

November 7, 2006

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:  
ADDITION OF ACTUATOR TRAINS TO MAIN STEAM AND FEEDWATER  
ISOLATION VALVES TECHNICAL SPECIFICATIONS (TAC NO. MD2895)

Dear Mr. Muench:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 171 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 August 25, 2006 (WM 06-0033), as supplemented by letter dated October 25, 2006 (WO 06-0041).

The amendment revises TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)," to add the associated actuator trains to (1) the limiting condition for operation (LCO), (2) the conditions, required actions, and completion times for the LCO, and (3) the surveillance requirements. Because of the two additional pages being added to TSs 3.7.2 and 3.7.3, the Table of Contents for the TSs is changed to account for the resulting renumbering of TS pages.

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. 171 to NPF-42  
2. Safety Evaluation

cc w/encls: See next page

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DATE	11/6/06	11/7/06	10/30/06	11/6/06	11/7/06

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WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 171  
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 August 25, 2006, as supplemented by letter dated October 25, 2006, 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 2.C.(2) of Facility Operating License No. NPF-42 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 171, 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 within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

David Terao, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: November 7, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 171

FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Replace the following pages of the Appendix A Technical Specifications with the attached 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.

REMOVE

iii  
3.7-5 to 3.7-39  
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INSERT

iii  
3.7-5 to 3.7-39  
3.7-40  
3.7-41

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 171

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 August 25, 2006, as supplemented by letter dated October 25, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML062430528 and ML063040662, 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 amendment would revise TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)," to add the associated actuator trains to (1) the limiting condition for operation (LCO), (2) the conditions, required actions, and completion times for the LCO, and (3) the surveillance requirements (SRs). The existing conditions and required actions in TS 3.7.2 would be renumbered to account for the proposed new conditions and required actions for TSs 3.7.2 and 3.7.3.

Each MSIV and MFIV has two actuator trains. The Table of Contents for the TSs would be changed to account for the resulting renumbering of TS pages.

The supplemental letter dated October 25, 2006, provided additional information that clarified the application, 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 September 1, 2006 (71 FR 52173).

The licensee also identified changes to the TS Bases associated with the proposed amendment and stated that these changes would be made in accordance with TS 5.5.14, "Technical Specifications Bases Control Program," at the time that the amendment is implemented, if approved.

2.0 BACKGROUND

As described in the application, the MSIVs are to isolate the main steamlines, and, thus, the steam generators (SGs) from the turbine, in the event of a high-energy line break. The MSIV terminates the flow from the unaffected or intact SGs to the line break. The MFIVs are to

isolate the main feedwater system flow to the secondary side of the SGs following a high-energy line break.

There are four MSIVs, one in each of the four main steamlines from the four SGs to the high-pressure turbine, outside the containment and downstream of the main steam safety valves on the main steamlines. They prevent uncontrolled blowdown from more than one SG in the event of a postulated design-basis accident (DBA).

There are four MFIVs, one in each of the four main feedwater lines outside containment and downstream of the feedwater control valve. The MFIVs isolate the non-safety-related portions of the feedwater system from the safety-related portions of the system and prevent uncontrolled blowdown from more than one SG in the event of a feedwater pipe rupture in the turbine building. The main feedwater check valve provides backup isolation.

Each MSIV and MFIV has two redundant actuator trains to meet the single-failure criterion in closing the valve. Only one of the two actuator trains for a valve is needed to close the valve. The licensee stated that one of the two trains is associated with separation group 4 (yellow) and the other is associated with separation group 4 (red). The main steam and feedwater isolation system (MSFIS) controls the actuator trains for the four MSIVs and MFIVs, with one of the two MSFIS trains to one of the two separation groups for each of the valves. This separation meets the single-failure criterion.

The required closure time of the MSIVs and MFIVs by the associated actuator trains for the accident analyses is less than or equal to 5 seconds, as specified in SRs 3.7.2.1 and 3.7.3.1. The frequency of the surveillances is in accordance with the plant inservice testing (IST) program. This is not being changed by this amendment.

The engineered safety feature actuation system (ESFAS) instrumentation function for closing the MSIVs (i.e., main steam line isolation) and the MFIVs (i.e., main feedwater isolation) is Functions 4.b and 5.a in TS Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation." These functions require two separate and redundant trains, with these two trains going separately to the two actuator trains for each MSIV and MFIV.

In its application, the licensee stated that only three of the four MSIVs and MFIVs are assumed to close in the WCGS accident analyses.

