PNR-016
LPDR

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 25 1984

Docket No. 50-528/529/530

Ms. Lynn Bernabei
Government Accountability Project
1901 Que Street, NW
Washington, DC 20009

IN RESPONSE REFER
TO FOIA-84-212

Dear Ms. Bernabei:

This is in partial response to your letter dated March 26, 1984, in which you requested, pursuant to the Freedom of Information Act, all documents related to problems encountered by the Arizona Public Service Company during hot functional testing of Palo Verde Nuclear Generating Station, Unit 1, last summer, 1983, including but not limited to problems with the RCS pumps, thermowells, thermal sleeves, and CEA shrouds; and any problems, deficiencies, failures or defects encountered by the Arizona Public Service Company in connection with the low pressure safety injection (LPSI) pumps at the Palo Verde Nuclear Generating Station, Units 1, 2 or 3.

The documents listed on Appendix A are subject to your request. These documents are being placed in the NRC Public Document Room in FOIA file folder 84-212 in your name.

The search and review of additional documents subject to your request is continuing. We will notify you when our actions have been completed.

Sincerely,

J. M. Felton, Director
Division of Rules and Records
Office of Administration

Enclosure: Appendix A

APPENDIX A

1.	3/14/84	Letter to G. Knighton from E. E. Van Brunt, Jr., re: PVNGS Unit Reactor Coolant System Demonstration Test w/attachment (10 pages)
2.	2/27/84	Letter to E. E. Van Brunt, Jr., from G. W. Knighton re: REQUEST FOR ADDITIONAL INFORMATION - PALO VERDE REACTOR COOLANT PUMPS w/enclosure (3 pages)
3.	2/15/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
4.	2/2/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (5 pages)
5.	1/27/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT, REVISION 1 w/attachment (3 pages)
6.	1/27/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT, REVISION 1 w/attachment (13 pages)
7.	1/26/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (4 pages)
8.	1/20/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT, REVISION 1 w/attachment (8 pages)
9.	1/18/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT - REVISION 1 (1 page)
10.	1/17/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (4 pages)
11.	1/16/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
12.	1/9/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
13.	1/5/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
14.	1/3/84	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (5 pages)
15.	12/30/83	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (7 pages)

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16. 12/19/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

17. 12/8/83 Letter to Arizona Public Service Company from E. A. Licitra re: SUMMARY OF VISIT TO CE PUMP TEST FACILITY IN NEWINGTON, NEW HAMPSHIRE w/enclosure (10 pages)

18. 12/6/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

19. 11/30/83 Memo for T. M. Novak from E. A. Licitra re: UPDATED STATUS ON PALO VERDE RCE PUMPS AND RELATED MATTERS (2 pages)

20. 11/29/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

21. 11/29/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

22. 11/9/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

23. 10/27/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

24. 10/26/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (1 page)

25. 10/24/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)

26. 10/13/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)

27. 10/13/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

28. 10/11/83 Memo for T. M. Novak from E. A. Licitra re: UPDATED STATUS ON PALO VERDE RCS PUMPS AND RELATED MATTERS (2 pages)

29. 10/5/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

30. 9/21/83 Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

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31.	9/20/83	MORNING REPORT - REGION V (1 page)
32.	9/15/83	MORNING REPORT - REGION V (1 page)
33.	9/6/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (15 pages)
34.	9/6/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: FINAL REPORT (2 pages)
35.	8/29/83	Letter to Arizona Public Service Company from E. A. Licitra re: SUMMARY OF MEETING CONCERNING RESULTS OF HOT FUNCTIONAL TESTING FOR PALO VERDE UNIT 1 w/attached list of meeting attendees and viewgraphs on Thermowells, RC Pumps, Thermal Sleeve and CEA Shroud Assembly (23 pages)
36.	8/19/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)
37.	8/19/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)
38.	8/19/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (5 pages)
39.	8/22/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)
40.	8/22/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)
41.	8/2/83	MORNING REPORT - REGION V (1 page)
42.	8/1/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/enclosure (3 pages)
43.	7/25/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/enclosure (10 pages)
44.	7/25/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/enclosure (3 pages)
45.	7/18/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
46.	5/11/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)

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47.	5/6/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: DEFICIENCY EVALUATION REPORT w/enclosure (3 pages)
48.	3/14/83	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: INTERIM REPORT w/enclosure (3 pages)
49.	9/29/82	Letter to D. M. Sternberg from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (4 pages)
50.	8/5/82	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)
51.	5/26/82	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (5 pages)
52.	3/19/82	Letter to B. H. Faulkenberry from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
53.	4/27/82	Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: TIME EXTENSION FOR REPORT (2 pages)
54.	1/28/82	Letter to B. H. Faulkenberry from E. E. Van Brunt, Jr., re: INTERIM REPORT w/attachment (3 pages)
55.	Undated	Memo for E. L. Jordan et. al. from T. W. Bishop re: CERTAIN INGERSOLL-RANK PUMPS WITH WESTINGHOUSE MOTORS HAVE DEFECTIVE WELDS ON THE PUMP MOTOR BRACKETS AND HAVE EXCESSIVE OIL LEAKAGE FROM THE MOTOR LOWER BEARING HOUSING w/enclosure (2 pages)
56.	11/30/83	Memo I. Novak from E. Licitra re: UPDATED STATUS ON PALO VERDE RCS PUMPS AND RELATED MATTERS (2 pages)
57.	10/31/83	Letter to Arizona Public Service Company from E. A. Licitra re: SUMMARY OF MEETING CONCERNING RESULTS OF HOT FUNCTIONAL TESTING FOR PALO VERDE UNIT 1 w/enclosed List of Meeting Attendees, Viewgraphs on Thermal Sleeves, Thermowells, RCS Pumps, and CEA Shrouds (36 pages)
58.	12/12/83	Letter to T. G. Woods from J. B. Martin re: NRC ENFORCEMENT CONFERENCE w/enclosed Inspection Report No. 50-528/83-43 (5 pages)
59.	12/12/83	Letter to T. G. Woods, Jr., from J. B. Martin re: PALO VERDE NUCLEAR GENERATING STATION CONSTRUCTION PERMIT w/enclosed Notice of Violation and Imposition of Civil Penalty and Notice of Deviation (14 pages)

