



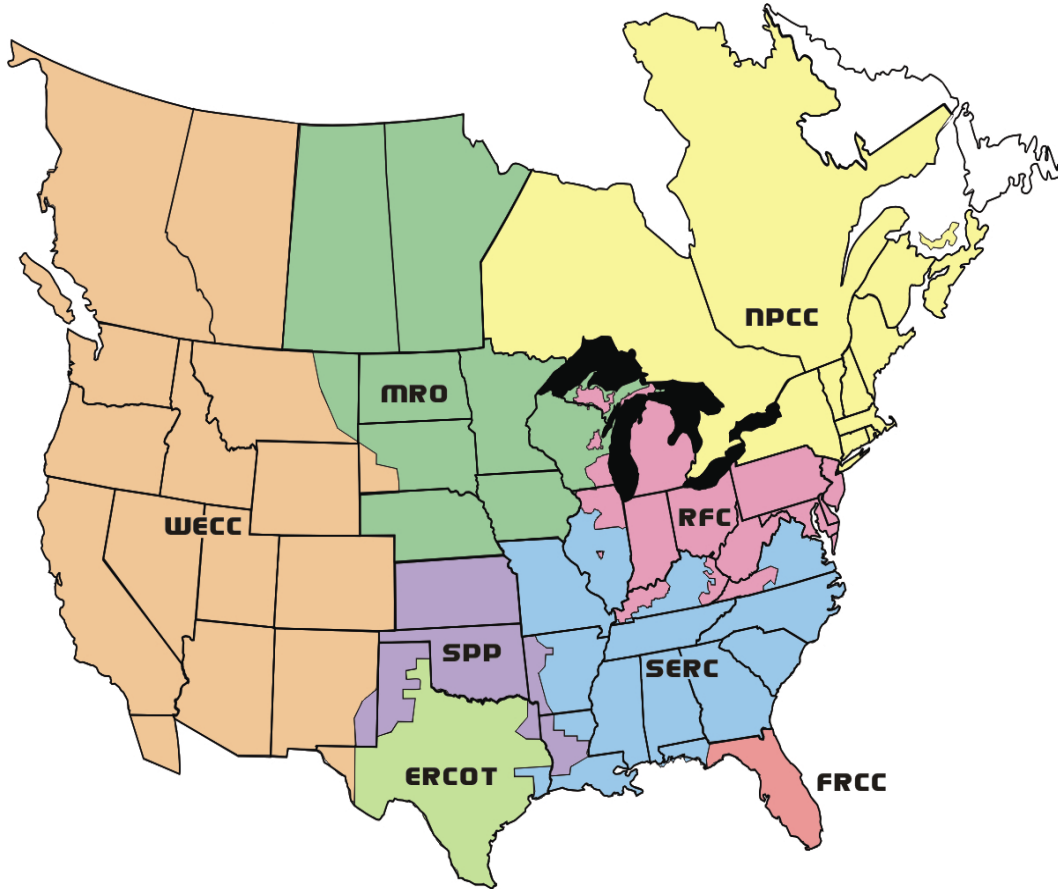
Presentation to TMEPA

July 16, 2010

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Tennessee Valley Authority



NERC And Regional Reliability Organizations



- **NERC :**
 - Formed in 1968 to ensure reliability of the Bulk Electric System
 - Designated as Bulk Power System reliability oversight authority by FERC (EPA 2005)
 - Develops and enforces standards for the reliable operation and planning of the bulk power system
 - FERC oversees NERC regulatory activities and approves penalties for non-compliance
- **SERC (RRO):**
 - Audits operating entities to ensure compliance with NERC and Regional standards
 - Sets regional standards for reliable operations and planning
- **TVA**
 - Serves as the Registered Entity responsible to comply with reliability standards
 - TVA was audited by SERC and NERC in May 2010



NERC Goals and Objectives

- Developing clear, mandatory reliability standards
- Facilitating a learning environment in the industry
- Promoting a strong culture of performance excellence and compliance
- Being a strong enforcement authority
- Improving transparency, consistency, quality, and timeliness
- Leveraging technology and information systems
- Building constructive partnerships between industry and government



NERC Compliance Key Deliverables

- Reliability Standards
 - Develop needed new standards
 - Identify areas for improvement to existing standards
 - Implement educational and technical assistance programs
 - Reestablish trust and foster industry leadership in standards process
- Compliance
 - Monitor and enforce compliance with standards
 - Improve quality and timeliness of compliance procedures
 - Improve transparency and consistency
 - Develop and apply risk-based approaches to audits, self certifications, and spot checks
 - Promote a strong culture of compliance
 - Align NERC and Regional Entity programs



NERC Compliance Key Deliverables

- Event Analysis
 - Improve event analysis and risk-based assessments
 - Develop clear bright line event reporting and classification criteria
 - Ensure timely communications of lessons learned
 - Develop recommendations tracking capability
- Cyber Security
 - Develop policy goals and scope for cyber security protection
 - Facilitate development of proactive and effective industry action plan
 - Establish minimum bright line criteria for bulk power asset identification
 - Improve communications with and between industry and government, as well as the public