### 3.0 REGULATORY EVALUATION

In Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36, "Technical specifications," the NRC established its regulatory requirements related to the content of TSs. In doing so, the NRC emphasized those matters related to the prevention of accidents and mitigation of consequences of such accidents. As recorded in the Statements of Consideration, Technical Specifications for Facility Licenses: Safety Analysis Reports (33 FR 18610, December 17, 1968), the NRC noted that licensees are expected to incorporate into their plant TSs those items that are directly related to maintaining the integrity of the physical barriers designed to contain radioactivity. Pursuant to 10 CFR 50.36, TSs are required to include items in five specific categories related to station operation. Specifically, those categories include: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) SRs;

(4) design features; and (5) administrative controls. However, the rule does not specify the particular requirements to be included in a plant's TSs.

As stated in 10 CFR 50.36(c)(2)(i), the LCOs "are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a[n LCO] 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 conditions and required actions specified for each LCO provide the remedial actions permitted by 10 CFR 50.36(c)(2)(i) when the LCO is not being met. They address single outages of components, trains, or subsystems for the SSCs addressed by LCOs. Because the TSs do not address every subcomponent and attendant equipment that make up the SSCs in the LCOs for the SSCs to perform their safety functions, the TSs also contain the definition of "Operable-Operability," which states the following:

A system, subsystem, train, component, or device shall be operable or have operability when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

The single-failure criterion for nuclear power plants is the requirement, for safety-related SSCs used to mitigate abnormal operational occurrences and DBAs, that there is sufficient redundancy in components and features such that the safety function(s) for any such SSC can be accomplished assuming any single failure. The single-failure criterion is defined in Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," of 10 CFR Part 50, and stated in GDCs 17, 34, 35, 38, 41, and 44. Plants are designed and licensed to meet the single-failure criterion. Plants are normally operated with the requirement that the single-failure criterion is being met in that the TSs contain LCOs that require that all necessary SSCs, which meet the four criteria in 10 CFR 50.36(c)(2)(ii), to be operable.

As explained in Generic Letter 80-30, "Clarification Of The Term 'Operable' As It Applies To Single Failure Criterion For Safety Systems Required By Technical Specifications," dated April 10, 1980, plant TSs are formulated to preserve the single-failure criterion (discussed below) for structures, systems, and components (SSCs) described in the final safety analysis report (FSAR) (i.e., the NRC-approved plant design basis) that are relied upon in the DBA analyses. By and large, the single-failure criterion is preserved by specifying LCOs that require all redundant components of safety-related systems to be operable. When the required redundancy is not maintained, either due to equipment failure or a maintenance outage, the TSs require an action to be taken with a CT which is a temporary relaxation of the single-failure criterion in that the specified CT allows a plant to operate with inoperable safety-related equipment (i.e., the single-failure criterion not being met) before the plant may have to shut down. The specified CT provides a limited time, consistent with overall system reliability and risk considerations, to fix the equipment or otherwise make it operable.

Given that the design and safety function(s) of the MSIVs and MFIVs and the associated actuator trains are not being changed by the proposed amendment, there are no applicable

GDCs related to the design and safety function of the MSIVs and MFIVs, and the associated actuator trains, for this amendment.

#### 4.0 TECHNICAL EVALUATION

In its application, the licensee proposed to add the actuator trains to TSs 3.7.2 and 3.7.3 in the following manner:

##### TS 3.7.2, MSIVs:

- Add the phrase "and their associated actuator trains" to LCO 3.7.2 to require that "the four MSIVs and their associated actuator trains shall be operable."
- Add five new Conditions A through E, and the associated required actions and CTs, to address inoperability of the eight actuator trains on the four MSIVs:
  - A. Condition A for one MSIV actuator train inoperable, with Required Action A.1 to restore the train to operable status within 7 days.
  - B. Condition B for two MSIV actuator trains inoperable for different MSIVs when the inoperable actuator trains are not in the same separation group, with Required Action B.1 of restoring one MSIV actuator train to operable status within 72 hours.
  - C. Condition C for two MSIV actuator trains inoperable when the inoperable actuator trains are in the same separation group, with Required Action C.1 of restoring one MSIV actuator train to operable status within 24 hours.
  - D. Condition D for two actuator trains inoperable for one MSIV, with the Required Action D.1 to declare the affected MSIV inoperable immediately.
  - E. Condition E for three or more actuator trains inoperable or Required Action and CT of the above Condition A, B, or C not being met, with Required Action E.1 to declare each affected MSIV inoperable immediately.
- Renumber the existing Conditions A through D for the above five new proposed conditions, and renumber the associated required actions. These conditions and required actions are changed as to what is required and the associated CTs are not changed.
- The phrase "MSIV actuates" is changed to "actuator train actuates the MSIV" in SR 3.7.2.2. The stated frequency of 18 months for the SR is not changed.

