December 5, 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: EXTENDED ALLOWED OUTAGE TIME FOR EMERGENCY DIESEL GENERATORS (TAC NOS. MC9425, MC9426, AND MC9427)

Dear Mr. Levine:

The Commission has issued the enclosed Amendment No. 164 to Facility Operating License No. NPF-41, Amendment No. 164 to Facility Operating License No. NPF-51, and Amendment No. 164 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 December 23, 2005, as supplemented by letters dated May 4 and August 3, 2006.

The amendments revise TS 3.8.1, "AC Sources - Operating," to extend the allowed out of service time for one inoperable emergency diesel generator from 72 hours to 10 days. TS 3.8.3, "Diesel Fuel Oil, Lube Oil, and Starting Air," is revised by the addition of a clarifying note to Condition F of this specification. Additionally, TS 3.4.9, "Pressurizer," is revised to delete the words contained in the limiting condition for operation which require that the two groups of pressurizer heaters are capable of being powered from an emergency power supply.

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/

Mel B. Fields, 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. 164 to NPF-41
2. Amendment No. 164 to NPF-51
3. Amendment No. 164 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

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ADAMS Accession Nos.: Pkg ML063350069 (Amd ML063350074, TS Pages **ML063390530**

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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. 164
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 December 23, 2005, as supplemented by letters dated May 4 and August 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 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 Operating License and Technical Specifications

Date of Issuance: December 5, 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. 164
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 December 23, 2005, as supplemented by letters dated May 4 and August 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 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 Operating License and Technical Specifications

Date of Issuance: December 5, 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. 164
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 December 23, 2005, as supplemented by letters dated May 4 and August 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 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 Operating License and Technical Specifications

Date of Issuance: December 5, 2006

ATTACHMENT TO LICENSE AMENDMENT NOS. 164, 164, AND 164

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
3.4.9-1	3.4.9-1
3.8.1-2	3.8.1-2
3.8.1-3	3.8.1-3
3.8.3-2	3.8.3-2
3.8.3-3	3.8.3-3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 164 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 164 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 164 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 December 23, 2005, as supplemented by letters dated May 4 and August 3, 2006 (Agencywide Documents and Access Management System (ADAMS) Accession Nos. ML060040310, ML061310140, and ML062410236, respectively), Arizona Public Service Company (APS, 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 3.8.1, "AC Sources - Operating," to extend the allowed outage time (AOT) for one inoperable emergency diesel generator (EDG) from 72 hours to 10 days. TS 3.8.3, "Diesel Fuel Oil, Lube Oil, and Starting Air," would be revised by the addition of a clarifying note to Condition F of this specification. Additionally, TS 3.4.9, "Pressurizer," would be revised to delete the words contained in the limiting condition for operation (LCO) which require that the two groups of pressurizer heaters are capable of being powered from an emergency power supply.

The supplemental letters dated May 4 and August 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 January 31, 2006 (71 FR 5080).

2.0 BACKGROUND

As described by the licensee's December 23, 2005, application, the Class 1E alternating current (AC) distribution system for each Palo Verde unit is divided into two load groups so that the loss of any one group or bus does not prevent the minimum safety functions from being performed. Each of these load groups or buses has connections to offsite power sources and a single dedicated EDG.

The offsite power is supplied to the 525 kV switchyard from offsite transmission networks. The 525 kV sources are stepped down to three 13.8 kV startup transformers which are shared amongst the three Palo Verde units. From the 525 kV switchyard, there are two sources which are electrically and physically separated circuits that provide AC power at 4.16 kV through engineered safety feature (ESF) service transformers fed by the 13.8 kV startup transformer sources, to the Class 1E distribution system.

The onsite standby power source for each Class 1E 4.16 kV AC bus is a dedicated EDG. Each EDG is capable of starting automatically on a safety injection actuation signal (SIAS), containment spray actuation signal (CSAS), auxiliary feedwater actuation signal (AFAS), or on a Class 1E 4.16 kV AC vital bus degraded voltage or undervoltage signal - loss of power. After the EDG has started, it will automatically tie to its respective bus if offsite power is tripped as a consequence of vital bus undervoltage or degraded voltage, independent of or coincident with an SIAS, CSAS, or AFAS signal. The EDGs will also start and operate in the standby mode without tying to the vital bus on an SIAS, CSAS, or AFAS signal alone. On a loss-of-offsite power (LOOP), an undervoltage/load-shed signal trips all vital loads and nonpermanently connected loads from the vital bus. As the EDG is connected to the vital bus, the vital loads are sequentially loaded to their respective vital bus by the ESF load sequencer.

During plant operation with both EDGs operable, if a LOOP occurs, the ESF electrical loads are automatically and sequentially loaded to the EDGs in sufficient time to provide for safe reactor shutdown or to mitigate the consequences of a design-basis accident (DBA) such as a loss-of-coolant accident (LOCA).

In the event of a station blackout (SBO), the gas turbine generators (GTGs) will supply AC power to the emergency loads of the blacked-out unit, for a revised duration of 16 hours, ensuring that stable operating conditions can be maintained during the SBO. The gas turbine system includes two GTGs, either of which is capable of meeting the AC power requirements for any one of the three Palo Verde units. The GTGs are normally shutdown and maintained in a standby condition during normal plant operations, ready to be put into service in the event of an SBO or LOOP. The GTGs operate only during an SBO event, during system testing, or at the operator's discretion during a LOOP to help restore offsite power. The GTGs are capable of being started and commence loading within 1 hour of initiation of an SBO event.

The main purpose of the proposed TS change is to extend the AOT for EDGs from the current 72 hours to 10 days. Additional TS changes are also proposed by the licensee to support the AOT extension change. The proposed AOT extension would allow the performance of various EDG maintenance and repair activities during plant operation, which would reduce plant refueling outage duration and improve EDG availability during shutdown.