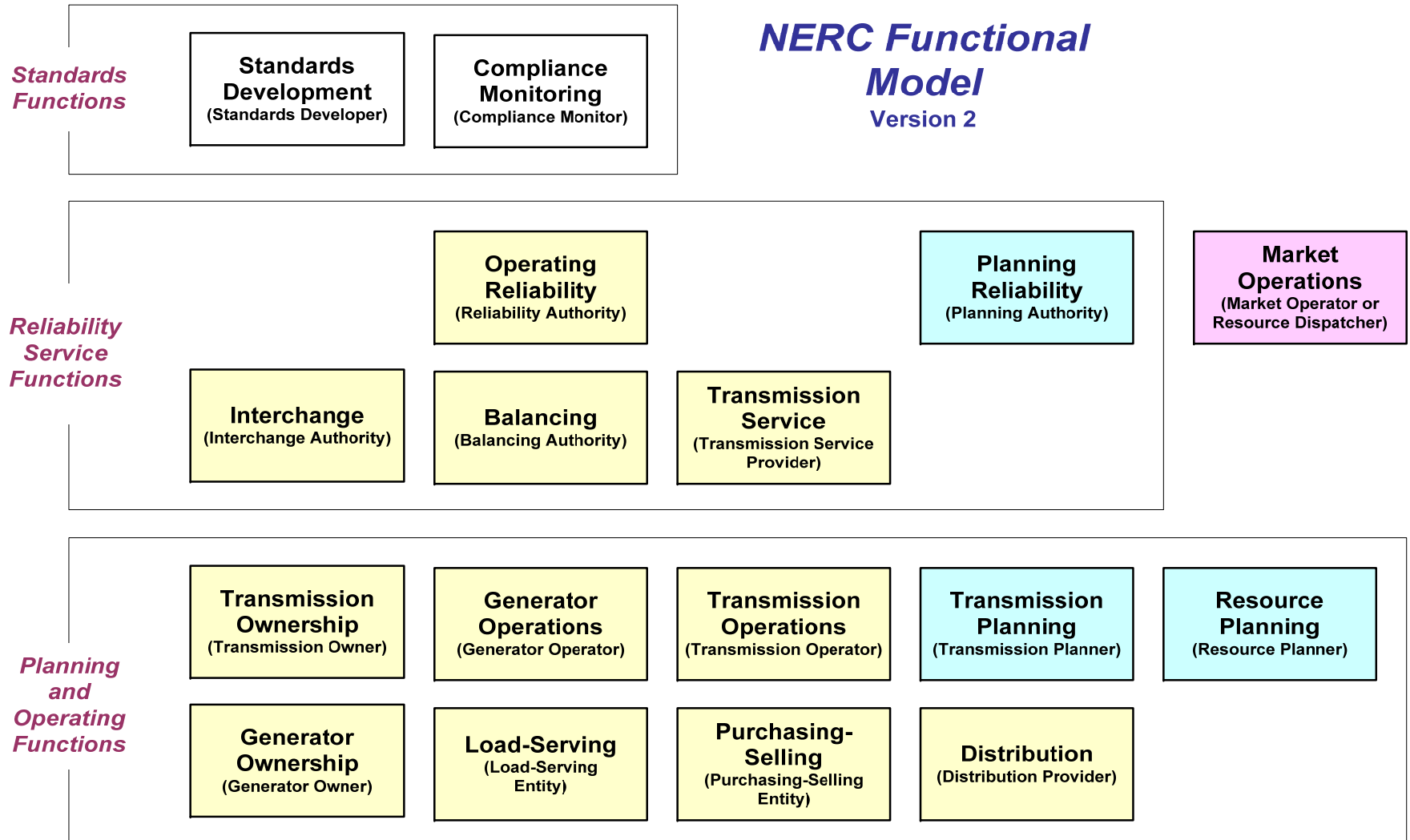


NERC Compliance Key Deliverables

- Reliability Assessments
 - Provide annual, seasonal, and special reliability assessments
 - Improve efficiency of data collection and analysis
 - Conduct thorough data validations
 - Develop and demonstrate system performance metrics to analyze reliability improvements and benefits, as well as risk/severity based methods
- Situation Awareness
 - Develop capability to include near real-time information and communications protocols
 - Improve lessons learned capabilities
 - Provide meaningful reliability issues tracking



Compliance – Functional Registration Areas





TVA Compliance Registration

- TVA is registered in all 14 of the Reliability Service, Planning and Operating functions defined by NERC
- Reliability Service Functions (5)
 - Reliability Coordinator
 - Planning Coordinator
 - Interchange Authority
 - Balancing Authority
 - Transmission Service Provider
- Planning and Operating Functions (9)
 - Transmission Owner
 - Transmission Operator
 - Transmission Planning
 - Resource Planning
 - Generator Owner
 - Generator Operator
 - Load Serving Entity
 - Purchasing-Selling Entity
 - Distribution Provider

