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SUBJECT: Provides 180-day response to GL 96-05, "Periodic
Verification of Design-Basis Capability of SR MOVs."

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TITLE: GL-96-05 Periodic Verif. of Design Basis Capability of Safety-Related

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102-03888- JML/AKK/JRP
March 18, 1997

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

Dear Sirs:

SUBJECT: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Response to NRC Generic Letter 96-05, Periodic Verification of
Design-Basis Capability of Safety-Related Motor-Operated Valves

This letter provides the 180 day response to Generic Letter 96-05, Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves. GL 96-05 requires Licensees to provide a written summary description of the MOV periodic verification program established in accordance with the Requested Actions paragraph of the Generic Letter. The Generic Letter requests that each licensee establish a program, or ensure the effectiveness of its current program, to verify, on a periodic basis, that safety-related MOVs continue to be capable of performing their safety-related functions within the current licensing basis of the facility. Arizona Public Service Company (APS) has implemented a program to periodically verify the safety-related motor-operated valves (MOV) are capable of performing their safety functions. The enclosure to this letter provides a written summary description of the MOV periodic verification program at the Palo Verde Nuclear Generating Station (PVNGS).

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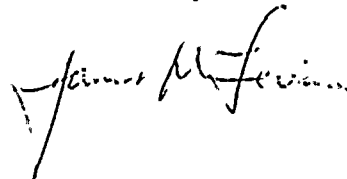
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Currently, PVNGS is a participant in the industry pilot effort to implement a risk-informed, performance-based inservice testing program. As part of this effort, PVNGS is reviewing the impact of adopting ASME Code Case OMN-1," Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor Operated Valve Assemblies in LWR Power Plants, OM Code 1995 Edition; Subsection ISTC" on the above pilot initiative and the periodic verification activities of the PVNGS MOV program. APS has reviewed the MOV periodic verification program to determine whether changes are appropriate in light of the information provided in GL 96-05 and will coordinate this review with APS' participation in the risk-informed inservice testing pilot program.

In addition, PVNGS is currently pursuing the option of participating in the Joint Owners Group (JOG) Periodic Verification Program. An additional discussion of the JOG can be found in the enclosure to this letter.

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

Sincerely,



JML/AKK/JRP/mah

Enclosure

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

U.S Nuclear Regulatory Commission
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bcc: G. R. Overbeck (7602)
J. F. Minnicks (7153)
M. R. Hooshmand (7152)
W. E. Ide (7616)
J. H. Hesser (7669)
M. E. Powell (7543)
M. L. Renfroe (7153)
B. P. Lindenlaub (7545)
A. K. Krainik (7636)
S. A. Bauer (7636)
W. W. Montefour (7466)
R. C. Fullmer (7997)

VERIFICATION OF ACCURACY

GL96-05

COMMITMENTS/ACTION PLAN (stated or implied)

Responsibility: J. F. Minnicks

RCTS No: 042377

Due Date: 3-30-98

ACTION 1. The dynamic test program is scheduled to begin during the Unit 1 seventh refueling outage (U1R7) spring of 1998.

ACTION 2. A sample of Low PV Margin MOVs will be dynamically tested on a one Refueling cycle frequency for the next three refueling cycles.

CHANGES TO UFSAR

N/A

U.S. Nuclear Regulatory Commission
Response to Generic Letter 96-05
Page 3

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MMW
MRP
MR
SB

VERIFICATION OF ACCURACY

GL96-05

COMMITMENTS/ACTION PLAN (stated or implied)

Responsibility: J. F. Minnicks

RCTS No: 042377

Due Date: 3-30-98

ACTION 1. The dynamic test program is scheduled to begin during the Unit 1 seventh refueling outage (U1R7) spring of 1998.

ACTION 2. ~~Low PV Margin MOVs will be sampled at a minimum of 30% of each group or a minimum of two valves to be dynamically tested once per refueling cycle for the next three cycles.~~

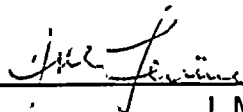
A sample of low PV Margin MOVs will be dynamically tested on one Refueling Cycle frequency for the next three Refueling Cycles.

