



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 5, 2006

Mr. Anthony Nowinowski, Manager  
Reactor Systems and Services  
Westinghouse Electric Company  
1000 Westinghouse Drive  
New Stanton, PA 15672

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT  
99901043/2006-201

Dear Mr. Nowinowski:

On August 22 and August 23, 2006, the U.S. Nuclear Regulatory Commission (NRC) inspection team conducted an inspection at your facility in New Stanton, Pennsylvania. At the conclusion of the inspection, Mr. Bill Rogers of my staff held an exit meeting and discussed the preliminary inspection findings with you and your staff. The enclosed report presents the details of this inspection.

This was a limited-scope inspection, which focused on assessing your compliance with the provisions of Title 10 of the *Code of Federal Regulations* (CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of 10 CFR Part 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," as it relates to environmentally qualified gauge pressure and differential pressure transmitters provided to the nuclear industry. This NRC inspection report is not intended to endorse or approve your overall quality assurance or 10 CFR Part 21 programs. This inspection consisted of an examination of procedures and representative records, interviews with personnel, and observations by the NRC inspectors.

During this inspection, it was found that the implementation of the Westinghouse Electric Company, Reactor Systems and Services (Westinghouse) quality assurance program failed to meet certain NRC requirements in the area of design verification, which was identified as a nonconformance.

Please provide a written statement in accordance with the instructions specified in the enclosed Notice of Nonconformance within 30 days from the date of this letter. We will consider extending the response time if you can show good cause for us to do so.

Mr. A. Nowinowski

- 2 -

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

Sincerely,

**(/RA by M. E. Mayfield)**

Michael E. Mayfield, Director  
Division of Engineering  
Office of Nuclear Reactor Regulation

Docket No: 99901043

Enclosures: 1. Notice of Nonconformance  
2. Inspection Report 99901043/2006-201

Mr. A. Nowinowski

- 2 -

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

Sincerely,

*(/RA by M. E. Mayfield)*

Michael E. Mayfield, Director  
Division of Engineering  
Office of Nuclear Reactor Regulation

Docket No: 99901043

- Enclosures: 1. Notice of Nonconformance
- 2. Inspection Report 99901043/2006-201

DISTRIBUTION:

EQVB R/F    ECollins  
 PUBLIC     GTracy  
 Docket File   PHiland

**DISK/DOCUMENT NAME:** E:\Filenet\ML062830068.wpd

**ADAMS ACCESSION No.:** ML062830068

ADAMS Availability/Sensitivity:  Publicly Available     Non-Publicly Available     Sensitive     Non-Sensitive

<b>OFC</b>	EQVB:DE:NRR	EICB:DE:NRR	SC:EQVB:DE:NRR	D:DE:NRR	
<b>NAME</b>	BRogers (KNaidu for BR)	HGarg (KNaidu for HG)	HHamzehee	MMayfield	
<b>DATE</b>	10/04/06	10/04/06	10/05/06	10/05/06	

**OFFICIAL RECORD COPY**

## NOTICE OF NONCONFORMANCE

Westinghouse Electric Company  
Reactor Systems and Services  
New Stanton, Pennsylvania

Docket Number 99901043  
Report Number 99901043/2006-201

Based on the results of a Nuclear Regulatory Commission (NRC) inspection conducted on August 22 - 23, 2006, of activities supporting safety-related purchase orders, it appears that certain activities were not conducted in accordance with NRC requirements.

Criterion III, "Design Control," of 10 CFR Part 50, Appendix B, requires, in part, that "measures shall be established for the selection and review for suitability of application of materials, parts, equipment, and process that are essential to the safety-related functions of the structures, systems and components." Criterion III also requires, in part, that ". . . design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program. . . Where a test program is used to verify the adequacy of a specific design feature, . . . it shall include suitable qualifications testing of a prototype unit under the most adverse design conditions. Design control measures shall be applied to items such as the following: reactor physics, stress, thermal, hydraulic, and accident analyses; compatibility of materials; accessibility for in-service inspection, maintenance, and repair; and delineation of acceptance criteria for inspections and tests. Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design. . ."