##### TS 3.7.3, MFIVs:

- Add the phrase "and their associated actuator trains" to LCO 3.7.3 to require that "the four MFIVs and their associated actuator trains shall be operable."

- Revise the note for separate condition entry for the actions for LCO 3.7.3 by replacing the word “valve” by the word “MFIV,” thus stating “Separate Condition entry is allowed for each MFIV.” Also, move the note to the new Condition F for one or more MFIVs inoperable.
- Add five new Conditions A through E, and the associated required actions and CTs, to address inoperability of the eight actuator trains on the four MFIVs:
  - A. Condition A for one MFIV actuator train inoperable, with Required Action A.1 to restore the train to operable status within 7 days.
  - B. Condition B for two MFIV actuator trains inoperable for different MFIVs when the inoperable actuator trains are not in the same separation group, with Required Action B.1 of restoring one MFIV actuator train to operable status within 72 hours.
  - C. Condition C for two MFIV actuator trains inoperable when the inoperable actuator trains are in the same separation group, with Required Action C.1 of restoring one MFIV actuator train to operable status within 24 hours.
  - D. Condition D for two actuator trains inoperable for one MFIV, with Required Action D.1 to declare the affected MFIV inoperable immediately.
  - E. Condition E for three or more actuator trains inoperable or Required Action and CT of the above Condition A, B, or C not being met, with Required Action E.1 to declare each affected MFIV inoperable immediately.
- Renumber the existing Conditions A through D for the above five new proposed conditions, and renumber the associated required actions. These conditions and required actions are changed as to what is required and the associated CTs are not changed.
- Add the phrase “of Condition F” to the re-numbered Condition G so that the reference to required action and associated CT not met is to the re-numbered Condition F.
- The phrase "MFIV actuates" is changed to "actuator train actuates the MFIV" in SR 3.7.3.2. The stated frequency of 18 months for the SR is not changed.

#### 4.1 Proposed Changes to LCOs 3.7.2 and 3.7.3

In its application, the licensee stated that it has proposed to revise LCOs 3.7.2 (MSIVs) and 3.7.3 (MFIVs) to specifically address the associated actuator trains for the MSIVs and MFIVs. In doing this, the licensee proposed to add the phrase "and their associated actuator trains" to LCOs 3.7.2 and 3.7.3 so that the requirement to be operable would apply to both the valves and the two associated actuator trains that are part of each valve.

## 4.2 Proposed Additional Conditions Based on Inoperable Valve Actuator Trains

This section discusses the proposed five new Conditions A through E, which address different conditions resulting from one or more inoperable actuator trains, and the associated CTs for the conditions. The proposed conditions and CTs are the same for TS 3.7.2 (MSIVs) and TS 3.7.3 (MFIVs) because both sets of valves are of the same design in that each valve has dual-redundant actuator trains, each of which is capable of closing the valve. The licensee stated that the proposed CTs were based on engineering judgment and consistency with CTs for other required actions in the TSs. The licensee also performed a probabilistic safety assessment (PSA) evaluation to gauge the acceptability of the CTs. This is addressed at the end of this section.

### Proposed Condition A

For proposed Condition A, for one actuator train (for either an MSIV or MFIV) being inoperable, on one valve, the licensee stated that a CT of 7 days to restore the inoperable train to operable status is reasonable because of the dual-redundant actuator train design in that only one actuator train is required for the closure of the valve. The licensee further stated that the proposed 7-day CT takes into account the design redundancy of the two actuator trains for each valve, that one valve is assumed not to close in the DBAs, a reasonable time for repairs to return the inoperable actuator train to operable status, and the low probability of a DBA occurring during the period an actuator train is inoperable. The licensee stated that the 7-day CT is consistent with Required Action A.1 of TS 3.7.5, "Auxiliary Feedwater (AFW) System," which has a 7-day CT to restore one inoperable steam supply of the two redundant steam supplies to the turbine-driven AFW pump.

### Proposed Condition B

For proposed Condition B, for two actuator trains (for either an MSIV or MFIV) being inoperable, on two different valves, when the inoperable actuator trains are not in the same separation group, the licensee stated that a CT of 72 hours to restore one actuator train to operable status is reasonable with regard to the dual-redundant actuator train design in that only one actuator train is required for the closure of the valve and one valve is assumed not to close in the DBAs. If the two inoperable actuator trains are in different separation groups, then each valve is still capable of closing on demand (i.e., there would have to be a further failure, such as an ESFAS instrumentation train to have a valve fail to close, as required for DBAs). However, comparing Condition B (two inoperable trains) to Condition A (one inoperable train), the licensee stated that it is appropriate to have a shorter CT for Condition B since there is an increased likelihood that a valve may fail to close in an accident. The licensee concluded that a CT of 72 hours for Condition B, which is significantly shorter than the 7-day CT proposed for Condition A, would be reasonable.

