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SUBJECT: Application for amend to license NPF-51,allowing one-time extension of required surveillance interval for MSI sys portion only of ESFAS logic.

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10 CFR 50.90
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102-04001 - JML/SAB/RMW
August 28, 1997

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
Request for Amendment to Technical Specification (TS) Table 4.3-2,
"Engineered Safety Features Actuation System Instrumentation
Surveillance Requirements," Under Exigent Circumstances**

Arizona Public Service Company (APS) requests an amendment to Technical Specification 4.3.2.1 for Main Steam Isolation System (MSIS) logic surveillance testing for PVNGS Unit 2. The proposed amendment to extend the required surveillance interval is requested under exigent circumstances. Unit 2 is currently in its 482nd day of operation and is in a coastdown at 73 percent power approaching its seventh refueling outage scheduled to begin on September 6, 1997.

The proposed amendment would allow a one-time extension of the required surveillance interval for the MSIS portion only of the Engineered Safety Feature Actuation System logic. As described in the enclosure to this letter, the risk associated with this extension is very small. The alternative which has been considered is to replace a control board switch which has a degraded contact block while at power. This comparatively, is a much higher risk evolution due to the necessity to work inside the control panels in the control room in close proximity to other protection circuits. This work has been completed on-line previously but with the outage so near, avoidance of the risk was deemed to be the appropriate option. The switch in its current condition has been determined to be operable. The five day extension would allow the plant to reach Mode 5 in the upcoming refueling outage where the switch replacement may be performed off-line.

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Request for Amendment to Technical Specification
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Provided in the enclosure to this letter are the following sections which support the proposed Technical Specification amendment:

- A. Explanation of the Exigent Circumstances
- B. Description of the Proposed Technical Specification Amendment
- C. Purpose of the Technical Specification
- D. Safety Analysis of the Proposed Technical Specification Amendment
- E. No Significant Hazards Consideration Determination
- F. Environmental Consideration
- G. Marked-up Technical Specification Page

This Technical Specification change has been carefully considered, weighing the risk of performance of this maintenance on-line against the low safety significance of a five day surveillance extension. As a result of this assessment, we present this proposed amendment for your approval. It is requested that this Technical Specification change be issued by 1700 MST on September 4, 1997 as the required surveillance interval expires at that time.

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

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

Sincerely,

Gregg K. Lambert
for JML

JML/SAB/RMW/rjh

Enclosure

cc: E. W. Merschoff (all w/Enclosure)
K. E. Perkins
K. M. Thomas
PVNGS Sr. Resident
A. V. Godwin (ARRA)

, 31/10/20

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

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

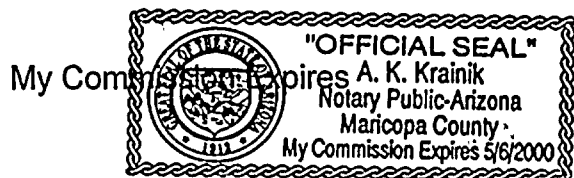


G. R. Overbeck

Sworn To Before Me This 28 Day Of August, 1997.



Notary Public





ENCLOSURE

**Proposed Amendment to Unit 2 Technical Specification
Table 4.3-2, "Engineered Safety Features Actuation System
Instrumentation Surveillance Requirements,"
Under Exigent Circumstances**

A. EXPLANATION OF THE EXIGENT CIRCUMSTANCES

APS is requesting an amendment to PVNGS Unit 2 Technical Specifications (TS) to extend the quarterly surveillance interval by five days beyond the 25% extension allowed by TS 4.0.2 for the channel functional test for the main steam isolation signal (MSIS) engineered safety features actuation system (ESFAS) logic consisting of matrix logic, initiation logic, automatic actuation logic and manual MSIS as listed in Table 4.3-2. The surveillance tests can not be performed because there is a degraded contact block on the control room manual MSIS switch for Channel C which could cause a spurious trip input to the MSIS initiation logic. Spurious actuation of this switch during the performance of the quarterly MSIS channel functional tests for trip paths 2 or 4 may cause an inadvertent MSIS signal and result in tripping the unit. The quarterly surveillances are due September 4, 1997, which includes the maximum extension of 25 percent allowed by TS 4.0.2. A five day surveillance extension would allow the Unit to complete a controlled shut down for the scheduled refueling outage on September 6, 1997, and proceed to Mode 5, where the surveillance is not required. The switch will be replaced after the Unit enters Mode 5 and tested prior to Unit startup.

