

April 3, 2008

Mr. Rick A. Muench
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
REVISION TO TECHNICAL SPECIFICATION 3.7.3, "MAIN FEEDWATER
ISOLATION VALVES," TO ADD MAIN FEEDWATER REGULATING VALVES
(MFRV) AND MFRV BYPASS VALVES (TAC NO. MD4840)

Dear Mr. Muench:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 177 to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated March 14, 2007 (ET 07-0004), as supplemented by letters dated December 18, 2007, and February 26, 2008 (ET 07-0052 and ET 08-0011, respectively).

The amendment revised TS 3.3.2, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)," by the addition of the main feedwater regulating valves (MFRVs), and associated MFRV bypass valves, to TS 3.7.3 and to TS Table 3.3.2-1, and changed page numbers in the TS Table of Contents. The application had other proposed changes to the plant that will be addressed later in future letters.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Jack Donohew, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures: 1. Amendment No. 177 to NPF-42
2. Safety Evaluation

cc w/encls: See next page

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OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	DSS/SBPB/BC	DIRS/ITSB/BC	OGC - NLO w/comments	NRR/LPL4/BC
NAME	JDonohew	JBurkhardt	DHarrison (*)	GWaig (*)	MSmith (*)	THiltz
DATE	4/1/08	3/31/08	03/10/08	03/10/08	3/19/08	4/3/08

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Wolf Creek Generating Station

(2/2006)

cc:

Jay Silberg, Esq.
Pillsbury Winthrop Shaw Pittman LLP
2300 N Street, NW
Washington, D.C. 20037

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 311
Burlington, KS 66839

Chief Engineer, Utilities Division
Kansas Corporation Commission
1500 SW Arrowhead Road
Topeka, KS 66604-4027

Office of the Governor
State of Kansas
Topeka, KS 66612

Attorney General
120 S.W. 10th Avenue, 2nd Floor
Topeka, KS 66612-1597

County Clerk
Coffey County Courthouse
110 South 6th Street
Burlington, KS 66839

Chief, Radiation and Asbestos Control
Section
Kansas Department of Health
and Environment
Bureau of Air and Radiation
1000 SW Jackson, Suite 310
Topeka, KS 66612-1366

Vice President Operations/Plant Manager
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

Supervisor Licensing
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

U.S. Nuclear Regulatory Commission
Resident Inspectors Office/Callaway Plant
8201 NRC Road
Steedman, MO 65077-1032

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177
License No. NPF-42

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Wolf Creek Generating Station (the facility) Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated March 14, 2007, as supplemented by letters dated December 18, 2007, and February 26, 2008, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph h 2.C.(2) of Facility Operating License No. NPF-42 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 177 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented before entry into Mode 3 in the restart from the spring 2008 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Thomas G. Hiltz, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Facility
Operating License and
Technical Specifications

Date of Issuance: April 3, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 177

FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Replace the following pages of the Facility Operating License No. NPF-42 and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Facility Operating License

REMOVE

- 4 -

INSERT

- 4 -

Technical Specifications (TSs)

REMOVE

iii
3.3-34
3.7-8
3.7-9
3.7-10
3.7-11 to 3.7-41

INSERT

iii
3.3-34
3.7-8
3.7-9
3.7-10
3.7-11 to 3.7-42*

* These pages are being issued to re-number the pages from TSs 3.7.4 through 3.7.18 since TS 3.7.3 is being issued with an additional page. The only changes to TSs 3.7.4 through 3.7.18 are to the page numbers. See the changes to page iii above of the Table of Contents.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. NPF-42
WOLF CREEK NUCLEAR OPERATING CORPORATION
WOLF CREEK GENERATING STATION
DOCKET NO. 50-482

1.0 INTRODUCTION

By application dated March 14, 2007, as supplemented by letters dated December 18, 2007, and February 26, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML070800193, ML073620328, and ML080640632, respectively), Wolf Creek Nuclear Operating Corporation (the licensee) requested changes to the Technical Specifications (TSs, Appendix A to Facility Operating License No. NPF-42) for the Wolf Creek Generating Station (WCGS). The proposed changes to the TSs are the following:

1. Changes to TS 3.3.2, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," to separate the main steam and feedwater isolation system (MSFIS) from the solid state protection system (SSPS) in ESFAS Functions 4.b and 5.a of Table 3.3.2-1.
2. Changes to 3.7.3, "Main Feedwater Isolation Valves (MFIVs)," for the addition of the main feedwater regulating valves (MFRVs), and associated MFRV bypass valves to TS 3.7.3.
3. Changes to Surveillance Requirements (SRs) 3.7.2.1 and 3.7.3.1 to adopt the Nuclear Regulatory Commission (NRC)-approved Technical Specification Task Force Traveler 491, Revision 2 (TSTF-491R2), "Removal of Main Steam and Main Feedwater Isolation Times."
4. Changes to the TS Table of Contents to change the title of TS 3.7.3 (see No. 2 above) and to re-number the TS pages for TS 3.7.4 through TS 3.7.18.

