AmerenUE
Callaway Plant

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May 4, 2009

ULNRC-05608

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

10 CFR 50.90

Ladies and Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
REVISION OF TECHNICAL SPECIFICATIONS 3.3.2 AND 3.7.3
(LICENSE AMENDMENT REQUEST OL-1289)

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

The proposed changes revise Technical Specifications (TS) 3.7.3, "Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating Valves (MFRVs) and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)," so that the Limiting Condition for Operation (LCO) and Applicability more accurately reflect the conditions for when the LCO should be applicable and more effectively provide appropriate exceptions to the Applicability for certain valve configurations. In minor changes, the title to TS 3.7.3 and the header for each page of the Specification is being revised. In addition, changes are proposed for the exception footnotes in TS Table 3.3.2-1 of TS 3.3.2, "ESFAS Instrumentation," in order to improve the application of existing notes and/or incorporate more appropriate notes as applicable.

The appropriate TS Bases changes for the proposed revisions to TS 3.7.3 are included for information and reflect the proposed changes.

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 TS Bases changes will be processed under the program for updates per TS 5.5.14, "Technical Specifications Bases Control Program," at the time this amendment is implemented. No commitments are contained in this amendment application.

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

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

AmerenUE requests approval of this license amendment request by May 4, 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) 676-8528, 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 Specifications
3 – Retyped Technical Specifications
4 – Proposed Technical Specification Bases Changes (for information only)

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EVALUATION

EVALUATION

1.0 DESCRIPTION

The proposed changes revise the LCO and Applicability for Technical Specification (TS) 3.7.3, "Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating Valves (MFRVs) and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)," such that the LCO would require the MFIV, MFRV, and MFRVBV "in each of the four main feedwater lines" to be OPERABLE. The Applicability section would be revised to clarify the exceptions to the Applicability for when the MFIV, MFRV, and/or MFRVBV in any main feedwater line is closed or isolated in accordance with the provisions of the exception(s). In minor changes, the title for TS 3.7.3 and the header for each page of the Specification are revised.

The proposed changes would also more accurately apply the exception footnotes in TS Table 3.3.2-1 of TS 3.3.2, "ESFAS Instrumentation," for Function 5, "Turbine Trip and Feedwater Isolation." The LCO Applicability Footnote (j) in Technical Specification (TS) Table 3.3.2-1, Function 5.b, "Turbine Trip and Feedwater Isolation, Automatic Actuation Logic and Actuation Relays (MSFIS)," would be replaced with new Footnote (l) to address an exception applicable only for the MFIVs. Other changes are proposed to ensure that Footnote (j) and other applicable notes in Table 3.3.2-1 are properly specified or linked to the applicable Modes for the various Functions to which the footnotes apply. In addition, Footnote (j) has also been added to all the sub-functions of Function 5.d, "Safety Injection."

2.0 PROPOSED CHANGES

TS 3.7.3 LCO currently reads:

"Four MFIVs, four MFRVs, and four MFRVBVs shall be OPERABLE."

After approval of this amendment request, TS 3.7.3 LCO would be revised to read as follows:

"The MFIV, MFRV, and MFRVBV in each of the four main feedwater lines shall be OPERABLE."

TS 3.7.3 Applicability currently reads:

"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."

After approval of this amendment request, TS 3.7.3 Applicability would be revised to read as follows:

"For the MFIV in each main feedwater line:

MODES 1, 2, and 3, except when:

a. The MFIV is closed and de-activated; or

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

For the MFRV in each main feedwater line:

MODES 1, 2, and 3, except when:

a. The MFIV is closed and de-activated; or

b. The MFRV is closed and de-activated or closed and isolated by a closed manual valve.

For the MFRVBV in each main feedwater line:

MODES 1, 2, AND 3, except when:

a. The MFIV is closed and de-activated; or

b. The MFRVBV is closed and de-activated or closed and isolated by a closed manual valve, or isolated by two closed manual valves."

TS Table 3.3.2-1 of TS 3.3.2, "ESFAS Instrumentation," currently has Footnote (j) that applies an exception to the LCO Applicability associated with Table Function 5.b, "Turbine Trip and Feedwater Isolation, Automatic Actuation Logic and Actuation Relays (MSFIS)." Current Footnote (j) is applicable to the MFIVs, MFRVs, and MFRVBVs. However the exception for Table 3.3.2-1, Function 5.b is only applicable for the MFIVs (not the MFRVs and MFRVBVs). Thus, new Footnote (l) replaces Footnote (j) for Table 3.3.2-1, Function 5.b, to address only the MFIVs. The new footnote states, "Except when all MFIVs are closed and de-activated."

Other changes to TS Table 3.3.2-1 include the application of the exception Footnote (j) to MODE 1 for the following Table 3.3.2-1 Functions: Function 5.a, "Automatic Actuation Logic and Actuation Relays (SSPS)"; Function 5.c, "SG Water Level – High High (P-14)"; Function 5.e.1, "Steam Generator Water Level Low-Low (Adverse Containment Environment)"; Function 5.e.2, "Steam Generator Water Level Low-Low (Normal Containment Environment); and Function 5.e.4, "Containment Pressure – Environmental Allowance Modifier." In addition, Footnote (j) has also been added to all the sub-functions of Function 5.d, "Safety Injection."

In minor changes, the title for TS 3.7.3 is revised from "Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating Valves (MFRVs) and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)" to "Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulating Valves (MFRVs), and Main Feedwater Regulating Valve Bypass Valves (MFRVBVs)." The header for each page of TS 3.7.3 is revised from "MFIVs and MFRVs and MFRV Bypass Valves" to "MFIVs, MFRVs, and MFRVBVs." The Table of Contents is updated accordingly.

TS markups are provided in Attachment 2, and retyped pages are included in Attachment 3. The corresponding TS Bases changes are provided for information only and are included in Attachment 4.

3.0 BACKGROUND

The MFIVs isolate main feedwater flow to the secondary side of the steam generators following a high energy line break. The MFRVs and MFRVBVs function to control feedwater flow to the steam generators and to provide backup isolation of main feedwater flow in the event an MFIV fails to close. Because an earthquake is not assumed to occur coincident with a spontaneous break of safety related secondary piping, loss of the non-safety grade MFRVs and MFRVBVs is not assumed. If the single active failure postulated for a secondary pipe break is the failure of a safety grade MFIV to close, then credit is taken for closing the non-safety grade MFRVs and MFRVBVs.

Feedwater is supplied to the four steam generators by four feedwater lines. One MFIV and one MFRV are installed in each of the four feedwater lines outside but close to containment. The MFRVBVs are located in six-inch lines that bypass flow around the MFRVs when in service. For each feedwater line, the MFIV is located downstream of the MFRV and MFRVBV.

The MFIV is a 14-inch gate valve with a system-medium actuator. The MFRV is an air-operated angle valve which automatically controls main feedwater flow between 20 percent and full power. The MFRVBV is an air-operated globe valve, which is normally used up to 25 percent power. It is normally closed during plant power operation

above 25 percent power, but may be occasionally open to support maintenance, post-maintenance testing, or other plant activities.

As shown in FSAR Figure 10.4-6 (Sheet 1 and 2), an MFIV cannot be isolated with closed manual valves; the MFRV can be isolated upstream by a closed manual valve; and the MFRVBV can be isolated both upstream and downstream with a closed manual valve.

Closure of the MFIVs or MFRVs and MFRVBVs terminates flow to the steam generators, thereby terminating the event for feedwater line breaks occurring upstream of the MFIVs or MFRVs and MFRVBVs. Since the MFIVs are located upsteam of the point where the auxiliary feedwater lines connect to the main feedwater check valves (located in containment), closure of the MFIVs or the MFRVs and MFRVBVs ensures delivery of auxiliary feedwater to the steam generators for support of the auxiliary feedwater specified safety function. Similarly, the consequences of events occurring in the main steam lines or in the main feedwater lines downstream of the MFIVs will be mitigated by valve closure. Closure of the MFIVs or MFRVs and MFRVBVs effectively terminates the addition of feedwater to an affected steam generator and limits the mass and energy release for main steam line breaks or feedwater line breaks inside containment.