The manual MSIS switches are used by the operating staff to initiate manual MSIS ESFAS signals prior to the automatic initiation of the ESFAS or in the unlikely event that an automatic actuation does not occur when required. The MSIS ESFAS logic utilizes a selective two-out-of-four configuration for manual actuation. Either Channel A or C manual MSIS switch will actuate leg 1-3 of the initiation logic (i.e., a half leg trip), while either Channel B or D manual MSIS switch will actuate leg 2-4 of the initiation logic. Initiation of both legs results in actuation of the MSIS signal. The identified condition of the Channel C MSIS handswitch does not affect the operability of the automatic initiation logic and the handswitch is capable of performing its TS function of manually initiating a half-leg trip of the MSIS ESFAS logic.

The degradation of the Channel C manual MSIS switch was identified on August 14, 1997, when a spurious trip of MSIS leg 1-3 initiation logic occurred. Subsequent troubleshooting determined that a higher than normal voltage drop exists across the switch, making it highly susceptible to spurious operation. The degradation of this switch does not, however, render the switch inoperable nor does it affect the operability of the ESFAS logic. The troubleshooting efforts confirmed that the switch is still capable of performing its design function of actuating the leg 1-3 initiation logic.

The ESFAS is a fail-safe design and is de-energized to trip. The high voltage drop across the switch results in the switch being sensitive to movement or vibration. Any movement or vibration of the switch will cause the switch to fail in the actuated condition, i.e., a trip of MSIS leg 1-3 initiation logic. Therefore, the performance of any testing of the ESFAS logic that would result in partial actuation of the MSIS leg 2-4 initiation logic has the probability of causing a MSIS actuation that will result in a unit trip and an unnecessary challenge to plant safety systems. Unit restart will not be possible due to fuel depletion.

This exigent situation exists and can not be avoided because (1) the degraded condition of the MSIS manual switch did not occur until August 14, 1997, and could not have been predicted, (2) performance of the ESFAS logic channel functional tests with the degraded switch could cause an inadvertent MSIS (and a resulting plant trip), and (3) the quarterly surveillance requirements cannot be extended beyond September 4, 1997, without exceeding TSs 3.3.2 and 4.0.2 periodicity requirements which would require entering TS 3.0.3 Action Statements to shut down the Unit.

Activities that have been completed subsequent to the identification of the event include troubleshooting, determining the cause of failure, evaluating the options and obtaining parts for repairing the switch. The final determination that the switch should not be replaced until the Unit was shutdown was made August 27, 1997. This determination was based on the fact that replacing the switch on-line at the end of the fuel cycle represents a higher nuclear safety risk than that of extending the surveillance requirements for the MSIS matrix logic, initiation logic, automatic actuation logic and manual MSIS portions of the ESFAS by five days.

Although APS has replaced these switches on-line before, this evolution is considered to be high risk due to the physical location of the switch and the close proximity to other ESFAS channels and Reactor Protection System channels. APS has determined that the risk associated with switch replacement outweighs the risk associated with increasing the allowed surveillance interval by five days. The physical location of the switch makes replacement a difficult and high risk task. The switch is located in the main control board, with one side next to a separation panel. The three remaining sides of the switch are bounded by other ESFAS actuation switches in the same channel. Replacement of the switch requires inserting a half leg trip into the MSIS initiation logic. The conductors are then de-terminated from a terminal board. The contact block, with the conductors still landed, is then removed from the back of the switch. Once the contact block is removed from the switch, the conductors are then transferred to the replacement contact block. The new block is then re-installed on the switch and the leads are landed on the terminal board. Although this task appears to be straightforward, there is a potential to cause an inadvertent actuation of other Channel C ESFAS parameters due to the close proximity of the other components in the ESFAS circuitry and the lack of free space in this area. The

risk associated with increasing the surveillance interval is discussed in Section D, and has been shown to be insignificant. Therefore, the risk associated with replacing the switch and potentially causing a Unit trip exceeds the risk of extending the surveillance interval by five days.

