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SUBJECT: Application for amends to licenses NPF-41,NPF-51 & NPF-74. Amends would provide temp method to respond to sustained degraded switchyard voltage.

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10 CFR 50.90

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WILLIAM L. STEWART
EXECUTIVE VICE PRESIDENT
NUCLEAR

102-03409-WLS/AKK/DRL
July 3, 1995

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Proposed Amendment to Technical Specification
3/4.8.1.1, A.C. Sources - Operating

Pursuant to 10 CFR 50.90, Arizona Public Service Company (APS) submits herewith a request to amend Facility Operating Licenses NPF-41, NPF-51, and NPF-74 for PVNGS Units 1, 2, and 3 on a temporary basis. The proposed amendment would add Technical Specification (TS) ACTION Statements 3.8.1.1.f and 3.8.1.1.g to TS 3.8.1.1, "A.C. Sources - Operating." These new ACTION Statements provide a temporary method to respond to a sustained degraded switchyard voltage.

Revision 1 to Licensee Event Report 93-011, dated February 6, 1995, describes the current inability of PVNGS Units 1, 2, and 3 to meet General Design Criterion (GDC) 17 of Appendix A to 10 CFR 50 at the lower end of expected switchyard voltage. The proposed amendments provide temporary, manual responses to sustained degraded switchyard voltage, but do not return PVNGS Units 1, 2, and 3 to full compliance with GDC 17. These amendments will expire upon the completion of the sixth refueling outage of PVNGS Units 1, 2, and 3 when full compliance with GDC 17 is achieved.

Provided in Enclosure 1 to this letter are the following sections which support the proposed TS amendment:

A. Description of the Proposed Technical Specification Amendment Request
B. Purpose of the Technical Specification
C. Need for the Technical Specification Amendment
D. Safety Analysis for the Proposed Technical Specification Amendment Request
E. No Significant Hazards Consideration Determination
F. Environmental Impact Determination

A001

G. Revised Technical Specification Pages

Enclosure 2 provides the marked-up TS pages to support the proposed amendment. By copy of this letter and its enclosures, the Arizona Radiation Regulatory Agency is being notified of this TS amendment request pursuant to 10 CFR 50.91(b)(1).

In accordance with Technical Specification Section 6.5, the Plant Review Board and Offsite Safety Review Committee have reviewed and concurred with this request. Pursuant to 10 CFR 50.91(b)(1), a copy of this request is being forwarded to the Arizona Radiation Regulatory Agency.

Should you have any questions, please contact Scott A. Bauer at (602) 393-5978.

Sincerely,

James M. Levine for WLS

WLS/AKK/DRL/rv
Enclosures

cc: L. J. Callan (all w/enclosures)
K. E. Perkins
B. E. Holian
K. E. Johnston
A. V. Godwin (ARRA)

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, J. M. Levine, represent that I am Vice President Nuclear Production, Arizona Public Service Company (APS), that the foregoing document has been signed by me on behalf of APS with full authority to do so, and that to the best of my knowledge and belief, the statements made therein are true and correct.

J. M. Levine

Sworn To Before Me This 3 Day Of July, 1995.

Notary Public

My Commission Expires

April 6, 1999

ENCLOSURE 1

PROPOSED AMENDMENT TO TECHNICAL SPECIFICATION SECTION 3/4.8.1.1

A.C. SOURCES - OPERATING

A. DESCRIPTION OF AMENDMENT REQUEST

The proposed Technical Specification (TS) amendment temporarily adds new ACTION Statements 3.8.1.1.f and 3.8.1.1.g to TS 3.8.1.1, "A.C. Sources - Operating," to provide a method of responding to sustained degraded switchyard voltage. The new ACTION Statements would require the manual blocking of Fast Bus Transfer (FBT) on one train within the first hour of a degraded switchyard voltage should the switchyard voltage fall below the level necessary for the Electrical Distribution System (EDS) to maintain compliance with General Design Criterion (GDC) 17 of Appendix A to 10 CFR 50. If the degraded switchyard voltage condition continues beyond the first hour, 1) the Emergency Diesel Generator (EDG) for the second train would be started, connected in parallel with the grid through the emergency bus, loaded, and then the emergency bus would be separated from the grid before the end of the second hour, and the offsite circuit would be restored within seventy-two hours; or 2) fast bus transfer for the second train would be blocked before the end of the second hour.

