


RSTRENG

A Modified Criterion for Evaluating the Remaining Strength of Corroded Pipe

The pipeline industry had used the "B31G" criterion to evaluate corroded pipe for removal or repair or for leaving it in service if the metal loss was within safe size limits as defined in the B31G criterion. A new and improved criterion was desired because of the known excess conservatism in the original B31G method. Even though the use of the B31G criterion undoubtedly helped pipeline operators to avoid many unnecessary cutouts, the excess conservatism continued to cause some unnecessary cutouts that could have been avoided without compromising safety.

Objective

The goal of the project was to reduce excess conservatism without creating an unsafe condition. It was necessary to revisit the 47 burst test results used to validate the B31G criterion and to assess whether or not the modified criterion provided an adequate means of predicting the effects of metal loss on the remaining strength of the corroded pipe. In addition, through efforts of individual companies 39 additional burst test results were made available for this validation effort.

Background

The original body of data on burst tests of corroded pipe that was used to validate the original B31G criterion was expanded considerably by data obtained from

companies who had performed their own burst tests. The expanded database shows that the modified criterion embodied an adequate margin of safety. The modified criterion could be used with detailed measurements of the metal loss and successive trial calculations to predict a minimum failure pressure for an area of metal loss based upon its "effective" area. Used in this mode, it tended to further reduce the excess conservatism embodied in the existing criterion. This more complex modified criterion analysis approach was developed into a PC-based program called **RSTRENG**.

Software Applicability

Pipeline operators are required under 49CFR192 and 49CFR195 to use either the **RSTRENG** or ASME/ANSI B31G criterion to evaluate remaining strength of corroded pipe. The **RSTRENG** criterion is less conservative than the B31G criterion, and therefore avoids many unnecessary pipe replacements (cutouts). **RSTRENG** permits a determination of the metal-loss anomalies that may safely remain in service at the current maximum operating pressure. For anomalies that exceed the recommended allowable size, the modified criterion will establish the appropriate pressure reduction to maintain an adequate margin of safety for all cases in which the reduced pressure level exceeds 55% of SMYS.

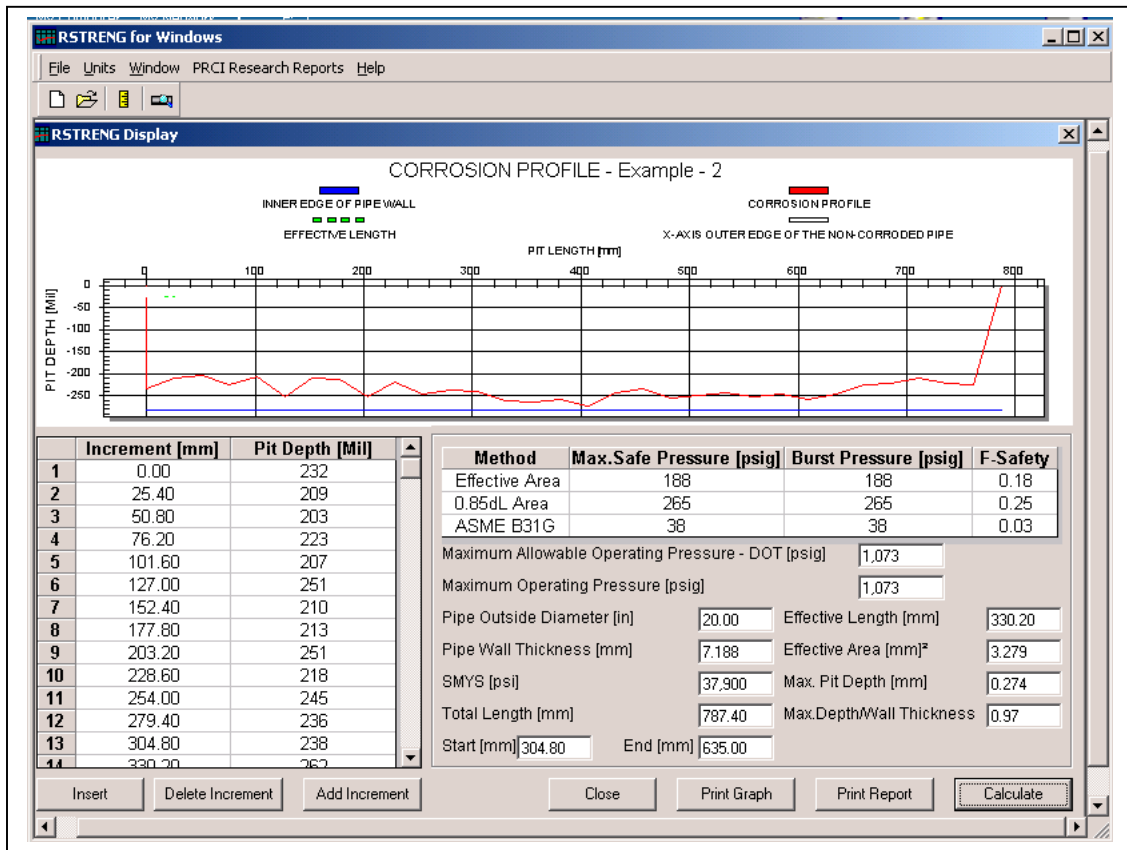
Validation

PRCI continues to validate the modified RSTRENG criterion. The latest results of 129 new tests involving corroded pipe or pipe samples containing corrosion-simulating defects provide both qualitative and quantitative validation of the RSTRENG technology

Benefits

The RSTRENG program is now in a more user-friendly Windows format and includes:

- Internationalized format
- All supporting technical documentation
- Comparison with B31G criterion
- Windows 2000 compatibility



For more information, contact:

Technical Toolboxes, Inc.
3801 Kirby Drive, Suite 520
Houston, TX 77098
Phone: (713) 630-0505
Fax: (713) 630-0560
E-mail: info@toolboxes.com

You can also visit our website at www.prci.com to purchase the technical documentation and software

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