3.0 REGULATORY EVALUATION

The Nuclear Regulatory Commission's (NRC or the Commission) regulatory requirements related to the content of the TSs are set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications." This regulation requires that the TSs include items in five specific categories. These categories include: (1) safety limits, limiting safety system settings and limiting control settings; (2) LCOs; (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. Additionally, Criterion 2 of 10 CFR 50.36(c)(2)(ii) requires an LCO to be established for a process variable, design feature, or

operating restriction that is an initial condition of a DBA or transient analysis that either assumes the failure of, or presents a challenge to, the integrity of a fission product barrier.

3.1 Deterministic Regulatory Evaluation

General Design Criterion (GDC) 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," of 10 CFR Part 50 requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accidents, and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

GDC-18, "Inspection and testing of electric power systems," requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.

3.2 Probabilistic Risk Regulatory Evaluation

The probabilistic regulatory evaluation, based on the objectives of the NRC staff's Policy Statement, "Use of Probabilistic Risk Assessment Methods in Nuclear Activities, Final Policy Statement," allows for enhanced decisionmaking and will result in more efficient use of resources, improvement in safety, and reduction of unnecessary burden. The regulatory documents used in this evaluation are:

a) Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," which describes a risk-informed approach, acceptable to the NRC, for assessing the nature and impact of proposed licensing basis changes by considering engineering issues and applying risk insights.

b) RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," which describes an acceptable risk-informed approach specifically for assessing TS changes in AOTs.

In addition to these RGs, the NRC staff used the guidance contained in Chapter 16.1, "Risk-Informed Decisionmaking: Technical Specifications," and Chapter 19, "Probabilistic Risk Assessment," of the Standard Review Plan (NUREG-0800), and the regulatory requirements of the Maintenance Rule (10 CFR 50.65(a)(4)).

NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," was prepared by the Nuclear Energy Institute to provide guidance to the nuclear industry on methods for assessing and managing the increase in risk that may result from maintenance activities. The NRC staff endorsed Revision 2 of NUMARC 93-01 in Revision 2 of RG 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." RG 1.182,

"Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants," endorsed a revised Section 11 to NUMARC 93-01, which was incorporated into Revision 3 of NUMARC 93-01.

4.0 TECHNICAL EVALUATION

4.1 Deterministic Evaluation

4.1.1 LCO 3.8.1 - "AC Sources - Operating"

This proposed change will extend the current AOT (also referred to as "Completion Time") for one inoperable EDG in LCO 3.8.1, Condition B, from 72 hours to 10 days. This change will also extend the maximum time that this LCO cannot be met from 6 days to 13 days. These changes will read as follows:

Completion Time for LCO 3.8.1, Condition A (one required offsite circuit inoperable), Required Action A.3, currently reads:

"72 hours AND 6 days from discovery of failure to meet LCO"

Completion Time for LCO 3.8.1, Condition A (one required offsite circuit inoperable), Required Action A.3, would be changed to read:

"72 hours AND 13 days from discovery of failure to meet LCO"

and,

Completion Time for LCO 3.8.1, Condition B (one DG inoperable), Required Action B.4, currently reads:

"72 hours AND 6 days from discovery of failure to meet LCO"

Completion Time for LCO 3.8.1, Condition B (one DG inoperable), Required Action B.4, would be changed to read:

"10 days AND 13 days from discovery of failure to meet LCO"

The changes to Completion Times for LCO 3.8.1, Required Actions A.3 and B.4 from 6 days to 13 days will accommodate for the extension time of the diesel generator AOT to 10 days.

The licensee stated that the proposed change would allow 10 days for the restoration of one inoperable EDG to operable status. This change will provide operational and maintenance flexibility. It will also allow performance of EDG inspection and maintenance activities during plant operation, reducing plant refueling outage duration and improve EDG availability during shutdown conditions.

The licensee stated that while in Condition B of LCO 3.8.1 with one EDG out of service, two offsite power sources to the affected load group, the GTGs and the entire unaffected load group and its associated EDG will remain available. Therefore, consistent with the

defense-in-depth philosophy, the proposed change will continue to provide for multiple means to accomplish safety functions and prevent the release of radioactive material in the event of an accident.

The licensee further stated that appropriate restrictions and compensatory measures will be established to assure that system redundancy, independence, and diversity are maintained commensurate with the risk associated with the extended AOT. These include TS and Maintenance Rule (10 CFR 50.65) programmatic requirements as well as administrative controls in accordance with the configuration risk management program (CRMP). To allow continued plant operation with an inoperable EDG, TS 3.8.1 currently requires all emergency equipment aligned to an operable EDG to have no inoperable components. This requirement is intended to provide assurance that a LOOP occurring concurrent with an inoperable EDG does not result in a complete loss of safety function of critical systems. In addition, appropriate plant procedures will include provisions for implementing compensatory measures and configuration risk management controls when an EDG is removed from service to assure the function of the system is maintained and the philosophy of defense-in-depth, as defined in RG 1.177, is maintained.

The licensee indicated that EDG reliability and availability are monitored and evaluated with respect to Maintenance Rule performance criteria to assure that EDG out-of-service times do not degrade operational safety over time.

In response to the NRC staff's request for additional information (RAI) regarding additional compensatory measures, the licensee's May 4, 2006, response provided a revised list of compensatory measures that will be implemented when utilizing an extended EDG completion time. For planned maintenance utilizing an extended completion time, the compensatory measures shall be implemented prior to entering TS 3.8.1, Condition B. For unplanned entry into an extended completion time, the compensatory measures shall be implemented without delay. The licensee commits to add to TS Bases B 3.8.1 the compensatory measures described below, which will be required in order to utilize the extended 10-day completion time.

1. The redundant EDG (along with all of its required systems, subsystems, trains, components, and devices) will be verified operable (as required by the TS) and no discretionary maintenance activities will be scheduled on the redundant (operable) EDG.

