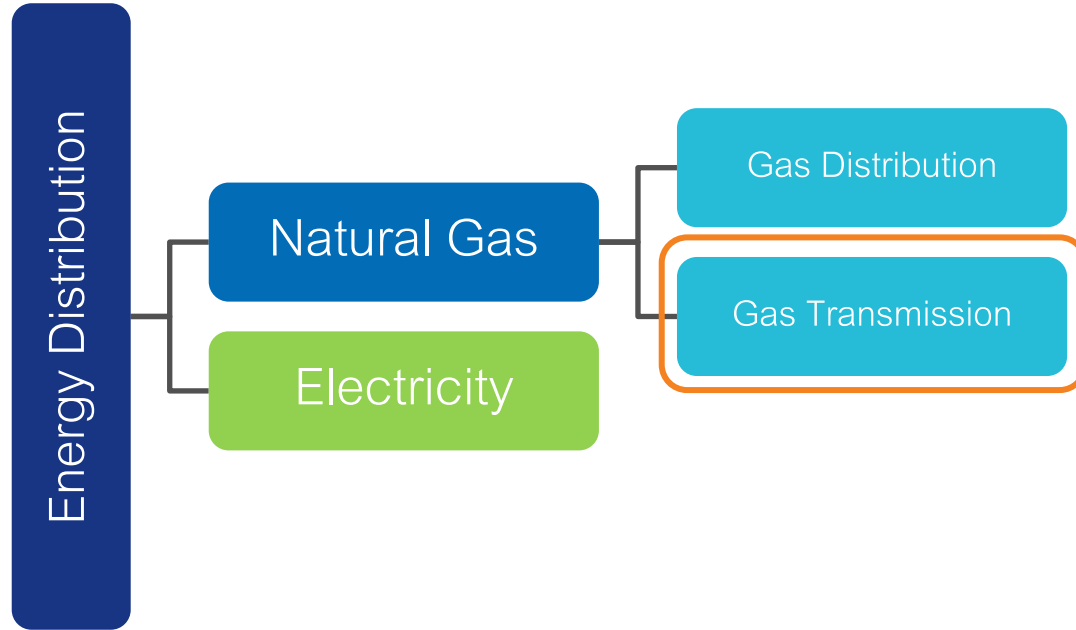


# Geomagnetically induced currents on long pipelines

Layton Manuel  
November 2017

# What does Jemena do?

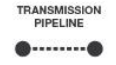


# What does Jemena do?



## Gas

- 1 Jemena Gas Network
- 2 **Eastern Gas Pipeline**
- 3 **Queensland Gas Pipeline**
- 4 **Northern Gas Pipeline** (under construction)
- 5 **Darling Downs Pipelines**
- 6 Colongra Gas Transmission and Storage Pipeline
- 7 VicHub
- 8 ActewAGL Distribution Partnership (50%)



