

June 16, 2006

Mr. Charles D. Naslund
Senior Vice President and Chief Nuclear Officer
Union Electric Company
Post Office Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: MAIN STEAM
ISOLATION VALVE ACTUATOR TRAINS (TAC NO. MC7212)

Dear Mr. Naslund:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 172 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated May 26, 2005 (ULNRC-05150), as supplemented by letter dated March 9, 2006 (ULNRC-05259).

The amendment revises TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," by adding the MSIV actuator trains to (1) the limiting condition for operation (LCO) and (2) the conditions, required actions, and completion times for the LCO. The existing conditions and required actions in TS 3.7.2 are renumbered to account for the new conditions and required actions.

A copy of the related Safety Evaluation is also 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. 50-483

Enclosures: 1. Amendment No. 172 to NPF-30
2. Safety Evaluation

cc w/encls: See next page

Mr. Charles D. Naslund
Senior Vice President and Chief Nuclear Officer
Union Electric Company
Post Office Box 620
Fulton, MO 65251

June 16, 2006

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: MAIN STEAM ISOLATION VALVE ACTUATOR TRAINS (TAC NO. MC7212)

Dear Mr. Naslund:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 172 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated May 26, 2005 (ULNRC-05150), as supplemented by letter dated March 9, 2006 (ULNRC-05259).

The amendment revises TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," by adding the MSIV actuator trains to (1) the limiting condition for operation (LCO) and (2) the conditions, required actions, and completion times for the LCO. The existing conditions and required actions in TS 3.7.2 are renumbered to account for the new conditions and required actions.

A copy of the related Safety Evaluation is also 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. 50-483

Enclosures: 1. Amendment No. 172 to NPF-30
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC	RidsNrrPMJDonohew	RidsAcrsAcnwMailCenter
LPLIV Reading	RidsNrrLALFeizollahi	RidsRegion4MailCenter (BJones)
RidsNrrDorl (CHaney/CHolden)	RidsNrrDorlDpr	RidsNrrDirsltsb (TKobetz)
RidsNrrDorlLplg (DTerao)	RidsOgcRp	GHill (2)

Accession No.: (Amd) **ML060810169** (TS) **MLML062190458** (Pkg) **ML060810181**

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	ITSB/BC	OGC	NRR/LPL4/BC
NAME	JDonohew	LFeizollahi DClark for	TKobetz	MZobler	DTerao
DATE	06/16/2006	06/16/2006	06/16/2006	06/16/2006	06/16/2006

OFFICIAL RECORD COPY

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 172
License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Union Electric Company (UE, the licensee) dated May 26, 2005, as supplemented by letter dated March 9, 2006, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, 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 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-30 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. 172 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This amendment is effective as of its date of issuance, and shall be implemented within 90 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: June 16, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 172

RENEWED FACILITY OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Replace the following page of the 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.

REMOVE

iii
3.7-5 to 3.7-41

INSERT

iii
3.7-5 to 3.7-41
3.7-5a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 172 TO FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application dated May 26, 2005, as supplemented by letter dated March 9, 2006 (Agencywide Documents Access and Management System Accession Nos. ML051590442 and ML060860220), the Union Electric Company (the licensee) requested changes to the Technical Specifications (TSs) for Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1 (Callaway). The licensee proposed to revise TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," by adding the MSIV actuator trains to (1) the limiting condition for operation (LCO) and (2) the conditions, required actions, and completion times (CTs) for when the LCO is not being met. The existing conditions and required actions in TS 3.7.2 would be renumbered to account for the proposed new conditions and required actions.

The supplemental letter dated March 9, 2006, provided additional clarifying information, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination published in the *Federal Register* on June 21, 2005 (70 FR 35740).

2.0 BACKGROUND

As described in the Final Safety Analysis Report (FSAR) for Callaway, the MSIVs are to isolate the main steamlines, and, thus, the steam generators (SGs) from the turbine, in the event of an accident or transient. 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 down stream of the main steam safety valves on the main steamlines. The MSIVs are stated to be bidirectional, double disc, parallel slide gate valves.

Each MSIV has two redundant actuator trains to meet the single-failure criterion in closing the valve. The licensee stated that the safety function of the MSIV actuator trains are to close the MSIV within the safety-analysis required time (a fast-close of the MSIV in less than or equal to 5 seconds) to prevent uncontrolled blowdown from more than one SG in the postulated design-basis main steamline break (MSLB) accident. This means that all four MSIVs close in the MSLB accident so that blowdown only comes from the SG on the affected main steamline and there is no blowdown from the turbine through the MSIV on the broken steamline. The licensee stated that either actuator train can independently perform the safety function to fast close the MSIV on demand in an MSLB accident in the time assumed in the accident and

containment analyses (i.e., the 5 seconds specified in Surveillance requirement (SR) 3.7.2.1 for MSIV operability).