The only changes to the TSs that are being addressed in this amendment are the changes in Nos. 2 and 4 above.

The changes to the TSs in No. 1 above, the changes to TS Table 3.3.2-1, were issued in Amendment No. 175 by letter dated March 3, 2008 (ADAMS Accession No. ML072970024).

The changes to the TSs in No. 3 above, the adoption of TSTF-491R2 by revising SRs 3.7.2.1 and 3.7.3.1 for the main steam isolation valves (MSIVs) and main feedwater isolation valves (MFIVs), respectively, to replace the valve isolation times in the SRs with the phrase “within limits,” were issued in Amendment No. 174 by letter dated August 28, 2007.

In the application, the licensee also proposed to replace (1) the MSIVs and MFIVs and (2) the MSFIS controls; however, these replacements do not involve any changes to the TSs. The proposed replacement of the MSIVs and MFIVs by new valves was approved in Amendment No. 176 by letter dated March 21, 2008 (ADAMS Accession No. ML080650219). The proposed replacement of the MSFIS controls, the last proposed change to the plant in the licensee's application, will be addressed in a future amendment.

In Attachments IV and V to the application, the licensee identified (1) changes to the TS Bases for the proposed amendment and (2) the list of regulatory commitments. In identifying changes to the TS Bases, the licensee is not requesting that NRC approve these changes; the changes to the TS Bases and the regulatory commitment is for the entirety of the proposed license amendment request in the application dated March 14, 2007. The identified changes to the TS Bases come under TS 5.5.14, “Technical Specification (TS) Bases Control Program,” which requires that “[l]icensees may make changes to the [TS] Bases without prior NRC approval provided the changes do not require either of the following: 1. a change to the TS incorporated in the license; or 2. a change to the update FSAR [Final Safety Analysis Report] that requires approval pursuant to 10 CFR [Title 10 of the *Code of Federal Regulations*] 50.59.”

Therefore, the proposed amendment would (1) revise TS 3.7.3 by the addition of the MFRVs and associated MFRV bypass valves and (2) change page numbers in the TS Table of Contents.

The supplemental letters dated December 18, 2007, and February 26, 2008, provided additional information that clarified the proposed changes in the application. The letter did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination published in the *Federal Register* on June 19, 2007 (72 FR 33785).

2.0 BACKGROUND

In its application, the licensee addressed the MFIVs, MFRVs, and MFRV bypass valves. The MFIVs are 14-gate valves with hydraulic actuators. The MFRVs are air-operated angle valves that control feedwater flow to the steam generator (SG) between approximately 30 percent and full power. The MFRV bypass valves are air-operated globe valves used to control flow to the SG up to approximately 30 percent power.

The MFIVs are safety-related valves that are credited in the safety analysis for isolation in the event of a feedwater line break (FLB) inside containment. In addition, closure of the MFIV limits the addition of feedwater to an SG in the event of a main steam line break (MSLB).

The MFRVs and MFRV bypass valves function to control feedwater flow to the SGs in that they can together terminate flow to SGs in the event of an FLB upstream of the MFIVs or MFRVs or an MSLB. The safety function of the MFRVs and MFRV bypass valves is credited in the WCGS

accident analyses to provide a backup to the MFIVs for the potential failure of an MFIV to close to terminate flow to the SGs. The licensee stated further that the MFRVs and MFRV bypass valves are highly reliable backups to the MFIVs and fully capable of mitigating the design basis events.

WCGS generates steam via four SGs which are supplied with feedwater. Each of the four SG feedwater lines contains an MFIV and an MFRV in series. The MFIVs are located outside of containment and downstream of the MFRVs. Each MFRV has an associated bypass valve (the MFRV bypass valve) in parallel with it. Therefore, the MFIV on each main feedwater line or the MFRV and MFRV bypass valve on that line can isolate the line. In other words, the closure of either (1) the MFIV or (2) the MFRV and MFRV bypass valves terminates flow through the main feedwater line.

Therefore, closure of the MFIVs or the MFRVs and MFRV bypass valves terminates flow to the SGs, thus terminating the FLB event occurring upstream of the MFIVs or MFRVs. The consequences of events occurring in the main steam lines or in the main feedwater lines downstream from the MFIVs will be also mitigated by their closure. Closure of the MFIVs or MFRVs and MFRV bypass valves terminates the addition of feedwater to an affected SG, thereby limiting the mass and energy release for MSLBs or FLBs inside containment and reducing the cooldown effects of MSLBs.

3.0 REGULATORY EVALUATION

In 10 CFR 50.36, the Commission established its regulatory requirements related to the content of the TSs. Pursuant to 10 CFR 50.36, TSs are required to include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. The rule does not specify the particular requirements to be included in a plant's TSs.

