

IEC 61850 Multivendor Station and Process Bus Substation Design

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Introduction

- Entergy's dive into IEC 61850 began in a file room deemed "lab"
- The lab evolved into an open test bed for multivendor interoperability
- Pilot Substation and Future Deployments



Pilot Substation - Joliet

- 230kV Substation containing two 100 MVA Power Transformers
- Pilot objective: Validate whether or not an IEC 61850 protection system is comparable with an existing copper system
- Digital system operating in parallel

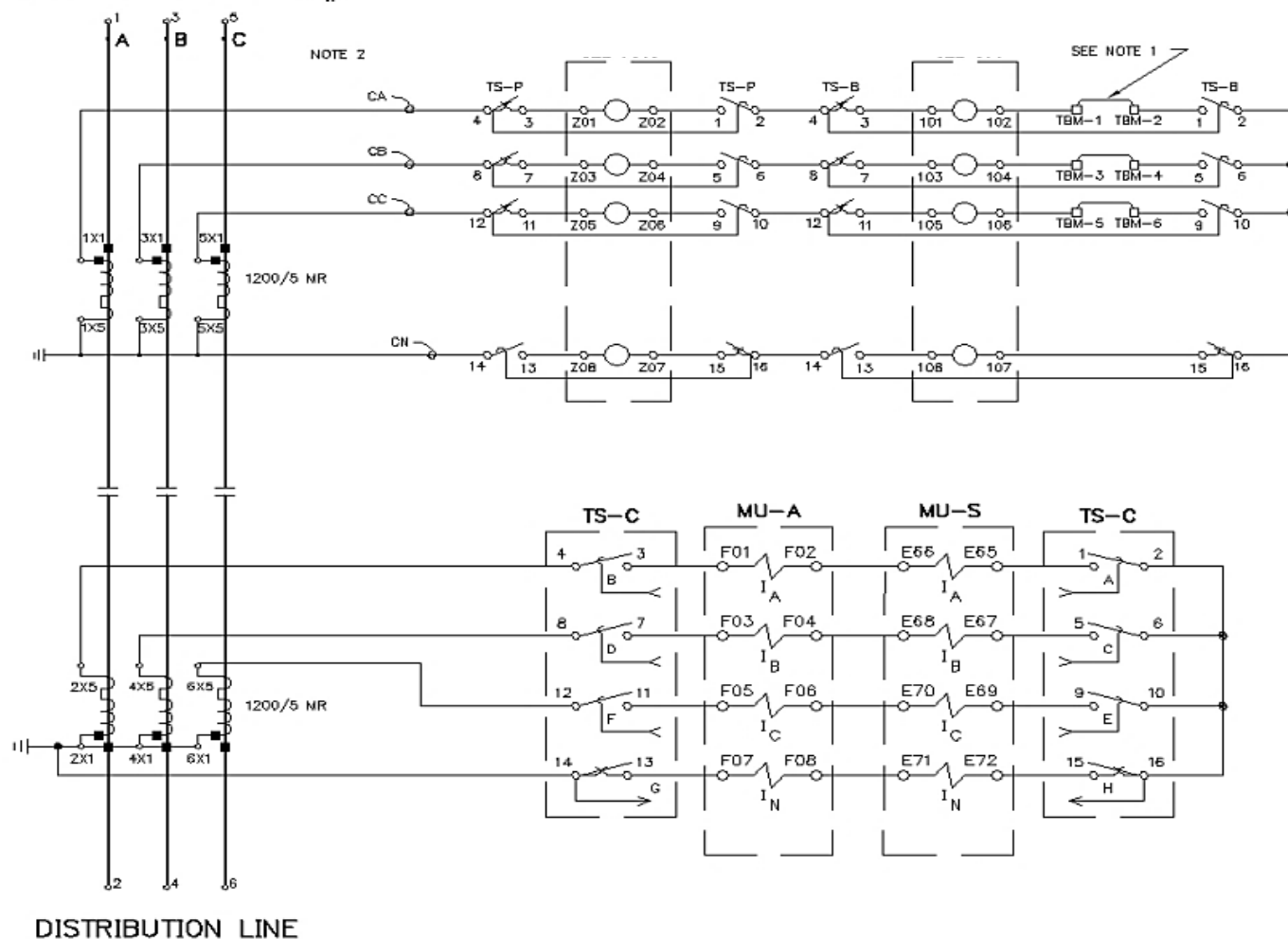


Joliet Design

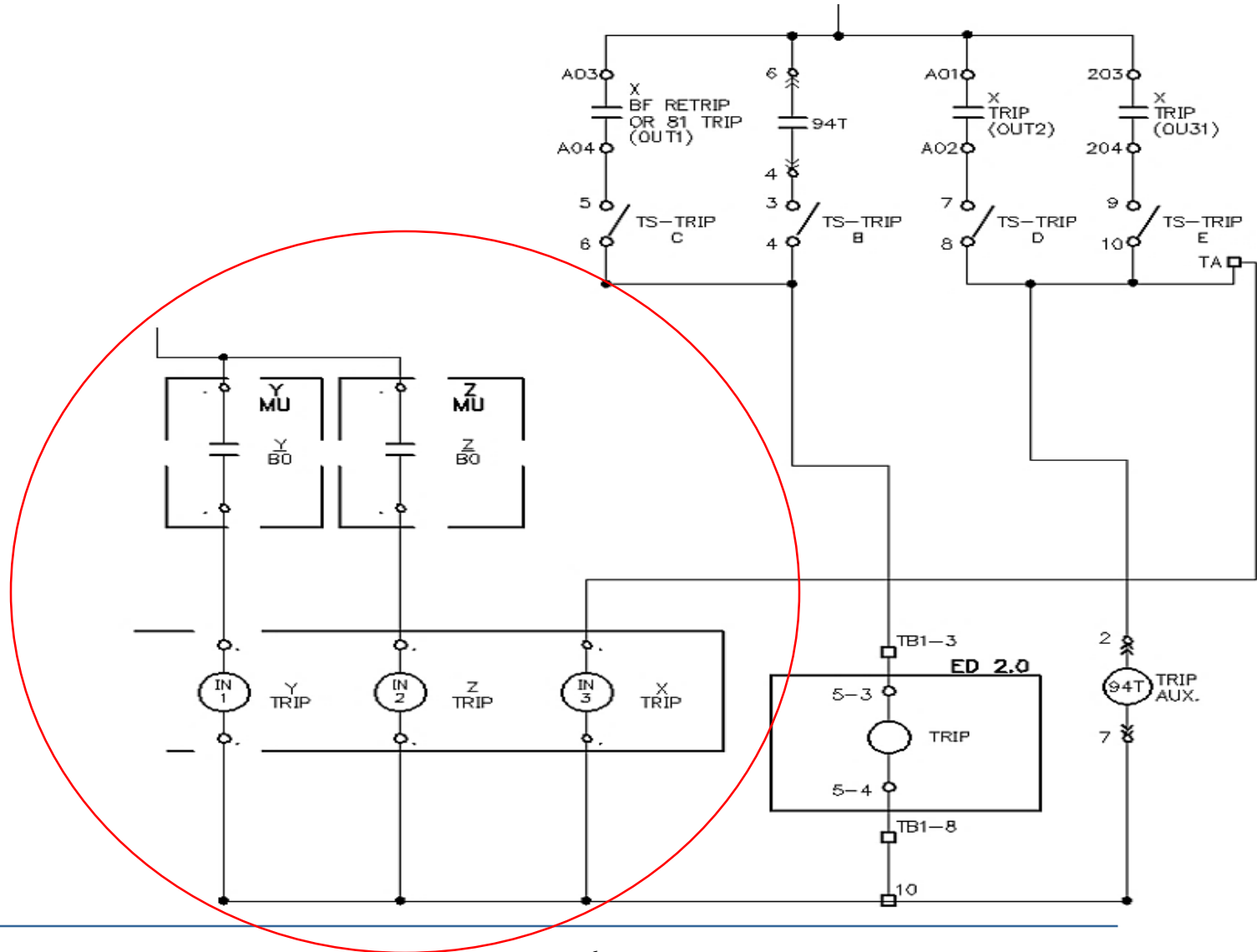


Joliet Design

13.8kV OPERATING BUS #2



Joliet Design



Results

- Reporting accurate data to control house HMIs
- Lack of operations yielded minimum data
- Entergy has begun conceptual design of its next digital substation



