specifications are therefore being proposed to incorporate requirements for secondary system isolation valves not currently addressed by the Technical Specifications, as follows.

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) and the main steam low point drain isolation valves (MSLPDIVs) to the scope of the TS. The proposed changes include revising the Limiting Condition for Operation (LCO) and Applicability sections of TS 3.7.2 and adding or revising Conditions, Required Actions, and Surveillance Requirements as necessary to address the MSIVBVs and MSLPDIVs. In minor changes, the title of TS 3.7.2 and the header on each page of TS 3.7.2 are revised. In addition, Footnote (i) for Function 4, "Steam Line Isolation," 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 support and/or be consistent with the revised Applicability of LCO 3.7.2. Footnote (i) is further revised to remove the MSIVs from the scope of the note so that it only addresses the MSIVBVs and MSLPDIVs. New exception footnote (k) is added to TS Table 3.3.2-1 for Function 4 to address the MSIVs alone.

The proposed changes also add new TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," to include a Limiting Condition for Operation and Surveillance Requirements for the secondary system isolation valves (SSIVs). The applicable SSIVs are the steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs). TS 3.3.2 and Table 3.3.2-1 are revised such that they reflect the actuation circuitry requirements necessary to support the SSIVs consistent with the Applicability of new LCO 3.7.19. New Function 10, "Steam Generator Blowdown and Sample Line

Isolation," is added to TS Table 3.3.2-1. New exception footnote (t) is added to Table 3.3.2-1 for Function 10 to address the SGBSIVs and SGBSSIVs.

2.0 PROPOSED CHANGES

This amendment application proposes to revise TS 3.7.2 to incorporate requirements for the MSIVBVs and MSLPDIVs. TS 3.7.2 is retitled to "Main Steam Isolation Valves (MSIVs), Main Steam Isolation Valve Bypass Valves (MSIVBVs), and Main Steam Low Point Drain Isolation Valves (MSLPDIVs)." In a minor change, the header for each page of TS 3.7.2 is revised to "MSIVs, MSIVBVs, and MSLPDIVs." TS 3.7.2 LCO, Applicability, ACTIONS, and Surveillance Requirements (SRs) are specifically revised to incorporate requirements for the MSIVBVs and MSLPDIVs. The LCO and Applicability are further revised to more clearly convey requirements and provisions on a "for each main steam line" basis. The proposed wording for the Applicability would ensure that the exceptions specified therein are properly interpreted when applied to any of the isolation valves (i.e., MSIV, MSIVBV, or MSLPDIV) in a steam line (s).

The proposed changes add new CONDITIONS, REQUIRED ACTIONS, and COMPLETION TIMES for the MSIVBVs and MSLPDIVs. Current CONDITION H is revised to CONDITION J, and Required Actions H.1 and H.2 are renumbered to Required Actions J.1 and J.2. Current CONDITION I is revised to CONDITION K and Required Actions I.1 and I.2 are renumbered as K.1 and K.2. CONDITION K now states "Required Action and Associated Completion Time of Condition H, I, or J not met." New CONDITION H is modified by a Note indicating that, when one or more MSIVBVs are inoperable, separate Condition entry is allowed for each main steam line. 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 7 days and verified closed or isolated once per seven days. New CONDITION I is modified by a Note indicating that, when one or more MSLPDIVs are inoperable, separate Condition entry is allowed for each main steam line. New CONDITION I addresses one or more MSLPDIVs inoperable, and Required Actions I.1 and I.2 require the inoperable MSLPDIV(s) to be closed or isolated in 7 days and verified closed or isolated once per seven days. Revised SR 3.7.2.2 incorporates "each MSIVBV, and each MSLPDIV" to be verified. New TS SR 3.7.2.3 requires the isolation time for each MSIVBV and each MSLPDIV to be verified that it is within limits when tested in accordance with the Inservice Testing Program.

A new Technical Specification 3.7.19, "Secondary System Isolation Valves (SSIVs)," is proposed with a Limiting Condition for Operation and Surveillance Requirements appropriate to the SSIVs. The applicable SSIVs are the steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs) (as identified in the new TS Bases section to be incorporated for TS 3.7.19). The LCO requires the SSIVs to be OPERABLE. The LCO is modified by a Note that allows locked closed manual SSIVs to be open under administrative controls.

The proposed Applicability requires the SSIVs to be OPERABLE in MODES 1, 2, and 3, when there is significant mass and energy in the RCS and steam generators. The LCO and Applicability convey requirements and provisions on a "for each secondary system flow path" basis. The proposed wording for the Applicability ensures that the exceptions specified therein are properly interpreted when applied to any of the isolation valves (SSIVs) in a secondary system flow path. Exceptions to the Applicability are allowed for cases where there is assurance that the SSIV is assured of performing its specified safety function and the associated secondary system flow path is or can be fully isolated.

The CONDITIONS and ACTIONS are modified by a Note to allow separate Condition entry for each SSIV. CONDITION A applies when one or more SSIVs are inoperable. Required Actions A.1 and A.2 require the SSIV to be closed or isolated in 7 days and verified closed or isolated once per 7 days. The Required Actions A.1 and A.2 have been modified by a Note that allows closed or isolated automatic SSIVs to be open or unisolated under administrative controls. CONDITION B applies when the Required Action and associated Completion Time (of Condition A) are not met. Upon entry into this Condition, 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 per Required Actions B.1 and B.2, respectively.

Appropriate SRs are proposed for the SSIVs. Proposed SR 3.7.19.1 verifies that the isolation time of each automatic SSIV is within limits when tested pursuant to the Inservice Testing Program. The Frequency for SR 3.7.19.1 is in accordance with the Inservice Testing Program. Proposed SR 3.7.19.2 verifies that each automatic SSIV in a secondary system flow path is capable of closure on an actual or simulated actuation signal.

Revisions to TS 3.3.2, "ESFAS Instrumentation," and Table 3.3.2-1 of TS 3.3.2 are required in association with the proposed changes to TS 3.7.2 and new TS 3.7.19. The instrumentation and actuation circuitry that generates and processes the signals to which the automatic valves being added to the TS are designed to respond must be addressed within TS 3.3.2. Because the MSIVs, MSIVBVs, and MSLPDIVs receive a steam line isolation signal (SLIS) to close, they are addressed in TS Table 3.3.2-1, Function 4, "Steam Line Isolation." The proposed change to TS 3.3.2, ESFAS Instrumentation, Table 3.3.2-1, Function 4, footnote (i) revises the current statement of footnote (i), "Except when all MSIVs are closed," to eliminate the MSIVs from the footnote and to state the following in order to address only the MSIVBVs and MSLPDIVs:

(i) Except when:

1. All MSIVBVs are closed and de-activated;

1.a Closed and de-activated; or

1.b Closed and isolated by a closed manual valve; or
1.c Isolated by two closed manual valves.

AND

2. All MSLPDIVs are:

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

Because Function 4.c, "Automatic Actuation Logic and Actuation Relays (MSFIS)," in TS Table 3.3.2-1 pertains only to the MSIVs, new footnote (k) is added and states, "Except when all MSIVs are closed and de-activated."

Together, proposed footnote (i) and new footnote (k) replace current footnote (i) in MODES 2 and 3 in TS Table 3.3.2-1 for Function 4.a, "Steam Line Isolation – Manual Initiation," Function 4.b, "Steam Line Isolation – Automatic Actuation Logic and Actuation Relays (SSPS)," Function 4.d, "Steam Line Isolation – Containment Pressure-High 2," Function 4.e.1, "Steam Line Isolation - Steam Line Pressure – Low," and in MODE 3 only for Function 4.e.2, "Steam Line Isolation – Steam Line Pressure – Negative Rate - High."

Changes to TS 3.3.2 based on new TS 3.7.19, "SSIVs," include the addition of new Required Action P.2 for Condition P (which applies when one or more manual auxiliary feedwater initiation or steam generator blowdown and sample line isolation channels are inoperable). Upon entering Condition P, Required Action P.2 would require declaring the associated steam generator blowdown and sample line isolation valves immediately inoperable (since these valves are designed to close in response to the manual start of an auxiliary feedwater pump or manual isolation of the steam generator blowdown and sample lines). Another change proposed for TS 3.3.2 is the addition of new Function 10, "Steam Generator Blowdown and Sample Line Isolation," to Table 3.3.2-1. Because the automatically operated SGBSIVs and SGBSSIVs receive a steam generator blowdown system isolation signal (SGBSIS) to close, they are associated with TS Table 3.3.2-1, new Function 10. New footnote (t) is being added to provide an Applicability exception for the associated instrumentation when the automatic SSIVs are closed and de-activated or isolated. Specifically, the new note reads as follows:

(t) Except when all Steam Generator Blowdown and Sample Line Isolation Valves are:

1. Closed and de-activated; or
2. Closed and isolated by a closed manual valve; or
3. Isolated by a combination of closed manual valve(s) and closed de-activated automatic valve(s).

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 installed in each steam header. 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, the individual main steam flows from the steam generators tie together in a parallel configuration which is then 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. Attached to the 12-inch line is a 1-inch diameter line back to the condenser. One air-operated low point drain isolation valve (MSLPDIV) is installed in each 1-inch drain line. The MSLPDIV 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. The steam generator blowdown system consists of a flash tank, a regenerative heat exchanger, an nonregenerative heat exchanger, filters, demineralizers, a surge tank, and discharge and drain pumps. Each of the four steam generators has its own blowdown and sample lines.

The blowdown from each of the steam generators is conveyed to the steam generator blowdown flash tank by 4-inch blowdown lines. One blowdown isolation valve (SGBSIV) is installed in each of the four blowdown lines outside the containment.

The SGBSIVs are designed to prevent uncontrolled blowdown from more than one steam generator. The valves isolate the nonsafety-related portions from the safety-related portions of the system.

Each of the four steam generators has a blowdown sample line. There are three safety-related sample isolation valves installed in each of the four sample lines. Two of the three valves are located inside containment (one from each sample point), and one valve is installed outside containment. The sample isolation valves are designed to prevent uncontrolled blowdown from more than one steam generator. The blowdown sample valves isolate the nonsafety-related portions from the safety-related portions of the system. FSAR Section 10.4.8 describes the Steam Generator Blowdown System. FSAR Figure 10.4-8 shows the location of the blowdown and sample isolation valves.

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 MSIVBVs are controlled from the main control board panel. The MSIVBVs also have manual handwheels that are normally locked in the neutral position. The specific MSIVBV valves IDs are ABHV0012, ABHV0015, ABHV0018, and ABHV0021. FSAR Figure 10.3-1 shows the location of the four MSIVBVs.

3.2 Main Steam Low Point Drain Isolation Valves (MSLPDIVs)

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 (MSLPDIV) is installed in each drain line. The MSLPDIVs are normally open to allow a steam trap to pass moisture to the main condenser. The MSLPDIVs close upon receipt of an SLIS and function to isolate the plant's secondary side. For emergency closure on receipt of an SLIS, 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. The MSLPDIVs fail in the closed position. The specific MSLPDIV valves IDs are ABLV0007, ABLV0008, ABLV0009, and ABLV0010. FSAR Figure 10.3-1 shows the location of the four MSLPDIVs.

3.3 Steam Generator Blowdown Isolation Valves (SGBSIVs)

There are four steam generator blowdown system isolation valves - one in each steam generator blowdown system line. 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 de-energized upon receipt of an SGBSIS (AFAS) signal, thus causing the SGBSIVs to automatically close. The specific SGBSIV valve IDs are BMHV001, BMHV002, BMHV003, and BMHV004. FSAR Figure 10.4-8 shows the location of the four SGBSIVs.

