



# Cased Pipelines and Solutions

Presentation: Pipeliners Club of Atlanta  
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*Felix Enriquez*

Casing Program Manager  
Southeast Sales Manager

Corrosion Consultant,  
Atlanta, GA  
2010-2014



Casing Program Manager,  
South East USA,  
Regional Sales Manager  
2019-Present

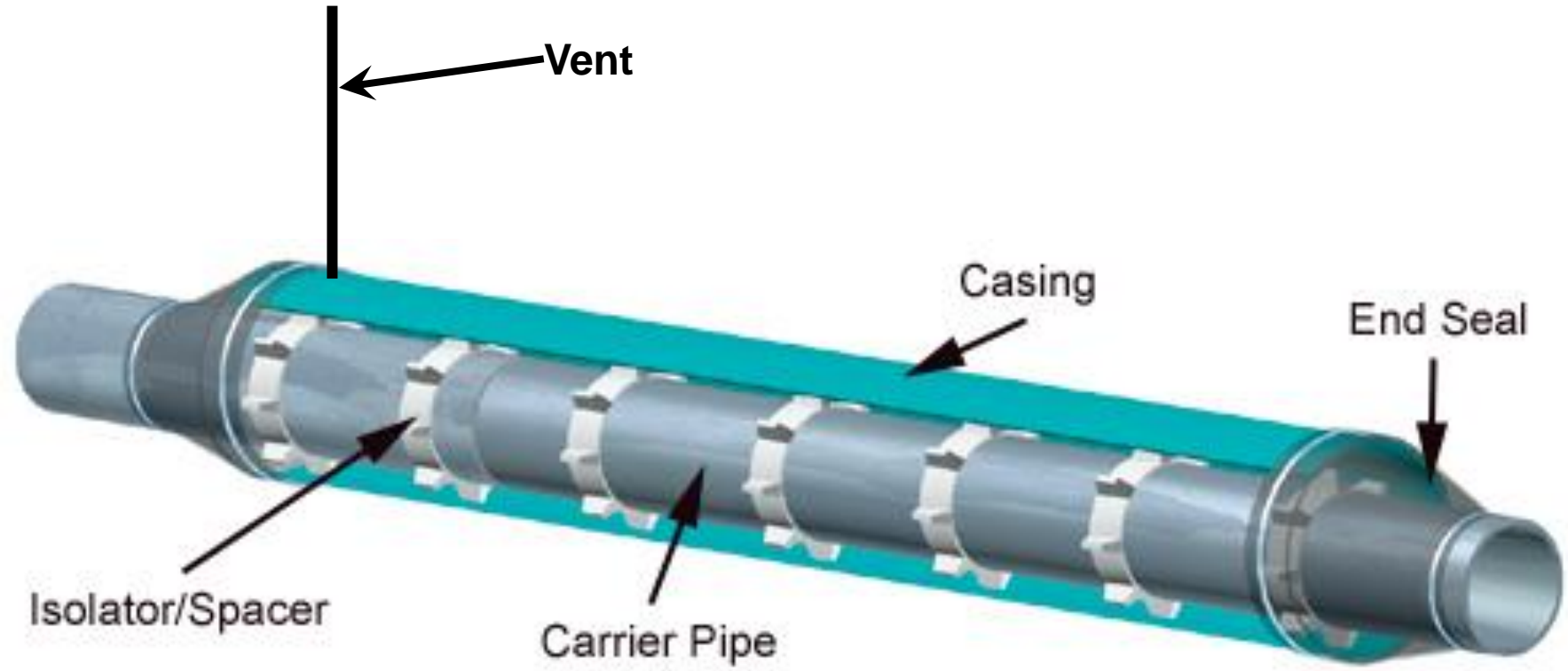


BS Civil and Environmental Engineering  
2010



Corrosion Program Manager,  
San Francisco, CA  
2014-2017  
Manager Integrity Management Program,  
ECDA, SCCDA, ICDA, DE  
2017-2019

Casing  
Components  
(typically)