CHANGES TO UFSAR

N/A

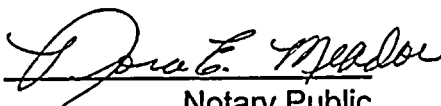
STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, J. M. Levine, represent that I am Senior Vice President - Nuclear, Arizona Public Service Company (APS), that the foregoing document has been signed by me on behalf of APS with full authority to do so, and that to the best of my knowledge and belief, the statements made therein are true and correct.



J. M. Levine

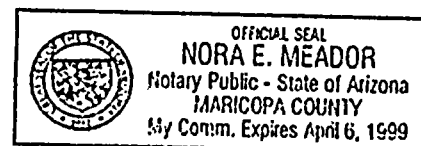
Sworn To Before Me This 18 Day Of March, 1997.



Notary Public

My Commission Expires

April 6, 1999



ENCLOSURE

GL 96-05 180 DAY RESPONSE

GL 96-05 Response

Generic Letter (GL) 96-05, requests each licensee to establish a program, or ensure the effectiveness of its current program, to verify on a periodic basis that safety-related MOVs continue to be capable of performing their safety functions within the current licensing basis of the facility. This letter is the requested 180 day response which provides a written summary description of the MOV periodic verification program at the Palo Verde Nuclear Generating Station (PVNGS).

Program Scope

The periodic verification program described in this letter applies to the valves in the scope of the GL 89-10 program.

Program Description

GL 96-05 requests each licensee to establish a program that addresses potential degradation that can result in (1) the increase in thrust or torque requirements to operate the valves, and (2) the decrease in the output capability of the motor actuator. The PVNGS periodic verification program addresses both areas as described below.

1. Program to address degradation resulting in increased thrust/torque requirements

To verify the design basis capability, 53 percent of the GL 89-10 MOVs were diagnostically tested under differential pressure (DP) conditions at or near the design basis differential pressure, in an effort to validate the various performance parameter assumptions used to calculate the MOVs minimum thrust/torque requirements. For some gate, globe and butterfly valves, in-situ testing could not be performed, or the test results did not provide meaningful data (76 percent of GL 89-10 MOVs were tested under DP conditions). For the MOVs not dynamically tested, the design basis capability was verified by reliance on the EPRI Performance Prediction Model (PPM) or, development of a Large Calculated Margin method or grouping with other dynamically tested MOVs in accordance with Supplement 6 of GL 89-10.

The design basis verification for the GL 89-10 MOVs did not include any additional margin specifically for age-related degradation. To address age-related degradation, which could increase the thrust/torque requirements to operate a MOV, the method used to validate the design basis capability must be considered. MOVs which were validated through use of the EPRI PPM are not expected to see any age-related

degradation beyond the bounding value specified by the PPM. The testing method used by EPRI determined the valve performance degraded until a plateau was reached. The bounding value used by the EPRI PPM program is based on the plateau value. Therefore, valves validated using the EPRI PPM model will not be dynamically tested in the future and will not have any additional margin added to the design basis parameters. This approach is used for 4 percent of the GL 89-10 valves.

MOVs for which the Large Calculated Margin approach was used to validate their design basis capability, a conservative Valve Factor (1.0 for gate valves, 2.0 for globe valves) was used in development of the minimum thrust required to overcome their design basis differential pressure condition. Additionally, a margin of 15% was applied to the minimum required thrust value for conservatism prior to adjustment for Rate of Loading Effects, application of torque switch repeatability and test equipment uncertainties, and adding margin for spring pack relaxation degradation and stem lubrication degradation (3-5%). The conservative margin incorporated in the calculated minimum required thrust setpoints for these MOVs is more than adequate to address any anticipated increase in required thrust resulting from aging effects. Therefore, valves in the large calculated margin category will not be dynamically tested in the future and will not have any additional margin added to the design basis parameters. This approach was used for 43 percent of the GL 89-10 valves.

