



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

FEB 9 1985

MEMORANDUM FOR:

Olan Parr, Branch Chief
Division of Systems Integration
Auxiliary Systems Branch

Victor Benaroya, Chief
Chemical Engineering Branch
Division of Engineering

FROM:

Gary M. Holahan, Chief
Operators Reactor Assessment Branch
Division of Licensing

SUBJECT:

FIRE DAMPERS FAILURE TO CLOSE

Enclosed for your information and use in your licensing reviews, are a January 17, 1985 event report and a Part 21 report on fire dampers manufactured by Ruskin Manufacturing. Following an inspection scheduled for mid-February, I&E will consider the issuance of an IE notice. If you have questions regarding this material, please contact Daniele Tarnoff/ORAB extension 29526.

Gary M. Holahan, Chief
Operators Reactor Assessment Branch
Division of Licensing

cc: R. Clark
C. Stahl
T. Kenyon
R. Buckley
~~E. Licitra~~
D. McDonald
K. Heitner
H. Shierling
D. Wagner
B. Siegel
D. Hood
A. Bournia
J. Wilson
R. Bevan
J. Stefano
M. Campagnone
G. Vissing
R. Hernan
E. Weinkam

V. Rooney
S. Burwell
M. Slosson
D. Wigginton
K. Jabbour
D. Osborne
J. Shea
M. Thadani
L. Olshan
J. Stevens
E. Reeves
V. Nerses
P. O'Connor
A. DiAgazio
J. Norris
H. Nicolaras
R. Auluck
G. Rivenbark
B. Baer

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PRIORITY ATTENTION REQUIRED

MORNING REPORT - REGION I

PRIORITY ATTENTION REQUIRED

1/17/85

TO : James Blaha, Director, Program Support and Analysis Staff
FROM: Thomas E. Murley, Regional Administrator, Region I

| Licensee/Facility | Notification/Subject | Description of Items or Events |
|---------------------------------|---|---|
| Calvert Cliffs Unit 1 50-317 | 1/16 RRI fax | At 4:42 p.m., 1/16, after performing surveillance testing for check valve operability required by the tech specs the licensee initiated a controlled shutdown of Unit 1 after discovering in-leakage into B11A Safety Injection Tank (SIT) when the High Pressure Safety Injection (HPSI) system is operating. The leakage path was identified to be 38 gpm reverse flow through the SIT discharge check valve. In accordance with their emergency plan the licensee declared an Unusual Event due to TS required shutdown. The HPSI system was declared inoperable due to potential insufficient flow rate to the RCS as a result of the identified leakage to the SIT. The licensee plans to proceed to Mode 4 (hot shutdown) to repair the valve. Main Steam Isolation Valve testing will also be performed to demonstrate MSIV reliability as a result of previous repairs to the MSIV hydraulic actuating system. The licensee made appropriate notifications for the unusual event. |
| Beaver Valley Unit 1 50-334 | 1/17 RRI fax/ Reactor Trip and Safety Injection | A reactor trip and safety injection occurred at 3:28 p.m., 1/16. With the reactor operating at 95% power, the breaker to Vital Bus No. 3 malfunctioned and tripped open. This resulted in the feedwater regulating valves going full open, causing a shrink of steam generator level. When operators took manual control of the feed system and closed the feed-reg valves, a feed flow-steam flow mismatch resulted and a reactor trip occurred. The safety injection resulted from a low steam line pressure signal and pumped approximately 1500 gallons of borated water into the reactor. Due to the safety injection an Unusual Event was declared at 6:15 p.m. and was terminated at 6:30 p.m. The breaker was replaced and the reactor restarted at about 7:05 a.m., 1/17. Resident inspectors are following up on the post-trip review. |
| Millstone Unit 3 50-423 | Potential Significant Construction Deficiency | The licensee reported that fire dampers manufactured by Air Balance and by Ruskin Mfg. failed to close during testing. These are non-motor-operated curtain type dampers used in category I HVAC systems (CDR 85-00-03). |

MORNING REPORT - REGION II
DATE: January 17, 1985

| LICENSEE/FACILITY | NOTIFICATION/SUBJECT | DESCRIPTION OF ITEM OR EVENT |
|------------------------------|---|--|
| Browns Ferry 1 DN: 50-259 | HQS Duty Officer, 1/16 and RI Telecom | At 2:40 (CST) the reactor tripped from 100% power on vessel low water. The main steam line isolation valves closed, HPCI and RCIC initiated, and two SRV's were manually opened for 15-20 seconds to control pressure. One SRV failed to close until the hand switch was cycled several times, HPCI injected and tripped on high water level. RCIC tripped on overspeed. Cause of the reactor trip was initially thought to be a failure of the master feedwater controller but a bench test found no problem with the controller. Region II is monitoring the licensee actions. |

