High Pressure Self Monitoring Composite Pipeline System

January 14, 2021

SMARTPIPE
TECHNOLOGIES

Smartpipe® Overview

SMARTPIPE TECHNOLOGIES

- Protective Outer Cover
- Retention Windings
- High Strength Pulling Tapes
- Fiber Optic Monitoring and Communication Cable
- High Strength Fiber Wrap

SMARTPIPE TECHNOLOGIES

What is Smartpipe®?

High Pressure Composite Pipeline System

- Fully Structural
- Long Lengths
- Embedded Fiber Optic Monitoring and Communication System & Valve Control
- Embedded Material Health Sensors *(NEW)*
- Non-Corroding

- Inserted into Existing Steel Pipeline (HPIR), or…
- Laid in Ditch

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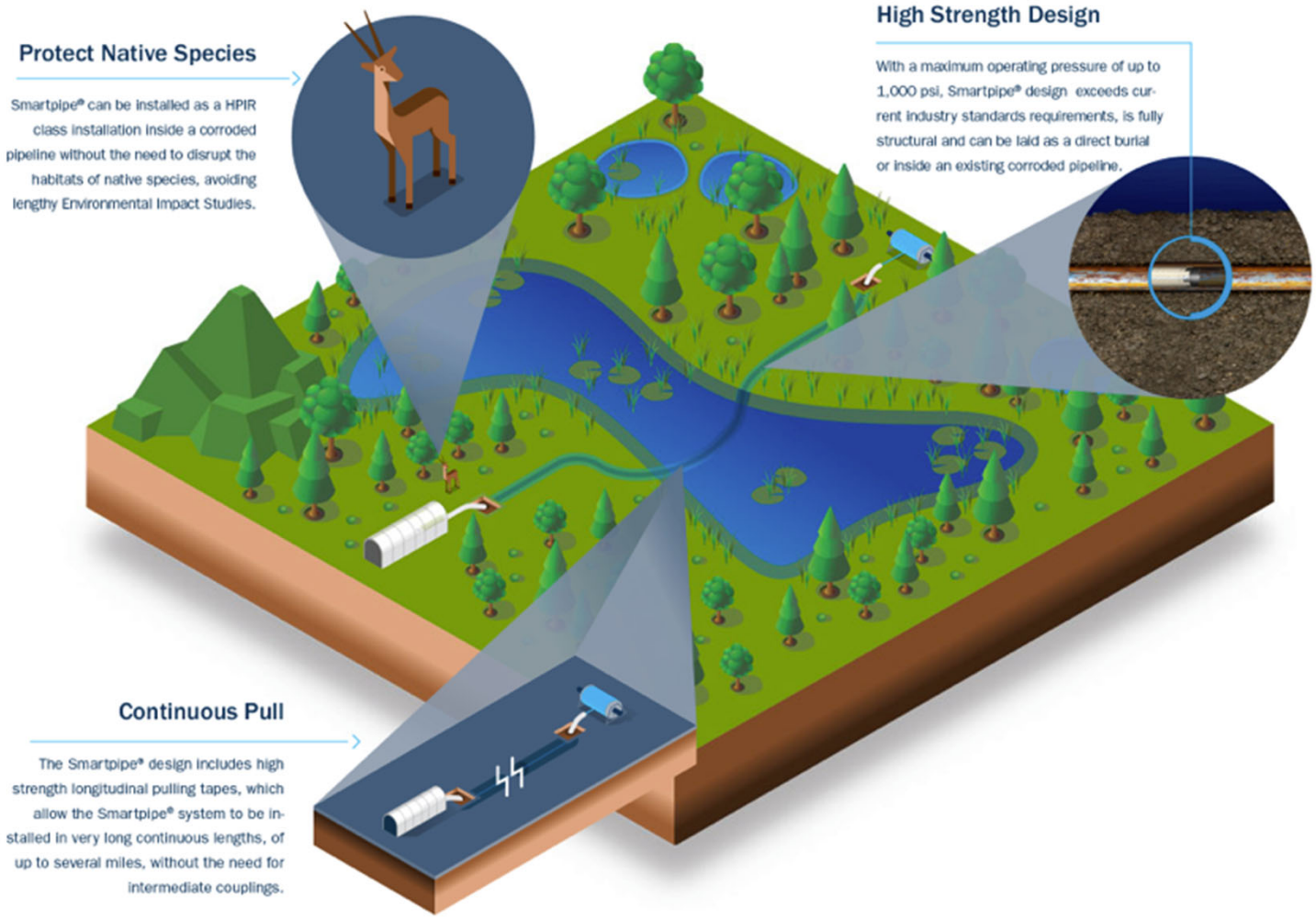
The Environmental Solution



