



**SAFETY IS IN YOUR HANDS.  
EVERY DIG. EVERY TIME.**



**CHECK  
THE BOX®**



# Construction Issues



U.S. Department of Transportation  
**Pipeline and Hazardous Materials Safety Administration**

John Harper email—[john.harper@dot.gov](mailto:john.harper@dot.gov)

# Safety



U.S. Department of Transportation  
Pipeline and Hazardous Materials Safety Administration



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# Safety

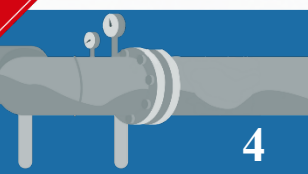
- Your safety is extremely important
- Heavy loads and large equipment can present special risks
- Do not place yourself in harm's way
- Make eye contact with heavy equipment operators
- Wear PPE and safety vests
- Be extremely cautious about entering the area between the pipe and ditch, standing next to the ditch and entering the ditch to observe welding





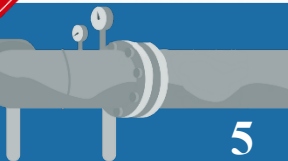
# Safety

Where are you standing?



# Safety

- Pipe on skids can move and fall
- Where would you park?





# Safety

- Do you want to be under these wires or near this equipment?



# Construction Issues



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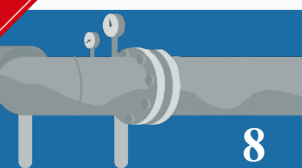
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# Coating Issues

## Construction Issues





# Coating Damage

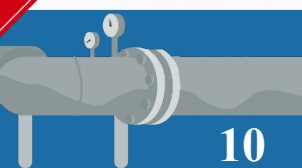
Due to Pipe Support





# Coating Issues

## Jeeping Over Soil





# Patch Stick Issues

- Poor application practices
- Soil stress can remove poorly installed patch stick repairs
- Heating the patch stick and dripping the product on the coating holiday is not acceptable
- The photo shows a poorly adhered patch stick repair
  - This was found upon uncovering a newly built pipeline



# Patch Stick Issues

- Manufacturer's procedures for patch stick application must be followed
- The photo shows an applied patch stick repair scratched off by a fingernail





# Patch Stick Issues

## Good patch stick application

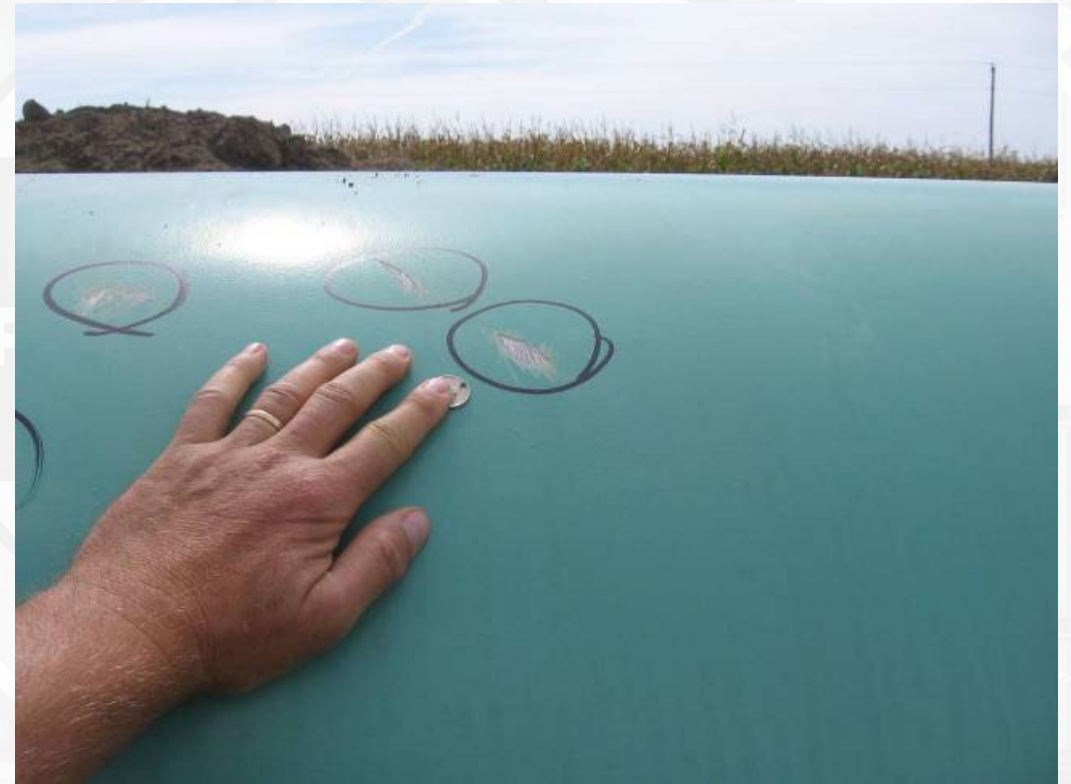
- Notice heated/discolored area around patch
- This indicates the pipe was heated before and during patch stick application



