# PJM DEDSTF SUBSTATION SUB-GROUP

# Status Update

- Develop path to tackle assignment
- Review of Transmission Owner Guidelines
- Engaged support from the TSS committee

**I. Transmission System Design Criteria**

A. Environmental Lines and Substations
1. Ambient Temperature
2. Wind loading Substations (no ice)
3. Ice load substations (no wind) 25mm radial ice
4. Wind coincident with 13mm radial ice 40mph (64km/h)
5. Seismic Substations
6. Flood Plain

B. Substations General
1. AC Station Service
   - Required Number Independent Sources
   - Quality of Sources
   - Need for Back up Generation
2. DC Supply
   - Required Number of Independent Batteries and Chargers
   - Capacity/Duty Cycle
   - Fusing/Protection
   - Quality/independence of Charger AC Supplies
3. Ground Grid Resistance

C. Substation Electrical
1. Line Terminal and Equipment Continuous Current
2. Short Circuit Current
3. Operating Voltage
4. RIV
5. Lightning Impulse Withstand Voltage (with and without arresters)
6. Switching Impulse Withstand
7. Surge arresters
8. Breaker Line closing Switching Surge Factor
9. System Grounding
10. Lightning trip out Performance (station)
11. Fault performance (circuit failure, including momentary) all other causes

# Status Update

- Transmission Owner Guidelines
- Detailed review of sections

**I. Design, Application, Maintenance & Operation Technical Requirements**

A. Overhead Transmission Lines
B. Power Cables
C. Large Power Transformers
D. Circuit Breakers
E. Load Interrupting Switches (Circuit Switches)
F. Disconnects & Switches
G. Shunt Capacitors
H. Instrument Transformers
I. AC Station Service
J. Substation Batteries & Chargers
K. DC Substation Service
L. Substation Operation & Maintenance
M. Carrier Current Line Traps
N. Insulation Coordination & Surge Protection
O. Relay and Control Building Requirements
P. Bus Design
Q. SVC's
R. Series Capacitors
S. Gas Insulated Substations
T. DC Inverters
U. HVDC Transmission

# Status Update

- Key areas of focus
  - Different voltages – 69kV, 138kV, etc.
  - Criteria based design
  - Functional layout
  - Future expansion
  - Minimum outages

# Status Update

- Path going forward
  - Review TSS guidelines in detail
  - Propose modifications to TSS committee
  - Develop overreaching preliminary document
    - Reference TSS guidelines where feasible