As shown in the figures provided in the supplemental letter dated March 9, 2006, an actuator train is an accumulator, the associated solenoid valves and piping allow the accumulator to pressurize the piston to fast close the valve. There is also the associated engineered safety feature (ESF) instrumentation train to open/close the solenoid valves so that the accumulators will fast close the MSIV. Even though there is only one piston to close the MSIV, each MSIV has two redundant and independent actuator trains and only one actuator train and one ESF instrumentation train is needed to close the MSIV. Therefore, the MSIV is designed to meet the single-failure criterion with respect to the actuator trains and the ESF instrumentation trains.

The ESF instrumentation function for closing the MSIVs (i.e., main steamline isolation) on a safety injection (SI) signal is Function 4.c in TS Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation." This function requires two separate and redundant trains, with these two trains going separately to the two actuator trains for each MSIV. The two actuation trains for each MSIV are what the licensee calls separation group 4 (yellow) and separation group 1 (red) for each valve. This separation meets the single failure criterion.

3.0 REGULATORY EVALUATION

In Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36, "Technical specifications," the NRC issued a rule and 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 (LSSSs), 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 "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specification..." The remedial actions in the TSs are specified in terms of LCO conditions, required actions, and CTs to complete the required actions. When an LCO is not being met, the CTs specified in the TSs are the time allowed in the TSs 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.

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 SSCs described in the FSAR (i.e., the NRC-approved plant design basis) that are

relied upon in the design-basis accident (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. Therefore, when a SSC is in a condition, required action, and CT in the TSs, the single failure criterion is not being met.

The conditions and required actions specified for each LCO provide the remedial actions required 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 have the definition of operable 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 (AOOs) 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 GDC 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, that meet the four criteria in 10 CFR 50.36(c)(2)(ii), are operable. However, as explained above, the TSs allow equipment to be inoperable (i.e., the single-failure criterion is not being met) for periods of time (i.e., the CTs) without requiring the plants to shut down. The plant design and licensing basis applies to how the plant was designed and licensed as described in the FSAR; the TSs applies to whether the SSCs and the attendant equipment for the SSCs are operable (i.e., no equipment is assumed to be inoperable to determine if an LCO is being met, and what condition, required action, and CT the plant is in) and CTs are specified for how long equipment may be inoperable before required actions must be completed.

NRC Regulatory Issue Summary (RIS) 2005-20, "Revision to Guidance Contained in NRC GL 91-18, "Information to Licensees regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability,"" dated September 26, 2005, provides the latest guidance on relevant changes that were made to NRC regulations, policies, and practices, and clarifies selected issues based on operating experience, including the issue of operability.

Given that the design and safety function(s) of the MSIVs and the MSIV actuator trains are not being changed by the proposed amendment, there are no applicable GDC related to the design and safety function of the MSIVs for this amendment.

4.0 TECHNICAL EVALUATION

In its application, the licensee proposed to add the MSIV actuator trains to TS 3.7.2 in the following manner:

- Add the phrase "and their associated actuator trains" to LCO 3.7.2 to require that the four MSIVs and their associated actuator trains are required to 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 in 72 hours.
 - 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 in 24 hours.
 - C. Condition C for two MSIV actuator trains inoperable when the inoperable actuator train are in the same separation group, with Required Action C.1 of restoring one MSIV actuator train to operable status in 4 hours.
 - D. Condition D for two actuator trains on one MSIV inoperable, 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 new proposed conditions.

The licensee did not propose any changes to the existing SRs 3.7.2.1 and 3.7.2.2, nor did it propose to add a new SR for periodically testing the actuator trains.

4.1 Proposed Change to LCO 3.7.2

In its application, the licensee stated that it has proposed to revise TS 3.7.2 on the MSIVs to specifically address the MSIV actuator trains. In doing this, the licensee proposed to add the phrase "and their associated actuator trains" so that LCO 3.7.2 and the requirement to be operable would apply to both the MSIV and the two associated MSIV actuator trains that are part of each MSIV.

4.2 Proposed Additional Conditions Based on Inoperable Actuator Trains

This section addresses the proposed five new Conditions A through E. For proposed Condition A, for one MSIV actuator train being inoperable, on one MSIV, the licensee stated that a CT of 72 hours 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 fast closure of the MSIV. The licensee further stated that the proposed 72-hour CT takes into account the design redundancy of the two actuator trains for each MSIV, a reasonable time for repairs to return the inoperable actuator to operability, and the low probability of the MSLB occurring during the period the train is inoperable.