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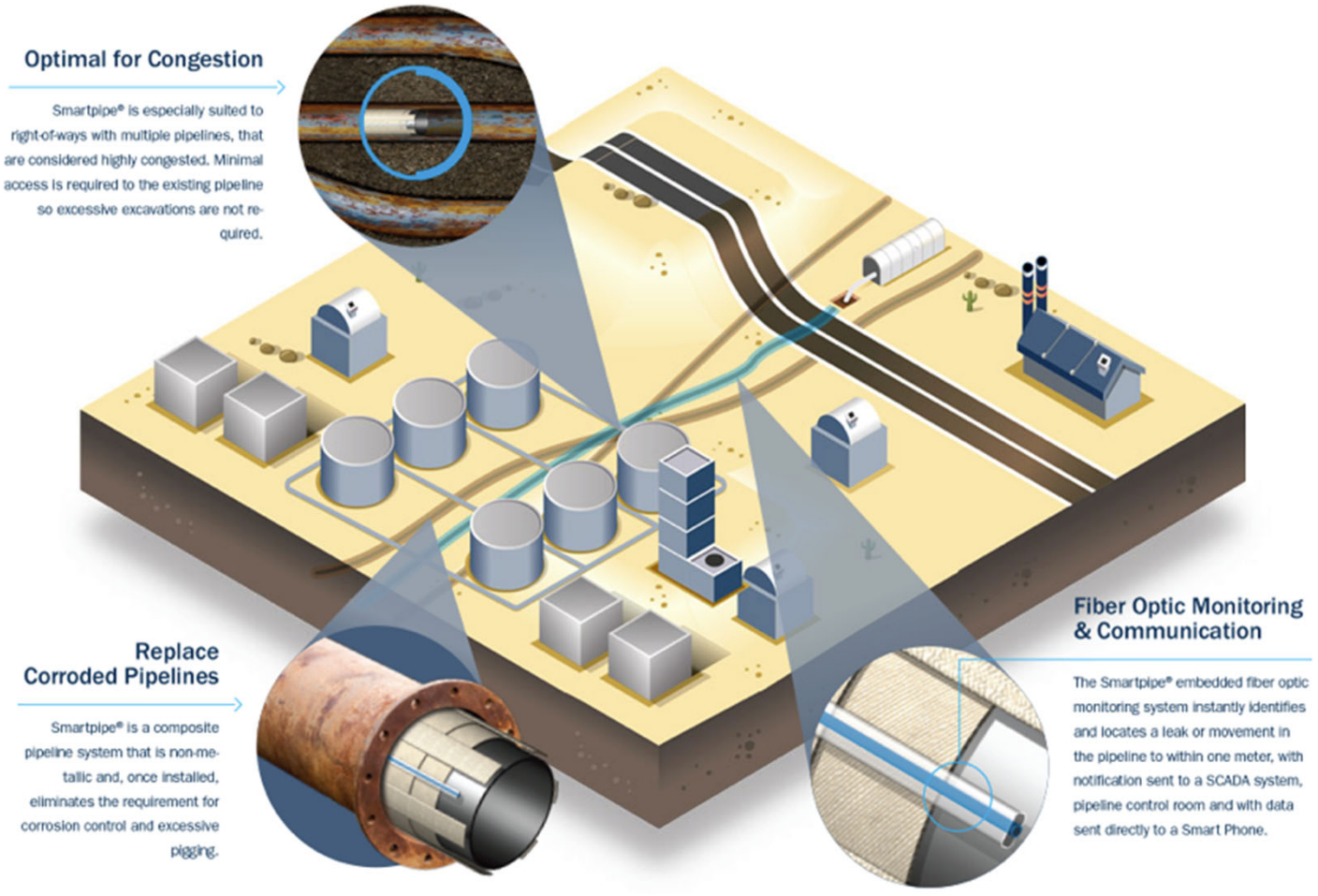
The Industrial Solution



