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MAR 22 1985

MEMORANDUM FOR: R. L. Baer, Chief, Engineering & Technical Support Branch, Division of Engineering and Quality Assurance, IE

FROM: W. S. Little, Chief, Operations Branch

SUBJECT: NRC DRAFT BULLETIN - FIRE DAMPER DESIGN, INSTALLATION, AND MAINTENANCE DEFICIENCIES IDENTIFIED AT NUCELAR POWER PLANTS

The enclosed draft of a proposed NRC Bulletin is transmitted to you for your review and action as discussed with members of your staff on February 27, 1985.

We believe that the fire dampers described in the enclosed draft are located in safety-related and nonsafety-related areas of nuclear plants. On February 28, 1985, Region III transmitted backup information to your staff regarding this issue. We believe this to be a generic problem since at least ten OL's and NTOL's have deficiencies in this area.

Discussions with your staff have indicated that specific actions to be taken in this area are ongoing. We recommend a bulletin be issued; however, we realize this determination will be made by you at a later date.

For further information, please contact myself (FTS 388-5578) or W. Guldemond (FTS 388-5574) of my staff.

W. S. Little, Chief
Operations Branch

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W. S. Little, Chief
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[redacted]: Fire Damper Design, Installation, and Maintenance Deficiencies Identified At Nuclear Power Plants

Addressees:

All holders of nuclear power reactor Operating Licenses (OLs) or Construction Permits (CPs) for action.

Purpose:

The purpose of this bulletin is to inform OLs and CP holders of several potentially generic problems involving the design, installation, and maintenance of fusible link and electro-thermal link fire damper assemblies located in walls, floors and/or ventilation ducts which penetrate fire barriers in safety-related areas. Any one, or all of the problems may exist at a facility. As a result, OLs and CP holders are requested to take those actions prescribed herein regarding this potentially generic problem.

Description of Circumstances:

On October 21, 1983, the NRC issued IE Information Notice No. 83-69 describing three potentially generic problems with fire dampers, including dampers not installed in accordance with drawings, one and one half hour rated dampers installed where three hour rated dampers were required, and dampers located in the duct(s) in a room and not within the fire wall penetration. Since that time, other deficiencies have been identified involving interlocking blade (curtain

type) fire dampers which failed to close completely. In addition, the NRC has received reports of fire damper design, installation, and maintenance deficiencies in fire dampers installed at the Davis-Besse, Monticello, Zimmer, Braidwood, Watts Bar, and Sequoyah nuclear plants, including (1) dampers failing to close completely under normal duct pressure and flow, (2) bent damper blades and tracks, (3) corroded damper assemblies, (4) zinc rich paint on springs, (5) dampers installed backwards, (6) melted fusible links, (7) dampers jammed in the open position, (8) dampers missing blades, (9) accumulation of dirt on damper tracks preventing closure, (10) malfunctioning negator springs, (11) damper "J" hooks installed backwards preventing closure of the dampers, (12) damper access restrictions, (13) drawings not indicating the location of required fire dampers and (14) installation of multiple (ganged) dampers not included in the manufacturer's certification testing program.

On November 6, 1984, the NRC was notified by Ruskin Manufacturing Division that seven fire dampers failed to close under normal duct pressure at the Palo Verde Nuclear Generating Station. Inspection of these fire damper assemblies showed bent blade assemblies and tracks excessive corrosion and paint deposits, and malfunctioning negator springs. Installation of new blade packages in these assemblies failed to result in successfuly cycling of the dampers under normal duct pressure. The failed dampers included Ruskin interlocking blade fire damper models IBD-21, IBD-23, and NIBD-23 supplied with closure springs. Ruskin is currently researching methods to modify these dampers to ensure closure under nominal air flow.

On January 18, 1985, Northern States Power (NSP) Company formally notified the NRC of fire damper design deficiencies identified at their Monticello Nuclear Generating Plant which resulted in the failure of seven of thirty installed Ruskin fire dampers to fully close under nominal air flow conditions. The deficiencies were discovered during testing consisting of removing the thermal link and using a trip wire to actuate the damper. Subsequent evaluations concluded that air stream velocities of 2000 to 3000 SCFM would be sufficient to prevent closure.

Redundant safety-related equipment and components at nuclear power plants are required to be separated by distance or by fire-resistant walls, floors, enclosures, or other types of fire barriers. All penetrations in the fire barriers are required to be protected against the spread of fire. Ventilation duct and wall penetrating fire barriers are required to be protected by means of fire dampers which are arranged to close in the event of fire. Improperly designed, installed, and maintained fire dampers could permit the passage of fire through a fire barrier and thereby jeopardize redundant safety-related systems.

Actions for all Holders of Operating Licenses

1. Perform a visual inspection of all fire dampers separating redundant safe shutdown equipment to establish the degree of conformance to design requirements and manufacturers' tested configurations and to detect conditions which could adversely impact damper operation. This inspection should specifically address those deficiencies described in this bulletin which are visually detectable.

2. Perform an inplace operability test of 10% of each model of fire damper by vendor utilized to separate redundant safe shutdown equipment. This test should verify that the assembly moves freely to its required position and latches under normal system operating conditions (e.g. normal ventilation flow and pressure). If failures indicative of a generic problem are encountered for a given damper model, the test sample size for that model shall be increased as appropriate to adequately characterize the problem.

3. Submit a summary report on the results of actions 1 and 2 above within 90 days of the receipt of this bulletin. This report should include any identified problems, corrective actions to be taken, and a schedule for completing corrective actions. A listing of those dampers which cannot be inspected or tested due to plant conditions shall be included along with a justification for continued operation and a schedule for completion of the above actions on those dampers.

Actions for all Holders of a Construction Permit

1. Perform a visual inspection of all fire dampers separating redundant safe shutdown equipment to establish the degree of conformance to design requirements and manufacturers' tested configurations and to detect conditions which could adversely impact damper operation. This inspection should specifically address those deficiencies described in this bulletin which are visually detectable.

2. If testing of fire dampers has been completed, review the test methodology and results to determine if:

   a. Dampers were verified to cycle during the test.

   b. Dampers were tested under nominal ventilation flow conditions.

3. If testing of fire dampers has not been completed, revise test procedures as necessary to ensure that the test requires verification of damper cycling under nominal ventilation flow conditions.

4. Submit a summary report on the results of the above actions within 90 days of the receipt of this bulletin. This report should include any identified problems, corrective actions to be taken, and a schedule for completing corrective actions.

Written reports describing the above actions shall be submitted to the appropriate Regional Administrator under oath or affirmation under provisions of Section 182a, Atomic Energy Act of 1954, as amended. Also, the original copy of the cover letter and a copy of the report shall be transmitted to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C. 20055 for reproduction and distribution.

This request for information was approved by the Office of Management and Budget under a blanket clearance number 3150-0011 which expires April 30, 1985. Comments on burden and duplication may be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D.C. 20503.

If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC Region Office or the technical contact listed below.

Director
Office of Inspection and Enforcement

Technical Contact:

Attachment:

1. Backup information
   Sent February 28, 1985