

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 • Seldon Street, Berlin, Connecticut

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

July 6, 1983

Docket No. 50-423

B10833

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

Dear Sir:

Millstone Nuclear Power Station, Unit No. 3
Reporting of Potential Significant Deficiencies in Design
and Construction: Westinghouse 7300 Process Protection
System - Potential Problems with NTC Card Relays (SD-39)

In a June 2, 1983 telephone conversation between your Mr. Johnson and our Mr. R. E. Lefebvre, Northeast Nuclear Energy Company (NNECO) reported a potential significant deficiency in the design of Millstone Unit No. 3 as required by Title 10, Code of Federal Regulations Part 50, Paragraph 55(e).

Our notification to you was made under the advice of Westinghouse, who on June 1, 1983 notified affected customers and the NRC of a potential problem concerning intermittent contact bounce of the Temperature Channel Test (NTC) card during seismic event.

Attached is a copy of Westinghouse letter NS-EPR-2774 from E. P. Rahe to R. C. DeYoung, dated June 8, 1983. NNECO has reviewed the subject problem and agrees with the Westinghouse assessment of the failure mode and concurs with the corrective action of installing a replacement relay prior to Millstone Unit No. 3 operation. As such, it is our position that this letter, including the attached Westinghouse report/correspondence, constitutes our final report on this significant deficiency.

Based on a July 6, 1983 telephone conversation between your Mr. J. Wiggins and our Mrs. P. C. Bandzes, this final report is being submitted to you on July 6 and not July 1 as was originally scheduled. We trust the above information satisfactorily responds to your concerns.

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PDR ADOCK 05000423
S PDR

1/1 IER7

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Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Council

W. G. Council
Senior Vice President

C. Frederick Sears

By: C. F. Sears
Vice President Nuclear and
Environmental Engineering



NEU-4705

Westinghouse
Electric CorporationWater Reactor
Divisions

Nuclear Operations Division

Box 355
Pittsburgh, Pennsylvania 15230

June 14, 1983

S.O. No: NEU-320
NEU-7.35.31Mr. S. Orefice
Project Engineer
NORTHEAST UTILITIES SERVICE COMPANY
P.O. Box 270
Hartford, Connecticut 06141NORTHEAST UTILITIES SERVICE COMPANY
MILLSTONE NUCLEAR POWER STATION
UNIT NO. 3
7300 Process Protection System Potential Problems
With NLP Card Heat Sinks and NTC Card Relays

Dear Mr. Orefice:

With reference to the subject potential problems, attached is a copy of Westinghouse letter NS-EPR-2774 from E. P. Rahe to R. C. DeYoung which was sent on June 8, 1983.

These potential problems were verbally discussed with a member of your projects organization on June 1, 1983.

Please feel free to contact us if there are further questions regarding the foregoing.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION


for R. L. Hofer, Manager
NUSCO Projects

Gregg/mmc/1251D:1

Attachment

cc: S. Orefice 4L, 4A
R. W. Ackley 6L, 3A

NEU-4705

bcc: R. L. Hofer 1L
R. Cepko 1L, 1A
D. R. Gregg 1L
W. E. Cheshire (MNC 578) 1L
J. Carlson (Hartford Sales) 1L
R. M. Pantuck (Boston Sales) 1L
NSID Central File R&D Bldg. 701, 4th Floor 1L, 1A
J. Dolan (W Site Manager) 2L, 2A
E. R. Duhn 1L

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Westinghouse
Electric Corporation

Water Reactor
Divisions

Box 355
Pittsburgh, Pennsylvania 15202

NS-EPR-2774

June 1, 1983

Mr. R. C. DeYoung, Director
Division of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Phillips Building
7920 Norfolk Avenue
Bethesda, MD 20014

Dear Mr. DeYoung:

This is to confirm the telephone conversation of June 1, 1983, between Messrs. D. H. Rawlins and C. G. Draughon of Westinghouse and Mr. N. Villalva of the NRC. In that conversation, Westinghouse notified the NRC of two potential problems within the Westinghouse 7300 Process Protection System. This was reported under 10CFR 21 for operating plants and under 10CFR 50.55(e) for plants under construction. Westinghouse has advised its NSSS utility customers of this determination. The two concerns are described below.