The MFIVs and MFRVs and MFRVBVs close on receipt of any safety injection signal, a Tavg – Low coincident with reactor trip (P-4) (not credited in any accident analysis), a low-low steam generator level, or steam generator water level – high high signal. The MFIVs may also be actuated manually.

4.0 TECHNICAL ANALYSIS

The license amendment request proposes to revise the TS 3.7.3 LCO and Applicability. The proposed changes enhance the current statements by more clearly conveying requirements and provisions on a "for each main feedwater line" basis. The Applicability section of LCO 3.7.3 contains exceptions based on having an MFIV, MFRV, and/or MFRVBV closed and de-activated or isolated. As currently worded, the Applicability section could be misinterpreted such that there is a potential for not assuring adequate isolation or isolation capability when one (or more) of the exceptions contained in the Applicability section is applied.

As noted previously, in MODES 1, 2, and 3, the MFIVs, MFRVs, and MFRVBVs are required to be OPERABLE whenever there is significant mass and energy in the RCS and steam generators, in order to limit the blowdown of more than one steam generator, and to limit the amount of available fluid that could be added to containment in the event of a secondary system pipe break inside containment. Operability (i.e., isolation capability) of these valves also supports the auxiliary feedwater function by ensuring that the non-safety portion of the feedwater piping can be isolated from the safety-related portion.

The revised TS 3.7.3 LCO requires the MFIV, MFRV, and MFRVBV to be OPERABLE "in each of the four main feedwater lines." Exceptions are specified in the Applicability of TS 3.7.3, which are based on the condition that the specified safety function can still be performed. In MODES 1, 2 and 3, exceptions to the Applicability are allowed for an MFIV, MFRV, or MFRVBV when the MFIV, MFRV, or MFRVBV is closed or isolated in accordance with specified provisions. Specifically, the MFIV, MFRV, or MFRVBV in a main feedwater line may be excepted from the Applicability of LCO 3.7.3 if there is assurance that the feedwater line is or can be fully isolated. This assurance can be provided by either requiring the "excepted" valve to be closed in a manner such that its closure cannot be adversely affected by a single active failure, or by having one (or both) of the other valves in that feedwater line closed in such a manner. Since, for each feedwater line, the MFIV serves as one isolation barrier and the combination of the MFRV and MFRVBV (which are in parallel) serves as the other barrier, the valve (or valves) that is (are) required to be closed in the described manner depends on which valve is being excepted from the LCO Applicability per the applicable exception.

The proposed changes to the Applicability of TS 3.7.3 make the intended exceptions and their provisions more clear and consistent with the basis described above. This clarity is achieved, in part, by specifying the exceptions in terms of the MFIV, MFRV, and/or MFRVBV "in each main feedwater line."

The basis for the exception given for an MFIV, MFRV, and/or MFRVBV in the revised Applicability is further described below.

MFIV Exception

To except an MFIV from the Applicability of LCO 3.7.3 for the affected feedwater line, isolation or isolation capability for the feedwater line can be assured as follows:

a. When the MFIV in a given main feedwater line is closed and de-activated, it is performing the specified safety function. Requiring the MFIV to be closed and de-activated provides assurance that the MFIV is performing the specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. The MFIV 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 MFIV all electrical power sources must be removed from the actuation solenoids on the MFIV and a drain or vent path must be available from the lower piston chamber.

b. Isolation of the affected feedwater line may also be ensured by closure of the MFRV and MFRVBV associated with that feedwater line (since the parallel combination of the MFRV and MFRVBV may serve as an isolation barrier for the

affected feedwater line in lieu of the MFIV).

When the MFRV is closed and de-activated or is closed and isolated by a closed manual valve, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valve. Alternatively, requiring the valve to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed. This provides a means of isolation that cannot be adversely affected by a single active failure.

When the MFRVBV is closed and de-activated or is closed and isolated by a closed manual valve, or is isolated by two closed manual valves, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valve. Alternatively, requiring the valve to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed, as this provides a means of isolation that cannot be adversely affected by a single active failure. Finally, the safety function may also be ensured when the MFRVBV is isolated by two closed manual valves, as this provides a means of isolation that cannot be adversely affected by a single active failure.

MFRV Exception

To except an MFRV from the Applicability of LCO 3.7.3 for the affected feedwater line, isolation or isolation capability for the feedwater line can be assured as follows: Isolation of the main feedwater line may be accomplished by closing and de-activating the MFIV. Alternatively, isolation capability can be ensured by closing and de-activating the MFRV itself, or closing and isolating the MFRV by a closed manual valve in combination with OPERABILITY or closure of the other valves, i.e., the MFIV and MFRVBV. (Closure in this case means closed in accordance with the Applicability exception taken for either the MFIV or MFRVBV as applicable.)

a. When the MFIV in a given main feedwater line is closed and de-activated, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. The MFIV 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 MFIV all electrical power sources must be removed from the actuation

solenoids on the MFIV and a drain or vent path must be available from the lower piston chamber.

b. When the MFRV in a given main feedwater line is closed and de-activated or is closed and isolated by a closed manual valve, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valves. Alternatively, requiring the MFRV to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed, as this provides a means of isolation that cannot be adversely affected by a single active failure.

MFRVBV Exception

To except an MFRVBV from the Applicability of LCO 3.7.3 for the affected feedwater line, isolation or isolation capability for the feedwater line can be assured as follows: Isolation of the main feedwater line may be accomplished by closing and de-activating the MFIV. Alternatively, isolation capability can be ensured by closing and de-activating the MFRVBV, or closing and isolating the MFRVBV with a closed manual valve, or isolating the MFRVBV with two closed manual valves, in combination with OPERABILITY or closure of the other valves, i.e., the MFIV and MFRV. (Closure in this case means closed in accordance with the Applicability exception taken for either the MFIV or MFRV as applicable.)

a. When the MFIV in a given main feedwater line is closed and de-activated, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. The MFIV 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 MFIV all electrical power sources must be removed from the actuation solenoids on the MFIV and a drain or vent path must be available from the lower piston chamber.

b. When the MFRVBV in the given main feedwater line is closed and de-activated or is closed and isolated by a closed manual valve, or isolated by two manual valves, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valves. Alternatively, requiring the MFRVBV to be closed and isolated by a closed manual valve also provides

assurance that the specified safety function is being performed, as this provides a means of isolation that cannot be adversely affected by a single active failure. Finally, the safety function may also be ensured when the MFRVBV is isolated by two closed manual valves, as this provides a means of isolation that cannot be adversely affected by a single active failure.

The license amendment request also proposes to add a new footnote to Table 3.3.2-1 of TS 3.3.2, "ESFAS Instrumentation." TS Table 3.3.2-1, Function 5.b, is revised to incorporate new Footnote (l). A review of the logic schematic drawings for the MFRVs and MFRVBVs show that the closing signal from the SSPS cabinets for main feedline isolation goes through reactor protection auxiliary relay racks which are not the same as Function 5.b for the MFIVs. The MSFIS cabinets only provide signal processing for the MFIVs. Because the MFRVs and the MFRVBVs do not both receive the Function 5.b (MSFIS) signal, current Footnote (j) is not correct and is being replaced with Footnote (l) which addresses only the MFIVs.

Because the exception Footnotes in Table 3.3.2-1 must be consistent with the exceptions allowed in the TS 3.7.3 Applicability for the MFIVs, MFRVs, and MFRVBVs, Footnote (j) is also applied to MODE 1 for the applicable sub-parts of Function 5, "Turbine Trip and Feedwater Isolation." In addition, Applicability exceptions for turbine trip and feedwater isolation after a safety injection signal (Function 5.d) should also reflect Footnote (j).

5.0 REGULATORY SAFETY ANALYSIS

This section addresses the standards of 10 CFR 50.92 as well as the applicable regulatory requirements and acceptance criteria.

