

Arizona Public Service Company

August 23, 1984  
ANPP-30271-TDS/TRB

U. S. Nuclear Regulatory Commission  
Region V  
Creskide 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 - DER 83-80  
A 50.55(e) Reportable Condition Relating To Main Feedwater  
Isolation Valves Closed In 20 Seconds; Specification  
Requires 5 Seconds.  
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Narbut and K. Parrish on  
November 23, 1983  
B) ANPP-28462, dated December 19, 1983 (Interim Report)  
C) ANPP-28800, dated February 6, 1984 (Time Extension)  
D) ANPP-28980, dated March 2, 1984 (Time Extension)  
E) ANPP-29178, dated March 28, 1984 (Time Extension)  
F) ANPP-29581, dated May 23, 1984 (Interim Report)  
G) ANPP-29975, dated July 16, 1984 (Time Extension)

Dear Sir:

Attached is our final written report of the deficiency referenced above,  
which has been determined to be Not Reportable under the requirements of  
10CFR50.55(e).

Very truly yours,

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

REGION VICE

EEVB/TRB/nj  
Attachment

cc: See Page Two

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cc: Richard DeYoung, Director  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

T. G. Woods, Jr.  
D. B. Karner  
W. E. Ide  
D. B. Fasnacht  
A. C. Rogers  
L. A. Souza  
D. E. Fowler  
T. D. Shriver  
C. N. Russo  
J. Vorees  
J. R. Bynum  
J. M. Allen  
J. A. Brand  
A. C. Gehr  
W. J. Stubblefield  
W. G. Bingham  
R. L. Patterson  
R. W. Welcher  
H. D. Foster  
D. R. Hawkinson  
L. E. Vorderbrueggen  
R. P. Zimmerman  
S. R. Frost  
J. Self  
M. Woods  
T. J. Bloom  
D. N. Stover

Records Center  
Institute of Nuclear Power Operations  
1100 Circle 75 Parkway, Suite 1500  
Atlanta, GA 30339

FINAL REPORT - DER 83-80  
DEFICIENCY EVALUATION 50.55(e)  
ARIZONA PUBLIC SERVICE COMPANY (APS)  
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

CESSAR, Chapter 5.1.4, Section I.9, specified a 5-second closing time for the Feedwater Isolation Valves (FWIV), and the Final Safety Analysis Report commits to meet this requirement. This requirement is necessary to limit the mass of water added to the steam generators following a main steam line break (MSLB) inside the containment. Any water admitted to the steam generator during such an MSLB will be converted to steam and released into the containment, thereby increasing the post-accident pressure and temperature. During startup testing, it was discovered that the closing time for the Feedwater Isolation Valves exceeded 5 seconds. Startup issued NCR SM-3168 to document this condition.

The hydraulic actuator of one valve (1JSGB-UV-137) was returned to Anchor Darling and installed on a test rig where closing time tests were performed under simulated operating conditions. The minimum closing time attainable was 7.3 seconds, and this was obtained with the following actuator adjustments:

- (a) nitrogen charge increased from 3400 psig to 3500 psig at 70°F, and
- (b) the setting of the "G" closing speed control valve changed from a 3/4 turn from full closed position to fully open.

To provide margin for closure time variability and allow for degradation over the 40-year plant life, a 10-second or less closing time requirement was specified for licensing purposes.

To preclude the initiation of various pressure/temperature/flow transients associated with fast closure under full flow operating conditions, the fast closure testing at the PVNGS will be static. Anchor Darling has specified a 2-second differential time adjustment for field testing with static ambient water. Therefore, an 8-second or less closing time for field testing meets the licensing requirement of 10 seconds (BPC Telex MIC #226667, ADVC Telex MIC #226669, and BPC Telex MIC #226668).

To evaluate the consequences of the deviation from the CESSAR interface requirement for FWIV closure time of five (5) seconds to ten (10) seconds, Combustion Engineering (C-E) provided PVNGS-specific mass/energy release data for the design basis main steam line break (MSLB) inside containment assuming a 10-second closure time (Letters V-CE-30008, dated March 30, 1984; V-CE-30051, dated April 10, 1984; V-CE-30177, dated May 1, 1984; and V-CE-30370, dated June 11, 1984).

Bechtel engineering performed a containment pressure-temperature response analysis using the new data from C-E and verified that:

(a) the containment temperature profile is enveloped by the equipment qualification thermal profile previously established using generic main steam line break (MSLB) blowdown data from CESSAR-F, and

(b) the peak containment pressure is also bounded by the existing loss-of-coolant-accident (LOCA) environmental qualification envelope.

C-E reanalyzed the limiting MSLB with a 10-second closure time for impact on reactor core thermal-hydraulic response and off-site radiological releases (Letter V-CE-30263, dated May 21, 1984). Their analysis confirms that a 10-second closure time will not pose a problem with post-trip return to power, core protection, or off-site radiological releases.

## II. Analysis of Safety Implications

During the original Acceptance Tests performed at the manufacturer's facility under simulated operating conditions, the closing time for each valve was checked six (6) times, and the maximum time-to-close was as follows:

| <u>Tag No.</u> | <u>Max. Time</u> | <u>Tag No.</u> | <u>Max. Time</u> | <u>Tag No.</u> | <u>Max. Time</u> |
|----------------|------------------|----------------|------------------|----------------|------------------|
| 1JSGA-UV-174   | - 8.20 sec.      | 2JSGA-UV-174   | - 8.76 sec.      | 3JSGA-UV-174   | - 9.35 sec.      |
| 1JSGA-UV-177   | - 8.19 sec.      | 2JSGA-UV-177   | - 8.88 sec.      | 3JSGA-UV-177   | - 9.09 sec.      |
| 1JSGB-UV-132   | - 9.00 sec.      | 2JSGB-UV-132   | - 8.63 sec.      | 3JSGB-UV-132   | - 8.65 sec.      |
| 1JSGB-UV-137   | - 7.79 sec.      | 2JSGB-UV-137   | - 8.81 sec.      | 3JSGB-UV-137   | - 8.67 sec.      |

All the valves had closing times less than ten (10) seconds during the original acceptance tests, and analysis confirmed that, for a 10-second closing time, peak containment environmental conditions are enveloped by previously specified values for equipment qualification and that reactor core performance and off-site radiological releases remain within acceptable limits. Therefore, the condition herein is evaluated as not reportable under 10 CFR Part 50.55(e) and Part 21 since, if left uncorrected, it would not have constituted a significant deficiency or substantial safety hazard.

## III. Corrective Action

1. By copy of this DER, Anchor Darling is directed to revise FWIV Instruction Manual No. E9023-9 to reflect the following corrective actions:

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- a. Closing Speed Control Valve "G" on the FWIV actuator will be set in fully open position.
  - b. The FWIV will be precharged with nitrogen at a pressure of 3500 psig and a temperature of 70° F.
2. Safety Analysis Report Change Notice No. 1174 has been issued to reflect a 10-second closing time requirement for the FWIV.
  3. For field testing with water in the line at stagnant ambient temperature and zero gauge pressure, but no flow, the specified closing time shall be 8 seconds or less. The test results shall be documented per Test Procedure 91-HF-1SG01.

The above corrective action is consistent with the final disposition of NCR SM-3168, and is effective for all three units.