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 are solenoid-operated globe valves which fail closed. The solenoid valves inside containment are energized from separate Class 1E sources than the outside containment solenoid valves. When open, the SGBSSIVs automatically close upon receipt of an SGBSIS (AFAS) signal. Four SGBSSIVs are located in the steam generator blowdown sample line inside containment and four SGBSSIVs are located in the sample line outside containment. Inside containment, the specific SGBSSIV valves IDs are BMHV0019, BMHV0020, BMHV0021, and BMHV0022. Outside containment, the specific SGBSSIV valves IDs are BMHV0065, BMHV0066, BMHV0067, and BMHV0068. Inside containment, one SGBSSIV is located in a line that connects between each steam generator's blowdown line and sample line. For each of the four cross-connect lines, the SGBSSIV valves IDs are BMHV0035, BMHV0036, BMHV0037, and BMHV0038. FSAR Figure 10.4-8 shows the location of the twelve SGBSSIVs.

3.5 Steam Generator Chemical Injection Isolation Valves (SGCIIVs)

The steam generator chemical injection system delivers chemicals to the steam generators via chemical addition through lines that tap directly into the feedwater lines, downstream of the main feedwater isolation valve. For each or any of the four feedwater lines, a positive displacement metering pump delivers the chemicals from a supply tank into the associated feedwater line via an injection flow path that includes an automatic air-operated globe isolation valve, a check valve, and a manual gate valve prior to entering into the feedwater system.

The steam generator chemical injection system is used to maintain proper system pH and scavenge oxygen present in the steam generators to minimize corrosion during plant shutdown conditions. The system adds hydrazine and amine mixture to the steam generator and is normally not in use during plant power operation, but it typically is during plant conditions in hot standby or cold layup.

During plant operation at full power, an infrequently performed test (steam generator moisture carryover measurement) utilizes the chemical injection flow path to determine the average moisture carryover content in steam from the steam generators using a radioactive tracer method. The steam generator chemical injection system is infrequently used during the modes of applicability of the new proposed TS 3.7.19.

The manual gate valve located in each chemical injection flow path is maintained locked closed until the system is used. The four locked closed manual valves are secondary system isolation valves (SGCIIVs). The SGCVIIV valves IDs are AEV0128, AEV0129, AEV0130, and AEV0131. FSAR Figure 10.4-6 (Sheet 2) shows the location of these valves.

When the system is used, the manual gate valve is opened under administrative controls. These controls include the presence of a dedicated operator who has constant communication with the control room while the flow path is open. Therefore, crediting the locked closed manual valve in the chemical injection flow path for isolation is warranted when it is only opened under administrative controls.
When the valves are closed 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, feedwater, blowdown 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 in order to limit the associated blowdown and/or isolate the non-safety portions of the secondary side from the safety-related portion. The SSIVs are being added to Technical Specifications under the same licensing basis as the current secondary system isolation valves covered in the Technical Specifications (i.e., the 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 "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 still perform a safety function(s).

4.0 TECHNICAL ANALYSIS

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

For the applicable design basis accident (main steam line break, feed line break, or steam generator tube rupture), the accident analysis assumes 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 (MSIVs, MSIVBVs, and MSLPDIVs) and Technical Specification 3.7.3 (Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulating Valves (MFRVs), and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)), the analysis assumptions require that the steam generator blowdown and sample line isolation valves are closed and the steam generator chemical injection flow path is isolated.

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 to isolate the plant's secondary side (i.e., the non-safety portion of the secondary system from the safety-related portion), thereby preventing any potential diversion of require auxiliary feedwater flow.

When plant accident conditions require feedline isolation, a feedwater isolation signal (FWIS) closes the main feedwater isolation valves, the main feedwater regulating valves, and the main feedwater regulating valve bypass valves. Closing these isolation valves also serves to isolate the plant's secondary side.

The steam generator blowdown system also includes the safety-related sample isolation valves. The sample isolation valves prevent uncontrolled blowdown from more than one steam generator and isolate the nonsafety-related portions from the safety-related portions of the system. When open, 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 secondary system isolation valves 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 required to mitigate the accident.

Because the MSIVs, MSIVBVs, MSLPDIVs, MFIVs, MFRVs, and MFRVBVs are addressed in TS 3.7.2 and TS 3.7.3, the other secondary system isolation valves (defined and discussed as SSIVs) are added to TS 3.7.19. Proposed new TS 3.7.19, addresses those secondary system isolation valves (SSIVs) that include SGBSIVs, SGBSSIVs, and SGCIIVs.

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, open MSIVBVs could allow a potential release flow path to exist following a postulated accident scenario such that isolation of the safety-related portions of the secondary system from non-safety-related portions could not be fully effected. Therefore, the MSIVBVs should be subject to requirements for isolation as are the MSIVs. The accident analyses include cases involving the failure of an MSIV to isolate its associated 28-inch main steam line. Because the MSIVBVs isolate only 2-inch lines, however, failure to isolate would result in a less significant impact upon the consequences of such an accident.

The MSLPDIVs are normally open during plant operation, while the MSIVs are also open. The MSLPDIVs allow a steam trap to pass moisture from the main steam line to the main condenser. As such, the open MSLPDIVs allow a potential release path, following a postulated accident scenario, and hinder the isolation of the safety-related portions of the secondary system from non-safety-related portions. Therefore, in the event of an accident, MSLPDIVs are required to isolate when open. However, because the MSLPDIVs isolate 1-inch lines, failure to isolate them alone should result in a less significant impact upon the consequences of the postulated accident.

The proposed LCO requires the MSIV and its associated actuator trains, the MSIVBV, and the MSLPDIV in each of the four main steam lines to be OPERABLE, thus to ensure that the flowpath(s) associated with each main steam line are capable of being isolated when required. The proposed changes to the LCO and Applicability enhance the current wording by more clearly conveying the requirements and provisions on a "for each main steam line" basis. This is especially effective for providing clear exceptions to the Applicability (as further explained below) which are permitted on the basis that isolation or isolation capability is still ensured when the exception is involved.

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 Applicability are allowed for the MSIVs and their associated actuator trains in MODES 2 and 3. In MODES 2 and 3, with the MSIVs closed and de-activated, the MSIVs are assured of performing their specified safety functions. Requiring the MSIVs to be closed and de-activated provides assurance that the specified safety function is being met, thus making it acceptable to exempt the affected MSIV(s) from the Applicability of TS 3.7.2 under such conditions.

Under the proposed changes, the MSIVBVs are required OPERABLE in MODES 1, 2, and 3. 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. In MODES 1, 2, and 3, exceptions to the Applicability for TS 3.7.2 are allowed for the MSIVBVs when they are assured of performing their specified safety function.

Similar to the proposed TS for MSIVs, the LCO requirements for the MSIVBVs are applicable in MODES 1, 2, and 3, but exceptions to the Applicability are permitted for an MSIVBV intended to be excepted from the Applicability. This exception is allowed when the MSIVBVs are assured of performing their specified safety function as follows: for each main steam line (1) the MSIVBV is closed and de-activated, or (2) the MSIVBV is closed and isolated by a closed manual valve, or (3) 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. Alternatively, requiring the MSIVBV to be closed and isolated by a closed manual valve provides assurance that the specified safety function is being

performed. Finally, the specified safety function may also be ensured by requiring the MSIVBV to be isolated by two closed manual valves.

Under the proposed changes, the MSLPDIVs are required OPERABLE in MODES 1, 2, and 3 per LCO 3.7.2. The MSLPDIVs are considered OPERABLE when their isolation times are within limits and they are capable of closing on an isolation actuation signal. In MODES 1, 2, and 3, exceptions to the Applicability for TS 3.7.2 are allowed for the MSLPDIVs when they are assured of performing their specified safety function. This assurance is provided when, for each main steam line, (1) the MSLPDIV is closed and de-activated, or (2) the MSLPDIV is closed and isolated by a closed manual valve, or (3) the MSLPDIV is isolated by two closed manual valves. When the MSLPDIV is closed and de-activated there is 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. Alternatively, requiring the MSLPDIV to be closed and isolated by a closed manual valve provides assurance that the specified safety function is being performed. Finally, the specified safety function may also be ensured by requiring the MSLPDIV to be isolated by two closed manual valves.

With respect to the manual valves used to isolate an MSLPDIV per the last of the above-described options, one manual valve meets ASME Class 2 requirements and the other manual valve meets Class D requirements. The method of isolation is acceptable because of the relatively small diameter of the line isolated (i.e., a 1-inch drain line) and the fact that the isolation valve in the Class D piping serves in addition to the closed manual valve located in the ASME Class 2 piping.

CONDITIONS, REQUIRED ACTIONS, and COMPLETION TIMES are proposed for one or more inoperable MSIVBVs and/or MSLPDIVs. Notes allowing separate Condition entry for these valves are to be included for the proposed Conditions. With one or more MSIVBVs or one or more MSLPDIVs inoperable, the valve(s) must be closed or isolated within 7 days and verified closed or isolated once per 7 days. The 7-day Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVBV or MSLPDIV, operating experience, and less significant consequences from a postulated accident following failure of the MSIVBV or MSLPDIV to isolate. For inoperable MSIVBVs or MSLPDIVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVBVs and MSLPDIVs 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 reasonably based on engineering judgment and other administrative controls to ensure that the MSIVBVs and MSLPDIVs are in the closed position.

The new TS surveillance requirements for the MSIVBVs and MSLPDIVs require demonstration of the valves' 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 and

MSLPDIV is capable of closure on an actual or simulated actuation signal. The frequency of MSIVBV and MSLPDIV 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 and MSLPDIV 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 and MSLPDIVs, 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 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. Except for the locked closed manual SSIVs (chemical injection isolation valves), the automatic SSIV valves receive ESFAS signals for automatic isolation. The wording of the new Specification is in terms of the "SSIVs" which are the locked closed manual steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs). These valves, which are more specifically identified in the Bases for new TS 3.7.19, include the automatic SSIVs, i.e., steam generator blowdown isolation valves BMHV0001, BMHV0002, BMHV0003, and BMHV0004 and steam generator blowdown sample line isolation valves BMHV0019, BMHV0020, BMHV0021, BMHV0022, BMHV0065, BMHV0066, BMHV0067, BMHV0068, BMHV0035, BMHV0036, BMHV0037, and BMHV0038, as well as the locked closed manual steam generator chemical injection isolation valves AEV0128, AEV0129, AEV0130, and AEV0131. The LCO proposed for TS 3.7.19 simply states, "SSIVs shall be OPERABLE."

The LCO is modified by a Note that allows the locked closed manual SSIVs to be open 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.

As noted previously, 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, in order to limit the amount of available fluid that could be added to containment in the event of a secondary system pipe break inside containment. This Applicability (i.e., MODES 1, 2, and 3) also supports the auxiliary feedwater function by ensuring that the non-safety portion of the secondary system piping can be isolated from the safety-related

portion (thus to prevent the diversion of auxiliary feedwater flow in the event of a demand).

Exceptions to the Applicability are allowed for cases where the SSIV is assured of performing its specified safety function. Specifically, the SSIVs in a secondary system line may be exempted from the Applicability of LCO 3.7.19 (i.e., exempted from the LCO requirement to be OPERABLE during an applicable MODE) if there is assurance that the associated secondary system flow path is or can be fully isolated. This assurance can be provided by requiring one SSIV to be closed in a manner such that its closure cannot be adversely affected by a single active failure, or by having the other SSIV in that secondary system flow path closed in such a manner. When one of the SSIVs is closed and de-activated, or is closed and isolated by a closed manual valve, or when the secondary system 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.

When isolating a secondary system flow path(s) associated with the steam generator blowdown connection line between the blowdown and sample lines, the SSIVs and the various options for isolation of the flow path must assure that the flow path associated with a connection between the SG blowdown and sample line paths are isolated.

Conditions, Required Actions, and Completion Times are proposed for the SSIVs under new TS 3.7.19. The CONDITIONS and REQUIRED ACTIONS are modified by a Note indicating that separate Condition entry is allowed for each secondary system flow path. With one (or more) SSIVs inoperable, Required Action A.1 must be taken to restore the affected valve (s) to OPERABLE status, or to close or isolate inoperable valve (s), 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, and is reasonable based on operating experience. See Section 4.4 for additional justification with regard to the reasonableness of such a Completion Time.