The proposed changes will revise the LCO and Applicability for TS 3.7.3 such that the LCO requires the MFIV, MFRV, and MFRVBV to be OPERABLE "in each of the four main feedwater lines." The Applicability is revised to clarify when exceptions to the LCO Applicability are allowed for the MFIV, MFRV, and/or MFRVBV in any main feedwater line. In a minor change, the title to TS 3.7.3 and the header for each page of the Specification is revised. In addition, the proposed changes replace Footnote (j) in TS Table 3.3.2-1 of TS 3.3.2 for Function 5.b. New Footnote (l) replaces Footnote (j) for Function 5.b and addresses only the MFIVs. The exception Footnote (j) is applied to MODE 1 for the applicable sub-parts of Function 5, "Turbine Trip and Feedwater Isolation," in TS Table 3.3.2-1. In addition, Footnote (j) has also been added to all the sub-functions of Function 5.d, "Safety Injection."

5.1 <u>No Significant Hazards Consideration (NSHC)</u>

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

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

Response: No

The proposed changes do not alter any design or operating limits, nor do they physically alter safety-related systems, nor do they affect the way in which safety-related systems perform their functions. The proposed changes do not change accident initiators or precursors assumed or postulated in the FSAR-described accident analyses, nor do they alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is normally operated and maintained. The proposed changes do not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended functions to mitigate the consequences of an initiating event within the assumed acceptance limits.

With specific regard to the proposed TS changes, although the changes involve the exceptions contained in the Applicability of TS 3.7.3 as well as the notes attached to TS Table 3.3.2-1 (which are themselves exceptions), the provisions of the exceptions and notes would continue to be based on the premise that adequate isolation or isolation capability exists for the main feedwater lines, i.e., that the required safety function is performed or capable of being performed as required or assumed for mitigation of the applicable postulated accidents.

All accident analysis acceptance criteria will therefore continue to be met with the proposed changes. The proposed changes will not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. The proposed changes will not alter any assumptions or change any mitigation actions in the radiological consequence evaluations in the FSAR. The applicable radiological dose acceptance criteria will continue to be met.

Overall protection system performance will remain within the bounds of the previously performed accident analyses.

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

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

Response: No

There are no proposed design changes, nor are there any changes in the method by which any safety-related plant structure, system, or component (SSC) performs its specified

safety function. The proposed changes will not affect the normal method of plant operation or change any operating parameters. No equipment performance requirements will be affected. The proposed changes will not alter any assumptions made in the safety analyses.

No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety-related system as a result of this amendment.

The proposed amendment will not alter the design or performance of the 7300 Process Protection System, Nuclear Instrumentation System, or Solid State Protection System used in the plant protection systems.

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

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

Response: No

There will be no effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling ratio (DNBR) limits, heat flux hot channel factor (F_Q), nuclear enthalpy rise hot channel factor ($F\Delta H$), loss of coolant accident peak cladding temperature (LOCA PCT), peak local power density, or any other margin of safety. The applicable radiological dose consequence acceptance criteria for design-basis transients and accidents will continue to be met.

The proposed changes do not eliminate any surveillances or alter the frequency of surveillances required by the Technical Specifications. None of the acceptance criteria for any accident analysis will be changed.

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

Conclusion:

Based on the above evaluation, AmerenUE concludes that the proposed amendment presents no 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

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The TSs ensure the operational capability of structures, systems, and components that are required to protect the health and safety of the public. The U.S. Nuclear Regulatory Commission's (NRC's) requirements related to the content of the TSs are contained in Section 50.36 of Title 10 of the Code of Federal Regulations (10 CFR 50.36) which requires that the TSs include items in the following specific categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements per 10 CFR 50.36(c)(3); (4) design features; and (5) administrative controls.

In general, there are two classes of changes to TSs: (1) changes needed to reflect modifications to the plant design basis (TSs are derived from the design basis), and (2) voluntary changes to take advantage of the evolution in policy and guidance as to the required content and preferred format of TSs over time. This amendment deals with the second class of changes.

Licensees may revise the TSs to adopt current format and content of NUREG-1431 Revision 3.1, "Standard Technical Specifications, Westinghouse Plants," provided that a plant-specific review supports a finding of continued adequate safety because: (1) the change is editorial, administrative, or provides clarification (i.e., no requirements are materially altered), (2) the change is more restrictive than the licensee's current requirement, or (3) the change is less restrictive than the licensee's current requirement, but nonetheless still affords adequate assurance of safety when judged against current regulatory standards. This amendment application meets the first and third findings above.

Although not directly related to the requested changes in this amendment application, the following regulatory requirements and guidance documents apply to the MFIVs, MFRVs, MFRVBVs and ESFAS instrumentation.

10CFR50, Appendix A, General Design Criteria (GDC):

GDC-2 requires that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without the loss of the capability to perform their safety functions.

GDC-4 requires that structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the

effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.

GDC-13 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-16 requires that the reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.

GDC-20 requires that the protection system(s) shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

GDC-21 requires that the protection system(s) shall be designed for high functional reliability and testability.

GDC-22 through GDC-25 and GDC-29 require various design attributes for the protection system(s), including independence, safe failure modes, separation from control systems, requirements for reactivity control malfunctions, and protection against anticipated operational occurrences.

GDC-34 requires the capability to remove residual heat, i.e., to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. The auxiliary feedwater system provides this capability until the RCS is depressurized and the residual heat removal system can perform the function to satisfy this requirement. Isolation of the main feedwater system, i.e., isolation of the non-safety portion from the safety-related portion of the system piping, supports the auxiliary feedwater function.

GDC-50 requires that the reactor containment structure, including access openings, penetrations, and the containment heat removal system shall be designed so that the containment structure and its internal compartments can accommodate, without

exceeding the design leakage rate and, with sufficient margin, the calculated pressure and temperature conditions resulting from any loss-of-coolant accident. This margin shall reflect consideration of (1) the effects of potential energy sources which have not been included in the determination of the peak conditions, such as energy in steam generators and energy from metal water and other chemical reactions that may result from degraded emergency core cooling functioning, (2) the limited experience and experimental data available for defining accident phenomena and containment responses, and (3) the conservatism of the calculational model and input parameters.

GDC-53 requires that the reactor containment shall be designed to permit (1) appropriate periodic inspection of all important areas, such as penetrations, (2) an appropriate surveillance program, and (3) periodic testing at containment design pressure of the leaktightness of penetrations which have resilient seals and expansion bellows.

GDC-54 requires that piping systems penetrating primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating these piping systems. Such piping systems shall be designed with a capability to test periodically the operability of the isolation valves and associated apparatus and to determine if valve leakage is within acceptable limits.

GDC-57 requires that each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside the containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve.

Regulatory Guide 1.22 discusses an acceptable method of satisfying GDC-20 and GDC-21 regarding the periodic testing of protection system actuation functions. These periodic tests should duplicate, as closely as practicable, the performance that is required of the actuation devices in the event of an accident.

10 CFR 50.55a(h) requires that the protection systems meet IEEE 279-1971. Section 4.2 of IEEE 279-1971 discusses the general functional requirement for protection systems to assure they satisfy the single failure criterion.

The proposed changes revise the LCO and Applicability of TS 3.7.3 for clarification. The clarifications enhance the specification while continuing to provide adequate assurance that the Main Feedwater System isolation function (s) is or will be effected on demand and that the plant will continue to be operated in a safe manner within the bounds of the applicable accident analyses. There are no changes to the ESFAS instrumentation or MFIV, MFRV, and MFRVBV design such that compliance with any of the regulatory requirements and guidance documents described would be affected. The above evaluations confirm that the plant will continue to comply with all

applicable regulatory requirements. The changes do not affect the commitment to Regulatory Guide 1.22 as documented in FSAR Section Appendix 3A.

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) 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 or significant increase in the amounts of any effluent 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 REFERENCES

7.1 Callaway License Amendment 167 dated May 31, 2005.
7.2 Callaway License Amendment 189 dated December 18, 2008.
7.3 FSAR Chapter 10.4
7.4 TS 3.3.2
7.5 TS 3.3.2 Bases
7.6 TS 3.7.3
7.7 TS 3.7.3 Bases

Attachment 2
to ULNRC-05608

Markup of Technical Specifications

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

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays (SSPS)	(j) 1,2[j], 3[j]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.14	NA
b. Automatic Actuation Logic and Actuation Relays (MSFIS)	(l) 1, 2[l], 3[l]	2 trains[o]	S	SR 3.3.2.3	NA
c. SG Water Level - High High (P-14)	(j) 1,2[j]	4 per SG	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	INSERT Z ≤ 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.