Arabi Substation

- 230kV Substation
- Susceptible to flooding
 - ◆ Planned to be reconstructed on opposite side of a levee
- Renamed to Culicchia Substation



Arabi Substation

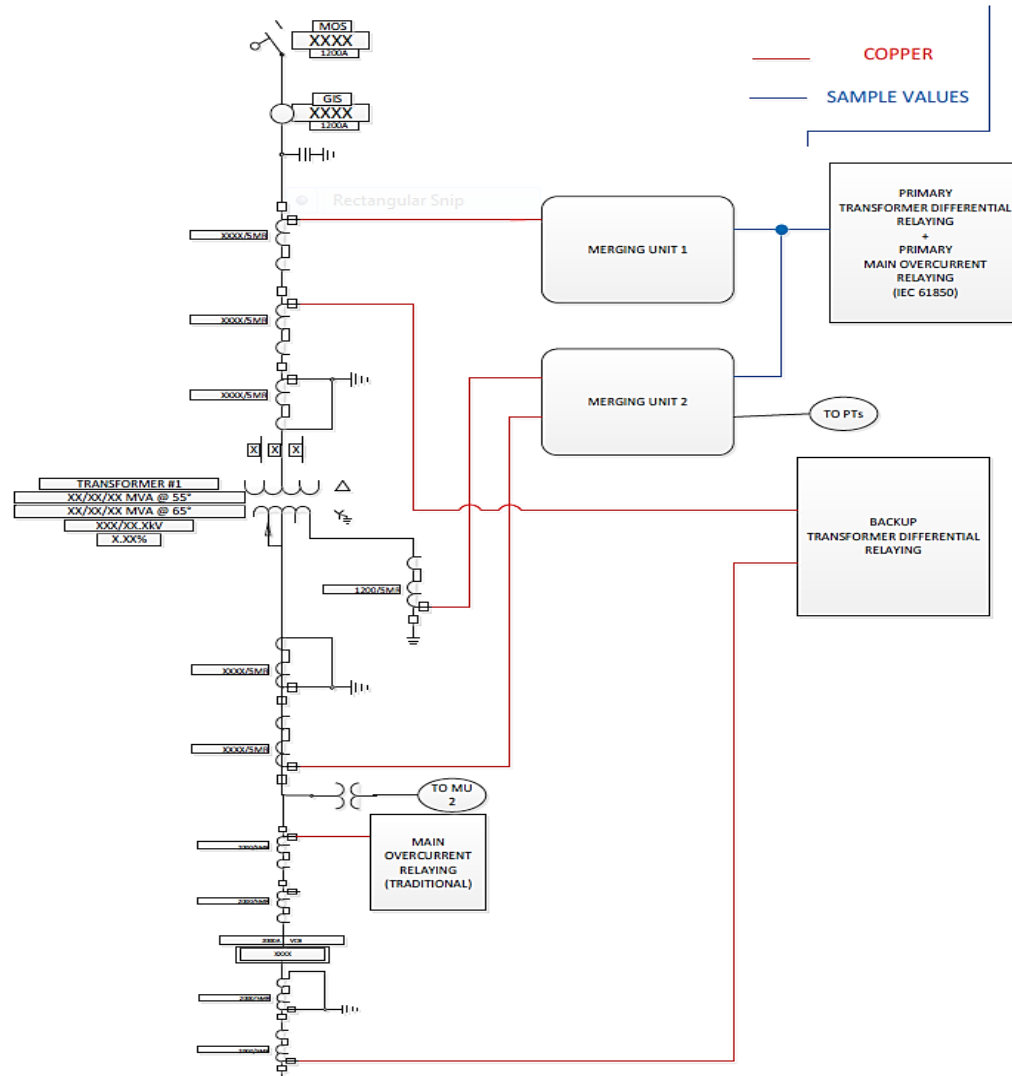


Culicchia Substation

