

MAR 04 1986

In Reply Refer To:  
Docket: 50-298

Nebraska Public Power District  
ATTN: J. M. Pilant, Manager, Technical  
Staff-Nuclear Power Group  
P. O. Box 499  
Columbus, Nebraska 68601

Gentlemen:

This forwards a copy of a letter from Promatec, dated February 17, 1986, for your information. This letter was a 10 CFR Part 21 report concerning defective material used in fire stops and may be applicable to the installations in your facility.

Sincerely,

Original Signed By  
J. E. Gagliardo

J. E. Gagliardo, Chief  
Reactor Projects Branch

Enclosure:  
As stated

cc w/enclosure:  
Guy Horn, Division Manager  
of Nuclear Operations  
Cooper Nuclear Station  
P. O. Box 98  
Brownville, Nebraska 68321

Kansas Radiation Control Program Director

Nebraska Radiation Control Program Director

bcc distrib. by RIV:

RPB	DRSP
Resident Inspector	R. D. Martin, RA
Section Chief, RPB/A	RSB
R&SPB	RIV File

RIV:RPB  
JEGagliardo/lk  
3/7/86

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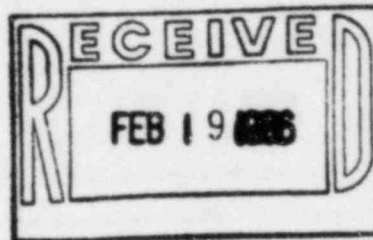
# PROMATEC

PROGRESSIVE MATERIALS AND TECHNOLOGIES, INC.

Q.100.020

February 17, 1986

U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011



Attention: Mr. Robert Martin  
Administrator, Region IV

Reference: 10 CFR Part 21 - Notification of Defects

Gentlemen:

Pursuant to the provisions of 10 CFR Part 21 - Reporting of Defects and Non-compliance, notification is hereby given of the existence of defective conduit seals at Waterford 3 and other nuclear generating stations as identified herein. Final information leading to this report was obtained on February 13, 1986 at 12:00 p.m. and verbal notification as required by § 21.21 (2) was given on February 14, 1986 at 8:36 p.m. to Mr. David Powell, U.S. Nuclear Regulatory Commission, Washington, D.C.

Information contained in this report is based on fire tests performed on two (2) existing seal configurations and subsequent preliminary evaluations conducted by B&B PROMATEC, Incorporated and Louisiana Power & Light Company. Details are as follows:

- (1) PROMATEC conducted a series fire tests on two (2) penetration/conduit seal configurations that are presently installed at various nuclear generating stations in accordance with the requirements of ASTM E119, 814 and IEEE 634. The initial purpose of the tests was to ascertain the effects "pull rope" extending through conduit seals would have on the ability of such seals to perform their intended function. While "pull rope" was shown not to be a factor in the ability of the seals to perform their intended function during initial tests, both conduit seals failed to perform properly causing the seal configuration themselves to become suspect.

Additional tests were conducted with the same configurations deleting "pull ropes" to determine design integrity of the seals. The configurations and characteristics tested are as shown on attachments 1

86-166

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# LETTER OF TRANSMITTAL

FEDERAL EXPRESS

021-052-732

Form No: QC-13

03/01/80

Rev 1 - 09/01/80

Rev 2 - 04/01/83

Rev 3 - 09/25/94

[Ref. QCP 0006]

DEPARTMENT: QA/QC

TRANSMITTAL NUMBER: 100/928

TO: <u>U.S. Nuclear Regulatory Commission</u> <u>611 Ryan Plaza Drive, Suite 1000</u> <u>Arlington, Tx. 76011</u>	DATE: <u>2/18/86</u> JOB NO: <u>MISC.</u>
ATTN: <u>Administrator, Region IV - Robert Martin</u>	RE: _____

GENTLEMEN:

WE ARE SENDING YOU: (xx) ATTACHED ( ) UNDER SEPARATE COVER  
( ) DRAWINGS ( ) COPY OF LETTER ( ) SPECIFICATIONS  
( ) QUALITY ASSURANCE PROGRAM ( ) QUALITY CONTROL PROCEDURES  
( ) PRODUCTION PROCEDURES ( ) \_\_\_\_\_  
( ) \_\_\_\_\_

