

ORGANIZATION: ROSEMOUNT, INC.
EDEN PRAIRIE, MINNESOTA

REPORT NO: 99900271/82-01	INSPECTION DATE(S) June 7-11, 1982	INSPECTION ON-SITE HOURS: 26
CORRESPONDENCE ADDRESS: Rosemount, Inc. ATTN: Mr. F. J. Oakley Vice President, Operations 12001 W. 78th Street Eden Prairie, MN 55344		
ORGANIZATION CONTACT: Mr. G. D. Anderson TELEPHONE NUMBER: (612) 941-5560		
PRINCIPAL PRODUCT: Temperature and pressure instrumentation qualified to IEEE 323 requirements.		
NUCLEAR INDUSTRY ACTIVITY: Five to ten percent of total activity is nuclear.		
ASSIGNED INSPECTOR:	<u><i>L. B. Parker</i></u> L. B. Parker, Reactive and Component Program Section (R&CPS)	<u>8/13/82</u> Date
OTHER INSPECTOR(S):		
APPROVED BY:	<u><i>I. Barnes</i></u> I. Barnes, Chief, R&CPS	<u>8/13/82</u> Date
INSPECTION BASES AND SCOPE:		
A. <u>BASES</u> : 10 CFR Part 50, Appendix B, and 10 CFR Part 21.		
B. <u>SCOPE</u> : This inspection was made in response to: (1) requests by Region II of the Nuclear Regulatory Commission (NRC) to evaluate: (a) a 10 CFR 50.55(e) report by Mississippi Power and Light Company (MP&L) concerning corroded terminal boards on transmitters used at Grand Gulf Nuclear Station (GGNS); (b) a 10 CFR 50.55(e) report by MP&L concerning "O" ring seals on transmitters which do not provide a seal that conforms with the requirements of NUREG-0588 (cont. on next page.)		
PLANT SITE APPLICABILITY: Docket Nos. 50-416, 50-417, 50-382, 50-245, 50-336, 50-387, and 50-388.		

DESIGNATED ORIGINAL
Certified By *Shelanne Joubert*

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for Class 1E equipment located inside containment; (2) a report from the NRC Senior Resident Inspector at Millstone Nuclear Station Units 1 and 2, and a 10 CFR 50.55(e) to the NRC Region IV from Waterford Unit No. 3 concerning corrosion degradation of resistance temperature detector (RTD) leads at the terminal block connection in the head of the RTD assembly; and (3) a 10 CFR 50.55(e) report by PP&L concerning a potential diode failure (identified by Rosemount) on the amplifier board of pressure transmitters, Models 1151 and 1152 with output codes A and D at Susquehanna Steam Electric Station. Additionally, the following areas were inspected: (1) status of previous inspection findings; and (2) manufacturing process control.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.1.5 of Quality Implementation Procedure (QIP) 21(I), Revision D, dated May 21, 1981, red lines on Inspection Procedure 3799-2, Revision B, dated June 18, 1981, were out-of-date and being used.
2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.1.5.1 of QIP 21(I), Revision D, step 3 of "Nuclear Assembly Operations Sheet," Operation No. 3935-N had been red lined without being initialled or dated.
3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 4.5.6 of the Industrial Division Quality Assurance Manual, Revision G, dated February 26, 1982, Travel Cards (Form 61024, Revision C) currently used in the final assembly of Model 1153's are not covered by a written procedure.
4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.2.2 of QIP 21(I), Revision D, the traveller for Part No. 01152-0033-0004, Revision F, for Bill of Material (BOM), Revision A, did not list the revision level of any of the listed process specifications.
5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and BOM 01153-0259-0052, Revision D, Run Date September 3, 1981 (which requires Process Procedure 01153-3032, Revision D), the Nuclear Traveller for Part No. 01153-0259-0052, Revision E, for BOM, Revision D, required Process Procedure 01153-3034, Revision D, for Operation No. 30, "Form and Serialize."