As stated in 10 CFR 50.36(d)(2)(i), LCOs "are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications ..." The remedial actions in the TSs are specified in terms of LCO conditions, required actions, and completion times (CTs), or allowed outage times, to complete the required actions.

As required by 10 CFR 50.36(d)(2)(ii), an LCO must be included in TS for any item meeting one of the following four criteria:

- Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
- Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

- Criterion 3: A structure, system, or component [(SSC)] that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
- Criterion 4: A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

Those items that do not fall within or satisfy any of the above criteria are not required to be included in the TSs.

As required by 10 CFR 50.36(d)(3), SRs are the requirements related to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

Paragraph 10 CFR 50.36(d)(2) requires the TSs to provide the actions that must be taken by a licensee when an LCO is not met. When an LCO is not being met, the CTs specified in the TSs are the time allowed for completing the specified required actions. The conditions and required actions specified in the TSs must be acceptable remedial actions for the LCO not being met, and the CTs must be a reasonable time for completing the required actions while maintaining the safe operation of the plant.

4.0 TECHNICAL EVALUATION

Because there is a safety function of the MFRVs and MFRV bypass valves in accident analyses to provide a backup to the MFIVs for the potential failure of an MFIV to close, the licensee has proposed in its application to expand TS 3.7.3 to include the MFRVs and their associated bypass valves.

4.1 Proposed Changes to the TSs

4.1.1 Proposed Changes to TS 3.7.3

1. Add the phrase “, and Main Feedwater Regulating Valves (MFRVs) and MFRV Bypass Valves,” to the title of TS 3.7.3.
2. Add the abbreviation "and MFRVs and MFRV Bypass Valves" to the upper right-hand-corner of every page of TS 3.7.3.
3. Revise LCO 3.7.3 to state the following: “Each MFIV and its associated actuator train, MFRV and MFRV Bypass Valve for the four main feedwater lines shall be OPERABLE.” The current requirement that the “four MFIVs and their associated actuators trains shall be OPERABLE” remains in the revised LCO 3.7.3 and is not changed.

4. Revise the applicable modes for LCO 3.7.3 by adding the following exceptions to Modes 2 and 3:
 - a. MFIV is closed and de-activated; or
 - b. MFRV is closed and deactivated or closed and isolated by a closed manual valve, and the MFRV bypass valve is either closed and de-activated, closed and isolated by a closed manual valve, or isolated by two closed manual valves.
5. Increase the CT for the existing Condition F, for one or more MFIVs inoperable, from 4 hours to 72 hours. The required actions for this condition are not changed.
6. Add the following new conditions G, H, and I to the list of conditions for when LCO 3.7.3 is not being met. The new conditions are the following:
 - a. Condition G, one or more MFRVs are inoperable, with required actions (1) to close or isolate the MFRV and (2) verify MFRV is closed or isolated, with the associated CTs of 72 hours and once per 7 days, respectively, and with a note that separate condition entry for each MFRV is allowed for the condition.
 - b. Condition H, one or more MFRV bypass valves inoperable, with required actions (1) to close or isolate the MFRV bypass valve and (2) verify MFRV bypass valve is closed or isolated, with the associated CTs of 72 hours and once per 7 days, respectively, and with a note that separate condition entry for each MFRV bypass valve is allowed for the condition.
 - c. Condition I, two valves in the same flow path inoperable, with a required action to isolate the affected flow path and the associated CT of 8 hours.
7. Re-number the existing Condition G to be Condition J, and add a reference to the new Conditions G, H, and I to the Condition J. Otherwise, the existing Condition G is not being changed, and the required actions and CTs for existing Condition G are not being changed. However, the required actions are also being re-numbered to be Required Actions J.1 and J.2.
8. Add the phrase “, MFRV and MFRV bypass valve” to the existing SR 3.7.3.1 that requires that the isolation time for the valves to be verified in accordance with the inservice testing program.
9. Add a new SR 3.7.3.3 to verify each MFRV and MFRV bypass valve actuates to the isolation position on an actual or simulated actuation signal at a surveillance test interval (STI) of every 18 months.

The proposed change to SR 3.7.3.1 to replace the valve isolation time by the phrase "within limits" and relocate the time to the TS 3.7.3 Bases is not included in this amendment. This change was part of the licensee adopting TSTF-491, Revision 2, and was issued in Amendment No. 174 by letter dated August 28, 2007.

4.1.2 Proposed Changes to TS Table 3.3.2-1

In adding the MFRVs and MFRV bypass valves to TS 3.7.3, the licensee has also proposed the following changes to Function 5, "Turbine and Feedwater Isolation," in TS Table 3.3.2-1, "Engineered Safety Feature Actuation System [(ESFAS)] Instrumentation":

1. Revise Footnote j for Function 5.a, the solid state protection system (SSPS) portion of the feedwater isolation function, and
2. Add new Footnote k for Function 5.b, the main steam and feedwater isolation system (MSFIS) portion of the feedwater isolation function.