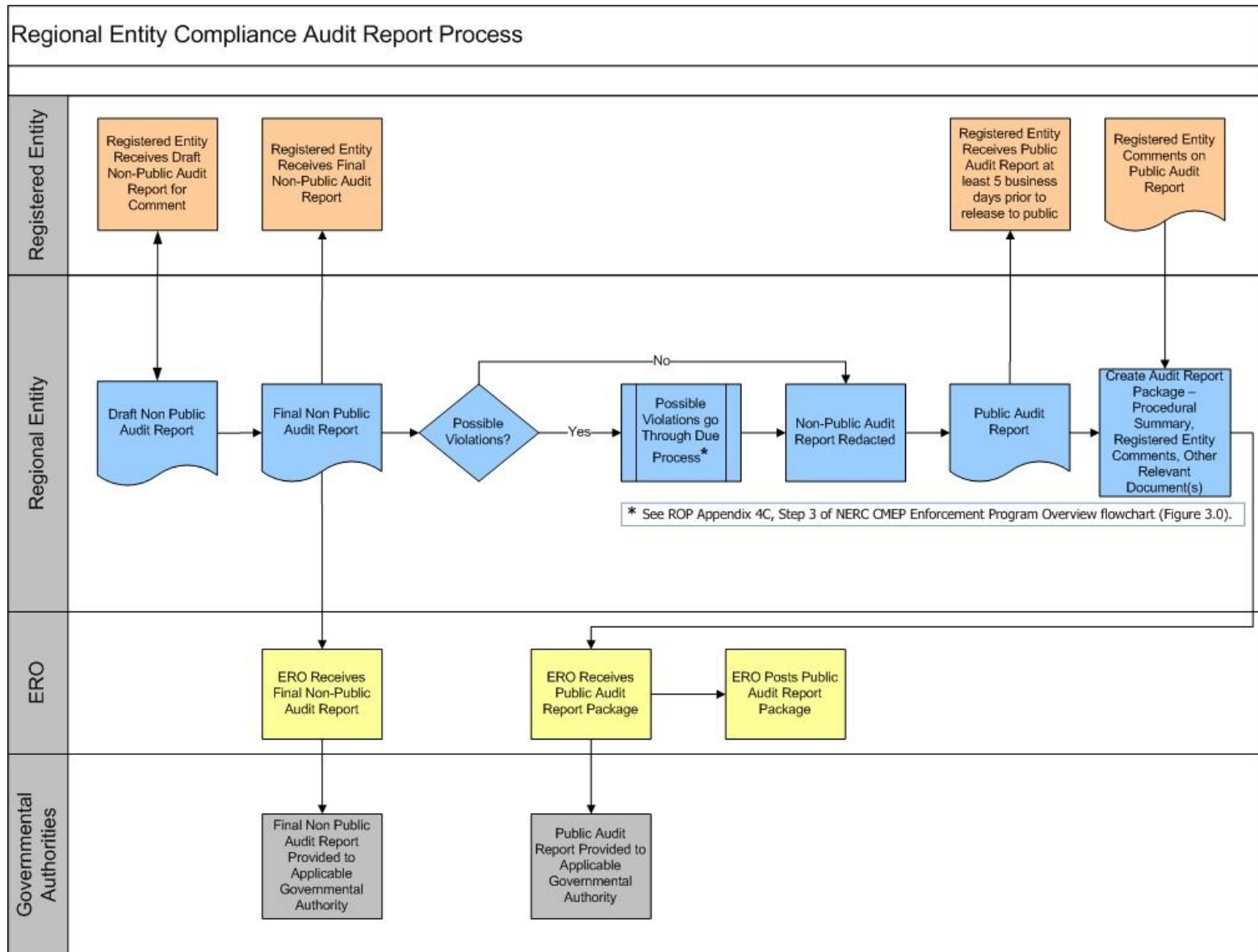


Compliance - Reliability Standards

BAL (6)	Resource and Demand Balancing	MOD (23)	Modeling, Data, and Analysis
CIP (9)	Critical Infrastructure Protection	ORG (0)	Organization Certification
COM (2)	Communications	PER (4)	Personnel Performance, Training, and Qualifications
EOP (9)	Emergency Preparedness and Operations	PRC (20)	Protection and Control
FAC (9)	Facilities Design, Connections and Maintenance	TOP (8)	Transmission Operations
INT (10)	Interchange Scheduling and Coordination	TPL (6)	Transmission Planning
IRO (9)	Interconnection Reliability Operations and Coordination	VAR (1)	Voltage and Reactive



NERC Compliance Audit Process





TVA was compliant on 40 of 42 audited standards

- 42 Standards Audited
- 40 Compliant
- 2 Potential Alleged Violations (PAV)
 - FAC-008
 - PRC-005
- ~~2~~ 1 Open Self Reports
 - VAR-002
 - ~~PRC-005~~
- Update:
 - SERC disallowed **X** PRC-005 Self Report (made during audit) – and changed it to a PAV

Status	Self Report Status	Operations Standards
Compliant	●	BAL-002
Compliant	●	BAL-005
Compliant	●	COM-001
Compliant	●	COM-002
Compliant	●	CIP-001
Compliant	●	EOP-001
Compliant	●	EOP-002
Compliant	●	EOP-003
Compliant	●	EOP-008
Compliant	●	EOP-005
Compliant	●	PER-001
Compliant	●	PER-002
Compliant	●	PER-003
Compliant	●	TOP-001
Compliant	●	VAR-002
Compliant	●	VAR-001
Compliant	●	TOP-002
Compliant	●	TOP-003
Compliant	●	TOP-004
Compliant	●	TOP-006
Compliant	●	TOP-007
Compliant	●	TOP-008
Compliant	●	NUC-001