B. DESCRIPTION OF THE PROPOSED TECHNICAL SPECIFICATION AMENDMENT

The proposed amendment will add a footnote to TS Table 4.3-2 to allow a one-time-only five day extension, beyond the 25% extension allowed by TS 4.0.2, to the 'quarterly requirement for the performance of channel functional tests for items IV.B.1, 2, and 3 for the matrix logic, initiation logic, and manual MSIS and IV.C, Automatic Actuation Logic, of the MSIS ESFAS logic. This extension will allow time to complete the scheduled Unit shutdown for refueling beginning on September 6, 1997. The Unit will proceed to Mode 5, where the surveillance is not required. The switch will be replaced after the Unit enters Mode 5 and tested prior to Unit startup.

C. PURPOSE OF THE TECHNICAL SPECIFICATION

PVNGS Unit 2 TS surveillance requirement 4.3.2.1 requires that the ESFAS instrumentation channels be demonstrated operable by performing the channel functional tests at the frequencies shown in Table 4.3-2. TS Table 4.3-2, items IV.B.1, 2, and 3, and IV.C, Automatic Actuation Logic, require that the channel functional tests for the MSIS ESFAS logic including matrix logic, initiation logic, automatic actuation logic and manual MSIS be performed at a periodicity of Q (quarterly), which is defined in TS Table 1.1 as at least once per 92 days. TS 4.0.2 allows a 25 percent maximum extension of the periodicity.

The operability of the reactor protection system and ESFAS instrumentation channels and bypasses ensures that (1) the associated Engineered Safety Features Actuation action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoint, (2) the specified coincidence logic is maintained, (3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and (4) sufficient system functional capability is available from diverse parameters. The operability of these systems is required to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the safety analyses.

The quarterly frequency for the channel functional tests for these systems is based on the analyses presented in the NRC approved topical report CEN-327-A, "RPS/ESFAS Extended Test Interval Evaluation", CEN-327-A, Supplement 1, and Calculation 13-JC-SB-200, Revision 01.

D. SAFETY ANALYSIS OF THE PROPOSED TS AMENDMENT

The proposed TS amendment would increase the surveillance interval on a one-time basis for the ESFAS MSIS instrumentation surveillance requirement of 4.3.2.1. Specifically, the quarterly CHANNEL FUNCTIONAL TEST requirements of Table 4.3-2, "Engineered Safety Features Actuation System Instrumentation Surveillance Requirements", items 1, 2 and 3 of IV.B, "ESFA System Logic" and item IV.C, "Automatic Actuation Logic", would be extended for five days beyond the 25 percent extension of the surveillance interval allowed by TS 4.0.2.

In TS Amendment numbers 78, 64 and 50 for Units 1, 2, and 3, respectively, approved July 15, 1994, the surveillance intervals for the MSIS CHANNEL FUNCTIONAL TEST were increased from monthly to quarterly. The extension was based upon topical reports CEN-327-A and CEN-327-A Supplement 1. Both reports were prepared by Combustion Engineering for the Combustion Engineering Owners Group (CEOG) and used probabilistic risk analysis techniques to demonstrate that the proposed surveillance interval extensions do not result in increased risk when compared with current technical specification requirements.

The NRC evaluation and acceptance of the topical reports is documented in Safety Evaluation Report (SER), "RPS/ESFAS Extended Test Interval Evaluation" issued in November 1989. As stated in the 1989 SER, the NRC found that CEN-327-A and its supplement were acceptable for justifying the proposed extension in surveillance test intervals from monthly to quarterly for the RPS and the ESFAS. In the generic SER, the NRC agreed that surveillance test intervals for the RPS and for the ESFAS could be extended.

CEN-327-A and its supplement constructed fault tree models for each of the ESFAS signals. Each ESFAS fault tree model specifically addressed common mode failures, operator error, reduced redundancy and random component failures. The studies found that the decrease in core melt frequency due to the reduced exposure to test-induced transients is 8.78×10^{-8} per year while the increase in core melt frequency due to the increase in system unavailability is less than 6.3×10^{-8} per year. Therefore, the net impact of increasing the surveillance interval from 30 days to 90 days resulted in a slight decrease in the overall core melt frequency.

The increase in the surveillance test interval that is being requested by this TS Amendment request is five days beyond the 25 percent extension of the interval. Given the results of topical reports CEN-327-A and CEN-327-A Supplement 1, where the overall core damage frequency would actually decrease for longer test intervals in this range, it is reasonable to conclude the requested extension would have either a positive effect, or, at worst, an insignificant negative effect, on core damage frequency.

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; or (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) Involve a significant reduction in a margin of safety. 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?