1. Heat Sinks on NLP Card

Description of Problem

Heat sink adhesive failures have been identified at several utilities and were reported to Westinghouse as field deficiencies. All reported field failures have occurred only on the loop power supply (NLP) cards. Westinghouse has determined that NLP printed circuit cards shipped from Westinghouse Industry Electronics Division (WIED) between August 1, 1980, and September 1, 1982, were equipped with a thermal heat sink assembly on the inverter transistors that are subject to potential failures in the adhesive bond in the thermal link assembly. The adhesive bond is between an insulating washer and the thermal link (see Attachment I). Failure of the bond can cause the heat sink plate to separate from the thermal links and fall off of the printed circuit board. The plate is conductive metal and under certain circumstances could cause shorting of low level signals if it became wedged between cards in the card frame. The affected printed circuit boards are:

~~3306160433~~ QB

5NLP Sub-Level 18 and above

6NLP Sub-Level 18 and above

Note: Previous Sub-Levels did not contain heat sinks. The assembly sub-level identification sticker is attached to the solder side of the card near the front edge. It is not the revision identified on the front edge.

The adhesive failure mechanism or expected number of hours of system operation before failure is not defined. All reported problems have occurred under normal system usage or storage. To date, these heat sink adhesive failures have not resulted in any damage to the Westinghouse 7300 Process Protection System nor have these failures resulted in any loss of system safety functions.

Corrective Action

Westinghouse has committed to provide replacements for the heat sinks that are subject to this potential adhesive failure mechanism. These heat sinks can be identified by inspection of the printed circuit card for hex nuts visible on the top side of the assembly. See attached drawing 404A605 (superseded) (Attachment 1). The new style heat sink has screw heads visible from the top side of the assembly (see Drawing 403A947 Attachment 2).

To justify continued plant operation until these heat sinks can be replaced with the new design, Westinghouse recommends that utilities inspect their 7300 Process Protection System for separated heat sinks and remove any heat sinks that are separated. This inspection should be conducted during each periodic system test until the heat sinks are replaced. In addition, Westinghouse has determined that:

- a. The NLP card can operate satisfactorily without the heat sink.
- b. If a heat sink dislocates during operation and causes a failure, the probability of the failure being detectable is high.

Attachment 3 to this letter is a listing of plants which have been shipped the potentially defective NLP cards. In addition to Westinghouse NSSS plants, WIED supplies this type of equipment directly to Architect Engineers for utility balance of plant (BOP) use and also to other NSSS vendors.

2. NTC Card Relay

Description of Problem

During seismic testing of the Temperature Channel Test (NTC) card, contact bounce was experienced in the mercury relay utilized on this card. This intermittent contact bounce will result in signal saturation of the downstream RTD Amplifier (NRA) card in the Hot and Cold circuits of the Westinghouse 7300 Process Protection System. In these systems, filters are adjusted to maintain a total time constant of approximately two seconds for the RTD/filter combination. Since the filter is downstream of the relay, the

0226 00/00/15 08:41
characteristic of the channel response depends on the time constant of the filter. For RTD's specified by Westinghouse, the filter has been set at either zero or two seconds depending on the type of RTD (fast or slow response) utilized. For applications utilizing unfiltered signals, saturation of the NRA card could delay initiation of the Overtemperature - Delta T and Overpower - Delta T trips. For applications utilizing a filtered signal, NRA card saturation would not prevent plant trips, but could result in a spurious plant trip. This problem only occurs as a result of contact bounce induced by a seismic event. A list of plants utilizing filtered and non-filtered circuitry are provided in Attachments 4A and B. This list also provides a reference for all Westinghouse plants utilizing 7300 process protection equipment.

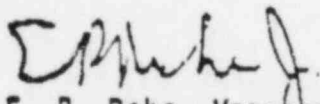
Corrective Action

Attachment 4B lists the plants utilizing unfiltered signals which may experience trip delays due to intermittent relay contact bounce during a seismic event. A replacement relay is being developed and tested and most of these plants will have the replacement relays installed prior to operation.

For operating plants with unfiltered signals, Westinghouse recommends that the existing filters be set for a one second response. This will eliminate the potential delay and ensure that the plant will trip on demand. If the plant does not have sufficient time response margin to accommodate the one second response, then the relays must be bypassed with permanently installed jumpers until the replacement relay is installed.

If you require additional information on these subjects, please contact C. G. Draughon of my staff at 412-374-5761.

Very truly yours,



E. P. Rahe, Manager
Nuclear Safety Department

/KEG

Attachment(s)

ACHMENT 1

INDUSTRY SYSTEMS DIVISION
PITTSBURGH, PA. U.S.A.