### Proposed Condition C

For proposed Condition C, for two actuator trains (for either an MSIV or MFIV) being inoperable, when the inoperable actuator trains are in the same separation group and, thus, on different valves, the licensee stated that a CT of 24 hours is appropriate. The licensee explained that the proposed CT of 24 hours is reasonable and conservative because each of

the two affected valves still has an operable actuator train to close the valve and one valve is assumed not to close in a DBA, and there is a low probability of such an event occurring during this period. In comparing this CT to other CTs in the TSs, the licensee stated that the CT is consistent with Condition G of Function 4.b (steamline isolation - automatic actuation logic and actuation relays) of TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," which provides a CT of 24 hours for restoring one train, of two required trains, to operable status. Because this ESFAS function provides the close signal to one of the two actuator trains for each of the four MSIVs or MFIVs, the licensee concludes that the loss of one actuation logic train is equivalent to the loss of all four actuator trains in the same separation group at the four MSIVs or MFIVs.

The licensee further stated that with two actuator trains in the same separation group being inoperable, an accident and an additional failure, such as the loss of the ESFAS instrumentation train in the other separation group, would result in two MSIVs, or two MFIVs, failing to close in the accident. Therefore, comparing Condition B (two inoperable trains in different separation groups on different valves) to Condition C (two inoperable trains in the same separation groups on different valves), it is appropriate to have a shorter CT for Condition C since there is an increased likelihood that an MSIV, or MFIV, may fail to close in an accident. The licensee's proposed CT of 24 hours for Condition C is significantly shorter than the proposed CT of 72 hours for the Condition B.

#### Proposed Condition D

Where two actuator trains are inoperable (on either an MSIV or an MFIV), proposed Condition D addresses when both inoperable actuator trains are on the same valve and requires that the affected valve be declared inoperable immediately. This proposed condition is consistent with the presence of only two actuator trains on a valve and, with both trains inoperable, the valve cannot perform its safety function(s) and there is no reason to consider any further action. With both actuator trains inoperable, the valve is inoperable. As defined in the TSs, the word "immediately" used as a CT means that "the required action should be pursued without delay and in a controlled manner." Declaring the affected valve inoperable would result in the licensee entering existing Condition A or C, depending on the number of valves that are inoperable and the reactor mode the plant is in. The licensee is not proposing to change the requirements in existing Conditions A and C with respect to the required actions and CTs when there are inoperable MSIVs or MFIVs.

#### Proposed Condition E

For proposed Condition E, where (1) three or more actuator trains are inoperable or (2) the above Condition A, B, or C are not met, the licensee proposed to immediately declare the affected MSIVs, or MFIVs, inoperable and, thus, immediately enter the existing Condition A, C, or LCO 3.0.3 (for MSIVs) or Condition A (for MFIVs), as is discussed above for proposed Condition D. For three or more inoperable actuator trains, the licensee stated that this would have to result in two or more actuator trains in the same separation group being inoperable, and, further, the failure of an ESFAS instrumentation train to the operable actuator train could result in two or more valves failing to perform their safety function(s). If any two of these actuator trains were on the same MSIV or MFIV, then the licensee would also have to enter proposed Condition D and declare the affected valve inoperable, as discussed above. The

licensee stated that it would be conservative to immediately declare the affected MSIVs or MFIVs inoperable for this proposed condition.

Proposed Condition E would also include the case where any of the required actions or CTs for proposed Conditions A, B, and C are not met. For this case, the licensee proposed to immediately declare the affected MSIVs or MFIVs inoperable and, thus, immediately enter the existing Condition A, C, or LCO 3.0.3, as is discussed above, for proposed Condition D. The licensee stated that this is conservative, and consistent with other specifications in the TSs, and the format of the Improved Standard TSs (NUREG-1431). The WCGS TSs are based on this Standard TSs.

#### PSA Evaluation of Proposed CTs

The licensee stated that a PSA was also performed to gauge the acceptability of the above CTs for the proposed Conditions A, B, and C for inoperable MSIV or MFIV actuator trains using the metrics in the following Regulatory Guides (RGs):

- RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated July 1998, and
- RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998.

The licensee stated that conclusion of the PSA evaluation was that the CTs for inoperable MSIV or MFIV actuator trains, which were based on engineering judgment and consistency with the WCGS TSs, were conservative.

