

# A Pipeline Operators Viewpoint on Underground Coatings Issues

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## Major Issues

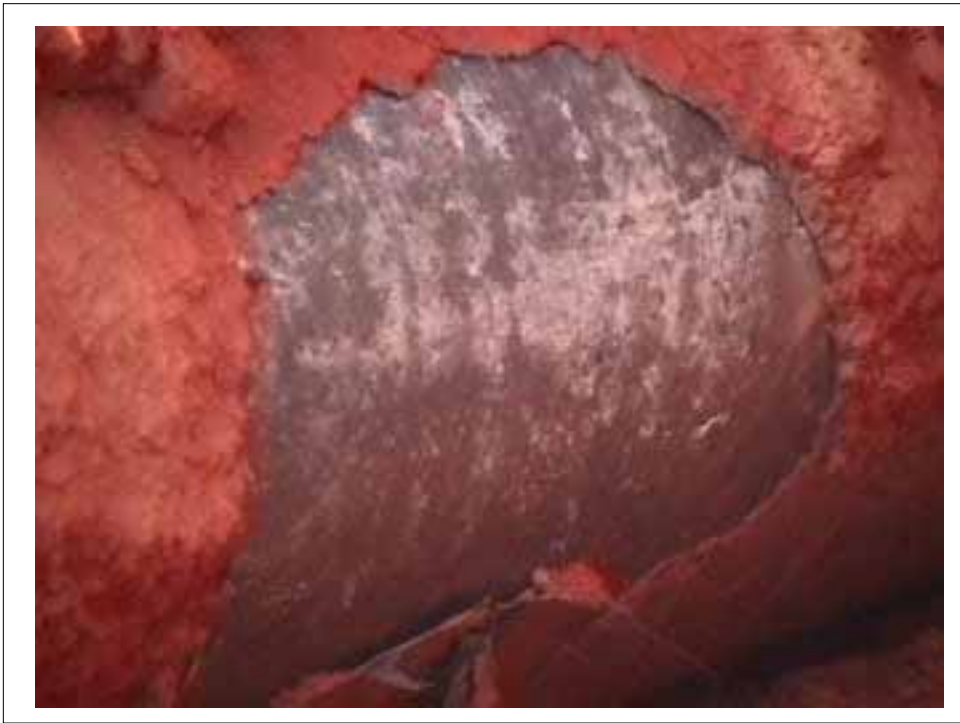
- Existing Pipeline Coatings
- Coatings for New Construction
- Coatings for Pipeline Rehabilitation
- Coatings for Pipeline Repairs

## Existing Pipeline Coatings

- Coal Tar Enamel
- Asphalt Enamel
- Extruded Polyethylene
- Fusion Bonded Epoxy
- Somastic
- Pritec
- Liquid Epoxy
- 3 Layer
- Tape
- Wax

## What is the issue with existing coatings?

- Age
- Condition
- Failure Mode
- Reparability
- Compatibility with Repair Coatings
- Hazards & Toxicity
- Transition Zones





## Transition Zones



## Issues

- CP Shielding
- Increased CP Levels
- Recoating

## Coatings for New Construction

- Most common is Fusion Bonded Epoxy – FBE
- Multi – Layer Systems Gaining in Popularity
- Issues are Coating the Weld Joints, Handling Damage, Flexibility and Coating Repair Methods – Quality Control & Inspector Standards.



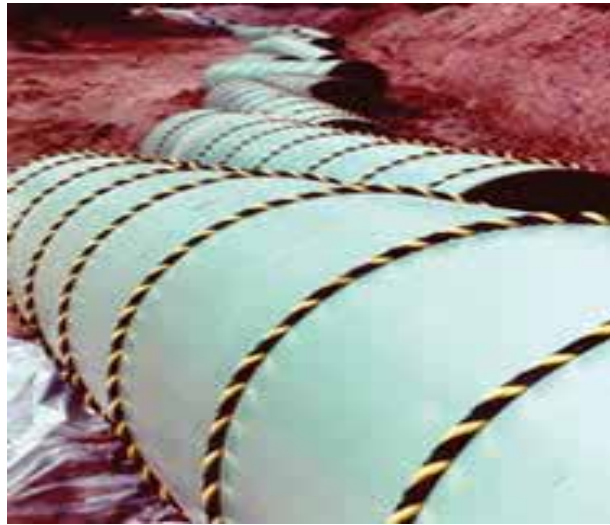
## Weld Joint



## Flexibility



## Handling Damage



## Handling Damage





## Coatings for Pipeline Rehabilitation Issues

- Compatibility with Existing Coatings
- Cure/Dry Time
- Performance
- Application
- Ambient Conditions
- Quality Control
- Inspector Standards



Job Site



Abrasive Blasting





## Holiday Testing





## Coatings for Pipeline Repairs

- Keyhole Coatings
- Wet ditch/hole Coatings
- Winter Grade/Summer Grade Coatings
- Cure/Dry Time

## Repair Coatings



## Repair Coatings



## Keyhole Coating



## Summary of Issues

- Repair & Rehabilitation Coatings are the major issue for pipeline operators.
- Deterioration & Aging of Existing Coatings are an ongoing issue for pipeline operators.
- Improving handling properties for new pipeline coatings, flexibility of new coatings, as well as weld joint coatings (quality) and in field repairs (quality) for the coating are major issues for pipeline operators.

## Additional Issues

- Development of new or standardization of existing short term testing methods to reliably predict long term coating performance.
- Investigate the effects of pipeline preheating or thermal treatment used in the application of new coatings may affect the strain aging in steel substrates.