NRC/Industry Coordination Meetings
Summary - UT in Lieu RT Research

Wallace Norris
RES/DE/CIB
wallace.norris@nrc.gov

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Preliminary Assessment

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- ASME developed two Code Cases (Section III, Section XI) that would allow UT in lieu of RT
- NRC tasked PNNL to conduct literature search in July 2009
  - Purpose: assess current state-of-the-art; identify gaps that might require additional investigation
- Review publicly available documents addressing reliability and capabilities of UT and RT
  - Over 600 journal and conference papers reviewed
  - Over 100 other related documents
- PNNL-19086, Technical Letter Report entitled, "Replacement of Radiography with Ultrasonics for the Nondestructive Inspection of Welds – Evaluation of Technical Gaps – An Interim Report" April 2010 [ADAMS No. ML101031254]

Preliminary Assessment Findings (cont'd)

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- A fundamental issue is that the UT research studies found focused mostly on planar flaws
  - Presents difficulty in understanding sensitivity of UT to volumetric flaws

- The studies found, in many cases, address issues in other industries (e.g., different materials) or very specific issues (e.g., variations of techniques or methods)
  - Makes direct comparisons impractical

Preliminary Assessment Findings (cont'd)

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- The studies indicate that:
  - UT detection rates and POD appear to be similar or better than RT detection rates and POD for planar flaws
  - UT in lieu of RT is feasible for volumetric flaw detection.
    - In replacing RT with UT, acceptance criteria for fabrication flaws need to be established (demonstrate equivalence with RT for nuclear applications).
  - UT and RT have roughly equivalent capabilities for length sizing. UT has distinct advantage in depth sizing and through-wall flaw location.
  - UT can be used with single-sided access while RT requires access to both sides.
    - Improvements needed in single-sided inspection.

Preliminary Assessment Findings (cont'd)

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- The studies indicate that:
  - Significant examiner training will be required because all volumetric NDE is very skill-dependent.
  - UT in lieu of RT will require ability to create and maintain permanent records.
  - In replacing RT with UT, expected fabrication types, locations, numbers, and sizes will have to be determined because inspection method that is chosen for a given examination likely is dependent on these parameters.
  - Ability of UT to discriminate between planar and volumetric flaws must be improved, particularly where there is high acoustic noise.

Current Activities

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- NRR developing user need request for RES
- RES/EPRI developing addendum to current memorandum of understanding
  - Addendum addresses shared research issues
    - Includes assessment of UT/RT
- EPRI/NRC planning UT/RT workshop in September 2010
  - Determine research currently underway
  - Assess gaps/needs