

## Pre-Screening NDT (NAVIGATOR)

### Aging Infrastructure Challenges

- Detecting where leaks and problem areas are occurring
- Pipelines may have unknown structural or hydraulic deterioration that negatively impacts pipeline operations
- Increasing customer and community expectations for service continuity and environmental stewardship

### Service Solution Overview

PICA's NAVIGATOR pre-screening NDT service solution is ideal for leak detection and is the critical first step in identifying other leading indicators for potential pipeline integrity issues. NAVIGATOR is an internal, free-swimming, adjustable buoyancy, multi-sensor acoustic sphere deployed while pipelines are in service.



### Proactive Asset Management

- Save money with targeted repairs versus full replacement
- Identification of locations where there is a high probability of corrosion and potential blockages that impact flow
- Avoid negative consequences with customers and communities



NAVIGATOR can be deployed in:

- Cast iron pipe
- Ductile iron pipe
- Steel pipe
- Concrete cylinder (bar-wrapped) pipe
- Reinforced concrete cylinder pipe
- Prestressed concrete cylinder pipe (PCCP)
- AC and plastic pipe

Pipeline applications include:

- Wastewater
- Raw water

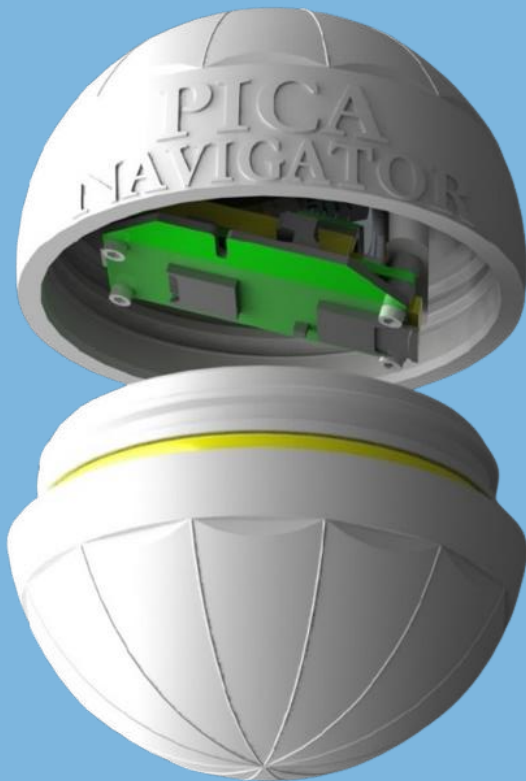
## NAVIGATOR – Multi-Sensor Acoustic Sphere

- Identifies leak and gas pocket anomalies with high-sensitivity acoustic and accelerometer sensors
- Profiles pressure gradient information to provide elevation surveys and detect deposits restricting flow
- Uses all screening information to identify leading indicators for potential integrity issues
- Can identify magnetic features in non-metallic pipelines and baseline magnetic flux readings in metallic pipelines

Pre-screening NDT assessments are often followed up with standard, intermediate, or advanced NDT services for more accurate and detailed analysis of pipeline integrity issues.



## TECHNOLOGICAL CAPABILITIES



NAVIGATOR is an internal, free-swimming, adjustable buoyancy, multi-sensor acoustic sphere deployed while pipelines are in service. These small diameter (3.25-3.75 inch/8.3-9.5 cm) spheres travel freely within pipelines ranging from 4 inches to 78 inches (10 cm to 198 cm) in diameter, screening for local leaks, gas pockets, elevation profile and other important pipe information from pressure and magnetometer data.

- The buoyancy of the device can be altered on-site to adapt to the operational fluid
  - The NAVIGATOR can either float at the top, travel along the bottom or have neutral buoyancy
- A magnetometer, accelerometer, acoustic and pressure sensor provide data for analysis
- Data is collected with a micro-USB memory card and analyzed by the experts at PICA within 72 hours for initial assessment
- Inspection velocity between 0.3 – 12 ft/sec (0.1-3.6 m/sec); Optimal & Recommended Range 1-4 ft/sec (0.3-1.2 m/sec)
- 32-140°F (0--60°C) and up to 125 psi (861 kPa)