Bases 3/4.8.1, 3/4.8.2, and 3/4.8.3, "A. C. Sources, D. C. Sources, and Onsite Distribution Systems," are being amended to provide guidance on how and why degraded offsite power voltage and the number of startup transformers in service affect compliance with GDC 17, and the basis for the additional ACTION Statements.

B. PURPOSE OF THE TECHNICAL SPECIFICATION

TS 3.8.1.1, "A.C. Sources - Operating," describes the requirements for both the offsite and the onsite A.C. sources. These requirements include the circuits from the switchyard to the onsite electrical distribution network as well as the EDG. The TS requires both offsite and both onsite power sources to be operable to ensure that sufficient capacity, capability, and single failure protection is available to assure that: 1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences; and 2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

C. NEED FOR THE TECHNICAL SPECIFICATION AMENDMENT

During the Design Basis and Calculation Reverification efforts at Palo Verde it was identified that, under certain accident scenarios at lower switchyard voltages within the range expected by the Updated Final Safety Analysis Report (UFSAR), substandard voltages would exist within the onsite Class 1E EDS. During accidents which result in a unit trip and a FBT, and occur at lower switchyard voltages, Essential Safety Features (ESF) loads would initially be sequenced on the preferred offsite power sources. However, sustained substandard voltages would exist on the

Class 1E 4.16 kV buses due to the FBT of non-Class 1E loads from the auxiliary transformer to the startup transformers. Due to the sustained substandard voltages, the Class 1E degraded voltage time delay relays would actuate to protect the downstream Class 1E loads. The Class 1E loads would be stripped from the Class 1E 4.16 kV buses and resequenced on the EDGs. This effect has been referred to as "double sequencing" and was reported in Revision 1 to Licensee Event Report (LER) 93-011 on February 6, 1995. Double sequencing was described in the LER as an unreviewed safety question in that an accident of a different type (e.g., a degraded voltage coincident with a LOCA) and a malfunction of a different type (i.e., double sequencing) was created.

Revision 1 to LER 93-011 reported that the Palo Verde Nuclear Generating Station (PVNGS) EDS is not in compliance with GDC 17 at the lower end of anticipated switchyard voltages in that the loss of the power generated by the nuclear power unit would result in the loss of both preferred offsite power circuits. The effect of this loss is that during accident conditions, ESF loads would initially sequence on offsite power but would then be stripped from the preferred circuits by the undervoltage relays. The ESF loads would then have to be resequenced on the EDGs. This would cause an interruption in the response of some safety systems such as safety injection and auxiliary feedwater. This interruption is not assumed in Updated Final Safety Analysis Report Chapter 6 and Chapter 15 safety analyses.

As an interim measure, Abnormal Operating procedures instruct that when all three startup transformers are in service, switchyard voltages are to be maintained at elevated voltages between 525 kV and 535 kV. Unit 1 is not vulnerable to double sequencing at or above, including instrument uncertainties, approximately 524 kV; while Units 2 and 3 are not vulnerable at or above, including instrument uncertainties, approximately 518 kV. The difference is due to additional loads on Unit 1 from the Water Reclamation Facility. Also, FBT is to be manually blocked in one train within the first hour of the disturbance if voltages below these values are encountered. The train which is blocked is then capable of supporting ESF loads throughout the entire range of credible switchyard voltages. If the disturbance continues into the second hour, the EDG for the other train is to be started, connected in parallel with the grid, loaded, and separated from the grid by the end of the second hour. In this configuration, the plant then has only one offsite power circuit INOPERABLE. When only two startup transformers are in service, the voltage provided to all three units must be at or above, including instrument uncertainties, approximately 525 kV. However, the response is the same as with three startup transformers in service.