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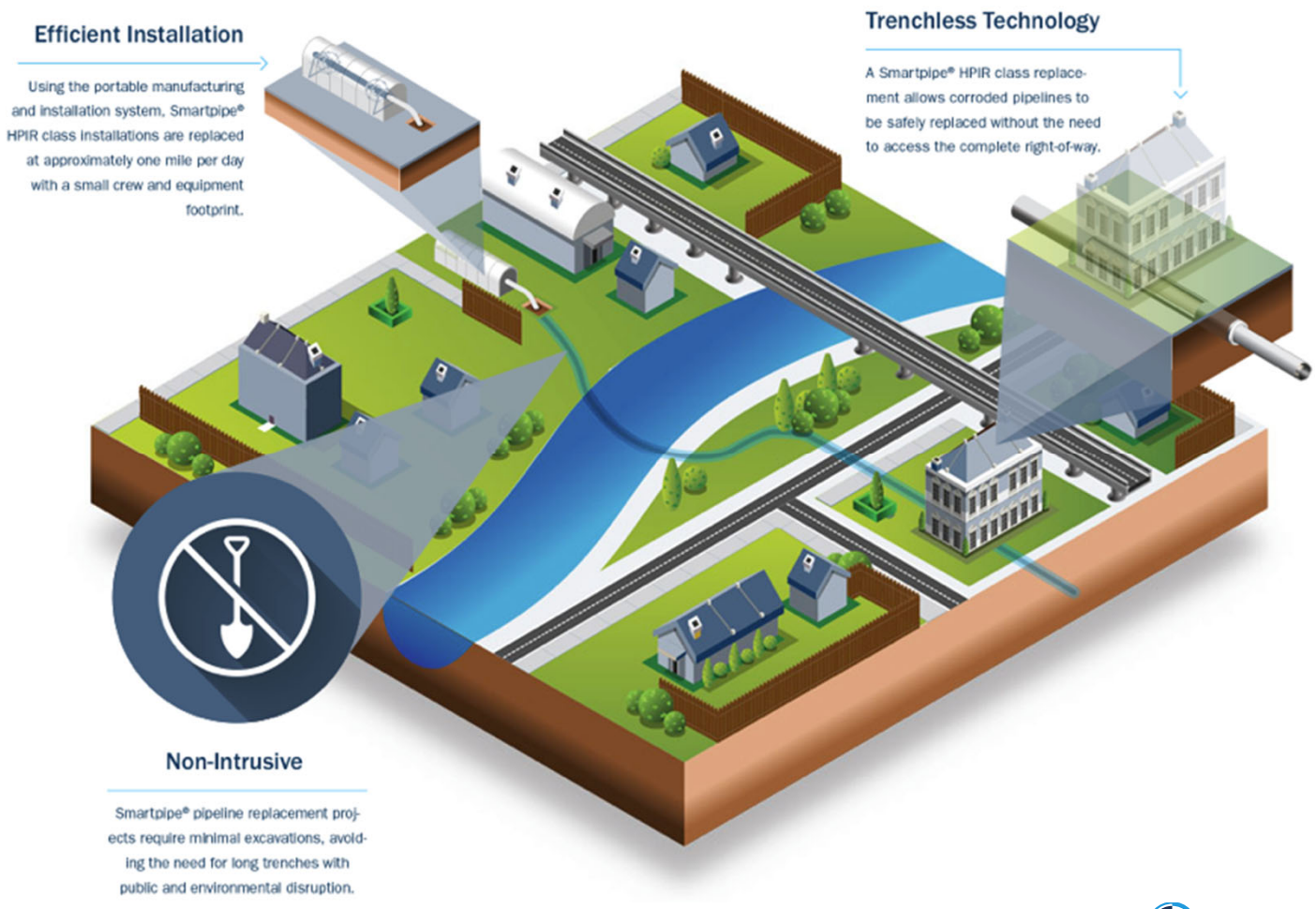
The Urban Solution



