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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-011-00: on 951018, identified procedural deficiency w/MSIV & FWIV ISTs due to personnel error. Verified operability of MSIVs & FWIVs. W/951123 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Arizona Public Service Company
PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

192-00952-JML/BAG/DLK
November 23, 1995

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

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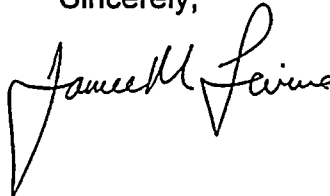
Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528, 50-529, 50-530
License Nos. NPF-41, NPF-51, NPF-74
Licensee Event Report 95-011-00**

Attached please find Licensee Event Report (LER) 95-011 prepared and submitted pursuant to 10CFR50.73. This LER reports a condition where Inservice Tests being performed on the Main Steam Isolation Valve and Feedwater Isolation Valve air operating subsystems were not adequate to demonstrate OPERABILITY under worst case accident conditions. This condition is being treated as a violation of plant Technical Specification 4.0.5.

In accordance with 10CFR50.73(d), a copy of this LER is being forwarded to the Regional Administrator, NRC Region IV. If you have any questions, please contact Burton A. Grabo, Section Leader, Nuclear Regulatory Affairs, at (602) 393-6492.

Sincerely,



JML/BAG/DLK

Attachments

cc: L. J. Callan (all with attachments)
K. E. Perkins
K. E. Johnston
INPO Records Center

9512050009 951123
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LICENSEE EVENT REPORT (LER)

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|---|---|-----------------------------|
| FACILITY NAME (1) Palo Verde Unit 1 | DOCKET NUMBER (2) 0 5 0 0 0 5 2 8 | PAGE (3) 1 OF 0 6 |
|---|---|-----------------------------|

TITLE (4)
Inadequate Main Steam Isolation Valve and Feed Water Isolation Valve Operating Air Inservice Tests

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | | |
|--------------------|------------|----------------------|--------------------|-------------------|-----------------|--------------------------|-----|------------------------|-------------------------------|--|------------------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAMES | | DOCKET NUMBERS |
| | | | | | | | | | Palo Verde Unit 2 | | 0 5 0 0 0 5 2 9 |
| 1 0 1 8 9 5 | 9 5 | - 0 1 1 - 0 0 | 1 1 2 3 9 5 | | | Palo Verde Unit 3 | | 0 5 0 0 0 5 3 0 | | | |

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|----------------------------------|--|--|--|-----------------------------------|---|--|---|-----------------------------------|---|---|--|---|
| OPERATING MODE (9) 1 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11) | | | | | | | | | | | |
| POWER LEVEL (10) 1 0 0 | <input type="checkbox"/> 20.402(b) | <input type="checkbox"/> 20.405(c) | <input type="checkbox"/> 50.73(a)(2)(iv) | <input type="checkbox"/> 73.71(b) | <input type="checkbox"/> 20.405(a)(1)(i) | <input type="checkbox"/> 50.36(c)(1) | <input type="checkbox"/> 50.73(a)(2)(v) | <input type="checkbox"/> 73.71(c) | <input type="checkbox"/> 20.405(a)(1)(ii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(vi) | <input type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| | <input type="checkbox"/> 20.405(a)(1)(iii) | <input checked="" type="checkbox"/> 50.73(a)(2)(i) | <input type="checkbox"/> 50.73(a)(2)(vii)(A) | | <input type="checkbox"/> 20.405(a)(1)(iv) | <input type="checkbox"/> 50.73(a)(2)(ii) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) | | <input type="checkbox"/> 20.405(a)(1)(v) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix) | |

LICENSEE CONTACT FOR THIS LER (12)

| | |
|--|---|
| NAME Burton A. Grabo, Section Leader, Nuclear Regulatory Affairs | TELEPHONE NUMBER AREA CODE 6 0 2 3 9 3 - 6 4 9 2 |
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS |
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SUPPLEMENTAL REPORT EXPECTED (14)