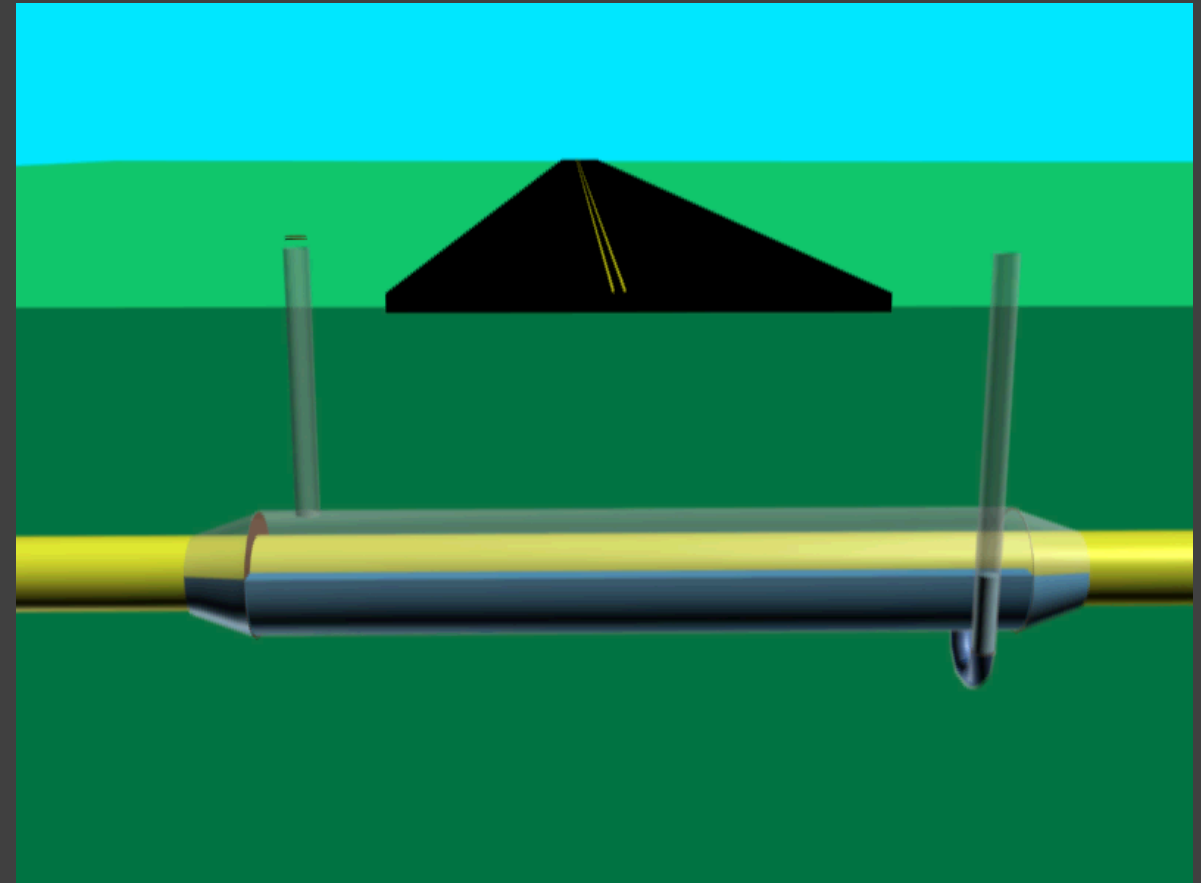
## Steel-Cased Pipelines:

### Why?

- Intended for Mechanical Protection
  - Roadways
  - Railroads

### Issues

- Electrochemically isolated space
- Difficult to access/inspect
- Difficult to protect from corrosion and clearly prove protection level
- Vents?