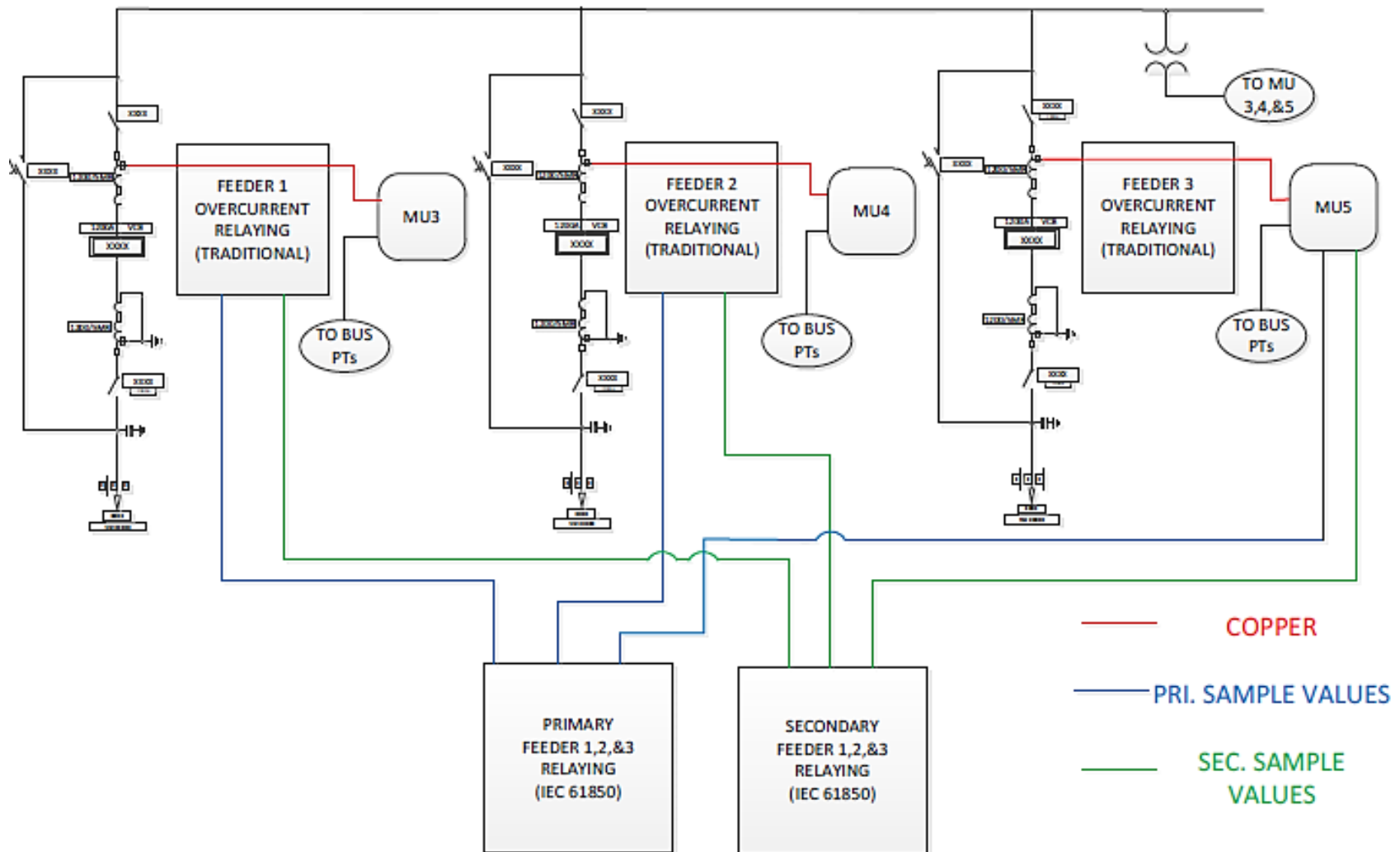
- Will comprise of two 230kV/13.8kV Power Transformers, two main breakers and 6-8 feeders
- Differ from Joliet
 - ◆ Primary Protection via IEC 61850
 - ◆ Secondary/Backup Protection via Copper



