W. Miller

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

FEB 15 1983

SSINS 9162

MEMORANDUM FOR: Edward L. Jordan, Director, Division of Engineering and Quality Assurance, IE
Richard W. Starostecki, Director, Division of Project and Resident Programs, RI
Charles E. Norelius, Director, Division of Project and Resident Programs, RIII
James E. Gagliardo, Director, Division of Resident, Reactor Project and Engineering Programs, RIV
Jesse L. Crews, Director, Division of Resident, Reactor Project and Engineering Inspection, RV

FROM: Richard C. Lewis, Director, Division of Project and Resident Programs

SUBJECT: POTENTIALLY GENERIC DEFICIENCY IN RUSKIN MANUFACTURING COMPANY FIRE DAMPERS

The enclosed potentially generic issue data sheet concerning nonfunctional fire dampers at Sequoyah and Watts Bar is forwarded for information per TI 2500/3.

R. C. Lewis

R. C. Lewis

Enclosure:
1. Fire Damper Issue Data Sheet
2. Sequoyah Special Report 83-02
3. Watts Bar CDR 390/82-113, 391/82-106

CONTACT: W. H. Miller
242-5582

ENCLOSURE 1

Data Sheet No.:RII:DPRP-83-04

POTENTIALLY GENERIC ISSUE DATA SHEET

Facility Sequoyah 1 and Watts Bar 1, 2 Docket No(s). 50-327, 50-390 50-391

Date of Event 1/27/83 Inspection or other Report Sequoyah Special Rpt 83-02 and Watts Bar CDR 390/82-113, 391/82-106.

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

During the preoperational tests of fire dampers at Watts Bar, vertical curtain type gravity operated fire dampers failed to close against normal operating air flow. Subsequent tests at Sequoyah confirmed this discrepancy. Refer to attached Sequoyah Special Report 83-02 and Watts Bar CDR 390/82-113, 391/82-106.

2. How Found (If appropriate)

Licensee identified the discrepancy while conducting operational tests of the dampers.

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

Fire dampers are provided in ventilation penetrations of fire barriers at practically all plants. The type dampers installed at Watts Bar and Sequoyah may also be located at other plants.

4. II (Region) W. H. Miller (Originator) T. Conlon (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

MASTER FILE

INSTRUCTION PROCEDURES

FOR

STORAGE, INSTALLATION, OPERATION & MAINTENANCE

OF

NIBD23 CURTAIN TYPE FIRE DAMPER/DOORS

RUSKIN MANUFACTURING COMPANY
P. O. Box 129
Grandview, Missouri 64030

VI

Reply ltr

RUSKIN Manufacturing Company RUSKIN. air handling specialties	ENGINEERING PROCEDURE NO. E-511
	Rev. No. 0
	Date: August 19, 1982
INSTALLATION INSTRUCTIONS - NIBD23 CURTAIN TYPE FIRE DAMPER/DOOR	Page 1 of 7

1.0 Prior to installation, fire damper/doors should be removed from packaging and inspected for damage, obstructions, rust or corrosion.

2.0 Installation of fire damper/doors

2.1 Fire damper/doors are marked with sticker indicating appropriate "UP" direction. Install fire damper/doors with "UP" arrow pointing "UP".

2.2 Installation Instructions

Damper/Doors shall be installed in accordance with the appropriate Ruskin "Installation Instruction" sheet (see attached forms II-IBD23 for Vertical Single or Dual Installation and Horizontal Installation) - or - in accordance with other "approved drawings, instructions or procedures" that may apply to a specific project. Any "approved drawings, instructions or procedures" issued by Ruskin, the Utility, or the Engineer describing installation for a specific project that may differ from the Standard Ruskin Installation Instructions should be followed.

2.3 Critical tolerances must be maintained after installation.

2.3.1 Dampers must be installed with frames straight, square and free of obstructions.

RUSKIN Manufacturing Company RUSKIN. air handling specialties	ENGINEERING PROCEDURE NO. E-511
	Rev. No. 0
	Date: August 19, 1982
INSTALLATION INSTRUCTIONS - NIBD23 CURTAIN TYPE FIRE DAMPER/DOOR	Page 2 of 7

2.3.2 Dampers shall be square within 3/8" when measured diagonally across corners.

NOTE: Other means of varifying squareness may be utilized if they accomplish similiar results.

