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SUBJECT: Forwards response to request for addl info re method used to verify that stress values obtained from piping verification test did not exceed limits of ASME Code Section III.

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October 29, 1987
161-00612-JGH/LJM

Docket No. STN 50-528

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Dear Gentlemen:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Unit 1 Piping Verification Test Summary -
Response to Request for Additional Information
File: 87-B-056-026

Attached is ANPP's response to your questions concerning the method used to verify that the stress values obtained from the Piping Verification Test did not exceed the limits as defined in Section III of the ASME Code.

If you have any questions, please contact W. F. Quinn at (602) 371-4087.

Very truly yours,

JG Haynes

J. G. Haynes
Vice President
Nuclear Production

JGH/LJM/rw
Attachment

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Attachment to
161-00612-JGH/LJM

ATTACHMENT

PVNGS steady state vibration test program consisted of obtaining vibration measurements in the following manner: 1) Preselected areas 2) areas where there appeared to be vibration and 3) areas randomly selected where measurements could be taken without disturbing the configuration of the pipe (i.e., removing the insulation etc.). These vibration measurements were compared to an allowable screening criteria of 2.5 in/sec. velocity.

The allowable screening velocity is based upon ANSI/ASME OM-3-1982 where

$$V_{allowable} = \frac{C_1 C_4 \times 3.64 \times 10^{-3} \; (0.8 \; SEL)}{C_3 \qquad\qquad C_2 K_2}$$

With

$C_1 = 0.50 \quad C_2 = 2.1 \quad K_2 = 2.0$

$C_3 = 1.3 \quad C_4 = 1.0 \quad SEL = \frac{1}{2}(20{,}000)$

Where $V_{allowable}$ = in/Sec and SEL (endurance stress at 10^6 cycles) = lb/in^2

Whenever the allowable screening velocity is exceeded, additional measurements are taken which include displacement versus time traces. The deflection serves as design input to the respective piping computer model. The resulting generated stresses caused by the imposed deflection is then compared to one half of the endurance limit.

An engineering evaluation was performed resulting with no cases exhibiting stress level larger than one half the endurance limit (10,000 psi) for all cases that exceeded the allowable screening velocity.

[illegible]