

# Arizona Public Service Company

August 29, 1984  
ANPP-30377-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 83-81  
A 50.55(e) Reportable Condition Relating to Schedule 160 SS  
Pipe From Gulfalloy Contains A Manufacturing Defect.  
File: 84-019-026; D.4.33.2

Reference: A) Telephone Conversation between J. Eckhardt and K. Parrish  
on November 28, 1983  
B) ANPP-28473, dated December 20, 1983 (Interim Report)  
C) ANPP-28917, dated February 22, 1984 (Time Extension)  
D) ANPP-29282, dated April 12, 1984 (Time Extension)  
E) ANPP-29625, dated May 31, 1984 (Time Extension)  
F) ANPP-30059, dated July 27, 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

EEVB/TRB/nj

Attachment

cc: See Page Two

8409170340 840829  
PDR ADOCK 05000528  
S PDR

IE-27

Mr. T. W. Bishop  
DER 83-81  
Page Two

cc: Richard DeYoung, Director  
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U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

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FINAL REPORT - DER 83-81  
DEFICIENCY EVALUATION 50.55(e)  
ARIZONA PUBLIC SERVICE COMPANY (APS)  
PVNGS UNITS 1, 2, 3

I. Description of Deficiency

A. During jobsite fabrication in the pipe fabrication shop, approximately twenty feet of 3-inch schedule 160 stainless steel (SA376) pipe (manufactured by Babcock & Wilcox) was found to contain manufacturing defects along the length of the pipe which violate the minimum wall thickness requirements. The required nominal wall thickness is 0.438" and the required minimum wall thickness is 0.383". Actual measurements revealed deficient areas where the wall thickness was 0.374" to 0.376". This nonconforming condition was documented on NCR PY-7257.

An additional ultrasonic test (UT) was performed on the entire spool piece except for areas where tags or taping prohibited examination. This test revealed deficient areas where the wall thickness measured from 0.370" to 0.382".

A field investigation of the material procurement revealed that B & W fabricated only three 3" diameter spools, each approximately 22-feet long from Heat #M6233. These spools were sold to Hub, Inc. and then sold to Gulfalloy, Inc. BPC bought these three spools from Gulfalloy, Inc. No other 3" Schedule 160 pipe has been ordered for PVNGS by BPC.

B. An investigation to locate and test (UT) other pipe with the same heat number (#M6233) revealed the following:

Item No.	Unit	Installation Document	Length	Measured Minimum Wall	Acceptable?	Deficiency Documented With
1	1	PC2567	1'-9"	0.400"	Yes	N/A
2	1	PC3306	0'-8"	0.415"	Yes	N/A
3	1	PC6208	0'-6-5/8"	0.395"	Yes	N/A
4	2	PC6394	0'-9"	0.412"	Yes	N/A
5	2	PC7259	0'-8-3/4"	0.396"	Yes	N/A
6	2	MCN33124	0'-5-1/2"	0.235"	No	NCR PA7416
7	3	PC6054	1'-7-3/8"	0.196"	No	NCR PC7261
8	3	MCN55464	2'-0-3/8"	0.399"	Yes	N/A
9	3	MCN55195	2'-9"	0.234"	No	NCR PC7415
10	3	MCN55538	1'-1"	0.203"	No	Installation not accepted - piece was cut out
11	Fab Shop	--	1'-6"	0.196"	No	Not installed
12	Laydown	N/A	22'-1-1/2"	0.409"	Yes	Not installed
13	Fab Shop	--	19'-10"	0.360"	No	NCR PY7257

The wall thicknesses were measured using the longitudinal wave method UT. Construction uses this method to determine the quality of a circumferential weld. However, the use of this method by the pipe manufacturer is not required by the ASME Code. Instead, the pipe manufacturer uses the shear wave method UT to determine the quality of its pipe.

The use of the shear wave method prevents identification of "inclusions." Inclusions (laminations, dissimilar metals, or "voids" within the wall thickness) are inherent anomalies which are acquired during pipe manufacturing.

A sample of the Item 10 piece was evaluated by Bechtel Materials and Quality Services Department (M&QS). An inclusion was identified and confirmed to be of the lamination type. This inclusion resulted in the minimum wall thickness reading obtained using the longitudinal wave method.

The pipe from heat number M6233 not accounted for in the above tabulation is attributed to scrap created during fabrication of the various spool pieces.

## II. Analysis of Safety Implications

The condition of Item No. 13 is evaluated as not reportable under the requirements of 10CRF50.55(e). A calculation (13-P-ZZ-584) by Bechtel Engineering indicates an acceptable minimum wall for this particular application may be as low as 0.350"; therefore, if this pipe were to be installed, it would be acceptable. If the condition had remained undetected it would not represent a safety significant condition.

The condition of Items 6, 7, 9, 10, and 11 is also evaluated as not reportable. The indication of minimum wall violations were a result of inclusions identified using the longitudinal wave method. The ASME III Code does not specify inclusions by themselves as grounds for rejection without additional physical tests. The wall thickness of these pieces of pipe was physically measured using a micrometer. The measurements revealed that these pipes have actual acceptable wall thicknesses.

III. Corrective Action

- A. NCR PY-7257 was dispositioned to return the pipe to the vendor for replacement. The pipe was returned to the pipe manufacturer for testing in May, 1984. The testing confirmed that the 19'-10" piece of pipe had an actual minimum wall reading of 0.360". This wall thickness is below the minimum requirements of 0.383" and therefore is considered rejectable by the manufacturer.
- B. NCRs PA-7416, PC-7261, and PC-7415 were dispositioned to replace the piping which is believed to contain inclusions and was assumed to be unacceptable. This pipe will be utilized only after a thorough ultrasonic test is performed on it to determine its acceptability.
- C. Uninstalled 3" Schedule 160 S.S. piping with heat number M6233 will be utilized only after a thorough ultrasonic test is performed on it to verify its acceptability.
- D. The Surveillance Inspection Plan for Specification No. 13-PM-307 was upgraded in Rev. 1, dated 4/27/84, to require 100% witnessing of the NDE examinations on all pipe and fittings prior to shipment to jobsite.
- E. A copy of this report will be provided to Gulfalloy, Inc. for information only.