Multiple Sources

MTBF = 315,766 hours
Availability = 99.9985%
Probability of Failure in 5 years = 12.95%

Option 2N
- 2 Utilities
- 2 Generators
- 2 ATS
- 2 UPS Systems
- STS

Multiple Voltages
- 35KV
- 15KV
- 13.2KV
- 5KV
- 600V
- 480/277V
- 415/240V
- 208/120V
- 500VDC
- 125VDC
- 24V
- 18V
Construction Schedule
Learning Objectives

• Gain the ability to systematically breakdown a single-line drawing.
• Identify different electrical systems involved and how they work.
• How to effectively review single line drawings for potential hazards.
### Notes:

1. Provide cable ampacity calculations per specification for underground feeders and for skid routed feeders. Worst case calculations are to be documented in the report.

2. Conductor sizes shown in schedule are based on copper conductors with THHN/THWN-2 insulation. Conduits: E = EMT; R = RIGID; P4 = PVC40; P8 = PVC80

3. Feeders consisting of multiple sets of conductors and conduits are to be provided with indicated size ground conductor in each conduit.

4. Feeders with designation K are for use when the majority of the load consists of nonlinear loads such as electric-discharge lighting, electronic computer/data processing, or similar equipment where harmonic currents are present in the neutral conductor.
PADMOUNT TRANSFORMERS

125VDC & Other Control Voltages
Station Battery
Where is the EM feed coming from?
Something is missing?
Uninterrupted Power Supply
UPS
UPS Maintenance Bypass Gear

Automatic Transfer Switch (ATS)
Static Transfer Switches (STS)

PDU's
Power Distribution Unit

RPP's
Reactive Power Panel
Distribution Panels

Transformers

Branch Panelboards

Busway
Be Careful of Similar Names

- REI-COLO1-MVS01A
- REI-COLO2-MVS01A
- REI-COLO3-MVS01A
- REI-COLO4-MVS01A
- REI-COLO5-MVS01A
- REI-COLO6-MVS01A
- REI-COLO1-MVS01B
- REI-COLO2-MVS01B
- REI-COLO3-MVS01B
- REI-COLO4-MVS01B
- REI-COLO5-MVS01B
- REI-COLO6-MVS01B
Key Take Aways

- De-energizing equipment is not sufficient to ensure personnel safety.
- Be certain that ALL energy sources are disabled before starting work.
- Utilize current Single Line Drawings to identify sources.
- Locking-out and/or Tagging-out (LOTO) ALL energy sources is critical to keeping personnel safe until conclusion of a task.
- LOTO is required whenever there is a possibility that someone or something could restore energy to the system, for example by: Operation of a switch, circuit breaker, etc.
- External Control Voltages for switchgear switching is critical.

THANK YOU!

ANY questions?