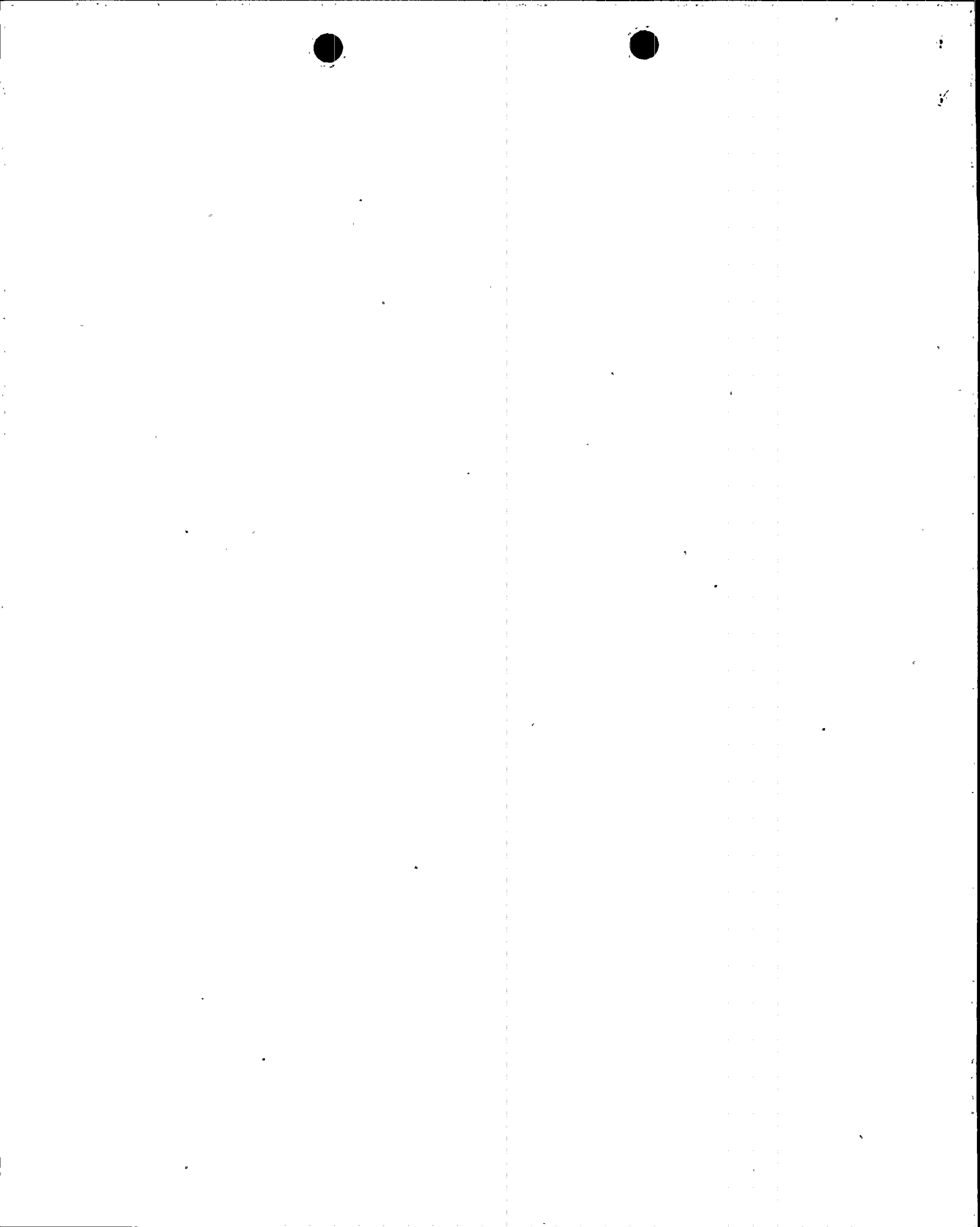
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| <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) | <input checked="" type="checkbox"/> NO | EXPECTED SUBMISSION DATE (15) | MONTH DAY YEAR |
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On October 18, 1995, at approximately 1500 MST, Palo Verde Units 1 and 2 were in Mode 1 (POWER OPERATION) operating at approximately 100 percent power and Unit 3 was in Mode 6 (REFUELING) when as a result of a Main Steam (SG) Design Basis Manual validation, a procedural deficiency was identified with the Main Steam Isolation Valve (MSIV) and Feed Water Isolation Valve (FWIV) Inservice Tests (IST). The method used to test the integrity of the MSIV and FWIV operating air subsystems verified that pressure would not drop from normal system pressure to the low pressure alarm setpoint when the subsystem was isolated for a period of 11 minutes - actual leakrates were not measured. The test did not account for worst case accident conditions. As a result, with the subsystems operating at a lower than normal pressure (less than 84 psig), the test acceptance criteria did not provide assurance that the MSIVs or FWIVs were OPERABLE. This condition is a violation of plant Technical Specification 4.0.5.