# Patch Stick Issues

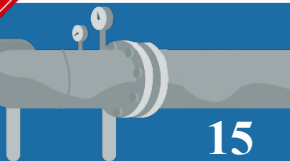
Only for Pinhole or Abrasion Repair

2-Part Epoxy Should Have Been Used

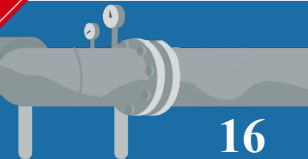
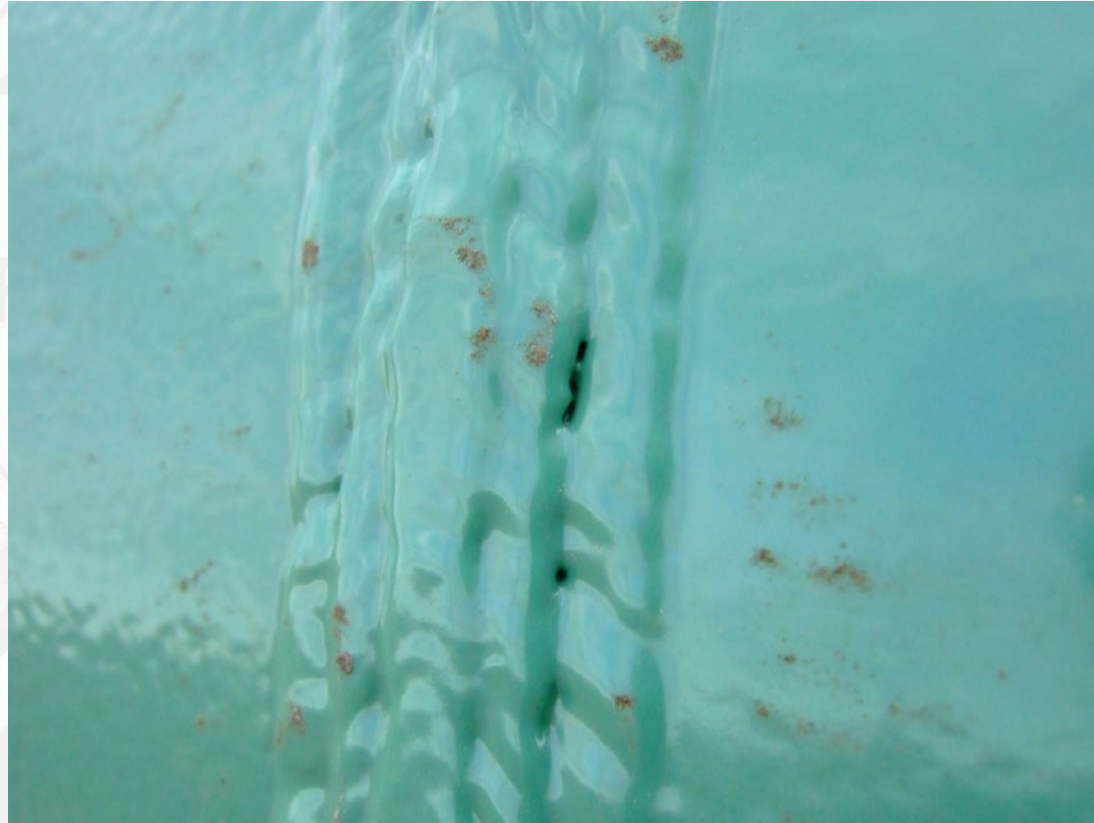