It is the SSPS that provides the signals to the MFRVs and MFRV bypass valves to close. Because the licensee is proposing to include these valves in the modes of applicability for TS 3.7.3, these valves must be included in modes of applicability for the SSPS in TS Table 3.3.2-1.

4.2 Licensee's Justification for Adding MFRVs and MFRV Bypass Valves to TS 3.7.3

The licensee's proposed changes to TS 3.7.3 add the MFRVs and associated MFRV bypass valves to the specification, taking credit for the ability of the MFRVs and the associated MFRV bypass valves for the safety function of the MFIVs (closure on isolation signals). The licensee stated that the MFRVs and MFRV bypass valves close on receipt of any safety injection (SI) signal, a Tavg-Low coincident with reactor trip (P-4), a low-low SG level, or an SG water level - high-high signal. Credit is taken in the accident analyses for the MFIVs to close on demand. However, the MFRVs and MFRV bypass valves are provided as a highly reliable backup in the unlikely event a mechanical failure prevented the primary MFIVs from fully closing. Therefore, the licensee stated, the MFRVs and MFRV bypass valves are fully capable of mitigating the design basis events (discussed in Section 2.0 of this safety evaluation (SE)) involving these valves being credited as a backup to the MFIVs.

While the MFRVs and MFRV bypass valves are not safety-grade equipment, they are still considered by the licensee as highly reliable backup valves to the MFIVs. The licensee is proposing that the MFRVs and MFRV bypass valves are tested to the same standards (frequency and closure time) as the MFIVs, but stated that the MFRVs and their bypass valves are not seismically qualified. The MFRVs and MFRV bypass valves are not HELB [high energy line break] missile protected. The licensee explained that because an earthquake is not assumed to occur coincidentally with a spontaneous break of safety-related secondary piping, then the loss of the non-safety grade MFRVs and MFRV bypass valves 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 non-safety grade MFRVs and MFRV bypass valves closing.

The MFRVs and MFRV bypass are not safety-grade equipment, but they are a highly reliable backup and close on the same isolation signals that closes the MFIVs and are tested to the same standards (frequency and closure time) as the MFIVs. In the unlikely event that a mechanical failure prevented the primary isolation valves from fully closing, the MFRVs and MFRV bypass valves are fully capable of mitigating the design-basis events. The difference between the MFRVs and MFRV bypass valves, and the MFIVs is that the MFRVs and MFRV bypass valves are not fully seismically qualified or missile protected. However, because an earthquake is not assumed to occur coincidentally with a spontaneous break of safety-related secondary piping, loss of the non-safety grade MFRVs and MFRV bypass valves 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 the non-safety grade MFRVs and MFRV bypass valves closing and isolating the main feedwater lines.

The licensee stated that this is supported by the NRC staff in NUREG-0138, "[NRC] Staff Discussion on Fifteen Technical Issues Listed in Attachment to November 3, 1976 Memorandum From Director, Office of Nuclear Reactor Regulation (NRR) to NRC Staff." In its application, the licensee provided the following statements from NUREG-0138:

Consistent with the lesser safety importance of the secondary system boundary, [the NRC] staff does not require that an earthquake be assumed to occur coincident[ly] with a postulated spontaneous break of the steamline piping; i.e., loss of equipment not designed to withstand a SSE [Safe Shutdown Earthquake] is not assumed coincident with an assumed spontaneous steamline break accident.

Continued reliability of these components over the life of the plant is assured by frequency (generally weekly) [of] in-service tests....Thus, the staff believes that it is acceptable to rely on these non-safety grade components in the steam and feedwater systems because their design and performance are compatible with the accident conditions for which they are called upon to function. It is the [NRC] staff position that utilization of these components as a backup to a single failure in safety grade components adequately protects the health and safety of the public.

Therefore, based on the discussion, the licensee concluded that the MFRVs and the associated bypass valves can be considered fully capable of reliably mitigating the design-basis events if the MFIVs fail to close.

In Section 5.1 of Attachment I to its application, the license stated that the MFRVs and MFRV bypass valves meet the criteria in 10 CFR 50.36(d)(2)(ii), which is the criteria for LCOs that must be included in the TSs. This is based on the licensee taking credit in its accident analyses for the MFRVs and MFRV bypass valves being operable and closing to perform the safety function of the MFIVs, if this is needed. This safety function would mitigate an accident and, thus, the MFRVs and MFRV bypass valves would then be an SSC that "is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier." Based on this, the NRC staff concludes that the MFRVs and MFRV bypass valves meet Criterion 3 of 10 CFR 50.36(d)(2)(ii) to be included in plant TSs.