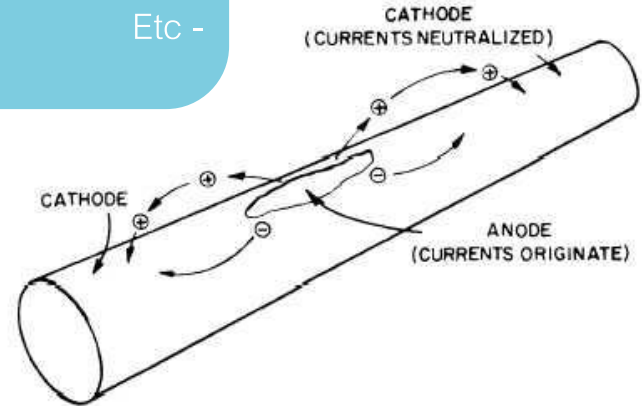
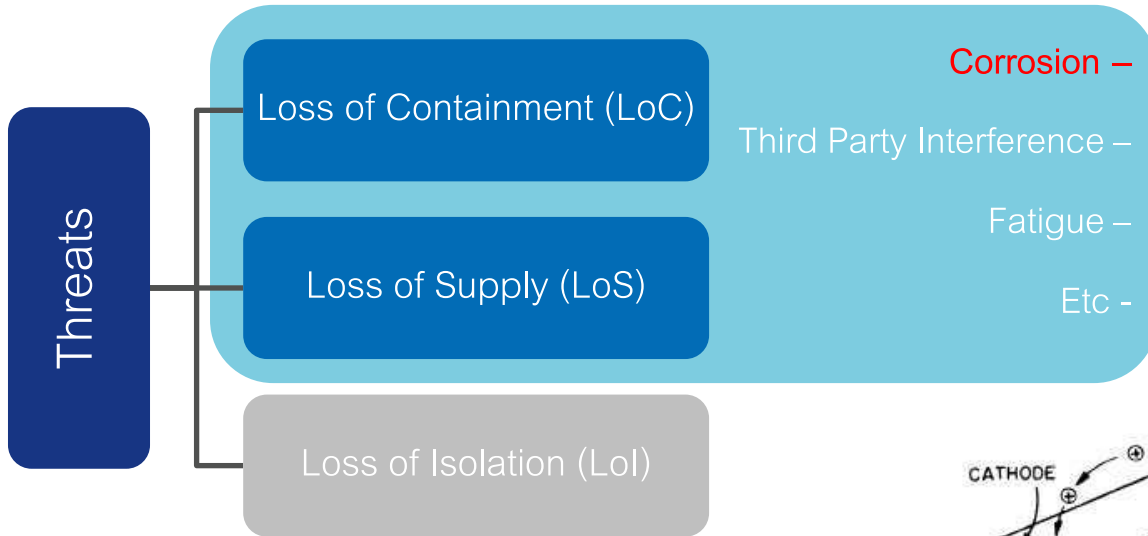
## Electricity

- 9 Jemena Electricity Network
- 10 United Energy Distribution (34%)

## Water

- 11 Rosehill Recycled Water

# What are the threats to integrity?



# Corrosion mitigation

Coating

Cathodic Protection (CP)



Primary corrosion mitigation

Will degrade over time



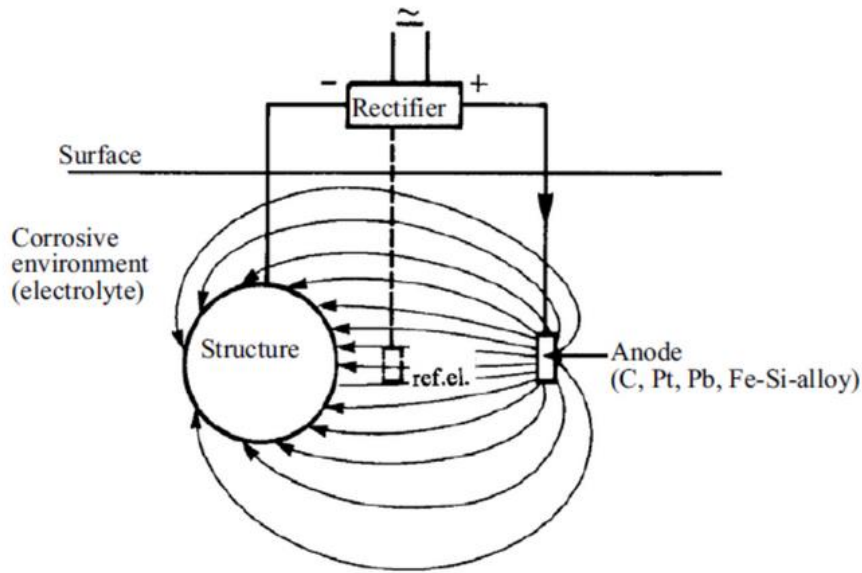
General corrosion -> Localised corrosion



# Corrosion mitigation

Coating

Cathodic Protection (CP)