Under the existing TSs, during a sustained degraded switchyard voltage, TS 3.0.3 is applicable since the plant does not conform to the Bases of TS 3.8.1 (noncompliance with GDC 17) and injection flows in both trains are interrupted due to double sequencing, resulting in both injection trains being inoperable. ACTION is required within one hour for TS 3.0.3. Once fast bus transfer is blocked in one train, that train

is OPERABLE and TS 3.0.3 is exited. Once the blocked train is OPERABLE, the next most limiting TS for the unblocked (or INOPERABLE) train is 3.8.2.1, "D.C. Sources - Operating." The double sequencing event may present substandard voltages to the Class 1E 125VDC battery chargers. Should the Class 1E 125VDC battery chargers not operate, the Class 1E 125VDC batteries would be required to provide 125VDC control power during both sequences of ESF circuit breaker cycling. The Class 1E 125VDC battery capacity calculations assume only one sequence. TS ACTION 3.8.2.1.a requires ACTION within two hours. To comply with this ACTION statement, the EDG on the second train would be loaded and separated from the offsite circuit within two hours. This returns the Class 1E 125VDC battery chargers to OPERABLE, and in this configuration, only one offsite power circuit remains INOPERABLE. TS ACTION 3.8.1.1.a, "A.C. Sources - Operating," allows this configuration for up to seventy-two hours.

This amendment request would create temporary ACTION statements 3.8.1.1.f and 3.8.1.1.g under TS 3.8.1.1. The proposed ACTION statements provide for the same responses within the same time requirements as would be implemented under the existing TSs. However, the proposed ACTIONs would eliminate the need to use multiple TSs to address a single degraded voltage condition.

Revision 1 to LER 93-011, dated February 6, 1995, describes the current inability of PVNGS Units 1, 2, and 3 to meet GDC 17 of Appendix A to 10 CFR 50 at the lower end of expected switchyard voltage. The proposed amendments provide temporary, manual responses to sustained degraded switchyard voltage but does not return PVNGS Units 1, 2, and 3 to full compliance with GDC 17. These ACTION statements do not eliminate the unreviewed safety question that currently exists when degraded switchyard voltage is present, but do constitute an appropriate response to prevent double sequencing when confronted with degraded switchyard voltage. These amendments will expire upon the completion of the sixth refueling outage of PVNGS Units 1, 2, and 3 when full compliance with GDC 17 is achieved.

D. SAFETY ANALYSIS OF THE PROPOSED AMENDMENT REQUEST

Background

The Palo Verde EDS is composed of two redundant, independent, preferred offsite A.C. power circuits. These are backed up by two redundant, independent, onsite EDGs. The offsite power circuits normally supply power from the startup transformers to the Class 1E 4.16 kV buses through the ESF transformers. The site has three startup transformers, each of which supplies two preferred power circuits (i.e., six circuits for three units). Each startup transformer supplies two different units, or, stated differently, each unit's Class 1E onsite circuits are fed from different startup transformers. Should a loss of offsite power occur, the Class 1E 4.16 kV buses separate from the ESF transformers and receive power from the EDGs.

The non-Class 1E portions of the EDS are fed from the main generator through the auxiliary transformer. Should a trip of a main generator occur, a FBT occurs which transfers the non-Class 1E loads from the auxiliary transformer to the startup transformers. This transfer results in all Class 1E and non-Class 1E loads being fed from the two startup transformers which feed that unit.

