Advanced Welding and Joining Technical Workshop

Boulder, Colorado, January 25-26, 2006

Working Group 5
Joining Issues for Nonmetallic Materials

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Attendance Breakdown

Approximate total attendance	10 persons
Federal Regulators	2 persons
State Regulators	0 persons
International Regulators	0 persons
Pipeline Industry	7 persons
Standard Organizations	0 persons
Researchers	1 persons
Academics	0 persons

Top 3 Identified Goals

Goal #1 – Develop NDE technology that can determine the integrity of all fusion joints.

Goal #2 – Improve on current joining technologies, including process validation to ensure proper equipment operation to mitigate human error.

Goal #3 – Develop quicker methods or testing practices for accurately predicting the integrity/residual life of older PE pipe joints.

Associated Actions

Goal #1: Develop NDE technology that can determine the integrity of all fusion joints

Regulatory: None expected at this time

Technology

1. Action: Improve existing or develop new NDE technologies
   Time: 1-3 years
2. Action: Develop/evaluate proof of concept
   Time: 1-3 years
3. Action: Determine standards of acceptability
   Time: 1-3 years

Consensus Standards

- Action: Create a consensus standard of acceptability for NDE
  Time: 3-5 years

General Knowledge

- Action: Study of existing, new and emerging NDE technologies
  Time Estimation: 0-1 years

Associated Actions

Goal #1 Requirements: Develop NDE technology that can determine the integrity of all fusion joints

Minimal requirements:

- 95% minimal accuracy
- Repeatability
- Simple pass/fail reporting
- Can detect flaws greater than the standard of acceptability
- Possible automated application
- All diameters and PE materials

Associated Actions

Goal #2: Improve on current joining technologies, including process validation to ensure proper equipment operation to mitigate human error

Regulatory: None at this time

Technology

1. Action: Improve on current manual and hydraulic processes for butt, saddle and socket joints
   Time Estimation: 1-3 years
2. Action: Develop a data logging system(s) for process validation
   Time Estimation: 1-3 years

Consensus Standards: None at this time

General Knowledge

1. Action: Study to determine data logging and user requirements for process validation
   Time Estimation: 0-1 years

Goal #2 Requirements: Improve on current joining technologies, including process validation to ensure proper equipment operation to mitigate human error

- Includes all joint types except electrofusion joints
- Must include both manual and hydraulic equipment
- Must include all PE materials and sizes applicable to current equipment

Associated Actions

Goal #3: Develop quicker methods or testing practices for accurately predicting the integrity/residual life of older PE pipe joints

Regulatory: Not at this time

Technology

1. Action: Develop proof of concept of most promising technologies to existing testing protocols
   Time Estimation: 1-3 years
2. Action: Correlate and validate to existing protocols
   Time Estimation: 1-3 years
3. Action: Develop tools or methods for field application
   Time Estimation: 3-8 years

Consensus Standards

- Action: Incorporate into existing standards; Time Estimation: 3-5 years

General Knowledge

- Action: Study to evaluate existing and emerging testing technologies.
  Time Estimation: 0-1 years

Goal #3 Requirements: Develop quicker methods or testing practices for accurately predicting the integrity/residual life of older PE pipe joints

- Alternate method to the current higher temperature testing and RPM validation method which significantly reduces the current test time
- Maximum time of 100 hours
- Short term test must be valid

Other Goals

1. Alternatives to scraping joints for electrofusion or better ways to determine if pipe has been properly scraped.

2. Compatibility of joining existing PE pipe to next generation pipe and materials.