2. No discretionary maintenance activities will be scheduled on the GTGs.

3. No discretionary maintenance activities will be scheduled on the startup transformers.

4. No discretionary maintenance activities will be scheduled in the APS switchyard or the unit's 13.8 kV power supply lines and transformers which could cause a line outage or challenge offsite power availability to the unit utilizing the extended EDG completion time.

5. All activity, including access, in the Salt River Project (SRP) switchyard shall be closely monitored and controlled. Discretionary maintenance within the switchyard that could challenge offsite power supply availability will be evaluated in accordance with 10 CFR 50.65(a)(4) and managed on a graded approach according to risk significance.

6. The GTGs will not be used for non-safety functions (i.e., power peaking to the grid).

7. Weather conditions are assessed prior to removing an EDG from service during planned maintenance activities. Additionally, EDG outages will not be scheduled when adverse weather conditions and/or unstable grid conditions are predicted or present.

8. All maintenance activities associated with the unit that is utilizing the extended EDG completion time will be assessed and managed per 10 CFR 50.65.

9. The functionality of the GTGs will be verified by ensuring that the monthly start test has been successfully completed within the previous four weeks before entering the extended EDG completion time.

10. The operability of the steam driven auxiliary feedwater pump will be verified before entering the extended EDG completion time.

11. The system dispatcher will be contacted once per day and informed of the EDG status, along with the power needs of the facility.

12. Should a severe weather warning be issued for the local area that could affect the switchyard or the offsite power supply during the extended EDG completion time, an operator will be available locally at the GTG should local operation of the GTG be required as a result of on-site weather-related damage.

13. No discretionary maintenance will be allowed on the main and unit auxiliary transformers associated with the unit.

In response to the NRC staff's RAI regarding the restrictions on the EDGs in the other two units when an EDG in one unit is in extended AOT, the licensee's May 4, 2006, response stated that procedural requirements (Paragraph 2.1.3 in Appendix B of procedure 70DP-ORA05, "Assessment of Risk When Performing Maintenance in Modes 1 and 2 ") would ensure that no more than one EDG at the Palo Verde site would be in a planned extended AOT at the same time.

In response to the NRC staff's RAI regarding communication protocol between control room operators at Palo Verde and the transmission system operator (TSO), the licensee's May 4, 2006, response stated that contacts with the TSO to determine current and anticipated grid maintenance conditions is accomplished by the licensee maintaining a listing of current and planned maintenance activities (1) in the Palo Verde switchyard and (2) on overhead lines that feed the Palo Verde switchyard. This planned switchyard maintenance is included in the risk assessment associated with evaluating grid-risk-sensitive maintenance activities. The TSO normally provides at least 3 days notice on planned switchyard maintenance that could impact Palo Verde.

The TSO also notifies Palo Verde of emergent work activities that could impact Palo Verde. Additionally, per compensatory measure no. 11, when utilizing the extended 10-day AOT, the system dispatcher will be contacted once per day and informed of the EDG status, along with the power needs of the facility.

In response to the NRC staff's RAI regarding the TSO notifying the plant operators of degraded grid conditions and what actions will be taken if degraded grid conditions occur during the EDG extended AOT, the licensee, on May 4, 2006, stated that new and emergent work activities (1) in the Palo Verde switchyard or (2) on overhead lines that feed the Palo Verde switchyard are communicated to the Palo Verde Unit 1 Operation Department from the TSO. New work items are evaluated for risk by the Palo Verde Work Week Manager (WWM). Emergent work items are evaluated for risk by either the control room staff or the WWM per procedure 70DP-ORA05. The risk assessments would be completed on a reasonable schedule commensurate with the safety significance of the condition as a result of the compensatory measures committed to by the licensee. The Palo Verde Unit 1 control room operators monitor switchyard voltage using a digital voltmeter equipped with low switchyard voltage alarms. If degraded grid conditions occur during the EDG extended AOT, procedure 70DP-ORA05 requires that the effect of emergent conditions on previously performed risk assessments and the associated risk management action level be assessed.

In response to the NRC staff's RAI regarding the GTG capability of meeting AC power requirements for any one of the three Palo Verde units, the licensee's May 4, 2006, response stated that additional capability, though not analyzed for DBAs, is available from the GTGs to provide power if needed. The operators have procedural guidance for aligning the electrical system to provide power from both GTGs for defense in depth during a DBA.

In response to the NRC staff's RAI regarding the current reliability and unavailability of the EDGs, the licensee's May 4, 2006, RAI response provided EDG reliability data as of March 31, 2006, as follows:

<u>Unit 1 EDG Reliability</u>

0 Failure per 20 demands
1 Failure per 50 demands: Meets the SBO reliability target of 95% with high confidence level of 92.3% (Alpha = 0.077)
2 Failures per 100 demands: Meets the SBO reliability target of 95% with high confidence level of 96.29% (Alpha = 0.0371)

<u>Unit 2 EDG Reliability</u>

0 Failure per 20 demands
1 Failure per 50 demands: Meets the SBO reliability target of 95% with high confidence level of 92.3% (Alpha = 0.077)
2 Failures per 100 demands: Meets the SBO reliability target of 95% with high confidence level of 96.29% (Alpha = 0.0371)

<u>Unit 3 EDG Reliability</u>

0 Failure per 20 demands
0 Failure per 50 demands:
2 Failures per 100 demands: Meets the SBO reliability target of 95% with high confidence level of 99.4% (Alpha = 0.006)

EDG unavailability as of March 31, 2006 (36-month rolling window):

Unit 1 EDG A = 0.79%	Unit 2 EDG A = 0.91%	Unit 3 EDG A = 0.96%
Unit 1 EDG B = 1.38%	Unit 2 EDG B = 0.76%	Unit 3 EDG B = 0.67%

The NRC staff has evaluated the proposed changes to determine whether the applicable regulations continue to be met and concludes that extending the AOT for an inoperable EDG from the current 72 hours to 10 days is acceptable. The NRC staff's conclusion is based on the following:

1. Alternate AC (AAC) power source (GTGs) will be available in the event of an SBO or LOOP. The functionality of the GTGs will be verified by ensuring that the monthly start test has been successfully completed within the previous four weeks before entering the extended EDG completion time.