Draft

3/7/86

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|--|---------------------------------|---------------------------------|
| Report Number: 999007/6/85-01 | Inspection Dates: 2/11-14/85 | Inspection ON Site hours: 52 |
| Correspondence Address: Ruskin Manufacturing Company ATTN: Mr. Richard Yarges Quality Assurance Manager Box 129 3900 Dr. Greaves Road Grandview, Missouri 64030 | | |
| Organizational Contact: Mr. Richard Yarges, QA Mgr. Telephone Number: (816) 761-7476 | | |
| Principal Product: Air Handling Components Nuclear Industry Activity: Approximately 6% | | |
| Assigned Inspector J.J. Petrosino, Reactive Inspection Section (RIS) | | |
| Other Inspector E.L. Burns, Brookhaven National Laboratory | | |
| Approved by: E.W. Merschhoff, Chief, RIS, VBB. | | |
| Inspection Bases and Scope: A.) Base: 10 CFR part 21 B.) Scope: 1.) Review circumstances concerning part 21 Fire Dampers failing to close under air flow 2.) Obtain information regarding Electro- Thermal Link (ETL) problem 3.) Obtain information for NRC evaluations of HVAC component & generic issues and functionability. | | |
| Plant Site Applicability: | | |

IE 204-6, 16 pp

(5.)

A.) Inspection Issues:

- 1.) Interlocking Blade Fire Dampers, failing to close under normal duct pressure
- 2.) Failure of Electro-Thermal Links (ETL), to function as designed, resulting in loss of fire damper closure capability.

B.) Inspection Findings:

- 1.) RMC has adequately notified all of their affected purchasers in regard to Fire Dampers failing to close under normal duct pressure. Additionally, RMC recommended testing of their Interlocking Blade Fire Dampers (IBFD), to verify proper operation.
- 2.) R.M.C. did not produce documents to assure that recent design modifications for horizontal Fire dampers at Palo Verde G.S. were subject to design control measures, prior to modification, commensurate with those applied to the original design for functional life, performance and seismic qualifications. implementation
- 3.) Two Additional deficiencies were identified that appear to be potentially generic to Fire dampers, and have resulted in loss of Fire Damper closure capability at Watts Bar and Palo Verde Generating Stations.

Ruskin

99900716/85-01

Plant Site Applicability:

Arkansas One (50-313), Beaver Valley 1&2 (50-334/412),
Bellevue 1&2 (50-438/439), Brainwood 1&2 (50-456/457),
Browns Ferry 1,2&3 (50-259/260/296), Byron 1&2 (50-____),
Callaway 1&2 (50-483/486), Catawba 1&2 (50-413/414),
Clinton #1 (50-461), Comanche Peak 1&2 (50-445/446),
DC Cook 1&2 (50-315/316), Davis Besse (50-346),
Diablo Canyon 1&2 (50-275/323), Duane Arnold (50-331),
Farley 1&2 (50-348/364), Hape Creek (50-354),
EI Hatch 1&2 (50-321/366), Indian Point #3 (50-286),
LaSalle 1&2 (50-373/374), Maine Yankee (50-309),
McGuire 1&2 (50-369/370), Millstone #3 (50-423),
Monticello (50-263), Oconee 1,2&3 (50-269/270/287),
Palo Verde 1,2&3 (50-528/529/530), Perry #1 (50-440),
Quad Cities 1&2 (50-254/265), River Bend (50-458),
Sequoyah 1&2 (50-327/328), South Texas 1&2 (50-498/499),
Susquehanna 1&2 (50-387/388), Turkey Point 3&4 (50-250/251),
Watts Bar #2 (50-390/391), Waterford #3 (50-382),
WPPSS 1&2 (50-397/460), Wolf Creek (50-482),
and Zion 1&2 (50-295/304)

64 Total Plants

C.) Supplemental Information:

- 1.) The RMC was notified by Ruskin Manufacturing Company, (RMC), Grandview, Missouri 64030, by letter on November 6, 1984, of an equipment deficiency with their curtain type, Interlocking Black Fire Dampers, (IBFD). The IBFD's are utilized to block air flow in Heating, Ventilation, Air Conditioning, (HVAC), system during a fire or smoke event.

RMC manufactures IBFD's at their Parsons Kansas facility, and affected Model numbers are NIBD23, IBD23, and IBD21.

The Waldinger Corporation, (TWC), Buckeye, Arizona, notified RMC of the deficiency, by letter, dated August 3, 1984. TWC identified seven (7) dampers that failed to cycle during an Arizona Public Service, (APS), system startup test. TWC is the HVAC installation contractor for Bechtel Power Corp. who is the Architect-Engineer for APS.