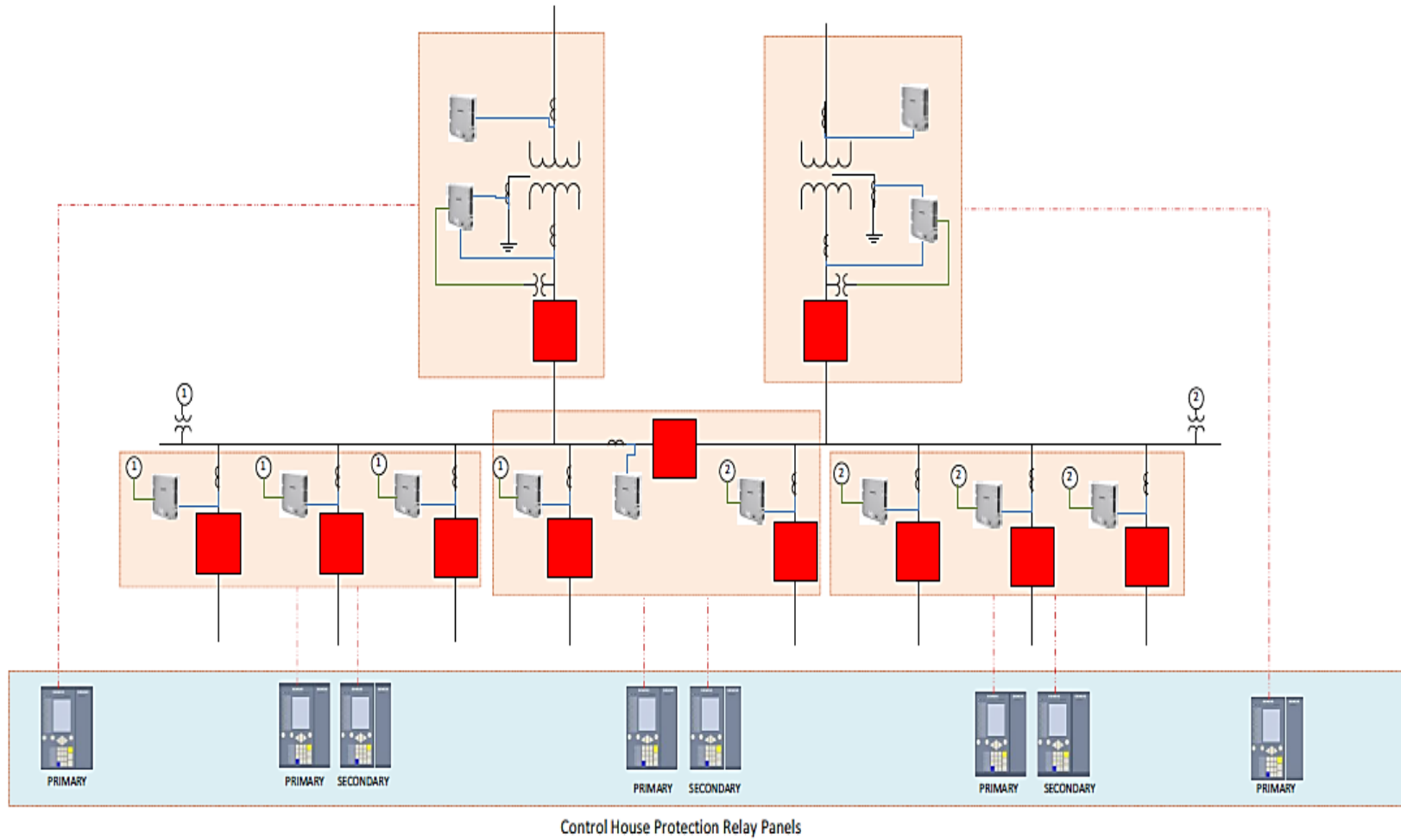
Transformer Primary Protection



Feeder Protection



Primary Protection Oneline



Conclusion

- Joliet is continuing to be monitored with plans of installation of merging units to additional breakers in the works.
- Entergy is currently procuring lab equipment to begin design, testing, and training for deployment at Culicchia Substation.



Questions

