November 17, 2006

Mr. James M. Levine
Executive Vice President, Generation
Arizona Public Service Company
P. O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 - ISSUANCE OF AMENDMENTS RE: MAIN STEAM ISOLATION VALVE ACTUATOR TRAINS (TAC NOS. MD3066, MD3067, AND MD3068)

Dear Mr. Levine:

The Commission has issued the enclosed Amendment No. 163 to Facility Operating License No. NPF-41, Amendment No. 163 to Facility Operating License No. NPF-51, and Amendment No. 163 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated September 26, 2006 (102-05574), as supplemented by the letter dated November 3, 2006 (102-05590).

The amendments revise TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," to include specific requirements for the MSIV actuator trains.

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 Nos. STN 50-528, STN 50-529,
and STN 50-530

Enclosures:
1. Amendment No. 163 to NPF-41
2. Amendment No. 163 to NPF-51
3. Amendment No. 163 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

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ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 163
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated September 26, 2006, as supplemented by the letter dated November 3, 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-41.

3. This license amendment is effective as of the date of issuance and shall be implemented within 10 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 Operating License and Technical Specifications

Date of Issuance: November 17, 2006

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 163
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated September 26, 2006, as supplemented by the letter dated November 3, 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-51.

3. This license amendment is effective as of the date of issuance and shall be implemented within 10 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 Operating License and Technical Specifications

Date of Issuance: November 17, 2006

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 163
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated September 26, 2006, as supplemented by the letter dated November 3, 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-74.

3. This license amendment is effective as of the date of issuance and shall be implemented within 10 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 Operating License and Technical Specifications

Date of Issuance: November 17, 2006

ATTACHMENT TO LICENSE AMENDMENT NOS. 163, 163, AND 163

FACILITY OPERATING LICENSE NOS. NPF-41, NPF-51, AND NPF-74

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

Replace Page 5 of Facility Operating License No. NPF-41 with the attached Page 5.

Replace Page 6 of Facility Operating License No. NPF-51 with the attached Page 6.

Replace Page 4 of Facility Operating License No. NPF-74 with the attached Page 4.

Replace the following pages 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	INSERT
3.7.2-1	3.7.2-1
3.7.2-2	3.7.2-2
-----	3.7.2-3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 163 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 163 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 163 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By application dated September 26, 2006, as supplemented by a letter dated November 3, 2006 (Agencywide Documents and Access Management System (ADAMS) Accession Nos. ML062760367 and ML063190323, respectively), Arizona Public Service Company (the licensee), requested changes to the Technical Specifications (TSs) for Palo Verde Nuclear Generating Station (Palo Verde), Units 1, 2, and 3.

These amendments would revise TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," to include specific requirements (Conditions, Required Actions, and Completion Times) for the MSIV actuator trains. Additionally, surveillance requirement (SR) 3.7.2.1 is being revised to clearly identify that each MSIV actuator train is required to be tested to support the operability of the associated MSIV. 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 TS 3.7.2.

The supplemental letter dated November 3, 2006, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination published in the *Federal Register* on October 5, 2006 (71 FR 58879).

2.0 BACKGROUND

For each Palo Verde unit, one MSIV is installed in each of the four main steamlines (two per steam generator) outside the containment and downstream of the main steam safety valves. The MSIVs prevent uncontrolled blowdown from more than one steam generator in the event of a postulated design basis accident (DBA). The MSIVs are 28-inch gate valves with redundant actuator trains (A and B). An actuator train consists of a pneumatic-hydraulic accumulator, an air reservoir, solenoid valves, shuttle valves and the main steam and feedwater isolation system (MSFIS) instrumentation circuitry. The MSFIS instrumentation and controls of one actuator

train are physically and electrically separate and independent of the instrumentation and controls of the other actuator train.