2.3.3 Frame to blade clearance must be 1/8" minimum to 7/16" maximum. To check this clearance, the following steps need to be followed:

2.3.3.1 Release blade package to a closed position.

2.3.3.2 Move blades to one side of frame and inspect other end for clearance, this should be checked in three (3) places: top, middle and bottom of blade package.

2.3.3.3 After inspection of clearance, blade package must be refolded, the fusible link replaced and the "S" hooks reconnected. "S" hooks may be crimped or uncrimped per drawing number 4875 (attached).

RUSKIN Manufacturing Company RUSKIN. air handling specialties	ENGINEERING PROCEDURE NO. E-511
	Rev. No. 0
	Date: August 19, 1982
INSTALLATION INSTRUCTIONS - NIBD23 CURTAIN TYPE FIRE DAMPER/DOOR	Page 3 of 7

2.4 Ruskin's Quality Assurance Department varifies and documents that fire damper/doors destined for Nuclear Power Plants have dimensional tolerance as indicated in 2.3 above at the time of shipment. Installer must maintain these dimensional tolerances after installation for the fire damper/doors to be warrantable.

2.4.1 Ruskin reserves the right to spot check installed dampers to varify that dimensional tolerances have been maintained after installation and will be relieved of any warranty responsibilities if dampers are installed improperly.

2.5 Accessibility must be provided to all installed fire damper/doors.

2.5.1 Fire damper/doors require inspection after installation as well as periodic inspection at intervals during system operation and replacement of fusible link should duct temperatures accidentally cause fusible link to melt. All fire damper/doors must be provided with suitable access doors and duct clearances to allow accomplishment of these functions without removal of duct. (This is a basic requirement of the National Fire Code - NFPA90A.)

RUSKIN

II-IBD23 1278
Replaces
Form II-IBD23 178

INSTALLATION INSTRUCTIONS CURTAIN TYPE IBD FIRE DOORS SINGLE & MULTI SECTION VERTICAL INSTALLATION SINGLE DOOR REQUIREMENTS

Openings in wall shall be ¼" to ½" larger than overall size of fire door and sleeve assembly.

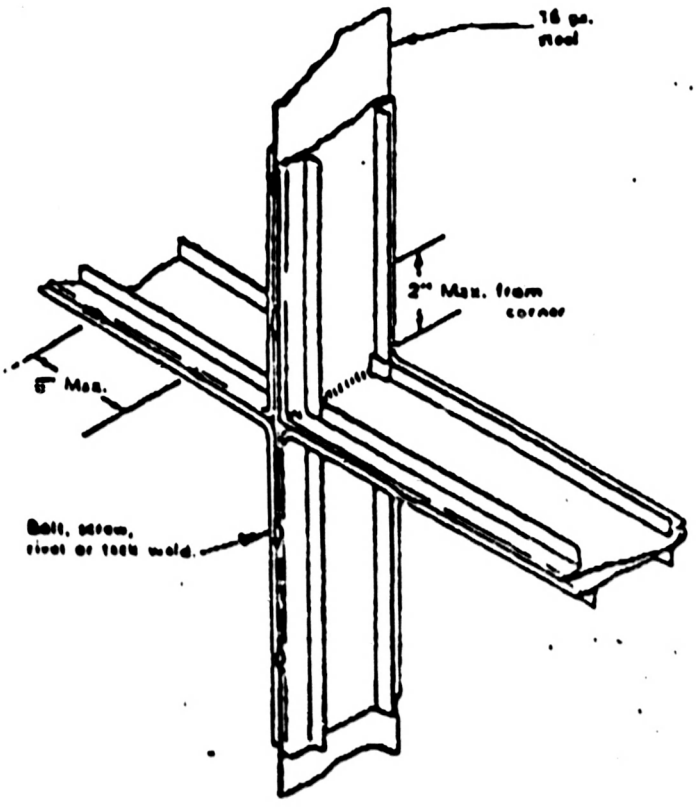
Sleeve gage shall be at least equal to the gage of the duct as defined by the appropriate SMACNA Duct Construction Standard, as described in NFPA90A, when one or more of the following Duct Sleeve Connections are used (Plain S Slip, Hemmed S Slip, Standing S Slip, Reinforced Standing S Slip, Inside Slip Joint, Double S Slip).

