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July 13, 1984  
ANPP-29958-TDS/TRB

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U. S. Nuclear Regulatory Commission  
Region V  
Creekside Oaks Office Park  
1450 Maria Lane - Suite 210  
Walnut Creek, CA 94596-5368

Attention: Mr. T. W. Bishop, Director  
Division of Resident  
Reactor Projects and Engineering Programs

Subject: Final Report - Revision 1 - DER 83-56  
A 50.55(e) Reportable Condition Relating to Discrepancies With  
Main Steam Isolation Valves by Anchor-Darling.  
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Narbut and R. Tucker on  
August 8, 1983  
B) ANPP-27606, dated August 22, 1983 (Interim Report)  
C) ANPP-28319, dated November 30, 1983 (Time Extension)  
D) ANPP-28863, dated February 14, 1984 (Time Extension)  
E) ANPP-29029, dated March 8, 1984 (Time Extension)  
F) ANPP-29296, dated April 13, 1984 (Final Report)

Dear Sir:

Attached is Revision 1 to the Final written report of the Reportable  
Deficiency under 10CFR50.55(e), referenced above. This Revision restates  
Section III, paragraph F, to accurately reflect the Corrective Action  
taken.

Very truly yours,

*E. E. Van Brunt*  
E. E. Van Brunt, Jr.  
APS Vice President, Nuclear  
ANPP Project Director

EEVB/TRB:db

Attachment

cc: See Page Two

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Mr. T. W. Bishop  
DER 83-56  
Page Two

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FINAL REPORT - REVISION 1 - DER 83-56  
DEFICIENCY EVALUATION 50.55(e)  
ARIZONA PUBLIC SERVICE COMPANY (APS)  
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

Specification 13-MM-234A specifies operability requirements for the Main Steam Isolation Valve (MSIV).

During the Unit 1 Hot Functional Testing Program, the project experienced considerable operational difficulties with the MSIV's supplied by the Anchor/Darling Valve Company (A/DVC). Repeated component failures required rework and modifications on the hydraulic actuators in order to commission the valves for testing. Similar hydraulic actuators are also supplied on the Feed Water Isolation Valve (FWIV) by Anchor/Darling. The problems range from safety considerations such as oil and nitrogen leakage, to operability concerns such as valve float, and valve droop. The conditions are as follows:

A. Hydraulic Reservoir/Oil Spray

Hydraulic oil reservoir overflowed following dumping of accumulators during the accumulator charge test. This condition has been attributed to the surge of the hydraulic fluid being returned to the reservoir.

B. Nitrogen Leakage

Excessive nitrogen leakage from nitrogen accumulators. This condition has been attributed to leaky fittings.

C. Hydraulic Pump Failures

This condition has been attributed to inadequate material of nonmetallic parts of the pump.

D. Fluid (Fitting) Leakage

Loss of hydraulic and instrument air pressure on the actuators. This condition was attributed to leaky fittings.

E. Valve Float

With equal pressure across the valve the MSIV and FWIV has the potential to float open due to fluid-pressure loss through the orifice to the cap end of the hydraulic cylinder.

F. Valve Droop

With no pressure in the mainsteam line the MSIVs droop approximately one (1) inch after they trip the full open limit switch. However, with pressure in the main steam line, the MSIVs do not droop. The droop deactivates the position limit switch which disables slow mode operation and gives spurious intermediate indications.

G. N<sub>2</sub> Accumulator Shutoff Valves

Nitrogen accumulator shutoff supply valves did not meet environmental qualification requirements. Nonmetallic parts in the valve are not rated for 120°F normal and 300°F accident temperatures at 5000 psig.

II. Analysis of Safety Implications

The Main Steam Isolation Valves (MSIV) and the Feed Water Isolation Valves (FWIV) are normally open and are designed to fail closed during a Design Basis Event (DBE).

The analysis of safety implications for each point are as follows.

A. Hydraulic Reservoir/Oil Spray

The hydraulic oil reservoir overflow condition does not impair the safety function of the valve to fast close in response to an MSIS signal. The spraying of hydraulic fluid in the surrounding area is an item of personnel safety.