The MSFIS instrumentation control logic has one safety function and several auxiliary functions for the valves it controls. The auxiliary functions are manually initiated and are primarily used for testing. The safety function is to propagate the Main Steam Isolation Signal (MSIS) during postulated plant events. The MSIS is generated by either low steam generator pressure, high steam generator level, or high containment pressure. The MSIS signal in either MSFIS train will cause an unrestricted fast-close of the MSIVs controlled by that train. This will also happen on a loss of 125 volt (v) DC vital bus power to either MSFIS logic cabinet or on loss of control power from either cabinet to the solenoid valves. Either actuator train on an MSIV can close the valve independent of the other actuator train.

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 (LSSSs), and limiting control settings; (2) limiting conditions for operation (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 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 structures, systems, and components (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-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 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 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 completion time (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, or follow any other remedial action specified in the TSs. The specified CT provides a limited time, consistent with overall system reliability and risk considerations, to fix the equipment or otherwise make it operable. Thus, when an SSC required by the TSs is inoperable, the plant design-basis single-failure criterion is not being met.

Given that the design and safety function(s) of the MSIVs 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 the associated actuator trains, 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 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 on an MSIV inoperable, with Required Action A.1 to restore the train to operable status within 7 days.

    B. Condition B, for two MSIVs each with a single actuator train inoperable such that the inoperable actuator trains are not in the same instrumentation train, with

Required Action B.1 to restore one MSIV actuator train to operable status within 72 hours.

C. Condition C, for two MSIVs each with a single actuator train inoperable such that both inoperable actuator trains are in the same instrumentation train, with Required Action C.1 to restore one MSIV actuator train to operable status within 48 hours.

D. Condition D, for two actuator trains for one MSIV inoperable, with Required Action D.1 to declare the affected MSIV inoperable immediately.

E. Condition E, for either three or more MSIV actuator trains inoperable or for the required action and CT of Condition A, B, or C not 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. Except for renumbering the conditions being referred to, these conditions, required actions, and CTs are not changed.

- The phrase "with each actuator train" is added to SR 3.7.2.2 to state: “Verify closure time of each MSIV is $\leq$ 4.6 seconds with each actuator train on an actual or simulated signal actuation signal.” The stated frequency of “In accordance with the Inservice Testing Program” for the SR is not changed.

The existing note for separate condition entry for each MSIV in existing Condition C for one or more MSIVs inoperable in Mode 2, 3, or 4 is not being changed by this amendment. There is not a similar note in the existing Condition A for one MSIV inoperable in Mode 1 and such a note is not being proposed in this amendment.

4.1 Proposed Changes to LCO 3.7.2

In its application, the licensee stated that it has proposed to revise LCO 3.7.2 to specifically address the associated dual-redundant actuator trains in each MSIV. In doing this, the licensee proposed to add the phrase "and their associated actuator trains" to LCO 3.7.2 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 addresses the proposed five new Conditions A through E to address different conditions resulting from one or more inoperable actuator trains, and the associated CTs for the conditions. The proposed conditions and CTs are based on each MSIV having 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 risk assessment (PRA) 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 inoperable actuator train, which would be on only one MSIV, 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, where two inoperable actuator trains are on two different MSIVs, when the inoperable actuator trains are not in the same MSFIS instrumentation train, the licensee stated that a CT of 72 hours to restore one actuator train to operable status is reasonable since the dual-redundant actuator train design in that only one actuator train is required for the closure of the valve and one MSIV is assumed not to close in the DBAs. If the two inoperable actuator trains are in different instrumentation trains, then the two affected valves are still capable of closing on demand (i.e., there would have to be a further failure, as for example an MSFIS 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 less than the 7-day CT proposed for Condition A, would be reasonable.

Proposed Condition C

For proposed Condition C, where two inoperable actuator trains are on two different MSIVs, when the inoperable actuator trains are in the same MSFIS instrumentation train, the licensee stated that a CT of 48 hours is appropriate. The licensee explained that the proposed CT of 48 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 D of Function 5.c (steamline isolation - automatic actuation logic and actuation relays) of TS Table 3.3.6-1, "Engineered Safety Features Actuation System Logic and Manual Trip Applicability," which provides a CT of 48 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, the licensee concluded that the loss of one actuation logic train is equivalent to the loss of all four actuator trains in the same MSFIS instrumentation train for the MSIVs.