#### 4.3 Separate Condition Entry Note

The existing note for separate condition entry for the actions for LCO 3.7.3 is being revised by replacing the word "valve" by the word "MFIV," and stating "Separate Condition entry is allowed for each MFIV." Also, the note is proposed to be moved to the new Condition F for one or more MFIVs inoperable. The proposed change maintains the separate condition entry for the MFIVs. There is no change in requirements for TS 3.7.3.

In its supplemental letter, the licensee stated that a "separate Condition entry" note was not proposed for TS 3.7.2 because the current Condition C (the proposed Condition H) already contains a "separate Condition entry" note for one or more MSIV inoperable in Mode 2 or 3. For TS 3.7.3, the existing "separate Condition entry" note to the LCO 3.7.3 actions is applicable only to the MFIVs (the valves) and is not being extended to the actuation trains being added to the LCO statement. Therefore, it only applies to the new Condition F for one or more inoperable MSIVs, and, to eliminate any confusion with respect to the actuator trains, the licensee proposed to move the note to the new Condition F. The licensee stated that the note for "separate Condition entry" for the MSIVs should be maintained in TS 3.7.3 because of (1) the very short CT for the new Condition F (i.e., 4 hours) and (2) the "separate Condition entry" note is the improved Standard TSs (NUREG-1431).

#### 4.4 SRs 3.7.2.2 and 3.7.3.2 for MSIVs and MFIVs

In its application, the licensee identified that SRs 3.7.2.2 (MSIVs) and 3.7.3.2 (MFIVs) would be changed to replace the phrase "MSIV [MFIV] actuates" with the phrase "actuator train actuates the MSIV [MFIV]." Therefore, the current SRs 3.7.2.2 and 3.7.3.2, which require verifying that each MSIV and MFIV actuates to the isolation on an actual or simulated actuation signal, would be changed to require verifying that each actuator train actuates the MSIV and MFIV to the isolation position on an actual or simulated actuation signal. The licensee stated that changes to SRs 3.7.2.2 and 3.7.3.2 were requested to clearly show that both actuator trains of the MSIVs and MFIVs are required to be tested. Since both actuator trains for an MSIV and an MFIV are capable of separately closing the valve, both actuator trains must be shown to close the valve on an actual or simulated signal. Neither the requirement that the valves are closed on an actual or simulated signal nor the frequency of performing the surveillance is being changed by this amendment.

#### 4.5 SRs 3.7.2.1 and 3.7.3.1 for MSIVs and MFIVs

The licensee did not propose to change SRs 3.7.2.1 (MSIVs) and 3.7.3.1 (MFIVs) in its amendment request. The SRs require the verification that the isolation time for each MSIV and MFIV is less than or equal to 5 seconds. These SRs do not need to be changed because the isolation time for the valve is independent of the actuator train (i.e., both actuator trains of the MSIV and MFIV must close the valve separately to meet the closure time needed by the accident analyses). As stated in the TS Bases for SR 3.7.2.1, the no-more-than-5-seconds closure time is "[t]he MSIV [MFIV] isolation time ... assumed in the accident and containment analyses." Based on this, the NRC staff concludes that SRs 3.7.2.1 and 3.7.3.1 are sufficient to determine if the actuator trains for each MSIV and MFIV closes in no more than 5 seconds as required by the safety analyses. The NRC staff further concludes that the existing frequency of testing the MSIV and MFIV in accordance with the IST program, which is stated in SRs 3.7.2.1 and 3.7.3.1, is also sufficient for the actuator trains because the actuator trains have been tested for operability at this frequency in the past and the MSIVs and MFIVs are not being changed by the amendment. Based on this, the NRC staff agrees with the licensee that changes to SRs 3.7.2.1 and 3.7.3.1 are not needed.

#### 4.6 Evaluation of Proposed TS Changes

The licensee has proposed to add the valve actuator trains to LCOs 3.7.2 and 3.7.3 by adding the phrase "and their associated actuator trains" to the LCO such that the new titles for the LCOs would be the following: "Four MSIVs [MFIVs] and their associated actuator trains shall be operable." The licensee stated that the proposed addition of actuator trains to LCO 3.7.2 is to add conditions, required actions, and CTs for the actuator trains, which are part of the MSIVs and MFIVs, to TSs 3.7.2 (MSIVs) and 3.7.3 (MFIVs).

