

# Nuclear Power Plant Buried and Underground Piping Systems

- + INTEGRATED SOLUTION SET ADDRESSING THE INDUSTRY INITIATIVE ON BURIED PIPING INTEGRITY AND THE GUIDELINE FOR THE MANAGEMENT OF UNDERGROUND PIPING AND TANK INTEGRITY NEI 09-14 (REV 1)
- + DIRECT ASSESSMENT ULTRASONIC BASED NDE TECHNOLOGY
- + LIFEQUEST™ PIPING FITNESS-FOR-SERVICE SOFTWARE SOLUTION

# INVISTA™ INTELLIGENT PIGGING TECHNOLOGY

## Benefits

### Ensure piping integrity

- + Identify degradation before radioactive materials are released into the environment
- + Maintain public and regulatory confidence

### Satisfy NEI 09-14 (Rev 1) inspection requirements

- + Determine condition assessment of buried piping containing radioactive material by June 30, 2013
- + Determine condition assessment of underground piping containing radioactive material by June 30, 2014
- + Determine condition assessment of non-safety related piping

### Maximize condition assessment of internal and external piping surfaces

- + Full volumetric ultrasonic inspection approach supports 'Reasonable Assurance' initiative requirements
- + Optimize aging management program for license renewal in compliance with GALL AMP XI.M41 requirements

### Minimize operational and safety risk

- + Identify areas of degradation to ensure precise excavation locations and significantly reduce risk to external pipe coatings, the pipe itself and adjacent piping
- + Inspect the entire pipe length faster and more accurately than with other methodologies

### Cost effective

- + Cost effective in comparison to alternatives
- + Localized excavations can cost \$100K - +\$1M depending upon location within the facility

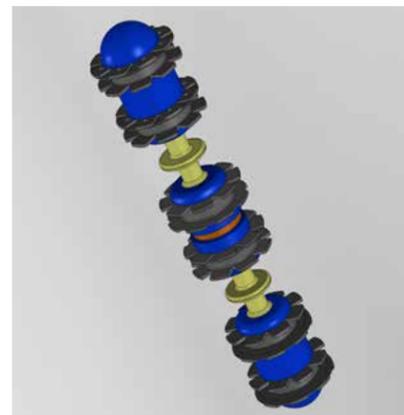
### Capable of inspecting piping constructed of many material types such as:

- + Carbon steel
- + Stainless steel
- + Copper
- + Aluminum
- + Galvanized steel
- + Other materials

## Features & Capabilities

Inspects 100% of internal and external pipe surfaces

- + Bi-directionality allows for launch/retrieval from same location
- + 48-240 ultrasonic transducers ensure 100% inspection coverage
- + 3" – 16" diameter piping
- + Inspects piping from a few feet long to several miles in length
- + Easily navigates:
  - Fittings (e.g. tees, wyes)
  - Short radius bends (e.g. 45°, 90°, 180°)
  - Valves (e.g. ball, gate and others which do not obstruct center bore of pipe)
  - Branched connections



## Foreign Material Exclusion

Foreign Material Exclusion (FME) is an important factor in the nuclear industry, thus Quest Integrity has spent considerable time ensuring FME considerations are included in our tool designs.

# LIFEQUEST™ FITNESS-FOR-SERVICE ASSESSMENT

## Applications

### Buried or inaccessible piping in nuclear power facilities

- + Service water
- + Condensate
- + Fire protection
- + Diesel fuel oil
- + Potable water

- + Floor and equipment drains
- + Waste water piping
- + Auxiliary/emergency piping
- + Hydrogen supply piping
- + Safety related piping
- + Not run-to-failure piping

- + Radioactive piping and environmentally sensitive piping
- + Lube oil
- + Raw water
- + Chemical
- + Gas
- + Other piping systems