Contrary to the above, Westinghouse had not demonstrated the environmental qualification of Barton models 763, 763A, and 764 pressure transmitter connector assemblies manufactured after PRIME Measurement Products May 1982 design change to the Barton pressure transmitter connector assembly which removed the heat-shrink sleeving over the individual external lead wires extending into the epoxy material. The pressure transmitter connector assemblies were supplied to NRC licensees for use in applications which required components to be environmentally qualified in accordance with 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants." This issue is identified as Nonconformance 99901043/2006-201-1.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, with a copy to the Chief, Quality and Vendor Branch B, Division of Engineering, Office of Nuclear Reactor Regulation, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to Notice of Nonconformance" and should include for each nonconformance: (1) the reason for the nonconformance, or if contested, the basis for disputing the nonconformance, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further noncompliances and (4) the dates your corrective action will be completed. Where good cause is shown, consideration will be given extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system, Agency-wide Documents Access and Management System (ADAMS), to the extent possible, it should not include any personal

**ENCLOSURE 1**

privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection, described in 10 CFR 73.21.

Dated this 5<sup>th</sup> day of October, 2006.

**U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION**

COMPANY: Westinghouse Electric Company  
Reactor Systems and Services  
1000 Westinghouse Drive  
New Stanton, PA 15672

CONTACT: Anthony Nowinowski, Manager  
Reactor Systems and Services  
Westinghouse Electric Company  
(724) 722-5925

DATES: August 22-23, 2006

REPORT NO: 99901043/2006-201

INSPECTORS: Bill Rogers, NRR/DE/EQVB  
Hukam Garg, NRR/DE/EICB

APPROVED BY: *(/RA by H. G. Hossein)* 10/05/2006

Hossein G. Hamzehee, Chief  
Quality & Vendor Branch B  
Division of Engineering (DE)  
Office of Nuclear Reactor Regulation (NRR)

Date

## **1.0 INSPECTION SUMMARY**

On August 22-23, 2006, the U.S. Nuclear Regulatory Commission (NRC) performed an inspection of Westinghouse Electric Company, Reactor Systems and Services (Westinghouse) at the New Stanton, Pennsylvania facility. The purpose of the inspection was to verify compliance with the regulations contained in 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants" and 10 CFR Part 21, "Reporting of Defects and Noncompliance."

The scope of the inspection focused on selected portions of the Westinghouse quality assurance program and the implementation of the program used in the environmental qualification of Barton pressure transmitters.

### **1.1 Nonconformances**

Nonconformance 99901043/2006-201-1 is discussed in Section 3.1.

### **1.2 Violations**

There were no violations identified during the inspection.

## **2.0 STATUS OF PREVIOUS INSPECTION FINDINGS**

Previous inspection findings were not reviewed during this inspection.

## **3.0 INSPECTION FINDINGS AND OTHER COMMENTS**

### **3.1 Review of the Environmental Qualification of Barton Pressure Transmitters**

#### **a. Inspection Scope**

The NRC inspectors reviewed Westinghouse activities related to the supply of environmentally qualified Barton pressure transmitters, manufactured by PRIME Measurement Products (PRIME), to NRC licensees. The NRC inspectors reviewed the Westinghouse environmental qualification process and the design change review process.

#### **b. Observations and Findings**

##### **(1) Westinghouse Design Change Review Process for Barton Pressure Transmitters**

Westinghouse supplies its customers Barton pressure transmitters, which are manufactured by PRIME to meet Westinghouse specifications, in accordance with the Westinghouse environmental qualification, and shipped with a Westinghouse Certificate of Qualification. Westinghouse stated that PRIME submits each Barton pressure transmitter design change to Westinghouse for their review and approval, documented on a Document Submittal Form (DSF). Westinghouse reviews the change, and, if approved, provides documentation of the approval to PRIME to allow for implementation

of the design change for the transmitters shipped to Westinghouse customers. Westinghouse stated that PRIME discussed proposed changes with Westinghouse, prior to submitting the DSF. If Westinghouse does not approve the changes then PRIME does not implement the change for transmitters which are manufactured to Westinghouse qualifications.

Westinghouse further explained that PRIME classifies the design changes in two categories: (1) Category I design changes, which may affect the environmental qualification of the pressure transmitters, and which are immediately submitted to Westinghouse for review and approval and (2) Category II design changes, which do not affect the environmental qualification, and which are submitted to Westinghouse periodically at an interval of two to three years for review and approval. The NRC inspectors reviewed DSF 33592, dated October 1, 1999, which closed out all the Category II design changes which were submitted as part of Revision 16 to the baseline design for model 763 Barton pressure transmitters. Westinghouse had reviewed the design changes, determined that they did not affect the environmental qualification, and accepted the changes. The NRC inspectors reviewed the Westinghouse conclusions for DSF 33592 and determined that the Westinghouse conclusion, that the design changes did not affect the environmental qualification of the pressure transmitters, was accurate.