No. The proposed TS amendment would increase the surveillance interval on a one-time basis for the ESFAS MSIS instrumentation surveillance requirement of 4.3.2.1. Specifically, the quarterly CHANNEL FUNCTIONAL TEST requirements of Table 4.3-2, "Engineered Safety Features Actuation System Instrumentation Surveillance Requirements", items 1, 2 and 3 of IV.B, "ESFA System Logic", and IV.C, "Automatic Actuation Logic", would be extended for five days beyond the 25 percent extension of the surveillance interval allowed by TS 4.0.2.

Increasing the surveillance interval does not constitute a physical change to the Unit or make changes in the setpoints, system logic or manual actuation. In addition, this change does not alter physical plant equipment or the way in which plant equipment is operated. Therefore, it does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The ESFAS is designed such that a single failure in the system will not prevent actuation of the system if required to do so. The manual initiation logic is designed in a selective two-out-of-four arrangement. Either Channel A or C will actuate leg 1-3 of the initiation logic. Either Channel B or D will actuate leg 2-4 of the initiation logic. When both legs have been actuated, then the appropriate signal will be generated, a MSIS in this case. The Channel C manual MSIS handswitch is still capable of performing its intended function - actuating MSIS leg 1-3 initiation logic. Therefore, the system may sustain a single failure and still be capable of performing its intended safety function of mitigating certain design basis events. Since the system actuation capability has not been changed by the requested surveillance interval extension, the proposed TS amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

No. The proposed TS amendment would increase the surveillance interval on a one-time basis for the ESFAS MSIS instrumentation surveillance requirement of 4.3.2.1. Specifically, the quarterly CHANNEL FUNCTIONAL TEST requirements of Table 4.3-2, "Engineered Safety Features Actuation System Instrumentation Surveillance Requirements", items 1, 2 and 3 of IV.B, "ESFA System Logic", and IV.C, "Automatic Actuation Logic", would be extended for five days beyond the 25 percent extension of the surveillance interval allowed by TS 4.0.2.

The proposed one-time surveillance interval extension does not introduce any new modes of plant operation or new accident precursors. No physical alterations to plant configurations or changes to system setpoints or logic are proposed by this request. The proposed TS amendment is requesting a one-time extension of the quarterly surveillance interval for the MSIS system logic and does not represent any activity which could initiate a new or different kind of accident. No new failure modes have been defined, nor any new system interactions introduced, for any plant system or component. In addition, no new limiting failure has been identified as a result of the proposed change.

The ESFAS MSIS system logic remains the same and is capable of performing its design function. Therefore, the proposed TS amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

No. The proposed TS amendment would increase the surveillance interval on a one-time basis for the ESFAS MSIS instrumentation surveillance requirement of 4.3.2.1. Specifically, the quarterly CHANNEL FUNCTIONAL TEST requirements of Table 4.3-2, "Engineered Safety Features Actuation System Instrumentation Surveillance Requirements", items 1, 2 and 3 of IV.B, "ESFA System Logic", and IV.C, "Automatic Actuation Logic", would be extended for five days beyond the 25 percent extension of the surveillance interval allowed by TS 4.0.2.

Under the proposed TS amendment, the ESFAS MSIS instrumentation, including the manual trip switches, remain capable of performing their safety functions. The proposed TS amendment does not affect the design or performance of the ESFAS MSIS logic. As such, the response of the MSIS actuation instrumentation would not change and, therefore, there would be no change in analyzed accident scenarios and/or outcomes. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

F. ENVIRONMENTAL CONSIDERATION

The proposed TS amendment would increase the surveillance interval on a one-time basis for the ESFAS MSIS instrumentation surveillance requirement of 4.3.2.1. Specifically, the quarterly CHANNEL FUNCTIONAL TEST requirements of Table 4.3-2, "Engineered Safety Features Actuation System Instrumentation Surveillance Requirements", items 1, 2 and 3 of IV.B, "ESFA System Logic", and IV.C, "Automatic Actuation Logic", would be extended for five days beyond the 25 percent extension of the surveillance interval allowed by TS 4.0.2.

APS has determined that the proposed amendment involves no changes in the amount or type of effluent that may be released offsite, and results in no increase in individual or cumulative occupational radiation exposure. As described above, the proposed TS amendment involves no significant hazards consideration and, as such, meets the eligibility criteria for categorical exclusion set forth in 10CFR 51.22(c)(9).

G. MARKED-UP TECHNICAL SPECIFICATION PAGE

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