## Solutions

### Detections and Sizing of:

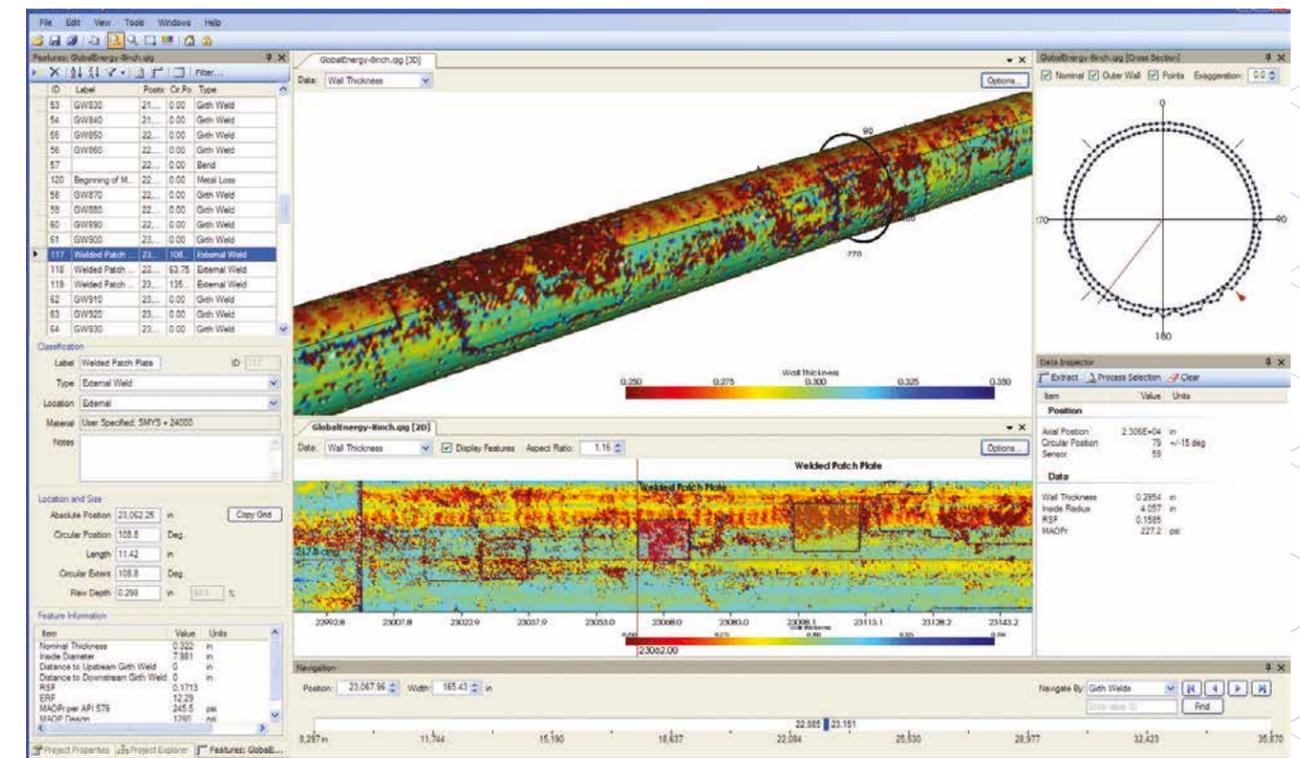
- + Corrosion
- + Corrosion under insulation (CUI)
- + Erosion
- + Soil environment corrosion due to coating failure
- + Pitting
- + Mechanical wear
- + Deformation (e.g. dents, ovality, bulging, swelling)

### Fitness-for-service per ASME FFS-1 / API-579 standards

- + LifeQuest software applications focused on each asset type
- + Calculates corrosion rates
- + Utilizes 100% of InVista inspection data
- + Provides future inspection frequency recommendations

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Quest Integrity, a TEAM company, is a global leader in the development and delivery of asset integrity and reliability management services. The company's integrated solutions consist of technology-enabled, advanced inspection and engineering assessment services and products that help organizations improve operational planning, increase profitability, and reduce operational and safety risks. Quest Integrity is built on a foundation of leading edge science and technology that has innovated and influenced industry best practices since 1971.

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