The NRC inspectors also reviewed a Category I change which was submitted as Report No. R 1-764-77, dated October 6, 1997. This change consisted of the environmental qualification of Operational Amplifiers used in the Barton pressure transmitters. Westinghouse accepted the change by DSF-F-33556 dated October 17, 1997. The NRC inspectors reviewed the testing and Westinghouse acceptance of environmental qualification of the operation amplifiers. The NRC inspectors determined that even though the results of one specific measurement performed during the test did not meet the Westinghouse acceptance criteria identified in the test plan, Westinghouse had accepted the report without providing an appropriate justification.

Westinghouse was able to provided a basis for accepting the data by demonstrating how the data was ultimately combined with other measured data to yield a final value which indicated acceptable performance of the operational amplifier. Westinghouse was able to provided a basis for accepting the data by demonstrating how the data, which when ultimately combined with other measured values, yielded a final value which indicated that the performance of the operational amplifier was acceptable. The NRC inspectors concluded that although the measured data was ultimately acceptable, the improper use of acceptance criteria in the absence of valid documented analysis and acceptance of the measured data, was a weakness in the Westinghouse design change review process.

## (2) Review of the Barton Pressure Transmitter May 1982 Design Change

Prior to 1981, Westinghouse qualified Barton pressure transmitters by verifying the environmental qualification of specific manufacturing lots. In 1981, Westinghouse developed methods to verify the environmental qualification of Barton pressure transmitters through the verification of the environmental qualification of a baseline design. The baseline method was used to demonstrate the environmental qualification of the supplied pressure transmitters by verifying conformance of the PRIME-



manufactured pressure transmitter to the baseline design qualified by Westinghouse. The Barton pressure transmitters qualified by the baseline method had individual Tefzel insulated external lead wires which were covered with Polyolefin heat-shrink sleeving extending into the epoxy potting material.

The Westinghouse baseline qualification methodology was documented in WCAP-8587, Revision 6, which was reviewed and approved by the NRC in a letter dated November 10, 1983. The NRC inspectors reviewed the Westinghouse Baseline Qualification Reports WCAP 8687 Supplement 2 - E01A, Revision 2, dated March 1983 for the Barton model 763 pressure transmitter and WCAP - 8687 Supplement 2 - E03A, Revision 2, dated March 1983 for Barton model 764 pressure transmitter. The test specimens were built to the Westinghouse Baseline Design Document 0763.1125-5, Revision 2, for model 763 and the Westinghouse Baseline Design Document 0764.1195.5, Revision 3, for model 764.

The NRC Inspectors reviewed the baseline design document Report No. 0763.1126.5 Revision 2, for Barton model 763 and Report No. 0764.1203.5, Revision 3 for Barton model 764 pressure transmitters. The NRC inspector reviewed the documents previously described and verified that baseline design for Barton model 763 pressure transmitter was completed August 5, 1981, and the baseline design for the Barton model 764 pressure transmitter was completed on November 6, 1981. The NRC inspectors did not identify any concerns with the environmental qualification documents for the Barton pressure transmitter connector assemblies which had heat-shrink sleeving covering the individual external leads extending into the epoxy potting material. Westinghouse indicated that no additional testing had been performed on the Barton pressure transmitters connector assemblies after the initial environmental qualification testing.

In May of 1982, PRIME made a design change to the Barton models 763, 763A, and 764 pressure transmitters which removed the heat-shrink sleeving over the individual external lead wires extending into the epoxy potting material. Subsequent to the May 1982 design change, all Barton models 763, 763A, and 764 pressure transmitter were manufactured without heat-shrink sleeving over the individual external leads extending into the epoxy potting material.