INSERT Y

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(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.

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INSERT Y

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

INSERT Z

The Applicability exceptions of Footnote (j) also apply to Function 5.d.

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]	(j)				
(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
	(j)(r)				
(2) Steam Generator Water Level Low-Low (Normal Containment Environment)	1[j], 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	≥ 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]	(j)				
(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.

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(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.

Superscript (S) not used in Table on this page

INSERT D

~~MFIVs and MFRVs and MFRV Bypass Valves~~

3.7.3

3.7 PLANT SYSTEMS

INSERT C

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

INSERT A

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

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

INSERT B

~~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.~~

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ACTIONS

NOTE

Separate Condition entry is allowed for each ~~valve.~~ main feedwater line.

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.~~ MFRVBV	72 hours
	AND		
	C.2	Verify ~~bypass valve~~ is closed or isolated.	Once per 7 days

(continued)

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INSERT A

The MFIV, MFRV, and MFRVBV in each of the four main feedwater lines shall be OPERABLE.

INSERT B

For the MFIV in each main feedwater line:

MODES 1, 2, and 3 except when:

a. The MFIV is closed and de-activated; or

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

For the MFRV in each main feedwater line:

MODES 1, 2, and 3, except when:

a. The MFIV is closed and de-activated; or

b. The MFRV is closed and de-activated or closed and isolated by a closed manual valve.

For the MFRVBV in each main feedwater line:

MODES 1, 2, and 3, except when:

a. The MFIV is closed and de-activated; or

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

INSERT C

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

INSERT D

MFIVs, MFRVs, and MFRVBVs

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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. AND E.2 Be in MODE 4.	6 hours 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

Attachment 3
to ULNRC-05608

Retyped Technical Specifications

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
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[l], 2[l], 3[l]	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. The Applicability exceptions of footnote (j) also apply to Function 5.d.				

(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 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[j], 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[j][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 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[j], 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.

3.7 PLANT SYSTEMS

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

LCO 3.7.3 The MFIV, MFRV, and MFRVBV in each of the four main feedwater lines shall be OPERABLE.

APPLICABILITY: For the MFIV in each main feedwater line:

MODES 1, 2, and 3 except when:

a. The MFIV is closed and de-activated; or

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

For the MFRV in each main feedwater line:

MODES 1, 2, and 3 except when:

a. The MFIV is closed and de-activated; or

b. The MFRV is closed and de-activated or closed and isolated by a closed manual valve.

For the MFRVBV in each main feedwater line:

MODES 1, 2, and 3 except when:

a. The MFIV is closed and de-activated; or

b. The 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 main feedwater line.

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 MFRVBV.	72 hours
	AND		
	C.2	Verify MFRVBV is closed or isolated.	Once per 7 days
D. Two valves in the same flow path inoperable.	D.1	Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

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

3.7 PLANT SYSTEMS

3.7.4 Atmospheric Steam Dump Valves (ASDs)

LCO 3.7.4 Four ASD lines shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

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

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

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

(continued)

ACTIONS (continued)

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

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

SURVEILLANCE REQUIREMENTS

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

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

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water System (ESW)

LCO 3.7.8 Two ESW trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable.	A.1 ---------- NOTE ---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," for emergency diesel generator made inoperable by ESW. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ESW. ---------- (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.	B.1	Be in MODE 3.	6 hours
	AND		
OR	B.2	Be in MODE 5.	36 hours
UHS inoperable for reasons other than Condition A.			

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

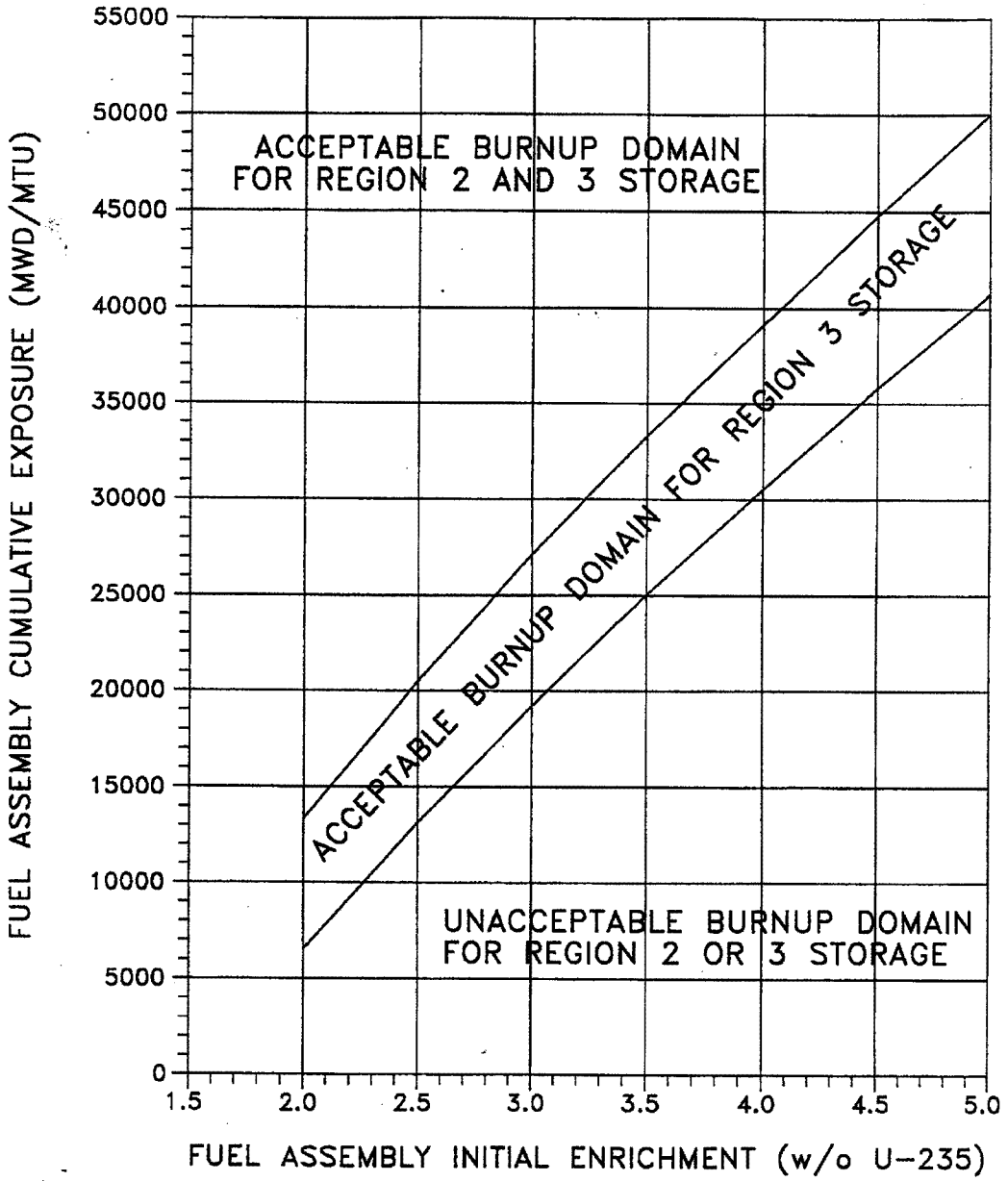

Figure 3.7.17-1 (page 1 of 1)
MINIMUM REQUIRED FUEL ASSEMBLY BURNUP AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGIONS 2 AND 3

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

Attachment 4
to ULNRC-05608

Proposed Technical Specification Bases Changes
(for information only)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY (continued)

5. Turbine Trip and Feedwater Isolation

The primary functions of the Turbine Trip and Feedwater Isolation signals are to prevent damage to the turbine due to water in the steam lines and to stop the excessive flow of feedwater into the SGs. These Functions are necessary to mitigate the effects of a high water level in the SGs, which could result in carryover of water into the steam lines and excessive cooldown of the primary system. The SG high water level is due to excessive feedwater flows.

