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 STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530
 AUTH. NAME: AUTHOR AFFILIATION
 VAN BRUNT, E.E. Arizona Public Service Co.
 RECIP. NAME: RECIPIENT AFFILIATION

MA/1

SUBJECT: Final deficiency report failure of vertical fire dampers to close. Investigation of closure problem determined that design tolerances not maintained between frame & damper slide. Deficient frame & damper blade will be replaced.

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NOTES: Standardized Plant. 05000528
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ARIZONA



PUBLIC SERVICE COMPANY

P. O. BOX 21666 • PHOENIX, ARIZONA 85036

September 15, 1980
ANPP-16357-BSK/JAR

U. S. Nuclear Regulatory Commission
Region V

Walnut Creek Plaza - Suite 202
1990 North California Boulevard
Walnut Creek, California 94596

Attention: Mr. G. S. Spencer, Chief
Reactor Construction and
Engineering Support Branch.

Subject: A 50.55(e) Reportable Condition Relating to Operability
Failure of Vertical Fire Dampers
Final Report
File: 80-019-026

Reference: (1) Telephone Conversation between J. Eckhardt and
J. E. Cook on July 23, 1980 (DER 80-9)
(2) Letter ANPP-15814, dated July 3, 1980
(Interim Report)

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 Projects
ANPP Project Director

EEVBJr/BSK:skc

Attachment

8009230653

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U. S. Nuclear Regulatory Commission
Attention: Mr. G. S. Spencer, Chief
ANPP-16357-BSK/JAR
September 15, 1980
Page 2

cc: Victor Stello, Jr., Director
~~Office of Inspection and Enforcement~~
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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FINAL REPORT
REPORTABLE DEFICIENCY 50.55(e)
ARIZONA PUBLIC SERVICE COMPANY (APS)
PVNGS UNITS #1, #2 AND #3

I. Description of Deficiency

Ruskin Fire Dampers, which are being purchased by the HVAC subcontractor The Waldinger Corporation, were modified in accordance with two (2) Part 21 Reports applying two different design modifications (#6 screw and spring clip addition). During cyclic testing, to verify these design modifications, some of the fire dampers failed to close. This failure was not related to the above design modifications.

The investigation of the closure problem determined that design tolerances were not maintained between the frame and the damper slide. Consequently, any minor distortion of the sheet metal slides on the fire damper sleeves will prevent proper closure of the damper blade assembly.

II. Analysis of Safety Implications

This condition is considered to be reportable based on these considerations.

1. Failure of the isolation fire damper could possibly result in loss of the fire barrier, and the loss of a safety-related or redundant system.
2. This condition required an extensive evaluation and repair procedure, and has resulted in the supplier modifying the product.

III. Corrective Action

The corrective action taken by the HVAC subcontractor, Waldinger, is summarized in the attached Waldinger letter, F-TWC-BPC-80-173, dated August 27, 1980. All of the fire dampers delivered, completely installed and not installed were cycled for operability. Those which did not meet the required tolerance between the frame and damper blade necessary to assure proper closing are being replaced. In addition, to assure that this tolerance is maintained during all phases of installation, Ruskin Manufacturing Company added a 10-gauge channel stiffener between the sleeve ...

and damper blade assembly to all new fire dampers that are over 12 inches high. All replacement and future dampers for PVNGS will have this modification. Waldinger will verify this channel modification during receipt inspection which will be performed to the revised Ruskin Drawings 5670 and 5672.



THE WALDINGER CORPORATION

P.O. Box 215 / Buckeye, Arizona 85326 / 602/386-5626

August 27, 1980
F-TWC-BPC-80-173

Bechtel Power Corporation
P. O. Box 49
Palo Verde, AZ 85343

Attention: Field Construction Manager

Reference: Palo Verde Nuclear Generating Station
Subcontract No. 10407-13-MM-598-HVAC
(1). NCR - 287
(2). NCR - 289
(3). NCR - 319

Subject: Fire Dampers

Gentlemen:

Please find attached a summary of the steps taken by Waldinger and their damper subcontractor, Ruskin Manufacturing Company to successfully correct the defective function of the fire dampers defined on referenced NCR's.

All of the fire dampers were cycle tested and those that did not meet the tolerance requirements necessary to ensure operability will be replaced.

Please advise of any questions.

Very truly yours,

THE WALDINGER CORPORATION

J. A. Ciminski
Project Manager
Palo Verde Nuclear Generating Station

JAC:RHJ:mmf

Attachment

cc: M. Shanken

August 27, 1980

FIRE DAMPER CORRECTION

Cause:

Some of the Ruskin fire dampers failed to pass a functional cycling test performed by Bechtel's HVAC subcontractor, The Waldinger Corporation.

It was found that design tolerances were not maintained between the frame and the blade. As a result, minor distortion of the sheet metal sides on the fire damper sleeves prevented proper closure of the damper blade assembly.

Corrective Action:

The Waldinger Corporation issued NCR 287 for Ruskin's design fix (spring clip additon) to the spring bracket on vertical fire dampers. Of the 109 dampers repaired per Ruskin Field Rework Plan 0021A, there were 8 dampers that failed to cycle.

The Waldinger Corporation issued NCR 289 for further testing of vertical fire dampers to check operability. Of the 41 dampers cycled in accordance with NCR 287, there were 2 dampers that failed to cycle. NCR 319 superceded NCR 289 for evaluation of the operability of the fire dampers.

A random sampling of 32 vertical fire dampers was made by The Waldinger Corporation, checking the allowable tolerance between damper frame and damper blade per Ruskin Field Statistical Inspection Plan WP 0021B. There were 5 fire dampers that exceeded the maximum allowable tolerance.

The Waldinger Corporation then issued NCR 319 for testing all remaining vertical and horizontal dampers in accordance with Ruskin Field Inspection Plan No. WP 0021B Revision 1. This plan included: (1) Releasing blade package to closed position by cutting S-hook; (2) After closing, move blades to one side of frame; (3) Measuring gap between frame and blade at top, middle and bottom; (4) Allowable tolerance between frame and blade is 1/8" minimum to 7/16" maximum; (5) Dampers not closing or not within tolerances are tagged reject. Of the 270 vertical fire dampers inspected per this test plan, 39 failed. Of the 46 horizontal fire dampers inspected, 9 failed (316 inspected, 48 total failed).

To summarize totally, 280 vertical and 46 horizontal fire dampers were tested. There were 49 vertical and 9 horizontal fire dampers that failed the test criteria. The test criteria consisted of cycling the blades followed by a clearance measurement between the frame and the blade. A total of 56 were scrapped and will be replaced with functional dampers. Two 48" diameter horizontal fire dampers were reworked in accordance with Ruskin Field Rework Plan 0021C.

Ruskin is 100% assured of the operability of the 231 vertical and 37 horizontal fire dampers that were successfully tested per Ruskin Plan No. 0021B Revision 1.

Ruskin has improved the design of the fire dampers for sleeved fire dampers that are over 12 inches high. Ruskin added a 10 gauge channel stiffener between the sleeve and the damper blade assembly (reference Ruskin drawings 5670 and 5672). Each new damper with this new fix will be cycled by Ruskin and checked to assure a clearance of 1/8" to 7/16" between the blade and the frame.

All fire dampers received at the jobsite will be cycled and checked for gap tolerances between the frame and blade to ensure operability.

JAC:RHJ:mmf