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60. 11/11/83 Letter to T. G. Woods, Jr., from J. B. Martin re: CONSTRUCTION APPRAISAL INSPECTION 50-528/83-34 w/enclosed Inspection Report 50-528/83-34 (67 pages)

61. 1/20/84 ANPP-1 THERMOWELL DESIGN COMPARISION w/other attached Viewgraphs (5 pages)

62. 2/24/84 TASK INTERFACE AGREEMENT w/attached letter dated 2/6/84 for D. G. Eisenhut from T. W. Bishop re: REQUEST FOR TRANSFER OF LEAD RESPONSIBILITY FOR EVALUATION OF LPSI PUMP PROBLEMS AND MODIFICATIONS AT PALO VERDE NUCLEAR GENERATING STATION (2 pages)

63. 2/10/82 Letter to W. G. Bingham from C. Ferguson re: ANPP BECHTEL JOB 10407 - ANTI-ROTATION PINS LPSI CSPumps w/attachment (2 pages)

64. 2/6/84 Memo for H. Denton et. al. from E. A. Licitra re: DAILY HIGHLIGHT (1 page)

65. 12/5/83 Letter to L. Bernabei from L. S. Dewey re: PALO VERDE COOLANT PUMP INQUIRY (1 page)

66. 4/1/80 POTENTIALLY GENERIC ISSUE DATA SHEET (1 page)

67. 3/21/84 Letter to L. Bernabei from L. S. Dewey re: HOT FUNCTIONAL TESTING (1 page)

68. 12/30/83 Letter to T. W. Bishop from E. E. Van Brunt, Jr., re: FINAL REPORT w/attachment (2 pages)

69. 3/13/84 Memo for H. R. Denton et. al. from E. A. Licitra re: DAILY HIGHLIGHT (2 pages)

70. 1/24/84 Letter to G. Knighton from E. E. Van Brunt, Jr., re: SAFETY INJECTION NOZZLE THERMAL LINER (1 page)

71. 1/31/84 Letter to G. Knighton from E. E. Van Brunt, Jr., re: CONTROL ELEMENT ASSEMBLY SHROUD (1 page)

72. 2/24/84 Letter to G. Knighton from E. E. Van Brunt, Jr., re: PVNGS UNIT REACTOR COOLANT SYSTEM DEMONSTRATION TEST (1 page)

73. 2/24/84 Letter to G. Knighton from E. E. Van Brunt, Jr., re: PALO VERDE (2 pages)

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74.	2/24/84	Letter to G. Knighton from E. E. Van Brunt, Jr., re: PALO VERDE (2 pages)
75.	2/27/84	Letter to L. Bernabei from L. S. Dewey re: HOT FUNCTIONAL TESTING (1 page)
76.	1/31/84	Letter to L. Bernabei from L. S. Dewey re: PALO VERDE COOLANT PUMP INQUIRY (1 page)
77.	2/8/84	Letter to L. Bernabei from L. S. Dewey re: HOT FUNCTIONAL TESTING (1 page)
78.	2/15/84	Letter to L. Bernabei from L. S. Dewey re: PALO VERDE COOLANT PUMP INQUIRY w/attachment (2 pages)
79.	2/2/84	Memo for R. J. Bosnak et. al. from G. W. Knighton re: EVALUATION OF REPORTS ON PALO VERDE THERMAL LINERS, THERMOWELLS AND CEA SHROUDS (2 pages)
80.	11/14/83	Memo for T. H. Novak from E. A. Licitra re: PALO VERDE COMPONENT TESTING w/attachment (4 pages)
81.	3/23/84	Letter to L. Bernabei from L. S. Dewey re: HANDOUT AT THE PALO VERDE MARCH 20, 1984 MEETING w/attachment (37 pages)

March 14, 1984
ANPP-29069 - ACR/WFQ

Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN-50-528/529/530
File: 84-056-026; G.1.01.10

Reference: Letter from E. E. Van Brunt, Jr., APS, to D. G. Knighton, NRC (ANPP-28939 WFQ/TFQ) dated February 24, 1984

Dear Mr. Knighton:

An updated preliminary description for the PVNGS Unit Reactor Coolant System Demonstration Test is attached for your information. This supercedes the preliminary description provided by the reference letter.

Please call if you have any questions on this matter.

Very truly yours,

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

EEVB/WFQ/wp
Attachment

cc: E. A. Licitra (w/a)
A. C. Gehr

March 14, 1984
ANPP-29069 - ACR/WFQ

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, A. Carter Rogers, represent that I am Nuclear Engineering Manager of Arizona Public Service Company, that the foregoing document has been signed by me for Edwin E. Van Brunt, Jr., Vice President, Nuclear, on behalf of Arizona Public Service Company with full authority so to do, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

A. Carter Rogers

Sworn to before me this 14th day of March, 1984.

Nora E. Meador
Notary Public

My Commission Expires:

My Commission Expires April 6, 1987

Rev. 1
2/29/84

REACTOR COOLANT SYSTEM DEMONSTRATION TEST

1.0 The primary objectives of the Reactor Coolant System Demonstration Test are as follows:

1.1 To verify the adequacy of the modification to the Upper Guide Structure (UGS).

1.2 To verify the adequacy of the modification to the four main Reactor Coolant Pumps.

1.3 To verify the adequacy of the redesign of the Reactor Coolant System Thermowells.

1.4 To measure and determine the Reactor Coolant System pump flow rates as follows:

1.4.1 Using Ultra Sonic flow measuring equipment

1.4.2 Using a high speed data logger (TDAS) to measure and record the RC pump delta pressures during coast down tests

1.5 To record, for baseline data, various Reactor Coolant Pump temperature, pressure and flows for all four RCP's on a continuous basis.

1.6 To record for baseline data on a continuous basis Reactor Coolant System and supporting plant system parameters. i.e.;

1.6.1 Nuclear Cooling Water temperatures

1.6.2 Nuclear Cooling Water flows

1.63 Seal injection flows

1.64 Seal injection temperatures

1.7 To collect data for a minimum of 200 hours of four (4) pump steady-state operation at a RCS temperature of 565 $\pm$ 5°F and 2250 $\pm$ 15 psia.

1.7.1 CE has determined through analysis of the Precritical Vibration Analysis Program (PVAF) data obtained from the Hot Functional testing that the primary forcing function frequency driving the UGS is approximately 14 Hz.