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 and in view of valve status indications in the control room and other administrative controls for ensuring 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 provisions of an Applicability exception may be met such that the LCO does not apply to the affected secondary system flow path.)

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, respectively. The allowed Completion Times are

reasonable based on operating experience and the time required for reaching the required unit conditions in an orderly manner without challenging unit systems.

With regard to the proposed Surveillance Requirements for new TS 3.7.19, new SR 3.7.19.1 verifies that the isolation time of each 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 automatic SSIVs. This surveillance does not include verifying a closure time for the steam generator chemical addition injection isolation valves. These are locked closed manual valves that are only opened under administrative controls. The Frequency for this SR is in accordance with the Inservice Testing Program.

New SR 3.7.19.2 verifies that each 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.

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

The addition of the MSIVBVs and MSLPDIVs to the scope of TS 3.7.2 (along with the clarifications being made to the Applicability of that TS), as well as the incorporation of new TS 3.7.19 for the SSIVs, requires appropriate supporting changes to be made to TS 3.3.2, "ESFAS Instrumentation." The TS 3.7.2 changes and the new TS 3.7.19 both require the revision (or addition) of footnotes associated with Table 3.3.2-1 of TS 3.3.2. New TS 3.7.19 requires the incorporation of a new section (Function) into Table 3.3.2-1.

The changes proposed for TS 3.7.2 include clarifications to when an MSIV, MSIVBV, or MSLPDIV may be "execpted" from the Applicability of TS 3.7.2. A similar clarification is being made for specifying when the instrumentation associated with these valves can be execpted from the Applicability of TS 3.3.2 per Footnote (i). Specifically, Footnote (i) in Table 3.3.2-1 is being revised to provide an exception to the TS instrumentation requirements for the Steam Line Isolation Function when the MSIVBVs and MSLPDIVs are closed and de-activated, or when they are closed and isolated by a closed manual valve, or when they are isolated by two closed manual valves. With the end-device safety function being met (i.e., with the noted valves closed and de-activated or isolated), the associated isolation actuation instrumentation is not required.

Footnote (k) is being added to Table 3.3.2-1. For TS Table 3.3.2-1, Function 4, "Steam Line Isolation," new footnote (k) addresses the MSIVs alone. Upon further review of Table 3.3.2-1, Function 4.c, "Automatic Actuation Logic and Actuation Relays (MSFIS)," it was determined that a new footnote (k) should be added to address only the MSIVs. A review of the logic schematic drawings confirmed that the MSFIS ESFAS

closing signal is only applicable to the MSIVs and does not include the MSIVBVs or MSLPDIVs. The signal from SSPS for steam line isolation goes through reactor protection auxiliary relay racks RP209 and RP210. These are not the same as Function 4.c in TS Table 3.3.2-1. The relay racks are considered to be part of the supporting equipment for the end device. In this case, when a relay rack is inoperable, the Condition causes entry into TS 3.7.2 LCO, not TS 3.3.2 LCO. None of the RP auxiliary relay racks are included in TS 3.3. Therefore based on the requirements for Function 4.c, a new footnote (k) is added to address only the MSIVs.

In a corresponding revision to TS Table 3.3.2-1, for MODES 2 and 3, footnote (k) and footnote (i) together replace footnote (i) for TS Table 3.3.2-1, Function 4.a, "Steam Line Isolation – Manual Initiation," Function 4.b, "Steam Line Isolation – Automatic Actuation Logic and Actuation Relays (SSPS)," Function 4.d, "Steam Line Isolation – Containment Pressure – High 2," Function 4.e.(1), "Steam Line Isolation – Steam Line Pressure (1) Low," and in MODE 3 only, Function 4.e.(2), "Steam Line Isolation – Steam Line Pressure (2) Negative Rate – High."

For the automatic SSIVs, the instrumentation that actuates the SSIVs must meet the same 10 CFR 50.36 criterion that the valves meet in requiring them in the TS. Auxiliary relays downstream of the BOP-ESFAS are considered end devices and are covered under LCO 3.7.19. TS 3.7.19 LCO Bases requires SSIVs to be OPERABLE when their associated auxiliary relays downstream of the BOP-ESFAS instrumentation circuitry are OPERABLE.

Additional changes to TS 3.3.2 and TS Table 3.3.2-1 are required to reflect the actuation circuitry requirements necessary to support the SGBSIVs and SGBSSIVs addressed by new LCO 3.7.19. Because the SGBSIVs and SGBSSIVs are designed to automatically close on a steam generator blowdown system isolation signal (SGBSIS) when open, new Function 10, "Steam Generator Blowdown System and Sample Line Isolation," has been added to TS Table 3.3.2-1. Adding new Function 10 to the TS Table 3.3.2-1 makes the instrumentation requirements for the SGBSIVs and SGBSSIVs visible to the operator and further assures successful TS compliance.

Proposed new Function 10 specifies the Applicable Modes, Required Channels, Conditions, and Surveillance Requirements for SGBSIV and SGBSSIV actuation. Function 10 includes 10.a, "Manual Initiation"; 10.b, "Automatic Actuation Logic and Actuation relays (BOP ESFAS); 10.c, "Safety Injection"; and 10.d, "Loss of Offsite Power." New exception footnote (t) has been added to the Table and applied for APPLICABLE MODES where TS 3.7.19 Applicability allows exceptions for the SGBSIVs and SGBSSIVs. The COMPLETION TIMES for TS 3.3.2 Required Actions for CONDITIONS P, Q, and R remain reasonable and appropriate for the SGBSIVs and SGBSSIVs as they are for the secondary system isolation valves currently addressed in TS 3.3.2.

In association with new Function 10.a, "Manual Initiation," new Required Action P.2 has been added to TS 3.3.2 for Condition P (one or more channel (s) inoperable).

Upon entering Condition P, Required Action P.2 requires the operator to immediately declare the associated steam generator blowdown and sample line isolation valve (s) inoperable.

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 secondary system isolation valves. This analysis was not used to establish the Completion Times proposed for restoring inoperable secondary system isolation valves under TS 3.7.2 or new TS 3.7.19, but was used to gauge the acceptability of the proposed Completion Times 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 are designed to prevent back flow through these lines and would effectively make the isolation risk (for failure of an SGCIIV to close) insignificant. Nevertheless, check valves were not credited in the risk analysis for the SGCIIVs.

Another example of the conservative approach taken in the PRA analysis concerns the risk associated with the failure of an SGBSSIV to close. Flow through the SGBSSIVs would be through 3/8-inch 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 this would effectively make the isolation valves risk insignificant.

Finally, it was 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
MSLPDIVs 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) secondary system isolation valves would be out of service simultaneously.

The results of the PRA analysis may be compared to the Completion Times specified for the secondary system isolation valves within the proposed Required Actions under TS 3.7.2 and new TS 3.7.19, as summarized below:

- New TS 3.7.2 Condition H applies to "One or more MSIVBVs inoperable" and Required Action H.1 is to "Close or isolate MSIVBV." New TS 3.7.2 Condition I applies to "One or more MSLPDIVs inoperable" and Required Action I.1 is to "Close or isolate MSLPDIV." The proposed Completion Time (CT) is specified as 7 days which is the same as the evaluated AOT as given on the Table above for MSIVBVs and MSLPDIVs. Therefore, from a risk analysis perspective, the CT for an inoperable MSIVBV or MSLPDIV is acceptable.

- New TS 3.7.19 Condition A applies to "One or more SSIVs inoperable" and Required Action A.1 is to "Close or isolate SSIV." The Completion Time for Required Action A.1 is proposed as 7 days which is less than the 10-day AOT evaluated for the SGCIIVs, SGBSIVs, and SGBSSIVs as given in the table above. Therefore, from a risk analysis perspective, the CT for an inoperable SSIV 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 proposed CTs. The results of the PRA analysis are presented herein simply to show that the proposed CTs 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 changes add the main steam isolation valve bypass valves (MSIVBVs) and the main steam low point drain isolation valves (MSLPDIVs) to the scope of TS 3.7.2, "Main Steam Isolation Valves (MSIVs)" and revises the name and statements for LCO and Applicability of TS 3.7.2. New Technical Specification, TS 3.7.19, "Secondary System Isolation Valves (SSIVs)," is proposed to establish requirements for the following secondary system isolation valves: steam generator chemical injection isolation valves (SGCIIVs), steam generator blowdown isolation valves (SGBSIVs), and steam generator sample line isolation valves (SGBSSIVs). Because the Applicability for TS 3.7.2 is revised and the Applicability for new TS 3.7.19 is proposed, TS 3.3.2, "ESFAS Instrumentation," and Table 3.3.2-1 of TS 3.3.2 must be revised to maintain consistency with TS 3.7.2 and TS 3.7.19. Changes to TS 3.3.2 include adding a new Required Action P.2 for Condition P; adding a new Function 10 to TS Table 3.3.2-1; revising existing TS Table 3.3.2-1, Function 4, footnote (i); and adding

new footnote (k) to TS Table 3.3.2-1, Function 4; and adding new footnote (t) to TS Table 3.3.2-1, Function 10.

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, MSIVBVs, MSLPDIVs, 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, MSIVBVs, MSLPDIVs, 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 changes to TS 3.3.2, TS Table 3.3.2-1, and exception footnotes associated with Table Function 4 and New Function 10 maintain consistency with the Applicability of revised TS 3.7.2 and new TS 3.7.19. Maintaining TS 3.3.2 and TS Table 3.3.2-1 consistent with the Applicability of TS 3.7.2 and TS 3.7.19 is consistent with the Westinghouse Standard Technical Specifications.

   These changes involve no physical changes to the facility and do not adversely affect the availability of the safety functions assumed for the

MSIVs, MSIVBVs, MSLPDIVs, 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, MSIVBVs, MSLPDIVs, 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 MSIVBVs, MSLPDIVs, and 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, MSIVBVs, and MSLPDIVs, as well as the proposed change to the LCO and Applicability for TS 3.7.2 and the proposed new TS 3.7.19 (and the corresponding changes to TS 3.3.2, "ESFAS Instrumentation") 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 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 criterion is the basis for the TS changes that are incorporating requirements for the SSIVs, MSIVBVs, and MSLPDIVs.

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, MSIVBVs, and MSLPDIVs addressed in this amendment application have been determined to meet Criterion 3 contained in 10 CFR 50.36(c)(2)(ii), and therefore, a Limiting Condition for Operation and Surveillance Requirements are being established for these valves.

Closure of the SSIVs, MSIVBVs, and MSLPDIVs ensures that assumptions used in the plant accident and containment analyses remain valid. In the event of a main steam line or feed line break, the SSIVs, MSIVBVs, and MSLPDIVs close to terminate the blowdown from the faulted steam generator and isolate the intact steam generators, and to isolate the plant secondary side (i.e., the non-safety portion from the safety-related portion) thereby preventing possible diversion of auxiliary feedwater flow. The assumed isolation response involves the valves governed by TS 3.7.2 (main steam isolation valves, main steam isolation valve bypass valves, and main steam low point drain isolation 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, as well as 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 from 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," require 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 be challenged. 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 similar to those proposed in the Wolf Creek license amendment request, submittal letter ET08.0039, titled "Docket No. 50-482: Revision to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and Addition of New TS 3.7.19, "Secondary System Isolation Valves," dated August 14, 2008, currently under review by the NRC staff (TAC NO. MD9469).

The addition of TS requirements for the secondary system isolation valves in new proposed TS 3.7.19, and the addition of the MSIVBVs and MSLPDIVs to TS 3.7.2 are

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 changes to TS 3.3.2, "ESFAS Instrumentation", TS Table 3.3.2-1, Table Function 4, footnote (i), the addition of new footnote (k) to the Table Function 4, the addition of new TS Table 3.3.2-1, Function 10, and the addition of new footnote (t) to Table Function 10 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."