The Function is actuated when the level in any SG exceeds the high high setpoint and performs the following functions:

- Trips the main turbine;
- Trips the MFW pumps, closing the pump discharge valves; and
- Initiates feedwater isolation.

With the exception of feedwater isolation, these listed functions, which are actuated by SG Water Level - High High or by an SI signal, are not credited in the safety analysis. The RTS also initiates a turbine trip signal whenever a reactor trip (P-4) is generated. In the event of SI, the unit is taken off line and the turbine generator must be tripped. The MFW System is also taken out of operation and the AFW System is automatically started. The SI signal was previously discussed.

While the above discussion applies to both turbine trip and feedwater isolation in response to excessive feedwater in MODES 1 and 2, feedwater isolation on SG low-low level is required for events in MODES 1, 2, and 3 where the assurance of AFW delivery to the intact steam generators is paramount in the accident analysis. The analyses for the Loss of Non-Emergency AC Power, Loss of Normal Feedwater, and Feedwater System Pipe Break events credit feedwater isolation on SG low-low level. Given the location of the feedwater check valves inside containment downstream of the point where AFW connects to the main feedwater piping, closure of the main feedwater isolation valves (MFIVs) is required to assure AFW flow is not diverted. The Applicable MODES for the feedwater isolation function on SG low-low level are consistent with those for the MFIVs and Main Feedwater Regulating Valves (MFVRVs) and Main Feedwater

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APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

5. Turbine Trip and Feedwater Isolation (continued)

~~Regulating Valve Bypass Valves (MRFRVBVs) in LCO 3.7.3 and AFW System (LCO 3.7.5).~~

a. Turbine Trip and Feedwater 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.

b. Feedwater Isolation - Automatic Actuation Logic and Actuation Relays (MSFIS)

Automatic Actuation Logic and Actuation Relays in the MSFIS consist of the same features and operate in the same manner as described for ESFAS Function 4.c.

c. Turbine Trip and Feedwater Isolation - Steam Generator Water Level - High High (P-14)

This signal provides protection against excessive feedwater flow. The ESFAS SG water level instruments provide 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 the protection function actuation) and a single failure in the other channels providing the protection function actuation. Thus, four OPERABLE channels per SG are required to satisfy the requirements with a two-out-of-four logic in any SG resulting in actuation signal generation.

The transmitters (d/p cells) are located inside containment. However, the events that this Function protects against cannot cause a severe environment in containment. Therefore, the Trip Setpoint reflects only steady state instrument uncertainties. The Trip Setpoint is ≤ 91.0% of narrow range span.

d. Turbine Trip and Feedwater Isolation - Safety Injection

Turbine Trip and Feedwater Isolation are also initiated by all Functions that initiate SI. The Feedwater Isolation Function requirements for these Functions are the same as

(continued)

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APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

d. Turbine Trip and Feedwater Isolation - Safety Injection (continued)

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, with the stipulation that the Applicability exceptions of Footnote (j) also apply to Function 5.d.

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e. Feedwater Isolation - Steam Generator Water Level - Low Low

SG Water Level - Low Low provides protection against a loss of heat sink by ensuring the isolation of normal feedwater and AFW delivery to the steam generators. Given the location of the feedwater line check valves inside containment downstream of the point where AFW connects to the main feedwater piping, closure of the MFIVs is required to assure AFW flow is not diverted. A feedwater line break 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 initiates feedwater isolation. 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

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APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

e. Feedwater Isolation - Steam Generator Water Level - Low Low (continued)

due to this harsh environment. The EAM enables a lower Steam Generator Water Level - Low Low (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 SG Water Level - Low Low Trip Setpoints are chosen to reflect both steady state and adverse environment instrument behavior. The Trip Setpoints for the Steam Generator 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.

INSERT B1

Turbine Trip and Feedwater Isolation Function 5.c, SG Water Level - High High must be OPERABLE in MODES 1 and 2 except when:

all MFIVs are closed and de-activated;

AND

all MFRVs are:

Closed and de-activated, or
Closed and isolated by a closed manual valve;

AND

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Function 5.a, Automatic Actuation Logic and Actuation Relays (SSPS), and Feedwater Isolation Function 5.e, SG Water Level – Low Low, must be OPERABLE in MODE 1, MODE 2, and MODE 3 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.

Turbine Trip and Feedwater Isolation Function 5.b, Automatic Actuation Logic and Actuation Relays (MSFIS), must be OPERABLE in MODE 1, MODE 2, and MODE 3 except when all MFIVs are closed and de-activated.

Turbine Trip and Feedwater Isolation Function 5.c, SG Water Level – High High, must be OPERABLE in MODE 1 and MODE 2 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

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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.

When these valves are in the above (flow path isolated) configurations, there is no requirement to have an OPERABLE actuation signal through Functions 5.a, 5.b, 5.c, 5.d, and 5.e since all the valves are already performing their specified safety function. In MODES 3, 4, 5, and 6, Function 5.c is not required to be OPERABLE. In MODES 4, 5, and 6, Functions 5.a, 5.b, and 5.e are not required to be OPERABLE. For Function 5.d, the provisions of Function 1 apply in addition to the Applicability exceptions for Footnote (j) which are the same as discussed above for the Functions 5.a, 5.c, and 5.e.

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

e. Feedwater Isolation - Steam Generator Water Level - Low Low (continued)

all MFRVBVs are:

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

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

In MODES 3, 4, 5, and 6, Function 5.c is not required to be OPERABLE. All other Turbine Trip and Feedwater Isolation Functions must be OPERABLE in MODE 1, MODE 2, and MODE 3 except when:

all MFIVs are closed and de-activated;

AND

all MRFRVs are:

Closed and de-activated, or
Closed and isolated by a closed manual valve;

AND

all MFRVBVs are:

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

When all of these valves are in the above configuration, there is no requirement to have an OPERABLE actuation signal since all the valves are already performing their specified safety function. In MODES 4, 5, and 6, Functions 5.a, 5.b, 5.d, and 5.e are not required to be OPERABLE.

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

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

e. Feedwater Isolation - Steam Generator Water Level - Low Low (continued)

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.

6. Auxiliary Feedwater

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For Information Only

The AFW System is designed to provide a secondary side heat sink for the reactor in the event that the MFW System is not available. The system has two motor driven pumps and a turbine driven pump, making it available during normal unit operation, during a loss of AC power, a loss of MFW, and during a Feedwater System pipe break. The normal source of water for the AFW System is the condensate storage tank (CST). A loss of suction pressure, coincident with an auxiliary feedwater actuation signal (AFAS), will automatically realign the pump suctions to the safety related Essential Service Water (ESW) System. The AFW System is aligned so that upon a pump start, flow is initiated to the respective SGs immediately.

a. Auxiliary Feedwater - Manual Initiation

Manual initiation of Auxiliary Feedwater can be accomplished from the control room. Each of the three AFW pumps has a pushbutton for manual AFAS initiation. The LCO requires three channels to be OPERABLE.

b. Auxiliary Feedwater - 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 ESFAS Function 1.b.

(continued)

INSERT F

INSERT E

B 3.7 PLANT SYSTEMS

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

BASES

BACKGROUND

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The MFIVs isolate main feedwater (MFW) flow to the secondary side of the steam generators following a high energy line break (HELB). The MFRVs and MFRVBVs function to control feedwater flow to the SGs and provide backup isolation of MFW flow in the event an MFIV fails to close. Because an earthquake is not assumed to occur coincident with a spontaneous break of safety related secondary piping, loss of the non-safety grade MFRVs and MFRVBVs is not assumed. If the single active failure postulated for a secondary pipe break is the failure of a safety grade MFIV to close, then credit is taken for closing the non-safety grade MFRVs and MFRVBVs.

The MFIV is a 14-inch gate valve with a system-medium actuator. Since the MFIV actuators are system-medium actuators, the MFIV isolation time is a function of steam generator steam pressure. The assumed single active failure of one of the redundant MFIV actuation trains will not prevent the MFIV from closing.