1.7.2 Per Nuclear Regulatory Guide 1.20 requirements - "to obtain sufficient vibratory cycles on all components" within the UGS at a forcing function frequency of 14 hertz then the time required equals:

$$\frac{10^7 \text{ cycles}}{50{,}400 \text{ cycles/hr @ 14Hz rate}}$$

= 198.4 hours.

2.0 Method to Obtain and Verify Objectives

2.1 Four major instrumentation test stations are being assembled to acquire and record data from both permanent plant instruments and temporarily installed instruments.

The permanent plant instruments will be used to provide baseline data on a continuous basis.

The temporary instrumentation will be used to verify the pump modifications, the UGS modifications and the thermowell redesign.

The temporary instruments can be categorized as follows:

2.1.1 Accelerometers

2.1.2 High Frequency Pressure transducers

2.1.3 Strain gauges

2.1.4 Ultra-sonic crystals

2.1.5 Suction pressure pressure transducers

2.2 Recording instrumentation

2.2.1 Thirteen 8 channel strip chart recorders

2.2.2 Five, 14 channel FM magnetic tape recorders

2.2.3 Micro-processor controlled data loggers

2.2.3.1 PERM DAS - Permanent Data Acquisition System

2.2.3.2 DART - Data Acquisition and Retrievable Terminal

2.2.3.3 TDAS - Temporary Data Acquisition System

2.3 Temporary Reactor Coolant System Pump Instruments

2.3.1 A tri-axial accelerometer mounted on the thrust bearing assembly on each of the four RCP's will monitor vibration/motion transferred from the pump/impeller through the pump shaft to the thrust bearing.

2.3.2 Three high frequency pressure transducers will measure the pressure pulses caused by the impeller vanes. Both frequency and amplitude of the pulses will be obtained and recorded:

These pressure pulse signals will also be routed to the UGS instrumentation test station so that the relationship between the pump pressure pulses and vibration and strain occurring within the UGS can be determined.

2.3.3 Three (3) tri-axial accelerometers, magnetically mounted on two of the cold legs and on Hot Leg 1 will measure pump induced vibrations of the RCS piping.

2.3.4 Four pressure transducers are being installed to measure the pump suction pressure for each of the Reactor Coolant pumps to verify adequate suction head pressure is present any time the pumps are in operation.

2.3.5 The Ultra-sonic crystals will be mounted on Hot Leg 1 and 2 to be used with the Ultra-sonic flow measuring equipment to determine the RCP flows for the system.

2.4 Thermowell Instrumentation

2.4.1 Three thermowells will have internally mounted bi-axial accelerometers to measure the motion of the thermowells caused by the pump pressure pulses. One of the thermowell outer nozzles will also have a bi-axial accelerometer to measure motion at the outer connector-head location to determine if any vibratory motion is being induced external to the RCS piping.

2.5 UGS Instrumentation

2.5.1 Nine bi-axial accelerometers are mounted in and on the tubes within the UGS to monitor vibration.

2.5.2 Seven high frequency pressure transducers are also mounted with the tubes to measure pressure pulses occurring in the tubes.

2.5.3 Eighteen (18) strain gauges are mounted on the tubing and webbing within the UGS - particularly in those areas where damage was found after the Hot Functional test.

3.0 Procedures

3.1 Controlling and Sequencing

3.1.1 The Reactor Coolant System Test Procedure 91HF-1RC17 has been written to control, sequence and coordinate data acquisition by the instrumentation test stations personnel and equipment as a fifty (50) test step sequence is performed to verify the test objectives and begin a 200 hour steady-state four pump run.

3.2 Implementing Procedures

3.2.1 Three implementing procedures have been written to provide a defined and controlled data acquisition system at each of the major test stations. These procedures are as follows:

3.2.1.1 UGS Modification Verification 91HF-1RC18

3.2.1.2 RCS Pump Data, Operating & Continuous Monitoring

3.2.1.3 Pre-Core RCS Flow Rate 91HF-1RC03, Rev. 1.

3.3 Pre and Post-test Inspection - RV.

3.3.1 The pre-inspection procedure will be a visual inspection with photographs. | 1

3.3.2 The post-test inspection will occur after the Demonstration Test has been completed and Reactor Vessel is disassembled. | 1

3.4 Post-test Inspection - Reactor Coolant Pump

3.4.1 At least one RCP will be disassembled and inspected for wear, damage, cracking, and cavitation effects after the RCS has been vented, cooled down, and drained.

4.0 Pre-Test Initial Conditions

4.1 The Pre-Core Hot Pump Test Controlling Document, 91HF-1ZZ05 will define and control operating support systems, valve line-ups and maneuver the plant to the pressure and temperature plateaus

required by the Reactor Coolant System Demonstration Test Procedure 91HF-1RC17. The Demonstration Test Director will control the Reactor Coolant pump starts, stops, and steady-state pump combinations required to reach the four pump 200 hour steady state run.

4.2 The initial temperature and pressure plateau is 150°F and 360-375 psia. This allows fill and vent, pressurizer bubble formation. | 1

| 1

5.0 Temperature and Pressure Bar-graph Explanation

5.1 there are seven (7) basic temperature steps denoted by the bar graph as follows:

5.1.1 150°F ± 5°F

5.1.2 200°F ± 5°F

5.1.3 260°F ± 5°F

5.1.4 360°F ± 5°F

5.1.5 500°F ± 5°F

5.1.6 550°F ± 5°F

5.1.7 565°F ± 5°F and 565°F ± 0.5°F

The 565°F ± 0.5°F is maintained during the ultrasonic flow measurements.

5.2 There are four (4) basic pressure plateaus denoted by the bar graph as follows:

5.2.1 360 - 375 psia

5.2.2 360 - 390 psia

5.2.3 1485 - 1515 psia

5.2.4 2235 - 2265 psia

5.3 Bar graph numbering

5.3.1 The numbers written above the bar graph plateaus such as 6- - - -16, 17 for temperature plateau 255 - 265°F (written below the bar) indicates those Test Sequences being performed in order at that temperature (and also pressure).