# Patch Stick Issues

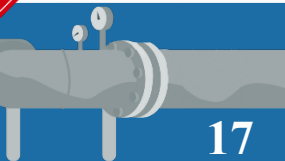


# Coating Issues





# Damage by Welding or Beveling Band



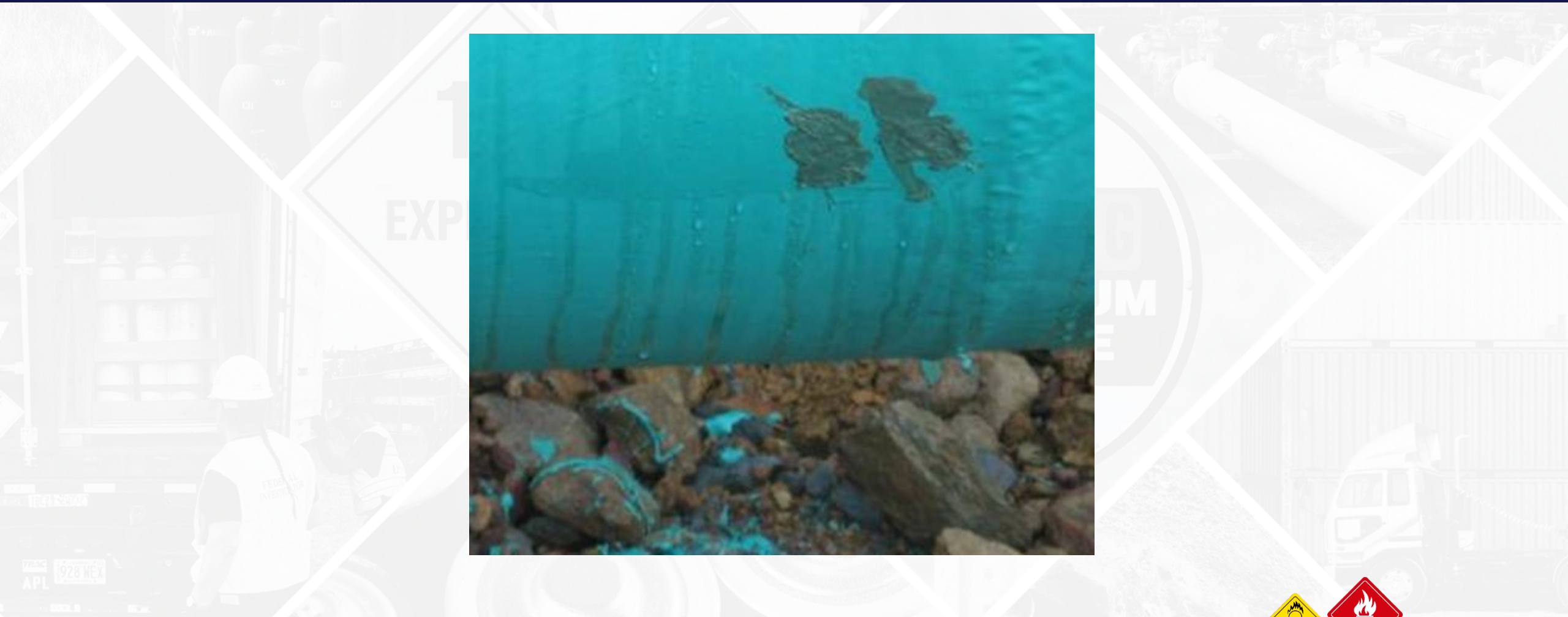
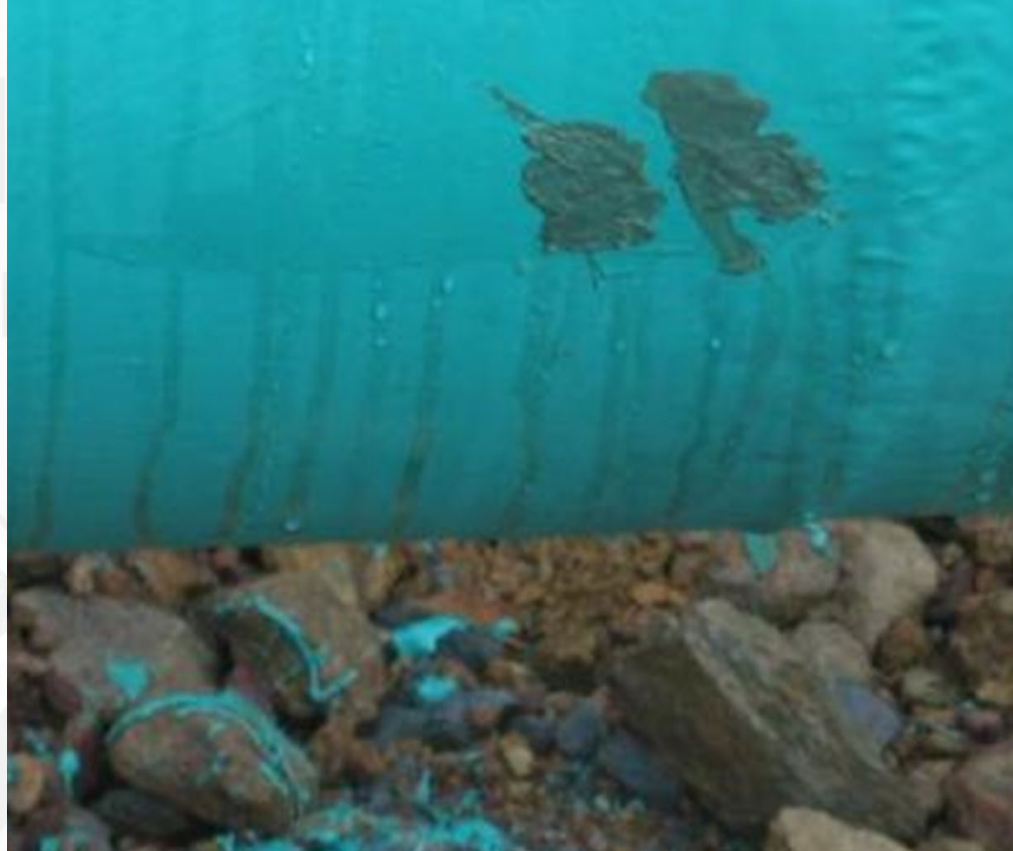
# 2-Part Epoxy

- Follow manufacturer's instructions
- Preparation required (Sanding = anchor pattern)
- Thoroughly mix product
- Use promptly
- If products start to cure before application, the repair presents the appearance of the next slide

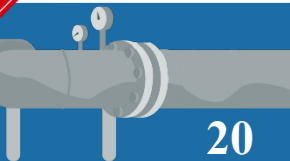




# Coating Issues



# Coating Issues





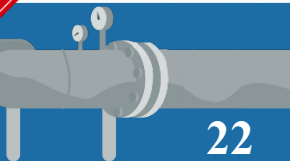
# Electronic Holiday Detection (Jeeping)

- Visual inspection must supplement jeeping
- Problems identified
- Bent defective spring
  - Not identifying and repairing all “jeeps”
- Passing over visible holiday without the jeep sounding
  - Based on experience, jeep voltage may need to be set as high as 3500V to detect coating defects



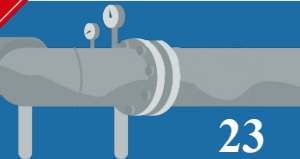
# Bent Spring

A bent jeep spring can miss coating holidays





# Overstretched Spring



# Coating Issues

- 199 jeeps on section





# Jeeping Issues

- Are the workmen finding coating holidays?
- Do the workmen operating the jeep have time to find and repair coating holidays?
- Is the jeep turned on?