RMC, stated in their November 6, 1984 letter, stated in part "... The test methods used originally utilized to test dampers under flow may not... depict actual installed conditions... Ruskin recommends that fire dampers supplied with choke springs, which require choke under air flow conditions, be tested to verify proper operation...", and "... is currently researching

C.) ... methods to modify fire dampers to ensure closure under air flow ..."

see #2 on page 5 first

4.) TVA/Watts Bar Nuclear Station identified 14 out of 47 ~~Electro~~ Electro-Thermal Links (ETL's), during a fire detection system test on November 20, 1984 that "failed to function as designed..."

and, resulting in a loss of fire damper closure capability.

Subsequently, all links were replaced after the initial failure and, subsequently, two failed to operate during the second test. Electrical resistance readings were taken on the two that failed and both ~~then~~ were replaced for a third test which was satisfactory. Interim corrective action is to verify an electrical resistance reading between 10-30 ohms prior to installation of the ETL's as recommended by the manufacturer, S.R. Products Inc, Mendonhall, Pennsylvania.

However, subsequent discussions with TVA/Watts Bar personnel have indicated that the ETL's may not have failed as originally stated. TVA/Watts Bar has generated a second NCR, Number W-220P, concerning dampers failing to close. A root cause evaluation is additionally currently in process, ^{concerning} ~~regarding~~ TVA NCR number W-210P and W-220P, both regarding ETL's/Fire Dampers.

- 2.) ~~Discussions with~~ RMC personnel indicated that at least 3 design modifications were planned or implemented at the Palo Verde G.S. due to the part 21 problem.

RMC's Engineering Procedure No. 112084 PV, "Horizontal Fire Damper Closure Modifications", dated November 20, 1984 describes methods to modify RMC IBFO model numbers IB02, IB023, NIB02, and NIB023, "... to provide increased closure ability under air flow."

The design modifications include, a.) Modified Blade Catch assembly, b.) Modified Bottom Blade Bracket & spring attachment, c.) Increased tension and size of regulator spring.

Design modification analysis records were requested and RMC provided two (2) "... Generic Test Reports for Horizontal and Vertical mounted fire dampers" dated 1/8/85 and 2/11/85, respectively. Both test reports stated their results were "... the maximum velocities, (fpm), and pressures, (W.G.) at which the dampers operated successfully". One section of the Horizontal, 1/8/85, Test Report reflected Testing of Dampers with "Oversized springs and New Blade Latches".

The RMC testing results appear to verify the adequacy of a portion of the design changes for specific sizes of IBFO's and at specific velocities.

Additionally, RMC submitted a "Horizontal Spring Bracket Analysis", dated February 25, 1985 to the Inspector on 3/1/85. The Analysis states in part, "... analysis will verify the adequacy of

C.2. cont.

...the new horizontal spring bracket assembly, to perform its required function during a generic seismic event..." . Mention of increased tension and signs of the negator springs were not observed at this time, additionally, spring tension relaxation was not noted as appearing in RMC's analysis.

This area will require additional review and evaluation during a future inspection.

3.) Two additional deficiencies were revealed during reviews of RMC's Watts Bar, (2/85), and Palo Verde (8/84) trip reports and subsequent discussions with RMC, TVA & Palo Verde personnel

a.) Nine separate IBFD's with ETL's have experienced closure problems, during startup and functional testing, due to Electrical Conduit interference. The Electrical Conduit causing the interference is typically attached to the ETL. After the ETL melts and falls apart the conduit appears to be falling, blocking or springing against the damper blades.

3.) (cont.) ^Q → b.) RMC's Watt Bar 2/5/85
Trip report also noted two separate dampers that had not closed due to "S" hook interference with the IBFD blades. Blades were caught in the "S" hook loops.

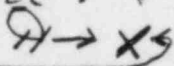
"S" hooks are utilized to hold the ETH or Thermal Links across the fire damper blades, until "heat" melts the link and releases the damper. RMC appears to use S hooks on all IBFD applications. RMC recommended to TVA that installation personnel be instructed on the proper orientation of "S" hooks at Watts Bar.

During a review of RMC's Installation Instructions ~~did not~~ ^{was not noted.}
note ~~any~~ specific reference to "S" hook orientation requirements. Discussions with Palo Verde personnel did however, reveal that a RMC Procedure, #53080C, does mention S hook orientation, which was not verified by the NRC inspectors.

The Waldinger Corp letter, dated August 24, 1984 to RMC, states in part, IBFD cycling problem was "... judged to be isolated to the horizontal dampers ..." by EMC.