Status	Self Report Status	Planning Standards
Compliant	●	FAC-001
Compliant	●	FAC-002
Compliant	●	FAC-003
Potential Violation	●	FAC-008
Compliant	●	FAC-009
Compliant	●	FAC-010
Compliant	●	FAC-014
Compliant	●	PRC-001
Compliant	●	PRC-004
Potential Violation	X ●	PRC-005
Compliant	●	PRC-008
Compliant	●	PRC-017*
Compliant	●	TPL-001
Compliant	●	TPL-002
Compliant	●	TPL-003
Compliant	●	IRO-001
Compliant	●	IRO-004
Compliant	●	IRO-005
Compliant	●	IRO-006

* TVA does not have Special Protection Systems

Self Report Status Legend

No Self Report	●
Open Self Report	●



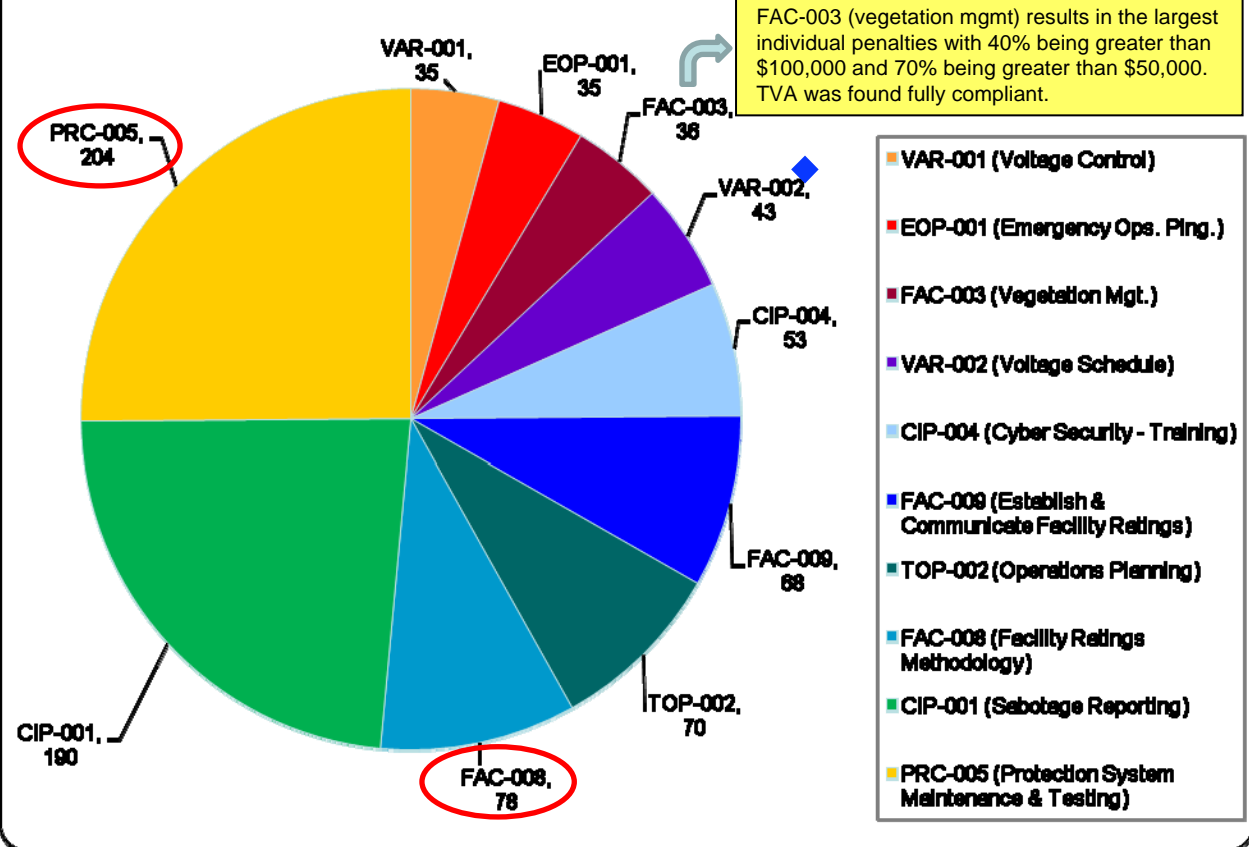
Industry Audit Results – NERC has indicated that \$0 penalties are a thing of the past

- \$29 million in penalties have been assessed to date.
- 16 penalties of \$100k or greater.
- The largest is \$25 million to Florida Power and Light
 - No NERC Reliability Standards were identified as being violated.
 - Sets precedent for FERC's and NERC's authority to assess penalties for events (blackouts, etc.) that are not the result of violated requirements.
- **NERC has indicated that \$0 penalties are a thing of the past and will cease to exist.**
- Entities are encouraged to self-report and those that do are considered to have a positive "Culture of Compliance" which will be a mitigating factor when determining penalty amounts.

