

# Electric Transmission

Presentation  
To  
*Senate Utilities Committee*

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# Electric Transmission Discussion Agenda

- Electric transmission systems
- Grid Reliability
- Regional Transmission Organizations
- Southwest Power Pool
- Future Expansion Plans
- Transmission Rates

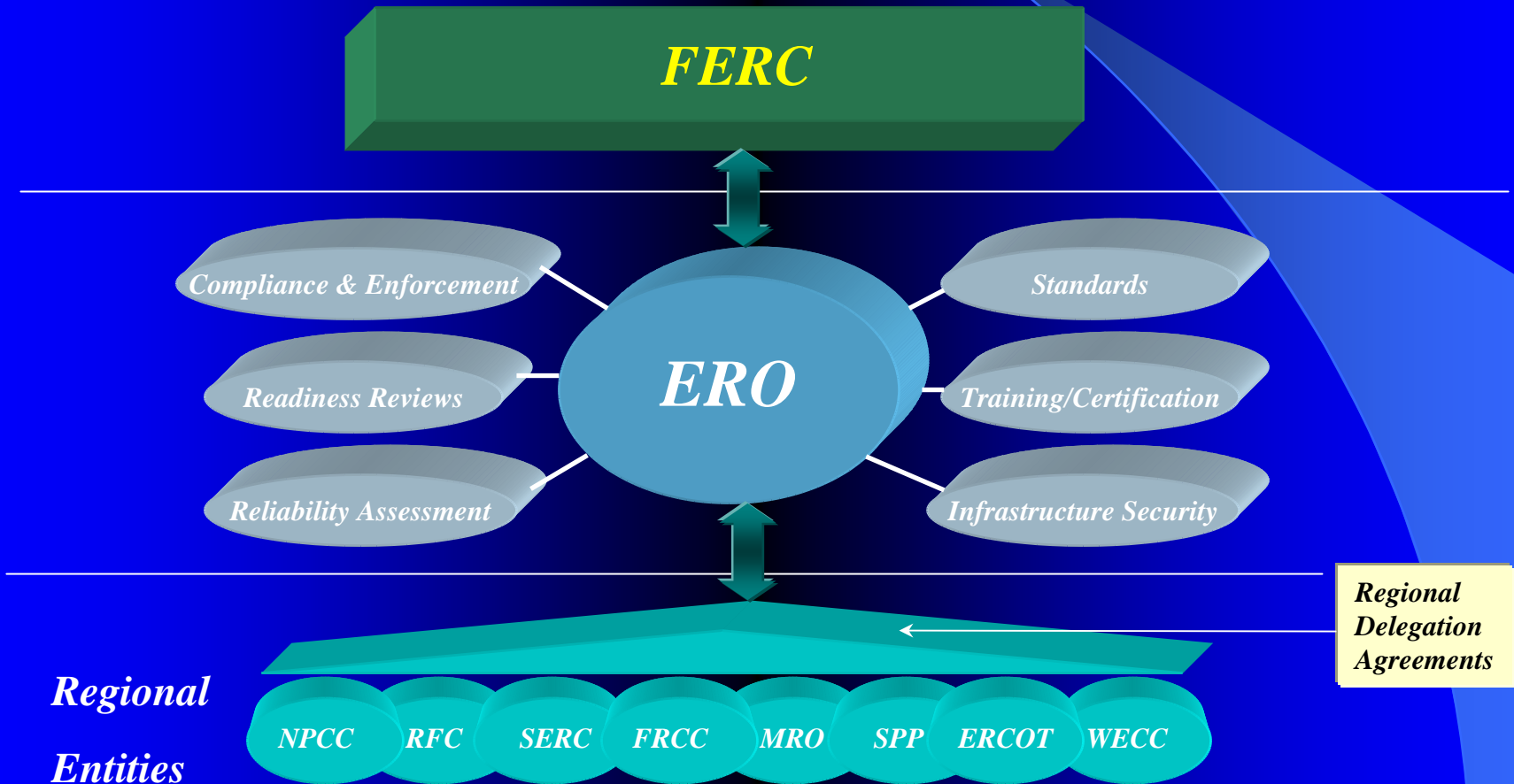
# Transmission System

- Efficiently transfers electric energy from generators to local distribution systems.
- High voltages (100kV & up) allow large energy transfers and optimum conductors.
- Interconnected grid operations
- Grid reliability is top priority