In adding the MFRV and MFRV bypass valves to TS 3.7.3, the licensee has proposed to add these valves to the title of TS 3.7.3 and to LCO 3.7.3. The proposed LCO 3.7.3 would require that four MFIVs and their associated actuator trains, and the four MFRVs and MFRV bypass valves be operable. The four MFRVs and MFRV bypass valves must be required to be operable because both the MFRV and the MFRV bypass valve on a main feedwater line must close to isolate the line, if the MFIV for the line does not close.

The licensee stated that the MFIVs, and the MFRVs and MFRV bypass valves, are considered operable when (1) the isolation times for the valves are within limits when given an isolation actuation signal and (2) the valves are capable of closing on an isolation actuation signal. Therefore, the MFRVs and MFRV bypass valves have the same operability requirements as do the current requirements for the MFIVs. The availability of the MFRVs and MFRV bypass valves to perform the backup isolation function is assured by the new requirements contained in the proposed TS change. Because the TS requirements provide assurance that MFRVs and MFRV bypass valves can perform the required isolation function, a 72-hour CT for one or more MFIVs being inoperable is warranted.

The licensee stated that the following CTs:

- 72 hours for one or more MFIVs, one or more MFRVs, or one or more MFRV bypass valves being inoperable, and
- 8 hours for two valves in the same flow path being inoperable

are reasonable based on operating experience and the low probability of an event occurring during this time period that would require isolation of the main feedwater flow paths. The licensee also stated that the extension of the CT for inoperable MFIVs could prevent an unnecessary plant shutdown transient or prevent a feedwater transient due to a less than adequate time allowed for a repair.

The licensee concluded that the proposed changes to incorporate the MFRVs and MFRV bypass valves into the TSs continue to provide adequate assurance that the valves taken credit at WCGS for isolating feedwater flow to SGs in accidents are maintained capable of performing their safety function (i.e., they are operable) and that WCGS will be operated in a safe manner within the bounds of the applicable accident analyses.

4.3 Licensee's Justification for Adding MFRVs and MFRVs to TS Table 3.3.2-1

In adding the MFRVs and MFRV bypass valves to TS 3.7.3, the modes of applicability for TS 3.7.3 were revised to account for when the MFRVs and MFRV bypass are closed and de-activated in Modes 2 and 3. These changes mean that the automatic main feedwater line isolation through (1) the MFIVs or (2) the MFRVs and MFRV bypass valves is required to be operable only when the plant is within the stated modes of applicability. The ESFAS instrumentation needed for this automatic main feedwater line isolation would, therefore, be required to be operable when the valves to close and isolate the line are required to be operable. Therefore, the licensee has proposed to revise Footnote j for the SSPS to have the modes of applicability for Modes 1 through 3 to be the same as the modes of applicability for TS 3.7.3.

Because Footnote j also applies to the modes of applicability for the MSFIS Function 5.b for feedwater isolation, the licensee has also proposed a new Footnote k to account for the modes of applicability of the MSFIS function for feedwater isolation. The new Footnote k is the same as the existing Footnote j except that the phrase "and de-activated" has been added so that all MFIVs are closed and de-activated. The new Footnote k is essentially the same requirement as the existing Footnote j and, when Footnote j is revised, it will retain the same requirement on the modes of applicability for MSFIS as the current Footnote j does. Since the MSFIS portion of Function 5 in TS Table 3.3.2-1 does not contain instrumentation for closing the MFRVs and MFRV bypass valves, the modes of applicability for MSFIS in TS Table 3.3.2-1 should not change because of the addition of the MFRVs and MFRV bypass valves to TS 3.7.3 and the proposed new Footnote does this for the MSFIS modes of applicability.

4.4 NRC Staff Evaluation

The licensee has proposed to add the four MFRVs and associated MFRV bypass valves to TS 3.7.3 because it is taking credit in accident analyses for the ability of the MFRVs and the associated bypass valves for the safety function of the MFIVs (closure on isolation signals). While the MFRVs and MFRV bypass valves are not safety-grade equipment, they are a highly reliable backup and close on the same isolation signals that closes the MFIVs; they will also be tested to the same standards (frequency and closure time) as the MFIVs. In the unlikely event that a mechanical failure prevented the primary isolation valves from fully closing, the MFRVs and MFRV bypass valves are fully capable of mitigating the design basis events.

The safety difference between the MFRVs and MFIVs is that the MFRVs are not fully seismically qualified or missile protected. However, because an earthquake is not assumed to occur coincidentally with a spontaneous break of safety-related secondary piping, loss of the non-safety grade MFRVs and MFRV bypass valves is not assumed. This is supported by NUREG-0138 that states that loss of equipment not designed to withstand an SSE is not assumed coincident with an assumed spontaneous steamline break accident and that it is acceptable to rely on these non-safety grade components in the steam and feedwater systems because their design and performance are compatible with the accident conditions for which they are called upon to function. Therefore, the NRC staff concludes that utilization of the MFRVs and MFRV bypass valves as a backup to a single failure in the MFIVs adequately protects the health and safety of the public and credit may be taken for the non-safety grade MFRVs and MFRV bypass valves closing in a design basis event involving the MFIVs. Therefore, the MFRVs and the associated bypass valves can be considered fully capable of reliably mitigating these design basis events.