2. The extended AOT would reduce entries into the LCO and reduce the number of EDG starts for major EDG maintenance activities.

3. EDG outages will not be scheduled when adverse weather conditions and/or unstable grid conditions are predicted or present.

4. The operability of the steam driven auxiliary feedwater pump will be verified before entering the extended EDG completion time.

5. No discretionary maintenance activities will be scheduled in the APS switchyard or the unit's 13.8 kV power supply lines and transformers which could cause a line outage or challenge offsite power availability to the unit utilizing the extended EDG completion time.

6. All activity, including access, in the SRP switchyard shall be closely monitored and controlled. Discretionary maintenance within the switchyard that could challenge offsite power supply availability will be evaluated in accordance with 10 CFR 50.65(a)(4) and managed on a graded approach according to risk significance.

7. The system dispatcher will be contacted once per day and informed of the EDG status, along with the power needs of the facility.

8. The licensee will implement its CRMP during the extended outage.

4.1.2 <u>LCO 3.4.9 - "Pressurizer"</u>

LCO 3.4.9.b currently reads:

"b. Two groups of pressurizer heaters OPERABLE with the capacity of each group ≥ 125 kW and capable of being powered from an emergency power supply."

LCO 3.4.9.b would be changed to read:

"b. Two groups of pressurizer heaters OPERABLE with the capacity of each group ≥ 125 kW."

The licensee stated that the current Palo Verde TS Bases for LCO 3.4.9 state that, “the heaters are not specifically used in accident analysis and the need to maintain subcooling in the long term during loss of offsite power, as indicated in NUREG-0737, ‘Clarification of TMI Action Plan Requirements,’ is the reason for their inclusion,” into this LCO. The intent of these heaters is to keep the reactor coolant in a subcooled condition with natural circulation at hot, high-pressure conditions for an undefined, but extended, time period after a LOOP.

The licensee stated that two banks (B1 and B2) of pressurizer heaters are connected to the Class 1E 4.16 kV buses via Class 1E 480 V load centers. The Class 1E 4.16 kV buses are normally supplied from offsite power. Upon a LOOP the EDGs will automatically start and connect to their dedicated Class 1E 4.16 kV bus, supplying power to the Class 1E pressurizer heaters (B1 and B2). Other emergency power supplies can additionally be aligned to the Class 1E 4.16 kV buses via onsite SBO GTGs and crosstie alignments with other units’ EDGs. Therefore, there is not a need or a requirement for the inclusion of the words, “and capable of being powered from an emergency power supply,” in this LCO.

The licensee proposed this change to support the extended EDG AOT because the current requirement could not be met when the associated EDG is inoperable because the EDG is the emergency source of power for the pressurizer heaters (B1 and B2). Without the proposed change, the LCO for the pressurizer would not be met and would require a plant shutdown.

The NRC staff finds the proposed change to the pressurizer TS to be consistent with the proposed changes to the EDG AOT. In addition, because the pressurizer heaters (B1 and B2) are supplied from the emergency 480 V electrical buses, which can also be powered through SBO GTGs and crosstie alignments with other units’ EDGs, power is available to the heaters during either a LOOP or an SBO. Therefore, the NRC staff finds the proposed change acceptable.

4.1.3 <u>LCO 3.8.3, Condition F</u>

The licensee’s proposed change would add a note to a portion of LCO 3.8.3, Condition F. This note will clarify the application of LCO 3.8.3, Condition F, for the condition when a diesel generator is starting and its associated air receiver pressure drops momentarily below 185 pounds per square inch gauge (psig).

Condition F of LCO 3.8.3, currently reads:

"Required Action and associated Completion Time not met.

OR

One or more DGs with diesel fuel oil, lube oil, or starting air subsystem inoperable for reasons other than Condition A, B, C, D, or E."

With the proposed addition of the note, Condition F of LCO 3.8.3 would be changed to read:

"Required Action and associated Completion Time not met.

OR

----------NOTE----------
Should the required starting air receiver pressure momentarily drop to <185 psig while starting the DG on one air receiver only, then entry into Condition F is not required.

One or more DGs with diesel fuel oil, lube oil, or starting air subsystem inoperable for reasons other than Condition A, B, C, D, or E."

This proposed change would alleviate unnecessary declaration of the EDG(s) as inoperable during the starting evolution of the diesel generator.

Periodic starting of the EDGs requires isolation of one of the two normally aligned air start receivers. During the subsequent diesel generator start, the air pressure in the one remaining air receiver may momentarily drop below the minimum required pressure of 185 psig. This is a momentary transient (typically less than 3 minutes) outside the band that does not invalidate the test and may be noted after a successful start on one bank of air compressors/air receivers. This would normally require immediately declaring the now running diesel generator inoperable (entry into LCO 3.8.3, Condition F) due to low pressure in the air start system (<185 psig). A successful Emergency or Test Mode start of the EDG makes entering the TS action to declare the diesel generator inoperable unnecessary as the engine has started successfully and is operating per procedures. If the engine starts normally, the air receiver system has performed its intended safety function. In all cases when the engine does not start properly, it would be declared inoperable per the requirements of LCO 3.8.1 and a troubleshooting plan would be developed regardless of the receiver air pressure status.

