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SUBJECT: Forwards results of testing which provide assurance of equipment operability & containment integrity during dsign-basis accident conditions,in response to GL 96-06.

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102-03943-JML/AKK/JRP
May 30, 1997

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-001

Reference: Letter 102-03855-JML/AKK/JRP, Dated January 28,1997
From J. M. Levine Senior Vice President Nuclear to USNRC
Subject : Response to NRC Generic Letter 96-06

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50- 528/529/530
Supplemental Response To NRC Generic Letter 96-06

As discussed in the referenced letter, Arizona Public Service Company (APS) committed to provide a supplemental response to Generic Letter 96-06. APS has conducted further analyses and testing to provide assurance of equipment operability and containment integrity during design-basis accident conditions. These efforts have been completed and the enclosed supplemental response provides the conclusions.

Should you have any questions, please contact Scott A. Bauer at (602) 393-5978.

Sincerely,

Gregg A. Overbeck
for JML

JML/AKK/JRP

Enclosure

cc: E. W. Merschoff
K. E. Perkins
J. W. Clifford
K. E. Johnston

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Enclosure

Generic Letter 96-06: Supplemental Response

GENERIC LETTER 96-06
SUPPLEMENTAL RESPONSE

BACKGROUND

PVNGS submitted the 120 day response to Generic Letter 96-06 to the Nuclear Regulatory Commission (NRC) on January 28, 1997 [Reference 1]. Operability assessments were provided and PVNGS stated that analyses and testing were in process to determine if further actions were required with respect to the containment penetration overpressurization issue. These efforts have been completed and this supplemental response details the conclusions resulting from the completed analyses and testing.

The table below lists the identified isolable piping, without installed relief valves, which penetrate the containment structure and are susceptible to overpressurization.

PVNGS ISOLABLE CONTAINMENT PENETRATIONS

SYSTEM	PENETRATION	ISOLATION VALVES
Nuclear Cooling Water (NC)	U034* (return from containment)	JNCAUV0402 JNCBUV0403 (MOV butterfly valves)
Radioactive Waste Drains (RD)	U009 (drain from containment)	JRDAUV0023 JRDBUV0024 (MOV/AOV* gate valves)
Normal Chilled Water (WC)	U061 (return from containment)	JWCAUV0062 JWCBUV0061 (MOV gate valves)
Demineralized Water (DW)	U006 (supply to containment)	PDWEV061 PDWEV062 (manual globe valves)
Fuel Pool Cooling and Cleanup (PC)	U050 (return from containment)	PPCEV070 PPCEV071 (manual gate valves)
Fuel Pool Cooling and Cleanup (PC)	U051 (supply to containment)	PPCEV075 PPCEV076 (manual gate valves)

* This information is corrected from Table 1 in the PVNGS GL 96-06, 120 Day Response.

In addition to the piping sections listed above, piping directly adjacent to the in-containment side of the PDWEV062, PPCEV071, and JRDAUV0023 isolation valves, also has the capability to trap system water. These sections of piping are non-safety related but were evaluated similarly to the penetration piping and

valves. The evaluations of these non-safety-related piping sections confirms that they will maintain structural integrity. Thus, there is no adverse impact on containment integrity or other safety-related systems as addressed in Reference 2.

The Generic Letter 96-06, 120 day response, also described that the as-built containment penetration configurations, which do not have installed relief valves, were evaluated and accepted by the NRC during initial PVNGS licensing. This acceptance was based on a qualitative assessment which credits pipe deformation, valve leakage, and limiting heat transfer effects to preclude penetration overpressurization.

In order to determine if a change is warranted to the licensing basis described above, a quantitative method was developed to model the behavior of the isolated penetrations and components under postulated design basis accident conditions. This work involved the development of analytical models and verification testing to predict valve gasket leakage pressures and corresponding leakage rates as well as the plastic behavior of the pipe. This work has been completed and the results are presented below.

RESULTS

The PVNGS 120 day response described inherent relief mechanisms in the valves and piping which will preclude failure due to overpressurization. These relief mechanisms consist of the body-to-bonnet gaskets in the gate and globe valves, which will leak to relieve pressure and then reseat, and limited plastic strain in the piping. The aforementioned analysis and testing demonstrate that leakage from the valve bonnets as described is quantifiable, predictable, and known (see Reference 3). Adjustments to the bolting torque values for several of the valves will ensure that internal pressures will remain below the ASME Code, Appendix F1000, stress allowables. Therefore, PVNGS considers utilization of these inherent relief mechanisms acceptable as a long-term design solution as well as to demonstrate current operability.

The PVNGS 120 day response also detailed leakage and deflection behavior evaluations of the E.P.T. epoxy filled seats installed on the Nuclear Cooling Water System isolation butterfly valves located on Penetration U034. These evaluations were used in conjunction with previous testing performed on this valve type to develop the operability assessment for this penetration. Although the testing utilized was applicable in part to the thermal overpressurization issues described in GL 96-06, it was not specific to these conditions. Further testing of the NC butterfly valves would be required to extend the operability assessment, detailed in the 120 day response, to an acceptable long-term design solution.

PVNGS has determined to install a single relief valve on the NC penetration in each unit in lieu of pursuing further testing.

PLANNED ACTIONS

In order to ensure that the internal pressures in the piping and valves in each of the affected penetrations will be below the ASME Code, Appendix F1000, stress allowables, several of the identified valve bonnet bolting torque values will be lowered to values that remain acceptable to the operating conditions. Additionally, to eliminate susceptibility of Penetration U034 to overpressurization, PVNGS will install a single relief valve on this penetration in each unit.

SCHEDULE

PVNGS will implement the modifications to adjust the valve bonnet bolt torque values and install a relief valve on the NC penetrations in accordance with the normal modification scheduling process. According to this schedule, implementation will begin with the next Unit 3 refueling outage (3R7) which will be completed in November of 1998. The modifications will be installed in Unit 2 in the refueling outage (2R8) ending in May of 1999 and in Unit 1 in the refueling outage (1R8) scheduled for completion in November of 1999.

REFERENCES

1. PVNGS Generic Letter 96-06 120 Day submittal, January 28,1997.

2. October 29, 1996 meeting minutes issued by the Nuclear Regulatory Commission on November 22,1996; Question and Answer 11 presented under "Questions Addressed To NRC During Meeting".

3. October 29, 1996 meeting minutes issued by the Nuclear Regulatory Commission on November 22,1996; Question and Answer 6 presented under "Questions Addressed To NRC During Meeting".