COPIES	DATE	SERIAL NO.	DESCRIPTION
2	2/18/86	Q.100.020	5 page letter with 3 attachments

THESE ARE SUBMITTED: ( ) FOR APPROVAL ( ) AS REQUESTED  
( ) FOR REVIEW AND COMMENT (xx) FOR YOUR USE ( ) RETURNED FOR  
( ) CORRECTIONS

REMARKS: \_\_\_\_\_

COPY TO: \_\_\_\_\_

SIGNED: \_\_\_\_\_

TITLE: Quality Control Secretary

PLEASE NOTE: RETURN YELLOW ACKNOWLEDGEMENT COPY TO B&B INSULATION, INC. Include any comments in space provided.

TRANSMITTAL: ( ) COMPLETE ( ) NOT COMPLETE ( ) DISCREPANCIES NOTED BELOW

Returned

by: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

P.O. BOX 4672, HOUSTON, TEXAS 77210. (713) 690-5240

White (Original)- Addressee;

Yellow - ACKNOWLEDGEMENT Return to Sender;

Pink - File Copy

and 2, and as further described below.

#### 1.0 Test Penetration Characteristics

One 8" x 8" blockout and one 8" x 20" blockout in a 12" thick concrete slab with two (2) conduit penetrators as described below and detailed on drawing no. B-519 (attachment 1).

1.1 4" diameter x 27" long steel conduit

1.2 40% actual fill of IEEE 383 rated cables. Cables were a total length of 62" and extended a minimum 36" above the slab.

1.3 Conduit extended a minimum 1" above the top of the slab and a minimum 12" into the furnace below the slab. Cable fill and mix within each conduit was similar to the ANI/MAERP requirement of one-third 16 GA/2 cond (Representing instrumentation cable), one-third 12 GA/7 cond (Representing control cable), and one-third 300 MCM/1 cond (Representing power cable).

#### 2.0 Penetration and Conduit Seal Characteristics

2.1 Materials used in installation consisted of:

2.1.1 Damming and cable separation - Alumina Silica Fibrous Material (Bulk and Board).

2.1.2 Penetration and conduit seal - Dow Corning 3-6548 Silicone RTV Foam

2.2 Penetration and conduit seal configurations were as follows:

2.2.1 Configuration 1097b.1 - Conduit seal with a minimum depth of 6" plus 1" damming as measured from the top of the slab; penetration seal with a minimum depth of 10" plus 1" damming as measured from the top of the slab.

2.2.2 Configuration 1097b.2 - Conduit seal with a minimum depth of 6" plus 1" of damming as measured from the top of the slab; penetration seal with a 6" depth plus 1" of damming as measured from the top of the slab.



### 3.0 Test Characteristics

- 3.1 Thermocouples were located in accordance with the requirements of IEEE 634 and ASTM E119 as shown on drawing no. B-520 (attachment 2).
  - 3.2 The prepared test slab assembly was exposed to the standard time temperature curve established by ASTM E119 for a period of three (3) hours with the following results:
    - 3.2.1 Configuration 1097b.2 - Thermocouple F-19 exceeded the maximum allowable with a temperature of 401° F at 1 hour, 23 minutes and a three (3) hour reading of 659° F.
    - 3.2.2 Configuration 1097b.1 - Thermocouple F-25 exceeded the maximum allowable with a temperature of 401° F at 2 hours, 14 minutes and a three (3) hour reading of 446° F.
  - 3.3 While no flame through was noted on the unexposed side and hose stream tests did not cause openings, heat transmission as indicated by the field thermocouples exceeded the maximum temperature requirement of 325° F above ambient. An autopsy was performed and resulted in the discovery that both conduit seals were reduced to ash.
  - 3.4 Although the affected seals did not meet the full three (3) hour requirement for heat transmission, both configurations are operable up to the time periods referenced in paragraphs 3.2.1 and 3.2.2, respectively.
- (2) The requirement to install conduit seals at the fire barrier was included in design specifications for various stations in order to comply with Branch Technical Position 9.5.1-29 (3). Preliminary investigations by Louisiana Power & Light Company and B&B PROMATEC indicate that the defective configurations are probably of a generic nature affecting an unspecified number of nuclear generating stations.