# Jeeping Over Attachments

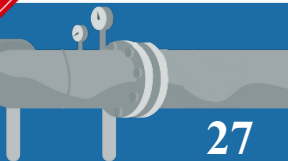
Manipulating the jeep spring over building fiberboard stuck to the pipe is poor practice





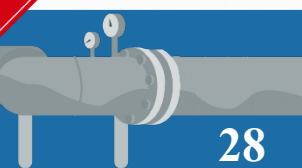
# Jeeping at Skids

Jeeping at skids only on lowering in is not usually per construction procedures



# Duct Tape

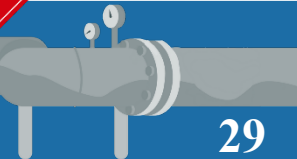
Duct tape can shield coating holidays





# Backfill Practices

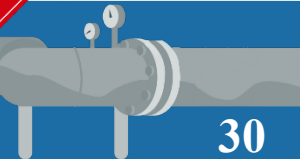
## Damage Due to Poor Backfill Practices





# Backfill Practices

- Look for coating holidays in the ditch
- Observing these indicates a problem





# Backfill Practices



# Backfill Issues

- Rock – Padding – Rock Shield
- Record area where RS applied



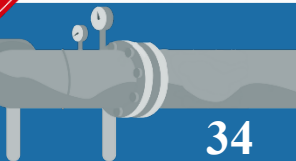


# Padding Machine





# Backfill Issues



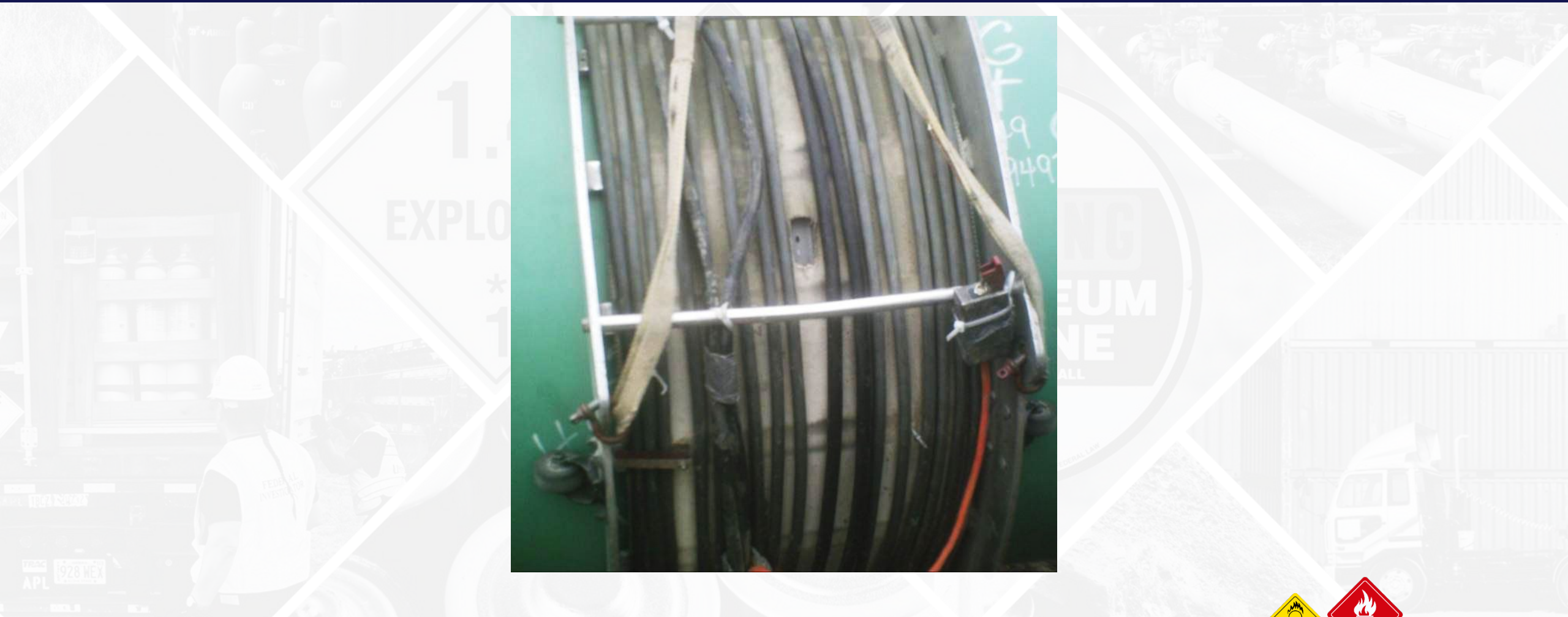


# Thin Film Epoxy Issues

- Insufficient heating
  - 3M procedure specify 425° – 488°F
  - Lower temperatures could mean improper curing
- Over heating during application can be a problem
  - Coating looks burnt and is unacceptable
- Poor sandblasting

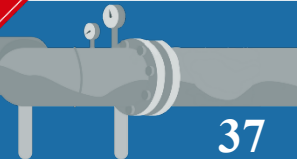


# Thin Film Epoxy Issues

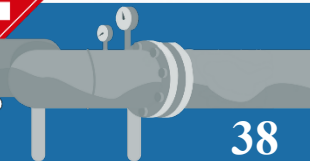




# Girth Weld Coating



# 425°F to 488°F



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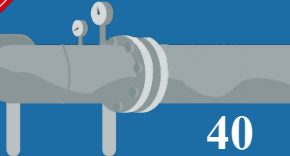


# Thin Film Epoxy Issues



# No Coating Coverage

Is there water in the pipe?





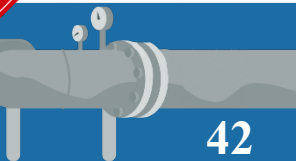
# Gauges and Bending

- Consult procedures
- Acceptable wall thickness?
- $< 1\%$  diameter?