○ = TVA Potential Alleged Violations

◆ = TVA Open Self Reports

2008 Ten Most Violated Reliability Standards





TVA will investigate Potential Alleged Violations and develop mitigation plans

Next Steps

- SERC has issued draft audit report and TVA provided comments
- TVA is developing mitigation plans for each Potential Alleged Violations (PAVs) and will submit mitigation plans to SERC
- SERC Audit staff will turn over to SERC Compliance Enforcement staff
- TVA will meet with SERC Compliance on mitigation plan mid-summer and with SERC Enforcement to negotiate settlement late summer



NERC Challenges to Compliance

- Meeting regulatory mandates
- NERC's initial three-year self-assessment, as well as the recommendations identified in the external audit of the compliance program
- Addressing bulk power system critical infrastructure protection issues
- Achieving efficiencies
- Recruiting and retaining qualified personnel



NERC Compliance Direction

- FERC Order 693 (Issued March 16, 2007)
 - Directed NERC to make changes to Reliability Standards
 - 6 Directives for NERC to modify certain Reliability Standards
 - FERC indicated a lack of progress on standard development in response to Order 693 directives
 - Order for NERC to propose modification of Electric Reliability Organization (NERC) Rules of Procedure
- NERC Leadership presentation
 - Define expectations on critical cyber assets
 - Develop methods to quantify and manage reliability risk
 - Evaluate event reporting criteria and risk-based analysis process
 - Prioritize and streamline standards development
 - Produce initial results-based standards (ie, transition from focus on compliance with minimum set of standards to compliance excellence)



Reliability Highlights



- All-time TVA summer peak
 - 33,482 MW
 - 8/16/07 @ 5 p.m. & 102° F
- All-time TVA winter peak
 - 32,572 MW
 - 1/16/09 @ 8 a.m. & 9° F
- Record energy delivered
 - Winter: 701 GWh on 1/8/2010
 - Summer: 657 GWh on 8/8/2007
- 99.999% reliable FY '00-'09



FY2010

Connection Point Interruptions (CPI) Load Not Served (LNS)

Avg. Interruptions
Connection Point

CPI - FY10 YTD	
Date	7/01/2010
CPI Unadjusted Actual	544
Lightning Adjustment	+9
CPI Adjusted	553
CPI Adjusted Rate	0.446
CPI Stretch Rate	0.515
CPI Target Rate	0.730
CPI Below Target	352

TVA Winning Performance	Target	Stretch
CPI	1.12	0.79

CPI and LNS data for the April Tornadoes and May Flood has been excluded as Major Events 38 and 39

Target Stretch Actual

LNS - FY10 YTD	
Date	7/01/2010
Actual	2.364
Stretch	2.729
Target	4.308
LNS in MWh this period	0.000

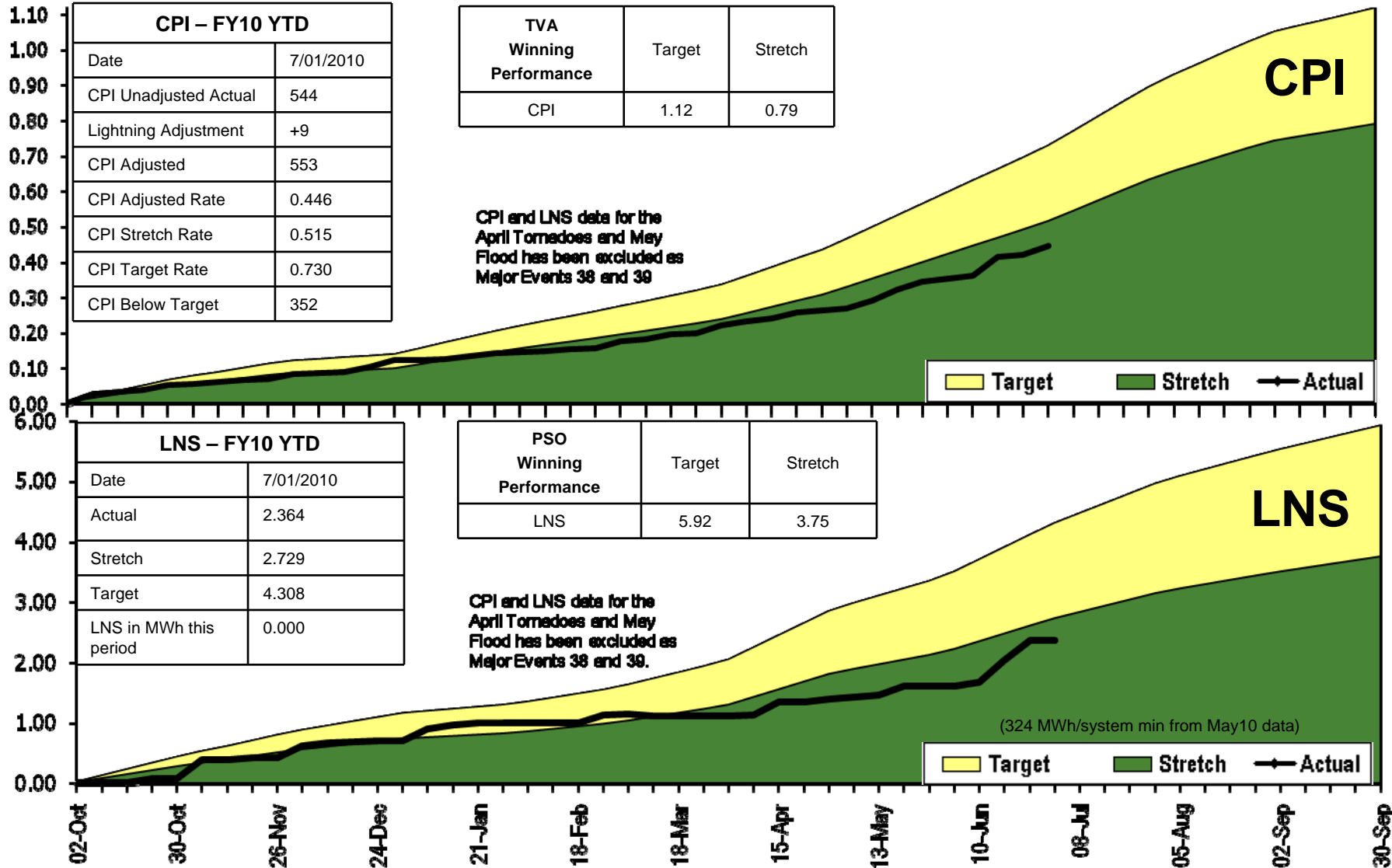
PSO Winning Performance	Target	Stretch
LNS	5.92	3.75