8.14 FSAR Figure 10.4-8, "Steam Generator Blowdown System."

8.15 FSAR Figure 10.4-6, "Feedwater System." (Sheet 2)

8.16 FSAR Figure 10.3-1, "Main Steam System." (Sheet 2)

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ATTACHMENT 2

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MARKUP OF TECHNICAL SPECIFICATION PAGES AND NEW TS 3.7.19

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Main Steam Isolation Valve Bypass Valves (MSIVBVs) and Main Steam Low Point Drain Isolation Valves (MSLPDIVs)

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INSERT AB

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
P. One or more channel(s) inoperable.	P.1 Declare associated auxiliary feedwater pump(s) inoperable.	Immediately
Q. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 2 hours for surveillance testing provided the other train is OPERABLE. ----------	
	Q.1 Be in MODE 3.	6 hours
	AND	
	Q.2 Be in MODE 4.	12 hours
R. One or both train(s) inoperable.	R.1 Restore train(s) to OPERABLE status.	48 hours
	OR	
	R.2.1 Be in MODE 3.	54 hours
	AND	
	R.2.2 Be in MODE 4.	60 hours

(continued)

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INSERT AB

	REQUIRED ACTION	COMPLETION TIME
AND		
P.2	Declare associated steam generator blowdown and sample line isolation valve(s) inoperable.	Immediately

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[k], 3[k]	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.
(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.

INSERT A

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INSERT A

(i) Except when:

1. All MSIVBVs are:

    1.a Closed and de-activated; or
    1.b Closed and isolated by a closed manual valve; or
    1.c Isolated by two closed manual valves.

AND

2. All MSLPDIVs are:

    2.a Closed and de-activated; or
    2.b Closed and isolated by a closed manual valve; or
    2.c Isolated by two closed manual valves.

(k) Except when all MSIVs are closed and de-activated.

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					
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[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.

(j) Except when:
1. All MFIVs are closed and de-activated;
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

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(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 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]					
(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:
1. All MFIVs are closed and de-activated;
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(k) Not used.

(l) Not used.

(q) Feedwater isolation only.

(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.

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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.

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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.

INSERT AA

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INSERT AA

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]
10. Steam Generator Blowdown and Sample Line Isolation					
a. Manual Initiation	1[t],2[t],3[t]	2 trains (1 per MDAFW pump)	P	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1[t],2[t],3[t]	2 trains	Q	SR 3.3.2.3	NA
c. Safety Injection	1[t],2[t],3[t]	Refer to Function 1 (Safety Injection) for initiation functions and requirements.			
d. Loss of Offsite Power	1[t],2[t],3[t]	2 trains	R	SR 3.3.2.7	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.

(t) Except when all Steam Generator Blowdown and Sample Line Isolation Valves are:
1. Closed and de-activated, or
2. Closed and isolated by a closed manual valve, or
3. Isolated by a combination of closed manual valve(s) and closed de-activated automatic valve(s).

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INSERT B → ~~MSIVs~~ 3.7.2

3.7 PLANT SYSTEMS

INSERT C

3.7.2 Main Steam Isolation Valves (MSIVs)

INSERT D

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

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 B

MSIVs, MSIVBVs, and MSLPDIVs

INSERT C

, Main Steam Isolation Valve Bypass Valves (MSIVBVs), and Main Steam Low Point Drain Isolation Valves (MSLPDIVs)

INSERT D

The MSIV and its associated actuator trains, the MSIVBV, and the MSLPDIV in each of the four main steam lines shall be OPERABLE.

INSERT D1

For the MSIV and its associated actuator trains in each main steam line:

MODE 1,
MODES 2 and 3 except when the MSIV is closed and de-activated.

For the MSIVBV in each main steam line:

MODES 1, 2, and 3 except when:

a. MSIVBV is closed and de-activated, or
b. MSIVBV is closed and isolated by a closed manual valve, or
c. MSIVBV is isolated by two closed manual valves.

For the MSLPDIV in each main steam line:

MODES 1, 2, and 3 except when:

a. MSLPDIV is closed and de-activated, or
b. MSLPDIV is closed and isolated by a closed manual valve, or
c. MSLPDIV is isolated by two closed manual valves.

INSERT B ~~MSIVs~~ 3.7.2

MSIV

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. OL-1277 Revised	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 J. ~~H.~~ ---------- NOTE ---------- Separate Condition entry is allowed for each ~~MSIV~~ main steam line. ---------- One or more MSIVs inoperable in MODE 2 or 3.	~~H.1~~ J.1	Close MSIV.	8 hours
	AND		
	~~H.2~~ J.2	Verify MSIV is closed.	Once per 7 days
K. ~~I.~~ Required Action and associated Completion Time of Condition ~~H~~ H, I, or J not met.	~~I.1~~ K.1	Be in MODE 3.	6 hours
	AND		
	~~I.2~~ K.2	Be in MODE 4.	12 hours

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INSERT E

H. --------NOTE---------- Separate Condition entry is allowed for each main steam line. ---------- One or more MSIVBVs inoperable.	H.1 Close or isolate MSIVBV. AND H.2 Verify MSIVBV is closed or isolated.	7 days Once per 7 days

I. --------NOTE---------- Separate Condition entry is allowed for each main steam line. ---------- One or more MSLPDIVs inoperable.	I.1 Close or isolate MSLPDIV. AND I.2 Verify MSLPDIV is closed or isolated.	7 days Once per 7 days

INSERT B → ~~MSIVs~~ 3.7.2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.2.1	Verify isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	18 months

INSERT F

INSERT G

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INSERT F

, each MSIVBV, and each MSLPDIV

INSERT G

SR 3.7.2.3	Verify isolation time of each MSIVBV and MSLPDIV 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 The SSIVs shall be OPERABLE.

---NOTE---
Locked closed manual SSIVs may be opened under administrative controls.

APPLICABILITY: MODES 1, 2, and 3 except for each secondary system flow path when:

a. At least one of the two associated SSIVs is closed and de-activated; or

b. At least one of the two associated SSIVs is closed and isolated by a closed manual valve; or

c. The SSIV flow path is isolated by two closed manual valves, or two closed de-activated automatic valves, or a combination of a closed manual valve and a closed de-activated automatic valve.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each secondary system flow path.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more SSIVs inoperable.	---NOTE--- Closed or isolated automatic SSIVs may be opened or unisolated under administrative controls. ---		
	A.1	Close or isolate SSIV.	7 days
	AND		
	A.2	Verify SSIV is closed or isolated.	Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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 the isolation time of each automatic SSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.19.2	Verify each 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

OL-1277 REVISED

RETYPED TECHNICAL SPECIFICATION PAGES AND NEW TS 3.7.19

TABLE OF CONTENTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
P. One or more channel(s) inoperable.	P.1	Declare associated auxiliary feedwater pump(s) inoperable.	Immediately
	AND		
	P.2	Declare associated steam generator blowdown and sample line isolation valve(s) inoperable.	Immediately
Q. One train inoperable.	---------- NOTE ---------- One train may be bypassed for up to 2 hours for surveillance testing provided the other train is OPERABLE. ----------		
	Q.1	Be in MODE 3.	6 hours
	AND		
	Q.2	Be in MODE 4.	12 hours
R. One or both train(s) inoperable.	R.1	Restore train(s) to OPERABLE status.	48 hours
	OR		
	R.2.1	Be in MODE 3.	54 hours
	AND		
	R.2.2	Be in MODE 4.	60 hours

(continued)

Table 3.3.2-1 (page 1 of 11)
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	$\leq$ 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	$\geq$ 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	$\geq$ 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 11)
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 11)
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][k], 3[i][k]	2	F	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2[i][k], 3[i][k]	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[k], 3[k]	2 trains[o]	S	SR 3.3.2.3	NA
	d. Containment Pressure - High 2	1,2[i][k], 3[i][k]	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 MSIVBVs are:
1.a Closed and de-activated, or
1.b Closed and isolated by a closed manual valve, or
1.c Isolated by two closed manual valves.
AND
2. All MSLPDIVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve, or
2.c Isolated by two closed manual valves.

(k) Except when all MSIVs are closed and de-activated.

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

Table 3.3.2-1 (page 4 of 11)
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)(k)], 3[(b)(i)(k)]	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)(k)]	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 MSIVBVs are:
1.a Closed and de-activated, or
1.b Closed and isolated by a closed manual valve, or
1.c Isolated by two closed manual valves.
AND
2. All MSLPDIVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve, or
2.c Isolated by two closed manual valves.
(k) Except when all MSIVs are closed and de-activated.
(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 11)
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[j],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[j], 2[j], 3[j]	2 trains[o]	S	SR 3.3.2.3	NA
	c. SG Water Level - High High (P-14)	1[j],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:
1. All MFIVs are closed and de-activated:
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(l) Except when all MFIVs are closed and de-activated.

(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 11)
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

(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:
1. All MFIVs are closed and de-activated;
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(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 11)
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]					
(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:
1. All MFIVs are closed and de-activated;
AND
2. All MFRVs are:
2.a Closed and de-activated, or
2.b Closed and isolated by a closed manual valve;
AND
3. All MFRVBVs are:
3.a Closed and de-activated, or
3.b Closed and isolated by a closed manual valve, or
3.c Isolated by two closed manual valves.

(q) Feedwater isolation only.

Table 3.3.2-1 (page 8 of 11)
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 9 of 11)
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.

(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 10 of 11)
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.

Table 3.3.2-1 (page 11 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
10.	Steam Generator Blowdown and Sample Line Isolation					
	a. Manual Initiation	1(t), 2(t), 3(t)	2 trains (1 per MDAFW pump)	P	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1(t), 2(t), 3(t)	2 trains	Q	SR 3.3.2.3	NA
	c. Safety Injection	1(t), 2(t), 3(t)	Refer to Function 1 (Safety Injection) for initiation functions and requirements.			
	d. Loss of Offsite Power	1(t), 2(t), 3(t)	2 trains	R	SR 3.3.2.7	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.

(t) Except when all Steam Generator Blowdown and Sample Line Isolation Valves are:
1.Closed and de-activated, or
2.Closed and isolated by a closed manual valve, or
3.Isolated by a combination of closed manual valve(s) and closed de-activated automatic valve(s).

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 AND F.2	Be in MODE 3. Be in MODE 4.	6 hours 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. OR 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. OR Both radiation monitoring channels inoperable. OR 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. ---------- One or more manual channels inoperable.	C.1 Place and maintain containment purge supply and exhaust valves in closed position. OR 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 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. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1	Place one CREVS train in CRVIS mode.	Immediately
	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 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. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	Immediately
	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. AND	Immediately

(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), Main Steam Isolation Valve Bypass Valves (MSIVBVs), and Main Steam Low Point Drain Isolation Valves (MSLPDIVs)

LCO 3.7.2 The MSIV and its associated actuator trains, the MSIVBV, and the MSLPDIV in each of the four main steam lines shall be OPERABLE.

APPLICABILITY: For the MSIV and its associated actuator trains in each main steam line:

MODE 1,
MODES 2 and 3 except when the MSIV is closed and de-activated.

For the MSIVBV in each main steam line:

MODES 1,2, and 3 except when:

a. MSIVBV is closed and de-activated, or
b. MSIVBV is closed and isolated by a closed manual valve, or
c. MSIVBV is isolated by two closed manual valves.