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D.) Evaluation and Application Information:

- 1) RMC manufactures nuclear related components at Parsons, Kansas and Minden, Louisiana, (Louvers are manufactured at Minden and all others at Parsons).
- 2) RMC Components manufactured which may be utilized for Nuclear applications are;
 - a.) Sluice Gate Dampers
 - b.) Louver Assemblies
 - c.) Backdraft Dampers
 - d.) Isolation Dampers
 - e.) Control Dampers
 - f.) Volume Dampers
 - g.) Balancing Dampers
- 3) The most affected application of the curtain type fire dampers, in regard to closure under air flow, are those which are horizontally installed.

- 4) IBFD closure spring, (negator spring), Tensions and sizes are being increased in most RMC applications.
- 5) The negator springs, are Flat rolled coils, are normally in an extended position. The extended position requires

5 Continued). unrolling of the spring. Questions concerning the possibility of relaxation of spring tension and qualified life should be pursued during a future NRC inspection.

6.) Remote damper operators, actuators, are mainly utilized on shutter type dampers by RMC. Some typical actuator manufacturers used by RMC are; Bettis, Limitorque, ITT, Paul-Monroe, and Johnson. RMC is currently completing the last of the Bettis actuator elastomer-lubricant "change outs". The "change out" was due to a previous part 21 report which identified a incompatibility between elastomer and lubricants on the Bettis actuators.

7.) Standards for manufacturing are Underwriters Laboratory, UL, Standard 555 and UL 10B.

Testing Standards utilized are Air Moving and Conditioning Association, AMCA, Standard 500.

Wyle Laboratories performed seismic qualification testing for RMC's IBFD on 3/23/79 & 7/22/80 per IEEE-344.

- 8.) It was indicated by RMC during discussions that ETL Installation instructions are provided to all customers, and Instruction sheets are usually inserted between the Fire Damper and ETL prior to component shipping.
- 9.) Installation Instructions did not appear to address RMC's IBFD orientation to Air flow.
- 10.) RMC Nuclear Fire Damper/Door, (NIBD23), Technical Data Sheets "note #1" states in part, "... Rating: are based on AMCA standard 500 using Test set up Apparatus Figure 5.3 (Damper installed with duct upstream & downstream) ...".
However, RMC personnel stated the actual test results, in the Data Sheets were based on figure 5.5 (Damper installed without duct downstream of damper).
The "Feature" section of the Data Sheet states in part, "... Spring closure (both vertical and horizontal units) ensures positive shut off at velocities as high as 5000 FPM and 10 inches water gage ...".

E. Comments / Observations

1.) RMC TVA/Watts Bar 2/5/85
 Trip Report states in part,
 "... majority of dampers in
 question are used for compartmentization
 of the control room and are equipped
 with side seals and ETH's and are
 referred to as "Smoke Dampers"... the
 side seals, which had been noted
 as previously holding up the blades,
 caused no problems during this test...
 Damper XFD-74 had jammed... the
 conduit may have held up the
 leading edge of... blade... Damper
 XFD-99... the conduit had fallen into
 the bottom of the frame, preventing
 complete closure... Damper XFD-74...
 had a section held open by a backwards
 S hook... ".

2.) South Texas project Purchase Order
 Specification requires RMC's IBFD's
 to operate at 3,550 FPM velocity
 and maintain a 9" inch Water Gage
 pressure.

3.) RMC Interoffice Memo from
 Ruskins Palo Verde Project Manager to
 Ruskins Design Engineer, dated 12/13/84
 states, "As you know, due to the recent
 testing of fire dampers under air flow

3 cont.)

For Palo Verde, modifications were made to the horizontal blade lock and Spring attachment to blade. Please verify these changes will not adversely affect the seismic qualifications". The return memo from the Design Engineer, dated 12/14/85, states, "The changes recently made to the horizontal dampers (blade lock & blade-spring attachment) will not adversely affect the seismic qualifications".

On 2/25/85 RMC signed off an analysis titled, "Horizontal Spring Bracket Analysis". RMC transmitted the analysis and it was received on 3/1/85. The "Introduction" states in part, "... this analysis will verify the adequacy of the new horizontal spring bracket assembly... during ... a seismic event...".

- 4.) Several discrepancies were discovered during this inspection and were discussed, some of which are;
- Exceeding the Two day limit on 10CFR part 21 notification requirements
 - Omission Beaver Valley From Purchasers list attached to the NRC 11/6/84 notification letter
 - Implementing field design modifications prior to seismic qualification analysis or retest at Palo Verde, contrary to RMC Procedure numbers P-109 and E-526

5.) Discussions with TVA personnel indicate that another probable root cause for the ETL is being evaluated. . . IT involves a ~~required~~ 2 pound spring Tension ~~to~~ Applied in series with the ETL. This Tension would pull apart the ETL links once they melted to ensure release of the IBFD's.

