10 CFR 50.55a

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

October 28, 1987

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Serial No. 87-634
NAPS/LNH:jmj
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
ASME SECTION XI RELIEF REQUEST - PUMP TESTING

In accordance with 10 CFR 50.55a, we are requesting relief from the provisions of ASME Section XI, 1980 Edition Subarticle IWP-3110. This request supplements our Inservice Testing Program for Pumps and Valves which was submitted to the NRC on October 5, 1983.

ASME Section XI, Subarticle IWP-3110 requires reference values to be one or more fixed sets of measured values. All subsequent test results shall be compared to these reference values. Implementing the requirements of IWP-3110 is difficult for certain systems because of the following reasons:

1. Plant conditions may not be the same as when the reference values were established.

2. Many reference points must be established to anticipate future plant conditions.

3. In systems such as Component Cooling and Service Water, reproducing one of these reference flow points is difficult with the large butterfly valves installed and it may not be desirable to alter the flow.

For these reasons, we request relief from ASME Section XI, Subarticle IWP-3110 for using a fixed set of measured referenced values.

As an alternative, we propose to use calculated reference values in the following method. A set of six pressure/flow points will be recorded during the reference value test. From these six points, an equation for the line will be calculated using third order polynomial regression. This technique employs a least-squares fit of the data by successive polynomials of order 1 through 3 and examines the standard deviation about the regression line in each case. The coefficients are calculated to the twelfth decimal point. The resulting third degree polynomial equation describes the reference curve. Flow points

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will be taken between the limits of the original data points. The resulting pressure is then compared to the ASME Section XI, Table IWP-3100-2 limits. Pumps may then be tested during normal operation without any valve throttling. An example of the calculated reference curve and acceptance criteria is attached.

Enclosed is a check for $150.00 for the application fee.

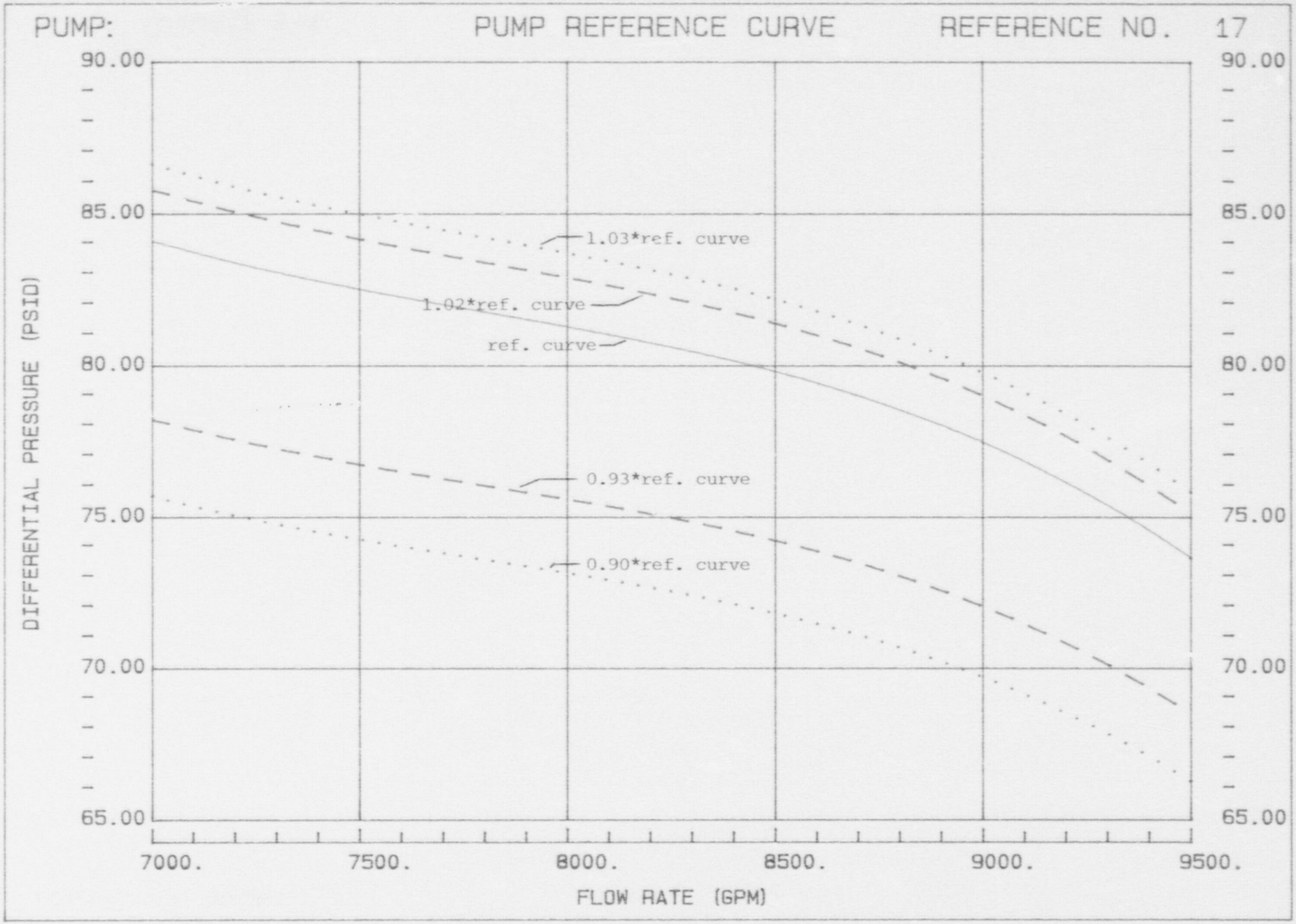
Very truly yours,

W. L. Stewart

Attachment

cc: U. S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Suite 2900
Atlanta, GA 30323

Mr. J. L. Caldwell
NRC Senior Resident Inspector
North Anna Power Station


PUMP:
PUMP REFERENCE CURVE
REFERENCE NO. 17
90.00
85.00
80.00
75.00
70.00
65.00
1.03*ref. curve
1.02*ref. curve
ref. curve
0.93*ref. curve
0.90*ref. curve
DIFFERENTIAL PRESSURE (PSID)
7000.
7500.
8000.
8500.
9000.
9500.
FLOW RATE (GPM)