The number and locations of all affected stations cannot be determined by Louisiana Power & Light Company or B&B PROMATEC as various utilities and seals contractors may have designed and installed similar configurations. Preliminary investigations by Louisiana Power & Light and B&B PROMATEC has determined that the following stations and

licensees are likely to be affected, as a minimum:

- \* WATERFORD 3.....Louisiana Power & Light Co.
- \* GRAND GULF 1.....Mississippi Power & Light Co.
- \* NUCLEAR ONE 1.....Arkansas Power & Light Co.
- \* SHEARON HARRIS 1.....Carolina Power & Light Co.
- \* WOLF CREEK.....Kansas Gas & Electric Co.
- \* CALLAWAY 1.....Union Electric Co.

Various organizations have participated in the design and installation of penetration and conduit seals at the locations identified thus far. Evaluations to determine the number and locations of all defective seals is expected to be an extensive, time consuming operation that would require the collective efforts of all affected organizations. Evaluations are currently in progress by B&B PROMATEC and Louisiana Power & Light for Waterford 3.

- (3) Other tests were conducted satisfactorily to provide potential corrective actions that may be taken for those seals determined to be unacceptable for the operability time periods previously referenced. Possible corrective action measure include:
  - (a) Evaluation of affected conduit seals to determine if exception can be taken to the required three (3) hour rating.
  - (b) Rework of conduit seals that can not be excepted from a three (3) hour rating by installing:
    - (1) Installing a 3" depth silicone RTV foam seal boxed off with 1" alumina silica board at the conduit termination point (attachment 3). This would also require the installation of an additional 6" depth seal at the nearest accessible point on the continuous run side of the conduit.
    - (2) Installing an additional 6" depth conduit seal at the nearest accessible point on the continuous run side of the conduit.

Due to the apparent generic nature of this condition, it is requested that assistance and/or direction by the NRC be given in order that we may proceed in the proper manner.

**PROMATEC**

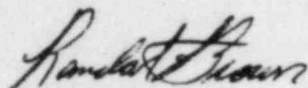
To: Administrator, Region IV  
From: Randal W. Brown  
Page 5 of 5

Q.100.020

Please contact the writer at (713) 690-5240 at your earliest convenience.

Sincerely yours,

PROMATEC



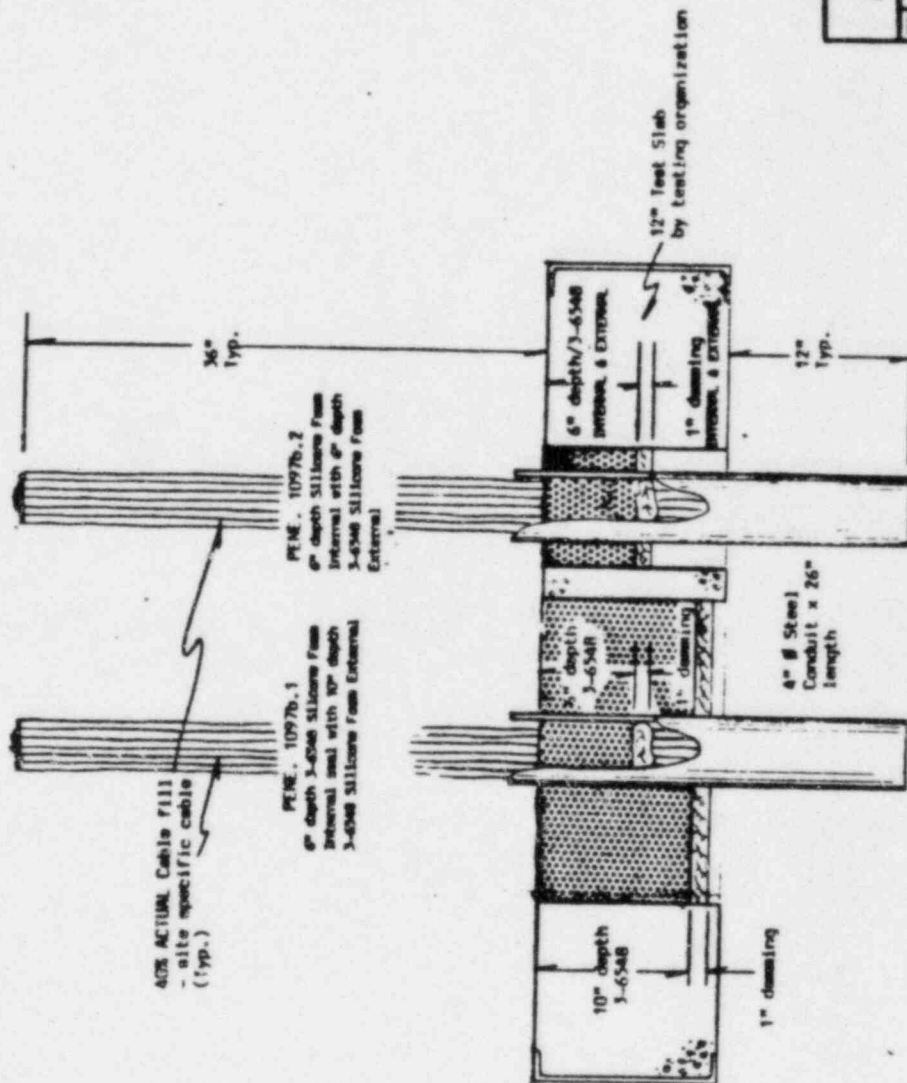
Randal W. Brown  
Quality Assurance Manager