Given that the MSIVs meet the criteria in 10 CFR 50.36(c)(2)(ii) to be included in the TSs and the actuator trains are part of the valves, the actuator trains must be capable of performing their related support function and may be included in the LCO statement. However, by requiring the MSIVs to be operable, LCO 3.7.2 would also be requiring the MSIV actuator trains to be operable without adding the words "associated actuator trains" to the LCO. Specifically, since there are two actuator trains for each MSIV, then the TSs could be written to include required

actions and CTs for having one or more actuator trains inoperable, given that all the MSIVs must close for the MSLB accident and only one of the two actuator trains for each MSIV must actuate for the MSIV to close. Thus, when there are inoperable MSIV actuator trains the approved Wolf Creek design basis is degraded in that the operating plant has inoperable equipment and no longer meets the single-failure criterion. The same can be stated for MFIVs and LCO 3.7.3.

Based on (1) the NRC staff precedent, in the standard TSs, of providing remedial actions for loss of single-failure protection for redundant safety system designs, and (2) the proposed CTs (addressed in Section 4.2 of this SE), the NRC staff concludes that the licensee's proposed addition of actuator trains to LCOs 3.7.2 (for MSIVs) and 3.7.3 (for MFIVs) meets the 10 CFR 50.36(c)(2)(i) standard to be included in the TSs, and is, therefore, acceptable.

The licensee has also proposed to add five conditions to LCOs 3.7.2 and 3.7.3 to address five different cases where there are inoperable MSIV or MFIV actuator trains because the existing conditions do not address inoperable actuator trains. These five conditions are evaluated below:

#### Proposed Condition A

Proposed Condition A is for one actuator train on one MSIV (or MFIV) being inoperable. As presented in its application and discussed above, the licensee has stated that the two actuator trains in an MSIV (or MFIV) are redundant and either train can close the valve within the 5 seconds required by the accident analysis, which is required by SR 3.7.2.1 (or SR 3.7.3.1). Each of the two actuator trains has an input from a separate ESFAS instrumentation train, as discussed in Section 2.0 of this SE. Based on this, the NRC staff concludes that loss of a single actuator is a loss-of-single-failure-protection degraded condition because one of the two actuator trains is inoperable.

A further failure (e.g., the loss of the other actuator train for the MSIV (or MFIV) or the loss of the ESFAS instrumentation train not in the same separation group as the actuator train that is inoperable) would result in a loss-of-function condition in that the MSIV would not be able to close upon demand. However, the TSs are based on actual failures of equipment and not on postulated future failures and each MSIV design is such that the loss of one actuator train does not in itself prevent the MSIV from closing in an accident. Thus, the loss of the actuator train causes the MSIV (or MFIV) to be in a loss-of-single-failure-protection degraded condition.

For an inoperable MSIV or MFIV actuator train, the licensee proposed the required action to restore the actuator train to operable status within 7 days.

In its application, the licensee stated that the 7-day CT is consistent with Required Action A.1 of TS 3.7.5, "Auxiliary Feedwater (AFW) System," which has a 7-day CT to restore one inoperable steam supply, of the two redundant steam supplies to the turbine-driven AFW pump, to operable status. The AFW system is composed of one turbine-driven pump and two motor-driven pumps, configured into three trains, that automatically supplies feedwater to the four steam generators to remove decay heat from the core in the reactor coolant system upon the loss of normal feedwater. Each motor-driven AFW pump provides 100 percent of the feedwater

flow required and the turbine-driven AFW pump provides 200 percent of the flow with the two redundant steam supplies.

LCO 3.7.5 requires that the three AFW trains, or pumps, shall be operable and Condition A for this LCO is that one of redundant steam supplies to the turbine-driven AFW pump is inoperable. The CT for Required Action A.1 to restore the inoperable steam supply to operable status is 7 days. It is stated in TS 3.7.5 Bases that the 7-day CT is based on the following:

1. The redundant steam supply to the turbine-driven AFW pump is operable,
2. The availability of redundant operable motor-driven AFW pumps, and
3. The low probability of an event occurring that requires the inoperable steam supply to the turbine-driven AFW pump.

With the dual actuator trains to an MSIV or MFIV and with one of the four MSIVs or MFIVs assumed not to close in an accident, the NRC staff concludes that the 7-day CT for an inoperable MSIV or MFIV actuator train, of redundant trains, is consistent with the 7-day CT for an inoperable steam supply, of redundant trains, to the turbine-driven AFW pump.

Therefore, the NRC staff concludes that the proposed Condition A for TSs 3.7.2 (the MSIVs) and 3.7.3 (the MFIVs) appropriately provides required actions and CTs for the condition of one actuator train being inoperable. Because (1) the proposed required action is to restore the inoperable actuator train to operable status, and (2) the valves can be closed by the operable actuator trains (one valve is assumed to not close in an accident), the proposed CT is a reasonable time to repair the inoperable actuator train and consistent with the TSs, and a PSA analysis showed the CT was conservative, the NRC staff concludes that the proposed required action and CT are reasonable and, therefore, acceptable. Based on the above discussion, the NRC staff further concludes that the proposed Condition A and its associated required action and CT for TSs 3.7.2 and 3.7.3 meet 10 CFR 50.36 and are, therefore, acceptable.