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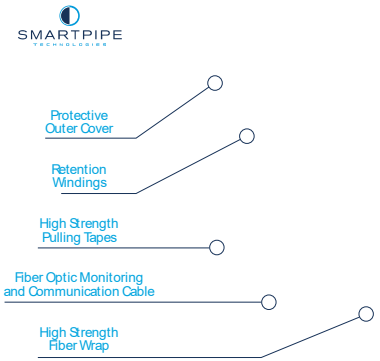
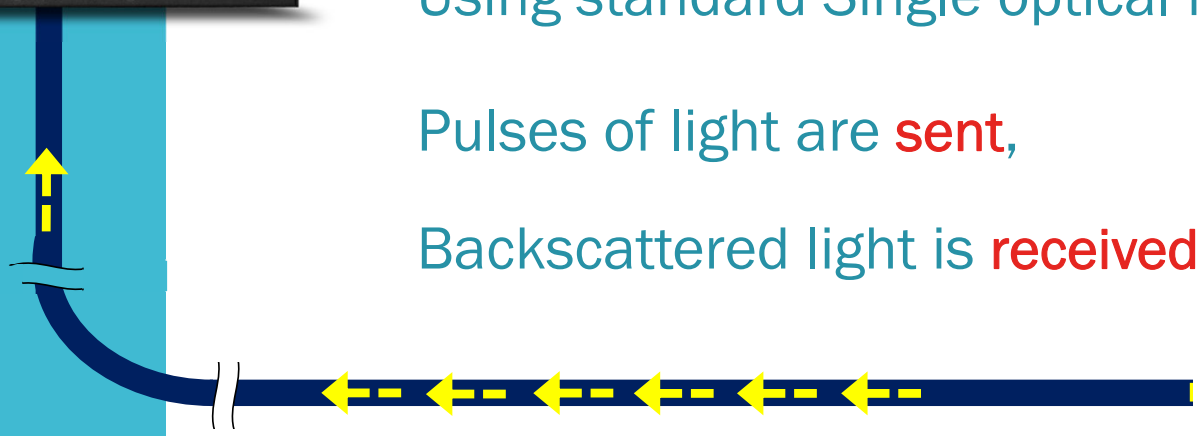
Distributed Acoustic Sensor (DAS)



Using standard Single optical fibre:

Pulses of light are **sent**,

Backscattered light is **received**.



The Fibre is the Sensor

Pipeline Integrity Management

LivePIPE Interface & Control

1. Installer Interface (HWI)

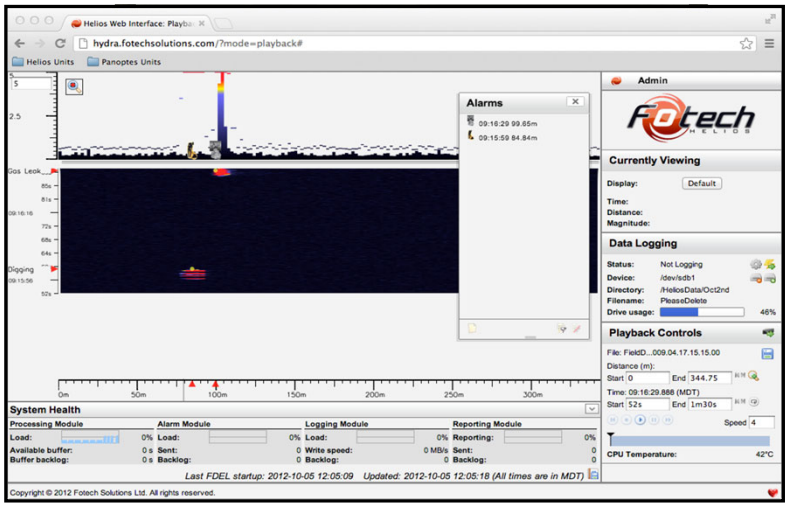
Real-time monitoring & control software installed on Helios.