5.4 Test Step Summary (145-155°F, 360-375 psia)

5.4.1 Test Steps 1 - 5 will monitor the following:

5.4.1.1 Internal/External thermowell vibration

5.4.1.2 Pump vibration and shaft orbit data. | 1

5.4.1.3 RCS pipe motion

5.4.1.4 UGS vibration, pressure and strain

5.4.1.5 Pump pressure pulsations | 1

5.4.1.6 Pump suction pressure

5.4.2 Test Steps 6 - 17 (255 - 265°F, 360 - 375 psia)

5.4.2.1 Pump vibration and orbit data | 1

5.4.2.2 RCS pipe motion

5.4.2.3 UGS Vibration, pressure, and strain

5.4.2.4 Pump pressure pulsations | 1

5.4.2.5 Pump suction pressure

Various single, dual and three pump configurations are provided during these test sequences, including start, stop, and steady-state conditions.

5.4.3 Test Steps 17 - 19 (355 - 365°F, 360 - 390° psia)

5.4.3.1 Pump vibration and orbit data | 1

5.4.3.2 RCS pipe motion

5.4.3.3 Pump pressure pulsations | 1

5.4.3.4 Pump suction pressure

5.4.4 Test Steps 20 - 25 (495 - 505°FF, 1485 - 1515 psia)

5.4.4.1 Pump vibration and orbit data | 1

5.4.4.2 RCS pipe motion

5.4.4.3 Pump pressure pulsations | 1

5.4.4.4 Pump suction pressure

5.4.4.5 UGS vibration, pressure, strain

5.4.5 Test Steps 25 - 39 (545 - 555°F, 2235 - 2265° psia)

5.4.5.1 Pump vibration and orbit data | 1

5.4.5.2 RCS pipe motion

5.4.5.3 Pump pressure pulsations | 1

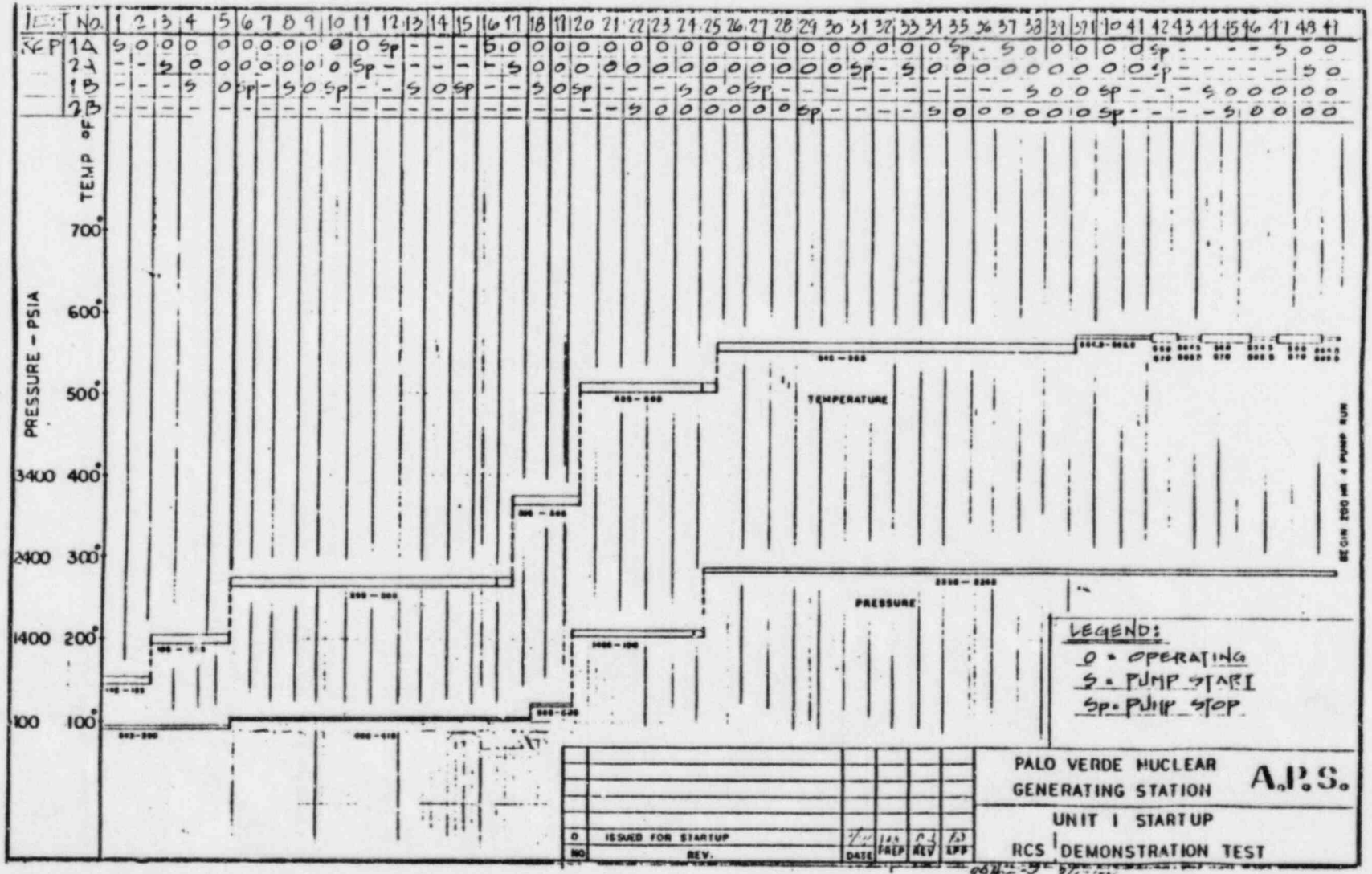
5.4.5.4 Pump suction pressure

5.4.5.5 UGS vibration, pressure, strain (UGS data completed at test step 39).

5.4.6 Test Steps 39-1 - 49 (560 - 570°F or 564.5 - 565.5°F @ 2235 - 2265° psia)

These test steps are primarily for determining the RCS combined flows using the Ultra-Sonic Flow Measuring equipment. Some of the Test Steps are used to maneuver the pump combinations for 4 - pump steady-state flow, no flow (all pumps off) and coast downs (RCP delta-pressure measurements) two pump combination. When flow data is being collected by ultra-sonics the temperature must be very stable. - This is the reason for the 565 $\pm$ 0.5°F tolerance.