For the MSLPDIV in each main steam line:

MODES 1,2, and 3 except when:

a. MSLPDIV is closed and de-activated, or
b. MSLPDIV is closed and isolated by a closed manual valve, or
c. MSLPDIV is isolated by two closed manual valves.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV actuator train inoperable.	A.1 Restore MSIV actuator train to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
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
E. Three or more MSIV 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

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.2.1	Verify isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	Verify each MSIV, each MSIVBV, and each MSLPDIV actuates to the isolation position on an actual or simulated actuation signal.	18 months
SR 3.7.2.3	Verify isolation time of each MSIVBV and MSLPDIV 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
	AND		Once per 12 hours thereafter
	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 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 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. ----------	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable. (continued)	A.1 (continued) Restore ESW train to OPERABLE status.	--------NOTE-------- A one-time Completion Time of 14 days is allowed to support planned replacement of ESW 'B' train piping prior to April 30, 2009. ---------- 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 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. OR UHS inoperable for reasons other than Condition A.	B.1 AND 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

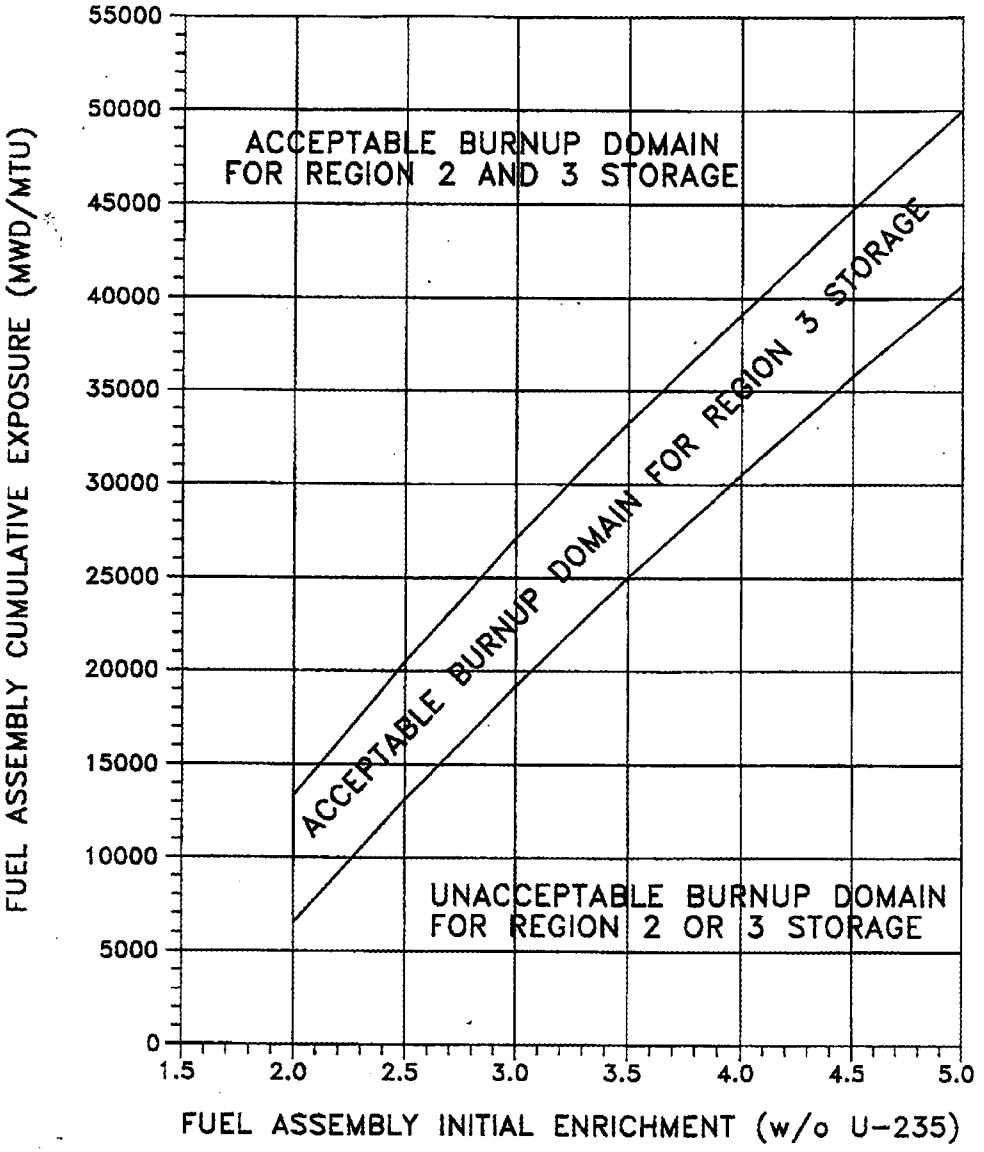

Figure 3.7.17-1 (page 1 of 1)
MINIMUM REQUIRED FUEL ASSEMBLY BURNUP AS A FUNCTION OF
INITIAL ENRICHMENT TO PERMIT STORAGE IN REGIONS 2 AND 3

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 The SSIVs shall be OPERABLE.

---------- NOTE ----------
Locked closed manual SSIVs may be opened under administrative controls.

APPLICABILITY: MODES 1, 2, and 3 except for each secondary system flow path when:

a. At least one of the two associated SSIVs is closed and de-activated; or

b. At least one of the two associated SSIVs is closed and isolated by a closed manual valve; or

c. The SSIV flow path is isolated by two closed manual valves, or two closed de-activated automatic valves, or a combination of a closed manual valve and a closed de-activated automatic valve.

ACTIONS

---------- NOTE ----------
Separate Condition entry is allowed for each secondary system flow path.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more SSIVs inoperable.	---------- NOTE ---------- Closed or isolated automatic SSIVs may be opened or unisolated under administrative controls. ----------		
	A.1	Close or isolate SSIV.	7 days
	AND		
	A.2	Verify SSIV is closed or isolated.	Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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 the isolation time of each automatic SSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.19.1	Verify each 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

OL-1277 REVISED

PROPOSED TECHNICAL SPECIFICATION BASES PAGES

(FOR INFORMATION ONLY)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY (continued)

initiation function. The two-out-of-three and the two-out-of-four configurations allow one channel to be tripped during maintenance or testing without causing an ESFAS initiation. In cases where an inoperable channel is placed in the tripped condition indefinitely to satisfy the Required Action of an LCO, the logic configurations are reduced to one-out-of-two and one-out-of-three where tripping of an additional channel, for any reason, would result in an ESFAS initiation. To allow for surveillance testing or setpoint adjustment of other channels while in this condition, several Required Actions allow the inoperable channel to be bypassed. Bypassing the inoperable channel creates a two-out-of-two or two-out-of-three logic configuration allowing a channel to be tripped for testing without causing an ESFAS initiation. Two logic or manual initiation channels are required to ensure no single random failure disables the ESFAS.

The required channels of ESFAS instrumentation provide unit protection in the event of any of the analyzed accidents. ESFAS protection functions are as follows:

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1. Safety Injection

Safety Injection (SI) provides two primary functions:

1. Primary side water addition to ensure maintenance or recovery of reactor vessel water level (coverage of the active fuel for heat removal, clad integrity, and for limiting peak clad temperature to < 2200°F); and

2. Boration to ensure recovery and maintenance of SDM (k_{eff} < 1.0).

For Information Only

These functions are necessary to mitigate the effects of high energy line breaks (HELBs) both inside and outside of containment. The SI signal is also used to initiate other Functions such as:

- Phase A Isolation;
- Reactor Trip;
- Turbine Trip;
- Feedwater Isolation;
- Start of motor driven auxiliary feedwater (AFW) pumps;

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

1. Safety Injection (continued)

- [Isolation of SG blowdown and sample lines;]
- Enabling automatic switchover of Emergency Core Cooling Systems (ECCS) suction to containment recirculation sumps, coincident with RWST low-low 1 level;
- Emergency DG start;
- Initiation of LSELS LOCA sequencer;
- Containment Cooling;
- Emergency Exhaust System in the LOCA (SIS) mode;
- Start of ESW and CCW pumps; and
- Hydrogen mixing fans start in slow speed.

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For Information Only (brackets For emphasis only)

These other functions ensure:

- Isolation of nonessential systems through containment penetrations;
- Trip of the turbine and reactor to limit power generation;
- Isolation of main feedwater (MFW) to limit secondary side mass losses;
- Start of AFW to ensure secondary side cooling capability;
- Isolation of SG blowdown and sample lines to limit uncontrolled SG blowdown;
- Enabling ECCS suction from the refueling water storage tank (RWST) switchover on low-low 1 RWST level to ensure continued cooling via use of the containment recirculation sumps;
- Emergency loads for LOCA are properly sequenced and powered;
- Containment cooling to preserve containment integrity;

(continued)

BASES

APPLICABLE SAFETY ANALYSIS, LCO, AND APPLICABILITY

b. Containment Isolation - Phase B Isolation (continued)

channels that actuate Containment Spray, Function 2). The Containment Pressure trip of Phase B Containment Isolation is energized to trip in order to minimize the potential of spurious trips that may damage the RCPs.

(1) Phase B Isolation - Manual Initiation

(2) Phase B Isolation - Automatic Actuation Logic and Actuation Relays (SSPS)

Manual and automatic initiation of Phase B containment isolation must be OPERABLE in MODES 1, 2, and 3, when there is a potential for an accident to occur. Manual initiation is also required in MODE 4 even though automatic actuation is not required. In this MODE, adequate time is available to manually actuate required components in the event of a DBA. However, because of the large number of components actuated on a Phase B containment isolation, actuation is simplified by the use of the manual actuation switches. Automatic actuation logic and actuation relays must be OPERABLE in MODE 4 to support system level manual initiation. In MODES 5 and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment to require Phase B containment isolation. There also is adequate time for the operator to evaluate unit conditions and manually actuate individual isolation valves in response to abnormal or accident conditions.

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For Information Only

(3) Phase B Isolation - Containment Pressure

The basis for containment pressure MODE applicability and the Trip Setpoint are as discussed for ESFAS Function 2.c above.

4. Steam Line Isolation

Isolation of the main steam lines provides protection in the event of an SLB inside or outside containment. Rapid isolation of the steam lines will limit the steam break accident to the blowdown

(continued)

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.

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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.

INSERT B

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~~

INSERT A

(continued)

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INSERT A

main steam isolation valve bypass valves (MSIVBVs), and the main steam low point drain isolation valves (MSLPDIVs)

INSERT B (page 1 of 3)

Steam Line Isolation Functions 4.a, Manual Initiation, 4.b, Automatic Actuation Logic and Actuation Relays (SSPS), 4.d, Containment Pressure – High 2, and 4.e.(1), Steam Line Pressure – Low must be OPERABLE in MODE 1 with no exceptions. Functions 4.a, 4.b, 4.d, and 4.e.1 must also be OPERABLE in MODE 2 and MODE 3 (except that Function 4.e.(1) is required in MODE 3 above P-11 and below P-11 unless safety injection on low steam line pressure is blocked) except when:

1. All MSIVs are closed and de-activated;

AND

2. All MSIVBVs are:

    2.a Closed and de-activated; or
    2.b Closed and isolated by a closed manual valve; or
    2.c Isolated by two closed manual valves.

AND

3. All MSLPDIVs are:

    3.a Closed and de-activated; or
    3.b Closed and isolated by a closed manual valve; or
    3.c Isolated by two closed manual valves.

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INSERT B continued (page 2 of 3)

Steam Line Isolation Function 4.c, Automatic Actuation Logic and Actuation Relays (MSFIS), must be OPERABLE in MODE 1 with no exceptions. Function 4.c must also be OPERABLE in MODE 2 and MODE 3 except when all MSIVs are closed and de-activated.

Steam Line Isolation Function 4.e.(2), Steam Line Pressure – Negative Rate – High, must be OPERABLE in MODE 3 below P-11 (except while blocked below P-11 when safety injection on low steam line pressure is not blocked) except when:

1. All MSIVs are closed and de-activated;

AND

2. All MSIVBVs are:

    2.a Closed and de-activated; or
    2.b Closed and isolated by a closed manual valve; or
    2.c Isolated by two closed manual valves.

AND

3. All MSLPDIVs are:

    3.a Closed and de-activated; or
    3.b Closed and isolated by a closed manual valve; or
    3.c Isolated by two closed manual valves.