With two actuator trains in the same MSFIS instrumentation train being inoperable, an accident and an additional failure, such as the loss of the other ESFAS instrumentation train, could result in two MSIVs 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 may fail to close in an accident. The licensee's proposed CT of 48 hours for Condition C is significantly shorter than the proposed CT of 72 hours for the Condition B.

Proposed Condition D

For proposed Condition D, where two inoperable actuator trains are on the same MSIV, Required Action D.1 is to declare that MSIV inoperable immediately. This proposed condition is consistent with the presence of only two actuator trains on a valve and, with both trains being inoperable, the valve cannot close to 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.

Proposed Condition E

For proposed Condition E, where (1) three or more actuator trains are inoperable or (2) the required actions and associated CTs for the above new Condition A, B, or C are not met, the licensee proposed to immediately declare the affected MSIVs inoperable. For three or more inoperable actuator trains, the licensee stated that this could involve two inoperable actuator trains on one MSIV and one inoperable actuator valve on another valve, or three inoperable actuator trains on three different MSIVs. This could mean that the inoperable actuator trains could be in the same MSFIS instrumentation train, and, further, the failure of a MSFIS instrumentation 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, 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 inoperable for this proposed condition. Because the licensee’s declaring the affected MSIVs inoperable would have a minimum of two MSIVs being declared inoperable, the licensee would immediately enter LCO 3.0.3 in Mode 1, because existing Condition A is only for one MSIV inoperable in Mode 1, or existing Condition C in Modes 2, 3, or 4.

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 LCO 3.0.3 or the existing Condition C. The licensee stated that this is conservative, and consistent with other specifications in the TSs, and the format of the Improved Standard TSs (NUREG-1432 for Combustion nuclear power plants). The Palo Verde TSs are based on these Standard TSs.

PRA Evaluation of Proposed CTs

The licensee stated that a PRA was also performed to gauge the acceptability of the above CTs for the proposed Conditions A, B, and C for inoperable MSIV 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 the conclusion of the PRA evaluation was that the CTs for inoperable MSIV actuator trains, which were based on engineering judgment and consistency with the Palo Verde TSs, were conservative.

4.3 SR 3.7.2.1 for MSIVs

The existing SR 3.7.2.1 requires the licensee to “Verify closure time of each MSIV is ≤ 4.6 seconds on an actual or simulated actuation signal.” The licensee has proposed to add the phrase “with each actuator train” to the SR to state the following: “Verify closure time of each MSIV is ≤ 4.6 seconds **with each actuator train** on an actual or simulated actuation signal.” The proposed change is shown in **bold**.

In its application, the licensee stated that the revision to SR 3.7.2.1 is to clearly show that each MSIV actuator train is required to be tested to support the operability of the associated MSIVs. The test of each of the dual-redundant actuator trains on an MSIV would also show the operability of the two actuator trains for each MSIV.

4.4 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" such that the new title for the LCO would be the following: "Four MSIVs 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 inoperable actuator trains.

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 for the MSIVs to be operable, 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 main steam line break (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 Palo Verde design basis is degraded in

that the operating plant has inoperable equipment and no longer meets the single-failure criterion.

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 LCO 3.7.2 meets the requirements of 10 CFR 50.36(c)(2)(i) to be included in the TSs, and is, therefore, acceptable.

The licensee has also 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 inoperable actuator train on one MSIV. As presented in its application and discussed above, the licensee has stated that the two actuator trains in an MSIV are redundant and either train can close the valve within the 4.6 seconds required by the accident analysis, which is required by SR 3.7.2.1. Each of the two actuator trains has an input from a separate MSFIS 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 the loss of the other MSFIS instrumentation train) 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 to be in a loss-of-single-failure-protection degraded condition.