5.4.7 After the successful completion of all test steps through and including 49, the RCS will begin the 200 hour 4 pump steady-state run. Data will continue to be taken on a once-per-shift basis; however, all test stations will be manned on a 24 hour continuous basis to monitor for any unsafe condition or any parameter trending towards an out-of-limit condition.


TEST NO.
RCP
1A
2A
1B
2B
TEMP °F
PRESSURE – PSIA
700°
600°
500°
400°
300°
200°
100°
3400
2400
1400
100
TEMPERATURE
PRESSURE
LEGEND:
O = OPERATING
S = PUMP START
Sp = PUMP STOP
0 ISSUED FOR STARTUP
NO REV.
DATE
PREP
REV
APP
PALO VERDE NUCLEAR GENERATING STATION
A.P.S.
UNIT 1 STARTUP
RCS DEMONSTRATION TEST

B-14

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

RECEIVED

(2)

FEB 27 1984

Docket Nos.: 50-528/529
and 50-530

Mr. E. E. Van Brunt, Jr.
Vice President - Nuclear Projects
Arizona Public Service Company
Post Office Box 21666
Phoenix, Arizona 85036

Dear Mr. Van Brunt:

Subject: Request for Additional Information - Palo Verde Reactor Coolant Pumps

By letter dated January 27, 1984, you provided an Interim Report relating to the evaluations of, and fixes for, the Palo Verde reactor coolant pump problems encountered during hot functional testing.

As a result of our review of this matter, we have determined the need for additional information in order to complete our assessment. The specific information needed is identified in the enclosed request.

We request that you provide responses to the enclosed questions and advise us within two weeks as to when the information will be provided.

If you have any questions regarding this request, you should contact Manny Licitra, the Licensing Project Manager.

Sincerely,

George W. Knighton

George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing

Enclosure:
As stated

cc: See next page

8403060429

3pp.

#2

Mr. E. E. Van Brunt, Jr.
Vice President - Nuclear Projects
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Phoenix, Arizona 85036

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Rosemead, California 91770

Ms. Margaret Walker
Deputy Director of Energy Programs
Economic Planning and Development Office
1700 West Washington
Phoenix, Arizona 85007

Mr. Rand L. Greenfield
Assistant Attorney General
Bataan Memorial Building
Santa Fe, New Mexico 87503

Resident Inspector Palo Verde/NPS
U.S. Nuclear Regulatory Commission
P. O. Box 21324
Phoenix, Arizona 85001

Ms. Patricia Lee Hourihan
6413 S. 26th Street
Phoenix, Arizona 85040

Regional Administrator - Region V
U. S. Nuclear Regulatory Commission
1450 Maria Lane
Suite 210
Walnut Creek, California 94596

Kenneth Berlin, Esq.
Winston & Strawn
Suite 500
2550 M Street, NW
Washington, DC 20037

Ms. Lynne Bernabei
Government Accountability Project
of the Institute for Policy
Studies
1901 Que Street, NW
Washington, DC 20009

Enclosure

Palo Verde Reactor Coolant Pump Questions

1. Testing of the Modified Pumps. Will the demonstration testing be of sufficient time to subject the parts which previously failed to an adequate number of fatigue cycles? Will the demonstration testing subject each pump to at least the maximum time at runout (maximum flow) which any pump saw during the original hot functional testing? In the verification testing of the pump design changes did the prototype pump see at least as much time at runout as the original design verification? How do you know that this is a sufficient time at runout to surface any problems in the design? Will the number of pump starts/stops in the demonstration testing be at least equal to those seen in the original hot functional testing?

2. Impeller Design Changes. In addition to tighter inspection of dimensions in the high stress area of the impeller blades, do you intend to increase the quality control and inspection of the impeller castings to control strength properties, inperfections in the castings, weld repairs, etc.? How was the impeller blade safety factor of 1.5 arrived at? Was this safety margin calculated with respect to the thinnest blade which failed? What safety margin exist at the thinnest blade dimensions allowed by the new inspection procedures? In Section 4.2.5 of the interim report, was the contribution of the reduction in impeller/diffuser blade passing loading 10% or 25% to the safety margin of 1.5? How was the effect of casting imperfections taken into account in the safety factor of 1.5?

3. KSB Model Testing. The interim report stated that KSB model tests showed a reduction of the potential for cavitation damage with the increased impeller vane to diffuser vane gap during operation at the low temperature runout flowrate condition. Is there a quantitative measure of this reduction? If so, what is it? Is some cavitation or cavitiation damage still expected to occur with the new design at these conditions? Were there any visual cavitation marks on the modified pump after testing at Newington?

4. CE-KSB Testing at Newington. Were the pressure pulsations from the pump discharge reduced by the design changes made to the pump? If so, by how much? Was the pulsation frequency changed? If so, by how much?

(3)

Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

February 15, 1984
ANPP-28883-BSK/TRB

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: Time Extension For Report - DER 83-61
A 50.55(e) Potentially Reportable Deficiency Relating To Unit 1 LPSI Pumps Failed To Start And Do Not Produce The Required Head.
File: 84-019-026; D.4.33.2

Reference: (A) Telephone conversation between P. Johnson and R. Tucker on September 14, 1983.
(B) ANPP-28001, dated October 13, 1983 (Interim Report)
(C) ANPP-28627, dated January 16, 1984 (Time Extension)

Dear Sir:

The NRC was notified of a potentially reportable deficiency in Reference (A), and an Interim Report was transmitted by Reference (B) and a Time Extension was requested by Reference (C). At that time, it was estimated that a Final Report would be available by February 23, 1984.

Due to the extensive investigation and evaluation required, it is now expected that this information will be finalized by April 17, 1984, at which time a complete report will be submitted.

There is no new information or change to the Interim Report at this time.