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6. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Step 7 of Tig Center Weld Set-up in Stretch Weld Procedure, 1153-3030, Revision B, dated October 12, 1979, and Step A of Verify Diaphragm Stretch, the standard weld log and the sensor operation log were used to record data instead of the logs identified in the procedure.
7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 4.2.2 of QIP 21(I), Revision D, the completed Nuclear Traveller for Part No. 01153-0259-0052, Revision E, for BOM, Revision D, does not indicate the six rejected NB52 sensor cells; Serial Nos. 749005, 749015, 749051, 749122, 749169, and 749176.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Unresolved Item (80-01): A determination could not be made as to how the General Electric (GE) Quality Assurance Program had qualified RMT 1152 transmitters to IEEE STD 323-1974.

Current RMT Product Data Sheet 2235, revised August 1981, states that the 1152 (E output code) transmitters are qualified per IEEE STD 323-1971 and IEEE-344 1975. Also 1151 (E&B output codes) are not nuclear qualified by RMT. This item is closed at RMT, and will be covered in a future inspection at the GE facility.

2. (Closed) Unresolved Item (80-01): RMT requested that the Gilbert Associates, Inc. requirement for 1153 (A output series) transmitters be changed from IEEE STD 344-1975 to IEEE STD 344-1971.

In August 1980, RMT qualified the 1153 (A output series) transmitters to IEEE STD 344-1975.

E. OTHER FINDINGS OR COMMENTS:

1. Regional Requests:

- a. On April 21, 1982, MP&L reported corroded terminal boards on pressure transmitters, flow transmitters and level transmitters at their GGNS Unit 1. MP&L issued 10 CFR Part 50.55(e) interim report (PRD-82/23) to NRC Region II concerning this problem on May 21, 1982. RMT had no knowledge of this corrosion problem. Bechtel Power Corporation, Gaithersburg, Maryland, will be contacted on this during a future inspection.

- b. On April 21, 1982, MP&L reported that installation of O-ring seals on RMT transmitters did not conform to requirements of NUREG 0588, Class 1E, for components located inside containment at their GGNS Units 1 and 2.

MP&L issued 10 CFR Part 50.55(e) final report for Unit 1 and an interim report for Unit 2 (PRD-82/22) to NRC Region II on May 21, 1982, which stated in part, "The Rosemount transmitters themselves did not contain a deficiency. The deficiency was caused by improper use of a hydrocarbon lubricant on the 'O' rings between the housings and the housing covers. This was done by Bechtel Power Corporation, Gaithersburg, Maryland."

RMT had no knowledge of this 'O' ring deficiency. However, RMT instruction manuals for the 1151, 1152, and 1153 model transmitters contain precautionary paragraphs requiring the use of silicone oil on the 'O' ring. Bechtel Power Corporation, Gaithersburg, Maryland, will be contacted on this problem during a future inspection.

- c. Millstone Nuclear Station Senior Resident Inspector identified the degradation of RMT resistance temperature detector (RTD) signals caused by corrosion of the RTD leads at a terminal block connection in the "head" of the RTD assembly (Rosemount Model 104ADA and 104AFC). This same deficiency was also identified in a 10 CFR Part 50.55(e) report by Louisiana Power and Light (LP&L) for their Waterford Unit No. 3.

LP&L had been notified of the deficiency by Ebasco Services, Incorporated, who in turn had been notified by Combustion Engineering, Power Systems, on July 27, 1981.

RMT states the following in a response letter to a NSAC/INPO Significant Event Report (SER): (1) "The RTD design cited in the report is unique to C-E reactors and possibly only Millstone"; and (2) "the RTD terminal lugs are tin plated and the terminal block fittings are copper. We would not expect any interaction between these materials under sealed conditions."

Since this RTD design was unique to C-E reactors, and the NSAC/INPO SER had been sent to CE, RMT considered the SER as notification of the deficiency to the purchasers.

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This RTD design has been discontinued by RMT. C-E reactor RTD designs have been changed to incorporate nickel plated terminal blocks as well as improved connection head design.

RMT has taken adequate corrective action and actions to prevent recurrence.

- d. PP&L reported that Rosemount had identified a potential diode failure on the amplifier board of pressure transmitter Models 1151 and 1152 with output codes A and D. RMT determined that this deficiency was caused by moisture entrapment during manufacture of the diode.

RMT traced the lots containing defective diodes and determined all of the defective diodes had been used by their Canadian manufacturing operations in the production of C-1152 transmitters which are not sold in the United States.

