Grid Reliability
NERC Actions to Address the August 14, 2003 Blackout

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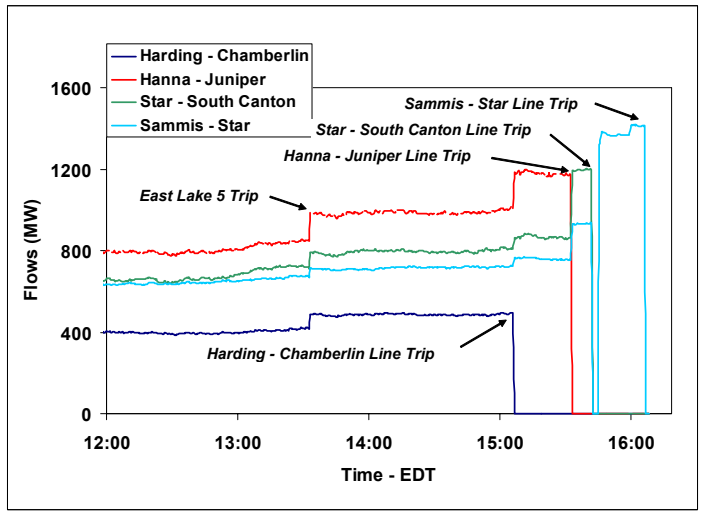
August 14, 2003

- Largest blackout in history
- Affected 8 states, 2 provinces, 3 regions
- Affected at least 50 million people
- Economic impact in billions
- It could have been avoided
- Public attention and industry commitment may help us to prevent another one, but reliability legislation is still needed

Immediate Causes of the Blackout

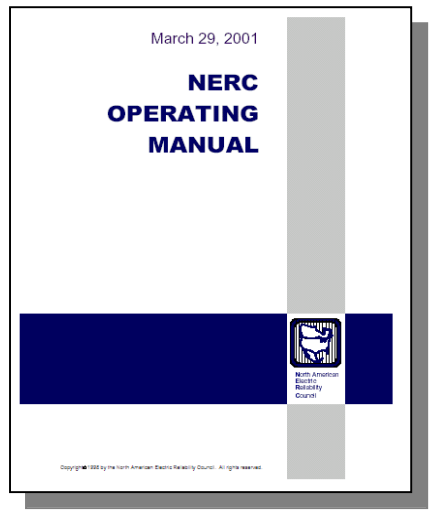
- Lack of situational awareness
- Failure to manage tree growth



- Ineffective diagnostic support

Violations of Reliability Standards

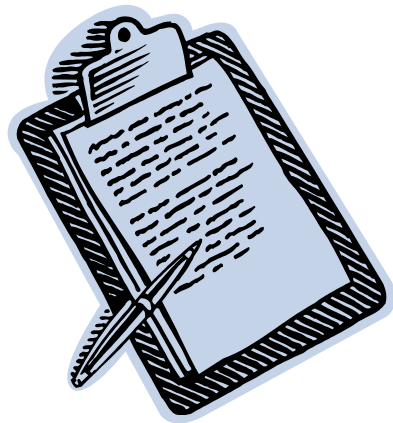
- Failure to return system to safe operating state w/in 30 minutes
- Failure to notify others of impending emergency
- Ineffective system monitoring capability
- Inadequate operator emergency training
- Failure to notify others of impending emergency



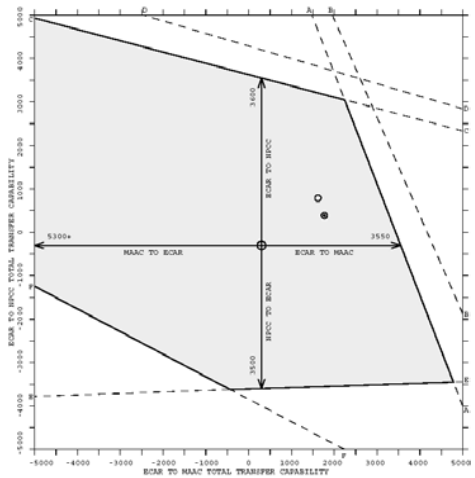
Operating Policies

Other Key Findings

- Compliance with reliability standards requires objective measurements and defined actions to resolve violations
- NERC operating policies do not clearly specify reliability coordinator and control area responsibilities
- Problems from prior blackouts were repeated: trees, tools, training



Other Key Findings



- Insufficient system planning & design studies, operations planning, facilities ratings
- Inaccurate modeling data
- NE Ohio system operated with insufficient reactive power margins
- Existing protection and controls could be better used to slow or minimize spread of a cascading outage

