TWO MERGED QUALIFICATION SYSTEMS – ASME/PDI AND ENIQ METHODOLOGY – USED TO SATISFY SWEDISH QUALIFICATION REQUIREMENTS FOR NPP RINGHALS UNITS 2 AND 3

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This paper describes how two qualification bodies, EPRI and the Swedish Qualification Centre (SQC) can complement each other for an NDT in-service inspection in Sweden. EPRI administers the Performance Demonstration Initiative (PDI) program on behalf of all U.S. utilities. This program focuses on the implementation of the American Society of Mechanical Engineers (ASME) Section XI, Appendix VIII Code requirements, whereas the SQC system is based on the ENIQ methodology.

The Swedish utility Ringhals AB operates one boiling water reactor (BWR) and three pressurized water reactors (PWR). The two PWR units will apply pre-emptive weld overlays (WOL) to pressurizer nozzle similar and dissimilar metal welds in 2012 and 2013, respectively. This is the first WOL project on this type of component in a Swedish NPP.

The nozzle-to-safe-end weld is part of the plant’s in-service inspection program, which means these welds will have to be inspected in the future utilizing a qualified procedure that has been approved by SQC. The utility has chosen an inspection company from the U.S. This company has a qualified a procedure in accordance with the EPRI PDI program for this type of component.

This project focused on the merging of the EPRI PDI program requirements with the Swedish qualification requirements, which have many similar attributes, but have some specific differences that required addressing. As stated previously, the EPRI PDI program is focused on satisfying ASME Section XI, Appendix VIII qualification requirements while the Swedish requirements which are based on ENIQ methodology. In order harmonize these requirements, SQC performed a detailed review of the activities performed by EPRI during the initial qualification of the procedure in order to determine what gaps were required to be filled in order to satisfy the Swedish requirements. Through Ringhals membership the EPRI NDE program, SQC was allowed full access to the qualification records and was able to work side by side with EPRI staff during this assessment.

As stated, both systems are very much the same when comes to the practical procedure and personnel demonstrations. The major differences identified were the pre-requisites required by Swedish rules that must be addressed by the inspection vendor prior to start of qualification.

Some major differences between the two systems are:

- The Swedish implementation of the ENIQ system requires a technical justification (TJ). The TJ is a document that collects all the information that provides evidence about the reliability of an NDT technique as applied to a specific component.
- Essential parameters (ENIQ definition) have to be identified along with tolerances and may differ from the Appendix VIII requirements.
- Tolerances for sizing and positioning may differ and have to be addressed.
- Procedure demonstration is allowed on specific open samples.
- Level of detail in the inspection procedure must be addressed.

None of the differences posed significant barriers to satisfying Swedish requirements and Ringhals asked SQC and EPRI to work together in addressing these differences. The SQC/EPRI team has developed a detailed demonstration plan that utilizes the EPRI specimens. Under direction of Ringhals, the SQC/EPRI team will work together to facilitate the additional demonstrations required at the EPRI facilities in Charlotte, NC, in the first half of 2012. This joint venture is expected to significantly reduce the overall qualification costs associated with sample manufacturing and travel. In the future it is possible that similar merged qualification exercises can be performed, which will potentially reduce qualification costs and build on the strong points of both systems.