RMT has taken adequate corrective action and actions to prevent recurrence.

- 2. Manufacturing Process Control - Travellers, Quality Implementation Procedures, drawings, engineering change authorizations, assembly operations sheets, traveller cards, bills of material, operation logs, and inspection procedures were examined from the following areas: sensor assembly, electronics assembly, and final nuclear assembly. Nonconformances B.1 through B.7 above were identified in this area of the inspection.

PERSONS CONTACTED

Company Rosemount Inc.

Dates June 7-11, 1982

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Inspector J. B. Parker

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NAME (Please Print)	TITLE (Please Print)	ORGANIZATION (Please Print)
* Gerry Andersen	QA Supervisor	Nuclear Operations Group
Fred Mades	Quality Engr.	Industrial Q.A.
Regina Rice	Production Supr.	Circuit Board Assembly
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Brad Larson	Senior QA Representative	Nuc. QA
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Betty Snyder	Advanced Inspector	Nuc. QA
Sandy Welter	Inspector	Nuc. QA
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Mary Hilroy	QC Engr.	Industrial QA
Alan Burger	QC Engr.	Industrial QA
Dick Zawacki	Manuf. Engr.	Industrial Projects
* Fred Oakley	Vice President	Operations
* Present at Exit interview		

Inspector L. B. PARKER
 Scope REACTIVE ITEMS

DOCUMENTS EXAMINED

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Item No.	Doc. Type	TITLE/SUBJECT	Doc Date	Doc Rev
1	Instruction Manual	Model 1151 HP Algaline Differential Pressure Transmitters for High Line Pressures #4197	10/75	-
2	Instruction Manual	Model 1152 Algaline Pressure Transmitters for Nuclear Service #4235	6/78	-
3	Instruction Manual	Model 1153 Series B Algaline Pressure Transmitters for Nuclear Service #4302	3/81	-
4	Product Data Sheet	Model 1152 Algaline Nuclear Pressure Transmitters #2235	8/81	-
5	Product Data Sheet	Model 1151 DP Algaline Differential Pressure Transmitter for High Differentials #2257	9/80	-
6	7	FROM: D. ZAWACKI, Rosemount, Inc. Subj: RTD terminal connection corrosion TO: F. SILLAC, Bailey Controls Co.	Dec. 4, 1981	-
7	NSAC/INPO SER	RTD Terminal Connection Corrosion at Millstone Unit 2 SER = Significant Event Report NSAC/AE COMBUSTION ENGINEERING/BECHTEL	7/7/81	-
8	7	FROM: R. L. VOLSTED, Rosemount, Inc. Subj: Response to NSAC/INPO SER TO: A. CHARBONNEAU, NSAC/INPO	Aug 12, 1981	-
9	7	FROM: R. L. VOLSTED, Rosemount, Inc. Subj: SER Final Draft TO: A. CHARBONNEAU, INPO	Sept. 9, 1981	-
10	1	# 104AJ CONNECTION HEAD	-	A
11	1	# 00089-0138 CONNECTION HEAD ASSEMBLY (FOR DUAL ELEMENTS)	-	A
12	1	# 104 AFC SENSOR, TEMPERATURE PLATINUM RESISTANCE TYPE	4/18/79	D
13	7	FROM: R. C. LASSELL, Rosemount Inc. Subj: Potential Zener Diode Failure TO: G. SCHULTZ, Westcott, Inc.	2/27/81	-
14	LIST	OF VENDORS NOTIFIED OF POTENTIAL ZENER DIODE FAILURE	-	-
15	5	FROM: BECHTEL, Gaithersburg Maryland #9645-2301.04 TO: Rosemount Inc.	Apr 15, 1976	3
16	SUBMITTALS FOR PDCS	FROM: Rosemount Inc. #1304245-3910A TO: Bechtel, Gaithersburg Maryland For 4302 Instr. Manual	4-28-82	
17	Same as 16	# 6 Instr Manuals #104/4126 4158 4110/4125 # 5 " " 4213 4263	12-21-78 12-8-78	


Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Inspector L. B. PARKER
 Scope MANUFACTURING
PROCESS CONTROL