# Proper Burial Depth on Bores





# Deep Enough/Protected from Erosion





# Laminations

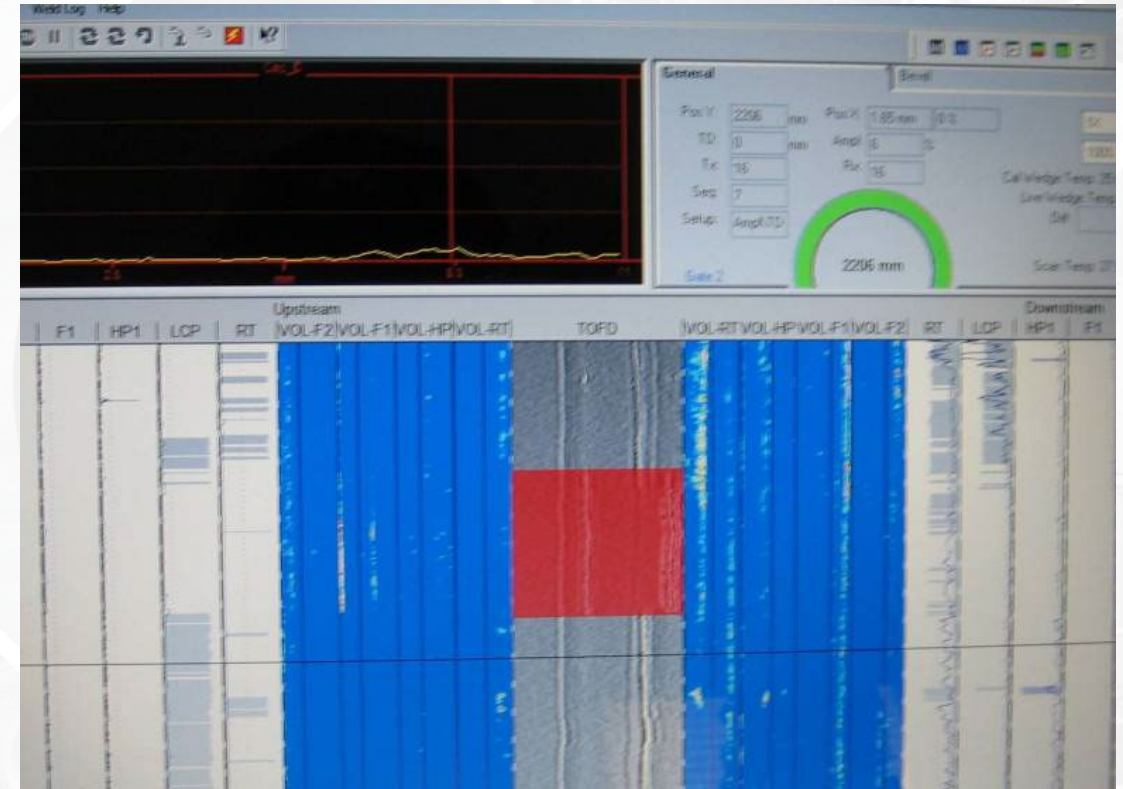
Can be an issue especially associated with an 80% waiver