As such, LCO 3.8.3, Condition 'F' would be modified by a note stating that, "Should the required starting air receiver pressure momentarily drop to <185 psig while starting the DG on one air receiver only, then entry into Condition F is not required." It is expected that this condition would be fairly short in duration (less than 3 minutes), as the air start compressor would quickly restore the air receiver pressure after the diesel start. The note modifying LCO 3.8.3, Condition F has been written to only apply to a single air receiver pressure momentarily dropping below 185 psig during the starting sequence of a diesel generator. This note is written in this manner because this is the only time and sequence of events that this condition is expected to possibly occur and this condition would not prevent the EDG from performing its safety function.

Because any momentary drop in air receiver pressure after a successful start of the EDG has no impact on the operability of the EDG, and because the air receiver pressure would rapidly be restored, the NRC staff finds the addition of this note to be acceptable.

4.1.4 Deterministic Evaluation Conclusion

The NRC staff concludes that the deterministic evaluation supports the proposed extension of the AOT for EDGs from the current 3 days to 10 days. Additionally, the NRC staff finds acceptable the proposed change to the pressurizer LCO in TS 3.4.9 and the addition of the note to Condition F of LCO 3.8.3. The NRC staff also concludes that the proposed changes will not affect the compliance of Palo Verde with the requirements of GDC-17 and GDC-18.

4.2 Probabilistic Risk Evaluation

4.2.1 Overview and Probabilistic Risk Analysis (PRA) Model

The licensee has evaluated its proposed EDG AOT changes from 72 hours to 10 days in accordance with the principal elements of risk-informed, plant-specific decisionmaking and the principles of risk-informed integrated decisionmaking processes of RG 1.174. The evaluation of the proposed changes employed the five principles of the RG 1.174 to determine that current regulations and guidelines of three deterministic and one risk-informed principle as well as the surveillance monitoring process continue to be met. The impact of the proposed 10-day EDG AOT on risk is evaluated in accordance with the acceptance guidelines in RG 1.174 and RG 1.177. Pursuant to the requirements of 10 CFR 50.65(a)(4), the risk-informed evaluation of the licensee's request includes consideration of the licensee's Maintenance Rule program to assess and manage the increase in risk that may result from the performance of proposed maintenance activities. Specifically, the Maintenance Rule requires consideration of the configuration associated with other potentially high-risk tasks during a EDG outage, as well as consideration of specific compensatory measures to minimize risk. All these elements would be included in the review process using the three-tiered approach suggested in RG 1.177:

Tier 1 - PRA Capability and Insights
Tier 2 - Avoidance of Risk-Significant Plant Configurations
Tier 3 - Risk-Informed Configuration Risk Management Program (CRMP)

Evaluations addressing each of these three tiers are provided below, and the PRA model serves as the licensee's primary tool for the risk-informed evaluations.

4.2.1.1 PRA Model Development and Maintenance

The Palo Verde PRA is based on the plant-specific Individual Plant Examination and the Individual Plant Examination for External Events (IPEEE) projects. The PRA model has undergone many updates and NRC staff reviews. The PRA model has been completely reconstituted to meet growing requirements and to assure its quality consistent with risk-informed decisionmaking. It was recently updated by the licensee's PRA team to incorporate review comments, current design, procedures, recent plant operation data, and model changes relevant to this amendment request. The current PRA model represents the as-built, as-operated state of all three Palo Verde units. Some milestones relevant to this submittal are as follows:

- Modeling of the SBO GTGs

- Refined modeling of in-plant power distribution for initiating events.

- Bayesian update of plant-specific data consistent with the Maintenance Rule.

- Updated initiating event frequencies in 2001 including LOOP.

- Added detailed switchyard modeling.

- Alternate offsite power supply to each ESF bus.

- Physical plant change added for ESF actuation system cabinet cooling fans.

- Palo Verde PRA includes internal events and fire events at power. The internal flooding employed a screening process. No vulnerability was found.

- Other external events, other than fire, were addressed using screening methods.

- The effects of weather included for this submittal through use of two LOOP initiators, one for severe weather another for extreme weather.

- The principal impact of a severe earthquake would be a LOOP. This is sufficiently bounded by the sensitivity study performed on LOOP frequency.

4.2.1.2 PRA Quality

In addition to the PRA modeling and development process discussed in the previous section, PRA quality is further enhanced with emphasis on the systems and trains relative to the proposed changes as discussed in the following attributes:

- Sufficient details for switchyard and electrical distribution modeling were included, such as power to and feeds from the start-up transformer, and distribution down to vital AC and direct current (DC).

- Many safety system component failure data are updated for the latest PRA model, and changes were incorporated to implement the NRC's Mitigating Systems Performance Index. Many failure rates were Bayesian updated.

- Common-cause modeling is converted to the Alpha-Parameter method as opposed to the Multiple Greek Letter method.

- These proposed changes were performed using the latest upgrade. As a result of these changes and upgrades, the truncation level for large early release frequency (LERF) was reduced from 2E-12 to 9E-13. The truncation level employed for the quantitative risk assessment is sufficient enough to capture at least 90 percent of the actual core damage frequency (CDF) and LERF.

Model	CDF Truncation Level	LERF Truncation Level
Internal Events	1.0E-11	9.0E-13 (*)

NOTE: * The original submittal, prior to the upgrades, used 2.0E-12

4.2.1.3 PRA Model Applications, Including External Events

The quantitative risk assessment was performed using the licensee PRA model to determine the risk of removing an EDG from service for planned maintenance activities in accordance with the proposed 10-day AOT. The risk metrics for the assessment include:

– Changes in CDF and LERF,
– Incremental conditional core damage probability (ICCDP),
– Incremental conditional large early release probability (ICLERP).

The insights from both internal events and external events were consolidated, including fires and seismic events. In summary, the licensee has concluded that the Fire Events initiated in the Diesel Generator Building contribute less than 1 percent of the total fire CDF and LERF. Fire CDF is about 24% of the combined CDF and Fire LERF is about 10% of the combined LERF.