RWB/dmck

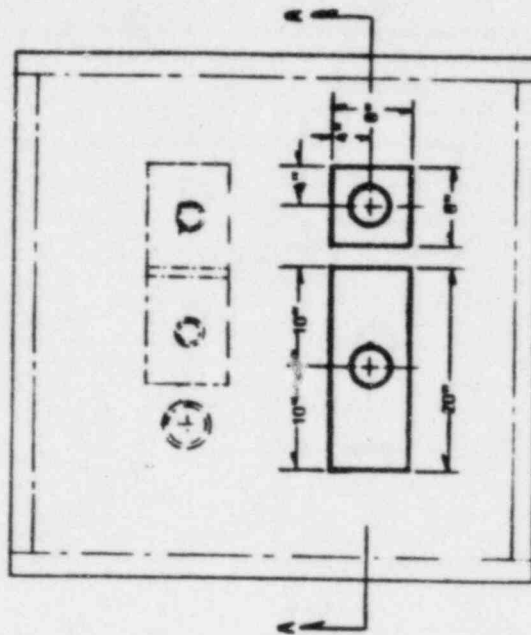
attachments: (1) Drawing Number B-519  
(2) Drawing Number B-520  
(3) Drawing Number B-505

cc: R. Block  
R. Pearson  
R. Werme  
G. Burt  
L. Spriggs  
B. Collier (LP&L)