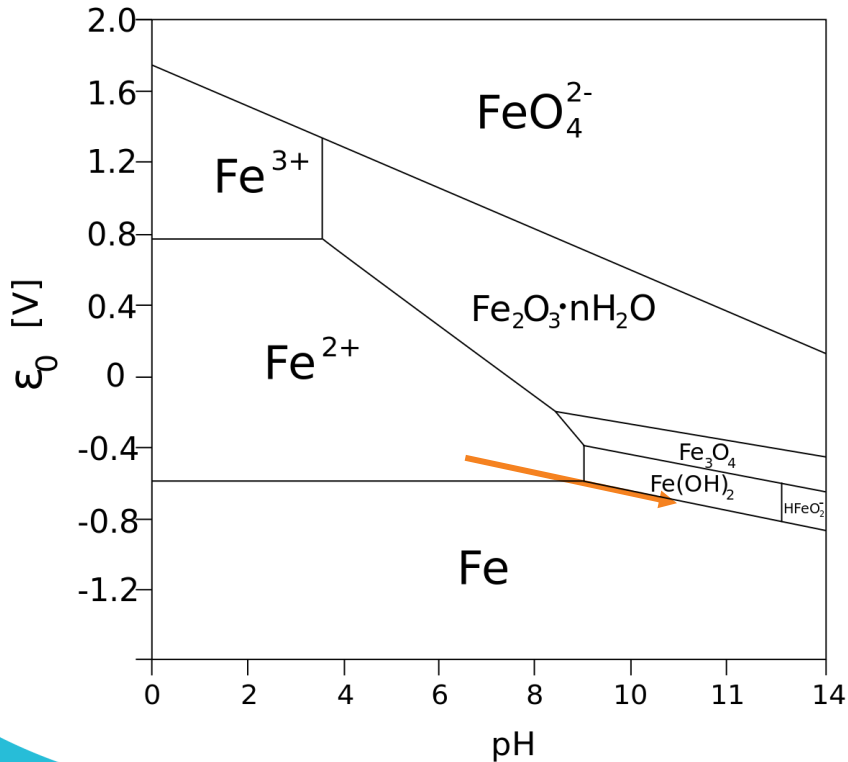
“Back-up” corrosion mitigation

Effective over reasonable distances (~100km)

# Corrosion mitigation

Coating

Cathodic Protection (CP)



“Back-up” corrosion mitigation

Effective over reasonable distances (~100km)

# Monitoring CP Performance

What?

How?

AS 2832.1 Section 2.2.2.2 Ferrous structure

*“The criteria for the protection of a buried ferrous structure is to maintain a potential on all parts of the structure equal to, or more negative than, -850mV with respect to a copper/copper sulphate reference electrode.”*

FREE OF VOLTAGE GRADIENT ERROR

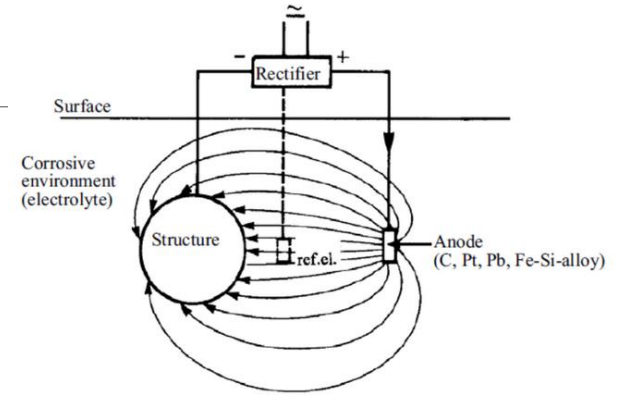
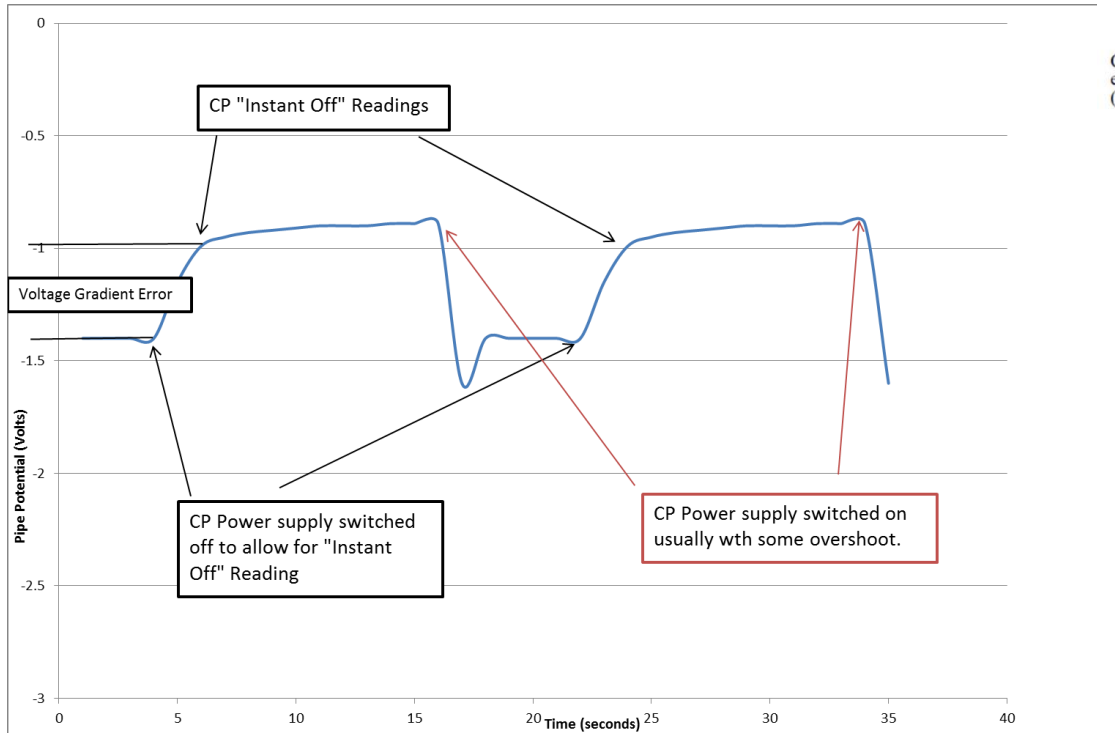