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INSERT B continued (page 3 of 3)

When these valves are in the above (flow path isolated) configuration, there is no requirement to have an OPERABLE actuation signal through Functions 4.a, 4.b, 4.c, 4.d, and 4.e since all the valves are already performing their specified safety function.

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

4. Steam Line Isolation (continued)

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.

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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)

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.

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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.

(2) Steam Line Pressure - Negative Rate - High

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

(continued)

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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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)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

6. Auxiliary Feedwater (continued)

c. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (BOP ESFAS)

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

d. Auxiliary Feedwater - Steam Generator Water Level - Low Low

SG Water Level - Low Low provides protection against a loss of heat sink. A feed line break, inside or outside of containment, or a loss of MFW, would result in a loss of SG water level. SG Water Level - Low Low provides input to the SG Water Level Control System. Therefore, the actuation logic must be able to withstand both an input failure to the control system, which may then require a protection function actuation, and a single failure in the other channels providing the protection function actuation. Thus, four OPERABLE channels are required to satisfy the requirements with two-out-of-four logic (the Environmental Allowance Modifier (EAM) function also uses a two-out-of-four logic). Two-out-of-four low level signals in any SG starts the motor-driven AFW pumps; in two SGs starts the turbine-driven AFW pump. As discussed in Reference 11, the SG Water Level - Low Low trip Function has been modified to allow a lower Trip Setpoint under normal containment environmental conditions.

The EAM circuitry reduces the potential for inadvertent trips via the EAM, enabled on containment pressure exceeding its setpoint as listed in Table B 3.3.2-1. Because the SG Water Level transmitters (d/p cells) are located inside containment, they may experience adverse environmental conditions due to a feedline break. The EAM function is used to monitor the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low Low (Adverse) trip setpoint to reflect the increased transmitter uncertainties due to this harsh environment. The EAM enables a lower Steam Generator Water Level - Low Low

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(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

d. Auxiliary Feedwater - Steam Generator Water Level - Low Low (continued)

(Normal) trip setpoint when these conditions are not present, thus allowing more margin to trip for normal operating conditions. If the EAM trip function has inoperable required channels, it is acceptable to place the inoperable channels in the tripped condition and continue operation. Placing the inoperable channels in the trip mode enables the Steam Generator Water Level - Low Low (Adverse) Function, for the EAM. If the Steam Generator Water Level - Low Low (Normal) trip Function has an inoperable required channel, the inoperable channel must be tripped, subject to the LCO Applicability footnote.

The Trip Setpoint reflects the inclusion of both steady state and adverse environment instrument uncertainties. The Trip Setpoints for the SG Water Level - Low Low (Adverse Containment Environment) and (Normal Containment Environment) bistables are ≥ 21.0% and ≥ 17.0% of narrow range span, respectively. The Trip Setpoint for the Containment Pressure - Environmental Allowance Modifier bistables is ≤ 1.5 psig.

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e. Auxiliary Feedwater - Safety Injection

An SI signal starts the motor driven AFW pumps. The AFW initiation functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating functions and requirements.

f. Auxiliary Feedwater - Loss of Offsite Power

The loss of offsite power (LOP) is detected by a voltage drop on each ESF bus. The LOP is sensed and processed by the circuitry for LOP DG Start (Load Shedder and Emergency Load Sequencer) and fed to BOP ESFAS by relay actuation. Loss of power to either ESF bus will start

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

f. Auxiliary Feedwater - Loss of Offsite Power (continued)

the turbine - driven AFW pump, to ensure that at least one SG contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following the reactor trip, and automatically isolate the SG blowdown and sample lines. In addition, once the diesel generators are started and up to speed, the motor - driven AFW pumps will be sequentially loaded onto the diesel generator buses.

Functions 6.a through 6.f must be OPERABLE in MODES 1, 2, and 3 to ensure that the SGs remain the heat sink for the reactor. SG Water Level - Low Low in any operating SG will cause the motor - driven AFW pumps to start. The system is aligned so that upon a start of the pump, water immediately begins to flow to the SGs. SG Water Level - Low Low in any two operating SGs will cause the turbine - driven pump to start. The SG Water Level - Low Low (Normal Containment Environment) channels do not provide protection when the Containment Pressure – Environmental Allowance Modifier (EAM) channels in the same protection sets are tripped since that enables the SG Water Level - Low Low (Adverse Containment Environment) channels with a higher water level trip setpoint. As such, the SG Water Level - Low Low (Normal Containment Environment) channels need not be OPERABLE when the Containment Pressure – EAM channels in the same protection sets are tripped, as discussed in a footnote to Table 3.3.2-1. These Functions do not have to be OPERABLE in MODES 5 and 6 because there is not enough heat being generated in the reactor to require the SGs as a heat sink. In MODE 4, AFW actuation does not need to be OPERABLE because either AFW or residual heat removal (RHR) will be available to remove decay heat or sufficient time is available to manually place either system in operation.

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(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

8. Engineered Safety Feature Actuation System Interlocks (continued)

b. Engineered Safety Feature Actuation System Interlocks - Pressurizer Pressure, P-11

The P-11 interlock permits a normal unit cooldown and depressurization without actuation of SI or main steam line isolation. With two-out-of-three pressurizer pressure channels (discussed previously) less than the P-11 setpoint, the operator can manually block the Pressurizer Pressure - Low and Steam Line Pressure - Low SI signals and the Steam Line Pressure - Low steam line isolation signal (previously discussed). When the Steam Line Pressure - Low steam line isolation signal is manually blocked, a main steam isolation signal on Steam Line Pressure - Negative Rate - High is automatically enabled.

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This provides protection for an SLB by closure of the MSIVs. With two-out-of-three pressurizer pressure channels above the P-11 setpoint, the Pressurizer Pressure - Low and Steam Line Pressure - Low SI signals and the Steam Line Pressure - Low steam line isolation signal are automatically enabled. The operator can also enable these trips by use of the respective manual unblock (reset) buttons. When the Steam Line Pressure - Low steam line isolation signal is enabled, the main steam isolation on Steam Line Pressure - Negative Rate - High is disabled. The Trip Setpoint reflects only steady state instrument uncertainties. The Trip Setpoint is $\leq$ 1970 psig.

This Function must be OPERABLE in MODES 1, 2, and 3 to allow an orderly cooldown and depressurization of the unit without the actuation of SI or main steam isolation. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because system pressure must already be below the P-11 setpoint for the requirements of the heatup and cooldown curves to be met.

9. Automatic Pressurizer PORV Actuation

For the inadvertent ECCS actuation at power event (a Condition II event), the safety analysis (Ref. 15) credits operator actions from the main control room to terminate flow from the normal charging pump (NCP) and to open both PORV block valves (assumed to initially be closed) and assure the availability of at least one PORV

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

9. Automatic Pressurizer PORV Actuation (continued)

for automatic pressure relief. Analysis results indicate that water relief through the pressurizer safety valves, which could result in the Condition II event degrading into a Condition III event if the safety valves did not reseat, is precluded if operator actions are taken within the times assumed in the Reference 15 analysis to terminate NCP flow and to assure at least one PORV is available for automatic pressure relief. The assumed operator action times conservatively bound the times measured during simulator exercises. Therefore, automatic PORV operation is an assumed safety function in MODES 1, 2, and 3. The PORVs are equipped with automatic actuation circuitry and manual control capability. The PORVs are considered OPERABLE in either the automatic or manual mode, as long as the automatic actuation circuitry is OPERABLE and the PORVs can be made available for automatic pressure relief by timely operator actions (Ref. 15) to open the associated block valves (if closed) and to assure the PORV handswitches are in the automatic operation position. The automatic mode is the preferred configuration, as this provides the required pressure relieving capability without reliance on operator actions.

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a. Automatic Pressurizer PORV Actuation – Automatic Actuation Logic and Actuation Relays (SSPS)

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for Function 1.b, except that the LCO is not applicable in MODE 4 as discussed below for Function 9.b.

b. Automatic Pressurizer PORV Actuation – Pressurizer Pressure – High

This signal provides protection against an inadvertent ECCS actuation at power event. Pressurizer pressure provides both control and protection functions: input to the Pressurizer Pressure Control System, reactor trip, SI, and automatic PORV actuation. Therefore, the actuation logic must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Thus, four OPERABLE channels are required to satisfy the requirements with a two-out-of-four opening logic. The Trip Setpoint is ≤2335 psig.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

b. Automatic Pressurizer PORV Actuation – Pressurizer Pressure – High (continued)

The automatic PORV opening logic is satisfied when two-out-of-four (2/4) pressurizer pressure channels exceed their setpoint. Continued operation is allowed with one inoperable channel in the tripped condition. In this case, the automatic opening logic would revert to one-out-of-three (1/3). A single failure (e.g., failed bistable card) in one of the remaining three channels could result in both PORVs opening and remaining open since the automatic closure logic requires three-out-of-four (3/4) channels to reset, which could not be satisfied with two inoperable channels. However, this event can be terminated by PORV block valve closure and the consequences of this event are bounded by the analysis of a stuck open pressurizer safety valve in Reference 16. Therefore, automatic PORV closure is not a required safety function and the OPERABILITY requirements are satisfied by four OPERABLE pressurizer pressure channels.

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Consistent with the Applicability of LCO 3.4.11, "Pressurizer PORVs," the LCO for Function 9 is not applicable in MODE 4 when both pressure and core energy are decreased and transients that could cause an overpressure condition will be slow to occur. This is also consistent with the Applicability of Functions 1.c, 1.d, and 1.e. LCO 3.4.12 addresses automatic PORV actuation instrumentation requirements in MODES 4 (with any RCS cold leg temperature ≤ 275°F), 5, and 6 with the reactor vessel head in place.

INSERT DD

The ESFAS instrumentation satisfies Criterion 3 of 10CFR50.36(c)(2)(ii).

ACTIONS

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

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

(continued)

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INSERT DD (page 1 of 3)

10. Steam Generator Blowdown and Sample Line Isolation

The accident analyses assume that the steam generators are isolated after the steam generator blowdown and sample line isolation valves receive an isolation signal. The postulated accidents include the main steam line break (MSLB), the feedwater line break (FWLB), and steam generator tube rupture (SGTR). These analyses consider the transient effects on the primary and secondary systems as well as the potential containment pressure and temperature impact on the containment design bases. Further discussions of these design basis accidents can be found in the FSAR, Chapters 6 and 15.

The steam generator blowdown and sample line isolation valves close to terminate the blowdown from the faulted steam generator and isolate the intact steam generators.

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. In addition to the valves governed by LCO 3.7.2, "Main Steam Isolation Valves, Main Steam Isolation Valve Bypass Valves, and Main Steam Low Point Drain Isolation Valves," and LCO 3.7.3, "Main Feedwater Isolation Valves, Main Feedwater Regulating Valves, and Main Feedwater Regulating Valve Bypass Valves," the analysis assumptions require that the valves governed by LCO 3.7.19, "Secondary Side Isolation Valves," are closed and the steam generator chemical injection flow path is isolated. Function 10 in LCO 3.3.2 covers the actuation instrumentation associated with the steam generator blowdown system isolation valves (SGBSIVs) and the steam generator blowdown system sample isolation valves (SGBSSIVs).

The SGBSIVs 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 a steam generator blowdown safety injection signal (SGBSIS) signal.