The plant-specific PRA model is used throughout the on-line work control, planning, and implementation processes. Risk contributors are identified and prioritized employing screening processes. No vulnerability was identified due to internal flooding. The small risk of internal flooding is attributed to specific plant features. For example, the diesel generator building has been equipped with sump pumps with level alarms, and there are no trip initiators in the building.

The PRA model maintenance and applications consist of model control and documentation, software control, model update process, and external reviews. The details of the maintenance and improvement processes are well documented for peer reviews, and the configuration control program is consistent with the 10 CFR 50.65(a)(4) Maintenance Rule program. PRA staff members are well qualified, and the Combustion Engineering Owners Group (CEOG) cross comparison process and technical positions are well established. The cross comparison process identifies similarities and differences among CEOG member PRAs, and the potential differences that impact the licensee PRA results are investigated. Differences in PRA results may be attributed to one of the following:

- Plant-specific design and operation
- Data
- Success criteria
- PRA modeling assumptions and modeling methodology

The guidance contained in RGs 1.174 and 1.177 was utilized by the licensee to ensure that the quantitative risk metric results of the PRA would be acceptable to support the proposed 10-day EDG AOT. The NRC staff has confidence that the results of the licensee's risk evaluations are technically sound and consistent with the expectations for quality set forth in RG 1.177.
In addition, the NRC staff has confidence that the scope, level of detail and quality of the licensee's PRA are sufficient to support a technically defensible and realistic evaluation of the risk changes resulting from the proposed change.

4.2.2 Tier 1 - PRA Capability and Insights

The licensee has evaluated the proposed EDG AOT changes to ensure that,

– current regulations and guidelines continue to be met,
– adequate defense-in-depth and safety margin provisions are maintained, and
– any increase in the at-power CDF and LERF are small and consistent with the NRC staff's Safety Goal Policy.

The risk impact of the proposed 10-day EDG AOT is evaluated based on the guidelines of RGs 1.174 and 1.177. To meet these acceptance guidelines, the licensee has to demonstrate that the requested EDG AOT extension has only a small impact on plant risk. In fact, an ICCDP of less than 5.0E-7 and an ICLERP of less than 5.0E-8 are considered small for a single TS AOT modification. Also, the licensee has to demonstrate that ICCDP contribution is distributed such that any increase in the associated conditional risk is small and within the normal operating background or risk fluctuations of the plant.

4.2.2.1 Risk Metrics

The risk metrics include the changes in average CDF and LERF prescribed in RG 1.174, and the ICCDP and ICLERP in accordance with RG 1.177. The truncation level for the risk calculations was based on the Palo Verde engineering analyses to capture more than 90 percent of actual CDF and LERF values. The truncation values for CDF and LERF were 1.0E-11 and 2E-12, respectively. The load distribution of EDGs A and B is asymmetric, and EDG A is selected for this review as the limiting risk contributor because of its higher risk compared with that of EDG B. The acceptable risk perturbation and normal plant risk variation during at-power operation are discussed in the next section, 4.2.2.2. The following table summarizes the evaluation results based on the proposed extension of the TS AOT by 7 days (from 3 days to 10 days):

Risk Metric Guideline	Applicable Guide	Acceptance Guideline	Evaluation Results	Assessment
Delta CDF	RG 1.174	<1.0E-06/yr	5.0E-07/yr	Acceptable
Delta LERF	RG 1.174	<1.0E-07/yr	2.6E-08/yr	Acceptable
ICCDP (internal events only)			5.41E-07(*)	
ICLERP (internal events only)			4.53E-08(*)	
Total CCDP (Internal + external)	RG 1.177	<5.0E-07	**7.11E-07(*)**	Conditionally Acceptable (See Section 4.2.2.2)
Total ICLERP (internal +external)	RG 1.177	<5.0E-08	**5.96E-07(*)**	Conditionally Acceptable (See Section 4.2.2.2)

Total ICCDP Configuration Risk	NUMARC 93-01	<1.0E-06	4.69E-07(*)	Maintenance Rule (Tier 2 evaluation in Section 4.2.3)
ICLERP Configuration Risk	NUMARC 93-01	<1.0E-07		Maintenance Rule (Tier 2 evaluation in Section 4.2.3)

Note: * For EDG A

4.2.2.2 ICCDP Distribution and Normal Operating Background Risk and Fluctuations

Configuration Risk Variation at Power Operation

The real time management of the Palo Verde operational configuration risk is implemented employing software in accordance with the Maintenance Rule requirements. Within the guidelines of the a(4) requirement of the Maintenance Rule, NUMARC 93-01 specifically allows a temporary variation of the configuration risk up to, but less than 1.0E-06 in ICCDP and 1.0E-07 in ICLERP. Any excess maintenance preventable functional failures of the systems or components are incorporated into the reliability data.

The licensee evaluated the configuration ICCDP during the proposed 10-day AOT, employing both base case (time-averaged nominal maintenance model) and zero maintenance configuration models, and the resulting values are compared for internal events. Furthermore, similar calculations were performed including fire events, but not seismic events. Seismic contribution to the incremental conditional probabilities would be small and bounded by the parametric uncertainty. The following table summarizes the results:

Case Events		Maintenance Model	Zero Maintenance Model
Internal Event ICCDP 7 day(*)	EDG A	5.41E-07	4.08E-07
	EDG B	4.53E-07	3.27E-07
Internal Event ICLERP 7 day(*)	EDG A	2.904E-08	2.18E-08
	EDG B	2.46E-08	1.80E-08
Internal + Fire ICCDP(**)	EDG A	**7.11E-07**	4.69E-07
	EDG B	**5.96E-07**	4.27E-07
Internal + Fire ICLERP(**)	EDG A	3.22E-08	
	EDG B	2.73E-08	

Note: * Re-calculated based on the AOT increase by 7 days (3 days to 10 days)
** Re-calculated based on the licensee submittal: Fire CDF is 24 percent of combined CDF and Fire LERF is about 10 percent of combined LERF.