Closure of the MFIVs or MFRVs and MFRVBVs terminates flow to the steam generators, terminating the event for feedwater line breaks (FWLBs) occurring upstream of the MFIVs or MFRVs and MFRVBVs. Since the MFIVs are located upstream of the point where the auxiliary feedwater lines connect to the main feedwater lines, which is in turn upstream of the main feedwater check valves (located in containment), closure of the MFIVs or the MFRVs and MFRVBVs ensures delivery of auxiliary feedwater to the steam generators for support of the auxiliary feedwater function (LCO 3.7.5) in the event of a main feedwater line break in the turbine building (i.e., upstream of the MFIVs, MFRVs, and MFRVBVs).

Similarly, the consequences of events occurring in the main steam lines or in the MFW lines downstream from the MFIVs will be mitigated by valve closure. Closure of the MFIVs or MFRVs and MFRVBVs effectively terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks (SLBs) or FWLBs inside containment, and reducing the cooldown effects for SLBs.

The MFIVs isolate the nonsafety related portions from the safety related portions of the system. In the event of a secondary side pipe rupture inside containment, the valves limit the quantity of high energy fluid that

(continued)

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INSERT E

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

INSERT F

MFIVs, MFRVs, and MFRVBVs

BASES

BACKGROUND (continued)

enters containment through the break, and provide a pressure boundary for the controlled addition of auxiliary feedwater (AFW) to the intact loops.

One MFIV and one MFRV are located on each MFW line, outside but close to containment. The MFRVBVs are located in six-inch lines that bypass flow around the MFRVs when in service. The MFRVBVs are normally closed during plant power operation above 25 percent power, but may be occasionally open to support maintenance, post-maintenance testing, or other plant activities. As shown in Reference 6, an MFIV can not be isolated with closed manual valves; the MFRV can be isolated upstream by a closed manual valve; and the MFRVBV can be isolated both upstream and downstream with a closed manual valve. The MFIVs and MFRVs and MFRVBVs are located upstream of the AFW injection point so that AFW may be supplied to the steam generators following MFIV or MFRV and MFRVBV closure. The piping volume from these valves to the steam generators is accounted for in calculating mass and energy releases, and purged and refilled prior to AFW reaching the steam generator following either an SLB or FWLB.

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INSERT C

The MFIVs and MFRVs and MFRVBVs close on receipt of any safety injection signal, a T_{avg} - Low coincident with reactor trip (P-4), a low-low steam generator level, or steam generator water level - high high signal. MFIVs may also be actuated manually. In addition to the MFIVs and MFRVs and MFRVBVs a check valve inside containment is available. The check valve isolates the feedwater line penetrating containment and ensures the pressure boundary of any intact loop not receiving auxiliary feedwater.

INSERT D

The MFIV actuators consist of two separate system-medium actuation trains each receiving an actuation signal from one of the redundant ESFAS channels. A single active failure in one power train would not prevent the other power train from functioning. The MFIVs, MFRVs and MFRVBVs provide the primary success path for events requiring feedwater isolation and isolation of non-safety-related portions from the safety-related portion of the system, such as, for auxiliary feedwater addition.

The MFRV and MFRVBV actuators consist of two separate actuation trains each receiving an actuation signal from one of the redundant ESFAS channels. Both trains are required to actuate to close the valve.

A description of the MFIVs and MFRVs and MFRVBVs is found in the FSAR, Section 10.4.7 (Ref. 1).

(continued)

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INSERT C

(not credited in any safety analysis – see Function 8.a Bases in LCO 3.3.2, "ESFAS Instrumentation"),

INSERT D

(skid-mounted at the valve)

BASES (Continued)

APPLICABLE SAFETY ANALYSES

Credit is taken in accident analysis for the MFIVs to close on demand. The function of the MFRVs and associated bypass valves as discussed in the accident analysis is to provide a diverse backup function to the MFIVs for the potential failure of an MFIV to close even though the MFRVs are located in the non-safety-related portion of the feedwater system. Further assurance of feedwater flow termination is provided by the SGFP trip function; however, SGFP trip is not credited in accident analysis. The accident analysis credits the main feedwater check valves as backup to the MFIVs to prevent SG blowdown for pipe ruptures in the non-seismic Category I portions of the feedwater system outside containment.

The impact of an MFIV isolation time as a function of steam generator steam pressure on the safety analyses has been evaluated in Reference 2 and 7. The evaluation concluded that a variable MFIV isolation time is acceptable with respect to the safety analyses. Figure B 3.7.3-1 is a curve of the MFIV isolation time limit as a function of steam generator steam pressure. Meeting the MFIV isolation times in Figure B 3.7.3-1 ensures that the evaluations performed in Reference 2 and 7 remain valid.

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Criterion 3 of 10 CFR 50.36(c)(2)(ii) indicates that components that are part of the primary success path and that actuate to mitigate an event that presents a challenge to a fission product barrier should be in Technical Specifications. The primary success path of a safety analysis consists of the combination and sequences of equipment needed to operate (including redundant trains/components) so that the plant response to the event remains within appropriate acceptance criteria. The primary success path includes backup and diverse equipment. The MFIVs, with their dual-redundant actuation trains, are the primary success path for feedwater isolation. The MFIVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). The MFRVs and MFRVBVs are backup and diverse equipment and satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO ensures that the MFIVs and MFRVs and MFRVBVs will isolate MFW flow to the steam generators, following an FWLB or main steam line break. The MFIVs will also isolate the nonsafety related portions from the safety related portions of the system.

INSERT A

~~This LCO requires that four MFIVs and four MFRVs and four MFRVBVs be OPERABLE.~~ The MFIVs and MFRVs and MFRVBVs are considered OPERABLE when both of their actuation trains are operable, their isolation times are within limits when given an isolation actuation signal, and they are capable of closing on an isolation actuation signal. Isolation time limits for the MFIVs are given in Figure 3.7.3-1.

the skid-mounted

at the valves

(continued)

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INSERT A

This LCO requires that the MFIV, MFRV, and MFRVBV for each of the four main feedwater lines be OPERABLE.

BASES

LCO (continued)

With one MFIV actuation train unavailable, a single failure of the other actuation train (such as its associated logic train) could prevent both the affected MFIV and the associated MFRV from closing. In the event of an MSLB, this could result in insufficient isolation of the feedwater line such that the mass and energy addition to containment (by feedwater addition to the steam generator with the broken steam line) would exceed the amount assumed in the accident analysis. Requiring both MFIV actuation trains for MFIV OPERABILITY thus ensures that adequate isolation capability in conformance with the accident analysis exists, assuming a single failure.

For the MFRVs and MFRVBVs, the LCO requires only that the trip close function is OPERABLE. No OPERABILITY requirements are imposed on the analog controls shown on Reference 5.

To ensure the MFRVs close on demand, the valves are provided with a backup nitrogen supply. In particular, the accident analyses assume all four MFRVs close simultaneously within 15 seconds following receipt of a valid Feedwater Isolation signal (FWIS) using the nitrogen backup system as the actuation medium. Consistent with this assumption, the nitrogen supply accumulator tank (TKA06) must be maintained at a pressure sufficient to ensure that all four MFRVs close simultaneously within the assumed time on demand. The tank must therefore be maintained at or above the required pressure (400 psig) for the MFRVs to be considered OPERABLE. (Ref. 9)

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Failure to meet the LCO requirements can result in additional mass and energy being released to containment following an SLB or FWLB inside containment. A feedwater isolation signal on high steam generator level is relied on to terminate an excess feedwater flow event.

APPLICABILITY

The MFIVs and MFRVs and MFRVBVs must be OPERABLE whenever there is significant mass and energy in the Reactor Coolant System and steam generators. This ensures that, in the event of an HELB, a single failure cannot result in the blowdown of more than one steam generator.

In MODES 1, 2, and 3, the MFIVs and MFRVs and MFRVBVs are required to be OPERABLE to limit the amount of available fluid that could be added to containment in the case of a secondary system pipe break inside containment, with the following exceptions.