# Monitoring CP Performance

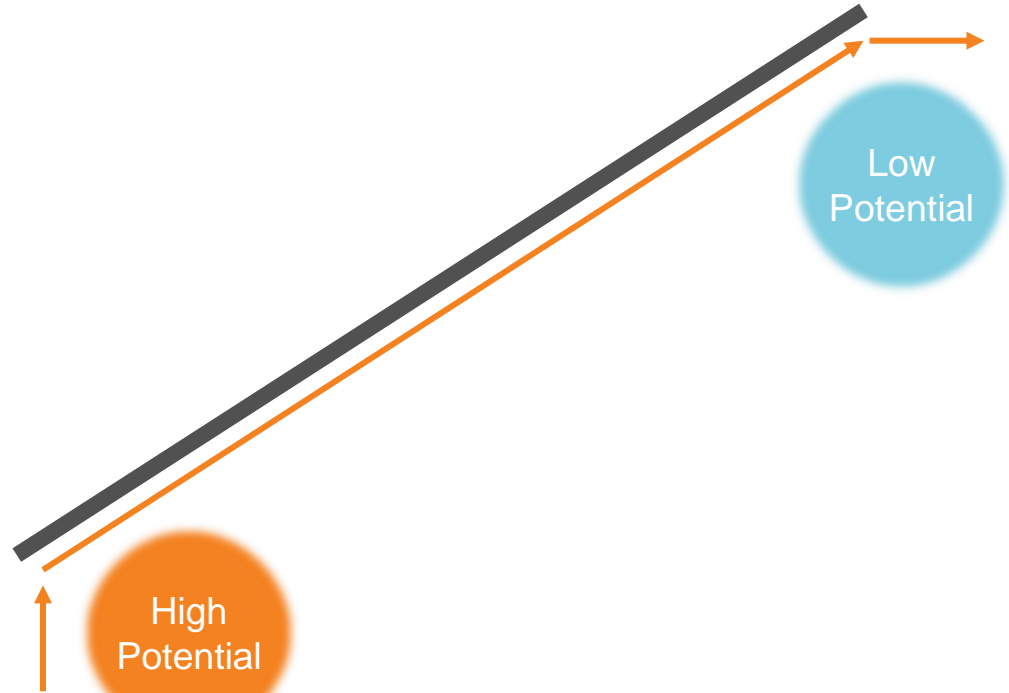
What?

How?