The cause of the event was personnel error during the initial development of the MSIV and FWIV ISTs. As corrective action, OPERABILITY of the MSIVs and FWIVs on Units 1 and 2 was verified and administrative controls were established on the affected subsystems to ensure the MSIVs and FWIVs remain OPERABLE.

There have been no previous similar events reported pursuant to 10CFR50.73 in the last three years.



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1. REPORTING REQUIREMENTS:

This LER 528/95-011-00 is being written to report a condition prohibited by the plant's Technical Specifications pursuant to 10 CFR 50.73(a)(2)(i)(B).

Specifically, at approximately 1500 MST on October 18, 1995, Palo Verde Units 1 and 2 were in Mode 1 (POWER OPERATION) operating at approximately 100 percent power and Unit 3 was in Mode 6 (REFUELING) when as a result of a Main Steam (SG) (SB) Design Basis Manual validation, a procedural deficiency was identified with the Main Steam Isolation Valve (MSIV) (SB) (ISV) and Feed Water Isolation Valve (FWIV) (SJ) (ISV) Inservice Tests (IST). The method used to test the integrity of the MSIV and FWIV operating air subsystems (JM) verified that pressure would not drop from normal system pressure to the low pressure alarm (PA) setpoint when the subsystem was isolated for a period of 11 minutes - actual leakrates were not measured. The test did not account for worst case accident conditions. As a result, with the subsystems operating at a lower than normal pressure (less than 84 psig), the test acceptance criteria did not provide assurance that the MSIVs or FWIVs were OPERABLE. This condition is a violation of plant Technical Specification 4.0.5.

2. EVENT DESCRIPTION:

On October 18, 1995, while reviewing a calculation to validate the SG design basis manual, an engineer (contract, non-licensed) discovered a discrepancy between the acceptance criteria specified in the MSIV and FWIV ISTs and the respective supporting calculation. The MSIVs and FWIVs are hydraulically actuated valves that rely on quality related operating air subsystems. The operating air subsystems are supplied by the Instrument Air (IA) (LD) system - a non-quality related system backed-up by the Nitrogen (GA) (LK) system which is also non-quality related. An air reservoir (RVR) and spring-loaded check valve (V) are provided in each operating air subsystem to satisfy the criteria for the quality related classification. (A typical sketch of the operating air subsystems showing the class break is provided as figure 1 in this LER.) There are a total of 8 MSIV operating air subsystems and 4 FWIV operating air subsystems per unit. The minimum air pressure needed to operate the MSIVs and FWIVs is approximately 48 psig and 47 psig respectively. The ISTs verify that the operating air subsystem pressure, when isolated, will not drop from the initial test pressure to the low pressure alarm setpoint of 65 ± 5.9 psig (note: 5.9 psig includes the setpoint tolerance of 1 psig plus instrument [90] inaccuracies of 4.9 psig). The ISTs did not consider that the operating air subsystem pressure could be as low as 59.1 psig (i.e., 65 - 5.9) at the start of an accident. The maximum operating air subsystem

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pressure could be as high as 95 psig. Since leakage was not being measured, the test results to date demonstrate only that subsystem leakrate is less than 35.9 psig (i.e., 95-59.1) during the 11 minute test. The tests do not verify that the MSIV or FWIV operating air subsystems will provide sufficient air for MSIV and FWIV operation under all possible operating or accident conditions.