CPI and LNS data for the April Tornadoes and May Flood has been excluded as Major Events 38 and 39.

(324 MWh/system min from May10 data)

Target Stretch Actual

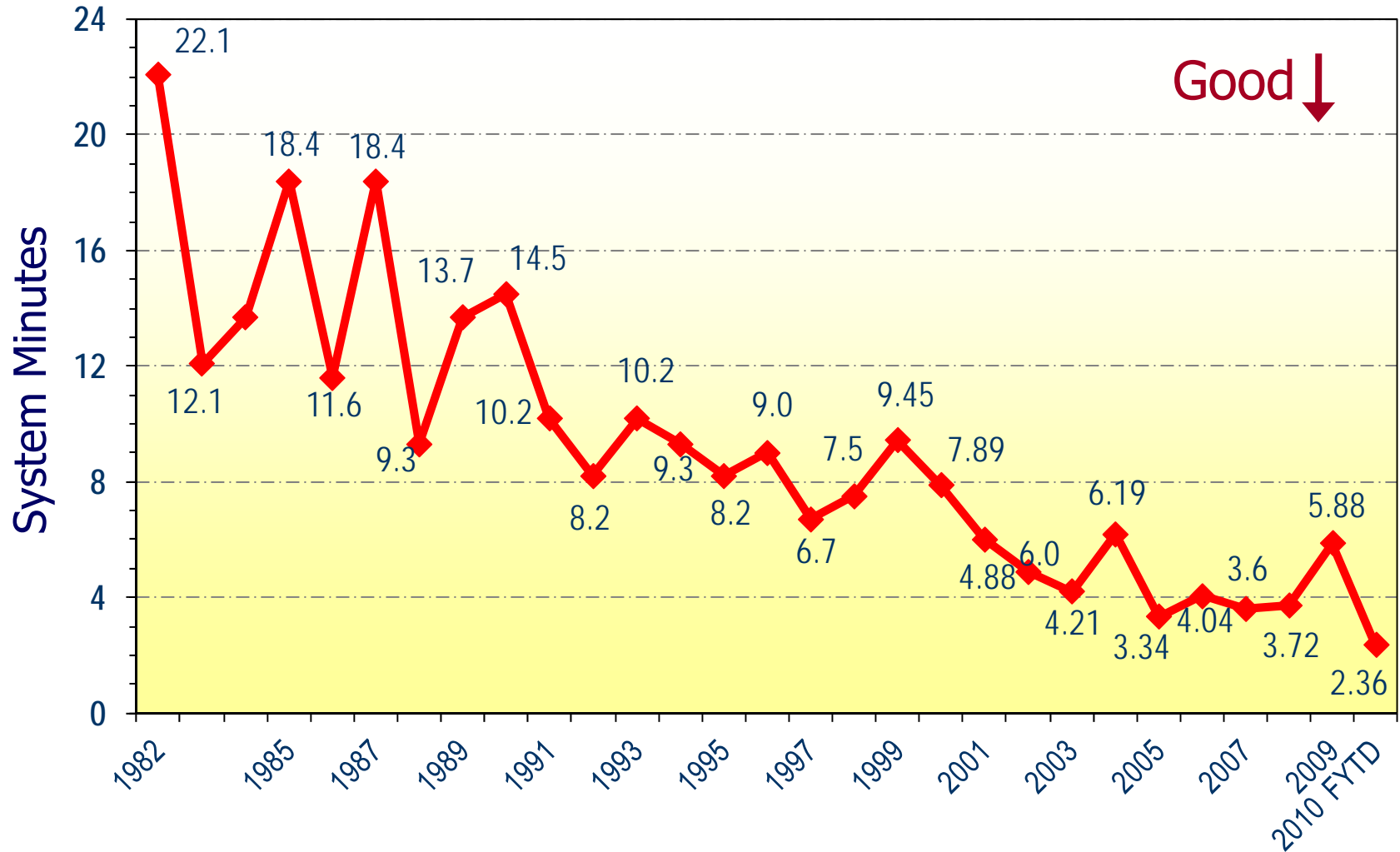
System Minutes





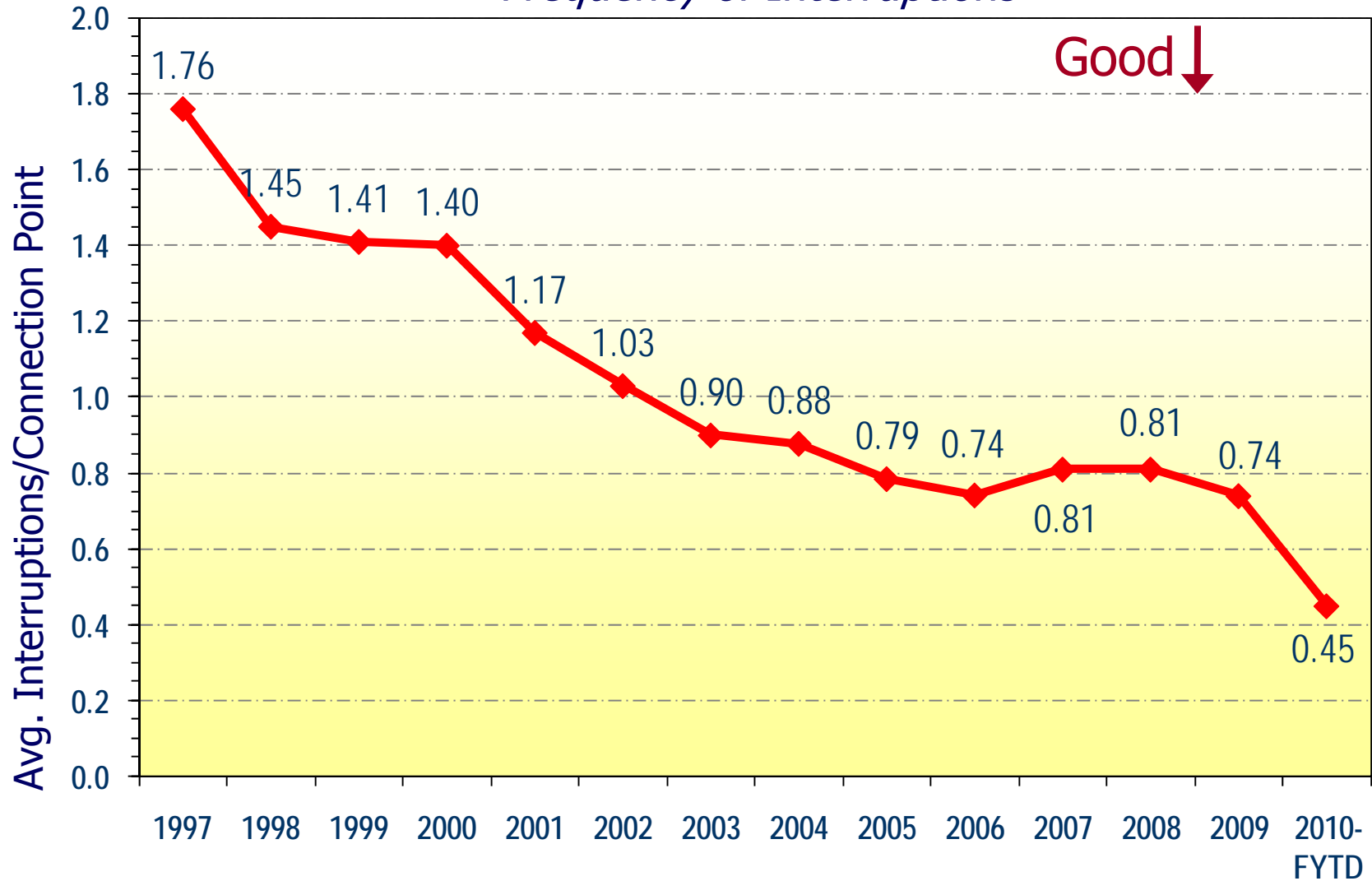
Outage Durations: Load-Not-Served


Duration of Interruptions



Customer Interruptions: Momentary

Frequency of Interruptions



A world map where the landmasses are filled with a dense pattern of small, glowing white dots, representing city lights at night. The map is set against a dark blue background. A white speech bubble with a black border is positioned in the upper left quadrant, pointing towards the North American continent.