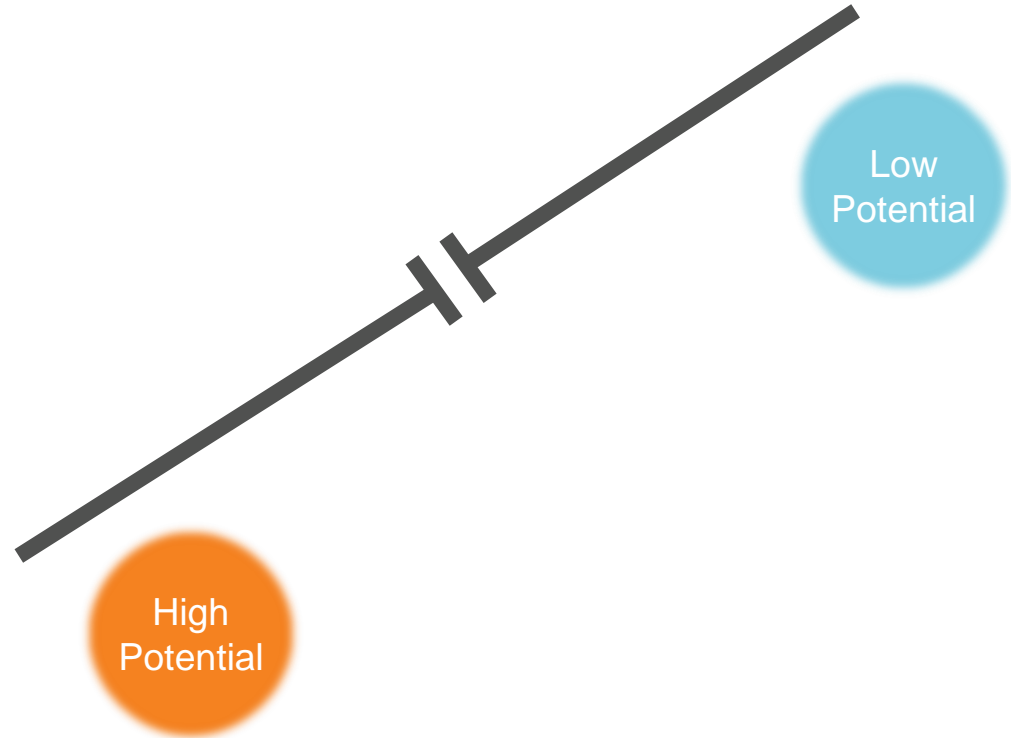
# Stray Currents – Tellurics/GICs

Why does it matter?