Atypical  
Casings



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Cold  
Weather Fill



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# Guidelines Standards & Regulations

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## PHMSA

- 192.323 Casing – Construction
- 192.467(c) Electrical Isolation

- 
- 
- NACE Standard Practice 0200 Steel-Cased Pipeline Practices
  - Guidelines for Integrity Assessment of Cased Pipe for Gas Transmission Pipelines in HCAs
  - NACE/ANSI Standard Practice 0502-2010 “Pipeline External Corrosion Direct Assessment Methodology”

## Types of Shorts

### Electrolytic Coupling

- End seal failure, no end seal
- Casing may have through wall corrosion
- Mud/Water
- Possibly seasonal
- May Allow for CP?
  - Proving protection?

### Metallic Contact

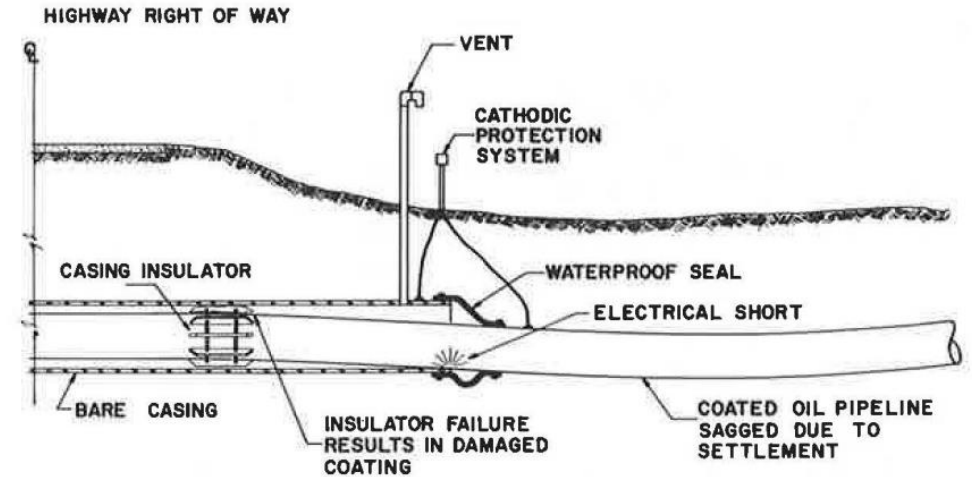
- Direct Short
- Metal to Metal Contact
- Large Corrosion Cells





## Possible Failures in Cased Pipes

- End Seal Failures/No End Seals
- Through wall corrosion on Casing
- Direct contact with carrier pipe
- Vent-carrier pipe short
- Corrugated Casing/Riveted Casing
- Conductive Materials Used



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Link Seal  
Failure



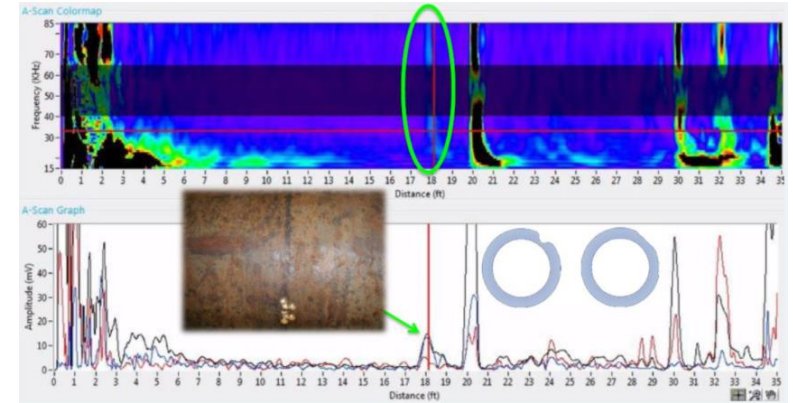
# Testing Methods (Direct)

## ILI

- Calls out “LARGE METAL OBJECT”
- Location of ends-Start and Stop (EMAT ILI)
- Indicates WL
  - Limited capacity depending on the technology due to metallic interference
- No direct indication of shorted or not

