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SUBJECT: Requests temporary waiver of compliance from LCO 3.6.3 to permit corrective maint on main feedwater isolation valves.

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WILLIAM F. CONWAY  
EXECUTIVE VICE PRESIDENT  
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161-03363-WFC  
July 27, 1990

Docket No. STN 50-530

Mr. John B. Martin  
Regional Administrator, Region V  
U. S. Nuclear Regulatory Commission  
1450 Maria Lane, Suite 210  
Walnut Creek, CA 94596-5368

Dear Mr. Martin:

Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Unit 3  
Request for a Temporary Waiver of Compliance of Limiting  
Condition for Operation 3.6.3 to Allow Corrective  
Maintenance to be Performed on the Main Feedwater  
Isolation Valves  
File: 90-056-026

Arizona Public Service (APS) respectfully requests a temporary waiver of compliance for a onetime per valve increase in the allowed outage time of the Main Feedwater Isolation Valves (FWIV) in Limiting Condition for Operation 3.6.3 from 4 to 12 hours. Twelve hours is consistent with the time necessary to replace two four-way valves and retest a FWIV. The purpose of this request is to replace four-way valves located in the FWIV actuators. This action will eliminate the possibility that incorrect elastomeric material is installed in the four-way valves and improve reliability of the FWIVs.

Description of Condition

On July 5, 1990 Unit 3 FWIV 3JSGAUV0177 failed its partial stroke surveillance test. The failure was attributed to one of the two four-way valves located in the FWIV actuator system. The four-way valve was replaced and the FWIV successfully retested in accordance with the surveillance procedure. The failure of the four-way valve initiated a root cause of failure Engineering Evaluation Request.

On July 18, 1990 the four-way valve was disassembled for performance of a root cause of failure determination. It was noted that 6 backup rings in the four-way valve appeared to have deteriorated in service. The 6 backup rings were sent to an independent laboratory for material identification. The results of the analysis showed the backup ring material to be polythioether/polysulfide elastomer. The material specified by the manufacturer for this application is Viton. Engineering concluded that the cause of the failure of the four-way valve was the installation of incorrect backup ring material. The backup ring

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material was not compatible with the Fyrquel hydraulic fluid used in the FWIV actuators. This led to deterioration of the material and subsequent failure of the four-way valve to function.

An investigation of the source of the backup ring material installed in the four-way valve was begun to determine if the condition was limited to valve 3JSGAUV0177. Maintenance records were reviewed and the source of the backup rings was traced to a purchase order for four-way valve rebuild kits received from the valve manufacturer Anchor/Darling. Further investigation revealed that four FWIVs rebuild kits and twenty Main Steam Isolation Valve (MSIV) rebuild kits were received under that purchase order. All four FWIV rebuild kits were installed in Unit 3. Seven MSIV rebuild kits were installed in Unit 1, ten MSIV rebuild kits were installed in Unit 3, two rebuild kits were not installed, and one rebuild kit has not yet been accounted for at this time.

To assure that none of the installed rebuild kits received under this purchase order contain backup rings of a material other than Viton, APS intends to immediately change out all four-way valves rebuilt with material received under that purchase order. This can be performed on the MSIVs within the currently allowed outage time in the Technical Specifications. However, the replacement of the four-way valves and retesting of the FWIV requires longer than the 4 hour allowed outage time and thus a temporary waiver of compliance is requested to avoid an unnecessary plant shutdown.

#### Compensatory Actions

The following compensatory measures are being taken prior to and during the waiver of compliance period to ensure the activity will be performed in the safest possible manner and to minimize potential effects of multiple system failures during the time period one of the FWIVs is inoperable:

1. Prior to commencing any work a briefing will be held with the operations, system engineering, and maintenance personnel.
2. The FWIV in series with the FWIV to be removed from service will be surveillance tested immediately prior to commencing work.
3. Each FWIV removed from service will be surveillance tested following replacement of the four-way valve to verify operability prior to proceeding to another FWIV. This way no more than one FWIV will be inoperable at any time.



4. Operations personnel will be instructed to take the following actions in the event a valid Main Steam Isolation Signal (MSIS) occurs during maintenance on one of the FWIVs and the FWIV in series does not close:

- a) Close the FWIV in series with the inoperable FWIV by using the handswitch in the control room.
- b) If the FWIV does not close in response to the handswitch, trip both main feedwater pumps, close their associated discharge valves, and initiate Auxiliary Feedwater.

These actions will provide additional assurance of preventing containment overpressurization and excessive reactor cooldown following a main steam line break, main feedwater line break, or loss of coolant accident during the period of time one of the FWIVs is inoperable. Additionally, these actions will prevent equipment damage in the event a failure of the feedwater control system results in overfeeding a steam generator to the MSIS trip setpoint.

#### Safety Evaluation

The safety function of the FWIVs is to "fast close" on a Main Steam Isolation Signal (MSIS). This action prevents containment overpressurization and excessive reactor cooldown following a main steam line break, main feedwater line break, or loss of coolant accident (LOCA). The closing of these valves also precludes any possibility of radioactive release from containment due to a condensate or feedwater line break.