Very truly yours,

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

EEVB/TRB:db

cc: See Page Two

8402280981

#3

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

T. G. Woods, Jr.
W. E. Ide
D. B. Fasnacht
A. C. Rogers
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J. Vorees
J. R. Bynum
P. P. Klute
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G. A. Fiorelli
S. R. Frost
J. Self
D. Canady

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

(4)

Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

February 2, 1984
ANPP-28778-BSK/TRB

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 - DER 83-40
A 50.55(e) Reportable Condition Relating to Unit 1 LPSI And CS Pump Motors Have Defective Welds And Are Leaking Oil.
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between A. D'Angelo and R. Tucker on June 29, 1983.
B) ANPP-27396 dated July 25, 1983 (Interim Report)
C) ANPP-27962 dated October 5, 1983 (Time Extension)
D) ANPP-28363 dated December 6, 1983 (Time Extension)
E) ANPP-28559 dated January 5, 1984 (Time Extension)

Dear Sir:

Attached is our final written report of the Reportable Deficiency under 10CFR50.55(e), referenced above.

Very truly yours,

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

EEVB/TRB:db
Attachment

cc: See Page Two

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1984 FEB -9 AM 11:46

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#4

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

T. G. Woods, Jr.
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A. C. Rogers
B. S. Kaplan
J. Vorees
J. R. Bynum
P. P. Klute
A. C. Gehr
W. J. Stubblefield
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R. L. Patterson
R. W. Welcher
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Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, GA 30339

FINAL REPORT - DER 83-40
DEFICIENCY EVALUATION 50.55(e)
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

During preoperational testing it was determined that the Units 1, 2, and 3 Low Pressure Safety Injection (LPSI) and Containment Spray (CS) pump motors exhibited excessive bearing housing oil leakage. It was also determined that defective welds were found on Units 1 and 2 LPSI and CS pumps motor lower end brackets. The pumps are manufactured by Ingersoll-Rand (IR), driven by Westinghouse electric motors and supplied by Combustion Engineering (C-E) with the following project tag numbers:

1SIA-P01	2SIA-P01	3SIA-P01
1SIB-P01	2SIB-P01	3SIB-P01
1SIA-P03	2SIA-P03	3SIA-P03
1SIB-P03	2SIB-P03	3SIB-P03

II. Analysis of Safety Implications

The operability of the Low Pressure Safety Injection (LPSI) and Containment Spray (CS) pumps is essential to the safe operation of the plant.

C-E investigation of the reported condition have determined that the defective welds on the Unit 1 and 2 pump motor lower end brackets would impact the structural integrity of the pumps during a design basis event (DBE). C-E has determined that the lower bearing housing oil leakage may impair the operability of the Units 1, 2 and 3 pumps during their expected lifetime. C-E letters V-CE-20360, V-CE-18587 support this position.

Based on the above, the conditions are evaluated as reportable under the requirements of 10CFR50.55(e), since if the conditions were to remain uncorrected, they would represent safety significant conditions.

The PVNGS project also evaluates the condition to be reportable under the requirements of 10CFR Part 21. Deficiency Evaluation Report 83-40 addresses reporting requirements specified under 10CFR21.21(b) (3) with the exception of sub-part (vi) which requires the number and location of other possible defective equipment.

III. Corrective Action

C-E letter V-C-18997 outlines the following corrective actions which are being taken to preclude recurrence:

A. Inspection of Unit 3 LPSI and CS pumps by C-E has determined that the motor lower end brackets do not contain defective welds and are acceptable. The pumps are identified by the following tag numbers:

3SIA-P01	3SIA-P03
3SIB-P01	3SIB-P03

B. Inspection by C-E of the Unit 1 and 2 LPSI and CS pumps has determined that defective welds on the motor lower end brackets were unacceptable. New lower motor end brackets are being installed in accordance with Westinghouse Field Repair Procedure PXR-FM02. The pumps are identified by the following tag numbers:

1SIA-P01	2SIA-P01
1SIB-P01	2SIB-P01
1SIA-P03	2SIA-P03
1SIB-P03	2SIB-P03

C. C-E and Westinghouse determined that replacement of lower bearing housings on the Units 1, 2 and 3 LPSI and CS pumps with a new design housing was necessary. New housings are being installed in accordance with Westinghouse Field Repair Procedure PXR-FM02. The pumps are identified by the following tag numbers:

1SIA-P01	2SIA-P01	3SIA-P01
1SIB-P01	2SIB-P01	3SIB-P01
1SIA-P03	1SIA-P03	3SIA-P03
1SIB-P03	2SIB-P03	3SIB-P03

D. NCR's SM-2132 and SM-3028 will be dispositioned as "Repair" and refer to DER 83-40.

E. A copy of this report will be sent to C-E for their review and disposition under the requirements of 10CFR Part 21.

Data Sheet No.: _____

Appendix A
TI 2500/3
4/1/80

POTENTIALLY GENERIC ISSUE DATA SHEET

Facility Palo Verde Nuclear Generating Station Docket No. 50-528, 529, 530

Date of Event Feb. 2, 1984 Inspection (or other Report NA

1. Brief Description of Issue (Not required if included in supporting data)

Certain Ingersoll-Rand Pumps with Westinghouse Motors have defective welds on the pump motor brackets and have excessive oil leakage from the motor lower bearing housing. ~~The Palo Verde pumps were provided~~

2. How Found (If appropriate)

Licensee construction deficiency report dated February 2, 1984

3. Why Considered Potentially Generic (i.e. - reference applicable criteria or give reason)

See attached licensee report

4. V (Region) P. Narbut (Originator) T Young (Section Chief/~~Branch~~ Chief) _____

5. Other Region Reporting That The Problem Has Also Been Identified By Them

Region _____, Chief Reporting _____, Docket No. _____

6. Evaluation by IE:HQ

Bulletin [ ] Circular [ ] Information Notice [ ]

Other [ ] _____

No further action required [ ]

(5)

Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

January 27, 1984
ANPP-28734-BSK/KCP

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: Interim Report, Revision 1 - DER 83-50
A 50.55(e) Potentially Reportable Deficiency Relating to Reactor Coolant Pump Has Broken Impeller Blade
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between T. Young and R. Tucker on July 18, 1983
B) ANPP-27594, dated August 19, 1983 (Interim Report)
C) ANPP-28314, dated November 29, 1983 (Time Extension)

Dear Sir:

The NRC was notified of a potentially reportable deficiency in Reference (A), an Interim Report was transmitted by Reference (B), and a Time Extension requested by Reference (C). At that time, it was estimated that a Final Report would be available by January 27, 1984.