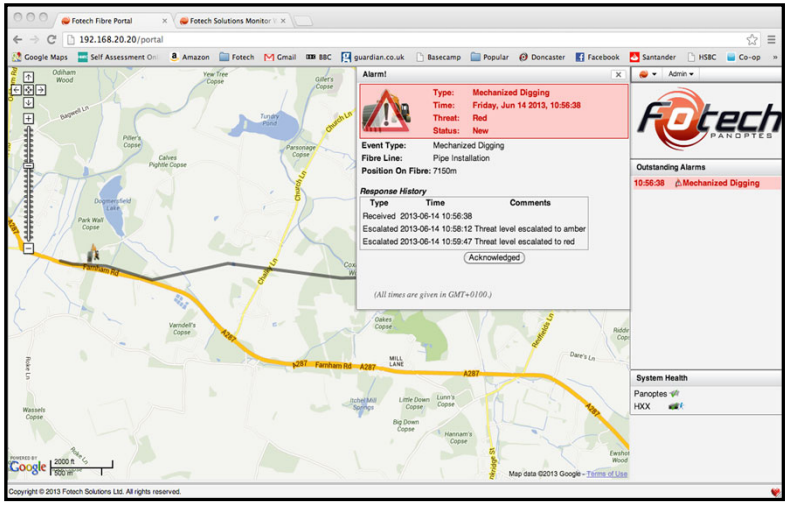
2. Operator Interface

Fotech's proprietary server Panoptes & alarm handing GUI.

3. Interface, client integration

Integration with multiple platforms including SCADA.





Smartpipe® Value Proposition

- Large Diameter Pipelines
  - 6” to 16” in long continuous segments
  - 24” coming soon
- High Pressures
  - Up to 2,000 psi MAOP
    - (Fully structural, pressure/temperature & diameter dependent)
- Long Replacement Lengths
  - up to several miles in one continuous segment
  - (Smartpipe® is “C”-Formed prior to installation)
  - If laid as a new pipeline in a ditch – “C”-forming not required
- Integrated Fiber Optics for Real Time Leak Detection, Impact, Ground Movement and Communications
- Portable Assembly Plant set up at the project site

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Product Development & Testing

Product Family 4” to 9” ID

- 2,200 psi to 1,800 psi @ 73ºF
- 2,000 psi to 1,400 psi @ 140ºF

Product Family 8” to 14” ID

- 2,000 psi to 1,200 psi @ 73ºF
- 1,500 psi to 850 psi @ 140ºF

Proposed SDTC Project

- ≤20” Diameter ≤ 720 psi @ 180ºF

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Portable Assembly Plant

Set up at Job Site

Continuously Produces Smartpipe® in Long Continuous Lengths

Approximately 1 Mile per Day

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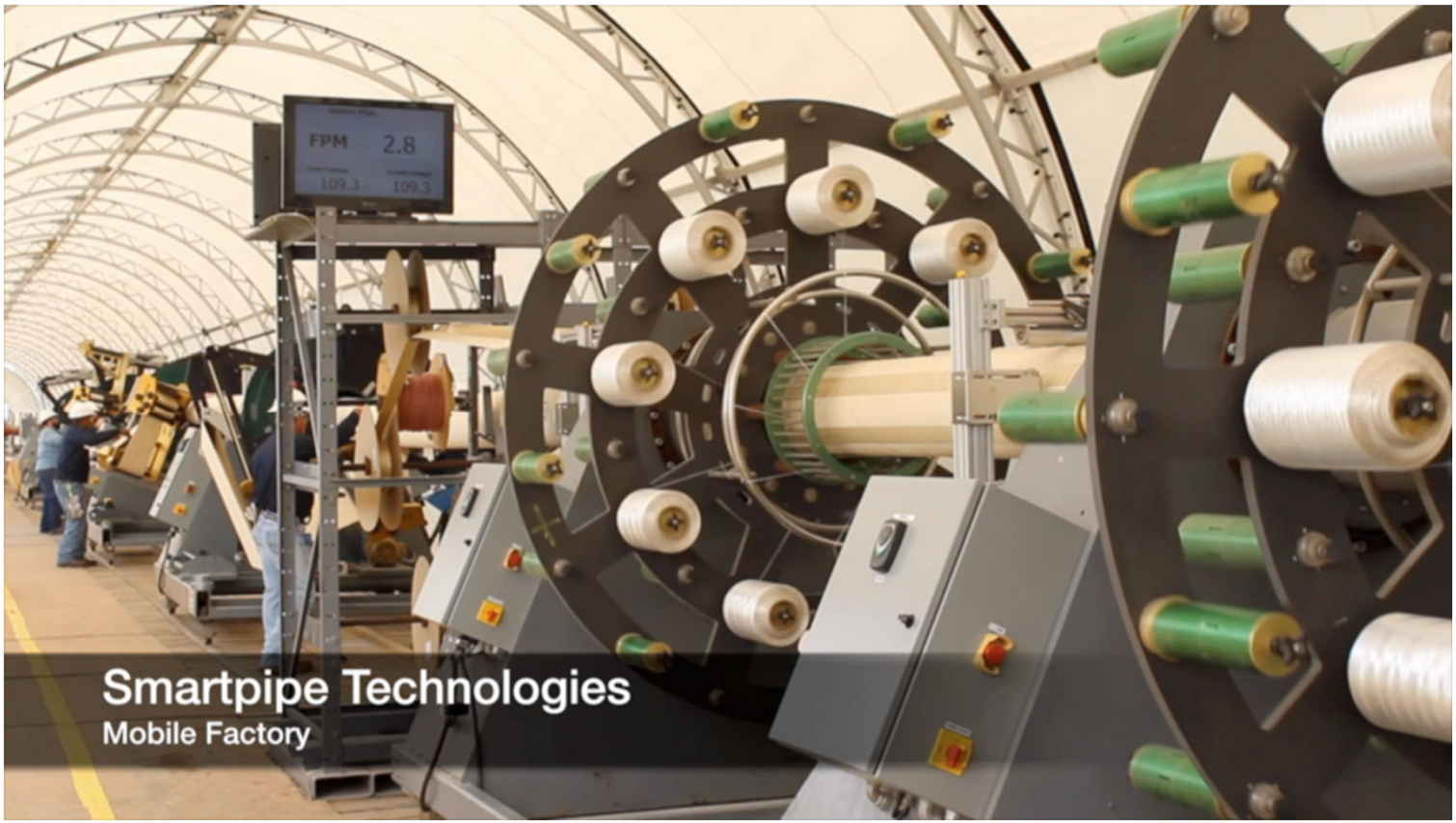
Portable Assembly Plant



