Palo Verde Nuclear Generating Station

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10CFR50.55a

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

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. 12

In accordance with the provisions of 10 CFR 50.55a(a)(3)(i), Arizona Public Service Company (APS) hereby submits Pump Relief Request No. 12 (PRR-12) to the second 10-year interval IST program for NRC Staff approval.

Pump Relief Request No. 12, provided in the enclosure, proposes an alternative to the pump testing requirements of paragraph 5.2(d) 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. 12 proposes an alternative method for evaluating pump tests when vane-pass frequency resonance spikes bias the test results above the code alert range limit.

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

Should you have any questions, please contact Scott A. Bauer at (623) 393-5978.

Sincerely,

M J Wisnir for
C. D. Mauldin

CDM/SAB/RKB/kg

Enclosure

cc: E. W. Merschoff [Region IV Adminstrator]
M. B. Fields [NRR Project Manager]
J. H. Moorman [Senior Resident Inspector]

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PDR ADOCK 05000528

ENCLOSURE

ASME SECTION XI

SECOND 10-YEAR INTERVAL IST PROGRAM

PUMP RELIEF REQUEST NO. 12

FOR PALO VERDE NUCLEAR GENERATING STATION

UNITS 1, 2 AND 3

Pump Relief Request No. 12 (PRR-12)
Pump Vibration at Vane Pass Frequency

Code Reference ASME Section XI, Division 1, 1989 Edition, IWP-1100

Components

Pump ID	Pump Description	Code Class	Drawing / Coord.
AFA-P01	Essential Auxiliary Feedwater Pump (Turbine-Driven)	3	AFP-01 / D06
AFB-P01	Essential Auxiliary Feedwater Pump (Motor-Driven)	3	AFP-01 / B06
AFN-P01	Non-Class Auxiliary Feedwater Pump (Motor-Driven)	N	AFP-01 / H06
CTA-P01	Condensate Transfer Pump	3	CTP-001 / C05
CTB-P01	Condensate Transfer Pump	3	CTP-001 / B05
ECA-P01	Essential Chilled Water Circulating Pump	3	ECP-001 / B08
ECB-P01	Essential Chilled Water Circulating Pump	3	ECP-001 / B04
EWA-P01	Essential Cooling Water Pump	3	EWP-001 / E06
EWB-P01	Essential Cooling Water Pump	3	EWP-001 / E02
PCA-P01	Spent Fuel Pool Cooling Pump	3	PCP-001 / D15
PCB-P01	Spent Fuel Pool Cooling Pump	3	PCP-001 / B15
SIA-P01	Low Pressure Safety Injection (LPSI) Pump	2	SIP-001 / F11
SIB-P01	Low Pressure Safety Injection (LPSI) Pump	2	SIP-001 / B11
SIA-P02	High Pressure Safety Injection (HPSI) Pump	2	SIP-001 / E11
SIB-P02	High Pressure Safety Injection (HPSI) Pump	2	SIP-001 / A11
SIA-P03	Containment Spray Pump	2	SIP-001 / H11
SIB-P03	Containment Spray Pump	2	SIP-001 / C11
SPA-P01	Essential Spray Pond Pump	3	SPP-001 Sh. 1 / C04
SPB-P01	Essential Spray Pond Pump	3	SPP-001 Sh. 1 / C07

Function Various

PVNGS Units ALL

Test Requirement Pressure, flow rate, and vibration (displacement or velocity) shall be determined and compared with corresponding reference values. All deviations from the reference values shall be compared with the limits given in Table 3 and corrective action taken as specified in paragraph 6.1. (OMa-1988 Part 6 par. 5.2(d))

Alternate Testing

If vane-passing frequencies cause broad-band vibration to exceed 0.325 inches per second (ips), commercial grade spectral analysis and spectral band monitoring shall be performed. The supporting analysis will include verification of the pump's operational readiness and an evaluation of test data that verifies that the subject pump is not expected to fall below the minimum required performance level in the periods between testing. The analysis will include an evaluation of trends indicated by the available test and maintenance data. The results of this analysis will be documented in the record of tests. After verifying that the pump is acceptable, separate reference values and range limits will be established for the frequency band below the vane-passing frequency, the vane-passing frequency band, and the frequency band above the vane-passing frequency. The range limits for the bands above and below the vane-passing frequency will be as specified in Table 3 of OM-6 Code. The range limits for the vane-passing frequency band will be 2 to 4 times the Reference Value for the Alert Range, and greater than 4 times the Reference Value for the Action Required Range.

Basis for Relief

The pump spectra often exhibit amplitude "spikes" at several different frequencies. One very prominent spike occurs at vane pass frequency, which can be caused by flow induced hydraulic conditions. The magnitude of this spike can cause the broad-band vibration to exceed the Code Alert Range limit of 0.325 ips. These conditions are not indicative of pump degradation.

The Unit 2 motor-driven Auxiliary Feedwater Pump, AFB-P01, is an example of a pump that is not designed to meet the current Code-required Alert Range limit (0.325 ips) in the vane-passing frequency band. Broad-band vibration amplitude as high as 0.46 ips has been experienced when the pump has been operating acceptably in the past. The vibration is primarily composed of response at the vane-passing frequency of 299 Hz, or 5 times the running speed. The pump manufacturer, Sulzer Bingham, has verified that elevated readings in this frequency band are not indicative of pump degradation.

Approval

Relief Request submitted in accordance with 10 CFR 50.55a(a)(3)(i).