The PVNGS Safety Evaluation Report and its supplements, Section 8.4.7, documents the adequacy of the offsite and onsite electrical distribution to protect against sustained degraded grid voltages. PVNGS was initially licensed with FBT blocking circuits (E. E. Van Brunt, Jr., APS to F. J. Miragilia, NRC, dated March 31, 1982). If the switchyard voltage could not provide adequate voltages at the Class 1E 4.16 kV buses subsequent to a FBT of non-Class 1E loads from the auxiliary transformer to the startup transformers, the FBT blocking relays would anticipate this and prevent the transfer of the non-Class 1E loads to the startup transformers. This would maintain adequate voltage to the ESF equipment from the Class 1E EDS throughout the entire range of credible sustained switchyard voltages. This would result in a loss of power to all non-Class 1E loads (e.g., the reactor coolant pumps, circulating water pumps, and normal plant lighting). This Loss of Offsite Power (LOP) event is analyzed.

Until self identified by engineering as a deficiency in 1990, settings for protective relays for the high voltage electrical distribution systems for Palo Verde were performed by a division of APS not within the scope of the Palo Verde 10 CFR 50, Appendix B, Quality Assurance Program; Configuration Control Program; or Design Control Program. The relays which blocked FBT under certain low voltage conditions were reset lower in 1986 in an effort to enhance a second function (generator coastdown) of the relays. This relay setting change did not receive a safety evaluation in accordance with 10 CFR 50.59. The new setting created a malfunction of a different type (i.e., double sequencing) and accident of a different type (e.g., Degraded Voltage + LOCA). Since the setting for the FBT blocking relays has been identified as inadequate through engineering's Design Basis and Calculation Reverification efforts, grid voltage has been administratively controlled above 525 kV to preclude double sequencing. However, resetting the relay to its pre-1986 setting is not recommended as: 1) the original setting was determined to be too high for its generator coastdown function and could cause a unit trip under load rejection conditions; 2) assumptions made by the original Architect/Engineer for the Class 1E Electrical Distribution System may be inadequate and may have resulted in an inadequate original design (i.e., the light and heavy loads are more extreme than originally assumed); and 3) the original design did not employ fault tolerant logic and could, therefore, permit unnecessary challenges to safety systems.

The proposed amendment is designed to balance the probability of double sequencing due to degraded voltage coincident with an accident, which is unlikely (4.9E-5/yr), against the probability of natural circulation due to a unit trip coincident

with degraded voltage, which is also unlikely but more probable (4.0E-3/yr). The amendment provides offsite power to half of the non-Class 1E loads for forced circulation to respond to a normal plant trip as well as EDG power and offsite power from the other train to the ESF equipment to respond to any accident.

Compensatory Actions

Pending modifications to restore automatic degraded voltage protection, administrative controls between the APS Energy Control Center (ECC) and the PVNGS Unit 1 control room have been implemented. The ECC has been instructed to maintain grid voltage between 525 kV and 535 kV. An alarm has been established at the ECC at 526 kV. When the alarm sounds, the ECC has been instructed to call the Unit 1 Control Room. Unit 1 will coordinate the response for the site. If the switchyard voltage is below the unit specific required voltages, the affected units will block one train of FBT within the first hour, in accordance with procedures. Should the disturbance last longer, the procedures go on to instruct the starting of the opposite train's EDG, connecting it in parallel to the grid, loading it, and separating it from the grid within two hours and restoring the offsite circuit within seventy-two hours. This amendment request includes an option to block FBT in the second train within two hours. This option is provided primarily in the event of complications with the EDG.

The blocking of one train of FBT returns one train of offsite and onsite power to conformance with GDC 17 throughout the entire credible range of sustained switchyard voltages. The train not blocked will have the ESF loads supplied by its EDG should the disturbance last beyond the second hour. This action minimizes the potential to double sequence in either train in the event of an accident. The option of blocking FBT in the second train would return both trains of offsite and onsite power to conformance with GDC 17 throughout the entire credible range of sustained switchyard voltages and is in conformance with the current licensing basis.