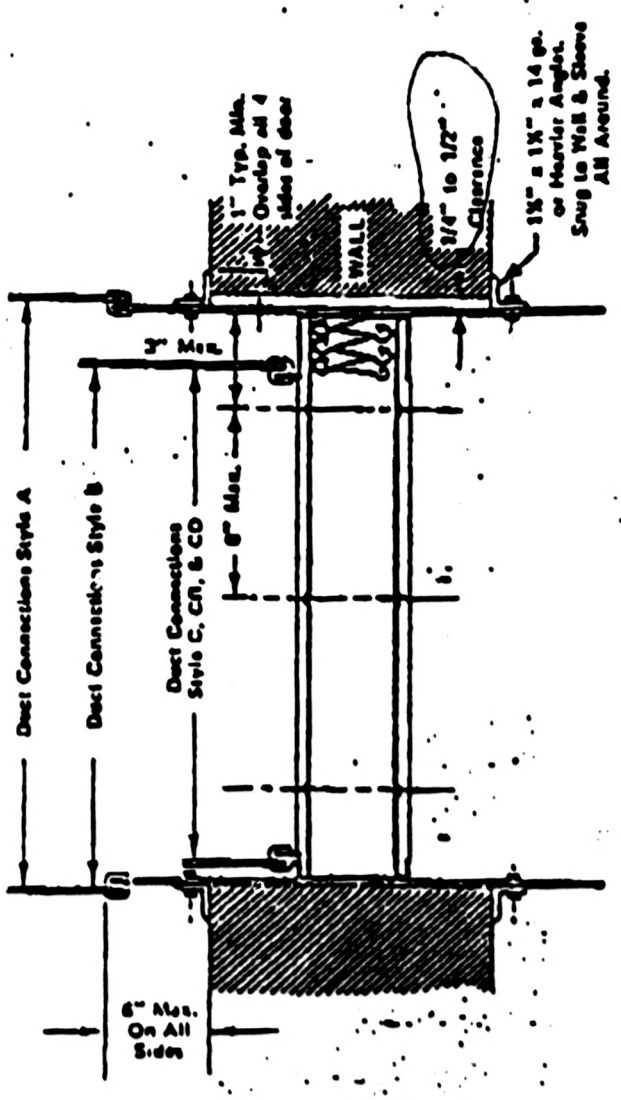
If any other Duct Sleeve Connections are used, the sleeve shall be minimum 16 gage for dampers up to 36"w x 24"h and 14 gage if width exceeds 36" or height exceeds 24".

Mounting angles shall be minimum of 1½" x 1½" x 14 gage and bolted, tack welded, riveted, or screwed to sleeve at maximum spacing of 8" and with minimum of two connections in each side, top and bottom. Mounting angles shall overlap wall a minimum of one inch on all four sides.

Door shall be bolted, tack welded, riveted, or screwed to sleeve on same spacing as angles.

If door is installed without connected duct work, 18 gage sleeve is recommended.





IBD23 Fire Door with 3 Hour UL Label for installation in walls required to have 3 or 4 hour Fire Protection Ratings.

INSTALLATION INSTRUCTIONS COMPLY WITH [illegible]RWRITERS LABORATORIES SAFETY STANDARDS 555

RUSKIN

II-IBD23 1279
Replaces
Form II-IBD23 178

INSTALLATION INSTRUCTIONS CURTAIN TYPE IBD FIRE DOORS SINGLE & MULTI SECTION VERTICAL INSTALLATION DUAL DOOR REQUIREMENTS

Openings in wall shall be ¼" to ½" larger than overall size of fire door and sleeve assembly.

