Black Start, Critical Load, and Estimated Online Capacity
Supplemental Information

SRSTF Meeting
November 30, 2012
Current vs. PJM/MMU Proposal
BS, CL, and Est. Online Capacity at 6 Hours

- **BS** (current BS + Est. 2,000 MW more)
- **CL** (all units <= 4 Hr)
- **CAPat6Hrs** (4 Hr Gen started after 90 min. BS + 30 min. switching time)

### CURRENT
- BS: 5,980 (90 min. + 30 min. switching)
- CL: 4,767 (largely steam <= 8 Hr)
- CAPat6Hrs: 29,572 (4 Hr Gen started after 90 min. BS + 30 min. switching time)

### PJM/MMU PROPOSAL
- BS: 7,980
- CL: 4,898
- CAPat6Hrs: 47,808 (4 Hr Gen started after 90 min. BS + 30 min. switching time)
General System Restoration Timeline

- **Step 1:** Black Start Online within 90 min. \((t=0 \ldots t=1.5 \text{ hr})\)
- **Step 2:** Paths Established within 30 min. \((t=1.5 \text{ hr} \ldots t = 2 \text{ hr})\)
- **Step 3:** \(\leq 4\) Hour Gen Online \((t=2 \text{ hr} \ldots t=6 \text{ hr})\)
- **Step 4:** Cranking Paths Established within 30 min. \((t=6 \text{ hr} \ldots t = 6.5 \text{ hr})\)
- **Step 5:** > 4 to 8 Hr Gen Online \((t=6.5 \text{ hr} \ldots t = 14.5 \text{ hr})\)
Benefits of PJM/MMU proposal:

- Increase the pool of available Black Start generation by an estimated 2,000 MW
- About the same amount of Critical Load, but an increase in the *number* of potentially cranked units by ~ 30%
- Gain ~ 60% more capacity online at roughly half the time
  - Current - 8 hour steam focus; PJM/MMU – 4 hour ALL gen focus