An indicator within the Palo Verde Plant Monitoring System (PMS) computer has been recently activated. The switchyard voltage is now displayed on a computer terminal in the Control Room and changes color should the voltage fall below required levels. The event also registers on the computer typer. This indication allows Unit 1 to rely on the PMS in addition to the ECC, to determine if action is required due to sustained degraded switchyard voltage and coordinate the response with Units 2 and 3.

Engineering design is underway to provide annunciation in the Unit 1 Control Room for degraded switchyard voltage. Installation is expected during the sixth refueling outage of Unit 1.

Analysis

The risk of having a degraded switchyard voltage, without fast bus transfer blocked, lies in the potential to double sequence. The proposed temporary response is to prevent the double sequencing potential in one train of the EDS within the first hour by blocking FBT. This then places the plant in a configuration which has the other train of offsite and onsite power remaining INOPERABLE, since none of the ESF equipment in the second train could be guaranteed to operate after being double sequenced. Response within one hour is consistent with response time required by TS 3.0.3 since this remains an unanalyzed condition.

With one train of FBT blocked, the other train of offsite and onsite power remains INOPERABLE. The next most limiting ACTION for the unblocked train is TS 3.8.2.1.a, "D. C. Sources - Operating," which has an Allowed Outage Time of two hours. In a degraded voltage event, the ability of the Class 1E 125VDC battery chargers to perform their function is indeterminate, therefore, the Class 1E 125VDC batteries must be assumed to provide the 125VDC control power to the Class 1E ESF circuit breakers for both of the sequences. The Class 1E 125VDC battery capacity calculations assume only one sequence. The proposed ACTION to restore the Class 1E 125VDC battery chargers to OPERABLE is to start the EDG, connect it through the emergency bus in parallel with the grid, load it, and disconnect the emergency bus from the grid within the second hour of a degraded switchyard voltage. This restores one of the A.C. power sources to the second train to OPERABLE and eliminates the vulnerability to double sequencing on the second train within two hours; the duration of ACTION 3.8.2.1.a.

Alternately, FBT can be blocked in the second train to return it to OPERABLE within the second hour. The plant was originally licensed with both trains blocked in degraded voltage situations. However, having the EDG provide power to the second train is preferable to blocking both trains, in order to maintain forced circulation should the plant trip.

Once power is provided to the second train from the EDG, only one offsite power circuit remains INOPERABLE. Under such a condition, the plant would normally enter ACTION 3.8.1.1.a which requires the restoration of the INOPERABLE power source to OPERABLE within seventy-two hours. The proposed ACTIONs would allow operation for up to seventy-two hours from the onset of the degraded switchyard voltage before requiring the plant be placed in HOT STANDBY within the next six hours and COLD SHUTDOWN within the following thirty hours.

Regulatory Guide 1.93, "Availability of Electric Power Sources," Revision 0, December 1974 recognizes that under certain conditions it may be safer to continue operation at full or reduced power for a limited time than to effect an immediate shutdown based on the loss of some of the required electric power sources. In an effort to minimize

the risk to the health and safety of the public, the proposed ACTIONs 3.8.1.1.f and 3.8.1.1.g balance the risk of a forced shutdown against the risk of remaining at power with a degraded switchyard voltage.

Probabilistic Risk Analysis (PRA) has compared the probability of a core melt event for 1) blocking fast bus transfer in one train after one hour for the next seventy-one hours, and in the second train after two hours for the next seventy hours; 2) blocking fast bus transfer in one train after the first hour for the next seventy-one hours and supplying power to the other train from the EDG after the second hour for seventy hours; and 3) a normal shutdown assuming the plant is in a normal configuration and no other transients or accidents, except an uncomplicated reactor trip, occur during the shutdown process. Seventy-two hours was chosen for comparison purposes as the proposed ACTIONs would allow operation for up to seventy-two hours with one offsite circuit INOPERABLE.