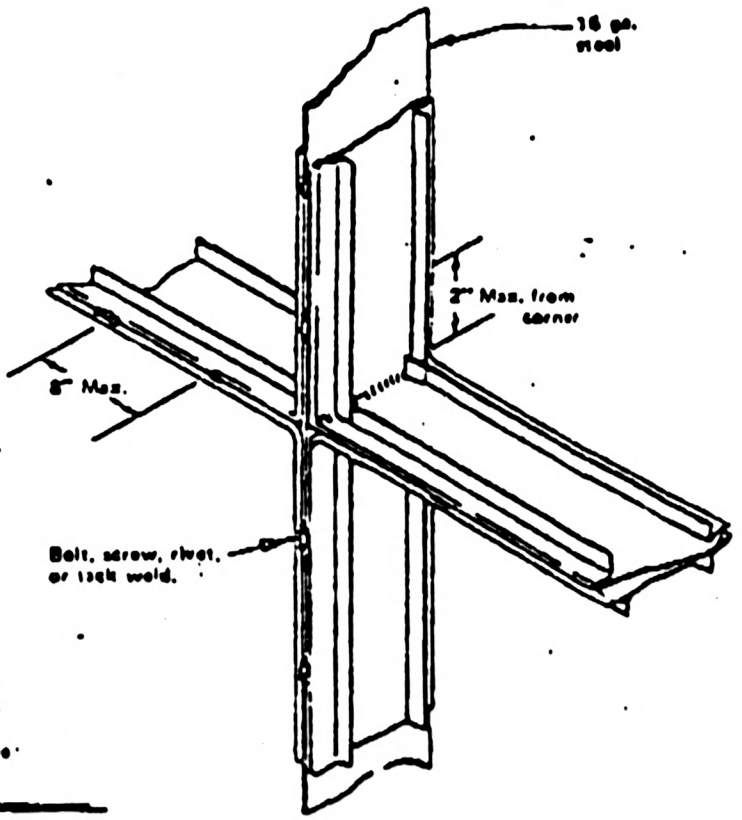
Sleeve gage shall be at least equal to the gage of the duct as defined by the appropriate SMACNA Duct Construction Standard, as described in NFPA90A, when one or more of the following Duct Sleeve Connections are used (Plain S Slip, Hemmed S Slip, Standing S Slip, Reinforced Standing S Slip, Inside Slip Joint, Double S Slip).

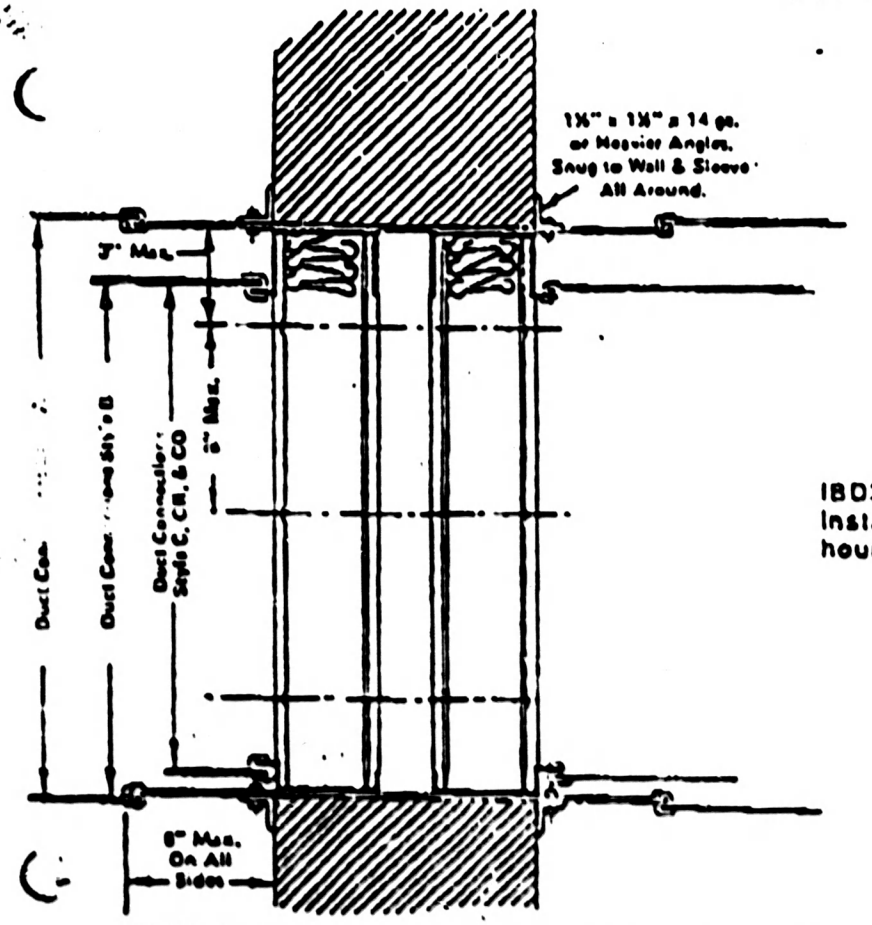
If any other Duct Sleeve Connections are used, the sleeve shall be minimum 16 gage for dampers up to 36"w x 24"h and 14 gage if width exceeds 36" or height exceeds 24".