## Guided Wave

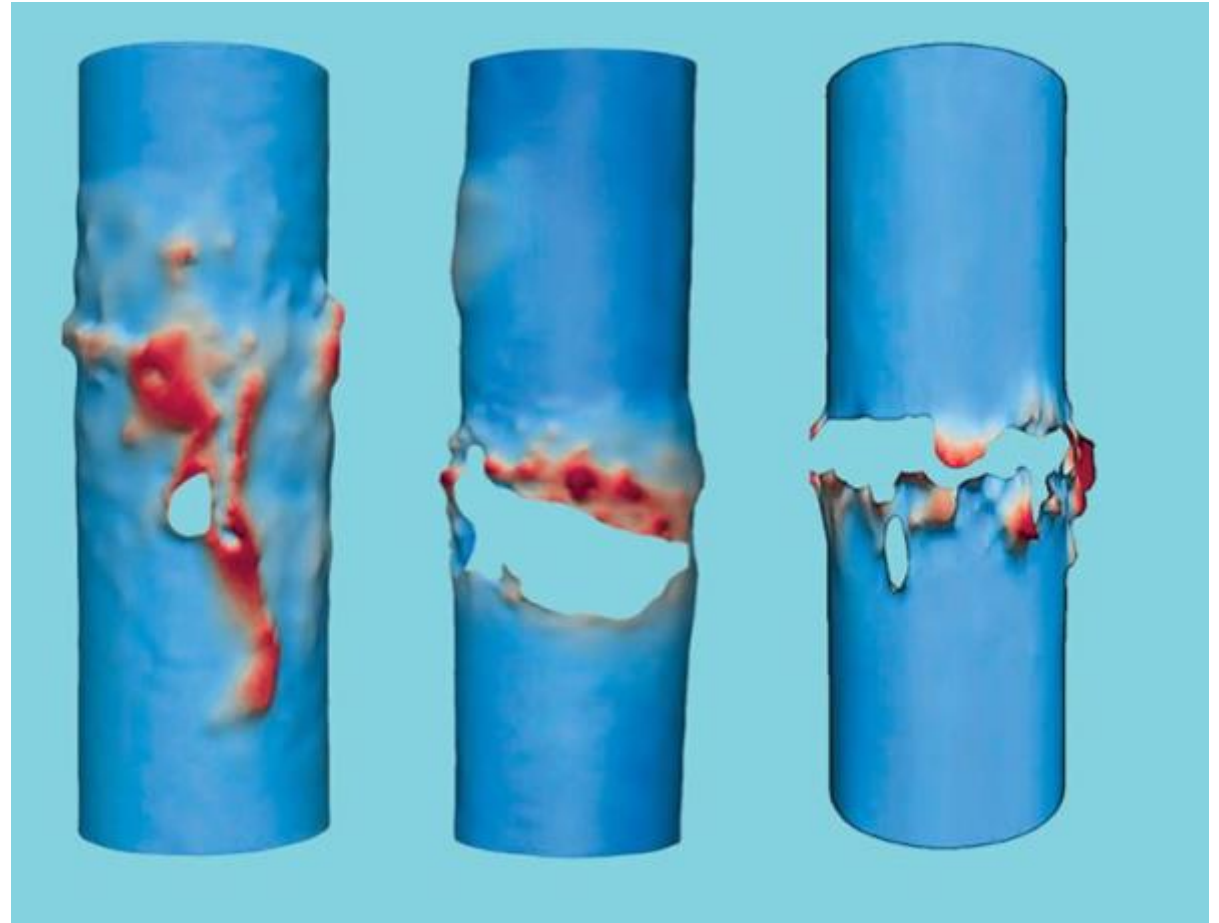
- Acoustic transducers
- Limited range
- Needs direct 360 access



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Acoustic  
Images of  
Cased  
Pipeline  
Failures



