

Wind Energy & Perfect Power

S&C Electric Company



S&C – Chicago

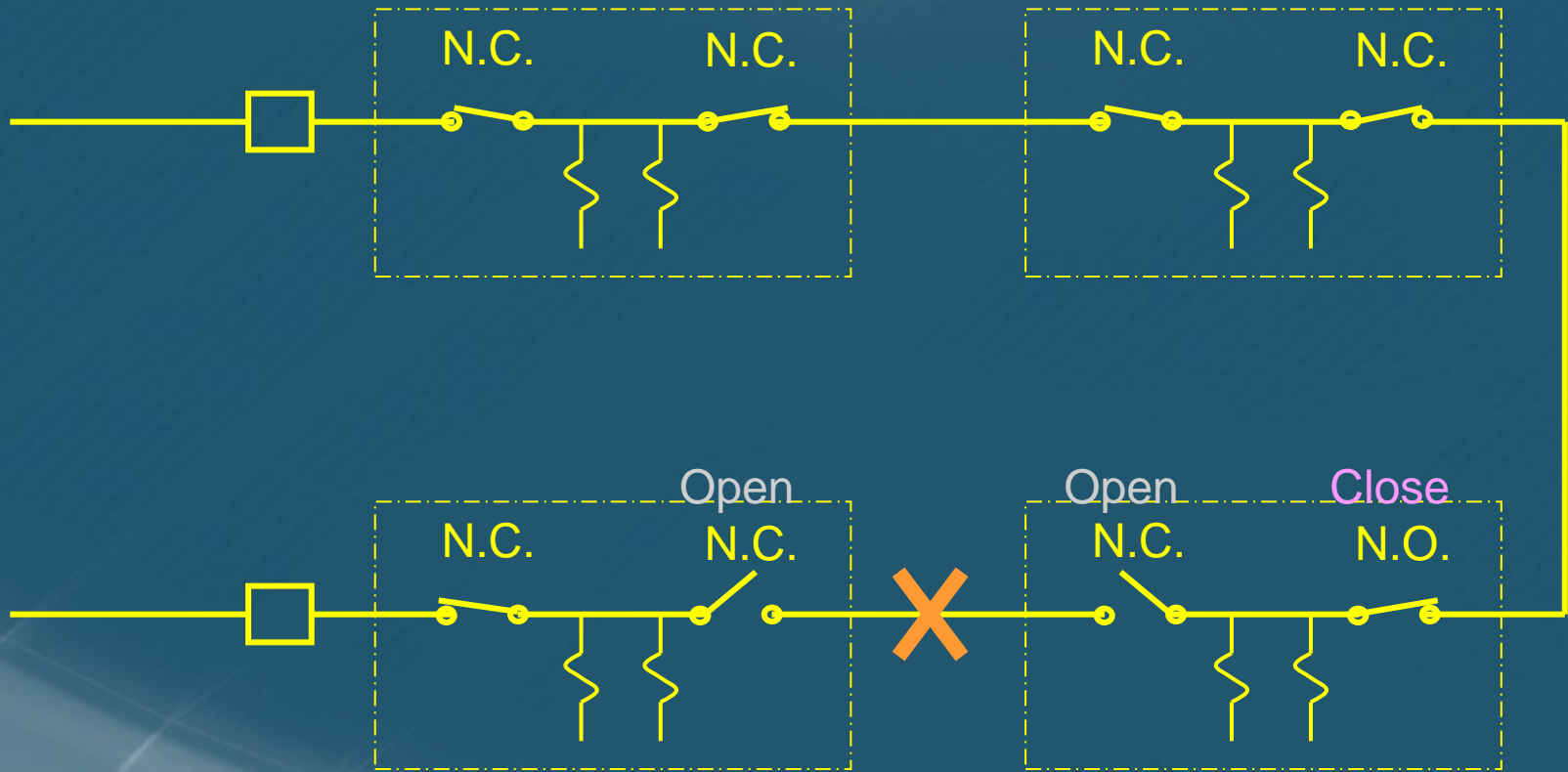
- **Worldwide Headquarters**
- **1700 Employees**
- **46 Acres**
- **1.2 Million Sq. Ft.**



High-Reliability Distribution System

- Perfect Power at IIT
- Fault interrupting switchgear
- High-speed communications-dependent relaying: POTT and DCB (Permissive Overreach Transfer Trip and Directional Comparison Block)
 - Typical fault clearing time: 6 cycles (0.100 seconds) or less
 - Clears faults with no outage to connected loads in closed-loop system
 - For opened-loop system, fault clearing can be followed by automatic closing of the open point

Underground Looped System



- All loads in service while main-line faults are repaired.

Typical Switchgear S&C Vista



High-Reliability Distribution System Summary

- Closed loop arrangement allows redundant paths for power flow to loads
- Faults on main loop cleared using high-speed communications assisted tripping of fault interrupter switchgear
 - Typical 6 cycle (0.100 second) fault clearing time
 - Power flow to loads continues uninterrupted
- “Switching” to redundant path not required, the alternate path is always ON
- Manual reset of fault interrupters after repairs are made
- Tap faults less likely because of short cable, low exposure
- Manual switching required to fully isolate a faulted tap
- Load can be manually switched to alternate tap until repairs are made
- SCADA / HMI not required for protection functions
- SCADA/HMI is required for visibility of system status, alarms to operators, and other automatic systems

S&C Supports Wind Energy EPC Projects

- Engineering and Design
 - Interconnection Studies
 - System Stability Studies
 - Analytical Studies
 - Electrical System Design
 - Civil and Structural Design
- Procurement and Equipment
 - S&C Equipment
 - Vista Pad Mount Switchgear
 - Energy Storage Systems
 - FVR Distribution Circuit Breakers
 - Circuit-Switcher & Trans-Rupter II
 - PureWave Power Quality systems
 - Intellirupter
 - Other Manufacturers
- Project and Construction Management



Interconnection with 25 kV Metal-Enclosed Switchgear

Summary

- Advanced protection and control schemes provide higher reliability than traditional distribution
 - Vista[®] Underground Distribution Switchgear
 - Radio and fiber communications
 - Multi-function microprocessor-based relays and controls
- Systems approach yields “No outage” capability
- Applying advanced engineering to Renewables projects

Questions?

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