

April 24, 2007

*Designated  
Original*

Document Control Desk  
Washington, D.C. 20555  
Copy To:  
Chief, Quality and Vendor Branch B,  
Division of Engineering,  
Office of Nuclear Reactor Regulation

SUBJECT: Reply to Notice of Nonconformances and Violation Identified in NRC  
Inspection Report 99901360/2006-201

Nonconformance 99901360/2006-201-01

1) Reason for the Nonconformance:

Manufacturing Instructions (MIs) for the Barton transmitter connector assemblies were developed by ITT Barton Industrial Engineers (IEs) and Manufacturing Engineers (ME's) and documented in an ITT Barton's computer system called AMAPS in the early 1980s. Those MIs contained operation steps and descriptions that the IEs and MEs thought were adequate to build the connector assemblies. Those MIs remained virtually unchanged over the years and were transferred into the Prime Measurement Products computer system called BPCS in 1999.

In retrospect, the ITT Barton MIs relied on the assembly operator's knowledge of how to build the connector assemblies. Prime Measurement Products only discovered in 2006 that there were assembly and quality issues with the connectors that resulted in the subsequent Advisory Letter issued in May of 2006 to all nuclear customers.

2) Corrective Steps Taken:

Prime Measurement Products re-designed its connector assembly to prevent exposed and broken lead wire conductors. New assembly fixtures were provided to the operators to facilitate further embedding of the lead wire insulation into the epoxy potting of the connector assembly. Very detailed manufacturing assembly instructions were developed and appropriate quality control inspection criteria were defined in procedure MAIO-4001.

However, these manufacturing assembly instructions were put on hold pending re-qualification of Prime Measurement Products re-designed connector assembly and no further transmitter connector assemblies have been manufactured for production use since the NRC visit in July of 2006.

3) Corrective Steps That Have Been Taken To Avoid Further Noncompliance's:

Prime Measurement Products and Cameron Measurement Systems have discontinued use of the original and re-designed connector assembly and have now implemented use of a qualified connector assembly manufactured by EGS. Neither Prime nor Cameron currently contemplates manufacturing the original or re-designed transmitter connector assembly.

4) Dates Corrective Action Will Be Completed:

The Model 764 Connector Assembly Manufacturing Instructions, drawing no. MAI0-4001, is completed but will not be used because connectors are now being purchased through EGS rather than manufactured.

Prime Measurement Products Engineering Report R3-764-80 justifies use of the EGS connector in the Barton Model 763 & 763A Gage Pressure Transmitters and the Barton Model 764 Differential Pressure Transmitters.

All actions completed.

Nonconformance 99901360/2006-201-02

1) Reason for the Nonconformance:

In 1982 ITT Barton did not completely evaluate the design change that removed the heat-shrink sleeving over the individual external lead wires extending into the epoxy potting material. Inefficiencies in the way Engineering Change Orders were processed at that time failed to consider all criteria established under Criterion III, "Design Control," of 10 CFR Part 50, Appendix B. The selection and review for suitability of application of material, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components was apparently not fully completed. As such the design change was not subjected to testing to determine if there was an environmental qualification impact.

2) Corrective Steps Taken:

Although the June 1982 design change that eliminated the heat shrink was intended to enhance the environmental protection, recent evaluations have concluded that insufficient data is available to support this position. Therefore, Prime concluded that a new IEEE-323 qualification test would be necessary in order to demonstrate qualification of the June 1982 connector assembly design. Consequently, Prime further concluded that every connector assembly manufactured by Barton and Prime since June 1982 is not fully qualified for use in a conductive accident environment like LOCA.

Because the exact heat shrink material used in the original Barton transmitter connector design could no longer be purchased a significant effort was made to create and justify a

similar design and to further justify the current design. A conservative leakage and thermal shock test program was developed to evaluate the environmental protection capabilities of various design and material combinations for the connector assemblies. These test were too severe in that they showed weaknesses in each variation of the connector that was tested that could not be justified without performing a complete IEEE-323 LOCA qualification test program.

In the interest of implementing an expedient fix, Prime Measurement Products investigated the use of a qualified alternate design connector like the EGS Quick Disconnect Connector (QDC). Prime engineering worked with EGS and Westinghouse on the evaluation of the EGS QDC for use on models 763, 763A and 764 transmitters and produced engineering report R3-764-80 justifying the use of this prequalified connector assembly.

Prime Measurement Products issue a new advisory letter in January 2007 to all its nuclear customers informing them of this new position.

3) Corrective Steps That Have Been Taken To Avoid Further Noncompliance's:

Prime Measurement Products and now Cameron Measurement Systems has discontinued the use of the original connector and is now purchasing the EGS QDC connector for all of Model 763, 763A and 764 transmitters being manufactured.

4) Dates Corrective Action Will Be Completed:

All actions are completed.

Violation 99901360/2006-201-03

1) Reason for the Violation:

Prime Measurement Products quality assurance procedure QU-121 has remained unchanged from the way it was originally written. Revision to QU-121 have been made only to change company names. NUPIC and NIAC quality system audits through the years never identified that QU-121 did not address all of the requirements of 10 CFR 21.21.

2) Corrective Steps Taken:

Prime procedure QU-121, "NRC Regulations to 10 CFR Part 21," Revision 3, dated September 24, 2003 will be re-written to address all the requirements of 10 CFR 21.21 (a)(2) the provision for interim reports, (a)(3) and the provision for notification of a director or responsible officer.

3) Corrective Steps That Have Been Taken To Avoid Further Noncompliance's:

Cameron Measurement Systems will review Prime's CMS other quality assurance procedures as is switches over to make sure they are in accordance with Title 10 of the Code of Federal Regulations.



