


MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

December 25, 2012

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Docket No. 99901030
MHI Ref: UEQ-20122013

**Subject: REPLY TO NOTICES OF NONCONFORMANCE NRC INSPECTION
REPORT NO. 99901030/2012-201**

Attached is Mitsubishi Heavy Industries, Ltd. (MHI) Reply to the Notices of Nonconformance, in accordance with the directions provided in NRC Inspection Report 99901030/2012-201, dated November 30, 2012. MHI acknowledges and agrees with the Notice of Nonconformance, and thanks the NRC for accomplishing a thorough inspection of MHI's activities associated with the mock-up and testing of re-designed anti-vibration bars that could be used as a long-term repair of the steam generators at San Onofre Nuclear Generating Station, Units 2 and 3.

If you have any questions regarding this Reply, or if additional information is required, please contact me by e-mail at ikuo_otake@mhi.co.jp.

Sincerely,



Ikuo Otake
Chief Engineer, Manager
Quality Assurance Department
Nuclear Energy Systems
Mitsubishi Heavy Industries, Ltd.

Enclosures:

1. MHI Reply to Notice of Nonconformance for Mock-up Testing (NRC Inspection Report No. 99901030/2012-201)

Cc: E.H. Roach, Chief
Construction Mechanical Vendor Branch
Division of Construction Inspection & Operational Programs
Office of New Reactors

D. Chapman
K. David
G. Grant



MHI Reply to Notice of Nonconformance for Mock-up Testing
(NRC Inspection Report No.99901030/2012-201)

From October 9-17, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at Mitsubishi Heavy Industries, Ltd. (MHI) facility in Kobe, Japan. The purpose of the inspection was to observe the mock-up testing of redesigned anti-vibration bars (AVBs) developed as a potential repair of the steam generators at San Onofre Generating Station (SONGS), Units 2 and 3. The NRC inspection team specifically observed various activities associated with the mock-up testing of a portion of the upper steam generator tube bundle. The mock-up testing was being conducted to determine if a repair to the SONGS steam generators incorporating redesigned AVBs was feasible.

The NRC Inspection Report lists the specific activities observed by the NRC inspection team. The NRC staff conducted the inspection to verify that MHI conducted the activities pursuant to a quality assurance (QA) program that complies with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." With the exception of the two nonconformances addressed in this Reply, the NRC inspection team concluded that MHI's QA policies and procedures comply with the applicable requirements of 10 CFR Part 50, as well as the NRC requirements in 10 CFR Part 21, "Reporting of Defects and Noncompliance."

As requested by the Notice of Nonconformance, MHI provides herein a written statement in reply to both nonconformance findings. As requested, the written statement for each of the nonconformance findings includes the following: (i) statement of the NRC nonconformance finding, (ii) the reason for the noncompliance, (iii) the corrective steps that have been taken to date and the results that have been achieved, (iv) the corrective actions that will be taken to avoid further noncompliance, and (v) the date when the corrective action will be completed.

Reply to Nonconformance 99901030/212-201-01

NONCONFORMANCE

Title 10 of Code of Federal Regulation, Part 50, Criterion VII, "Control of Purchased Material, Equipment, and Services," states in part, that "Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents."

Requisition Card 8161999-KA-110044, dated May 8, 2012, specified that Sumitomo Metal Industries supply 1187 tubes that conformed to the original replacement steam generator tube manufacturing Specification L5-04FZ041, Revision 4. The original specification had a number of specific visual and dimensional specifications for the tubes including outside diameter straightness, bending radius for the u-bend region, and total length.

Mitsubishi Heavy Industries Document L5-04GA592, "San Onofre Nuclear Generating station, Units 2 & 3 Replacement Steam Generators, Mock-Up Test Plan for Verification of Repair Measures for Tube Vibration Issue," Revision 5, dated October 4, 2012, was identified as "Safety Related." Table 4.3.1, "Extraction of Controlled Dimensions for mock-up Tube (Single Item)," lists tube outside diameter straightness, tube bending radius, and total tube length as "Necessary" examination items. Tables 2.2.1, 2.2.5, and 2.2.6 list how the previous three items were to be measured and the actual

measurement specifications.

Contrary to the above, as of October 17, 2012, MHI failed to ensure that the alloy 690 seamless tubes purchased from Sumitomo Metal Industries and used to construct the steam generator u-tube bundle mock-up, conformed to the procurement requirements identified in the purchase order and purchase specifications. Specifically, MHI did not provide objective evidence that the tube outside diameter straightness, tube bending radius, and total tube length conformed to the requirements Requisition Card 8161999-KA-110044 and Inspection Document L5-04GA592 measurement criteria.

This issue has been identified as Nonconformance 99901030/2012-201-01.

REASON FOR NONCONFORMANCE

The background of this nonconformance about a procurement control is as follows:

Requisition Card 8161999-KA-110044 specified that the tubes for the mock-up supplied by Sumitomo Metal Industries were to conform to the manufacturing specification of the original MHI-supplied SONGS replacement steam generator (RSG) tubes. The supplier requested a deviation from the original RSG manufacturing specification in order to measure the outside diameter for the straight region of the tube by micrometer instead of laser, which had been used for the original RSG tubes. After evaluating the reasonableness of the requested change for the method of measurement of the outside tube diameter, MHI accepted this deviation because the mechanical instrument used by the supplier for the measurement satisfied the requirements for accuracy. MHI did not, however, make a record of the evaluation results, and did not revise the requisition card to reflect this change from the original manufacturing Specification of the original RSG tubes.