For proposed Condition B, for two MSIV actuator trains being inoperable, on two different MSIVs, when the inoperable actuator trains are not in the same separation group, the licensee stated that a CT of 24 hours to restore one MSIV actuator train to operable status is reasonable since the dual-redundant actuator train design in that only one actuator train is required for the fast closure of the MSIV. If the two inoperable actuator trains are in different separation groups, then each MSIV is still capable of closing on demand (i.e., there would have to be a further failure, as for example an ESF instrumentation train to have an MSIV fail to close fast as required for the MSLB accident). 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 MSIV may fail to close in the MSLB accident. The licensee stated that a CT of 24 hours for Condition B would be reasonable.

For proposed Condition C, for two MSIV actuator trains being inoperable, when the inoperable actuator trains are in the same separation group and, thus, on different MSIVs, the licensee stated that a CT of 4 hours is appropriate because an actuator train is inoperable on two different MSIVs, but the actuator trains are in the same separation group. The licensee stated that the proposed CT of 4 hours is conservative with respect to the low probability of an event occurring during this period which would require MSIV closure. With two actuator trains in the same separation group being inoperable, an MSLB accident and the loss of the ESF instrumentation train in the other separation group would result in two MSIVs failing to close in the accident. Comparing Condition B (two inoperable trains in different separation groups on different MSIVs) to Condition C (two inoperable trains in the same separation groups on different MSIVs), the licensee stated that it is appropriate to have a shorter CT for Condition C since there is an increased likelihood that an MSIV may fail to close in the MSLB accident. The licensee stated that a CT of 4 hours for Condition C would be reasonable.

For proposed Condition D, for two actuator trains being inoperable on one MSIV, the licensee stated that this condition addresses when both inoperable actuator trains are on the same MSIV and requires that the affected MSIV be declared inoperable immediately. This proposed condition is consistent with there being only two actuator trains on an MSIV and, thus, with both trains being inoperable, the MSIV can not perform its safety function(s) and there is no reason to consider any further action whether or not the MSIV is inoperable. With both actuator trains inoperable, the MSIV 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 MSIV inoperable would result in the licensee entering existing Condition A or C depending on the number of MSIVs 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 on what are the required actions and CTs when there are inoperable MSIVs.

For proposed Condition E, for three or more actuator trains inoperable or the above Condition A, B, or C not being met, the licensee proposed to immediately declare the affected MSIVs inoperable and, thus, immediately enter the existing Condition A or C, 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 the worst failure of a ESF instrumentation train could result in two or more MSIVs failing to perform their safety function(s). If any two of these actuator trains were on the same MSIV, then the licensee would also have to enter proposed Condition D and declare the affected MSIV inoperable, as discussed above. The licensee stated that it would be conservative to immediately declare the affected MSIVs 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 inoperable and, thus, immediately enter the existing Condition A or C, as is discussed above, for proposed Condition D. The licensee also stated that it would be conservative to immediately declare the affected MSIVs inoperable for this case.

4.3 Proposed CTs Based on Risk

The licensee explained that it used probabilistic risk analysis (PRA) to evaluate the proposed CTs for the proposed Conditions A, B, and C for inoperable MSIV actuator trains, and the PRA, used conservative assumptions (e.g., no credit for operator action) and the metrics in the following Regulatory Guides (RGs):

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

The licensee stated that the PRA was not used to determine what the CTs should be for the proposed conditions, but to show that the proposed CTs were conservative with respect to the CTs determined from the PRA. The licensee provided the following table of (1) the maximum CTs based on the PRA for the proposed Conditions A, B, and C, and (2) the proposed CTs for these conditions:

Proposed Condition		Maximum CT Based on PRA	Proposed CT
Condition A	One actuator train on one MSIV inoperable	17 days	72 hours

Proposed Condition		Maximum CT Based on PRA	Proposed CT
Condition B	One actuator train on one MSIV inoperable <u>and</u> one actuator train in the other [separation] train on a different MSIV inoperable	8 days	24 hours
Condition C	One actuator train on one MSIV inoperable <u>and</u> one actuator train in the same separation train on a different MSIV inoperable	5 hours	4 hours

The licensee stated that, for each of the above proposed conditions, the associated proposed CT is conservative with respect to what it had calculated in its PRA analysis.

The proposed Conditions D and E are not included in the table because the proposed CTs for these conditions is not a time, but the required action should be performed "immediately."