The total ICCDPs of 7.11E-07 and 5.96E-07 for EDGs A and B, respectively, exceed 5.0E-07 of the acceptance guidelines specified in RG 1.177. However, when the ICCDPs are evaluated using the configuration "zero" maintenance model, the total ICCDPs are 4.69E-07 for EDG A and 4.27E-07 for EDG B. These values are within the acceptable guideline as shown in the above table. During at-power operation, the conditional core damage probability of 1.0E-06 is considered to be an acceptable operational risk variation under the NUMARC 93-01 guidelines. Considering the proposed compensatory measures and the normal operating risk fluctuation of the plant (the base case ICCDP value of 7.11E-07 exceeds the acceptance guideline by 2.11E-07), the NRC staff concluded that the licensee's proposed AOT extension is consistent with the NRC Standard Review Plan, Chapter 16.1, Section II.B, "Probabilistic Guidelines," for Tier 1, normal operational risk fluctuation.

Changes to Average CDF and LERF

The amendment of the proposed AOT extension by 7 days would alter the unavailability of EDG from the current 3 days to 10 days, and the change would impact the yearly averages of the CDF and LERF accordingly. Consistent with RG 1.174 guidelines, the best estimate of EDG unavailability was evaluated based on the additional unavailability of a 7-day AOT extension. The increased EDG unavailability was added to the current unavailability, and the model was re-quantified using the new value for the EDG maintenance unavailability. The resulting changes to CDF and LERF are 5.0E-07/yr and 2.6E-08/yr, respectively. These changes are within the acceptance guidelines for the incremental CDF and LERF in RG 1.174 (1.0E-06/yr for CDF and 1.0E-07/yr for LERF) and are, therefore, acceptable to the NRC staff.

PRA Quality and Epistemic Uncertainty

The licensee's submittal provided a sufficient level of detail to evaluate the risk impact of the proposed changes. Further, the risk information provided by the licensee has established a cause-effect relationship to identify the portions of the PRA affected by the changes, where the PRA elements have been peer-reviewed externally and reviewed for adequacy. The sensitivity study of the grid-related LOOP frequency and the importance of operator actions related to the changes are performed both quantitatively and qualitatively. This is consistent with the guidelines provided in RG 1.177, including the risk impact to shutdown and forced shutdown risk.

The parametric values of the failure rates, initiators, and human errors are used to quantify the accident sequence frequencies, which can generate an adequate probability distribution for CDF and associated accident sequences. The model development employed the industry's state of knowledge, and included appropriate component failures in terms of both a fail-to-start (consistent with the binomial approach) and a fail-to-run (consistent with the Poisson model), human performance and common-cause failure. Plant specific data has been collected through failure data trending and Maintenance Rule requirements, such as maintenance preventable functional failures, and the failure rates have been updated via Bayesian update. The uncertainty associated with the completeness was not evaluated. The licensee demonstrated (Attachment 2 of the December 23, 2005, submittal) that the licensee PRA model has been maintained using an established procedure for staff qualification, model control and documentation, and PRA software control based on the industry's state of the art methodology, including the model update and external review process.

4.2.2.3 Risk Insights

External Events

The Palo Verde PRA model covers internal events only at power and includes fire events. The internal flooding was addressed using a screening process, and no vulnerability was found. In fact, the EDG building is not susceptible to internal flooding based on the following observations:

- Sumps with level alarms and sump pump,
- No high-capacity water systems (only Essential Spray Pond EDG engine cooling), and
- No trip initiators.

Palo Verde was a pilot plant for fire-induced vulnerability evaluation methodology, and subsequently, completed a fire PRA, although it is not a part of the on-line risk monitor. However, Palo Verde expects to add it as an industry standard. With the fire model included, fire CDF and LERF will be explicitly accounted for as well as fire-related compensatory measures. The external events (excluding fire) were evaluated using screening methods. The Palo Verde units are in a low seismic hazard zone, as reported in the IPEEE, and the bounding sensitivity study on LOOP frequency has been evaluated with respect to this amendment request. Severe and extreme weather are accounted for through two LOOP initiators. In summary, the fire events originating in the diesel building are less than 1 percent of total fire CDF and LERF, and the fire CDF is about 24 percent and 10 percent of the total combined CDF and LERF, respectively.

Forced Shutdown Risk and Shutdown Risk

The license evaluated the risk due to forced shutdown while an EDG is out-of-service. The best estimate of the forced shutdown risk is less than 2.0E-7 during a potential additional EDG outage of 7 days in a 1 year period. The shutdown risk was not quantified because the Palo Verde PRA model does not have a shutdown model. However, the licensee is planning to perform planned maintenance on one EDG online during power operation so shutdown risk is not considered to be a significant issue by the NRC staff.

4.2.3 Tier 2 - Avoidance of Risk-Significant Plant Configuration

The objective of Tier 2 is to identify potentially high-risk configurations promptly and to ensure that appropriate restrictions are placed on such high-risk configurations. The high-risk configurations could occur if additional equipment is taken out-of-service concurrently or due to other risk significant operational plant evolutions while in the extended EDG AOT.

4.2.3.1 Prompt Detection of High Risk Configurations

The Palo Verde licensee employs the configuration risk threshold corresponding to the Nuclear Energy Institute (NEI) recommended “establish risk management actions” level in NEI’s NUMARC 93-01, Revision 3, Chapter 11. Under the Maintenance Rule and in particular, for compliance with paragraph (a)(4) of the rule, NUMARC 93-01 establishes a threshold value of an acceptable configurational incremental core damage probability of 1E-06. The licensee implemented an industry-wide acceptable risk management software called EOOS, to

schedule, detect, and identify the potentially high-risk configurations as a routine operational tool, which meets the intent of both quantitative and qualitative risk control. The licensee also administers similar thresholds for incremental early release probability based on a limiting value of 1E-07, consistent with the NUMARC 93-01 guideline. Based on the risk considerations under the fourth principle of RG 1.174 and the Maintenance Rule program, the NRC staff concludes that the aforementioned approach to detect and to limit potentially high-risk configurations is prudent and acceptable for the proposed application.