The SGBSSIVs prevent uncontrolled blowdown from more than one steam generator and isolate the nonsafety-related portions from the safety-related

INSERT DD continued (page 2 of 3)

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 signal.

a. Manual Initiation

Manual initiation of the motor-driven auxiliary feedwater (MDAFW) pumps can be accomplished from the control room. This also sends a signal in that separation group to the SGBSIS (isolation signal). Both of the motor-driven AFW pumps have a pushbutton for manual AFAS initiation. The LCO requires two trains (one per MDAFW pump) to be OPERABLE.

b. Automatic Actuation Logic and Actuation Relays (BOP-ESFAS)

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for Function 6.c, except that the LCO has an Applicability exception when the isolation function is otherwise satisfied, as discussed below.

c. Safety Injection

The SGBSIS (isolation signal) to these valves is initiated by all the Functions that initiate safety injection (SI). The input requirements for Function 10.c are the same as the requirements for the SI function, except that the LCO has additional Applicability exceptions when the isolation function is otherwise satisfied, as discussed below. Therefore, the other requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all other initiating functions and requirements.

d. Loss of Offsite Power

The loss of offsite power (LOP) is detected by a voltage drop on each ESF bus. The LOP is sensed and processed by the circuitry for LOP DG Start (Load Shedder and Emergency Load Sequencer) and fed to BOP ESFAS by relay actuation. Loss of power to either ESF bus will initiate the SGBSIS (isolation signal) to these valves.

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INSERT DD continued (page 3 of 3)

Functions 10.a through 10.d must be OPERABLE in MODES 1, 2, and 3, when there is significant mass and energy in the RCS and steam generators. When the SGBSIVs and the SGBSSIVs 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 the SGBSIVs and the SGBSSIVs when isolation of the potential flow path is assured, such as when these valves are closed and de-activated, or when they are closed and isolated by a closed manual valve, or when the flow path is isolated by a combination of closed manual valve(s) and closed and de-activated automatic valve(s). An air-operated SGBSIV is de-activated when power and air are removed from its actuation solenoid valves, and a solenoid-operated SGBSSIV is de-activated when power is removed from its associated solenoid valve.

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

The actuation logic for these valves is shown on FSAR Figure 7.3-1, sheet 2.

BASES

ACTIONS (continued)

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

Condition N applies to the Environmental Allowance Modifier (EAM) circuitry for the SG Water Level - Low Low trip Functions in MODES 1, 2, and 3. With one or more EAM channel(s) inoperable, they must be placed in the tripped condition within 72 hours. Placing an EAM channel in trip automatically enables the SG Water Level - Low Low (Adverse Containment Environment) bistable for that protection channel, with its higher SG level Trip Setpoint (a higher trip setpoint means a feedwater isolation or an AFW actuation would occur sooner). The Completion Time of 72 hours is based on Reference 18. If the inoperable channel cannot be placed in the tripped condition within the specified Completion Time, the unit must be placed in a MODE where this Function is not required to be OPERABLE. The unit must be placed in MODE 3 within an additional six hours and in MODE 4 within the following six hours.

O.1 and O.2

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Condition O applies to the Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low trip Function. The Condensate Storage Tank is the highly reliable and preferred suction source for the AFW pumps. This function has a two-out-of-three trip logic. Therefore, continued operation is allowed with one inoperable channel until the performance of the next monthly COT on one of the other channels, as long as the inoperable channel is placed in trip within 1 hour.

P.1 P.1 and P.2

INSERT EE

Condition P applies to the Auxiliary Feedwater Manual Initiation trip Function. The associated auxiliary feedwater pump(s) must be declared inoperable immediately when one or more channel(s) is inoperable. Refer to LCO 3.7.5, "Auxiliary Feedwater (AFW) System."

Q.1 and Q.2

INSERT FF

INSERT GG

Condition Q applies to the Auxiliary Feedwater Balance of Plant ESFAS automatic actuation logic and actuation relays. With one train inoperable, the unit must be brought to MODE 3 within 6 hours and MODE 4 within the following 6 hours. The Required Actions are modified by a Note that allows one train to be bypassed for up to 2 hours for surveillance testing provided the other train is OPERABLE.

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(continued)

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INSERT EE

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

INSERT FF

(Example 1.3-1 explains the independence of these Completion Times).

INSERT GG

and Steam Generator Blowdown and Sample Line Isolation Valve Actuation Function 10.b

BASES

ACTIONS
(continued)

R.1, R.2.1, and R.2.2

Condition R applies to the Auxiliary Feedwater Loss of Offsite Power trip Function. With the inoperability of one or both train(s), 48 hours are allowed to return the train(s) to OPERABLE status. The specified Completion Time is reasonable considering this Function is ~~only~~ associated with the turbine driven auxiliary feedwater pump (TDAFP), the available redundancy provided by the motor driven auxiliary feedwater pumps, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within ~~the next~~ 6 hours and in MODE 4 within ~~the following~~ 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require ~~the TDAFP~~ this equipment for mitigation.

S.1, S.2.1, and S2.2

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

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

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

INSERT HH

INSERT II

12

INSERT JJ

INSERT KK

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(continued)

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INSERT HH

and the Steam Generator Blowdown and Sample Line Isolation Valve Actuation Function 10.d.

INSERT II

and other isolation valves,

INSERT JJ

(Example 1.3-1 explains the independence of these Completion Times).

INSERT KK

and the ESFAS Function 10 valves,

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.2 (continued)

condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 19.

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SR 3.3.2.3

SR 3.3.2.3 is the performance of an ACTUATION LOGIC TEST using the BOP ESFAS automatic tester. The continuity check does not have to be performed, as explained in the Note. This SR is applied to the balance of plant actuation logic and relays that do not have circuits installed to perform the continuity check. This test is required every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data. In addition, SR 3.3.2.3 is the performance of an ACTUATION LOGIC TEST of the MSFIS PLC actuation logic, initiated from the SSPS slave relays. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The time allowed for the testing (4 hours) is justified in Reference 8. The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 19.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

A COT is performed on each required channel to ensure the channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The Frequency of 184 days is justified in Reference 19.

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every 92 days. The SR is modified by a Note that excludes slave relays K602, K620, K622, K624, K630, K740, K741, and K750 which are included in testing required by SR 3.3.2.13 and SR 3.3.2.14. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data.

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INSERT LL

SR 3.3.2.7

SR 3.3.2.7 is the performance of a TADOT every 18 months. This test is a check of the AFW pump start on Loss of Offsite Power trip Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of

(continued)

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INSERT LL

and the Steam Generator Blowdown and Sample Line Isolation Valve Actuation Function 10.d.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.7 (continued)

the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The trip actuating devices tested within the scope of SR 3.3.2.7 are the LSELS output relays and BOP ESFAS separation groups 1 and 4 logic associated with the automatic start of the turbine driven auxiliary feedwater pumps on an ESF bus undervoltage condition. The Frequency is adequate. It is based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints for relays. The trip actuating devices tested have no associated setpoint.

INSERT MM

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and AFW pump start on trip of all MFW pumps. The Manual Safety Injection TADOT shall independently verify OPERABILITY of the undervoltage and shunt trip handswitch contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers as well as the contacts for safety injection actuation. It is performed every 18 months. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

INSERT NN

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SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test

(continued)

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INSERT MM

and closure of the steam generator blowdown isolation valves and sample line isolation valves

INSERT NN

, and manual generation of an SGBSIS (Function 10.a).

INSERT C

MSIVs

B 3.7.2

INSERT D

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.

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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.

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.

(skid-mounted at the valve)

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 E

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 is found in the FSAR, Section 10.3 (Ref. 1).

, MSIVBVs, and MSLPDIVs

(continued)

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INSERT C

MSIVs, MSIVBVs, and MSLPDIVs

INSERT D

, Main Steam Isolation Valve Bypass Valves (MSIVBVs), and Main Steam Low Point Drain Isolation Valves (MSLPDIVs)

INSERT E

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 MSIVBV, 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. The MSIVBVs fail in the closed position.

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. Attached to the 12-inch line is a 1-inch diameter line back to the condenser. One air-operated low point drain isolation valve (MSLPDIV) is installed in each 1-inch drain line. The MSLPDIVs are normally open to allow a steam trap to pass moisture to the main condenser. The MSLPDIVs close upon receipt of an SLIS and function to isolate the plant's secondary side. For emergency closure on receipt of an SLIS, 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. The MSLPDIVs fail in the closed position.

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 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).

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.

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 in the unaffected

(continued)

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INSERT F1

The postulated accidents (including the main steam line break, the feed water line break, and the steam generator tube rupture) assume the MSIVs, MSIVBVs, and MSLPDIVs function to isolate the secondary system to ensure the primary success path for steamline and feedline isolation and for delivery of required auxiliary feedwater flow.

INSERT F

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.

The MSLPDIVs are normally open during power operation to allow a steam trap to pass moisture to the main condenser. The MSLPDIVs close upon receipt of an SLIS and function to isolate the plant's secondary side.

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 isolates the break and limits the blowdown to a single steam generator.

, MSIVBVs, and MSLPDIVs

c. A break downstream of the MSIVs will be isolated by the closure of the MSIVs, MSIVBVs, and MSLPDIVs.

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.

less limiting

e. The MSIVs are also utilized during other 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 satisfy Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

INSERT G

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 H

This LCO provides assurance that the MSIVs 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.

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Revised

(continued)

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INSERT G

This LCO requires that the MSIV and its associated actuator trains, the MSIVBV, and the MSLPDIV for each of the four main steam lines be OPERABLE.

INSERT H

The MSIVBVs and MSLPDIVs 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.

INSERT I

, MSIVBVs, and MSLPDIVs

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 J

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 I (page 1 of 2)

Steam is supplied to the turbine and other loads from the four steam generators by four main steam lines. One MSIV and MSIVBV is installed in each of the four main steam lines. One MSLPDIV is installed in the drain line off each of the four main steam lines. When the main steam line that feeds a given steam generator and its low point drain are isolated, the specified safety function is being met.

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

a. When the MSIV in a given main steam line is closed and de-activated in MODES 2 and 3, it is performing the specified safety function for that main steam line. Requiring the MSIV to be closed and de-activated provides assurance that the MSIV for that main steam line is 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 MSIV, all electrical power sources must be removed from the actuation solenoids and a drain or vent path must be available from the lower piston chamber.

b. When the MSIVBV in a given main steam line is closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves, it is 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 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 closed and isolated by a closed manual valve provides additional assurance that the specified safety function is being performed. Requiring the MSIVBV to be isolated by two closed manual valves also provides additional assurance that the specified safety function is being performed.

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INSERT I (page 1 of 2)

Steam is supplied to the four steam generators by four main steam lines. One MSIV and MSIVBV is installed in each of the four main steam lines. One MSLPDIV is installed in the drain line off each of the four main steam lines. When the main steam line that feeds the steam generator is isolated and the main steam line drain line is isolated, the specified safety function is being met.

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

a. When the MSIV in a given main steam line is closed and de-activated in MODES 2 and 3, it is performing the specified safety function for that main steam line. Requiring the MSIV to be closed and de-activated provides assurance that the MSIV for that main steam line is 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 MSIV, the electrical power sources must be removed from the actuation solenoids and a drain or vent path must be available from the lower piston chamber.

b. When the MSIVBV in a given main steam line is closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves, it is 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 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 closed and isolated by a closed manual valve provides additional assurance that the specified safety function is being performed. Requiring the MSIVBV to be isolated by two closed manual valves also provides additional assurance that the specified safety function is being performed.

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INSERT I continued (page 2 of 2)

c. When the MSLPDIV in a given main steam line is closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves, it is 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 failure, thus assuring the MSLPDIV 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 MSLPDIV to be closed and isolated by a closed manual valve provides additional assurance that the specified safety function is being performed. Requiring the MSLPDIV to be isolated by two closed manual valves also provides additional assurance that the specified safety function is being performed.

INSERT J

Conditions F and J 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 J applies so that Required Actions J.1 and J.2 are required to be entered. Condition K subsequently applies if the Required Action and associated Completion Time of Condition J cannot be met.

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

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

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

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.

(continued)

ACTIONS (continued)

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, 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

(continued)

BASES

ACTIONS

F.1 (continued)

are inoperable. When only a single MSIV actuator train is inoperable (for one MSIV), Condition A applies and entry only into Required Action A.1 is required. (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 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.