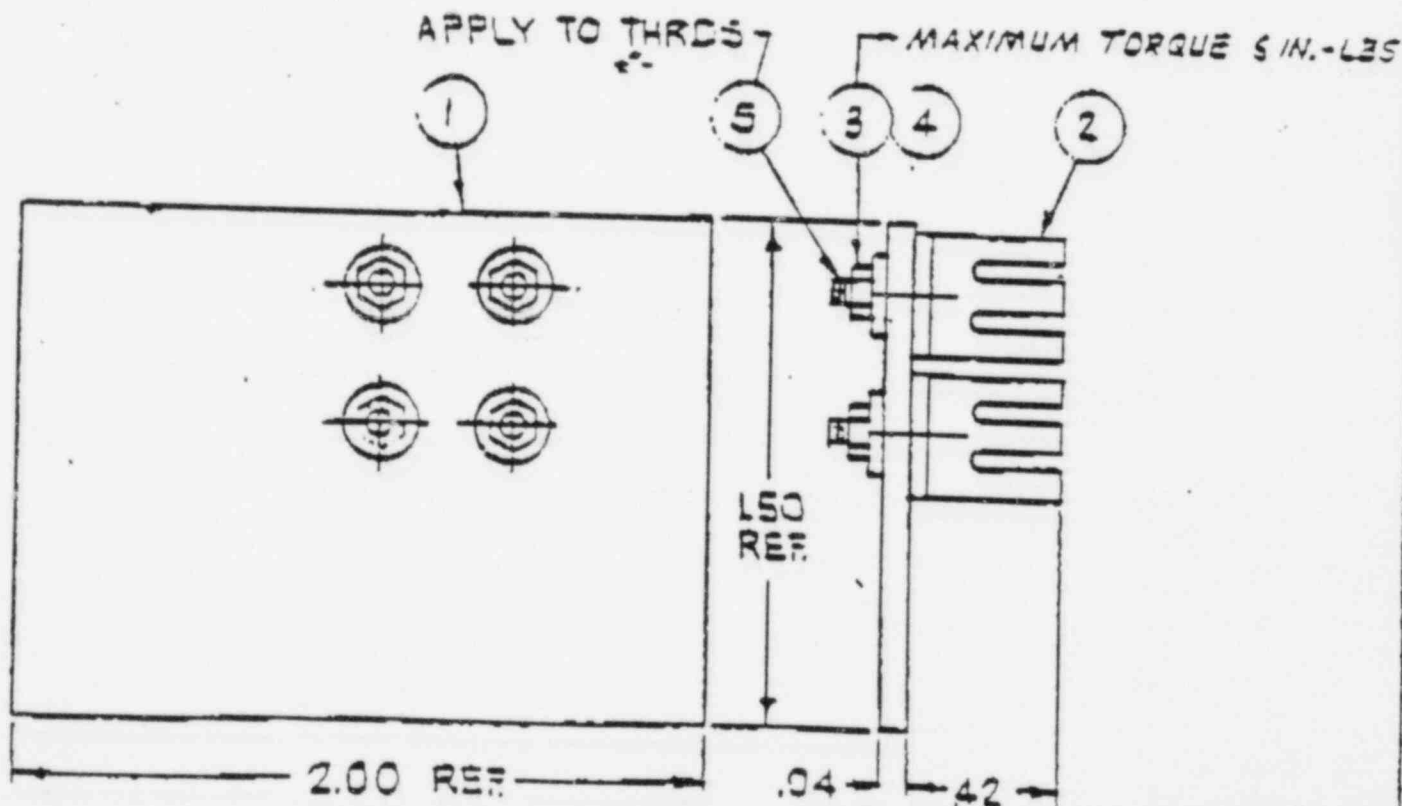


FINISH CHART

SYM.		DESCRIPTION - MATERIAL DIMENSIONS IN INCHES	PART. NO. OR REF. DWG.	STYLE NO.	FINISH CHART					
ITEM	SYM.				GR.	1	2	3	4	5
1		HEAT SINK PLATE		2335 A35H01	1					
2		THERMAL LINK		404AG06H01	4					
3		.138-32-NYLON HEX NUT 09080			4					
4		.133 EXT. TOOTH WASHER 11009			4					
5		LOCTITE #271	26182							

SUPERSEDED BY
 NOTE: DWG. 403A947G01 FOR OLD
 OR NEW DESIGN.

1-TO RETROFIT TO EXISTING P.C. BOARD ASSEMBLIES, MOUNT THERMAL LINK IT.2 TO TRANSISTORS BEFORE ASSEMBLING TO HEAT SINK PLATE IT.1.