INSERT B

~~Exceptions to the APPLICABILITY are allowed for the following cases where the valve is assured of performing its safety function (Reference 6):~~

~~a. When the MFIV is closed and de-activated, it is performing its safety function. Requiring the valve closed and de-activated~~

(continued)

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INSERT B (page 1 of 4)

Feedwater is supplied to the four steam generators by four feedwater lines. One MFIV is installed in each of the four feedwater lines downstream of the MFRV and MFRVBV. When the feedwater line that feeds the steam generator is isolated, the specified safety function is being met. When there is assurance that the feedwater line is or can be fully isolated, exceptions are allowed in the Applicability based on the condition that the specified safety function can still be performed. In MODES 1, 2 and 3, exceptions to the APPLICABILITY are allowed for an MFIV, MFRV, and/or MFRVBV when isolation assurance can be provided by either requiring the valve to be closed in a manner such that its closure cannot be adversely affected by a single active failure, or by having one (or both) of the other valves in that feedwater line closed in such a manner. Since, for each feedwater line, the MFIV serves as one isolation barrier and the combination of the MFRV and MFRVBV (which are in parallel) serves as the other barrier, the valve (or valves) that is (are) required to be closed in the described manner depends on which valve is execpted from the LCO Applicability.

The basis for the exception given for an MFIV, MFRV, and/or MFRVBV in the Applicability is described below.

<u>MFIV Exception</u>

To execpt an MFIV from the Applicability for the affected feedwater line, isolation or isolation capability for the feedwater line can be assured as follows:

a. When the MFIV in a given main feedwater line is closed and de-activated, it is performing the specified safety function. Requiring the MFIV to be closed and de-activated provides assurance that the MFIV is performing the specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. The MFIV 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 MFIV all electrical power sources must be removed from the actuation solenoids on the MFIV and a drain or vent path must be available from the lower piston chamber.

b. Isolation of the affected feedwater line may also be ensured by closure of the MFRV and MFRVBV associated with that feedwater line (since the parallel combination of the MFRV and MFRVBV may serve as an isolation barrier for the affected feedwater line in lieu of the MFIV).

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INSERT B (page 2 of 4)

When the MFRV is closed and de-activated or is closed and isolated by a closed manual valve, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valve. Alternatively, requiring the valve to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed. This provides a means of isolation that cannot be adversely affected by a single active failure.

When the MFRVBV is closed and de-activated or is closed and isolated by a closed manual valve, or is isolated by two closed manual valves, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valve. Alternatively, requiring the valve to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed, as this provides a means of isolation that cannot be adversely affected by a single active failure. Finally, the safety function may also be ensured when the MFRVBV is isolated by two closed manual valves, as this provides a means of isolation that cannot be adversely affected by a single active failure.

MFRV Exception

To execpt an MFRV from the Applicability of LCO 3.7.3 for the affected feedwater line, isolation or isolation capability for the feedwater line can be assured as follows: Isolation of the main feedwater line may be accomplished by closing and de-activating the MFIV. Alternatively, isolation capability can be ensured by closing and de-activating the MFRV, or closing and isolating the MFRV by a closed manual valve in combination with OPERABILITY or closure of the other valves, i.e., the MFIV and MFRVBV. (Closure in this case means closed in accordance with the Applicability exception taken for either the MFIV or MFRVBV as applicable.)

a. When the MFIV in a given main feedwater line is closed and de-activated, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. The MFIV is a system-medium actuated valve, opened by system

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INSERT B (page 3 of 4)

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 MFIV all electrical power sources must be removed from the actuation solenoids on the MFIV and a drain or vent path must be available from the lower piston chamber.

b. When the MFRV in a given main feedwater line is closed and de-activated or is closed and isolated by a closed manual valve, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valves. Alternatively, requiring the MFRV to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed, as this provides a means of isolation that cannot be adversely affected by a single active failure.

MFRVBV Exception

To execpt an MFRVBV from the Applicability of LCO 3.7.3 for the affected feedwater line, isolation or isolation capability for the feedwater line can be assured as follows: Isolation of the main feedwater line may be accomplished by closing and de-activating the MFIV. Alternatively, isolation capability can be ensured by closing and de-activating the MFRVBV, or closing and isolating the MFRVBV with a closed manual valve, or isolating the MFRVBV with two closed manual valves, in combination with OPERABILITY or closure of the other valves, i.e., the MFIV and MFRV. (Closure in this case means closed in accordance with the Applicability exception taken for either the MFIV or MFRV as applicable.)

a. When the MFIV in a given main feedwater line is closed and de-activated, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. The MFIV 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 MFIV all electrical power sources must be removed from the actuation solenoids on the MFIV and a drain or vent path must be available from the lower piston chamber.

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INSERT B (page 4 of 4)

b. When the MFRVBV in the given main feedwater line is closed and de-activated or is closed and isolated by a closed manual valve, or isolated by two manual valves, it is performing its specified safety function. Requiring the valve to be closed and de-activated provides assurance that it is performing its specified safety function, as it provides a means of isolation that cannot be adversely affected by a single active failure. When the valve is de-activated, power is removed from the actuation solenoids on the valves. Alternatively, requiring the MFRVBV to be closed and isolated by a closed manual valve also provides assurance that the specified safety function is being performed, as this provides a means of isolation that cannot be adversely affected by a single active failure. Finally, the safety function may also be ensured when the MFRVBV is isolated by two closed manual valves, as this provides a means of isolation that cannot be adversely affected by a single active failure.

APPLICABILITY (continued)

provides dual assurance that it is performing its safety function. When the valve is de-activated, power is removed from the actuation solenoids on the valves.

b. When the MFRV is closed and de-activated or is closed and isolated by a closed manual valve, it is performing its safety function. Requiring the valve closed and de-activated provides dual assurance that it is performing its safety function. When the valve is de-activated, power is removed from the actuation solenoids on the valves. Requiring the valve closed and isolated by a closed manual valve also provides dual assurance that it is performing its safety function.

c. When the MFRVBV is closed and de-activated, or is closed and isolated by a closed manual valve, or is isolated by two closed manual valves, it is performing its safety function. Requiring the valve closed and de-activated provides dual assurance that it is performing its safety function. When the valve is de-activated, power is removed from the actuation solenoids on the valves. Requiring the valve closed and isolated by a closed manual valve also provides dual assurance that it is performing its safety function. Finally, there is dual assurance that the safety function is being performed when the MFRVBV is isolated by two closed manual valves.

In MODES 4, 5, and 6, steam generator energy is low. Therefore, the MFIVs and MFRVs and MFRVBVs are not required to mitigate the effects of a feedwater or steamline break in these MODES.

ACTIONS

The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each ~~valve.~~ main feedwater line.

A.1 and A.2

With one MFIV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close inoperable affected valves within 72 hours. When these valves are closed, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the dual-redundant actuation trains on the MFIVs, the redundancy afforded by the remaining OPERABLE valves, and the low probability of an event occurring during this time period that would require isolation of

(continued)

BASES

ACTIONS

A.1 and A.2 (continued)

the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFIVs that are closed must be verified on a periodic basis that they are 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 closed.

If the MFIVs are closed and de-activated, this LCO does not apply as discussed in the Applicability section of these Bases.

B.1 and B.2

With one MFRV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or to isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

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

C.1 and C.2

With one MFRVBV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or to isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

(continued)

ACTIONS

C.1 and C.2 (continued)

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFRVBVs 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 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 closed or isolated. If the MFRVBVs are 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.

D.1

Two inoperable valves in the same flow path is treated the same as loss of the isolation capability of this flow path. For each feedwater line there are two flow paths, defined as flow through the MFRV/MFIV and flow through the MFRVBV/MFIV. Because the MFIV, MFRV, and MFRVBV are of different designs, a common mode failure of the valves in the same flow path is not likely. However, under these conditions, affected valves in each flow path must be restored to OPERABLE status, or the affected flow path isolated within 8 hours. This action returns the system to the condition where at least one valve in each flow path is performing the required safety function. The 8 hour Completion Time is reasonable, based on operating experience, to complete the actions required to close the MFIV or MFRV and MFRVBV, or otherwise isolate the affected flow path.