6) Construction Deficiency Reports or part of reports have not been located to further review the "S" hook and conduit interference problems. Additional review will be directed in this area.

DERs50.55(e) REPORTS

| <u>DER NUMBER</u> | <u>TYPE</u> | <u>FOLLOW-UP REPORT #</u> | <u>STATUS</u> | <u>DESCRIPTION</u> |
|-----------------------|-------------|-------------------------------|---------------|--|
| 80-02 | N/R | 82-08 | C | TUBING SUPPORT CALCULATION ERROR - SEISMIC CATEGORY 1 INSTRUMENTATION |
| 80-03 | N/R | 82-07 | C | SPECIFIED SIZE OF STRUCTURAL STEEL FILLET WELDS |
| 80-04 | N/R | 82-03 | C | POSSIBLE DISQUAL. OF ROCKBESTOS CLASS IE CABLE |
| 80-05 | NR | 82-07 | C | VISUAL INSPECTION INSTEAD OF PENETRANT INSPECTION OF 2" THRU 4" ASME III, CLASS III PIPE WELDS |
| 80-06 | REPORTABLE | 82-07 | C | UNDERSIZE FILLET WELDS - ITT GRINNELL SWAY STRUTS FABRICATED PRIOR TO 11/15/78 |
| 80-07 | N/R | 82-03 | C | WELD DOCUMENTATION ERROR - INTERPASS TEMP - ASME III, CLASS 2, CVN TESTED MATERIAL |
| 80-08 | N/R | 82-07 | C | SUITABILITY OF HILTI HDE CONCRETE ANCHORS |
| 80-09 | REPORTABLE | 82-07 | C | RUSKIN VERT. FIRE DAMPERS FAILURE CLOSE - COMPLETELY DUE TO FRAME DISTORTION - ALL UNITS - PART 21 REPORT |
| 80-10 | REPORTABLE | 82-08 | C | FAULTY NAMCO LIMIT SWITCHES - ALL UNITS PART 21 REPORT & IEB 79-28 |
| 80-11 | REPORTABLE | 82-12 | C | FAULTY PRES. SWITCH-CHLORINE DETECT. - PART 21 |
| 80-12 | N/R | 82-08 | C | NONCODE SPOOL INSTALLED IN 3" CODE LINE-CVCS SYSTEM |
| 80-13 | REPORTABLE | 82-08 | C | REINFORCING STEEL DOWELS OMITTED FROM CONCRETE PLACEMENT - UNIT 3 AUX BLDG WALL 70' |
| 80-14 | N/R | 82-12 | C | PIPE SUPPORT ANCHOR STRAP CONFIGURATION |

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DERs50.55(e) REPORTS

| <u>DER NUMBER</u> | <u>TYPE</u> | <u>FOLLOW-UP REPORT #</u> | <u>STATUS</u> | <u>DESCRIPTION</u> |
|-----------------------|------------------------------|-------------------------------|---------------------------|---|
| 84-53 | P/R N/R | OPEN 85-07 | CLOSED OPEN | VALVE NUTS/STUDS FOUND LOOSE OR MISSING |
| 84-54 | REPORTABLE | 84-61 84-65 85-05 | CLOSED OPEN | SUMP ISOLATION VALVE COULD NOT BE OPENED ELECTRICALLY |
| 84-55 | REPORTABLE | 84-60 84-51 | CLOSED OPEN | UNQUALIFIED FOXBORO MODULES INSTALLED IN CLASS Q1E CABINETS |
| 84-56 | P/R Reportable | 85-01 | CLOSED OPEN | FIRE DAMPERS NOT CLOSING FULLY DURING PRE-OP TESTS |
| 84-57 | N/R | | OPEN | VALVE FAILED TO CLOSE IN REQUIRED 10 SECONDS |
| 84-58 | N/R | 84-54 | C | VALVE FAILED TO OPEN MECHANICALLY |
| 84-59 | REPORTABLE | 84-60 85-05 | CLOSED OPEN | CABLE INSULATION DAMAGED BY FIRE STOPS |
| 84-60 | REPORTABLE | 84-60 | C | TWO INCOMPATIBLE LUBRICANTS USED IN VALVE OPERATORS |
| 84-61 | N/R | 84-54 | OPEN | IF LOOP CHARGE VALVE STICKS OPEN AUX. SPRAY SYSTEM MAY FAIL |
| 84-62 | P/R N/R | | OPEN | IF HPSI RECEIVES CONCURRENTLY OPEN/CLOSE SIGNAL, HPSI DOES NOT COME ON LINE |
| 84-63 | N/R | | OPEN | SOLENOID VALVE FAIL TO CLOSE DURING DEMO TEST |
| 84-64 | P/R Reportable | 84-65 85-10 | OPEN | 6 SNUBBERS ARE LOCKED UP |
| 84-65 | N/R | | OPEN | INST. LEAD OUT SHIELD SPLIT EXPOSING CERAMIC INSULATION |
| 84-66 | REPORTABLE | | OPEN | DOWNCOMER FWIV FAILED TO CLOSE UNDER DYNAMIC TEST (TIA) |
| 84-67 | N/R | | OPEN | MAGNETIC REED POSITION SWITCH FAILED TO CHANGE STATE WHEN ENERGIZED |
| 84-68 | REPORTABLE | 84-60 | C | CHILLER "A" WOULD NOT RESEQUENCE ON LINE AFTER LOSS OF POWER |