SUPPRESSED

STANDARD DRAWING
ANY CHANGE MUST BE AUTHORIZED
BY DEVELOPMENT ENGINEERING DEPT

~~404A-655~~

INDUSTRY SYSTEMS DIVISION
ATTN: R. P. U.S.A.

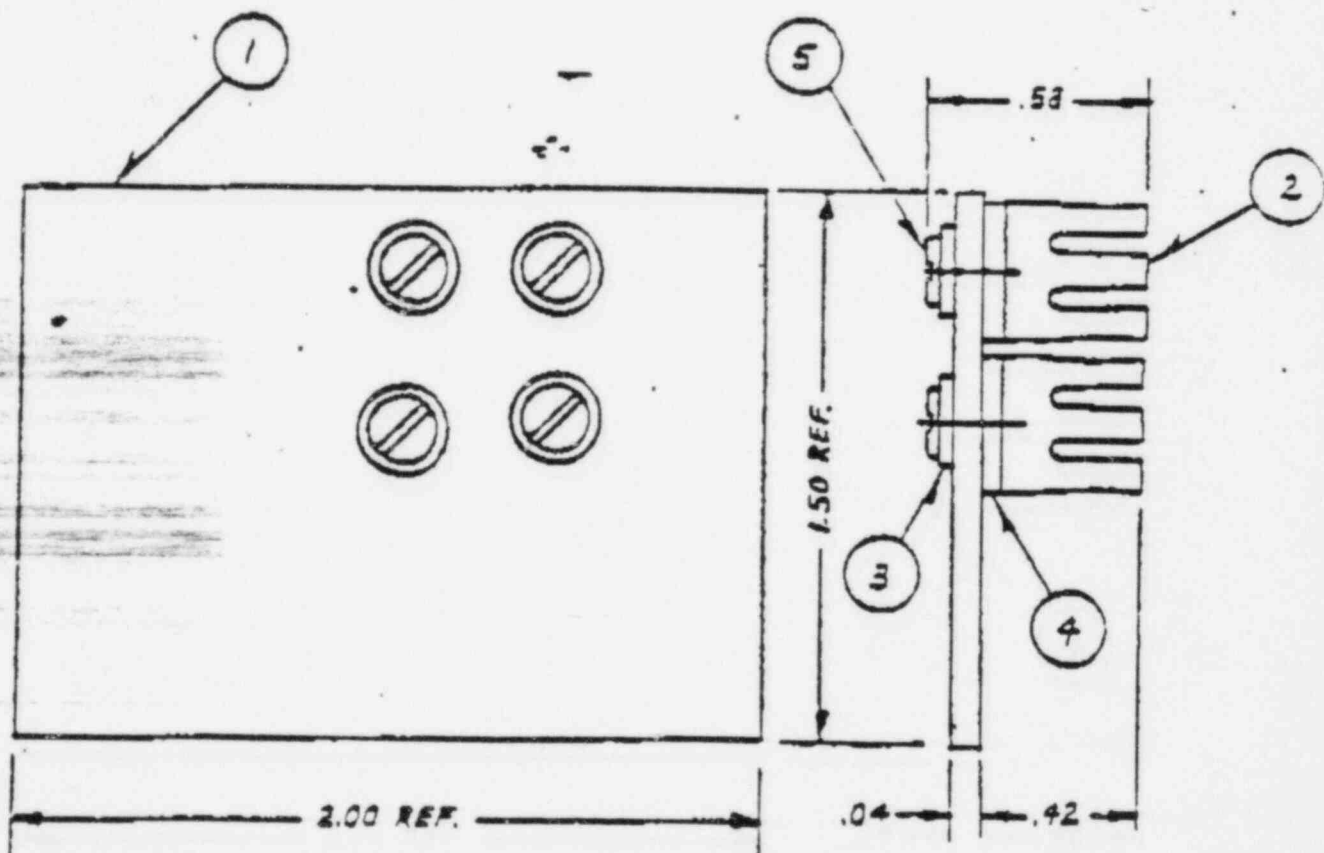


Dwg. 403A947

SUN. 1.

FINISH CHART.

ITEM	STYLE NO.	DESCRIPTION	GROUP				
			1	2	3	4	5
1	2835A35H01	HEAT SINK PLATE	1				
2	404A947H01	THERMAL LINK	4				
3		H02 SHOULDER WASHER	4				
4		H03 3E O WASHER	4				
5	10101	4-40 x .25 SCREW, BLIND. HD.	4				



STANDARD DRAWING
ANY CHANGE MUST BE AUTHORIZED
BY DEVELOPMENT ENGINEERING DEPT

403A947

Plants Having Potentially Defective NLP Cards

IED records show the following projects have some NLP Cards with the old style heat sink assemblies which should be replaced.