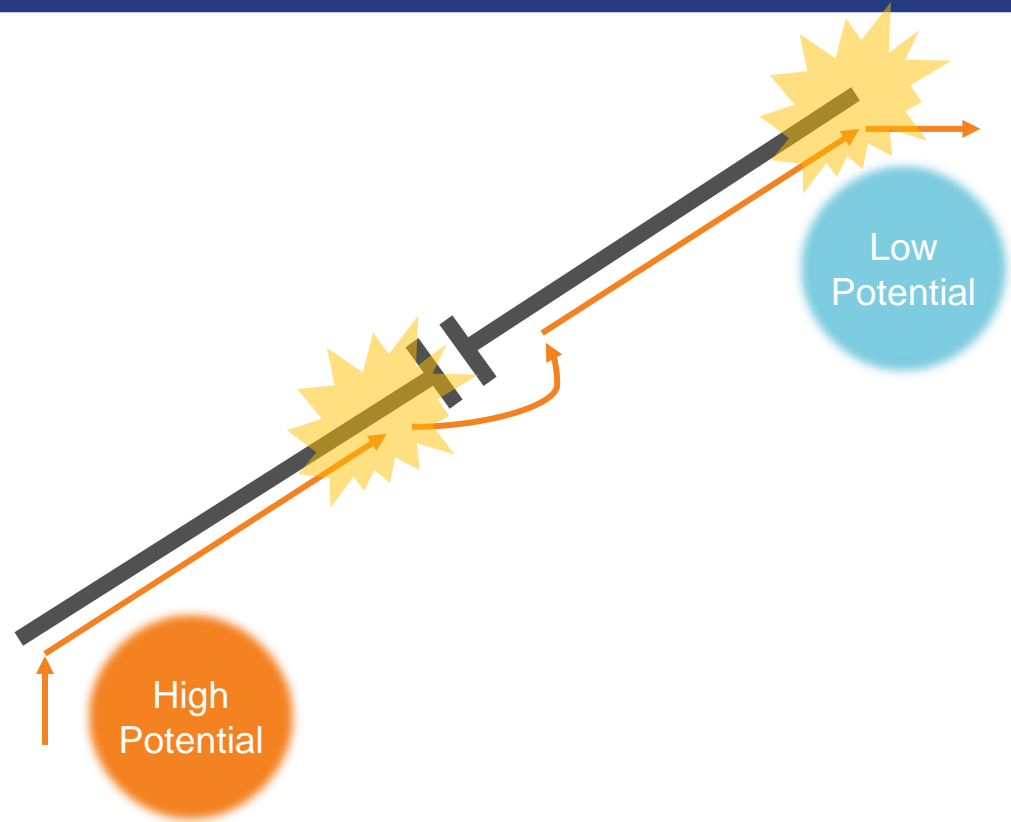
# Stray Currents – Tellurics/GICs

Why does it matter?