Due to the duplicaiton of information and reporting involved, DER 83-50 is being combined with and transferred to DER 83-49, in accordance with the revised Interim Report, attached, and as discussed with Mr. Paul Narbut of your office. It is expected that this information will be finalized in DER 83-49 by June 15, 1984, at which time a complete report will be submitted.

Very truly yours,

E E Van Brunt Jr.

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

EEVB/KCP:pt
Attachment

cc: See Page Two

8402130426

#5

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

T. G. Woods, Jr.
J. A. Roedel
D. B. Fasnacht
A. C. Rogers
B. S. Kaplan
W. E. Ide
J. Vorees
J. R. Bynum
P. P. Klute
A. C. Gehr
W. J. Stubblefield
W. G. Bingham
R. L. Patterson
R. W. Welcher
H. D. Foster
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G. A. Fiorelli
S. R. Frost
J. Self
D. Canady

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

File: DER 83-50

INTERIM REPORT - REVISION 1 - DER 83-50
POTENTIAL REPORTABLE DEFICIENCY
ARIZONA PUBLIC SERVICE COMPANY (APS)
PNVGS UNIT 1

I. Potential Problem

A. Two (2) blades had large pieces (6x4 and 8x10) missing. Missing pieces are believed to be in the RCP System.

B. There was a crack approximately ten inches (10") long on one impeller in the vicinity of the upper root area.

C. Damage to the diffuser wear ring.

D. Evidence of cavitation damage to five (5) blades of the diffuser.

II. Approach To and Status of Proposed Resolution

Bechtel Engineering is corresponding with CE to provide reportability disposition and technical justification for corrective action. The deficiencies identified in Section I were originally identified in NCR's SM-2597, SM-2599, SM-2402 and SM-2432. All previous Reactor Coolant Pump NCR's, including those listed above, have since been superseded by NCR's SM-2657, SM-2658, SM-2659 and SM-2660. These four (4) NCR's, and the corresponding corrective action, are being documented in DER 83-49. Therefore, to prevent duplicate reporting, DER 83-50 is being transferred to and combined with DER 83-49.

II. Projected Completion of Corrective Action and Submittal of the Final Report

Refer to the Interim Report, Revision 1, for DER 83-49.

(7)

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Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

1984 FEB -2 PM 1:36

REGION V

January 26, 1984
ANPP-28732-BSK/TRB

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 - DER 83-62
A 50.55(e) Reportable Condition Relating to Core Support Barrel Snubbers Have Loose Or Missing Cap Screw Retainer Pins
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Narbut and R. Tucker on September 19, 1983
B) ANPP-28073, dated October 24, 1983 (Interim Report)

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
ANPP Project Director

EEVB/TRB:ru

Attachment

cc: See Page Two

8402130391

#7

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

T. G. Woods, Jr.
W. E. Ide
D. B. Pasnacht
A. C. Rogers
B. S. Kaplan
J. Vorees
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Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, GA 30339

FINAL REPORT - DER 83-62
DEFICIENCY EVALUATION 50.55(e)
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNIT 1

I. Description of Deficiency

During inspection of the Unit 1 Reactor Vessel (RV) after hot functional testing, it was revealed that the Core Support Barrel (CSB) snubbers had loose or missing cap retained pins. The snubber locations were identified as 0 degree azimuth, 50 degree azimuth and 180 degree azimuth. The core barrel snubbers are supplied by Combustion Engineering (C-E)

II. Analysis of Safety Implications

C-E letter V-CE-19266 addresses the analysis of safety implications as follows:

> The design of the Core Support Barrel Snubber lug requires that the reactor vessel lug shims be removable to accommodate field sizing and machining operations. The resulting bolted connection incorporates a torquing arrangement to ensure a tight shim assembly during plant operation. A final torque of 275 ft-lbs is applied to each snubber attachment bolt to accomplish this purpose. To further assure that the bolts remain in place, staking pins are inserted to prevent rotation of the bolts. They are secured by upsetting material above the pin in the slot cut in the snubber shim for pin insertion. Finally, the shims, pins and bolts are captured in the assembly by the RV snubber lug and the CSB bracket geometry.
>
> Following the hot functional testing of ANPP Unit 1, two staking pins were found to be missing. Also, several of the other pins were discovered to be loose in their holes. It is not known when the two pins became lost; they were photographed in place one week prior to installation of the core support barrel into the vessel. One possibility is that hot functional testing vibratory loads contributed to their becoming loose, allowing them to be lost during CSB disassembly operations. They cannot become lost once the CSB is in place.

If the pins are not present during plant operation the bolts are still expected to retain their applied torque due to the fact that anticipated vibratory loads are too small to affect the bolt preload. Other factors such as the bolt length to diameter relationship and the direction of the vibratory loads work to reinforce the retention of bolt preload. In essence, for the bolts to work loose, vibratory loads must change the original preload and this is not expected.

However, in the unlikely event that the bolt loses its preload, the shim will be retained by the close tolerance of .015" maximum between shim and bracket surfaces and also by the geometry of the bracket. The shim is physically held in place with or without the bolts being tight. C-E concludes that with the shim held in place, it provides the support required during a Design Basis Event. Therefore, the safety of operation would not be adversely impacted.

Based on the above, this condition is evaluated as not reportable under the requirements of 10CFR50.55(e) and 10CFR21, since if this condition were to remain uncorrected, it would not represent a significant safety condition.

III. Corrective Action

C-E has defined the corrective action as follows:

A. A field retrofit has been initiated to replace the lost pins and to check all staking pins and pin holes to determine whether or not drawing tolerances have been met. For closer control longer staking pins and smaller gap at the top of the pin has been stipulated in the field retrofit. Meeting all installation requirements will assure that the pins are properly located prior to installing the Core Support Barrel.

B. NCR SM-2578 will be dispositioned as "Repair" in accordance with C-E field retrofit instructions above.

C. C-E will issue site process sheets to perform inspections on Units 2 & 3 to ensure all staking pins are properly installed.

(8)

Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

January 20, 1984
ANPP-28654-BSK/KCP

See Separate Folder

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: Interim Report, Revision 1 - DER 83-57
A 50.55(e) Potentially Reportable Deficiency Relating to
Cracks In The Control Element Assembly Shroud
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between P. Johnson and R. Tucker on July 29, 1983
B) ANPP-27598, dated August 19, 1983 (Interim Report)
C) ANPP-28093, dated October 26, 1983 (Time Extension)

Dear Sir:

The NRC was notified of a potentially reportable deficiency in Reference (A), an Interim Report was transmitted by Reference (B), and a Time Extension was requested by Reference (C). At that time, it was estimated that a Final Report would be available by March 9, 1984.

