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Ultrasonic Instrument Equivalency

The PDI Process

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Ultrasonic Instrument Equivalency

- Current Process
  - Obtain a letter from manufacturer stating the pulser, receiver, amplifier, and other critical components are the same in two or more instruments
  - Modify the Table 3 document to include the equivalency
  - Change PDI calibration sheets to include the new instrument(s)

- Proposed Process
  - Still obtain a letter from the manufacturer stating equivalency
  - Request the instruments be sent to EPRI for evaluation and perform a brief series of tests
  - Modify Table 3 document and change PDI calibration sheets

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Tests Performed

- Current Tests
  - If the instrument is used in a PDI examination and the examiner is given a passing grade the instrument is considered acceptable
- Proposed Tests
  - Independent evaluation of each instrument using the same settings, search unit, cable, and target
  - Using an Oscilloscope compare the pulse signal from both instruments using the Table 2 settings
  - When possible using Sync/Trigger features of the instruments compare the same signal with one instrument providing the pulse and the second instrument providing the receiver

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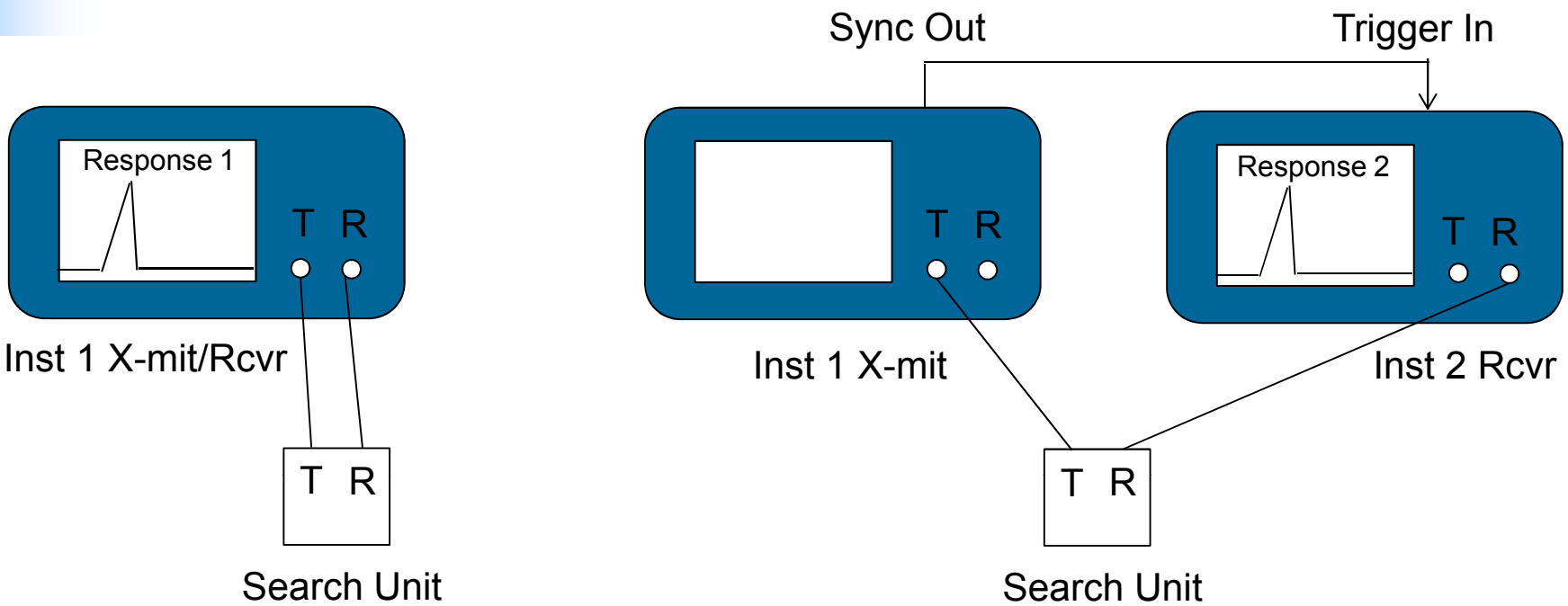
Recommended Tests



- Compare Response 1 to Response 2
- Swap X-mit/Rcvr and Sync/Trig on the instruments and repeat

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Additional Option – Proposed 2013 WP Project

- *Evaluation of ASME NDE Equipment Equivalency Requirements*
  - This project will review and examine the current ASME requirements for UT equipment equivalencies
  - Users typically do system equivalencies that test the loop response of two complete systems but this can be unreliable
    - This project will evaluate ASME tolerances for instrument equivalencies
    - If unreasonable – this project will develop a revised set of criteria and a whitepaper to justify the code revision.
  - The Utility and Vendors will gain the most benefit by taking advantage of the ASME Code Case
    - Report in 2013 describing the Phase 1 research and recommendations
    - A Code Case submitted in 2014 using research conducted in Phase 1 as the technical basis

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Conclusions

- The current process provides a reasonable level of assurance the instruments are equivalent through the demonstration process
- The added steps to the process would provide even greater confidence
- The added steps (in most cases) could be performed in a couple of hours including setup and cleanup
- If approved, the proposed work plan project to evaluate the current Article 4000 criteria for instrument equivalency could be a method for providing the instrument manufactures a defined set of parameters to test for equivalency

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