#### Proposed Conditions B, C, and D

For the case of two actuator trains being inoperable, the licensee has made a distinction among the following three different situations, based on which separation group and MSIVs the actuator trains are part of:

1. Two actuator trains inoperable for different MSIVs and the actuator trains being in different separation groups (e.g., yellow and red on different MSIVs),
2. Two actuator trains inoperable for different MSIVs and the actuator trains being in the same separation groups (e.g., yellow or red on different MSIVs), and
3. Two actuator trains inoperable on the same MSIV (e.g., yellow and red on the same MSIV).

For the three different cases given above, the licensee has proposed Condition B for case 1, Condition C for case 2, and Condition D for case 3.

For Condition B, where the two inoperable actuator trains are not on the same MSIV or MFIV, the affected valves are in a loss-of-single-failure-protection degraded condition and actions should be taken to restore the actuator trains to operable status within a reasonable CT. The required actions proposed by the licensee for both conditions are to restore one actuator train MSIV to operable status. This action when completed would result in only one actuator train being inoperable, and the licensee would exit proposed Condition B and enter proposed Condition A, which is discussed above. The licensee stated that the proposed Condition B is more likely to result in an MSIV not closing than proposed Condition A (only one actuator train inoperable). The proposed CT of 72 hours is based on (1) the extent to which the affected MSIVs are inoperable, (2) being less than the proposed CT of 7 days for Condition A, (3) one MSIV or MFIV is assumed not to close in an accident, and (4) the PSA analysis shows that the CT is conservative. Based on this, the NRC staff concludes that the proposed required actions and CTs for proposed Conditions B and C are reasonable, and, therefore, acceptable. Based on this, the NRC staff further concludes that the proposed required actions and CTs for proposed Condition B meet 10 CFR 50.36, and are, therefore, acceptable.

Proposed Condition C is similar to the above Condition B. For Condition C, where the two inoperable actuator trains are not on the same MSIV or MFIV, the affected valves are in a loss-of-single-failure-protection degraded condition and actions should be taken to restore the actuator trains to operable status within a reasonable CT. The required actions proposed by the licensee for both conditions are to restore one actuator train MSIV to operable status. This action when completed would result in only one actuator train being inoperable, and the licensee would exit proposed Condition C and enter proposed Condition A, which is discussed above. The licensee also stated that the proposed Condition C is more likely to result in an MSIV not closing than proposed Condition A (only one actuator train inoperable).

In addition, for proposed Condition C, as discussed above in Section 4.2 of this SE, the licensee (1) concluded that the loss of one ESFAS actuation logic train is equivalent to the loss of all four actuator trains in the same separation group at the four MSIVs or MFIVs, and (2) proposed for Condition C the same CT of 24 hours for restoring an inoperable actuation logic train to operable status in Condition G for Functions 4.b (MSIV actuation logic) and 5.a (MFIV actuation logic) in TS Table 3.3.2-1. The licensee is equating the CT for proposed Condition C for an inoperable MSIV or MFIV actuator train to the CT for Condition G for an inoperable MSFIS actuation logic train in that the licensee is proposing that both conditions should have the same CT to restore the inoperable train. Because an inoperable ESFAS actuation train affects all of either the MSIVs or MFIVs and the inoperable actuator trains affects two MSIVs, or MFIVs, the NRC staff concludes that the licensee's logic of equating these two conditions is reasonable, and having the same CT for the conditions is acceptable.

Therefore, the proposed CT of 72 hours for Condition C is based on (1) the extent to which the affected MSIVs are inoperable, (2) being less than the proposed CT of 7 days for Condition A (one MSIV or MFIV is assumed not to close in an accident), (3) the consistency with the CT being the same as the CT for an inoperable MSFIS actuation logic train, and (4) the PSA analysis shows that the CT is conservative. Based on this, the NRC staff concludes that the proposed required actions and CTs for proposed Condition C are reasonable, and, therefore, acceptable. As such, the NRC staff further concludes that these proposed changes meet 10 CFR 50.36, and are, therefore, acceptable.