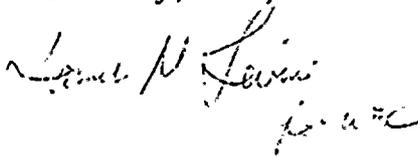
There are four FWIVs, two in series in each feedwater line. One valve in each line is actuated from "A" train and one valve is actuated from "B" train providing completely redundant functions. In addition, there are two check valves installed in each main feedwater line inside containment in series with the FWIVs which would prevent leakage outside containment following a LOCA. In the event an MSIS occurs during performance of the four-way valve replacement, the FWIV in series with the FWIV out of service is actuated from a different safety train and should close. The redundant FWIV in each feedwater line will be surveillance tested for operability prior to commencing work on the FWIV in the same line. Maintenance will only be conducted on one FWIV at a time. During this period the FWIV actuator will be disabled and the valve will be maintained in an open condition by unbalanced pressure force on the stem. Extension of the four hour limit would not compromise any safety function performed by the FWIVs, would not cause an unnecessary transient on the unit by forcing shutdown of the unit to perform this replacement, and would resolve any uncertainties concerning the continued operability of FWIVs.

Mr. John B. Martin  
U. S. Nuclear Regulatory Commission  
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The PVNGS Plant Review Board has reviewed and concurred with this request for a waiver of compliance. APS has performed a No Significant Hazards Analysis and Environmental Impact Consideration Determination, Attachment A, and concluded that replacement of the four-way valve installed in these feedwater isolation valve actuators while at power, as proposed in this request, is the best option available for assuring continued operability of the valves and safety of operation. Failure to approve this extension would result in a forced outage and cause substantial financial loss without any appreciable benefit in safety.

Sincerely,



Janet N. Lewis  
jnl

WFC/JST/jle  
Attachment

cc: C. M. Trammell (all w/attachment)  
S. R. Peterson  
D. H. Coe  
A. C. Gehr  
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July 27, 1990

### Basis for No Significant Hazards Consideration

The Commission has provided standards for determining whether a significant hazards consideration exists, as stated in 10 CFR 50.92. A proposed regional waiver of compliance to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with a proposed waiver of compliance 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 waiver of compliance request follows:

Standard 1: Involve a significant increase in the probability or consequences of an accident previously evaluated.

The extension of the allowed outage time from 4 to 12 hours will provide an opportunity to perform corrective maintenance on FWIVs and will provide assurance of continued operability. Failure to grant relief from the 4 hour allowed outage time would result in an unnecessary shutdown and consequent transient on the plant to perform this maintenance. Placing the unit in cold shutdown would result in a transient condition which is the time when safety systems are most likely to be challenged. Extending the allowed outage time would allow the actuator four-way valves to be replaced at power without placing the unit in this transient.

This work has been previously performed successfully at power on main feedwater isolation valves (FWIVs) under a waiver of compliance. The FWIVs will be repaired one valve at a time. There is a redundant valve from a different safety train in series with the out of service valve in each main feedwater line. This valve performs the same function and will be surveillance tested for operability prior to commencing work. In addition, there are two check valves installed in each main feedwater line inside containment in series with the FWIVs which would prevent leakage outside containment following a LOCA. For containment integrity to be compromised during performance of the four-way valve replacement all of the following would have to occur; 1) the plant would have to experience an event causing core damage and providing communication between the steam generator and containment environment or reactor coolant system; 2) the other FWIV in series with the FWIV being repaired would have to fail to close; 3) the two check valves inside containment would have to fail to seal against containment pressure; 4) the feedwater line outside containment would have to rupture. Thus extension of the allowed time, for one of the feedwater isolation valves may be out of service from 4 to 12 hours, does not constitute a significant increase in the probability or consequences of an accident previously evaluated.



Standard 2: Create the possibility of a new or different kind of accident from any accident previously evaluated.

Increasing the allowed outage time of Limiting Condition for Operation 3.6.3 from 4 to 12 hours on a onetime only basis for the purpose of replacing four-way valves is the safest course of action available. This extension will allow the valve to be verified in a qualified condition and not impose an unnecessary shutdown. The safety function of the valve will be performed by the redundant valve in the main feedwater line should a main steam isolation signal occur during performance of this corrective maintenance. No possibility of a new or different kind of accident from any previously evaluated is created by the extension of the allowed outage time.

Standard 3: Involve a significant reduction in a margin of safety.

The safety function of the FWIVs is to fast close on a Main Steam Isolation Signal (MSIS). This action prevents containment overpressurization and excessive reactor cooldown following a main steam line break, main feedwater line break, or loss of coolant accident. The closing of these valves also precludes any possibility of radioactive release from containment due to a condensate or feedwater line break. There are four FWIVs, two in series in each feedwater line, one valve in each line is actuated from "A" train and one valve is actuated from "B" train providing completely redundant functions. The FWIV valve in series with the out of service FWIV is actuated from a different safety train and will close in the event an MSIS occurs during performance of the four-way valve replacement. This FWIV will be surveillance tested for operability prior to commencing work on the FWIV in the same feedwater line. Extension of the 4 hour limit would not compromise any safety function performed by the FWIVs and would not cause an unnecessary transient on the unit by forcing shutdown of the unit to perform this replacement. Completion of this corrective maintenance activity will remove any question concerning the continued operability of the FWIVs.

Environmental Impact Consideration Determination

The proposed waiver of compliance request does not involve an unreviewed environmental question because operation of PVNGS Unit 3 in accordance with this change, would not:

1. Result in a significant increase in any adverse environmental impact previously evaluated in the Final Environmental Statement (FES) as modified by the staff's testimony to the Atomic Safety and Licensing Board; or
2. Result in a significant change in effluents or power levels; or
3. Result in matters not previously reviewed in the licensing basis for PVNGS which may have a significant environmental impact.

As discussed above, no significant reduction in safety and no new accidents are introduced by this change. This waiver of compliance does not affect effluents, or power levels, and has no environmental impact.



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