Mounting angles shall be minimum of 1½" x 1½" x 14 gage and bolted, tack welded, riveted, or screwed to sleeve at maximum spacing of 8" and with minimum of two connections in each side, top and bottom. Mounting angles shall overlap wall a minimum of one inch on all four sides.

Door shall be bolted, tack welded, riveted, or screwed to sleeve on same spacing as angles.

If door is installed without connected duct work, 18 gage sleeve is recommended.





IBD23 Fire Door with 3 Hour UL Label for installation in walls required to have 3 or 4 hour Fire Protection Ratings.

NOTE: Dual Fire Doors are not always required. This information provided for those local jurisdictions that require Dual Fire Doors to comply with restrictive local codes.

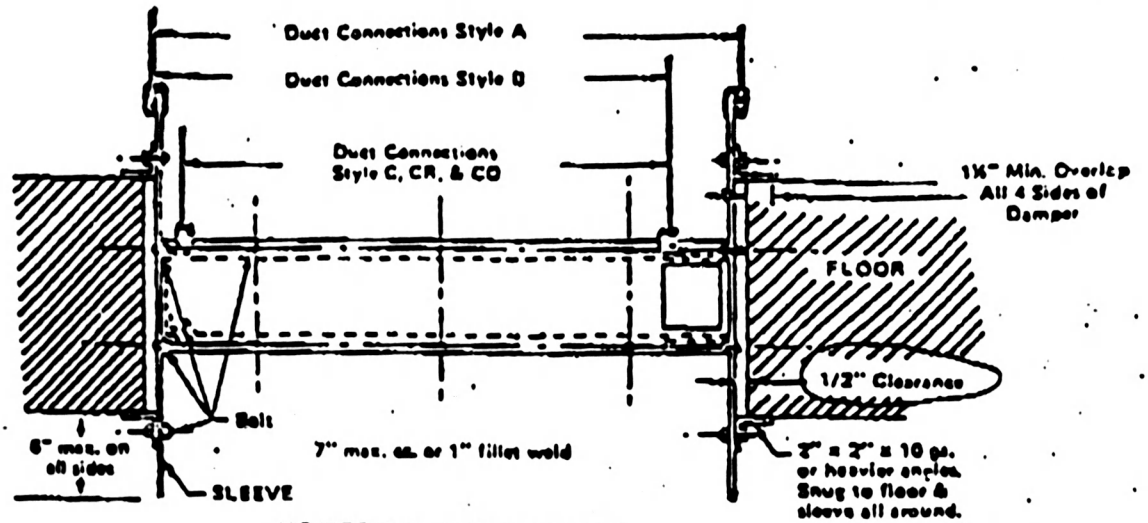
INSTALLATION INSTRUCTIONS COMPLY WITH UNDERWRITERS LABORATORIES SAFETY STANDARDS 555