For a single inoperable MSIV 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, 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 two 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 the 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. There is a redundant steam supply to the turbine-driven AFW pump, and

2. The availability of redundant operable motor-driven AFW pumps.

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

Therefore, the NRC staff concludes that the proposed Condition A for TSs 3.7.2 appropriately provides required actions and CTs for the condition of one inoperable MSIV actuator train. 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 PRA 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 TS 3.7.2 meets 10 CFR 50.36 and is, 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 two different MSIVs and the inoperable actuator trains are not in the same MSFIS instrumentation train,

2. Two actuator trains inoperable for two different MSIVs and the inoperable actuator trains are in the same MSFIS instrumentation train, and

3. Two actuator trains inoperable on the same MSIV, and thus would be in different MSFIS instrumentation trains.

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 and not in the same MSFIS instrumentation train, 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 action proposed by the licensee is to restore one actuator train 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 MSIV actuator trains are inoperable in that loss of a MSFIS instrumentation train only

prevents one MSIV from closing, (2) being less than the proposed CT of 7 days for Condition A, (3) one MSIV is assumed not to close in an accident, and (4) the PRA analysis shows that the CT is conservative. Based on this, the NRC staff concludes that the proposed required action and CT for proposed Condition B is 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.

For Condition C, where the two inoperable actuator trains are not on the same MSIV, but are in the same MSFIS instrumentation train, the affected valves are again 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 action proposed by the licensee is to restore one actuator train to operable status. This action when completed again 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 MSFIS actuation logic train is equivalent to the loss of all four actuator trains in the same MSFIS instrumentation train at the four MSIVs, and (2) proposed for Condition C the same CT of 48 hours for restoring an inoperable actuation logic train to operable status in Condition D for Functions 5.c in TS Table 3.3.6-1. The licensee is equating the CT for proposed Condition C for an inoperable MSIV actuator train to the CT for Condition D 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 the MSIVs and two inoperable actuator trains affect only two MSIVs, the NRC staff concludes that (1) the licensee's logic of equating these two conditions is conservative and reasonable, and (2) having the same CT for the conditions is acceptable.

Therefore, the proposed CT of 48 hours for Condition C is based on (1) the extent to which the affected MSIV actuator trains are inoperable, (2) being less than the proposed CT of 7 days for Condition A (one MSIV 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 which affects 4 MSIVs, and (4) the PRA assessment 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 conservative and 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, where the loss of two actuator trains on one MSIV would prevent the valve from closing in an accident., the licensee has proposed 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 licensee would then be required to immediately enter either existing Condition A or C, depending on the plant mode. The current TS required actions and CTs for an inoperable MSIV are not being changed by this amendment, which is acceptable to the NRC

staff. Based on this, the NRC staff further concludes that the proposed required action and CT for proposed Condition D for TS 3.7.2 meets 10 CFR 50.36 and is, therefore, acceptable.

Proposed Condition E

Proposed Condition E is for either (1) three or more inoperable actuator trains or (2) the required actions and CTs of proposed Conditions A, B, or C are not met. The licensee proposed that the required action and CT are to declare each affected MSIV inoperable immediately. 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 significantly degraded state.

The licensee stated that this required action and CT for proposed Condition E are conservative. The NRC staff agrees with the licensee that the proposed required action and CT are conservative because either (1) or (2) of this proposed condition results in two or more MSIVs being declared inoperable immediately. This would require the licensee to immediately enter LCO 3.0.3 or existing Condition C, depending on the plant mode, and take the current required actions and CTs for inoperable MSIVs. The NRC staff finds that this is a conservative response to Condition E. Based on this determination, the NRC staff concludes that the proposed required action and CT for proposed Condition E 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 LCO 3.7.2

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. 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 D would become references to the renumbered 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. The NRC staff further concludes that these proposed changes meet 10 CFR 50.36 and are, therefore, acceptable.

4.5 Conclusion

Based on the evaluation in the previous Section 4.4 of this SE, the NRC staff concludes that the proposed amendment acceptably clarifies what should be done by the licensee when MSIV actuator trains are inoperable and meets 10 CFR 50.36, and, therefore, is acceptable.

4.6 Change to the TS Bases for TS 3.7.2

In Attachment 3 to its application and its supplemental letter, 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 Arizona 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 installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes a surveillance requirement. 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 published in the *Federal Register* on October 5, 2006 (71 FR 58879). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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