E.1 and E.2

If the MFIV(s) and MFRV(s) and MFRVBV(s) cannot be restored to OPERABLE status, or 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 in at least 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 full power conditions in an orderly manner and without challenging unit systems.

(continued)

BASES (Continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the closure time of each MFRV and MFRVBV is ≤15 seconds when tested pursuant to the Inservice Testing Program. The MFRV and MFRVBV closure time is assumed in the accident and containment analyses. For the MFRVs, performance of this surveillance involves simultaneously stroking the MFRVs closed using nitrogen at or below the required accumulator pressure (400 psig) and verifying that the valves close within the required limit. (Ref. 9)

For the MFRVs this Surveillance is normally performed upon returning the unit to operation following a refueling outage, or it may be performed as required for post-maintenance testing under appropriate conditions during applicable MODES. The MFRVs should normally not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the unit generating power. However, when the plant is operating using the MFRVBVs (steam generator level maintained solely by flow through the MFRVBVs), the surveillance for the MFRVs may be performed for post-maintenance testing during such conditions without increasing plant risk.

For the MFRVBVs, 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.

For verifying valve closure time when returning the unit to operation following a refueling outage, the SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated. Test conditions are with the unit at nominal operating temperature and pressure, as dicussed in Reference 8.

Per Reference 4, if it is necessary to adjust stem packing to stop packing leakage and if a required stroke test is not practical in the current plant MODE, it should be shown by analysis that the packing adjustment is within torque limits specified by the manufacturer for the existing configuration of packing, and that the performance parameters of the valve are not adversely affected. A confirmatory test must be performed at the first available opportunity when plant conditions allow testing. Packing adjustments beyond the manufacturer's limits may not be performed without (1) an engineering analysis and (2) input from the manufacturer, unless tests can be performed after adjustments.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 (continued)

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

SR 3.7.3.2

This SR verifies that each MFIV, MFRV, and MFRVBV is capable of closure on an actual or simulated actuation signal. For the MFIVs the manual fast close handswitch in the Control Room provides an acceptable actuation signal. Each MFIV actuation train must be tested separately. For the MFRVs and the MFRVBVs, actuation of solenoids locally at the MFRVs and MFRVBVs constitutes an acceptable simulated actuation signal.

This Surveillance is normally performed for the MFIVs and MFRVs upon returning the unit to operation following a refueling outage in conjunction with SR 3.7.3.1. The SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR for the MFRVs and MFRVBVs. This allows a delay of testing until MODE 3 to establish conditions consistent with those necessary to perform SR 3.7.3.1 and SR 3.7.3.2 concurrently for the MFRVs and for the MFRVBVs, as necessary.

The 18 month Frequency for testing the MFIVs, MFRVs, and MFRVBVs per this SR is based on the refueling cycle and is acceptable from a reliability standpoint.

SR 3.7.3.3

This SR verifies that the closure time of each MFIV is within the limits of Figure B 3.7.3-1 from each actuation train when tested pursuant to the Inservice Testing Program. The MFIV closure time is assumed in the accident and containment analyses. Figure B 3.7.3-1 is a curve of the MFIV isolation time limit as a function of steam generator steam pressure, since there is no pressure indication available at the MFIVs. The acceptance curve for the MFIV stroke time conservatively accounts for the potential pressure differential between the steam generator pressure indication and the pressure at the MFIVs. Meeting the MFIV isolation times in Figure B 3.7.3-1 ensures that the evaluations performed in Reference 2 and Reference 7 remain valid. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. These valves should not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the unit generating power.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 (continued)

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

REFERENCES

1. FSAR, Section 10.4.7, Condensate and Feedwater System.
2. Westinghouse Letter, SCP-05-027, Revision 2, dated September 9,2005.
3. FSAR, Table 7.3-14, NSSS Instrument Operating Conditions for Isolation Functions.
4. NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."
5. FSAR Figure 7.2-1, Sheets 13 and 14.
6. FSAR Figure 10.4-6, Sheets 1 and 2.
7. WCAP-16265-P, dated August 2004.
8. ASME Code for Operation and Maintenance of Nuclear Power Plants.
9. FSAR Section 9.3.1, Compressed Air System

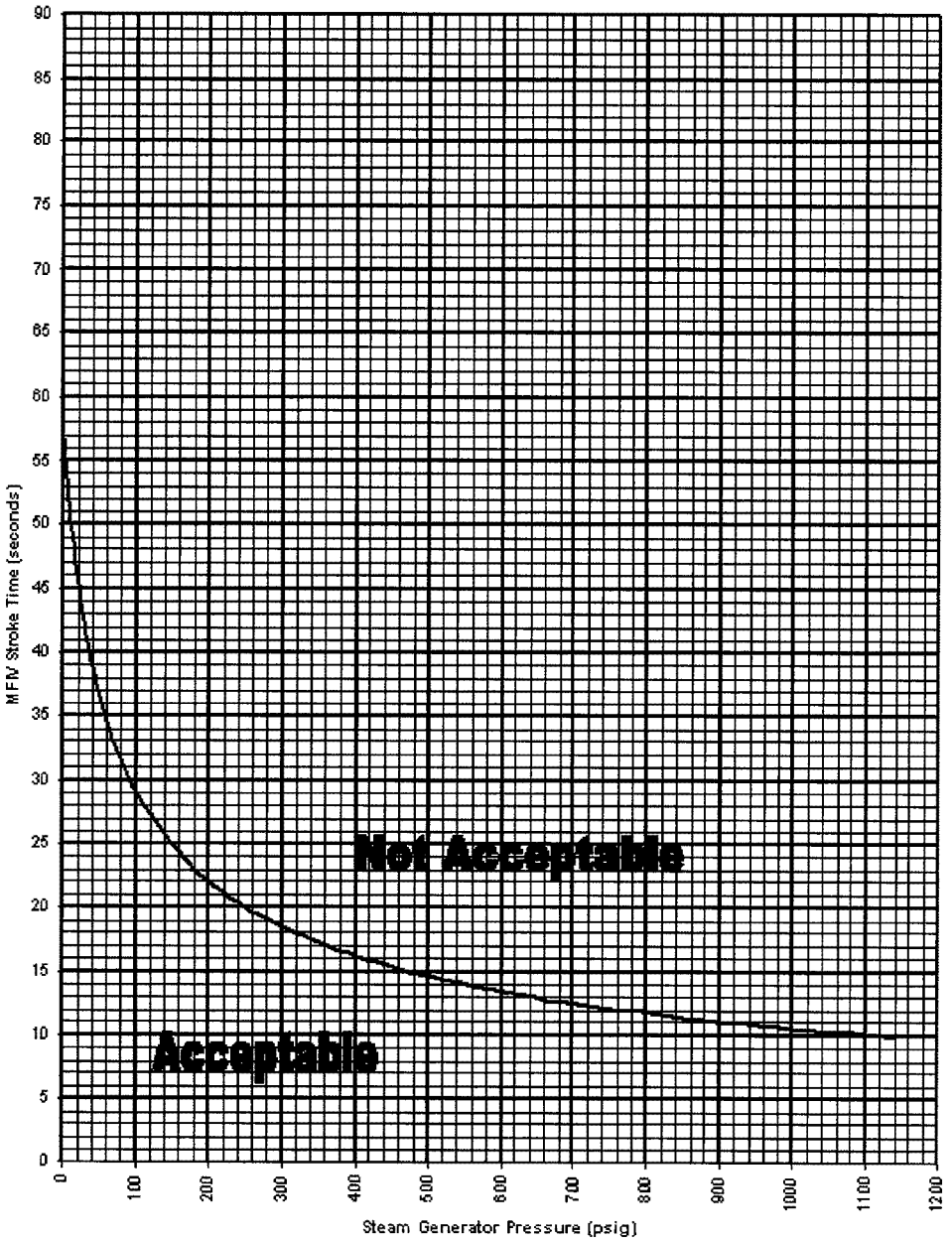

Figure B 3.7.3-1 (page 1 of 1)
MFIV Stroke Time Limit vs Steam Generator Pressure