B. Nitrogen Leakage

Excessive nitrogen leakage into the atmosphere will reduce the stored energy available in the accumulator to close the valve thus impairing the safety function of the MSIV/FWIV.

C. Hydraulic Pump Failures

This condition has been attributed to inadequate material of the nonmetallic parts of the pump internals. This condition if left uncorrected would impair safety function of the MSIV/FWIV.

D. Fluid (Fitting) Leakage

Leaky hydraulic and instrument air fittings, if left uncorrected, would impair the safety function due to insufficient hydraulic fluid and/or instrument air, required for operation of the valve.

E. Valve Float

Since the valve floats open with equal pressure across the valve, this condition would impair the safety function of the MSIV/FWIV.

F. Valve Droop

Valve drooping was observed at no pressure in the line. Since there will always be pressure in the line during normal operation, the valves will not droop. Hence this will not impair the the safety function of MSIV/FWIV.

G. N<sub>2</sub> Accumulator Shutoff Valves

This condition if left uncorrected would impair the safety function of the MSIV/FWIV.

A review of the above listed items reveals that all items, with the exception of Items A and F, would preclude the safety related functions of the hydraulic operators to ensure the isolation valves would fail-closed and maintain this position during and after a design basis event.

Based on the above, this condition is evaluated as reportable under the requirements of 10CFR50.55(e), since if this condition were to remain uncorrected, it would represent a significant safety condition.

The PVNGS also evaluates this condition as reportable under the requirements of 10CFR21.21(b)(3), with the exception of subpart (vi), which requires the number and location of all other components supplied.

III. Corrective Action

A. Hydraulic Reservoir/Oil Spray

As per A/DV recommendation, a larger hydraulic reservoir with baffles is being installed in each MSIV and FWIV to preclude oil spray. DCP 1SM-SG-103, 3SM-SG-103 and SCM-SG-103 for Units 1, 2 and 3 have been issued to perform this work prior to fuel load for each unit.

B. Nitrogen Leakage

Nitrogen leakage to atmosphere were restricted by minimizing the number of fittings in the tubing. DCPs ISJ-SG-102, 2SJ-SG-102 and 3CJ-SG-102 have been issued to perform this work for Units 1, 2 and 3 prior to fuel load for each unit.

C. Hydraulic Pump Failures

Nonmetallic components of the pumps were replaced by suitable material as recommended/specified by SC hydraulic (pump manufacture).

Work for Unit 1 was carried out per SFR #1SG-165. Work on Units 2 and 3 will be implemented via DCPs 2SM and 3CM-SG-086 prior to fuel load for each unit.

D. Fluid (Fitting) Leakage

Oil and air system fitting leakage has been corrected using Loctite 277 as a sealing agent, as per A/DVC's recommendation. Corrective action will be in accordance with Item B.

E. Valve Float

A/DV recommended the installation of a relief valve in series with the orifice to prevent the valve from floating open. DCP 1SM-SG-103, 2SM-SG-103, 3CM-SG-103 for Units 1, 2 and 3 has been issued to perform this work on the MSIV and FWIV prior to fuel load for each unit.

F. Valve Droop

Valve droops, which causes conflicting valve position indications in the control room, occurs only during "slow mode" open/close operation so it is not safety-related.

In lieu of a physical change, a simple procedural change can eliminate the conflicting position indications in the control room. Whenever one train gives an "intermediate" indication at the end of valve travel, this will be corrected by operating the switch for that train until the intermediate indication clears. The vendor Instruction Manual No. E9023-9 has been revised to reflect this corrective action.

G. N<sub>2</sub> Accumulator Shutoff Valve

A/DV is providing valve kits to replace stem and stem packing at no cost. DCP 1SJ-SG-102, 2SJ-SG-102, 3CJ-SG-102 for Units 1, 2, and 3 has been issued to perform this work on the MSIV and FWIV prior to fuel load for each unit.

H. General

A seminar was arranged on February 28 and 29, 1984 at PVNGS site to cover operation, maintenance and troubleshooting of the MSIV and FWIV hydraulic actuator.

- I. NCRs SM-2968 and SM-3215 will be dispositioned in accordance with their respective DCPs.
- J. A copy of this report will be sent to Anchor/Darling for their review under the requirements of 10CFR21.