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Item No.	Doc. Type	TITLE/SUBJECT	Doc Date	Doc Rev
1	VENDORS LIST	Approved vendors list, Part Number Sort,	Apr. 19, 1982	13:44
2	QA Form	AVL Data Entry Form (61088, Rev B) Addition of Company Code AB, Part No 1199-257 TRI-Clamp #5NL Vendor Name Chandler Ind.	4-1-82	-
3	Receiving Document	Vendor No. 85133 Anderson Automatics Inc. Part No. 01153-0235-002 1000 stems, Vent, SST, Modified PO No E62054	-	A
4	LOT TAG	P.O. No E62054 Item No. 1153-235-2 Lot # W1 	-	A
5	3	Insps. Procedure for Vent, SST, Weld Flange Part# 1153-235 Dwg# 1153-235 Rev A	3-15-82	-
6	QA Record	Insp. Record for Part# 1153-235-2 Order # E62054 Lot # W1 mfg. Anderson	6-8-82	-
7	1	# 01153-0235 (Two pages) ECA 813451	3-8-82	A
8	1	# 1153-0176 (Two pages) ECA 810076	1-30-81	B
9	TRAVELLER	Nuclear Traveller (Form No. 60904-5) Dwg No T01153-0259-052 Sensor, Stretched Diaphragm Rev B BOM Rev ECA# 811552 JB	10-5-81	-
10	4	Rosemount Industrial Division QA Manual 1742	4-1-82	G
11	3	Seismic Test Procedure for 1153 Series A Pressure Transmitters	9-22-80	A
12	Report	Qualification Report Rosemount Model 1152 Output Code "E" Pressure Transmitters # 38019	10-12-80	A
13	"	Low level Radiation Test Report for Rosemount Model 1152 Pressure Transmitter RMT Report # 9805A	9-11-80	-
14	"	Test Results of Rosemount Model 1152 pressure transmitters Supplementary Radiation Test II RMT Report # 98022C	10-15-80	-
15	"	Seismic Qualification Test Report for 1153 A Transmitters # 68011E	-	C
16	3	Insp. Procedure # 1P3799-3 Model No 1152 Page 2	4-21-80	Org Rel
17	3	same as 16 Page 1	6-18-81	B

Document Types:

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| 1. Drawing | 5. Purchas Order |
| 2. Specification | 6. Internal Memo |
| 3. Procedure | 7. Letter |
| 4. QA Manual | 8. Other (Specify-if necessary) |

Inspector L. B. PARKER

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DOCUMENTS EXAMINED

Item No.	Doc. Type	TITLE/SUBJECT	Doc Date	Doc Rev
18	ASSEMBLY SHEET	NUCLEAR ASSY OPERATIONS SHEET Work Station 3935 Part# 1153-15-1 2 pgs.	2/20/80	B
19	"	Oper. No. 3935-N Rev B Part Name 1153 A-Series Header Casting Same as 18 except work station 3931	8/23/79	A
20	Traveller Card	(Form 61024 Rev B) for a 1153 GBB Serial # 651922 3863	-	-
21	Traveller	(Nuclear Application) Part No. 01152-0033-0004 Rev F Bom Rev A. PWA Amplifier 4-20 MA	UNK	3
22	"	BOM 01152-0033-0004 Assy PWA Amplifier 2 sheets	4/26/82	A
23	Nuclear Traveller	Part No 1153-0259-0052 Rev E BOM D TO 1153-0259-0052 Sensor Stretched Diaphragm	10/5/81	B
24	"	BOM 01153-0259-0052 NUC Sensor STR. Diag.	9/8/81	D
25	"	# 1153-3030 Stretch Weld Procedure 13 pages	10/18/79	B
26	Log	Sensor Revolution Box Serial # 0077 NB52 6 pages Job Number 0274 Heat # 86459 Lot # 0084	6/7/82	-
27	"	QIP 22E In Process Inspection 8 pages	5/15/79	D
28	"	QIP 21(I) Manufacturing Engineering Document Control 9 pages	5/21/81	D
29	"	QIP 23 I Production Control 2 pages	6/2/81	A
30	Change Orders Traveller	QIP 23 I Production Control 1 page	4-1-82	A 1
31	print package	Procedures and Prints for Item 23	-	-

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)