The Grouping approach was used to validate the design basis capability for 53 percent of the GL 89-10 valves. For each Generic Letter 89-10 MOV group, a valve factor assumption was used to calculate the minimum required thrust using a bounding value from the group's test bases. As well, an adjustment for Rate of Loading effects was used to calculate the minimum required thrust using a bounding value from the group's test bases. Thus, a degree of margin is included in the calculated minimum required thrust prior to the percentage adjustments for spring pack relaxation degradation, stem lubrication degradation, torque switch repeatability and test equipment uncertainties. These conservatism's are inherent in the Adjusted Required Thrust setpoint prior to determining the PVNGS Periodic Verification (PV) Margin.

PVNGS has defined PV Margin as follows;

$$\text{PV Margin \%} = \frac{(\text{Adjusted Actuator Output Thrust} - \text{Adjusted Required Thrust})}{\text{Adjusted Required Thrust}}$$

Low PV Margin (PV Margin < 5%) valve groups will require periodic dynamic testing or modification to increase PV Margin. A sample of low PV Margin MOVs will be dynamically tested on a one refueling cycle frequency for the next three refueling cycles. Age degradation effects, if any, identified by this testing will be applied to the required thrust setpoints of the tested Low PV Margin valve group. The significance of the findings will then determine if further testing, or margin adjustment is needed for the

higher PV Margin valves. The dynamic test program is scheduled to begin during the Unit 1 seventh refueling outage (U1R7) scheduled for the spring of 1998.

The above dynamic test program is modeled after the Joint Owners Group (JOG) Periodic Verification program. PVNGS intends to participate in the JOG program, however, the formal inclusion of Combustion Engineering plants into the JOG had not been completed prior to this submittal. PVNGS intends to perform dynamic testing for selected valves to support the JOG research effort and will incorporate the results of that research into the PVNGS periodic verification program, as appropriate.

2. Program to address degradation resulting in decreased output capability of the motor actuator

Static testing will adequately provide information on the thrust/torque output of the motor actuator and any changes to the motor-actuator output as a result of aging effects. Currently, PVNGS performs a static diagnostic test on each GL 89-10 MOV every other refueling outage (approximately every 36 months) which can be extended to a maximum of three refueling outages. The performance indicating parameters of the static testing are trended to identify degrading conditions.

The PVNGS periodic verification program allows the flexibility to use feedback from existing programs and industry information to adjust test frequencies, test methods and design assumptions throughout the life of the plant. The program will ensure that an adequate level of performance monitoring is maintained.

PVNGS is also considering other test methodologies as part of the periodic verification program. For example, motor power testing may be used to monitor MOV performance between full diagnostic test periods when the diagnostic test periods are extended. In addition to static and dynamic testing, preventive maintenance is also performed to ensure the condition of the actuator and stem lubrication is maintained at acceptable performance levels.

Risk-Based Inservice Testing Initiative

Generic Letter 96-05 states that licensees involved in the risk-based inservice testing (RB-IST) initiative, need to specifically address the relationship of the ASME OMN-1 code case to their pilot initiative. PVNGS is one of the pilot plants for the industry's risk-based inservice testing (RB-IST) initiative, and PVNGS is developing a new risk ranking study which uses a blend of probabilistic and deterministic methods to ascertain the relative risk significance of plant components. PVNGS will use risk ranking information when adjusting test frequencies, test methods and maintenance schedules. The risk ranking will also be used, in conjunction with the MOV margin calculations, to determine the priority of implementation for planned program changes. The results of

the new study will be used in the development of the RB-IST initiative, which will be modeled after the program described in the ASME OMN-1 code case.

Conclusion

The existing program of preventive maintenance, static diagnostic testing and the addition of supplemental dynamic testing, either as part of the JOG program or the separate site specific test program described above, meets the requirements of GL 96-05. In addition, the PVNGS periodic verification program allows for the necessary flexibility to adjust testing frequencies and test methods while continuing to assure the capability of GL 89-10 program MOVs to perform their safety-related function throughout the remaining life of the plants.