DERs50.55(e) REPORTS

| <u>DER NUMBER</u> | <u>TYPE</u> | <u>FOLLOW-UP REPORT #</u> | <u>STATUS</u> | <u>DESCRIPTION</u> |
|-----------------------|------------------------------|-------------------------------|---------------------------|--|
| 84-100 | P/R Reportable | 84-65 | CLOSED OPEN | 480V MCC TERMINAL OVERHEATING |
| 84-101 | P/R Reportable | 84-65 85-10 | CLOSED OPEN | CONTAINMENT PURGE VALVES FAILED TO OPEN |
| Code 4 84-102 | P/R Reportable | 84-65 85-05 | CLOSED OPEN | ANCHOR DARTING CHECK VALVES HAVE LOOSE SHAFTS |
| 84-103 | P/R Reportable | 85-01 | OPEN CLOSED | O/G Bldg roof hatch slab could move given high winds and a tornado |
| 84-106 | N/R P/R | | OPEN | SPURIOUS LOAD SHEDS OF PORTIONS OF B Train CSFAS. |
| 85-01 | P/R | | OPEN | Aux Feed Pump Turbine |
| 85-02 | N/R | | OPEN | SCR Leakage |
| 85-03 | P/R | | OPEN | SEISMIC GAP IN CONTAINMENT |
| 85-04 | P/R | | OPEN | TYPE 'A' FIRE DAMPER INSTALLATION |



RUSKIN®

Division of Philips Industries Inc.

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Phone 816 761 7476
TELEX 42 4192

Factories: Parsons and Great Bend, Kansas, Anaheim, California,
Minden, Louisiana, and Bronx, New York

Representatives in all Major Cities

November 6, 1984

Director, Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 10555

Sir:

In accordance with the requirements of 10 CFR part 21, Ruskin Manufacturing Company, located at 3900 Dr. Greaves Road, Grandview, Missouri 64030, is herewith reporting that we have discovered a deficiency with equipment furnished by Ruskin Manufacturing Company for Nuclear Power Plant application.

On August 7, 1984 Ruskin received a letter from The Waldinger Corporation addressing seven (7) fire dampers failure to close under normal duct pressure at Palo Verde Nuclear Generating Station.

On August 13, 1984 Ruskin visited the jobsite to inspect dampers. The results of the inspection revealed damper condition to exhibit bent blades, bent blade tracks, rust and zinc rich paint on springs.

On August 20, 1984 after Engineering review of inspection results, Ruskin again visited the jobsite for Engineering review of above referenced damper conditions. As a result of this review Ruskin recommended that the blade packages be replaced in the affected fire dampers.

On October 30, 1984, Ruskin was notified, by The Waldinger Corporation, that the new blade packages had been installed and tested. The fire dampers with the newly installed blade packages would still not cycle under normal duct pressure.

Ruskin Engineering immediately began to evaluate the problem to determine the cause of the dampers failure to close under air flow. Results of this evaluation indicated the test methods originally utilized to test dampers under flow may not accurately depict actual installed conditions.

Ruskin fire dampers were tested in accordance with AMCA 500, test figure 5.5, mounted on the face of the test tunnel. Actual installed condition, in ductwork, may not result in proper performance as tested to AMCA. Ruskin, on November 2, and 5 1984, performed air flow tests in accordance with AMCA 500 with damper mounted on face of tunnel as well as with damper mounted in ductwork. The results of this test indicated that face mounted damper would close at much higher static pressure than the damper which was installed in ductwork.

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PDR ADOCK 050000215
PDR

SPP

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CONTROL DAMPERS

• FINE DAMPERS •

• DUCKDRAFT DAMPERS •

• LOUVERS

November 6, 1984
U. S. Nuclear Regulatory Commission
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Since no facility exists to properly test dampers under flow that would simulate all field installed conditions, and relationship between face mounted damper and damper installed in ductwork cannot be accurately calculated, Ruskin recommends that fire dampers supplied with closure springs, which require closure under air flow conditions, be tested to verify proper operation. This condition affects only interlocking blade fire dampers Model IBD-21, IBD-23 and NIBD-23 supplied with closure springs by Ruskin.

