

1 Mechanical Damage Threat Management

1.1 Course Description

This course examines the threat management process for mechanical damage. It describes the general threat management process (identification, assessment, planning, and execution) and explores various techniques along with their associated methods, including prevention, monitoring, assessment, remediation, and mitigation. The course also compares the benefits and limitations of each technique within the context of mechanical damage threat management.

Self-assessments reinforce key concepts, and a final graded assessment evaluates the learner's understanding of the material. The online course format allows individuals to review and reinforce the material at their own pace. What sets this course apart is its holistic overview of mechanical damage threat management and inclusion of case studies, which provide learners with opportunities to apply their knowledge in a practical and relevant way within the industry.

Format: Online

Duration: ~3 hours

1.2 Learning Objectives

By the end of the course, participants should be able to:

1. Explain the application of the threat management process to the investigation and management of mechanical damage threats.
2. Describe the threat management methods and associated techniques used to manage mechanical damage threats.
3. Compare the benefits and limitations of each technique within the context of mechanical damage threat management.
4. Identify threat management techniques appropriate for a given situation through the use of case studies.

1.3 Who Should Take This Course

The course is best suited for:

- Individuals who are involved in pipeline integrity and are seeking foundational knowledge about the process, techniques, and associated methods used to manage the threat of mechanical damage.
- Early-to-mid-career practitioners with an engineering/technical background (e.g., technicians, technologists, engineers).
- Individuals with a basic understanding of pipeline design, construction, and operation principles and activities.

1.4 Course Topics

Main topic areas covered in this course include:

- Background
 - Threat Management Process
 - Identifying and Managing Defects and Defect-Prone Areas
 - Types of Mechanical Damage Features
 - Identification of Mechanical Damage
- Mechanical Damage and the Threat Management Process
- Threat Management Techniques, Associated Methods, Benefits, and Limitations
 - Threat Management Methods
 - Threat Management Techniques

- Main Techniques for Mechanical Damage Threat Management
 - Design Parameters
 - Pipeline Construction Inspection
 - Third-Party Crossing and Encroachment Agreements
 - Public Awareness Programs
 - Excavation Procedures
 - Signage (Pipeline Markers)
 - One-Call Systems
 - Slabbing
 - ROW Maintenance and Rehabilitation
 - Operational Training
 - Incident Tracking
 - Right-of-Way Monitoring and Surveillance
 - Leak Detection
 - In-Line Inspection
 - Cathodic Protection Monitoring
 - Direct Examination
 - Repair Sleeves
 - Pipe Replacement (Cut-Out Repairs)
 - Pressure Management
- Mechanical Damage Case Studies