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Your Ref: NRC Vendor Inspection Report
Number 99901408/2018-201

Our Ref: LTR-NRC-19-13
March 11, 2019

Subject: Reply to Notice of Nonconformance Cited in NRC Inspection Report No. 99901408/2018-201

Dated March 11, 2019

Attached is Westinghouse Electric Sweden AB's (for this purpose, "Westinghouse") response to the NRC letter, dated February 4th 2019, requesting additional clarification to Westinghouse letter LTR-NCR-19-1 to address the subject Notice of Nonconformance (NON).

Any question regarding this response should be addressed to me.

Russell Bastyr
Vice President
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Nonconformance 99901408/2018-201

We have reviewed your letter and found that it is not fully responsive to NON 99901408/2018-201-02. Specifically:

1. Your response to NON 99901408/2018-201-02 failed to address several areas of concern to the NRC staff. Please clarify your response as follows:

- a. *The response states that Welding Procedure Specification No. 172 provides the production process control limit as 0.5 to 2.0 mm and, based on information provided by the welder (during an interview after the inspection), the root gap is normally verified by the welder by using a filler material wire of 1.6 mm diameter. It is noted that the procedure requirement of 0.5 to 2.0 mm should be followed and measured with an appropriate gauge or measuring tool other than estimating and/or use of unapproved material/method. Discuss why is it acceptable to use a filler wire to measure a dimension in lieu of an appropriate gauge or measuring tool.*

Westinghouse response: Westinghouse agrees that using a filler material to measure a root gap is not an acceptable method. The information was added to provide background information on how the joint preparation concerning the root gap had been set-up in the past. Westinghouse performs 100% Nondestructive Radiographic examination on this weld (weld to attach the velocity limiter to the blade) which verifies the soundness of the weld in produced Control Rods.

Westinghouse has implemented the use of a calibrated gauge and do so going forward as described in Westinghouse response letter LTR-NRC-19-1, see Nonconformance 99901408/2018-201-02 CA4:

Corrective Action #4: Implement suitable M&TE gauge to be used by the welder when setting up the root gap or verifying other production process control limits. Ensure the M&TE is included in the M&TE-register and calibrated according to standard routines.

- b. *The response states that on this occasion, the root gap was measured to exceed the limits by 0.1 mm (total gap of 2.1 mm). However, as stated in the NRC's inspection report, only a feeler gauge of 2.0 mm was used. Since no other measuring device was used, discuss how the total gap of 2.1 mm was measured since the weld joint had been welded already.*

Westinghouse response: Westinghouse has clarified this issue through a follow-up interview. This interview confirmed that only a 2.0 mm feeler gauge was used. The assessment of the welder involved is that the root gap was slightly greater than 2.0 mm but less than 3 mm greater. Westinghouse performs 100% Nondestructive Radiographic examination on this weld (in accordance with specification requirement) which verifies soundness of the weld.

- c. *The response states that the Procedure Qualification Report (PQR) shows that 3.0 mm had been used during welding qualification and the 2.0 mm limit is established as a production process control limit.*

- i. *Discuss how the full range of parameters are qualified for the 3.0 mm root gap, since PQR No. KR222-157, Revision 2, dated February 9, 2017, only used 2.0 mm maximum gap in the qualification weld.*

Westinghouse Response: The qualification report PQR No. KR 222-157 rev 2 indicates a joint preparation with approximately a 2 mm root gap. Additionally, PQR No. KR 222-128 chapter 2.1 indicates a joint preparation with a 1.5-3 mm root gap. In both qualification reports, the root gap is not recognized as a qualified parameter; therefore lower/upper root gap limits are not qualified. The root gap

used during the qualification was between 1.5-3 mm (approximately 2 mm). It is a suggested root gap selected to ensure a sound welding process for the SF6-weld.

Westinghouse has revised the WPS 172 (Welding Procedure Specification) root gap to be set between 1-3 mm and clarified that it is a production control limit. This follows the recommendations in standard ISO 9692-1 "*Welding and allied processes -- Recommendations for joint preparation -- Part 1: Manual metal-arc welding, gas-shielded metal-arc welding, gas welding, TIG welding and beam welding of steels.*" The standard recommends using a root gap in the range of 1 to 3 mm for a double V-preparation.

Also as mentioned in the letter LTR-NRC-19-1, 100% Nondestructive Radiographic examination is performed by a qualified inspector on the SF6-weld (i.e., the weld attaching the velocity limiter to the blade).

- ii. *Discuss how the rework qualification performed in PQR No. 222-128 applies to the initial weld No. SF6 and how it covers the full range of parameters as stated in PQR No. KR222-157.*

Westinghouse Response: In the qualification PQR No. KR 222-128, the entire weld SF6 was removed to qualify a rework for replacement of a new velocity limiter including new weld joint preparations of the absorber cross blade followed by welding the velocity limiter to the blade. Therefore, the welding setup prior to perform the rework weld (as qualified in PQR No. KR 222-128) has similar prerequisites in comparison to the initial welding of SF6. Westinghouse therefore concludes that the result from PQR No. KR 222-128 can be used for both the initial SF6 weld in production and the rework welding of SF6-weld. In both cases (initial and rework of the SF6-weld), WPS 172 is used today and includes reference to both PQR No. KR 222-128 and PQR No. KR 222-157 (note: WPS 172 has superseded WPS 183 which was used during the rework qualification PQR No. KR 222-128).

- d. *The response states that Corrective Action No. 5 will issue lessons learned, but does not include any training to avoid future non-compliances. Discuss your plans to provide training to ensure that personnel understand that appropriate gauges or measuring tools are used to measure dimensions in lieu of just visual estimation and/or use of unapproved material/methods to avoid future non-compliances.*

Westinghouse Response: Westinghouse has summarized the identified issue in a training slide deck and reinforced the requirement to use suitable and calibrated measurement and test equipment (M&TE), as required in Westinghouse QMS and controlling procedures, to verify control limits. During February 2019, Westinghouse Quality and Operations Managers held multiple training sessions on lessons learned from this event for production workshop and quality staff. All pertinent staff has been trained and the training attendance has been recorded and attached in the CAP.