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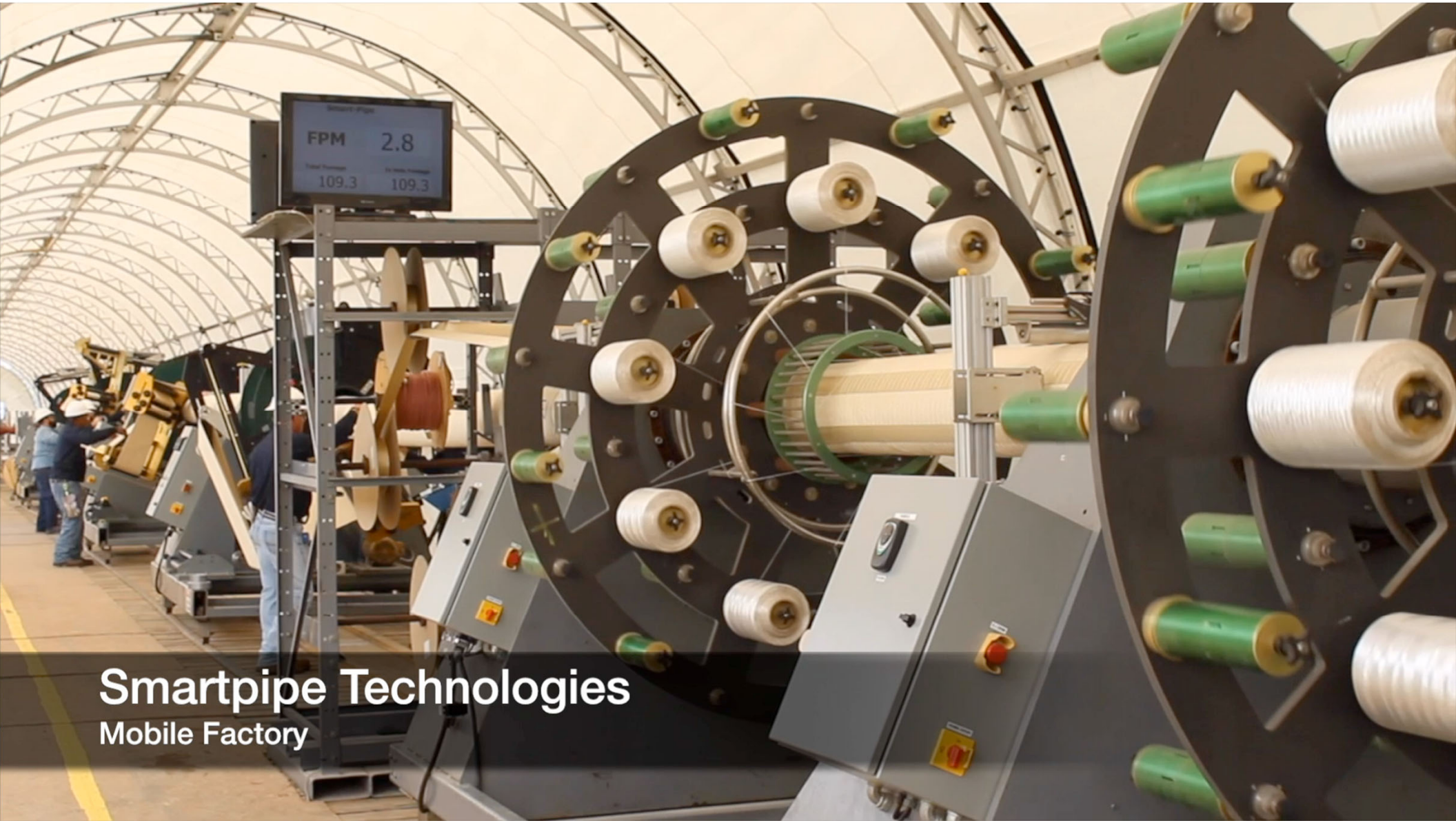

