Discussion on UT in lieu of RT for Construction

Nuclear

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Problem - UT in Lieu of RT is Disallowed for Section III

Regulator Issues with Relevant Section III Code Cases:

N-659 (UT in lieu of RT)

1. Qualifies procedure by adding 2-3 construction flaws to Sect. V or XI qualified procedure
- Inadequate evaluation of capabilities; not all flaws represented
2. Credits beam skipping for bi-directional coverage
- Seen as problematic in stainless steels and complex geometries
3. Specifies a ***weld plus ½ t*** exam volume
- Thought inadequate for thin-wall components
4. Staff wants 2%t flaws with Section III, NB-2553(c) specified lengths included in qualification

Code Case N-818 (Analytical approach to acceptance criteria)

- ". . an analytical approach for the acceptance of certain fabrication flaws could be acceptable if appropriately justified and the scope limited to ferritic materials."
- Adding stainless or dissimilar metal requires more research (see N-659 issues above)

Summary of Industry Issues with Section III Status Quo

NDE Redundant and Costly (financially and structurally)

- Weld subjected to RT
  - Shutting down other area work and exposing personnel to additional radiological exposure
- Results failing RT acceptance criteria are repaired
- Continue 1-2 until weld is accepted
- Weld subjected to Section XI PSI with qualified UT
- Results failing Section XI PSI acceptance criteria are repaired
- If indications are detected that RT missed
  - Evaluated to Section III AND Section XI acceptance criteria
  - Unacceptable results are repaired, and the examination process must be repeated

RT Acceptance Criteria in Section III

- Forces repair of benign volumetric discontinuities
  - Operating experience has not shown these to be detrimental to component life
  - Repairs increase likelihood of in-service cracking

Intended and Potential Actions

1. Develop technical basis to support code case revisions

a. Explore qualification options that alleviate regulatory concerns

b. Explore adequacy of UT beam skipping for characterization

c. Determine proper exam volumes for thin wall components

d. Evaluate disposition options to eliminate repair of benign discontinuities

2. Revise Case(s) to obtain regulatory acceptance for UT option

3. Explore crediting Sect. III UT for PSI

Potential Challenges

- Would a 2%t flaw size prove difficult to detect & characterize?
- Is the adequacy of beam skipping easily justifiable?
- Would acceptance of benign fabrication discontinuities prove difficult for regulator approval?
- Using Section III examinations to meet Section XI PSI may require changes to qualification requirements in Section III
- Are there other challenges?
  - If so, please let me know your thoughts and concerns

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