RUSKIN Mfg. Co. P. O. Box 129 Grandview, Mo. 64030

RUSKIN

II-IBD23-1079
Replaces II-IBD23-879

THREE HOUR UL CLASSIFIED CURTAIN TYPE IBD FIRE DAMPERS SINGLE & MULTI SECTION HORIZONTAL INSTALLATION

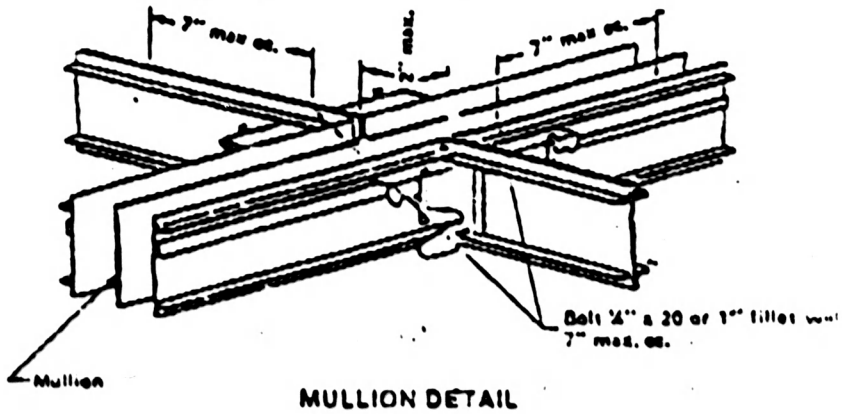


HORIZONTAL INSTALLATION

The mullion between the sides of the dampers shall be either a 4½ in. wide steel plate (14 MSG galvanized steel) or 1½ by 4½ in. tubular section (12 MSG galvanized steel). Mullion length shall be equal to length of two adjoining dampers.

The steel plate mullion shall be sandwiched between sides of dampers with frames welded at top and bottom with 1 in. long fillet welds spaced 7 in. O.C.

The tubular section mullion shall be welded to the sides of the damper frames with 1 in. long fillet welds spaced 6 in. O.C.



MULLION DETAIL

NOTES

Openings in floor or wall shall be 1 in. larger than overall size of the damper and sleeve assembly.

Sleeve gage shall be at least equal to the gage of the duct as defined by the appropriate SMACNA Duct Construction Standard and described in NFPA 90A when one or more of the following Duct-Sleeve Connections are used (Plain "S" Slip, Hemmed "S" Slip, Standing "S" Slip, Reinforced Standing "S" Slip, Inside Slip Joint, and Double "S" Slip). If any other Duct-Sleeve Connections are used, sleeve shall be minimum of 16 gage for dampers up to 36"w x 24"h or 14 gage if damper width exceeds 36" or height exceeds 24".

Mounting angles shall be a minimum of 2" x 2" x 10 gage bolted with ¼" - 20 bolts and nuts, 8" - C-C maximum minimum 2 bolts in each side, top and bottom or weld with 1" fillet welds on same centers. Mounting angles shall overlap wall a minimum of one and one-half inches on four sides.

Dampers shall be bolted or welded to sleeve on same spacing as angles.

INSTALLATION INSTRUCTIONS COMPLY WITH UNDERWRITERS LABORATORIES SAFETY STANDARDS 555

DETERMINATION OF REPORTABILITY
INFORMATION WORKSHEET FOR 10CFR50.55(e)

Plant WATTS B/R Item Number 5036

Title DAMPERS NOT ADEQUATELY SHOWN ON DESIGN TYPICAL DRAWINGS

NLS Engr FRANKIE WHITE Date 8/22/83 NLS Supv [signature] Date 8/24/83

Determination under 50.55(e) - Reportable (X), Non-Reportable ( ) (Only true if A, B, and C1 below are affirmative and C2 is negative.)