**PROMATEC**



SECTION A-A



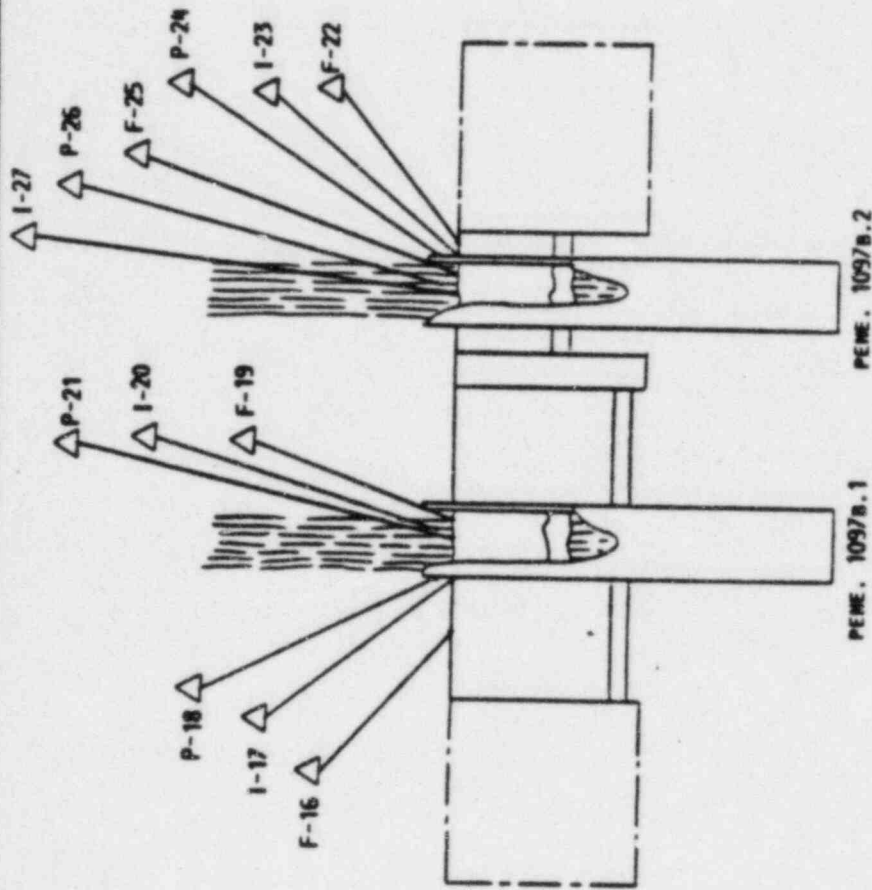
TEST SLAB LAYOUT

REVISION APPROVAL		REVISIONS	
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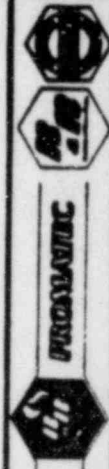
		<b>PROSPECT</b>	
CTP 1097b CONDUIT TEST TEST LAYOUT AND DETAILS		DRAWING BY: <b>LCS</b> DATE: <b>01/13/06</b> SCALE: <b>AS SHOWN</b> PROJECT: <b>B-519</b>	