4.4 SRs 3.7.2.1 and 3.7.2.2 for LCO 3.7.2

In its application, the licensee did not identify any new SRs for the revised LCO 3.7.2 with the actuator trains added to the LCO. In a conference call on March 15, 2006, with the licensee, the licensee explained that no new SR is needed for determining the operability of the actuator trains. The existing SR 3.7.2.1 to verify that the isolation time of each MSIV is no more than 5 seconds in accordance with the inservice testing (IST) program will also determine if the two actuator trains for the MSIV are operable because it is the actuator trains that act to close the valve within the required time. The licensee further stated that the description of SR 3.7.2.1 in the TS 3.7.2 Bases shows that this SR is sufficient to determine if the actuator trains for each MSIV are operable.

The existing SR 3.7.2.2 verifies that each MSIV actuates to its isolation position on an actual or simulated actuation signal. Since each of the two actuator train is activated by a separate actuation signal, this SR will demonstrate that both actuator trains are operable.

In the TS Bases for SR 3.7.2.1, it is stated that "This SR verifies that [the] MSIV closure time is ≤ 5 seconds from each actuator train when tested pursuant to the Inservice Testing Program." Based on this statement, each of the two actuator trains are separately tested in SR 3.7.2.1 to demonstrate that the MSIV closes in no more than 5 seconds. As stated in the TS Bases for SR 3.7.2.1, the no more than 5 seconds closure time is "The MSIV isolation time assumed in the accident and containment analyses." Based on this, the NRC staff concludes that SR 3.7.2.1 is sufficient to determine if the actuator trains for each MSIV closes in no more than 5 seconds. The NRC staff further concludes that the existing frequency of testing the MSIV in accordance with the IST program, which is stated in SR 3.7.2.1, is also sufficient for the actuator trains because the actuator trains have been tested for operability at this frequency in

the past. The licensee also did not see a reason to revise the existing frequency for testing the MSIV and the actuator trains.

Based on this, the NRC staff agrees with the licensee that no additional SRs are need to demonstrate the operability of the actuator trains.

4.5 Evaluation of Proposed TS Changes

The licensee has proposed to add the MSIV actuator trains to LCO 3.7.2 by adding the phrase "and their associated actuator trains" to the LCO such that the new title for LCO 3.7.2 would be the following: "Four MSIVs and their associated actuator trains shall be operable." The licensee stated that the proposed addition of MSIV 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, to TS 3.7.2.

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 MSIVs, the MSIV actuator trains must be capable of performing their related support function and should, therefore, also be included in the TSs. 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. Having said that, it is also true that there are two actuator trains for each MSIV and the TSs could 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 there are 8 actuator trains for the four MSIVs. Thus, when there are inoperable MSIV actuator trains the approved Callaway design basis is degraded in that the operating plant has broken equipment and no longer meets the single failure criterion. Based on (1) the NRC staff precedence, in the standard TSs, of providing remedial actions for loss of single failure protection for redundant safety system designs, and (2) the maximum CTs from the licensee's PRA analysis (addressed in Section 4.3 of this SE), the NRC staff concludes that the licensee's proposed addition of actuator trains to LCO 3.7.2 meets the 10 CFR 50.36(c)(2)(i) criteria to be included in the TSs, and is, therefore, acceptable.

The licensee has proposed to add five conditions to LCO 3.7.2 to address five different cases where there are inoperable MSIV 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 being inoperable. As presented in its application and discussed above, the licensee has stated that the two actuator trains in a MSIV are redundant and either train can close the MSIV within the 5 seconds required by the accident analysis, which is required by SR 3.7.2.1. The figures submitted in the supplemental letter dated March 9, 2006, show two actuator trains each of which has an input from a separate ESF instrumentation train, as discussed in Section 2.0 of this SE, and check valves to separate the two actuator trains. 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.

It is true that a further failure (e.g., the loss of the other actuator train for the MSIV or the loss of the ESF 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 presupposed future failures and each MSIV design is such that the loss of one actuator train does not in itself prevent the MSIV from performing its safety function. Thus the loss of the actuator train causes the MSIV to be in a loss-of-single-failure-protection degraded condition.