The testing method deficiency was documented on a Condition Report/Disposition Request (CRDR), and on October 18, 1995, at approximately 1630 MST the Site Shift Manager was notified. A walkdown was performed in Units 1 and 2 to verify that the MSIV and FWIV operating air subsystems were being operated at minimum pressure of 84 psig. (The MSIVs and FWIVs were not required to be OPERABLE in Unit 3 while in Mode 6.) Maintaining the operating air subsystem pressure at 84 psig or greater ensures that sufficient air will be available, under worst case accident conditions, to operate the MSIVs and FWIVs. The "as found" pressures in the MSIV and FWIV operating air subsystems were greater than 84 psig with the exception of one which was found at 82 psig. Corrective action was taken to raise air pressure to a value greater than 84 psig. At approximately 2200 MST on October 18, 1995, an Operability Determination (OD) was performed. The OD specified the minimum operating pressure that must be maintained in order to consider the MSIVs and FWIVs OPERABLE. Because the ISTs have been deficient since initial startup and the air operating subsystems were not periodically verified to be above 84 psig, the previous operational status of the MSIVs and FWIVs is indeterminate. Prior to October 18, 1995, the MSIVs and FWIVs may have at times been inoperable and may have exceeded their respective TS allowed outage time. The event was evaluated and determined to be reportable on October 27, 1995, pursuant to 10 CFR 50.73(a)(2)(i)(B).

As an interim corrective action, a night order was issued on October 19, 1995, that instituted a shiftly surveillance to verify that outlet pressure on the MSIV and FWIV operating air regulators (90) is greater than 84 psig and maintained in a normal control band of 88 to 92 psig. Additionally, the MSIV and FWIV ISTs have been revised to include a new test method that measures subsystem leakage and calculates a leakrate. The revised ISTs were successfully performed in Unit 3. The interim corrective action will remain in effect until the revised ISTs are successfully performed in Units 1 and 2.

3. ASSESSMENT OF THE SAFETY CONSEQUENCES AND THE IMPLICATIONS OF THIS EVENT:

The safety function of the MSIVs and FWIVs is to close on a Main Steam Isolation Signal to isolate main steam and main feedwater flow from and to the secondary side of the steam generators (AB). The test method used to

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verify the integrity of the MSIV and FWIV operating air subsystems did not adequately ensure that, under worst case conditions, the subsystems were capable of providing sufficient air to close the MSIVs and FWIVs. The tests in actuality verified that leakage from the operating air subsystems was less than 35.9 psig in 11 minutes. Based on the worst case accident, with a starting pressure of less than 84 psig and a maximum acceptable leakrate, the operating air subsystems may not have been capable of performing their intended safety function.

Actual subsystem leakage was measured on two MSIVs and one FWIV in 1994 while performing maintenance on their low pressure alarm switches (PA) (63). The revised MSIV and FWIV ISTs have also been performed in Unit 3. Leakage on the operating air subsystems was found to be less than 1 psig in 11 minutes. Even though leakrate data is not available on all the affected operating air subsystems, APS believes that leakrates are far less than 35.9 psig in 11 minutes and more on the order of 1 psig in 11 minutes based on the leakrate measurements taken on 15 of the 36 affected subsystems. Additionally, the IA system is designed with a backup nitrogen supply. The backup nitrogen supply is not a quality related system, but it is a passive system designed to provide a backup to IA. Based on the above, APS considers the safety consequences and implications of this event low.

The event did not result in any challenges to the fission product barriers or result in any releases of radioactive materials. This event did not adversely affect the safe operation of the plant or the health and safety of the public.

4. CAUSE OF THE EVENT:

An independent investigation of this event is being conducted in accordance with the APS Corrective Action Program. The investigation determined that the inadequate test method was attributed to personnel error during the initial development of the MSIV and FWIV ISTs (SALP Cause Code A: Personnel Error). No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event.

5. STRUCTURES, SYSTEMS, OR COMPONENTS INFORMATION:

Although the MSIVs and FWIVs may have been technically inoperable at the start of the event, there were no system failures involved in this event. No failures of components with multiple functions were involved. No failures that rendered a train of a safety system inoperable were involved. There were no safety system responses and none were necessary.



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6. CORRECTIVE ACTION TO PREVENT RECURRENCE:

A new IST method has been developed to verify the integrity of the MSIV and FWIV operating air subsystems. The new test method measures subsystem leakage and calculates a leakrate. The new acceptance criteria is based on the 11 minute bounding accident and the pressure difference between a postulated initial pressure of 59.1 psig and the minimum pressure required to operate the MSIVs or FWIVs (approximately 48.1 and 47.1 psig respectively). The revised ISTs were successfully performed in Unit 3. Engineering, Operations, and Work Control personnel are evaluating the benefit and feasibility of testing the Units 1 and 2 valves on-line.

7. PREVIOUS SIMILAR EVENTS:

There have been no previous similar events reported pursuant to 10CFR50.73 in the last three years.



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FIGURE 1 Simplified Drawing