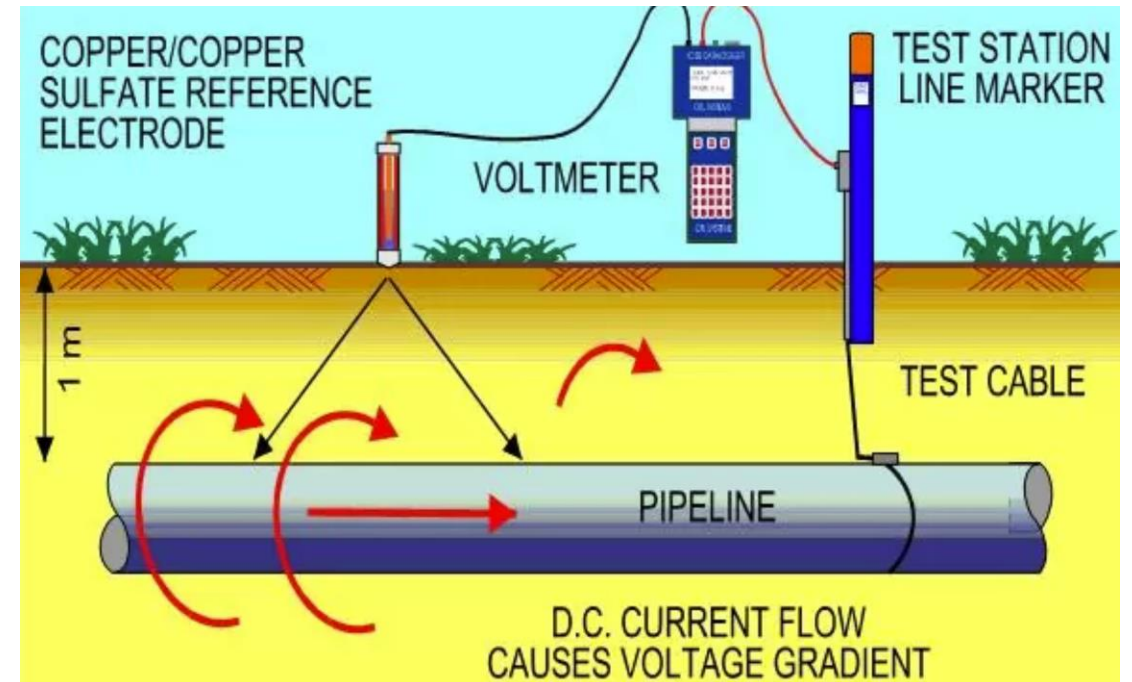
Testing  
Methods  
(Indirect)

With Vents

- P/S and C/S potentials
- Interrupted potentials
- Capacitor Test (Panhandle Eastern)
- Internal Resistance Test

Without Vents

- DCVG/ACVG
- PCM



## Solutions

### Remove the Casing

- Difficult accessibility
- Highway/RR may not allow
- High Costs

### Establish a Non-Corrosive Environment

- Expose Ends
- Remove 3'-5' of casing
- Investigate Condition
- Flush Annulus
- Install High Dielectric Filler
  - NACE SPO200Compliant
  - Trenton Fill-Coat #1



# Systematic Approach to Address Cased Pipelines



## Setting up a Casing Program:

- Understand Population
  - Classify Population
    - Contact type and Possible solutions
      - Remove or Mitigate
  - Address highest Risk areas first
    - HCA's/ Class locations
  - Be prepared to be flexible
    - Casings are generally always atypical
    - Spacer, wood
    - Metal Probe Bar Contact
  - Understand how to cut casings
    - Depth control
    - Line to Sacramento
- RISK = Consequence X Likelihood