4) Dates Corrective Action Will Be Completed:

Cameron Measurement Systems is in the process of switching Prime's QMS to its new location on 4040 Capital Ave. and is expecting to finish in 60 to 90 days.

Tom Roide



Manager Quality Assurance  
Cameron Measurement Systems

	<b>QUALITY ASSURANCE PROGRAM</b>		No.: QU-121
	Subject: NRC REGULATIONS TO 10CFR, PART 21		Effective: 04/17/07      Rev.: 4
Measurement Systems division	Signature	Title	Supersedes: QU-121, Rev. 3 Dated 09/24/03
	By: T. Roide 	Quality Manager	
	App: P. Holley	VP Operations & GM	Page 1 of 4

**1. INTENT**

1.1. The intent of this procedure is to identify the requirements of Title 10, Chapter 1, Code of Federal Regulations, Part 21, and the methods for implementation at Cameron.

**2. REQUIREMENTS**

2.1. 10CFR21 requires notification to the Nuclear Regulatory Commission by any individual Manager or any responsible officer of a firm, constructing, owning, operating or supplying basic components to any facility or activity licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended, or the Energy Reorganization Action of 1974, who obtains information reasonably indicating that:

The facility activity or basic component supplied to such facility or activity contains defects which could create a substantial safety hazard.

2.2. Applicability

All Cameron employees involved in the administration, design, procurement, test or inspection of a Cameron product processed under the provisions of 10CFR, Part 21.

**3. DEFINITIONS**

3.1. Cameron is a supplier of BASIC COMPONENTS to the Nuclear Power Industry, and as such, there are specific key definitions in 10CFR, Part 21, which are applicable to our product and our responsibilities. The following definitions are in no way intended to be all inclusive and are offered as guidelines only.

3.1.1. Basic Component means a component or part necessary to;

- 1) the integrity of the reactor coolant pressure boundary,
- 2) the capability to shut down the reactor and maintain in a safe shut-down condition, or
- 3) the capability to prevent or mitigate the consequences of accidents.

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- 3.1.2. Defect means a deviation in a basic component that on the basis of evaluation could cause a substantial safety hazard.
- 3.1.3. Deviation means a condition or circumstance involving a basic component that could contribute to exceeding a safety limit; or Deviation may also mean a departure from the technical requirements included in a procurement document.
- 3.1.4. Discovery means the completion of the documentation first identifying the existence of a deviation or failure to comply.
- 3.1.5. Evaluation means the process of determining whether a particular deviation could create a substantial hazard.

**4. PROCEDURE**

- 4.1. Any Cameron employee who is aware of a potential deviation in a product to which 10CFR, Part 21 applies, shall immediately notify the Manager of Quality Assurance using the form provided as part of this procedure. Within 3 working days of receipt of this notification, the Manager of Quality Assurance will convene a meeting with members of an Executive Board which will include, at a minimum, the Director of Engineering, the Manager of Nuclear Products Engineering, and the initiator of the notification if he/she is other than one of the committee members.

The purpose of this meeting is to determine if the reported potential defect falls within the criteria defined in 10CFR, Part 21. If the results of the meeting indicate that the report is within that criteria, the date of the original written report shall be considered as the date of discovery. The Manager of Quality Assurance shall assure that the deviation is evaluated within the allowable 60 day period and that, when applicable, information is provided to the President for notifications within the requirements of 10CFR, Part 21.

- 4.2. If an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard cannot be completed within 60 days from the discovery of the deviation or failure to comply, an interim report will be prepared and submitted to the Commission through a director or responsible officer or designated person. The interim report should describe the deviation or failure to comply that is being evaluated and should also state when the evaluation will be completed.
- 4.3. Ensure that a director or responsible officer subject to the regulations of this part is informed as soon as practicable, and, in all cases, within 5 working days after completion of the evaluation required by 10CFR21 paragraph 21.21(a)(1).



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**5. RECORDS**

5.1. Records identified in 10CFR, Part 21, shall be maintained as described in QU-116.

**6. FEEDBACK**

6.1. The employee who made the initial notification shall be informed of the action taken by management.



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**POTENTIAL DEVIATION REPORT**

**REPORT**

Report No.: \_\_\_\_\_

Item No.: \_\_\_\_\_

Description of Deviation: \_\_\_\_\_  
\_\_\_\_\_

Description: \_\_\_\_\_

Reported By: \_\_\_\_\_

Date: \_\_\_\_\_

Logged By: \_\_\_\_\_

Date: \_\_\_\_\_

1  
D  
A  
Y

**PRELIMINARY REVIEW**

**SCHEDULE**

Report Received By: \_\_\_\_\_

Date: \_\_\_\_\_

Preliminary Review By: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_

W  
3 D  
A  
Y

**EVALUATION**

**PROGRESS REPORT**

Evaluation/Progress Report Responsibility: \_\_\_\_\_

Evaluation Results: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WEEKLY   
BI-WEEKLY   
MONTHLY

Evaluated By: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_

C  
D  
4 A  
2 Y  
S

**FINAL REVIEW**

Deviation Reportable: Yes \_\_\_\_\_ No \_\_\_\_\_ (See Attached)

Determination By: \_\_\_\_\_

Date: \_\_\_\_\_

GM Final Notification By: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_

W  
D  
3 A  
Y  
S

**10CFR REPORT**

INTERIM OR  FINAL

NRC Report By: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_

W  
D  
3 A  
Y  
S

**CORRECTIVE ACTION**

CAR NO.: \_\_\_\_\_

Date: \_\_\_\_\_