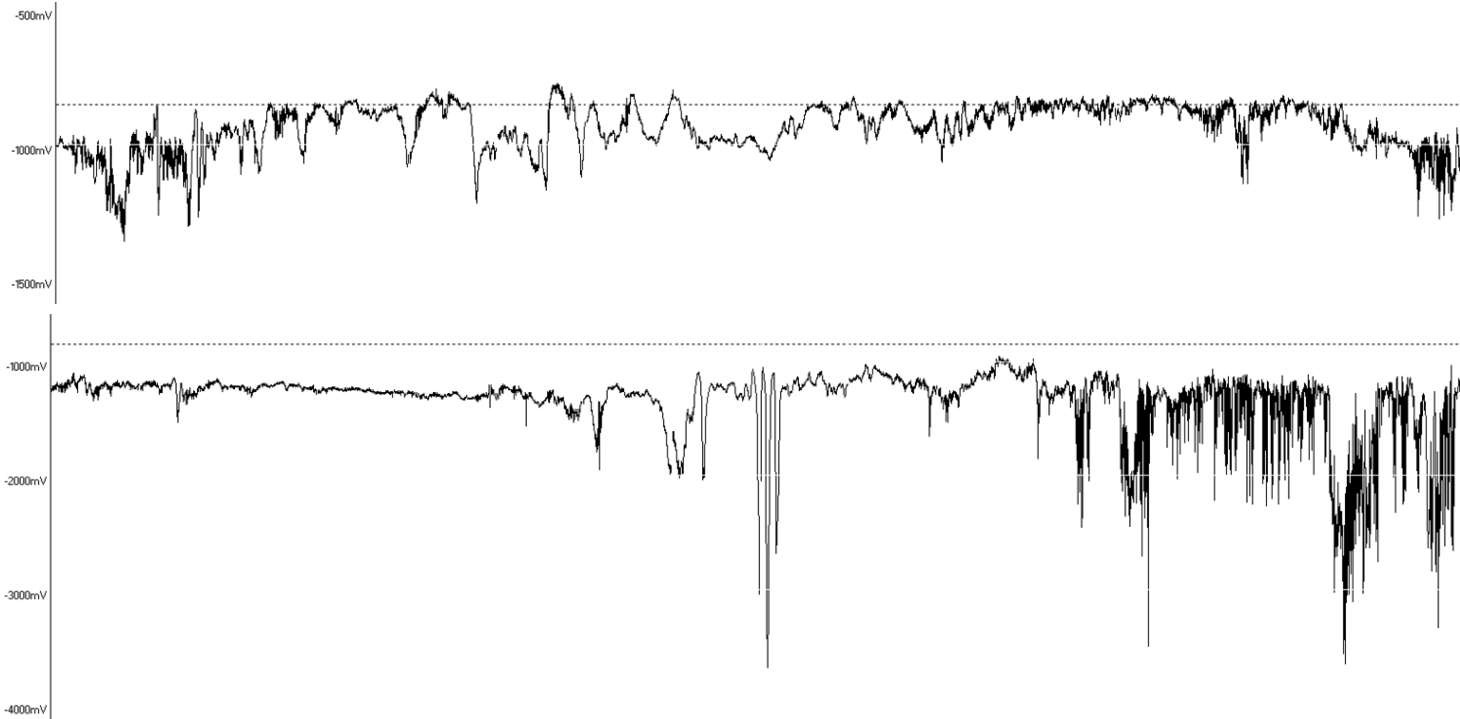
# Stray Currents – Tellurics/GICs

Why does it matter?



# Stray Currents – Tellurics/GICs

24 Hour data logging – EGP



# Stray Currents – Tellurics/GICs

Why does it matter?

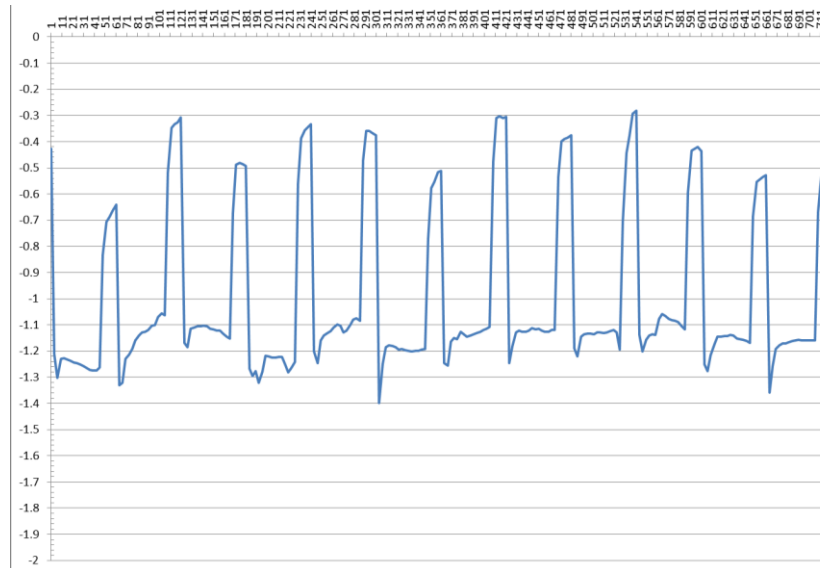
Obscures Measurements

Integrity

Comparison

AS 2832.1 Section 2.2.2.2 Ferrous structure

*“The structure potential shall not be more positive than the protection criterion for more than 5% of the test period”*