Change to LCO 3.7.3

The licensee stated that the addition of the MFRVs and MFRV bypass valves to LCO 3.7.3 met 10 CFR 50.36(d)(2)(ii). The regulation 10 CFR 50.36(d)(2)(ii) lists the criteria for LCOs to be included in the plant TSs. Criterion 3 is that an SSC is part of the primary success path and functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Because the licensee is taking credit for the MFRVs and MFRB bypass valves as a backup to the MFIVs in design basis events and the NRC staff does not disagree with this credit being

taken in these events, the NRC staff concludes that these valves meet Criterion 3 and, therefore, these valves may be added to LCO 3.7.3 because the addition of these valves meets 10 CFR 50.36(d)(2)(ii).

Changes to Applicable Modes, LCO Remedial Actions, and SRs

Because the licensee has proposed to change LCO 3.7.3 to add the MFRV and MFRV bypass valves, these valves, as required by 10 CFR 50.36, have to be added to the LCO applicable modes, LCO remedial actions, and SRs. Because these valves will be required to be operable, licensee has proposed in some cases, the appropriate applicable modes for when these valves are required to be operable, the appropriate remedial actions to be performed when the valves are inoperable, and the appropriate SRs to demonstrate that these valves are operable must be defined and included in TS 3.7.3.

The licensee has proposed to add the MFRVs and MFRV bypass valves to the modes of applicability, LCO remedial actions, and SRs in a manner that is consistent with the improved standard TSs in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants," Revision 3.1, dated December 1, 2005. The WCGS TSs are based on NUREG-1431, Revision 1, dated April 1995, but that later amendments to the WCGS TSs have included NUREG-1431 up to Revision 3.1.

The proposed changes to TS 3.7.3 applicable modes, LCO conditions and remedial actions, and SRs are based on the licensee being able to close and isolate the main feedwater lines by closing either (1) the MFIVs or (2) the MFRVs and MFRV bypass valves. The proposed TS changes revise the modes of applicability for LCO 3.7.3; add new action conditions, required actions, and CTs for remedial actions for inoperable MFRVs and MFRV bypass valves; and add a new SR 3.7.3.3 and revise the existing SR 3.7.3.1 to demonstrate that the MFRVs and MFRV bypass valves are operable.

The closure limit for the MFRVs and MFRV bypass valves is the closure limits included in the re-analyses to the design basis events that are included in the application. As stated in the licensee's letter dated September 12, 2007, in the response to NRC question 1(a) in Attachment II to the letter, the requirement for a valve to isolate the main feedwater line to close within 15 seconds at a system pressure of 400 pounds per square inch gauge comes from the accident analyses. Therefore, as stated in the TS Bases pages in Attachment IV to the March 14, 2007, letter, insert B 3.7.3-6b, the MFRV and MFRV bypass valves meet this closure time requirement. The September 12, 2007, letter is a supplemental letter to Amendment No. 176 issued by letter dated March 21, 2008, that approved the replacement of the MSIVs and MFIVs by new valves that had a valve closure time of 15 seconds for DBAs. Therefore, based on Amendment No. 176, the MFRVs and MFRV bypass valves cannot have a valve closure time greater than 15 seconds and be a backup to the MFIVs to close and isolate the main feedwater line.

The NRC staff has reviewed the proposed changes to TS 3.7.3 for adding the MFRVs and MFRV bypass valves to the LCO. Based on this review, the NRC staff concludes that the proposed TS changes adequately address (1) the remedial action, including the conditions, required actions and CTs, for when the MFRVs and/or MFRV bypass valves are inoperable,

(2) the surveillances to determine if these valves are operable, and (3) the applicable modes for these valves.

The proposed remedial conditions and required actions for inoperable MFRVs and MFRV bypass valves, proposed Conditions G and H, respectively, are consistent with that for the MFIVs. The proposed CT of 72 hours is addressed in the next subsection. The proposed Condition I for two inoperable valves in the same flow path addresses the possibility that there are two inoperable valves in a main feedwater line and, therefore, the line can no longer be isolated by either the MFIV or the MFRV and MFRV bypass valve for that line. For this condition, there is no backup to the inoperable valve or valves and the CT should be less than the 72 hours proposed for the existing Condition F and proposed Conditions G and H. For Condition I, the licensee proposed the CT of 8 hours and stated the 8 hours was reasonable, based on operating experience and low probability that there are two valves on the line being inoperable.