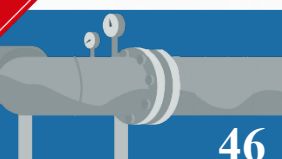


# Automated Ultrasonics (AUT)

Easily shows laminations



# Construction Issues

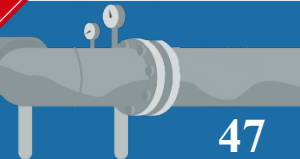


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# Construction Issues



# Construction Issues

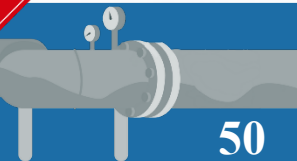




# Construction Issues

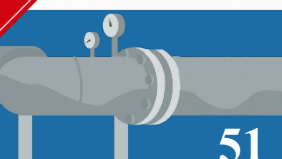


# Construction Issues

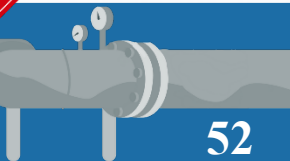




# Rock Shield Needed



# Construction Issues





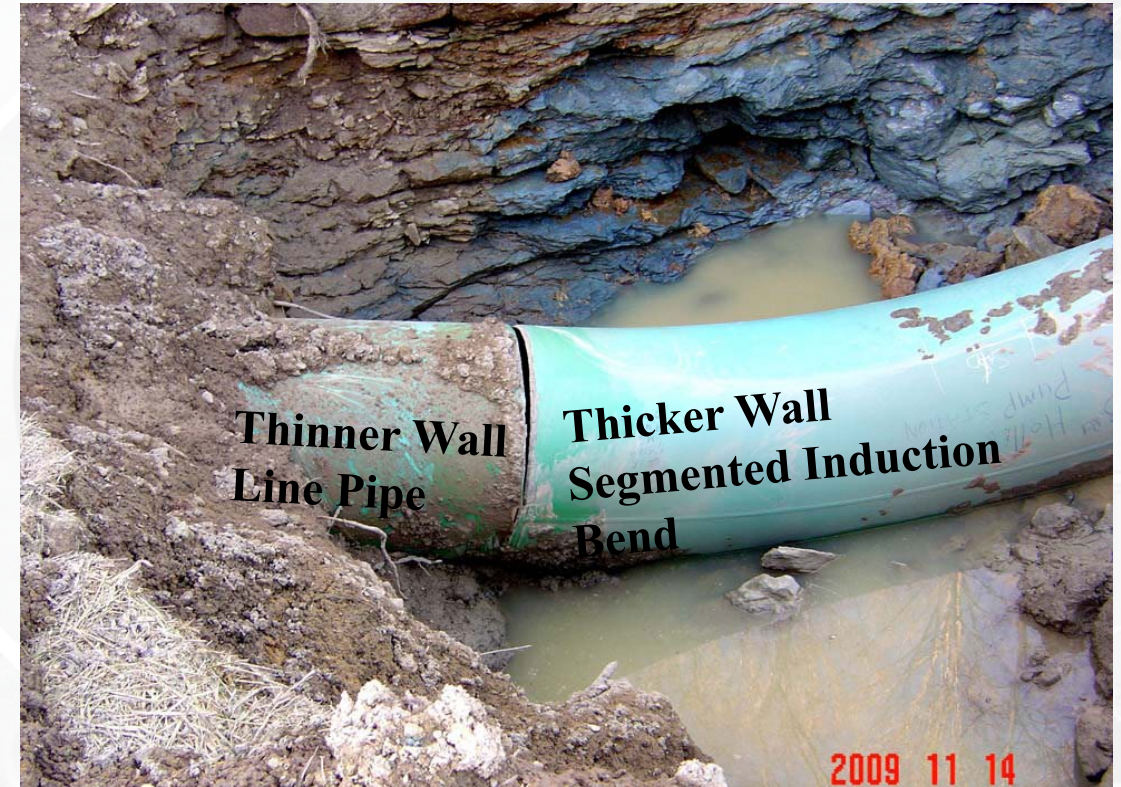
# Construction Issues





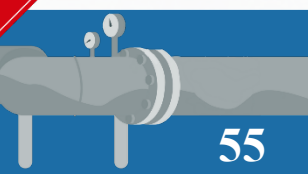
# ADB-10-03 Girth Weld Quality Issues

- Misalignment
- Thickness transitions
- Welding practices
- Below in-service failure occurred at 65% SMYS



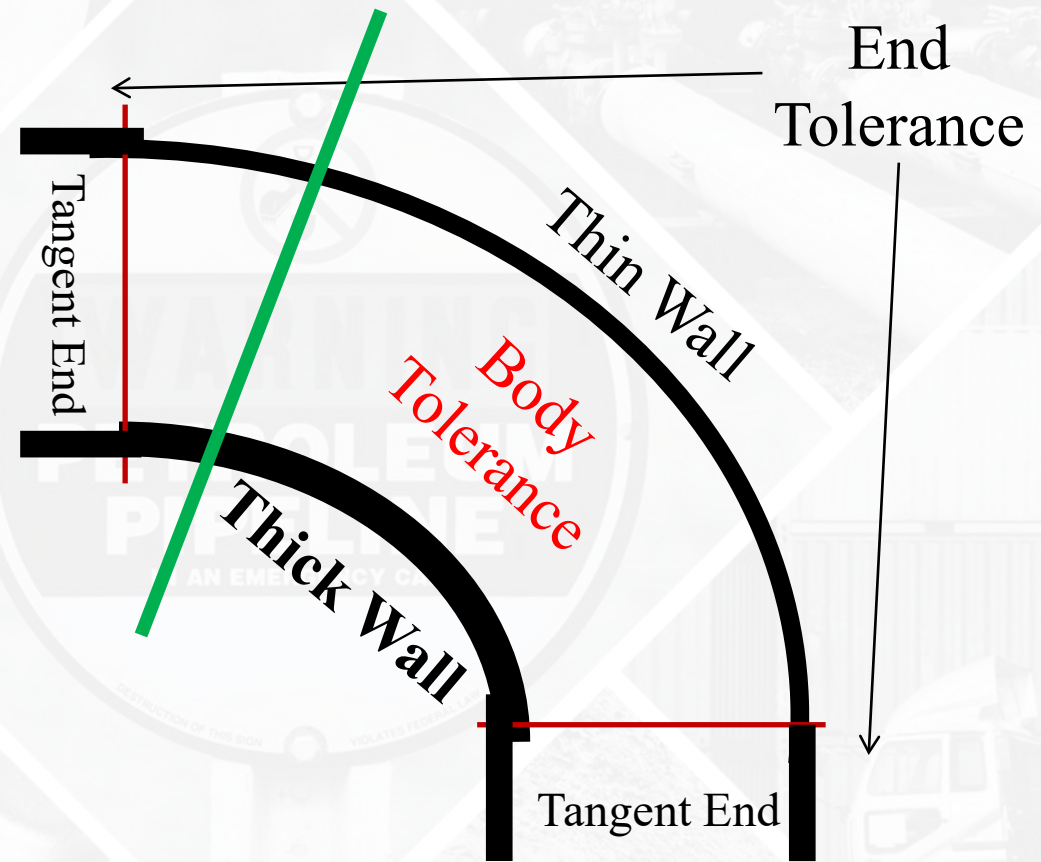


# ADB-10-03 Girth Weld Quality Issues

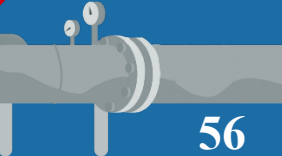


# Bends and Fittings

- Bend fittings
- Hot induction bends
- If cutting bends, use segmentable bends with tighter body tolerance
- Ends should meet:
  - API 5L dimensional limits
  - API 1104 fit-up requirements