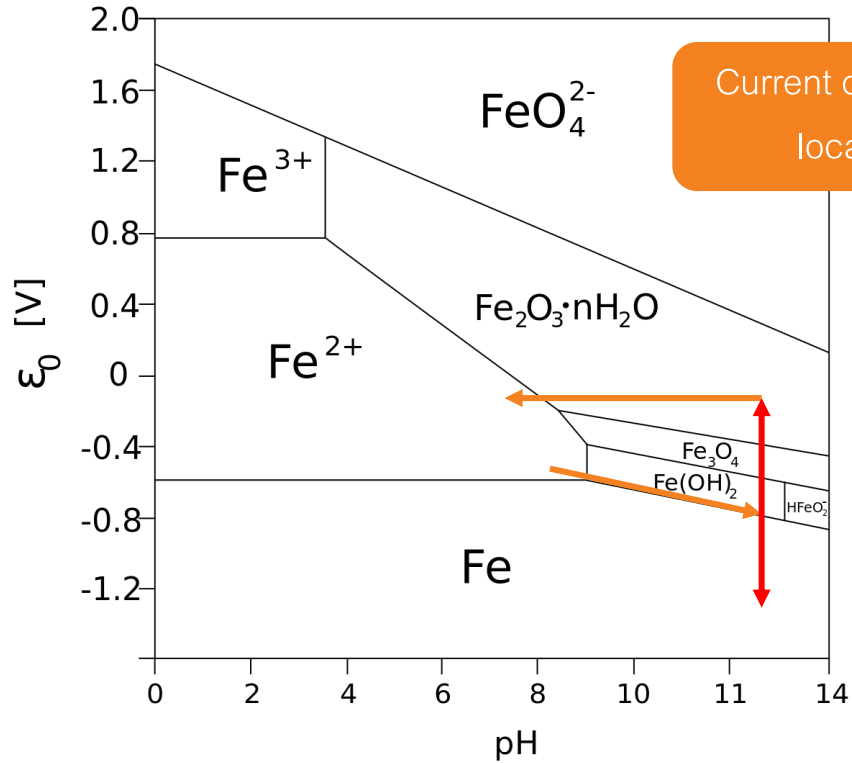
# Stray Currents – Tellurics/GICs

Why does it matter?

Obscures Measurements

Integrity

Comparison



# Stray Currents – Tellurics/GICs

Why does it matter?

Obscures Measurements

Integrity

Comparison

No loss of wall thickness

No gas leaks





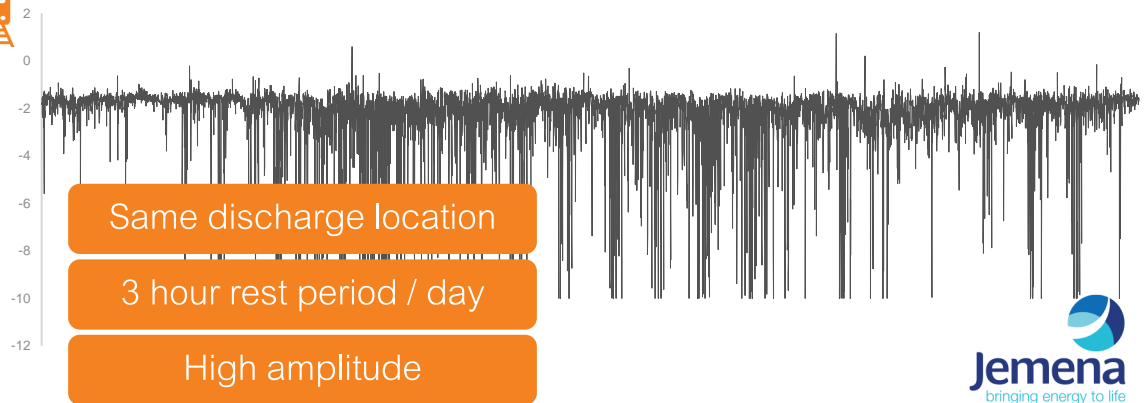
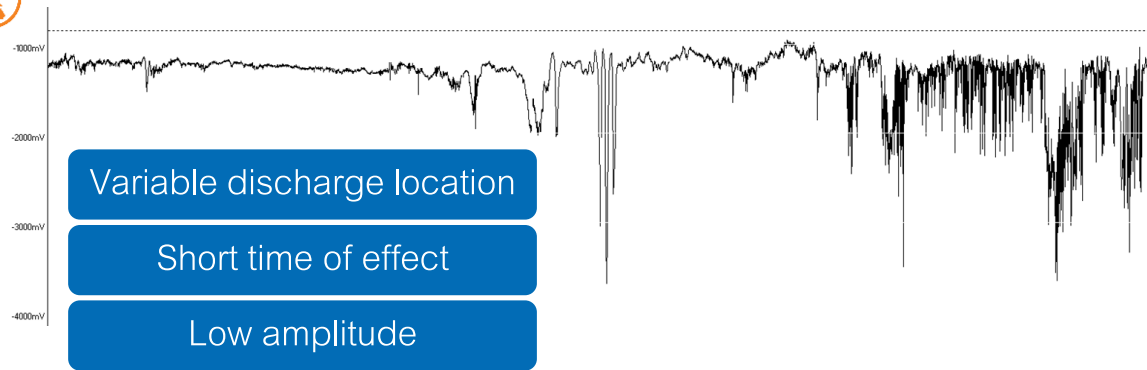
# Stray Currents – Comparison

Why does it matter?

Obscures Measurements

Integrity

Comparison



# Questions?



What concerns are there?

Destruction of monolithic  
insulating joints

Disruption/destruction of  
SCADA system

# Questions?

Thank you!  
Any questions?

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