MHI relied on the Certified Material Test Report (CMTR) which stated that all measurements based on visual and dimensional examination after final cutting were acceptable. However the attachments to the CMTR only provided for three of the six dimensional inspections and did not provide objective evidence that the tube outside diameter straightness, tube bending radius, and total tube length conformed to the requirements of Requisition Card 8161999-KA-110044 and Inspection Document L5-04GA592 measurement criteria during inspection.

The reasons for the nonconformance identified above are as follows:

1. There was a description for handling the supplier's deviation requests in the Steam Generator Design Section's procurement procedure, "Procedure for Preparation of Purchase Specification" (5BBB40-N01). However, this description was not clear enough as to what was required and the procurement person's understanding of the requirements was not sufficient.
2. The requirements in Requisition Card 8161999-KA-110044 for inspection records required to be provided by Sumitomo Metal Industries were not clear enough.
3. The receiving inspector utilized the CMTR to ascertain that required dimensions were verified, but the CMTR only confirmed the requirements of Requisition Card 8161999-KA-110044 were met and did not provide actual details of the tube outside diameter straightness, tube bending radius, and total tube length.

**CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED AND
CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER
NONCONFORMANCE**

1. MHI evaluated the impact of these nonconformances on the mock-up test results and concluded that the nonconformances did not affect the validity of the test results for the following reasons:

1.1 The mock-up test was not affected by the deviation from the original manufacturing specification concerning the measurement of the outside diameter of the straight region of the tube. MHI has confirmed that the mechanical instrument device (micrometer), used for the tube measurement, satisfies the requirements for accuracy.

1.2 The mock-up test was not affected by the insufficient description of the measurements in the CMTR because (i) subsequent to NRC Inspection, MHI confirmed from Sumitomo Metal Industries' internal records that the full length, bending radius and outside diameter are acceptable, and (ii) MHI obtained a Certificate of Compliance from Sumitomo Metal Industries which provides written certification that each item was inspected and satisfied the applicable requirements.

2. MHI issued CAR-12-076(0). Corrective and preventive actions are as follows:

2.1 A specific procedure for handling deviation requests from a supplier will be added to the Steam Generator Design Section's procurement procedure "5BBB40-N01".

2.2 Training on procurement control work will be provided to applicable persons. This training shall insure that personnel are trained to: (i) sufficiently clarify requirements in a requisition card or procurement specification; and (ii) handle deviation requests from a supplier in compliance with the Steam Generator Design Section's procurement procedure "5BBB40-N01".

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

A specific procedure for handling deviation requests from a supplier has been added to the Steam Generator Design Section's procurement procedure "5BBB40-N01."

Training on procurement control work will be provided to applicable persons by January 31, 2013.

Reply to Nonconformance 99901030/2012-201-02

NONCONFORMANCE

Criterion III, "Design Control," of Appendix B to 10 CFR 50, states in part, that "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components."

Contrary to the above, as of October 17, 2012, MHI failed to establish adequate measures for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components for the dedication of commercially procure calibration services. Specifically, MHI did not perform a commercial grade dedication of the calibration services procured commercially from Tokyo Sokki Kenkyujo Co., Ltd. Mitsubishi Heavy Industries did not identify or verify critical characteristics that would ensure that Tokyo Sokki Kenkyujo Co., Ltd. would have the capabilities necessary to perform the calibration of a measurement instrument (resistor box) used as part of the strain gauge contact force measurement in the mock-up test, with additional anti-vibration bars inserted in the steam generator tube bundle.

This issue has been identified as Nonconformance 99901030/2012-201-02

REASON FOR NONCONFORMANCE

The reason for the nonconformance was inappropriate understanding of the necessity to perform commercial grade dedication (CGD) of the commercial grade calibration services provided by Tokyo Sokki Kenkyujo Co., Ltd. in performing safety-related calibration services for a measurement instrument (Resistor Box) used as part of the strain measurement for the mock-up tests with additional AVBs inserted. While the strain gages were appropriately accepted by CGD, MHI Takasago failed to appreciate that the Resistor Box calibration by Tokyo Sokki Kenkyujo Co., Ltd. required CGD of the vendor services. MHI Takasago inappropriately evaluated and qualified Tokyo Sokki Kenkyujo Co., Ltd. as a calibration service supplier by audit. Tokyo Sokki Kenkyujo Co., Ltd. had a certificate of ISO 9001 compliance, but did not have Appendix B or Part 21 programs. Therefore MHI Takasago did not perform CGD of commercial grade calibration service.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED AND CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER NONCONFORMANCE

1. MHI Takasago issued a Corrective Action Request, NCR-21-2012. Corrective and preventive actions are as follows:
2. MHI will identify critical characteristics and perform CGD for the Resistor Box. Based on the result of CGD, MHI will verify adequacy of the calibration services of the Resistor Box.
3. MHI will indoctrinate applicable personnel of the necessity of CGD for calibration services supplied by the suppliers who do not have an Appendix B QA Program.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

MHI will complete the corrective actions by February 28, 2013.