Board Resolutions

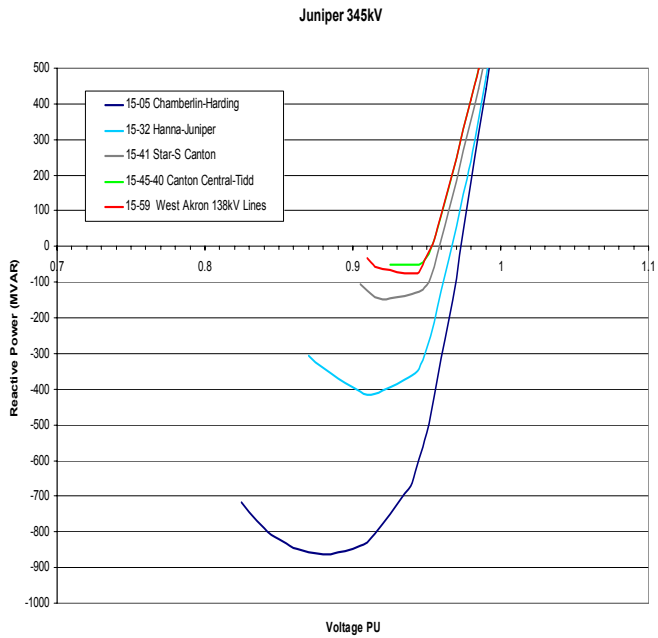
- Receive reports on all standards violations
- Improve compliance with reliability standards
- Provide greater transparency to standards violations, while respecting confidentiality requirements and need for due process
- Work closely with federal, state, and provincial regulators in the US, Canada & Mexico to ensure public interest is met

Blackout Recommendations

- Corrective Actions
- Strategic Initiatives
- Technical Initiatives

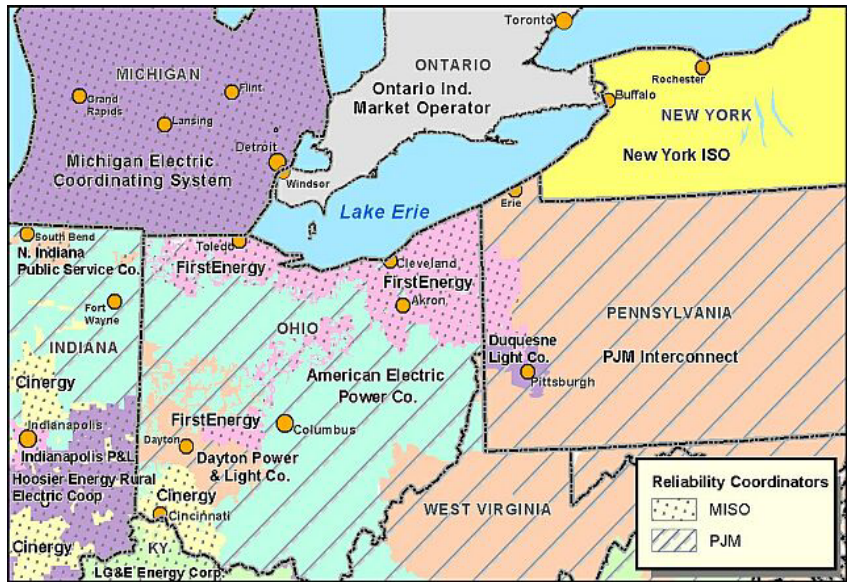
Corrective Actions: FE

- Voltage criteria and reactive resources
- Operational preparedness and action plan
- Emergency response capabilities and preparedness
- Control center and operator training

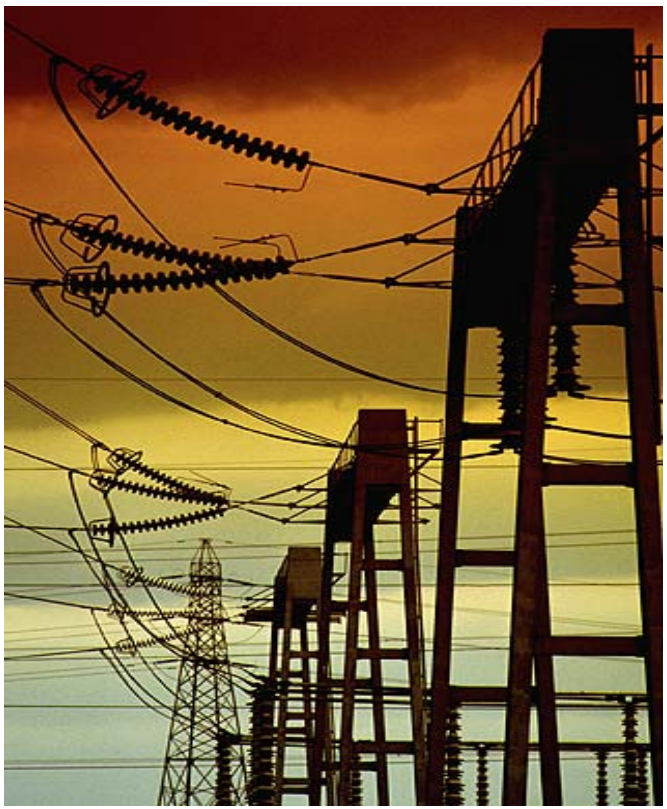


Corrective Actions:Reliability Coordinators

- MISO
  - Reliability tools
  - Visualization tools
  - Operator training
  - Communications
  - Operating agreements
- PJM
  - Communications protocols and procedures