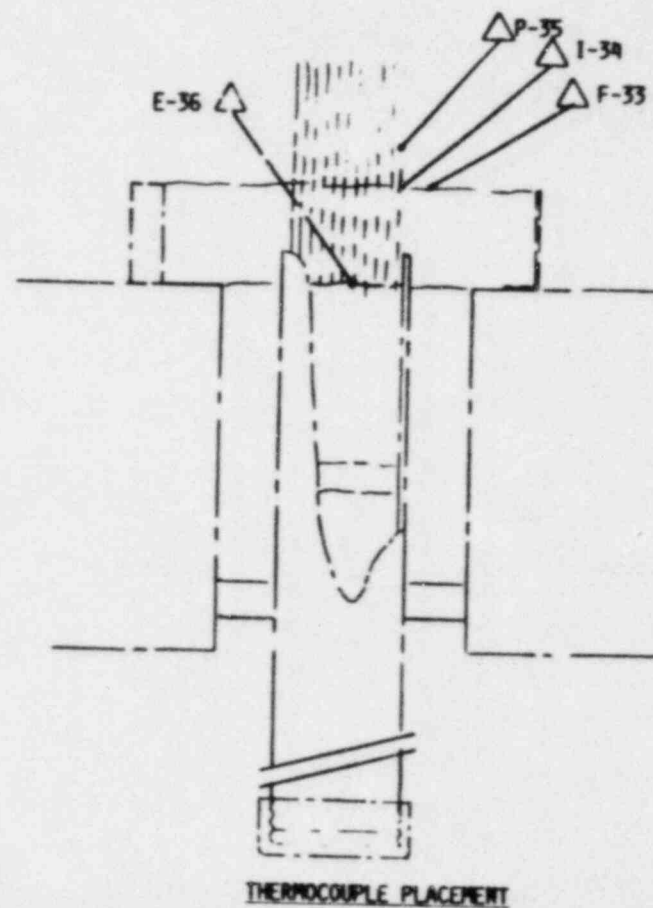
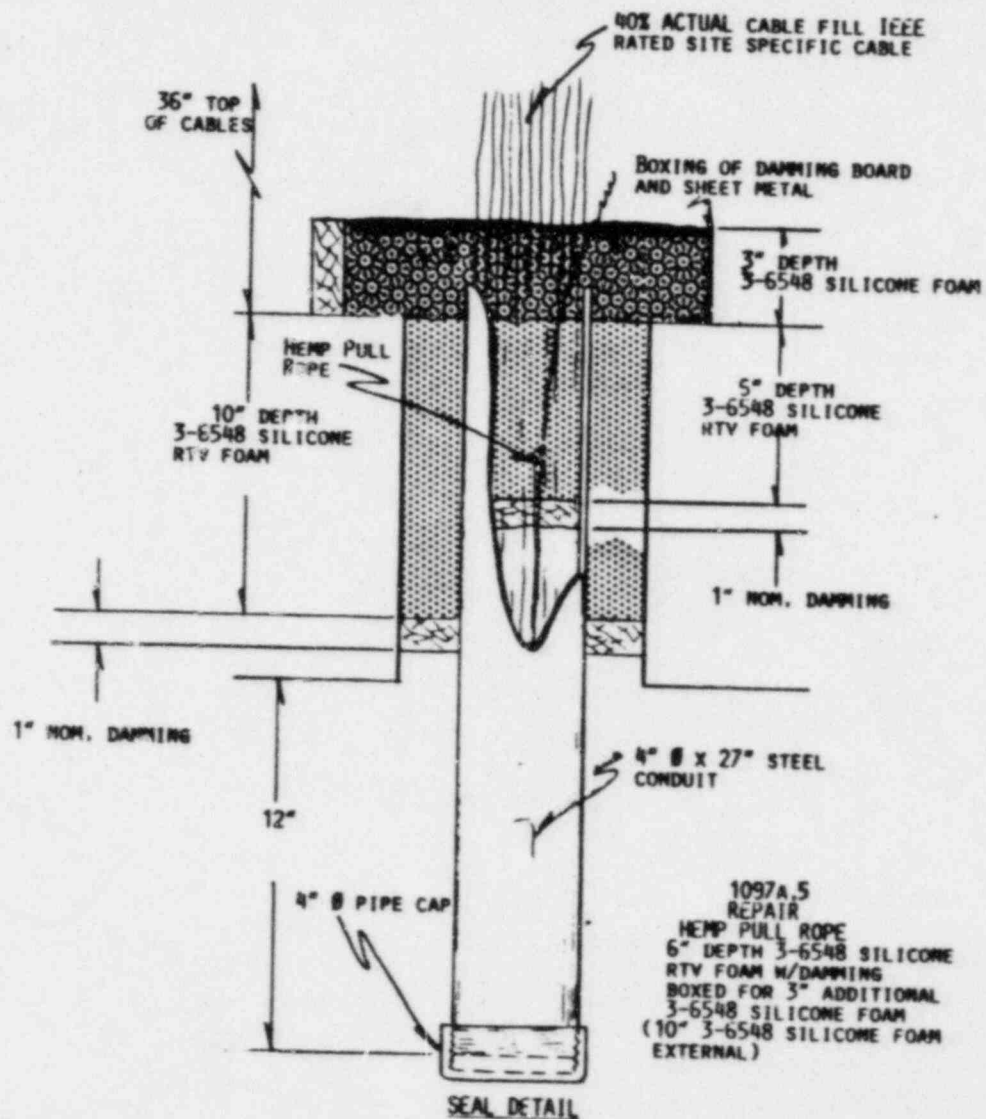
THERMOCOUPLE PLACEMENT

REVISION APPROVAL			REVISIONS		
NO	DATE	BY	NO	DATE	BY
1			1		
2			2		
3			3		
4			4		
5			5		



CTP 1097/B CONDUIT TEST  
THERMOCOUPLE PLACEMENT

DESIGNED BY	LCS	DATE	1/13/86
ENGINEER	HTS	REVIEWED BY	---
TESTED		DATE	1/13/86
		BY	---



REVISION APPROVAL			REVISIONS		
NO.	DATE	BY	NO.	DATE	BY
1			1		
2			2		
3			3		
4			4		
5			5		

**PROMAT**

**AS NOTED**

CTP 1097A CONDUIT TEST  
CTP 1097A.5 DETAIL & TC PLACEMENT

DESIGNED BY: LCS  
CHECKED BY: DB  
DATE: 11/29/05  
SCALE: NTS  
B-505