Software Implementation of ECA procedures for New Construction and In-Service Assessment

API-3-1

Contract Number: PR-350-174508

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PRCI 2018 TC Meeting
Oct 23 - 26, 2018
San Diego, CA, USA
Implemented ECA/Assessment Procedures

- API 1104 Annex A (Option 2)
  - Stress-based (nominally elastic condition)
- CSA Z662 Annex K (Option 2)
  - Stress-based
- ABD-1 strain-based design
  - Strain-based
  - Modern GMAW and FCAW/SMAW welds
- PRCI SIA-1-7
  - Strain-based
  - Vintage welds
  - Migrated from SIA-1-7 tensile strain capacity calculation sheet
Software Package – API 1104

- Graphic user interface
- Data export
- Built-in software manual and documentation

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Software – CSA Z662

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Help Manual - Documentation

- Broad application scenarios
- Specific limits on input parameters
- Sensibility and error check
  - In document
  - In calculation routine
- Getting the right values for input parameters
- Prevention of misuse
- Examples of ABD-1 TSC equations
  - One recent seismic design, TSC was computed beyond 5%.
    - Pipe was ERW
  - An actual design for a construction project – applied to scenarios beyond the range of procedures
  - A recent IPC paper – TSC was computed way beyond its sensible possibility
Next Steps

- Final team review / beta release: November 2018
- Version 1.0 release: December 2018
- Suggest putting in more efforts in documentation and guidance
  - Powerful tools could have great consequences.
  - For instance, tensile strain capacity of vintage girth welds
    - Many people wish to use the tool
    - Requisite understanding of materials, welding, etc., may be limited.
  - Produce a guidance document using Research Bank funds?