Strategic Initiatives



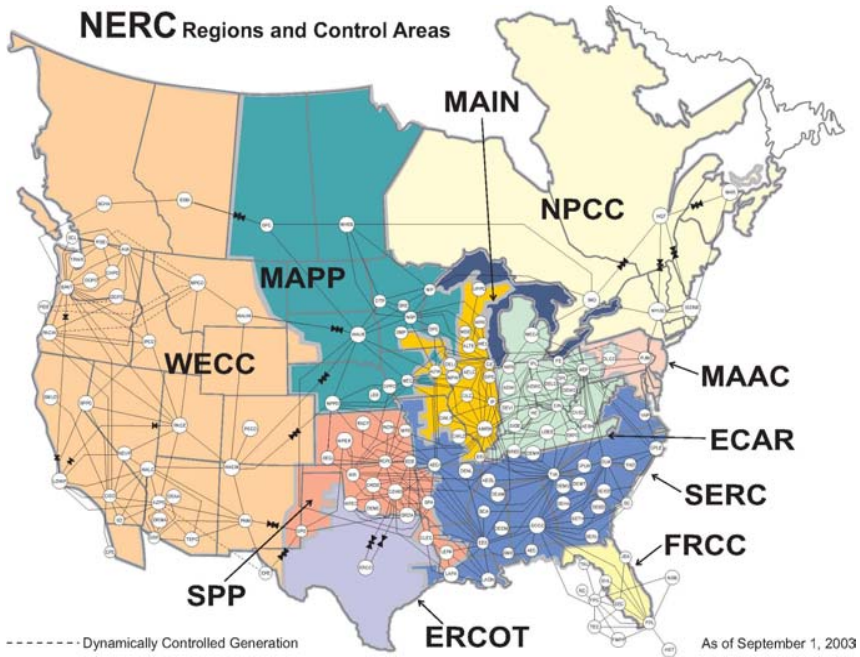
- Performance reviews
- Readiness audits
- Vegetation-related outage reporting
- Recommendations implementation tracking

Performance Reviews

- Strengthen Compliance Enforcement Program
- Regular *confidential* reports to the Board
- More transparency

Readiness Audits

- Audit all control areas (150) and reliability coordinators (18)
- Conduct on a 3-year cycle
- Reports to the Board



Vegetation Reports

- Transmission owners to report tree contacts to the Regions (230+ kV)
- Regions report to NERC
- Use WECC procedure as a model
- Regions to report annually on vegetation management surveys

Recommendations Tracking

- NERC and Regions will track:
  - Implementation of recommendations
  - Compliance audit results
  - Lessons learned from system disturbances
  - Build on successful regional processes

Technical Initiatives

- Operator & RC emergency response training
- Reactive power & voltage control
- Cascade mitigation
- RC/CA functions, authorities & requirements
- Real-time operating tools
- Restoration review
- Time-synchronized data measurements
- Reevaluate system design, planning & operating criteria
- System modeling & data exchange standards

Next Steps

- Implement technical recommendations
- Finalize NERC technical report
- Develop public disclosure process for reporting compliance violations
- Work with FERC, states & provinces to ensure and improve reliability in the future
- Enact reliability legislation

Reliability Legislation

- Mandatory and enforceable standards
- All owners, operators and users of bulk power system
- Set and enforced by independent self-regulatory organization
- Subject to FERC oversight in U.S.
- Enforcement delegated to regional entities
- Degree of protection under antitrust laws

Strength of SRO Model

- Partnership between government and private sector
  - Industry expertise, experience, technical competence
  - Government oversight to assure fairness, openness, due process, accountability
- Recognizes international character of grid
  - Interests from U.S., Canada, and Mexico
  - Work to single, acceptable solution in ERO

Reliability legislation coalition

- AEP
- APPA
- CEA
- EEI
- ERCOT
- FRCC
- IEEE-USA
- MAIN
- MAPP
- NARUC
- NASEO
- NASUCA
- NEMA
- NPCC
- NRECA
- Pepco Holdings
- SERC
- Southern Company
- SPP
- TXU
- WECC
- WGA

Status of Legislation

- H.R. 6 (with reliability provisions) passed House
- Remains pending business in Senate
- Stand-alone reliability legislation
  - HR 3004 (Mr. Dingell)
  - S 2014 (Senator Cantwell)