Smartpipe Technologies

Mobile Factory

Re-Rounding Process

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Connectors

Preparation

Swaging

Final Coupling

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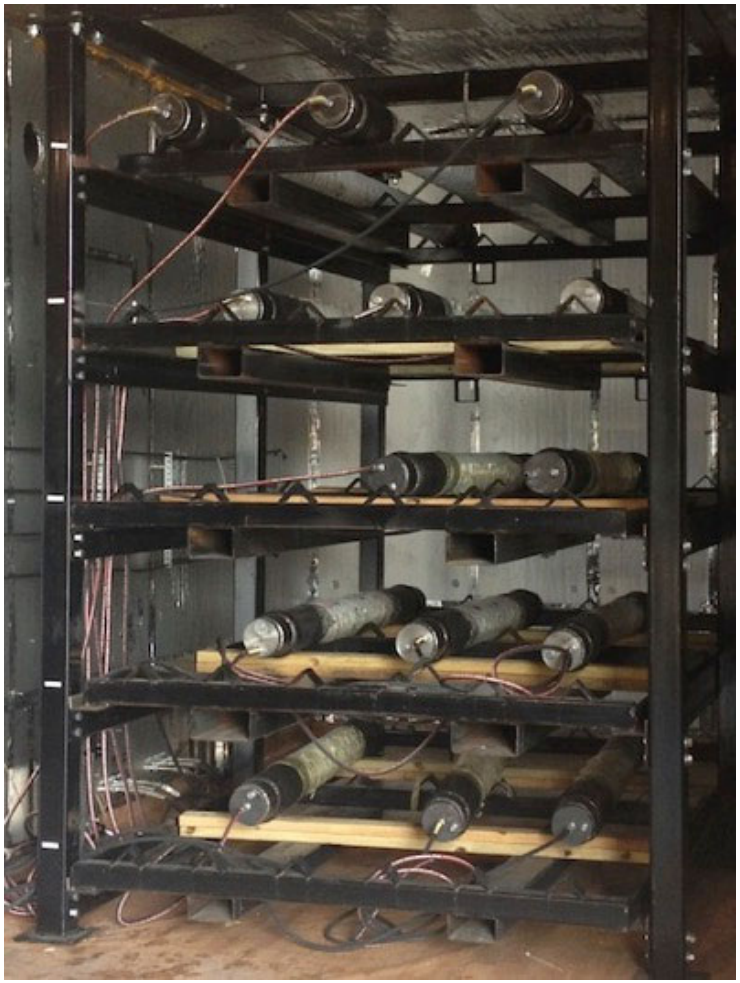
Robust R&D Program

Extensive Testing and In-service systems



Elevated Temperature Test Bay
With Samples at 60ºC

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ADV Integrity

Cyclical Dent Testing

Cyclical Bend Testing

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Testing Operations

Testing Bays and Prototyping Machine

80ºC, 60ºC and 20ºC Test Bays

Control Room with Computer Monitoring

SMARTPIPE TECHNOLOGIES

#1 Priority
SAFETY

#1 Priority - Safety

ENBRIDGE
Life Takes Energy™

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Thank You

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