I. Supplied with Original of NSSS Process Protection Systems:SITE

P.S. OF N.H. - SEABROOK
 KO-RI #2 - KOREA
 NAPOT PT. - PHILIPPINES
 VANDELLOS - SPAIN
 WOLF CREEK
 CALLAWAY #2
 NAPOT PT. - PHILIPPINES
 TAIWAN POWER - MAANSHAN #1
 TAIWAN POWER - MAANSHAN #2
 KO-RI #5 - KOREA
 CP&L - SHEARON HARRIS #1
 DUKE POWER - CATAWBA #1
 DUKE POWER - CATAWBA #2
 N.E. UTILITIES - MILLSTONE #3
 S.C. ELECTRIC & GAS - SUMMER
 LEMONIZ, SPAIN
 ASCO, SPAIN
 ASCO, SPAIN
 COMM. EDISON - BYRON #1
 COMM. EDISON - BYRON #2
 COMM. EDISON - BRAIDWOOD #1
 COMM. EDISON - BRAIDWOOD #2
 TEXAS UTILITIES - COMANCHE PEAK #1
 TEXAS UTILITIES - COMANCHE PEAK #2
 CALLAWAY #1
 WOLF CREEK #1
 CALLAWAY #2
 P.S. OF N.H. - SEABROOK

II. Supplied in Other Than NSSS Systems:SITE

VEPCO - NORTH ANNA
 VEPCO - NORTH ANNA
 SO. CAROLINA ELECTRIC & GAS - SUMMER
 COMMONWEALTH EDISON
 SO. CAROLINA ELECTRIC & GAS - SUMMER
 SO. CAROLINA ELECTRIC & GAS - SUMMER
 AMERICAN ELECTRIC POWER
 IND. & MICH. POWER
 KANSAS GAS & ELECTRIC

II. Supplied in Other Than NSSS Systems (Cont.):SITE

PASNY - INDIAN PT.
 VEPCO - NORTH ANNA
 DUKE POWER
 CON ED - INDIAN PT.
 VEPCO - NORTH ANNA
 DUKE POWER
 ALABAMA POWER - FARLEY
 ALABAMA POWER - FARLEY
 ANGRA - BRAZIL
 ALMARAZ - SPAIN
 KOREA ELECTRIC - KO-RI 2
 KOREA ELECTRIC - KO-RI 2
 PHILIPPINES - NAPOT PT.
 PHILIPPINES - NAPOT PT.
 TAIWAN POWER - MAANSHAN
 ALMARAZ - SPAIN
 PHILIPPINES - NAPOT PT.

III. Repair OrdersSITE

CON ED - INDIAN PT. #2
 TEXAS UTILITIES - COMANCHE PEAK
 IND. & MICH. POWER (AEP) RVLS
 P.S. OF N.H. - SEABROOK #2
 DUKE POWER - CATAWBA
 KRSKO
 TVA - SEQUOYAH
 TVA - SEQUOYAH

NOTE: - = WNSD ALSO BEING NOTIFIED AS THIS WAS AN NSD ORDER
 * = THIS SITE IS ALSO ON THE SYSTEMS LIST

ATTACHMENT 4A

Filtered Plants
(Utilize a Fast Response RTD)

- * Joseph M. Farley Unit 1
- * Joseph M. Farley Unit 2
- * North Anna Unit 1
- * Wm. B. McGuire Unit 1
- * North Anna Unit 2
- * Wm. B. McGuire Unit 2

- * Operating Plants

ATTACHMENT 4B.

Non-Filtered Plants
(Utilize a Slow Response RTD)

- ** Comanche Peak Units 1 and 2
- Seabrook Units 1 and 2
- Beaver Valley Unit 2
- Byron Units 1 and 2
- Braidwood Units 1 and 2
- Vogtle Units 1 and 2
- Shearon Harris Units 1 and 2
- Catawba Units 1 and 2
- South Texas Units 1 and 2
- Millstone Unit 3
- Marble Hill Units 1 and 2
- * Virgil C. Summer
- Callaway Unit 1
- Wolf Creek Unit 1

* Operating Plants

- ** Overttemperature N-16 channels for these plants utilize Tcold signal. NRA card saturation would not prevent plant trips, but could result in a spurious plant trip.