For proposed Condition D, the loss of two actuator trains on one MSIV or MFIV would prevent the valve from closing in an accident. The licensee has proposed to have the required action and CT of declaring the affected MSIV or MFIV inoperable immediately. As stated above, the CT of "Immediately" for the TSs means that "the required action should be pursued without delay and in a controlled manner." Given that the two inoperable actuator trains make the MSIV or MFIV incapable of performing its safety function, the NRC staff concludes that the current TS required action and CT for an inoperable MSIV, or MFIV, should apply. Based on this, the NRC staff further concludes that the proposed required action and CT for proposed Condition D for TS 3.7.2 (for MSIVs) and TS 3.7.3 (for MFIVs) meet 10 CFR 50.36 and, therefore, are acceptable.

#### Proposed Condition E

Proposed Condition E is for three or more actuator trains being inoperable or that the required actions and CTs of proposed Conditions A, B, or C are not being met. The licensee proposed that the required action and CT are to declare each affected MSIV or MFIV inoperable immediately. The licensee stated that this required action and CT are conservative. The NRC staff has reviewed the proposed Condition E and concludes that with three or more actuator trains being inoperable, the MSIVs or MFIVs are in a significantly degraded state.

The NRC staff agrees with the licensee that the proposed required action and CT for proposed Condition E are conservative because this proposed condition results in two or more MSIVs or MFIVs being inoperable, and places the plant in proposed Condition H (one or more MSIVs or MFIVs inoperable in Mode 2 or 3) via LCO 3.0.3. Based on this determination, the NRC staff concludes that the proposed required action and CT are reasonable and, therefore, acceptable. The NRC staff further concludes that the proposed required actions and CTs for proposed Condition E meet 10 CFR 50.36 and are, therefore, acceptable.

#### Additional Conditions for Inoperable Actuator Trains

In considering whether additional conditions are needed in addition to the five proposed conditions for inoperable actuator trains, the NRC staff concludes that, with the proposed Condition E for three or more actuator trains inoperable, no additional condition is needed.

#### Renumbering Existing Conditions in LCOs 3.7.2 and 3.7.3

With the proposed addition of Conditions A through E to LCOs 3.7.2 and 3.7.3, the licensee also proposed to renumber the existing (1) Conditions A through D in LCO 3.7.2 and (2) Conditions A and B in LCO 3.7.3. The existing conditions for LCO 3.7.2 would become new Conditions F through I, and the references, in existing Conditions B and D, to the existing Conditions A and C would become references to the renumbered Conditions F and H. The existing conditions for LCO 3.7.3 would become the new Conditions F and G, and the reference in existing Condition B to the required action and associated CT not being met would have the phrase "of Condition F" added because the condition being referenced is the renumbered Condition F.

These proposed changes are administrative in nature in that they account for the five new proposed conditions, and do not change any existing requirements in TS 3.7.2. Based on this,

the NRC staff concludes that these proposed changes to existing Conditions A through D are acceptable. The NRC staff further concludes that these proposed changes meet 10 CFR 50.36 and are, therefore, acceptable.

#### Revising and Moving the “separate Condition entry” Note for TS 3.7.3

The licensee proposed changes to the “separate Condition entry” note for TS 3.7.3 that (1) replaces the word “valves” by “MFIVs” and (2) places the note in the new Condition F for one or more MFIVs inoperable. The current note applies only to MFIVs and the proposed changes maintain this with the MFIV actuator trains being added to TS 3.7.3. Therefore, the proposed changes are administrative in nature, to assure that separate condition entry in TS 3.7.3 is clearly understood, with no change to any requirements in TS 3.7.3. As such, the NRC staff concludes that the proposed changes meet 10 CFR 50.36 and are, therefore, acceptable.

#### 4.7 Conclusion

Based on the evaluation in Section 4.6 of this SE, the NRC staff concludes that the proposed amendment acceptably clarifies what should be done by the licensee when MSIV and MFIV actuator trains are inoperable and meets 10 CFR 50.36, and, therefore, is acceptable. In adding the new conditions and required actions for the MSIV actuator trains to TSs 3.7.2 and 3.7.3, the licensee is adding an additional page to TSs 3.7.2 and 3.7.3, which also adds two additional pages to TS Section 3.7, “Plant Systems.” This additional page changes the page numbers in the TS Table of Contents for TS Sections 3.7.3 through 3.7.18. Because the change in page numbering is an administrative change and does not change any requirements in the TSs, the NRC staff concludes that it meets 10 CFR 50.36 and is, therefore, acceptable.

#### 4.8 Change to the TS Bases for TSs 3.7.2 and 3.7.3

In Attachment V to its application, the licensee also identified changes to the Bases for TSs 3.7.2 and 3.7.3 that it intended to make based on the amendment. These changes would be made to the TS Bases in accordance with TS 5.5.14. The NRC staff has reviewed these identified changes and has no disagreement with the changes.

#### 5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Kansas 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

(71 FR 52173) published September 1, 2006. 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.

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