The NRC inspectors reviewed the Westinghouse documentation related to the environmental qualification of the Barton pressure transmitter connector assemblies, manufactured subsequent to the May 1982 design change, without heat-shrink sleeving on the individual external leads extending into the epoxy potting material. The May 1982 design change was discussed in PRIME Report R3-764-79, dated June 23, 2006, which had been provided to Westinghouse and which identified three Engineering Orders (EOs), EO 11172, dated January 7, 1982, EO 12380, dated June 24, 1982, and EO 21958, dated October, 24, 1990, all of which identified the removal of the heat-shrink sleeving. During the inspection, Westinghouse indicated that they were not able to locate the files which documented the review of the design change included in EOs 11172 and 12380. Subsequent to the inspection, Westinghouse informed the staff that it was able to find the documentation which approved EO 12380. EO 12380, which included the design without heat-shrink sleeving on the individual external leads extending into the epoxy potting material, was approved (belatedly, i.e., 8 years later) by Westinghouse by DSF F-8275 on January 25, 1990. However, the approval did not

include a discussion or basis for acceptance for the May 1982 design change which removed the heat-shrink sleeving over the individual external leads extending into the epoxy potting material.

The NRC staff found that Westinghouse was unable to provide documentation to demonstrate that the post-May 1982 design, without heat-shrink sleeving on the individual external lead wires extending into the epoxy potting material, is environmentally qualified, as described by Regulatory Guide 1.89, "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants," Institute of Electrical and Electronics Engineers, Inc., (IEEE) Standard 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," and other applicable industry standards. Failure to demonstrate the environmental qualification of the post-May 1982 pressure transmitter connector assemblies, without heat-shrink sleeving on the individual external lead wires extending into the epoxy material, was identified as a nonconformance contrary to Criterion III of 10 CFR Part 50, Appendix B. (Nonconformance 999010403/2006-201-1)

It should be noted that the issue concerning environmental qualification does not apply to pressure transmitter connector assemblies supplied by Westinghouse which were manufactured prior to the May 1982 design change, with heat-shrink sleeving over the individual external lead wires extending into the epoxy material. In addition, pressure transmitters manufactured prior to May of 1982 may have had the connector assemblies replaced with the post-May 1982 connector assembly design either in the field or at PRIME during maintenance or repair activities.

c. Conclusions

Based on the review of documentation and discussions with Westinghouse management and staff, the NRC inspectors concluded that the Westinghouse design change review activities and the associated documentation of these activities had areas of weakness. This was mainly due to the acceptance of data outside of specified acceptance criteria without justification during the review of the environmental qualification data of operational amplifiers, and not demonstrating the environmental qualification of the post-May 1982 Barton pressure transmitter connector assemblies, without heat-shrink sleeving over the individual external lead wires extending into the epoxy material. Nonconformance 99901043/2006-201-01 was identified.

3.2 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspectors reviewed Westinghouse procedure WEC 21.0, "Identification and Reporting of Conditions Adverse to Safety," and associated documents related to the implementation of the Westinghouse 10 CFR Part 21 program.

b. Observations and Findings

The NRC inspectors reviewed WEC 21.0, which was developed to implement the requirements of 10 CFR Part 21. WEC provided Westinghouse employees with information concerning the basic requirements of 10 CFR Part 21 and its applicability to vendors and NRC licensees. The document defined important terms such as basic component, deviation, defect, discovery and

evaluation. In addition, WEC 21.1 provided guidance on decisions on notification, notification guidelines, reporting deviations to customers such that the customer can perform, evaluate, and report defects to the NRC. The NRC inspectors determined that the procedure provided adequate guidance. The NRC inspectors reviewed the Westinghouse documentation of deviations related to Barton pressure transmitters and other selected issues. The NRC inspectors determined that the Westinghouse reviews were documented and processed within the periods required by 10 CFR 21.21.

c. Conclusions

The NRC inspectors concluded that the written Westinghouse procedure implementing the requirements of 10 CFR Part 21 provided adequate guidance and that the Westinghouse's reviews were processed in a timely manner. The inspectors did not identify any adverse findings in this area.

#### **4.0 MANAGEMENT MEETINGS AND PERSONNEL CONTACTED**

##### 4.1 Entrance and Exit Meetings

During the entrance meeting on August 22, 2006, the NRC inspection team discussed the scope of the inspection, outlined the areas to be inspected, and established interfaces with Westinghouse staff and management. During the exit meeting on August 23, 2006, the NRC team discussed its observations and preliminary findings with Westinghouse management and staff.

##### 4.2 Persons Contacted

Anthony Nowinowski, Manager	Reactor Systems and Services, Westinghouse
Jeffrey Zielinski	Engineer, Westinghouse
Michael Laubham	Quality Assurance Engineer, Westinghouse
Robert Jabbs	Advanced Technical Engineer, Westinghouse
John Zotter	Senior Engineer, Westinghouse