4.2.3.2 Additional Measures to Restrict High-Risk Configurations

The following high-risk configurations to be avoided were identified by the licensee:

- Severe weather can affect the reliability of offsite power and may not be predictable, particularly during the summer. Severe winter weather is relatively mild in terms of extreme energy, and is also more predictable as to its severity. The licensee's procedural guidance prohibits work scheduling on the AAC power source, SBO GTG or Start-up Transformer concurrently with any unit's EDG. The guidance also limits work in the switchyard during the periods when any one of the EDGs is not available.

- Palo Verde Units are independent of each other, a configuration in one unit does not affect the risk profile of another unit, other than sharing start-up transformers and the switchyard. The SBO GTGs are also shared, but they are not normally connected to any of the units. Although the GTGs can supply two units with load restrictions, they are designed to serve only one unit at a time. Therefore, no more than one of the site's six EDGs is taken out of service at any given time, thus minimizing the possibility of an SBO occurring in more than one unit.

- Station procedure 70DP-0RA05 provides additional risk reduction and restriction measures as follows:

  - With an acceptable risk assessment, work on the same train system is allowed concurrently with EDG work.

  - Opposite train work is not routinely scheduled, and the risk assessment of any emergent work items are evaluated prior to the work schedule.

  - Work schedule may require additional adjustment if EDG work exceeds the scheduled time.

4.2.4 Tier 3 - Risk-Informed Configuration Risk Management

The Palo Verde configuration risk management program (CRMP) is addressed by a risk-informed on-line risk management process, conforms to the requirements of the Maintenance Rule, and is consistent with the guidelines provided in NUMARC 93-01. The licensee established the CRMP requirements in the Palo Verde Technical Requirements Manual, Section 5.0.500.19. The procedures and guidance governing this process are Station Procedure 70DP-0RA05 and the EOOS. Palo Verde has implemented the EOOS computer real time software in each unit, for scheduling and planning maintenance and to monitor the real-time configuration risk and its profile. The EOOS software is an acceptable industrywide

standard computer program for risk monitoring, and provides assurance that the risk associated with the planned on-line work activities and emergent work are evaluated and appropriately scheduled in a timely manner. The licensee's CRMP program includes provisions for performing a configuration-dependent assessment of the overall impact on risk of the proposed plant configuration prior to, and during the performance of on-line work activities. Risk is re-assessed if an unscheduled equipment failure or malfunction, or emerging condition, produces a plant configuration that had not been evaluated previously. Based on the licensee's CRMP, its implementation in conformance to the Maintenance Rule, and appropriate use of the EOOS, the NRC staff finds that the licensee's program is adequate to support the proposed amendment.

4.2.5 Probabilistic Risk Evaluation Conclusion

The proposed changes were evaluated by the NRC staff based on a risk-informed assessment and the deterministic guidelines in RG 1.174 and applicable Standard Review Plans. While the EDG A ICCDP, 4.69E-07, of the configuration risk model is within the RG 1.177 guideline, the EDG A ICCDP, 7.11E-07, of the baseline model exceeds 5.0E-07 of the acceptance guidelines by 2.71E-07. However, 7.11E-07 is well within the acceptable CRMP risk variation during at-power operation, where 1.0E-06 is considered an acceptable operational risk variation using the NUMARC 93-01 guidelines under the Maintenance Rule requirements. Considering the proposed compensatory measures and the normal operating risk fluctuation of the plant, the NRC staff concludes that the licensee's proposed AOT extension is consistent with the NRC Standard Review Plan 16.1, Section II.B, "Probabilistic Guidelines," Item 1 for Tier 1, normal operational risk fluctuation. On the basis of the risk considerations in RG 1.174 and the Maintenance Rule, the licensee's program to detect and to limit potentially high-risk configurations is considered prudent and acceptable by the NRC staff for the proposed application, and is consistent with the Tier 2 objective. The NRC staff concludes that the licensee's CRMP and the use of EOOS are in conformance with the Maintenance Rule, and the NRC staff finds that the licensee's programs are adequate to support the proposed amendment request.

The NRC staff concludes that the proposed extension of the EDG AOT under LCO 3.8.1 from 3 days to 10 days is acceptable, because the impact on the plant risk for allowing a 10-day AOT is acceptably small for the total postulated events, both internal and external.

5.0 REGULATORY COMMITMENTS

The licensee's May 4, 2006, letter provided a list of compensatory measures that will be implemented when utilizing an extended EDG completion time. These compensatory measures are itemized in Section 4.1.1. of this Safety Evaluation. For planned maintenance utilizing an extended completion time, the compensatory measures shall be implemented prior to entering TS 3.8.1, Condition B. For unplanned entry into an extended completion time, the compensatory measures shall be implemented without delay.

The licensee provided a regulatory commitment to add the compensatory measures to the TS Bases. The NRC staff has reviewed the licensee's Commitment Management System, and concluded that it complies with NEI's Document 99-04, Revision 0, "Guidelines for Managing NRC Commitment Changes," July 1999. In SECY-00-045, dated February 22, 2000, the NRC staff informed the Commission that it had found that NEI 99-04 contains acceptable guidance

for controlling regulatory commitments made by power reactor licensees to the NRC. Therefore, the staff considers the regulatory commitment to add the compensatory measures to the TS Bases to be sufficient for the purposes of approving the licensee's amendment request.

6.0 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.

7.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to 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 amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on January 31, 2006 (71 FR 5080). Accordingly, the amendments meet 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 amendments.

8.0 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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