

# **Ultrasonic Weld Inspection of Heavy Wall Vessels and API 934-A Considerations**

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There are significant advantages associated with the ultrasonic examination of heavy wall vessel welds compared to radiographic examination. Some of advantages with ultrasonic testing (UT) include the ability to inspect with less disruption to fabrication work, ability to inspect joints that are “radiographable with difficulty”, and generally provide a higher detection capability of planar (crack like) flaws. However, UT involves more complex techniques and interpretation compared to RT. ASME Section V and ASME Section VIII Division 2 provide some guidance on the use of UT in lieu of RT. However, the ASME requirements are primarily focused on the general assessment of the procedure and limited assessment of the UT personnel. This paper will share experience with blind test qualification examination of UT personnel. The examinations reflected various joint types (e.g., U-groove butt welds, single sided access for nozzles, weld overlaid surfaces, etc.) as well as different UT techniques (e.g., TOFD, PAUT). Furthermore, API 934-A requires specific and highly sensitive UT techniques for transverse fabrication related cracking. The ability to detect the expected flaws will be dependent on UT technique (e.g., TOFD versus shear wave UT), steel “cleanliness”, etc. This paper will summarize the learnings from the application of API 934-A and ASME NDE requirements for heavy wall hydro processing reactors.