The PRA has shown that the probability of a core melt event during power operation with FBT blocked in one train after one hour for the next seventy one hours, and in the second train after two hours for the next seventy hours is approximately 1.91E-6. The probability of a core melt event during power operation with FBT blocked in one train after one hour for the next seventy one hours and the EDG powering the opposite train after the second hour for the next seventy hours (the proposed configuration) is between approximately 1.91E-6 and 1.93E-6. A range is provided because the current PRA model can only model blocking both trains or the EDGs supplying both trains. The risk lies somewhere between the two values. The probability of a core melt event due to a normal shutdown assuming the plant is in a normal configuration and no other transients or accidents, except an uncomplicated reactor trip, occur during the shutdown process is 2.4E-6. The risk can not be calculated for a forced shutdown with degraded switchyard voltage present but it is expected to be higher. The results are summarized graphically in Figure 1.

E. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not:

1. involve a significant increase in the probability or consequences of an accident previously evaluated;

2. create the possibility of a new or different kind of accident from any previously evaluated; or

3. involve a significant reduction in a margin of safety.

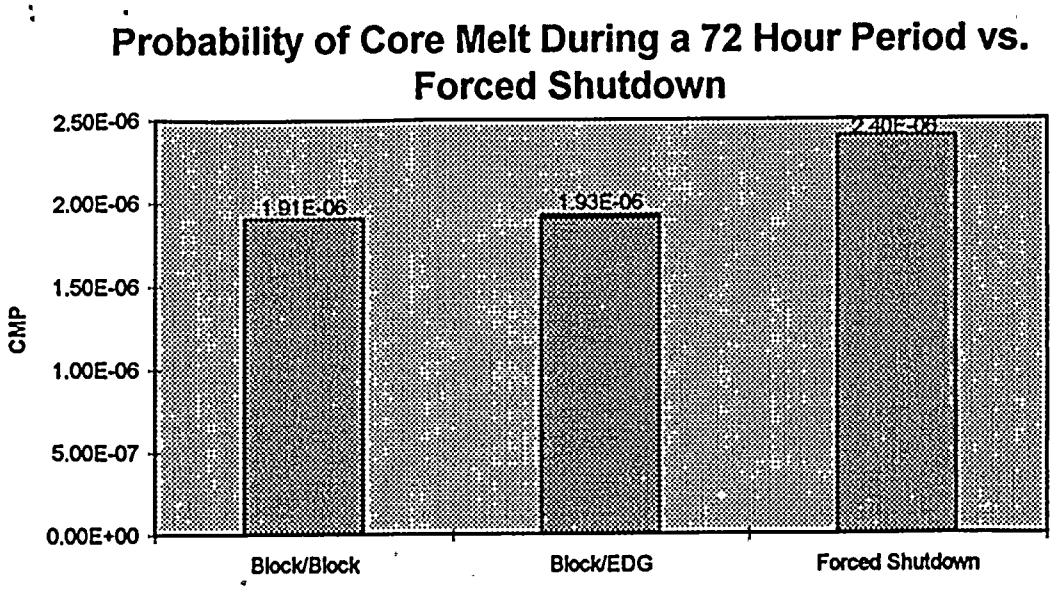

Figure 1

A discussion of these standards as they relate to this amendment request follows:

Standard 1: Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change does not significantly increase the probability of an accident previously evaluated in the Updated Final Safety Analysis Report (UFSAR). The safety function of the Electrical Distribution System (EDS) is to provide sufficient capacity and capability to assure that 1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and 2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. In addition, it shall have sufficient independence, redundancy, and testability to perform its safety function assuming a single failure. The proposed ACTIONs will restore the EDS to conformance with General Design Criterion (GDC) 17 of Appendix A to 10 CFR 50. Once in conformance with GDC 17, the system will be capable of performing its safety function as analyzed in Chapters 6 and 15 of the UFSAR. The proposed temporary change has no effect on the probability of accident initiation, therefore, the probability of an accident previously evaluated has not been significantly increased.