## Filling Casings with Trenton Fill-Coat #1



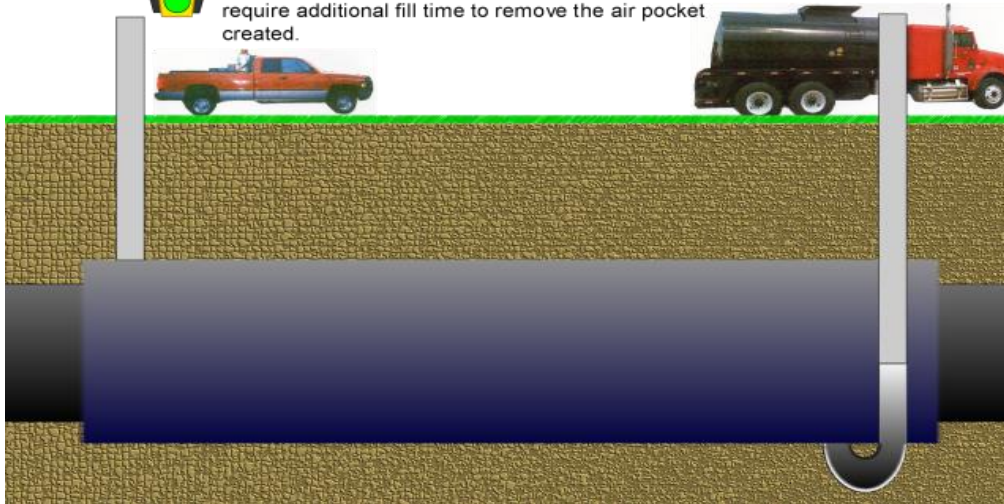


**TOP & BOTTOM VENTS LEVEL CASING**



**WET:** Blower will discharge water out the bottom vent (see dry)

**DRY:** We would fill this from the bottom vent to the top, thus filling without creating an air pocket. This casing could be filled from the top but would require additional fill time to remove the air pocket created.



# Filling Casings: Fill-Coat #1 Hot Applied Casing Filler

## What it does:

- Establishes a Non-Corrosive environment
  - Permanently
- Satisfy Department of Transportation requirements
- Arrest corrosion inside an existing casing
  - Eliminate necessary components for corrosion
- Help prevent future shorted casings
- Mitigate atmospheric corrosion

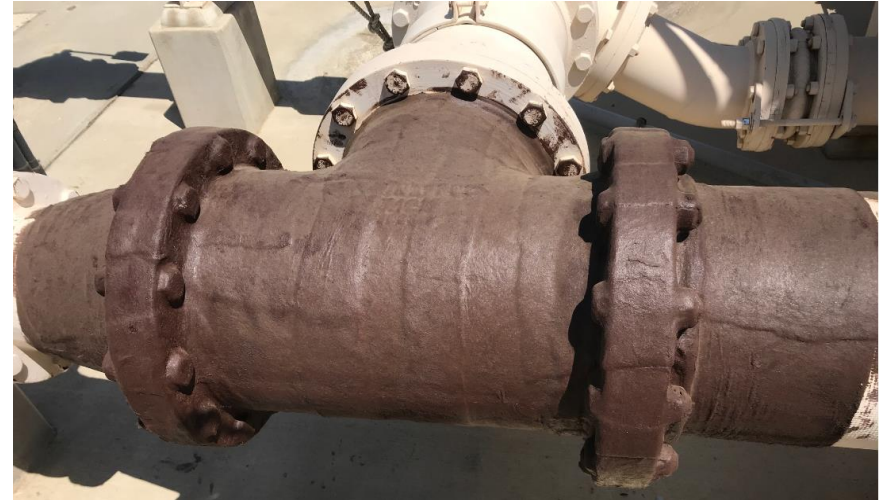
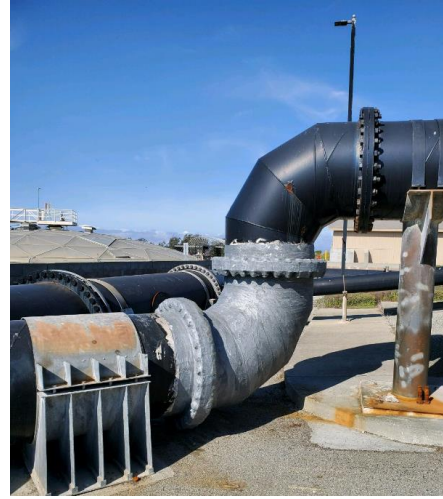


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Filled Casing with Hot-Applied  
Fill-Coat #1 Casing Filler

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Primers,  
Coatings,  
Outer wraps

# Questions?

Contact information:

(706)870-2202

[Fenriquez@Trentoncorp.com](mailto:Fenriquez@Trentoncorp.com)

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