The proposed SRs to demonstrate operability for the MFRVs and MFRV bypass valves will be the same as the SRs for the MFIVs. The licensee stated that the operability of the MFRVs and MFRV bypass valves is demonstrated by (1) valve closure time within the limit assumed for the accident analyses involving the main feedwater line and (2) the valves would actuate to the closed position on an actual or simulated actuation signal. The proposed revision to SR 3.7.3.1 and the new SR 3.7.3.3 for the MFRV and MFRV bypass valves are the same SRs as the existing SR 3.7.3.1 and 3.7.3.2 that are used to demonstrate operability for the MFIVs. The STI for these SRs are not changed. The proposed new SR 3.7.3.3 contains the same note as in the existing SRs 3.7.3.1 and 3.7.3.2 that the SR is only required to be performed in Modes 1 and 2.

These proposed TS changes are also consistent with the remedial actions, surveillances, and modes of applicability for the MFRVs and MFRV bypass valves in the improved standard TSs for Westinghouse plants in NUREG-1431. The proposed TS changes to add the MFRVs and MFRV bypass valves are also consistent with the remedial actions and SRs for the MFIVs. The 8 hours for proposed Condition I is also in the improved standard TSs.

Based on the above discussion in this subsection, the NRC staff concludes that these proposed changes to TS 3.7.3 meet 10 CFR 50.36.

Change to the CT for Existing Condition F and Proposed CTs for Conditions G and H

This approval of the changes to TS 3.7.3 includes the extension of the CT from 4 hours to 72 hours for one or more inoperable MFIVs and for one or more MFRVs or MFRV bypass valves. The proposed CT for verifying the valves are closed remains the same as that in the existing Condition F. The extension of the CT for one or more inoperable MFIV and the proposed 72 hours for the MFRV and MFRV bypass valves is based on the MFRVs and MFRV bypass valves backing up the MFIVs so that one or more inoperable MFIV, MFRV, or MFRV bypass valves may have more than the current CT of 4 hours.

If one or more MFIVs are inoperable, there may be up to 72 hours to close the MFIV because there is the operable MFRV and MFRV bypass valve on the same main feedwater line to close and isolate the line. This CT is the same CT of 72 hours in the actions for TS 3.7.3 for the case of two inoperable MFIV actuator trains where the two inoperable actuator trains are not in the

same separation group. Since each MFIV has two redundant actuator trains to close the valve, having two inoperable actuator trains where the two trains are not in the same separation group means that there are two MFIVs each with one inoperable actuator train and one operable actuator train capable of closing the valve within the limit for the valve. This is the same as the present case of an inoperable MFIV with an operable MFRV and MFRV bypass valve to perform the MFIV safety function with the limit for the valve. On the same basis, this would apply to one or more inoperable MFRVs or MFRV bypass valves with the operable MFIV to perform the MFRV and MFRV bypass valve safety function. Therefore, the NRC staff concludes that the proposed CT of 72 hours to (1) close the inoperable MFIV for existing Condition F and (2) close the inoperable MFRV or MFRV bypass valve for proposed Conditions G and H is acceptable and meets 10 CFR 50.36.

Separate Condition Entry for New Conditions G and H

Also, the separate condition entry for the MFIVs in the current TSs is simply being extended to the MFRVs and MFRV bypass valves, and is in NUREG-1431 for these valves. This is treating the MFRVs and MFRV bypass valves in the same manner as the MFIVs. Since the MFRVs and MFRV bypass valves are being credited as backup valves to the MFIVs, the NRC staff concludes that this proposed change is acceptable and meets 10 CFR 50.36.

Administrative Changes to TS 3.7.3

The proposed addition of MFRVs and MFRV bypass valves to the title of TS 3.7.3 and to the abbreviation in the upper right-hand corner of the TS 3.7.3 pages is necessary because LCO 3.7.3 will include the requirement that the MFRVs and MFRV bypass valves are operable and, by the format of the TSs, the title must contain the components listed in the LCO. Based on this, the NRC staff concludes that these proposed changes to the format of TS 3.7.3 maintain the format of the WCGS TSs and meet 10 CFR 50.36.

Changes to the Modes of Applicability for Functions 5.a and 5.b of TS Table 3.3.2-1

The modes of applicability for (1) TS 3.7.3 on the MFIVs, MFRVs, and MFRV bypass valves and (2) Function 5, feedwater isolation, in TS Table 3.3.2-1 on ESFAS instrumentation have to be the same. The modes of applicability determined the reactor modes that systems and components are required to be operable by the TSs. TS 3.7.3 are the valves that isolate the feedwater lines and TS Table 3.3.2-1 are the ESFAS instrumentation that automatically acts to isolate the feedwater lines. A signal from the ESFAS instrumentation goes to the feedwater valves to isolate the lines.