A. The subject condition, had it remained uncorrected (could) ~~(could not)~~ have affected adversely the safety of operations of the plant.
Explanation: ~~TVA~~ Des has not generated typical drawings which reflect a) installation dimensions for flow control operated dampers b) manufacturer's minimum space requirements between fire damper and the cinderblock sleeve and c) backdraft dampers. Some of the certain-type fire dampers were installed per the drawing with zero clearance, therefore, in the event of a fire, the fire could not be contained in the isolated area because the dampers may fail to close due to the zero clearance and the fire could spread through the HVAC system. See Back →

B. The item (is) ~~(is not)~~ considered significant as defined by 10CFR50.55(e).

No 1. The condition represents a significant breakdown of a portion of the Quality Assurance Program for the plant. TVA ( ), Vendor ( )

YES 2. The condition represents a significant deficiency in final design as approved and ~~released for construction~~ such that the design does not conform to (issued design criteria) ~~(criteria and bases stated in the SAR) (conditions of the construction permit).~~

Yes due to deficiency in final design 3. The condition represents (a significant deficiency in construction) (~~significant damage~~) to a ~~(structure)~~ (system) (component) which will require extensive (~~evaluation~~) (redesign) (~~repair~~) or meet (issued design criteria) ~~(criteria and bases stated in the SAR) (conditions of the construction permit)~~ or to establish the adequacy of the ~~(structure)~~ (system) (component) to perform its intended safety function.

→ NO 4. The condition represents a significant deviation from performance specifications which will require extensive (evaluation) (redesign) (repair) to establish the adequacy of a (structure) (system) (component) to meet (issued design criteria) (criteria and bases in the SAR) (conditions of the construction permit) or to establish the adequacy of the (structure) (system) (component) to perform its intended safety function.

Explanation (items B.1-B.4) This condition represents a significant deficiency in final design since the typical design drawings do not reflect the manufacturer's minimum space requirements for clearance. This also represents a significant deficiency in construction due to design drawings that were used to install the dampers.

8.1

C1. Does the affected unit(s) have a CP? ~~(X)~~Yes ( )No
2. Does the affected unit(s) have an OL? ( )Yes ~~(X)~~No

D. Are there implications to other matters not included on the NCR or to other plants?

jmw 9/13/83 ~~We had a similar type problem @ SQN which was corrected. We do not have any deficiencies of this type @ BLN or any other TVA nuclear plant. B&W has recognized this problem in the past and designed the fire dampers accordingly. An investigation will be made to evaluate the applicability of this deficiency to SQN and BFN.~~

E. Basis of reportability statement:

Since item A ((is)) ~~(is not) affirmative~~ and/or item B ((is)) ~~(is not)~~ affirmative, the condition ((is)) ~~(is not)~~ reportable under 10CFR50.5(e).

(A. Continued)

jmw 9/13/83 compartmentation and the fire could spread to

FMTCFR.50 The HVAC ductwork could lose ^ safety-related equipment ~~due to increased heat and pressure~~; and thus adversely affect the safe operation of the plants. Note: this ductwork (HVAC system) is located in Aux Bldg. A 100% inspection of all curtain-type fire dampers will be made.

C1. Does the affected unit(s) have a CP? ~~(X)~~Yes ( )No
2. Does the affected unit(s) have an OL? ( )Yes ~~(X)~~No

D. Are there implications to other matters not included on the NCR or to other plants?

jaw 9/13/83 ~~We had a similar type problem @ SQN which was corrected. We do not have any deficiencies of this type @ BLN or any other TVA nuclear plant. BLN has recognized this problem in the past and designed the fire dampers accordingly. An investigation will be made to evaluate the applicability of this deficiency to SQN and BFN.~~

E. Basis of reportability statement:

Since item A ((is)) ~~(is not)~~ affirmative and/or item B ((is)) ~~(is not)~~ affirmative, the condition ((is)) ~~(is not)~~ reportable under 10CFR50.5(e).

(A. Continued)

jaw 9/13/83

FMTCFR.50 1 The HVAC ductwork could lose compartmentation and the fire could spread to safety-related equipment due to increased heat and pressure, thus adversely affecting the safe operation of the plant. Note: this ductwork (HVAC system) is located in Aux Bldg. A 100% inspection of all curtain-type fire dampers will be made.1