Due to the extensive investigation and evaluation required, a revised Interim Report is attached. It is now expected that this information will be finalized by June 15, 1984, at which time a complete report will be submitted.

Very truly yours,

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

EEVB/KCP:ru
Attachment:
CE Doc. No. CEN-267(V)-P,
Proprietary Copy # 1

cc: See Page Two

8402030216

#8

CE Doc. No. CEN-267(V)-P
Proprietary Copies

cc:

Richard DeYoung, Director Office of Inspection and Enforcement U. S. Nuclear Regulatory Commission Washington, D. C. 20555	# 2
T. G. Woods, Jr.	# 3
J. A. Roedel	☆
D. B. Fasnacht	*
A. C. Rogers	*
B. S. Kaplan	*
W. E. Ide	*
J. Vorees	*
J. R. Bynum	*
P. P. Klute	*
A. C. Gehr	# 4
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W. G. Bingham	# 6
R. L. Patterson	# 7
R. W. Welcher	# 8
H. Foster	# 9
D. R. Hawkinson	# 10
L. E. Vorderbrueggen	# 11
G. A. Fiorelli	# 12
S. R. Frost	*
J. Self	*
D. Canady	*
Records Center Institute of Nuclear Power Operations 1100 Circle 75 Parkway, Suite 1500 Atlanta, GA 30339	*
Mr. E. Licitra, Project Manager U. S. Nuclear Regulatory Commission Phillips Building 7920 Norfolk Avenue Bethesda, Maryland 20814	# 13 through 37
File: DER 83-57	# 38

* Non-Proprietary Copy Attached

INTERIM REPORT - REVISION 1 - DER 83-57
POTENTIAL REPORTABLE DEFICIENCY
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNIT 1

I. Potential Problem

Post Hot Functional Inspection of the Unit 1 Reactor Vessel revealed the following defects/discrepancies:

A. Cracks in the control element assembly (CEA) shroud sub-assemblies.

B. Chatter marks evident around the top of the support flange.

C. CEA shroud assembly appears to be shifted slightly out of position.

D. One (1) CEA guide is bowed out of shape and pressed against the shroud wall.

E. Fine layer of metal particles evident over top of the support flange.

II. Approach to and Status of Proposed Resolution

Bechtel Engineering is corresponding with C-E, to provide a reportability disposition and technical justification for corrective action. The C-E Interim Report, "Performance Evaluation of the Palo Verde Control Element Assembly Shroud", is attached, and provides a description of the problem, inspections, tests and analyses performed to date, and corrective actions.

III. Projected Completion of Corrective Action and Submittal of the Final Report

Evaluation of this condition and submittal of the Final Report is forecast to be completed by June 15, 1984.

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex 99297

C-E POWER SYSTEMS

January 19, 1984
V-CE-19614

Mr. E. E. Van Brunt, Jr.
Arizona Nuclear Power Project
P.O. Box 21666
Phoenix, Arizona 85036

Subject: 10 CFR 50.55(e) Report on the CEA Shroud

Dear Mr. Van Brunt:

Enclosed for your submittal to the Nuclear Regulatory Commission is the interim 10 CFR 50.55(e) report on the Control Element Assembly (CEA) shroud along with the proprietary affidavit. Copies 1 through 25 of the proprietary report are intended for submittal to the NRC. Copies 26 through 43 are provided for APS use. In addition 15 copies of the non-proprietary version are also enclosed. This report is an "interim" report and is considered complete to date. Upon completion of the remaining tests and analysis of data a final report will be submitted for your comments and subsequent submission to the NRC.

Very truly yours,

C. Ferguson
Project Manager

CF/TJC:tmr
Enclosure
cc: Messrs:
G. C. Andognini w/Copy 44
J. Vorees
W. H. Wilson
W. G. Bingham w/Copy 45
R. H. Holm
J. W. Dilk
G. A. Butterworth
S. N. Mager
D. B. Amerine w/Copy 46
W. L. MacDonald
J. R. Bynum

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

Combustion Engineering, Inc.)
State of Connecticut)
County of Hartford) SS.:

I, A. E. Scherer, depose and say that I am the Director, Nuclear Licensing, of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations and in conjunction with the construction permit of Arizona Public Service, for withholding this information.

The information for which proprietary treatment is sought is contained in the following document:

CEN-267(V)-P, Interim Report on the Performance Evaluation of the Palo Verde Control Element Assembly Shroud, January, 1984.

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Combustion Engineering in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The information sought to be withheld from public disclosure are the experimental data from the Palo Verde 1 Comprehensive Vibration Assessment Program (CVAP) and other associated laboratory tests, detailed design data, and analytical results for the Control Element Assembly (CEA) shroud, which is owned and has been held in confidence by Combustion Engineering.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a substantial competitive advantage to Combustion Engineering.

3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F.M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject document herein are proprietary.

4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.

5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:

a. A similar product is manufactured and sold by major pressurized water reactor competitors of Combustion Engineering.

b. Development of this information by C-E required thousands of manhours of effort and hundreds of thousands of dollars. To the best of my knowledge and belief a competitor would have to undergo similar expense in generating equivalent information.

c. In order to acquire such information, a competitor would also require considerable time and inconvenience related to the detailed design, testing, and analysis for the Control Element Assembly shroud.

d. The information required significant effort and expense to obtain the licensing approvals necessary for application of the information. Avoidance of this expense would decrease a competitor's cost in applying the information and marketing the product to which the information is applicable.

e. The information consists of experiemental data and the associated laboratory tests, detailed design data, and analytical results for vibration testing of the Control Element Assembly (CEA) shroud at Palo Verde 1, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

f. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of Combustion Engineering's competitors to utilize such information

without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.

g. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with their technology development. In addition, disclosure would have an adverse economic impact on Combustion Engineering's potential for obtaining or maintaining foreign licensees.

Further the deponent sayeth not.

A. E. Scherer
Director
Nuclear Licensing

Sworn to before me
this 19th day of January, 1984

Theresa Regan
Notary Public