Ruskin is currently researching methods to modify fire dampers to ensure closure under air flow.

Attachment I to this letter identifies the affected jobsites by location and the number of units supplied to each.

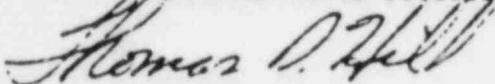
In closing, please find enclosed a copy of the letter describing the situation contained in this letter, which will be sent to each affected site.

If further questions should arise, please contact us at once.

Thank you for your cooperation.

Sincerely,

RUSKIN MANUFACTURING DIVISION



Thomas D. Hill
President

Enclosures: Attachment I
Notification Form Letter

NOTE: For further discussions, questions, or concerns on this matter, please contact:

Richard J. Yarges
Ruskin Manufacturing Division
(816) 761-7476

Browns Ferry Nuclear Plant
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 27902
11 Units

Sequoyah Nuclear Plant
Tennessee Valley Authority
See Above
64 Units

Watts Bar Nuclear Plant
Tennessee Valley Authority
See Above
344 Units

Bellefonte Nuclear Plant
Tennessee Valley Authority
See Above
144 Units

Yellow Creek Nuclear Plant
Tennessee Valley Authority
See Above
204 Units

Palo Verde Nuclear Generating Station
The Waldinger Corporation
P.O. Box 215
Buckeye, Arizona 85326
963 Units

Turkey Point
Florida Power and Light
P.O. Box 3088
Florida City, Florida 33034
2 Units

W.P.P.S.S. Unit 1
Bechtel Power Corporation
P.O. Box 650
Richland, Washington 99352
303 Units

Maine Yankee Atomic Power
Maine Yankee
R.R. 2 Box 3270
Wiscusset, Maine 04578
20 Units

Diablo Canyon
Pacific Gas and Electric
77 Beal St.
San Francisco, California 94106
19 Units

Hope Creek
Bechtel Construction, Inc.
P.O. Box 3955
San Francisco, California 94119
893 Units

Clinton
Zack Company
4600 W. 12th Place
Chicago, Illinois 60650
262 Units

Midland
Zack Company
See Above
366 Units

LaSalle
Zack Company
See Above
106 Units

Wm. H. Zimmer Nuclear Power Station
Waldinger-Young & Bertke
2601 Bell Avenue
Des Moines, Iowa 50321
5 Units

Waterford #3
Louisiana Power and Light
142 Delaronde St.
New Orleans, Louisiana 70174
26 Units

Quad Cities
Zack Company
4600 W. 12th Place
Chicago, Illinois 60650
19 Units

Morrison Construction
P.O. Box 1130
Hammond, Indiana 46320
4 Units

Perry Nuclear
Robert Irsay
P.O. Box 205
Perry, Ohio 44081
520 Units

Susquehanna
Peabody and Wind Eng. CO.
275 Geiger
Philadelphia, PA. 19115
95 Units

Arkansas Nuclear One
Arkansas Power and Light
P.O. Box 551
Little Rock, Arkansas 72203
144 Units

Monticello
AZCO Inc.
c/o Northern States Power
P.O. Box 655
Monticello, Minnesota 55362
30 Units

Comanche Peak
Texas Utilities
P.O. Box 1002
Glen Rose, Texas
379 Units

South Texas Project
Intermech, Inc.
P.O. Box 2279
Bay City, Texas 77414
153 Units

Indian Point #3
Power Authority of the State of New York
P.O. Box 215
Buchanan, New York 10511
2 Units

D. C. Cook
American Electric Power Service Corp.
P.O. Box 16631
Columbus, Ohio 43216
22 Units

Catawba Nuclear
Bahnsen Service
P.O. Box 384
Clover, South Carolina 29710
421 Units

Millstone
Stone and Webster
P.O. Box 345
Waterford, CT. 06385
17 Units

Duane Arnold
Iowa Electric Light and Power
P.O. Box 351
Cedar Rapids, Iowa 52406
22 Units

Byron Nuclear
American Warming & Ventilating
1310 Indian Wood Circle
Maumee, Ohio 43537
51 Units

Braidwood Nuclear
American Warming & Ventilating
See Above
51 Units

Farley Nuclear
Alabama Power
P.O. Box 2641
Birmingham, Alabama 35291
72 Units

Callaway
Bechtel Power
15740 Shady Grove Rd.
Gaithersburg, Maryland 20877-1454
375 Units