The licensee has proposed to revise Footnote j of TS Table 3.3.2-1. This footnote applies to Modes 2 and 3 of both ESFAS Function 5.a (SSPS) and 5.b (MSFIS) of TS Table 3.3.2-1. Since it is only SSPS that provides the closure signal to the MFRVs and MFRV bypass valves, it is only the footnote to Modes 2 and 3 for Function 5.a (SSPS) that must be revised to account for the changes to the modes of applicability for the addition of MFRV and MFRV bypass valves to TS 3.7.3. By its supplemental letter dated December 18, 2007, the licensee has proposed to revise Footnote j to have the same modes of applicability for Modes 2 and 3 for Function 5.a (SSPS). Based on this, the NRC staff concludes that the proposed Footnote j is acceptable and meets 10 CFR 50.36.

By the licensee's proposal to revise Footnote j, without the proposed new Footnote k, the licensee would also be proposing to change the modes of applicability for Modes 2 and 3 for Function 5.b (MSFIS) because this footnote applies also to the modes of applicability for this function. Because the MSFIS function is not involved in the operation of the MFRVs and MFRV bypass valves, there should not be a change in the modes of applicability for Function 5.b (MSFIS) in TS Table 3.3.2-1 because the MFRVs and MFRV bypass valves are being added to TS 3.7.3. Therefore, the licensee proposed Footnote k, in its application and supplemental letter dated December 18, 2007, which is essentially the same requirement stated in the existing Footnote j before the proposed change to the footnote. By adding the phrase "and de-activated" to the existing Footnote j, the proposed Footnote k is "[e]xcept when all MFIVs are closed and de-activated." This proposed requirement is more stringent than the existing Footnote j, which is simply "[e]xcept when all MFIVs are closed." The addition of the phrase "and de-activated" provides more assurance that the MFIVs will not be open and that the MSFIS instrumentation does not need to be operable and available to close the valves if the feedwater lines need to be isolated in response to an accident. Based on this, the NRC staff concludes that the proposed Footnote k is acceptable and meets 10 CFR 50.36.

4.5 Conclusions

In Section 4.3 of this SE, the NRC staff concluded that the proposed changes to add the four MFRVs and MFRV bypass valves to TS 3.7.3, which are listed in Section 4.1 of this SE, meet 10 CFR 50.36. Based on this conclusion, the NRC staff further concludes that these proposed changes to TS 3.7.3 and TS Table 3.3.2-1 are acceptable.

In revising TS 3.7.3, the licensee has added to the number of pages contained within TS 3.7.3. The licensee has proposed to (1) change the title of TS 3.7.3 and (2) re-number the pages of the remaining TSs 3.7.4 through 3.7.18 in Section 3.7, "Plant Systems," of the WCGS TSs. As discussed in Section 4.4 of this SE, the licensee has proposed to add the phrase "and Main Feedwater regulating Valves (MFRVs) and MFRV Bypass Valves" to the title of TS 3.7.3 and the NRC staff has concluded that this is acceptable. Based on this, the licensee has proposed to add the same phrase to the title of TS 3.7.3 in the Table of Contents. Also, the TSs 3.7.4 through 3.7.18 are being re-numbered with no changes to any of the requirements, text, or format of these TSs, and, therefore, the only change is to the page numbers. Because (1) changing the title in the Table of Contents to conform to the title of the TS and (2) re-numbering of TS pages in the Table of Contents, with no other change to the TS pages, is strictly administrative and does not change any requirements in the TSs, the NRC staff concludes that this (1) re-titling of TS 3.7.3 and (2) TS page re-numbering and the associated change to page numbers in the TS Table of Contents is acceptable and meets 10 CFR 50.36. Based on this, the NRC staff further concludes that these administrative changes to the TSs are acceptable.

The licensee identified a regulatory commitment in Attachment V to its application. The licensee committed to implement the license amendment prior to the startup from refueling outage 16 (RO 16), which is scheduled for the spring of 2008. The implementation of this amendment would be done with the implementation of (1) Amendment No. 175 issued March 3, 2008, which approved the separation of the SSPS and MSFIS in TS Table 3.3.2-1 and (2) Amendment No. 176 issued March 21, 2008, which approved the replacement of the MSIVs and MFIVs in RO 16. The NRC staff concludes that this current amendment can be implemented at the same time these other two amendments are implemented, which is the implementation date in the

regulatory commitment, prior to the startup from RO 16. Based on this, the NRC staff concludes that the implementation date in the regulatory commitment is acceptable for this amendment.

4.6 Identified Changes to TS 3.7.3 Bases

The licensee identified changes to the TS Bases for TS 3.7.3 in Attachment IV to its application and to its supplemental letter of February 26, 2008. These changes have been reviewed by the NRC staff not to approve the changes, but to determine if the staff has any disagreement with the identified changes. Changes to the TS Bases are controlled by TS 5.5.14 as discussed in Section 1.0 of this SE. In reviewing these identified changes, the NRC staff had no disagreement with the identified changes to the TS Bases.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Missouri State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (72 FR 33785, published on June 19, 2007). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

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

Principal Contributor: Jack Donohew

Date: April 3, 2008