J.1 and J.2 → H.1 and H.2

Condition J → Condition H

INSERT K

MODE (caps)

one

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.

main steam line.

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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.

(continued)

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INSERT K (page 1 of 2)

H.1 and H.2

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

With one or more MSIVBVs inoperable, action must be taken to restore each MSIVBV to OPERABLE status within 7 days or the inoperable MSIVBV must be closed or isolated. When closed or isolated, the MSIVBV is already in the position required by the assumptions in the safety analysis. The 7 day Completion Time is reasonable, considering 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 7 days, 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 MSIVBV in a given main steam line is closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves, this LCO does not apply as discussed in the Applicability section of these Bases.

I.1 and I.2

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

With one or more MSLPDIVs inoperable, action must be taken to restore each MSLPDIV to OPERABLE status within 7 days or the inoperable MSLPDIV must be closed or isolated. When closed or isolated, the MSLPDIV is already in the position required by the assumptions in the safety analysis. The 7 day Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSLPDIVs.

When the MSLPDIV is isolated by two closed manual valves, one manual valve meets ASME Class 2 requirements and the other manual valve meets Class D requirements. The method of isolation is acceptable because (1) the MSLPDIV is an isolation valve in the secondary system, (2) the line isolated is a 1-inch drain line, and (3) the isolation valve in the Class D piping serves in addition to the other closed manual valve located in the ASME Class 2 piping.

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INSERT K continued (page 2 of 2)

For inoperable MSLPDIVs that cannot be restored to OPERABLE status within 7 days, but are closed or isolated, the inoperable MSLPDIVs 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 MSLPDIV in a given steam line is closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves, this LCO does not apply as discussed in the Applicability section of these Bases.

BASES

K.1 and K.2

ACTIONS
(continued)

J.1 and J.2

INSERT L

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 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

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.

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The Frequency is in accordance with the Inservice Testing Program.

SR 3.7.2.2

INSERT M

For the MSIVs each

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.

INSERT N

, MSIVBV, and MSLPDIV

(continued)

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INSERT L

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

INSERT M

, each MSIVBV, and each MSLPDIV

INSERT N

SR 3.7.2.3

This SR verifies that the closure time of each MSIVBV and MSLPDIV 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 and MSLPDIVs, 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.

INSERT C → ~~MSIVs~~ B 3.7.2

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. FSAR 6.2.1.4.3.3, Containment Pressure - Temperature Results.
6. Amendment 172 to Facility Operating License No. NPF-30, (NRC Safety Evaluation included), Callaway Unit 1, dated June 16, 2006.
7. Westinghouse Letter, SCP-07-26, dated March 6, 2007.

re-space

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INSERT C → MSIVs
B 3.7.2
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Revised

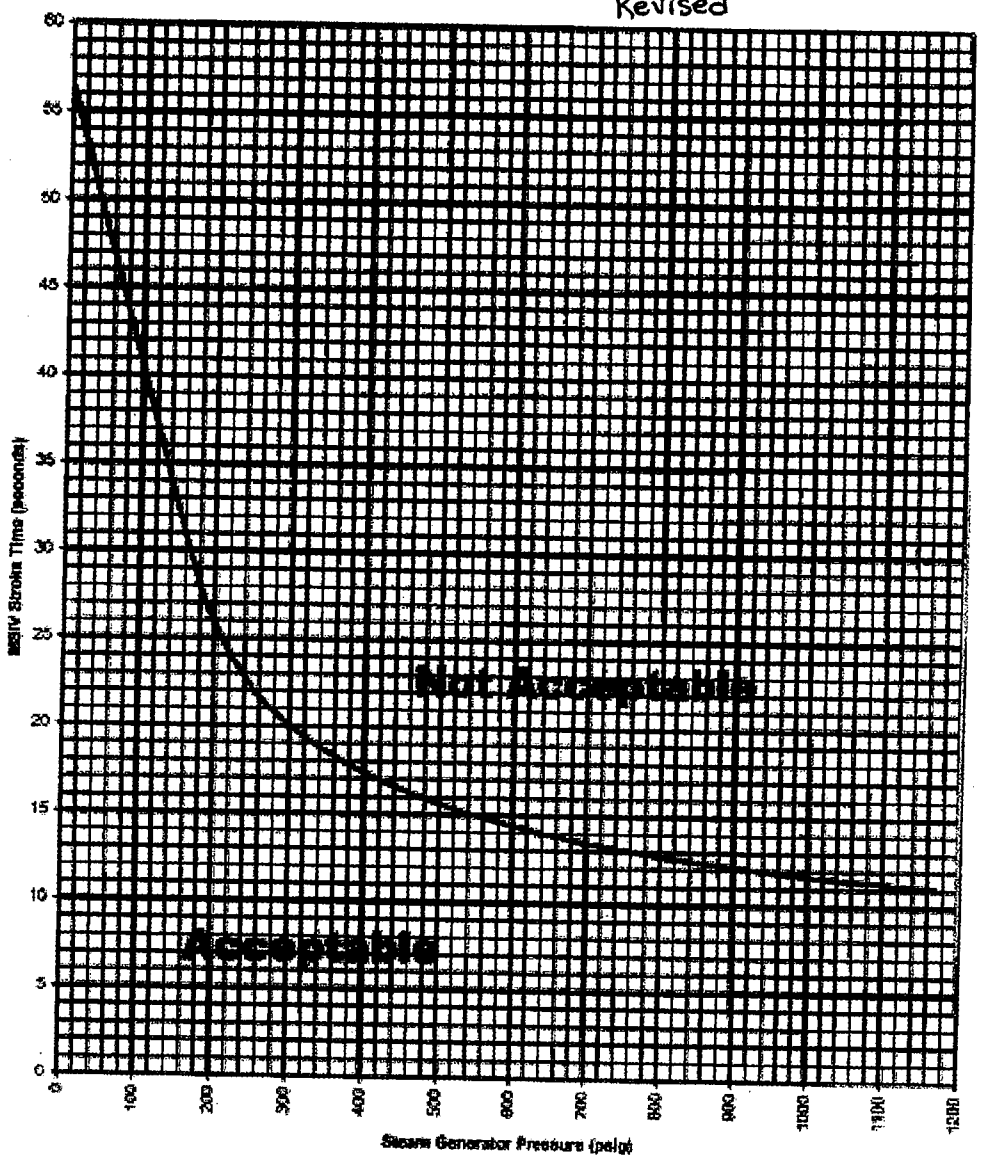

Figure B 3.7.2-1 (page 1 of 1)
MSIV Stroke Time Limit vs Steam Generator Pressure

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 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, Main Steam Isolation Valve Bypass Valves, and Main Steam Low Point Drain Isolation 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 are closed and the steam generator chemical injection flow path is isolated.

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 the turbine-driven AFAS. This ensures availability of the TDAFP. The motor-driven AFAS signal closes the steam generator blowdown and sample isolation valves in order to isolate the plant's secondary side.

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.

BASES

BACKGROUND
(continued)

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.

When plant accident conditions require feedline isolation, a feedwater isolation signal (FWIS) trips the main feedwater pumps and closes the main feedwater isolation valves, the main feedwater regulating valves, and the main feedwater regulating valve bypass valves. The FWIS also provides a signal to close the air-operated chemical injection isolation valve located in the chemical injection flow path associated with each main feedwater line. The valves automatically fail closed when an FWIS is received.

The steam generator chemical injection system delivers chemicals to the steam generators via chemical addition through lines that tap directly into the feedwater lines, downstream of the main feedwater isolation valve. For each or any of the four feedwater lines, a positive displacement metering pump delivers the chemicals from a supply tank into the associated feedwater line via an injection flow path that includes an automatic air-operated globe isolation valve, a check valve, and a manual valve prior to entering into the feedwater system.

The steam generator chemical injection system is used to maintain proper system pH and scavenge oxygen present in the steam generators to minimize corrosion during plant shutdown conditions. The system adds hydrazine and amine mixture to the steam generator and is normally not in use during plant power operation, except during plant conditions in hot standby or cold layup. However, during plant operation at full power, an infrequently performed test (Steam Generator Moisture Carryover Measurement) utilizes the chemical injection flow path to determine the average moisture carryover content in steam from the steam generators using a radioactive tracer method. The steam generator chemical injection system is infrequently used during the Applicability of this Specification.

BASES

BACKGROUND
(continued)

The manual valve located in each chemical injection flow path is maintained locked closed until the system is used. When the system is used, the manual valve is opened under administrative controls. These controls include the presence of a dedicated operator who has constant communication with the control room while the flow path is open. Therefore crediting the locked closed manual valve in the chemical injection flow path for isolation is warranted when it is only opened under administrative controls.

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 (not credited in any safety analysis – see Function 8.a Bases in LCO 3.3.2, "ESFAS Instrumentation"), steam generator water level high-high, or steam generator 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).

The SGBSIS (AFAS) isolates the steam generator blowdown and sample lines. An SGBSIS (AFAS) is generated by an SIS, motor-driven AFAS, or under voltage on Switchgear 4.16 KV buses NB01 or NB02 (Ref. 4).

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

APPLICABLE
SAFETY
ANALYSES

The accident analyses assume that the steam generators are isolated after secondary system isolation valves receive an isolation signal. The postulated accidents include the main steam line break, the feed water line break, and steam generator tube rupture. Further discussions of these design basis accidents 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. These valves therefore satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

This LCO ensures the secondary system isolation valves will isolate the plant's secondary side and ensures the required flow of auxiliary feedwater to the intact steam generators. The automatic secondary system isolation valves are considered OPERABLE when their isolation times are within limits and they are capable of closing on an isolation actuation signal. OPERABILITY of the automatic SSIVs also requires the OPERABILITY of the auxiliary relays downstream of the Balance of Plant (BOP) Engineered Safety Feature Actuation System (ESFAS) cabinets (the auxiliary relays in the RP system cabinets are considered to be part of the end devices covered by this LCO).

The locked closed manual valves in the chemical injection flow path are considered OPERABLE when they are locked closed. Locked closed manual secondary system isolation valves include: steam generator chemical injection isolation valves (AEV0128, AEV0129, AEV0130, and AEV0131).

Automatic secondary system isolation valves include: (1) steam generator blowdown isolation valves (BMHV0001, BMHV0002, BMHV0003, and BMHV0004) and (2) steam generator blowdown sample line isolation valves (BMHV0019, BMHV0020, BMHV0021, BMHV0022, BMHV0065, BMHV0066, BMHV0067, BMHV0068, BMHV0035, BMHV0036, BMHV0037, and BMHV0038).

The LCO is modified by a NOTE to allow the locked closed chemical injection valves to be opened 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 in each secondary system flow path 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 the automatic SSIVs when isolation of the potential flow path is assured, such as when at least one SSIV in a flow path is closed and de-activated, or is closed and isolated by a closed manual valve, or the SSIV flow path is isolated by two closed manual valves, or two closed de-activated automatic valves, or a combination of a closed manual valve and a closed de-activated automatic valve. An air-operated SSIV is de-activated when power and air are removed from its actuation solenoid valves, and a solenoid-operated SSIV is de-activated when power is removed from its associated solenoid valve.

BASES

APPLICABILITY
(continued)

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 secondary system flow path.

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.

The Required Actions have been modified by a Note that allows the closed or isolated automatic SSIV to be opened or 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 may be closed or the flow path may be isolated rapidly when a need for isolation is indicated.

BASES

ACTIONS
(continued)

B.1 and B.2

If the Required Action and associated Completion Time of Condition A are not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed 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 that the isolation time of each 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. 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 locked closed valves, which are not included in the IST program, because the valves are passive (typically not required to actuate into their safety position) and they contain a locking device and a check valve in their flow path.

For the SSIVs, performance of this surveillance may be 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.

SR 3.7.19.2

This SR verifies that each 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 Figure 10.4-8, Sheet 1, Note 9
4. FSAR Figure 7.2-1, Sheet 2