The consequences of an accident previously evaluated in the UFSAR will not be significantly increased. Restoring one train to OPERABLE, by blocking Fast Bus Transfer (FBT), within one hour is consistent with the response time of Technical Specification (TS) ACTION 3.0.3. The second train will be restored to OPERABLE by

having its Emergency Diesel Generator (EDG) started, loaded, and separated from offsite power within two hours or FBT will be blocked within two hours. Action within two hours is consistent with the plant's TS since TS ACTION 3.8.2.1.a, "D. C. Sources - Operating," would be the most limiting requirement with one train of inoperable electric power. In a degraded voltage event, the ability of the Class 1E 125VDC battery chargers to perform their function is indeterminate, therefore, the Class 1E 125VDC batteries must be assumed to provide the 125VDC control power to the Class 1E Engineered Safety Features (ESF) circuit breakers for both of their sequences. The battery capacity calculations assume only one sequence. Once one train is restored to OPERABLE and the other train's EDG demonstrated to be OPERABLE by loading and separating from the grid, ACTION 3.8.1.1.a, for one INOPERABLE offsite power supply, allows operation to continue for up to seventy-two hours. If both trains are blocked, then both trains are OPERABLE.

The proposed change will ensure that the train that blocks FBT will be in conformance with GDC 17 should a subsequent accident occur. As such, that train of ESF equipment will be supplied Class 1E preferred and standby power in the manner assumed by Chapters 6 and 15 analyses. Starting, loading, and separating the other train's EDG from offsite power ensures that the second train of ESF equipment is prepared to respond to any subsequent accident. This configuration presents one OPERABLE offsite circuit and two OPERABLE EDGs to any subsequent accident, and would be capable of withstanding the single failures in the UFSAR Table 15.0-0, "Single Failures." Optionally, with both trains blocked, both are OPERABLE and would be capable of withstanding the single failures in the UFSAR Table 15.0-0, "Single Failures."

Standard 2: Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Given the current licensing basis, the proposed temporary TS change does not create the possibility of an accident of a new or different kind. The plant is currently licensed to have both trains of FBT blocked when low switchyard voltages exist in order to prevent the loss of power generated by the nuclear power unit from causing the loss of the preferred power circuits. The proposed temporary TS ACTIONs 3.8.1.1.f and 3.8.1.1.g are being added as ACTIONs to prevent a double sequencing event from occurring. The train that is blocked is consistent with previous UFSAR Chapter 6 and Chapter 15 safety analyses since it will conform to GDC 17 prior to the onset of the accident. Under this condition it will be able to contribute to the mitigation of an accident and withstand the effects of any single failure equal to its ability when initially analyzed and licensed. The EDG which is loaded and isolated from offsite power also contributes to GDC 17 compliance since the entire system can withstand a Loss of Offsite Power (LOP) and a single failure of an EDG. With both trains blocked, the EDS is in compliance with GDC 17 and is analyzed.

It is understood that an accident of a different kind will exist if a degraded voltage condition occurs coincident with an accident (e.g., LOCA [versus the analyzed LOP + LOCA]). Should such an accident occur, the manual action described in the proposed ACTION statements could not be credited to protect the plant. However, the purpose of proposed ACTIONs 3.8.1.1.f and 3.8.1.1.g is to provide an appropriate response to degraded voltage prior to an accident by eliminating the malfunction of a different type (double sequencing) and an accident of a different type (e.g., degraded voltage + LOCA) for one train within one hour and for the second train within two hours. This duration of response is consistent with the required responses currently in the TSs 3.0.3, 3.8.2.1.a, and 3.8.1.1.a.

Standard 3: Does the proposed change involve a significant reduction in a margin of safety?