Wolf Creek
Bechtel Power
See Above
355 Units

Davis Besse
Toledo Edison
300 Madison Avenue
Toledo, Ohio 43652
2 Units

Zion
Commonwealth Edison
P.O. Box 767
Chicago, Illinois 60690
6 Units

Oconee
Mill Power Supply
P.O. Box 32307
Charlotte, North Carolina 28232
2 Units

Oconee
Bahnson Service
P.O. Box 159
Seneca, South Carolina 29678
26 Units

W.P.P.S.S. #2
W.P.P.S.S.
P.O. Box 968
Richland, Washington 99352
14 Units

E. I. Hatch
Bechtel Power
15740 Shady Grove Rd.
Gaithersburg, Maryland 20877-1454
1 Unit

River Bend
Stone and Webster
P.O. Box 5200
Cherry Hill, New Jersey 08034
98 Units

McGuire
Bahnson Service Company
P.O. Box 57
Cornelius, North Carolina 28031
11 Units

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 666-6911

February 22, 1985

Docket No. 50-423
F0674A

Dr. Thomas E. Murley
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Dr. Murley:

Millstone Nuclear Power Station, Unit No. 3
Reporting of Potential Significant Deficiencies
in Design and Construction:
Non-Motor Operated Curtain Type Fire Dampers (SD-70)

In a January 16, 1985 telephone conversation between your Mr. T. Rebelowski and our Mr. J. Putnam, Northeast Nuclear Energy Company (NNECO) reported a potential significant deficiency in the construction of Millstone Unit No. 3 as required by 10CFR50.55(e).

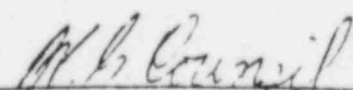
The potential significant deficiency involves non-motor operated curtain type fire dampers which may not close under flow conditions. These fire dampers are used in the HVAC systems at Millstone Unit No. 3 and are manufactured by Air Balance Company or Ruskin Manufacturing. We have determined that this is a significant deficiency for Millstone Unit No. 3.

All of the subject QA Category I fire dampers requiring closure under system flow will be tested in place for closure under design flow conditions. Any dampers which fail this test will be evaluated on a case-by-case basis to determine the best course of corrective action and modified accordingly.

We consider this to be our final report for SD-70. As discussed with Mr. T. Rebelowski, this report is being provided by February 22 rather than February 15, 1985. We trust that the above information satisfactorily responds to your concerns.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



W. G. Council
Senior Vice President

8503150323 (app)

cc: Mr. J. M. Taylor, Director
Division of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Phillips Building
7920 Norfolk Avenue
Bethesda, MD 20814

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 666-6911

March 20, 1985

Docket No. 50-423
B11491

Dr. Thomas E. Murley
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

- References: 1. W. G. Counsil letter to T. E. Murley, F0674A, dated February 22, 1985.
2. U.S. Nuclear Regulatory Commission, Branch Technical Position CMEB 9.5-1, dated July 1981.

Dear Dr. Murley:

Millstone Nuclear Power Station, Unit No. 3
Reporting of Potential Significant Deficiencies in Design and Construction:
Non-Motor Operated Curtain-Type Fire Dampers (SD-70)
Amendment to Final Report

In a January 16, 1985 telephone conversation between your Mr. T. Rebelowski and our Mr. J. Putnam, Northeast Nuclear Energy Company (NNECO) reported a potential significant deficiency in the construction of Millstone Unit No. 3 as required by 10CFR50.55(e). We determined that this is a significant deficiency for Millstone Unit No. 3 and provided you with a final report in Reference 1.

The significant deficiency involved non-motor operated curtain-type fire dampers which may not close under flow conditions. These fire dampers are used in the HVAC systems at Millstone Unit No. 3 and are manufactured by Air Balance Company or Ruskin Manufacturing.


We informed you in Reference 1 that all of the subject QA Category 1 fire dampers requiring closure under design flow would be tested in place for closure under design flow conditions. Any dampers which fail this test will be evaluated on a case-by-case basis to determine the best course of corrective action and modified accordingly.

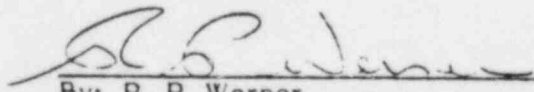
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Subsequent discussions with the NRC identified the need to extend this testing and evaluation to QA Category II and III fire dampers. Therefore, we would like to amend our final report on SD-70 to include testing in place for closure under design flow conditions for all QA Category II and III fire dampers installed in fire boundaries separating redundant safety-related areas at Millstone Unit No. 3, as defined in Reference 2.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY


W. G. Counsil
Senior Vice President


By: R. P. Werner
Vice President

cc: Mr. J. M. Taylor, Director
Division of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Phillips Building
7920 Norfolk Avenue
Bethesda, MD 20814