Hot induction bend cross-section





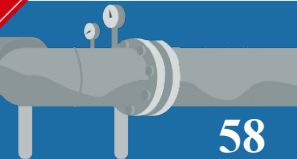
# Caliper Pig



# Anomaly Dig

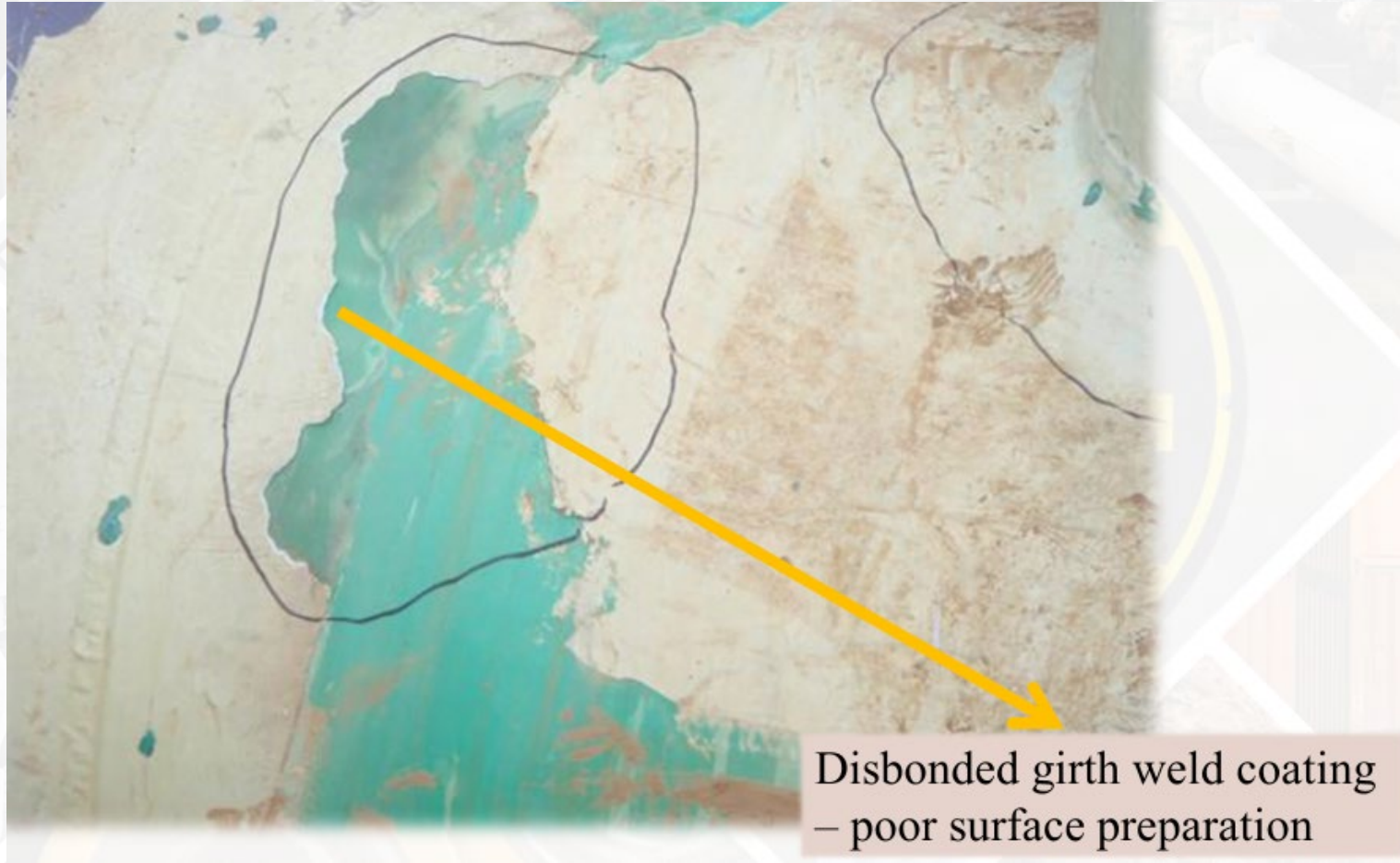


Pipe on Solid Rock





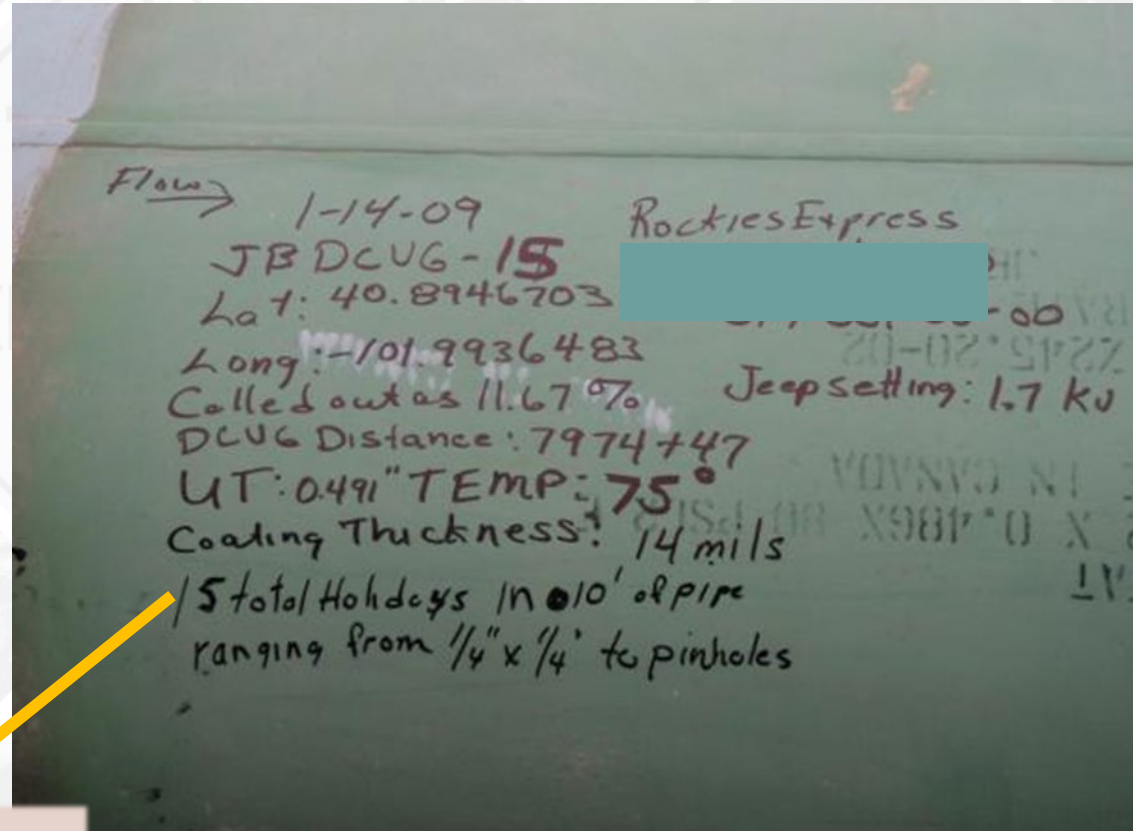
# DCVG Dig on First Phase



Disbonded girth weld coating  
- poor surface preparation



# DCVG Dig

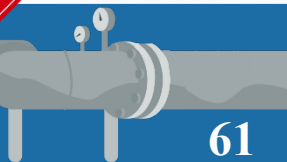
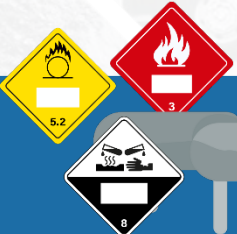
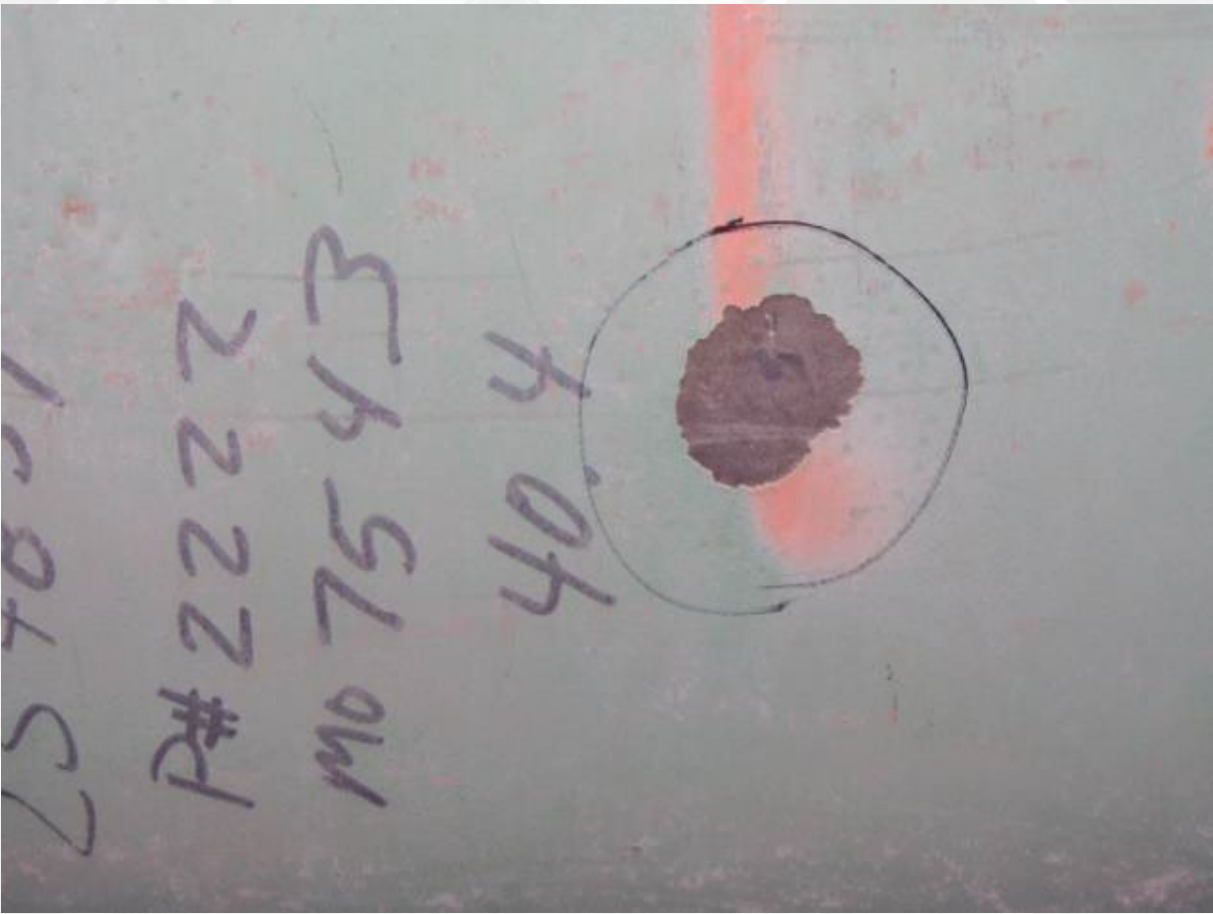


15 Holidays





# DCVG Dig



# DCVG Dig on First Phase

Girth weld coating mixed with backfill

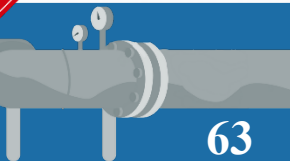


Wet Epoxy Mixed  
with Backfill



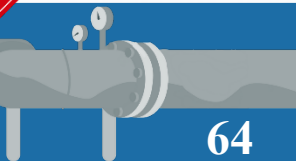


# Are There Sufficient Weights?





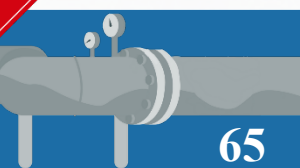
# Protected from Rocks in the Ditch



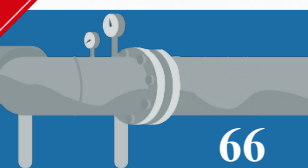


# Pipe Defect

Does remaining wall thickness meet requirements of API 5L?



# Grinding Remaining W.T.





# Thank you



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