



10CFR50.55a

Palo Verde Nuclear
Generating Station

David Mauldin
Vice President
Nuclear Engineering
and Support

TEL (623) 393-5553

FAX (623) 393-6077

102-04881-CDM/SAB/TNW

January 21, 2003

Mail Station 7605

P O Box 52034

Phoenix, AZ 85072-2034

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
11555 Rockville Pike
Rockville, MD. 20852

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket No. STN 50-528/529/530
Second 10-Year Interval Inservice Testing (IST) Program –
Pump Relief Request No. 13**

In accordance with the provisions of 10 CFR 50.55a(a)(3)(ii), Arizona Public Service Company (APS) hereby submits Pump Relief Request No. 13 (PRR-13) to the second 10-year interval IST program for NRC Staff approval.

Pump Relief Request No. 13, provided in the enclosure, proposes an alternative to the pump testing requirements of paragraph 6.1 of the American Society of Mechanical Engineers (ASME)/American National Standards Institute (ANSI) Code for the Operations and Maintenance of Nuclear Power Plants, Part 6, (OM-6), as implemented through IWP-1100 of the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition. Specifically, Pump Relief Request No. 13 proposes an alternative method for testing High Pressure Safety Injection (HPSI) Pumps when the refueling interval design full flow test results are in the code specified alert range. APS requests the Staff's approval of the proposed relief request prior to July 2003.

No commitments are being made to the NRC by this letter.

Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,

CDM/SAB/TNW/kg

Enclosure

cc:

E. W. Merschoff [Region IV]
J. N. Donohew [NRR Project Manager]
N. L. Salgado [Senior Resident Inspector]

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance

Callaway • Comanche Peak • Diablo Canyon • Palo Verde • South Texas Project • Wolf Creek

A047

ENCLOSURE

ASME SECTION XI

SECOND 10-YEAR INTERVAL IST PROGRAM

PUMP RELIEF REQUEST NO. 13

FOR PALO VERDE NUCLEAR GENERATING STATION

UNITS 1, 2 AND 3

Pump Request No. 13 (PRR-13)

Proposed Alternative In Accordance with 10 CFR 50.55a(a)(3)(ii)

1. ASME Code Component(s) Affected

The subject of this relief request is High Pressure Safety Injection (HPSI) pumps SIA-P02 and SIB-P02. The HPSI pumps are ASME Class 2 pumps that provide high-pressure coolant injection of borated water into the reactor coolant system under accident conditions. They also provide flow for long-term cooling and flushing to prevent boron precipitation.

2. Applicable Code Edition and Addenda

The Code edition/addenda applicable to this relief request is the OMa-1988 Addenda to ASME/ANSI OM-1987, "Operation and Maintenance of Nuclear Power Plants", Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants".

3. Applicable Code Requirement

"If deviations fall within the alert range of Table 3, the frequency of testing specified in para. 5.1 shall be doubled until the cause of the deviation is determined and the condition corrected." (OM-6 para. 6.1)

4. Basis for Hardship or Unusual Difficulty without Compensating Increase In Level of Quality or Safety

The HPSI pumps are tested quarterly per OM-6 para. 5.1 on their minimum-flow (mini-flow) recirculation path, but flow rate is not credited because the flow instrument has only limited capability. Due to this limitation, full-flow testing is performed during refueling outages per Pump Relief Request No. 6 (PRR-06). However, PRR-06 provides no guidance for action to take when pump parameters fall within the Alert Range.

During the 10th Refueling Outage in PVNGS Unit 1, train "A" HPSI pump outboard horizontal vibration was in the Alert Range during full-flow testing. Paragraph 6.1 of the Code requires that the normal once per 3-month testing frequency shall be doubled if a parameter falls within the Alert Range. Since the full-flow test is performed on a refueling outage (18 month) frequency, the intent of the code is understood to mean that refueling outage full-flow tests are to be performed on a 9-month frequency for a parameter in the Alert Range.