99.9999%
Reliable

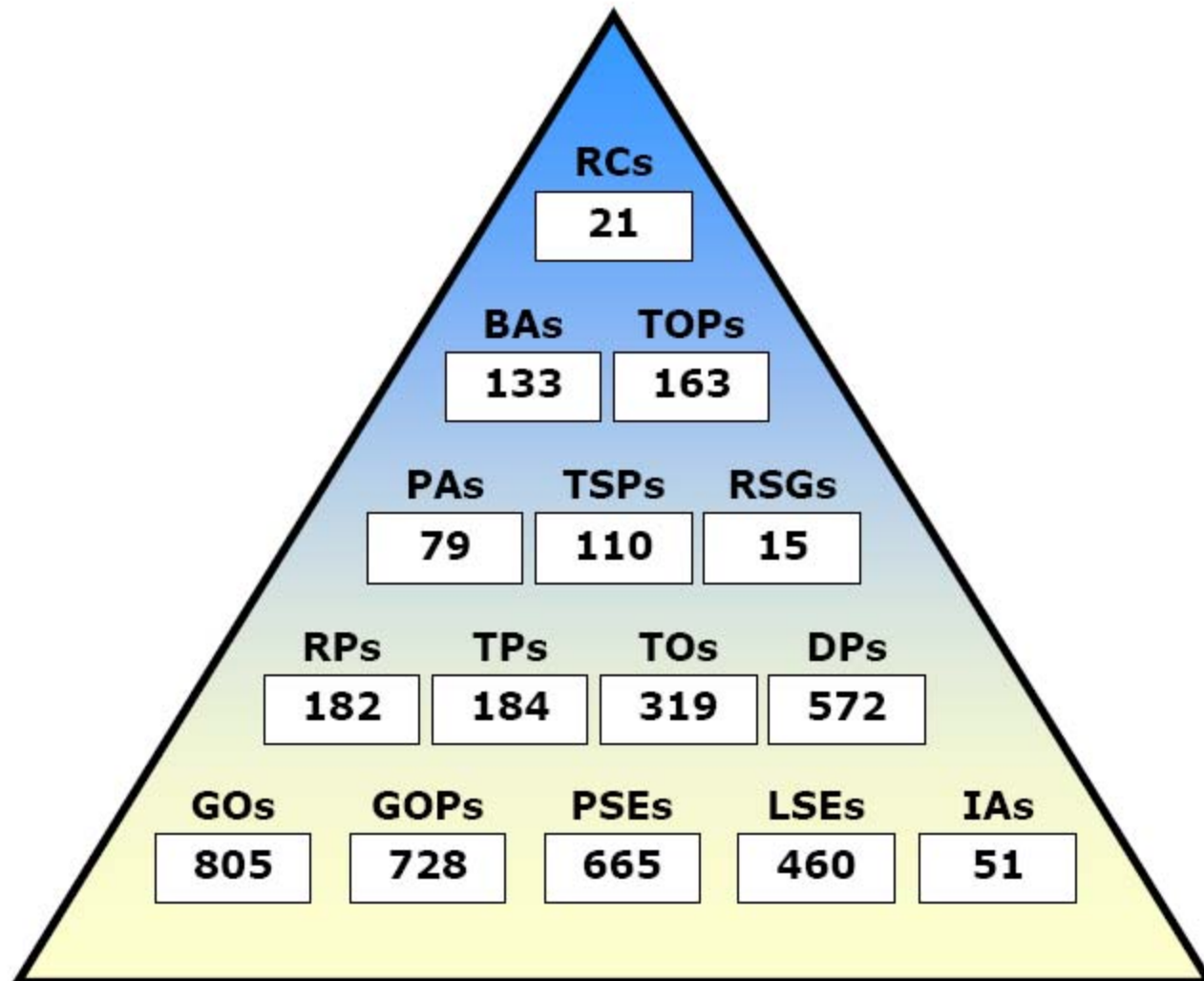


Keeping the Lights On & Generating
Prosperity You Can See



Appendix

Number of Entities on Compliance Registry, By Function





NERC Cyber Compliance Broader Requirements

- NERC Critical Infrastructure Protection (CIP) standards went into effect on January 1, 2010 to protect cyber-technology substations and generation plants that are deemed important to the reliability of the grid.
- NERC Standards require :
 - Identification of assets/locations that are critical to the reliable operation of the Bulk Power System (Critical Assets)
 - Identification of critical cyber assets that are located at the critical facilities (Critical Cyber Assets)
 - Controlled access to the critical cyber assets
- TVA and Distributors are co-located, and jointly operate facilities, in certain locations that contain critical cyber assets. All personnel needing access to these facilities must meet specific access requirements.
- In order to meet the Reliability Standards requirements, TVA and Power Distributor must develop a process for review and approval of access rights.
- Initial approach has been to “disconnect” the Critical Cyber Assets from network connection at all transmission facilities deemed critical assets.



Access Process— Next Steps

- Disconnect devices from wide area network at co-located facilities
- Disconnect devices from wide area network at other critical cyber asset locations
- Finalize procedures, access approval and training for impacted employees
- Finalize and execute, as needed, access MOUs
- Implement Access Control – Late 2010



Potential Violations / Open Self Reports

Extent of condition for PRC-005 potential violation is under investigation

Reliability Standard	Title of Reliability Standard	Assessment
FAC-008-1	Facility Ratings Methodology Issue with a 2007/2008 revision of a procedure – actual practice and current procedures in compliance (GO's).	Potential Violation
PRC-005-1	Transmission and Generation Protection System Maintenance and Testing Colbert Unit 2 generation protection relay - identified an instance of overdue surveillance (PSO handles this for FPG).	Potential Violation
Reliability Standard	Title of Reliability Standard	Assessment
PRC-005-1	Transmission and Generation Protection System Maintenance and Testing Failure to perform PM inspection on microwave station at South Jackson and various hydro station batteries. Failure to perform inspections on Electro mechanical relays (TVA reported for Power Distributor). <u>Sequoyah protection system battery - identified an instance of overdue surveillance.</u>	Open Self-Report R2.1
VAR-002-1.1a	Generator Operation for Maintaining Network Voltage Schedules Johnsonville did not report off AVR within 30 minutes.	Open Self-Reports R1, R2 and R3