Therefore, the NRC staff concludes that the proposed Condition A appropriately provides required actions and CTs for the condition of one actuator train being inoperable. Because the proposed required action is to restore the inoperable actuator train to operable status, and the licensee has stated that the proposed CT is a reasonable time for repairs to be made to return the inoperable actuator train to operability and is less than the CT calculated from a PRA analysis, the NRC staff concludes that the proposed required action and CT are reasonable and, therefore, acceptable. Based on this, the NRC staff further concludes that the proposed Condition A and its associated required action and CT 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 Conditions B and C, where the two inoperable actuator trains that are not on the same MSIV, the affected MSIVs are in a loss-of-single-failure-protection degraded condition and actions should be taken to restore the actuator trains to operability 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 or C and enter proposed Condition A, which is discussed above. The licensee stated that the proposed Condition B and C are more likely to result in an MSIV not closing than proposed Condition A (only one actuator train inoperable). The proposed CTs are based on (1) the extent to which the affected MSIVs are inoperable, (2) being less than the proposed CT for Condition A, and (3) being less than the maximum CTs from the PRA. 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 Conditions B and C meet 10 CFR 50.36, and are, therefore, acceptable.

For proposed Condition D, the loss of two actuator trains on one MSIV would prevent the MSIV from performing its safety function. The licensee has proposed to have the required action and CT of declaring the affected MSIV 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 incapable of performing its safety function, the NRC staff concludes that the current TS required action and CT for an inoperable MSIV should apply. Based on this, the NRC staff further concludes that the proposed required action and CT for proposed Condition D 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 Condition A, B, or C are not being met. The licensee proposed that the required action and CT are to declare each affected MSIV 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 are in a significant 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 being inoperable, and places the plant in proposed Condition H (one or more MSIVs inoperable in Mode 2 or 3) via LCO 3.0.3. Based on this, the NRC staff also concludes that the proposed required action and CT are reasonable and, therefore, acceptable. Based on this, 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 A Through D

With the proposed addition of Conditions A through E to LCO 3.7.2, the licensee also proposed to re-number the existing Conditions A through D. The existing conditions would then 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 re-numbered Conditions F and H. 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. Based on this, the NRC staff further concludes that these proposed changes meet 10 CFR 50.36 and are, therefore, acceptable.

4.6 Conclusion

Based on the evaluation in Section 4.5 of this SE, the NRC staff concludes that the proposed amendment in the licensee's application dated May 26, 2005, acceptably clarifies what should

be done when 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 TS 3.7.2, the licensee is adding an additional page to TS 3.7.2, which also adds an additional page 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.

4.7 Change to the TS Bases for TS 3.7.2

In Attachment 5 to its application, the licensee also identified changes to the Bases for TS 3.7.2 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, "Technical Specification (TS) Bases Control Program." 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 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 (70 FR 35740; June 21, 2005). 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: June 16, 2006

Callaway Plant, Unit 1

cc:

Professional Nuclear Consulting, Inc.
19041 Raines Drive
Derwood, MD 20855

John O'Neill, Esq.
Pillsbury Winthrop Shaw Pittman LLP
2300 N. Street, N.W.
Washington, D.C. 20037

Mr. Mark A. Reidmeyer, Regional
Regulatory Affairs Supervisor
Regulatory Affairs
AmerenUE
P.O. Box 620
Fulton, MO 65251

U.S. Nuclear Regulatory Commission
Resident Inspector Office
8201 NRC Road
Steedman, MO 65077-1302

Mr. Les H. Kanuckel
Manager, Quality Assurance
AmerenUE
P.O. Box 620
Fulton, MO 65251

Missouri Public Service Commission
Governor Office Building
200 Madison Street
Jefferson City, MO 65102-0360

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-4005

Mr. H. Floyd Gilzow
Deputy Director for Policy
Missouri Department of Natural Resources
P. O. Box 176
Jefferson City, MO 65102-0176

Mr. Rick A. Muench
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KA 66839

Mr. Dan I. Bolef, President
Kay Drey, Representative
Board of Directors Coalition for the
Environment
6267 Delmar Boulevard
University City, MO 63130

Mr. Lee Fritz, Presiding Commissioner
Callaway County Court House
10 East Fifth Street
Fulton, MO 65151

Mr. David E. Shafer
Superintendent, Licensing
Regulatory Affairs
AmerenUE
P.O. Box 66149, MC 470
St. Louis, MO 63166-6149

Mr. Keith D. Young
Manager, Regulatory Affairs
AmerenUE
P.O. Box 620
Fulton, MO 65251

Mr. Keith G. Henke, Planner
Division of Community and Public Health
Office of Emergency Coordination
930 Wildwood P.O. Box 570
Jefferson City, MO 65102

Certrec Corporation
4200 South Hulen, Suite 630
Fort Worth, TX 76109

Director, Missouri State Emergency
Management Agency
P.O. Box 116
Jefferson City, MO 65102-0116