



# MAPPro 4.0

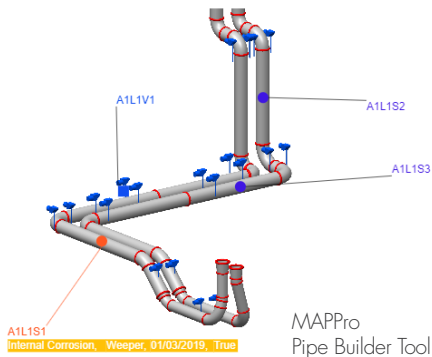
## MANAGING AGING PIPING PROGRAM

Program Management Software

**MAPPro**<sup>TM</sup>  
MANAGING AGING PIPING PROGRAM



Evaluating and managing the integrity of buried piping and other underground Systems, Structures, and Components, especially those in the nuclear industry that contain radionuclides, is a challenging issue that requires multiple skill sets to handle properly. The processes and practices involve specialized skills as part of an overall Asset Life Cycle Management approach that shifts the focus from costly remediations to a proactive prevention plan. Structural Integrity Associates, Inc. (SI) has established and proven techniques for successfully ranking, inspecting, and mitigating the degradation of buried and underground assets that can lead to improved plant safety and reliability.



SI is unique in the industry as we offer an integrated, multi-disciplinary approach to buried and underground corrosion concerns. SI has the comprehensive expertise to assist in all phases of above-ground piping, buried piping, and underground asset integrity programs. From program development, data integration, risk ranking, and conducting assessments of cathodic protection (CP) systems to using Guided Wave Technology and Linear Phased Array to locate and characterize corrosion damage. Once the foundation has been established, knowing how to disposition those findings and mitigate future degradation is critical. Integrating all available information (i.e., design, soil, groundwater, CP system operation, plant history, etc.) will lead to informed decision-making and improved process management.



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### Baseline Risk Ranking & Inspection Planning

Program Development | Data Collection | Risk Ranking | Inspection Planning

### Inspection & NDE

Indirect Inspection | Direct Examination | Condition Report

### Condition Assessment

Disposition | Cause Analysis | Define Remediation

### Asset Management Plan

Mitigation | Monitoring | Analysis Trending | Reinspection Interval

## Baseline Risk Ranking & Inspection Planning

### Program Development Resources

- EPRI 3002018352 (1016456 Rev2)
- EPRI 1016687
- NEI 07-07
- NEI 09-14
- NUREG - 1801/2191 XI.M34/XI.M41 (GALL)
- Independent MAP review of existing programs

### Data Collection

- EPRI BPWorks™ database population
- MAPProView™ - component digitizing & data visualization
- 3-D component modeling
- Ground Water Monitoring Wells

### Risk Ranking

- MAPPro Dynamic Segmentation™
- MAPPro Risk™
- Probabilistic Leak Evaluation

### Inspection Planning

- Threat Assessment
- Criteria Development
- Acceptance Criteria
- Technique Selection
- Effectiveness Optimization
- Scheduling

## Inspection - Reasonable Assurance

### Indirect Inspection

- InTellus – Coating Condition & Cathodic Protection (CP) System Effectiveness Survey
- CP System Design and Repair
- SoilPro – site selection, soil corrosivity analysis, corrosion rate calculations
- Guided Wave Testing

### Direct Inspection

- Bell Hole Inspections (coating, CP, UT, Latitude™)
- Ultrasonic Wall Thickness Testing
- Electromagnetic Acoustic Transducer (EMAT) Testing
- Linear Phased Array UT and TOFD
- PT, MT, radiography

### Condition Report

- Evaluation support (Int/Ext corrosion modeling)
- Data Integration
- Fitness for Service
- Extent of Corrosion Analysis
- Life Cycle Management Assessments

## Condition Assessment

### Disposition

- Code Case N-513-4, N-597-1 calculations
- Pre-Inspection Flaw Handbook
- Reinspection interval calculations
- Fracture Mechanics & Finite Element Analysis

### Cause Analysis

- Metallurgical Failure Analysis
- Apparent/Root Cause Analysis

### Remediation

- Repair Plan and Procedures
- Remediation Plan Development
- 3rd Party Design & Procedure Review

## Asset Management Plan

### Mitigation

- Cathodic Protection System Design or Repair
- Coating Reconditioning: Selection / Design
- Materials Engineering: Selection / Design
- Groundwater (NEI 07-07) Program Integration

### Monitoring

- Installation & Testing Services
- Cathodic Protection Test Stations and Wells
- Permanently Installed Guided Wave Collars
- Permanent CP Half-cells
- Corrosion Coupons (Internal & External)
- BloGEORGE™

### Analysis Trending

- Corrosion Monitoring & Data Mining
- CP System Performance
- Ground Water Monitoring Wells
- Industry/Fleet Benchmark & Gap Analyses
- Assessment of Water Treatment Programs

### Reinspection Interval

- Integrating Inspection Results, soil properties, CP, and Coupons into remaining Life Estimations

### Training

- MAPPro 4.0 and MAPProView training
- Program Management & Risk Management
- Corrosion Principles & Threat Assessment
- Cathodic Protection System Management
- Direct Inspections
- Flaw Evaluations