As described in PRR-06, it is not practical to perform full-flow HPSI pump testing during power operation. The discharge pressure of the HPSI pumps is not sufficient to overcome RCS pressure and allow flow through the safety injection headers. Testing at cold shutdown conditions with the reactor head installed is prohibited to

preclude RCS pressure transients that could result in exceeding Technical Specification pressure-temperature limits (LTOP). The only practical means of performing HPSI full-flow testing is with the reactor vessel head removed. Shutting down the unit in the middle of a fuel cycle and removing the reactor head for the sole purpose of full-flow testing this pump would challenge plant systems and personnel and would not add a level of quality or safety over that which could be obtained by testing the pump in accordance with the proposed alternative. The proposed alternative will provide sufficient information to determine the continued operational readiness of the pump without requiring a reactor shutdown and removal of the reactor vessel head. Therefore, granting this relief request would not adversely impact the health and safety of the public.

5. Proposed Alternative and Basis for Use

In lieu of midcycle full-flow testing with the reactor head removed, PVNGS will test HPSI pumps at midcycle while the pump is on mini-flow recirculation. (HPSI pump full-flow testing will continue to be performed every refueling outage.) A set of reference values for vibration during mini-flow testing have already been established in accordance with OM-6 Section 4. Alert and Required Action Ranges have been determined in accordance with Code requirements.

The test frequency will be once every 9 months, double the nominal full-flow test frequency of once every refueling outage established in PRR-06. All Code-required parameters will be measured and evaluated during the mini-flow test except for flow rate. The only flow instrumentation in the recirculation line (permanently-mounted ultrasonic flowmeter) has limited capability, and its accuracy is not sufficient to meet OM-6 accuracy requirements. However, the fixed resistance provided by the recirculation line will provide consistent test conditions for midcycle testing. Therefore, the flowmeter will not be used to set the flowrate during mini-flow testing.

The basis for this relief request stems from a specific condition affecting HPSI pump SIA-P02 in Unit 1(HPSI 1A). Prior to the 9th Refueling Outage in Unit 1 (Spring 2001), HPSI pump 1A vibration levels were acceptable with mini-flow outboard horizontal vibration only occasionally entering the Alert range. During the 9th Refueling Outage, the pump mechanical seals and bearings were replaced as part of the preventive maintenance program. Following the seal and bearing replacement, outboard horizontal vibration on mini-flow increased to approximately 0.40 inches per second (ips), which is in the Alert Range. However, the outboard horizontal vibration remained within acceptable limits during full-flow testing. Corrective action was taken during the 10th Refueling Outage in Unit 1 (Fall 2002) by replacing the outboard bearing with a bearing of slightly different design having an axial preload as recommended by the pump manufacturer. This unexpectedly increased the outboard horizontal vibration to approximately 0.44 ips on mini-flow and approximately 0.40 ips during full-flow testing (both in the Alert Range).

No other HPSI 1A full-flow vibration parameters are in the Alert Range at this time. The full-flow outboard horizontal vibration value is below the Required Action Range

of 0.7 ips. Various troubleshooting actions, including alignment and balance checks, baseplate mounting bolt tightening, and additional bracing have not reduced the vibration to below the alert range.

Vibration analysis indicates that the cause of the elevated outboard horizontal vibration is structural resonance, and not a pump problem. Hydraulic performance continues to be acceptable. In addition, bearing oil analysis does not indicate any unusual wear or other anomalies with HPSI pump 1A. Therefore, there is no indication of any internal degradation of HPSI pump 1A.

The HPSI pumps are standby pumps. Little degradation is expected during power operation. The HPSI pumps will continue to be monitored in accordance with quarterly testing requirements at mini-flow conditions. This monitoring strategy will ensure the continued operational readiness of the HPSI pumps.

6. Duration of Proposed Alternative

The proposed alternative will be in effect for the remainder of the second 10-Year Interval IST Program which ends January 15, 2008.

7. Precedents

A review of NUREG-1482 and NUREG/CR-6396 did not identify any precedents to this Relief Request.

8. References

ASME/ANSI OM-1987, "Operation and Maintenance of Nuclear Power Plants", Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants", with OMa-1988 Addenda.

NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants", April 1995.

NUREG/CR-6396, "Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements", February 1996.