The margin of safety has not been reduced in that the train which has FBT blocked prior to the onset of an accident will be in conformance with GDC 17 (which is the basis to TS 3/4.8.1). Since the blocked train is in conformance with GDC 17 prior to the onset of an accident, it will support the single failure analyses and the safety analyses to the extent previously analyzed and licensed. The train not blocked will have its EDG started, loaded, and separated from offsite power prior to the end of the second hour. Action within two hours is consistent with TS 3.8.2.1.a. The proposed action recovers one train of A.C. sources in one hour and places the plant in a configuration of one less power source than is required by LCO 3.8.1.1 within two hours. Currently, TS ACTION 3.8.1.1.a (one power source inoperable) has a duration of seventy-two hours. The proposed ACTION requires responses within time frames consistent with TSs 3.0.3, 3.8.2.1.a, and 3.8.1.1.a, and therefore, does not reduce the margin of safety. Optionally, restoration of the second train by blocking FBT within two hours is also consistent with response times required by TS 3.0.3 and 3.8.2.1.a and therefore, also does not reduce the margin of safety. TS 3.8.1.1.a would not be required with both trains of FBT blocked as all four AC power sources would then be OPERABLE.

Regulatory Guide 1.93, "Availability of Electric Power Sources," Revision 0, December 1974 recognizes that under certain conditions it may be safer to continue operation at full or reduced power for a limited time than to effect an immediate shutdown based on the loss of some of the required electric power sources. In an effort to minimize the risk to the health and safety of the public, the proposed ACTIONs 3.8.1.1.f and 3.8.1.1.g balance the risk of a forced shutdown against the risk of remaining at power with a degraded switchyard voltage.

Probabilistic Risk Analysis (PRA) has compared the probability of a core melt event for 1) blocking fast bus transfer in one train after one hour for the next seventy-one hours, and in the second train after two hours for the next seventy hours; 2) blocking fast bus transfer in one train after the first hour for the next seventy-one hours, and

supplying power to the other train from the EDG after the second hour for seventy hours; and 3) a normal shutdown assuming the plant is in a normal configuration and no other transients or accidents except an uncomplicated reactor trip occurs during the shutdown process. Seventy-two hours was chosen for comparison purposes as the proposed ACTIONs would allow operation for up to seventy-two hours with one offsite circuit INOPERABLE.

The PRA has shown that the probability of a core melt event during power operation with FBT blocked in one train after one hour for the next seventy-one hours, and in the second train after two hours for the next seventy hours is approximately 1.91E-6. The probability of a core melt event during power operation with FBT blocked in one train after one hour for the next seventy-one hours and the EDG powering the opposite train after the second hour for the next seventy hours (the proposed configuration) is between approximately 1.91E-6 and 1.93E-6. A range is provided because the current PRA model can only model blocking both trains or the EDGs supplying both trains. The risk lies somewhere between the two values. The probability of a core melt event due to a normal shutdown assuming the plant is in a normal configuration and no other transients or accidents except an uncomplicated reactor trip occurs during the shutdown process is 2.4E-6. The risk can not be calculated for a forced shutdown with degraded switchyard voltage present but it is expected to be higher. Therefore, the analysis provided is conservative.

F. ENVIRONMENTAL IMPACT DETERMINATION

APS has determined that the proposed amendment involves no change in the amount or type of effluent that may be released offsite, and that there is no increase in individual or cumulative occupational radiation exposure. As such, operation of PVNGS Units 1, 2, and 3 in accordance with the proposed amendment, does not involve an unreviewed environmental safety question.

G. REVISED TECHNICAL SPECIFICATION PAGES

Unit 1	Unit 2	Unit 3
3/4 8-2A	3/4 8-2A	3/4 8-2A
B 3/4 8-2A	B 3/4 8-2A	B 3/4 8-2A

ENCLOSURE 2

REVISED PAGES TO

TECHNICAL SPECIFICATION SECTION 3/4.8.1

A.C. SOURCES