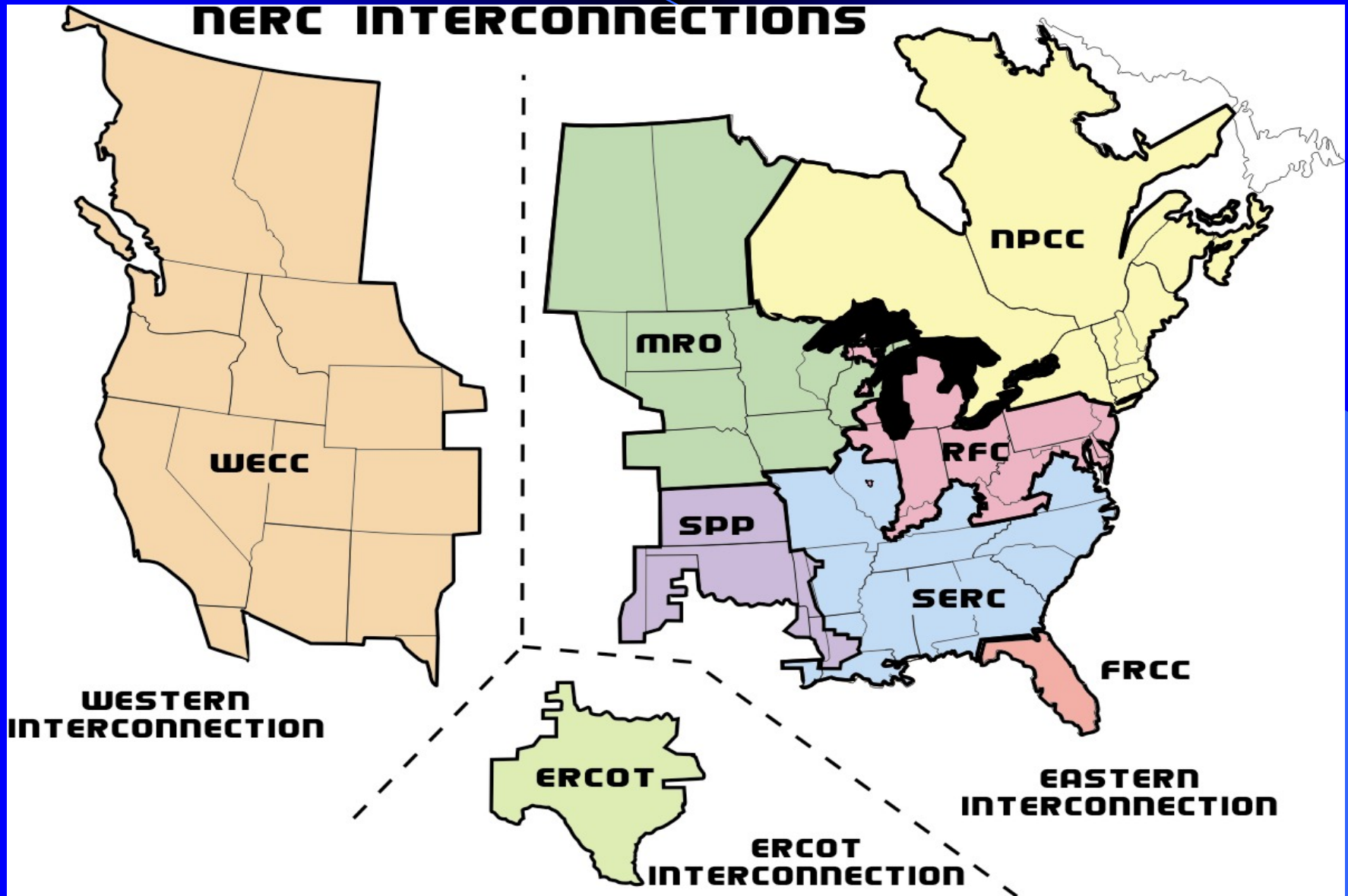
# Grid Reliability

- North American Electric Reliability Council (NERC) provided reliability oversight.
- EPAct 2005
  - Gives FERC jurisdiction over grid reliability.
  - Electric Reliability Organization (ERO)
  - Mandatory Compliance
  - ERO to monitor and enforce mandatory reliability standards
    - Now applies to all users and operators
- Reliability standards: strict, complex and growing.

# Electric Reliability Organization (ERO)



# 3 Interconnections / 8 NERC Regions



The background is a solid blue color. A white arc starts from the top left and curves towards the center. A light blue wedge-shaped area is located on the right side, pointing towards the center.

# Regional Transmission Organization (RTO)

# History of RTO formation

- 1970's – energy crisis points out the need for more fuel diversity in the United States
- 1978 – Federal law (PURPA) to encourage alternative energy development such as cogeneration
  - Required existing utilities to buy electricity from certain new facilities
- 1992 – Federal law (Energy Policy Act) granting authority to FERC to order Open Access to the transmission system
  - Existing transmission owners required to negotiate with entities interested in using the transmission system



# History of RTO formation

- 1996 – FERC Order 888 and 889 required transmission owning utilities to file open access tariffs
  - Standardized the terms and conditions of transmission service
  - FERC provided the standard terms
  - Terms could be modified with FERC approval
  - Required a split between a utility’s transmission and energy marketing operations
- 1999 – FERC Order 2000 encouraged RTO formation
  - Established the general characteristics and functions to be performed by RTOs
  - “Voluntary” process – however FERC threatened to revoke a utility’s ability to sell electricity at market prices if they did not join an RTO

# History of RTO formation

- 2002 – FERC issues Standard Market Design (SMD) notice of proposed rulemaking
  - Mandated RTO formation
  - Final order never issued due to many states expressing concern over the proposal
- 2004 – FERC orders Standards of Conduct
- 2004 – SPP Receives RTO Approval from FERC
- Each of these events has led towards regionalized transmission service and energy markets

# RTO Activities

- Establish and administer Transmission Tariffs
- Regional transmission planning and expansion
- Congestion management
- Establish available transmission capacity
- Interregional reliability coordination
- Implement energy markets

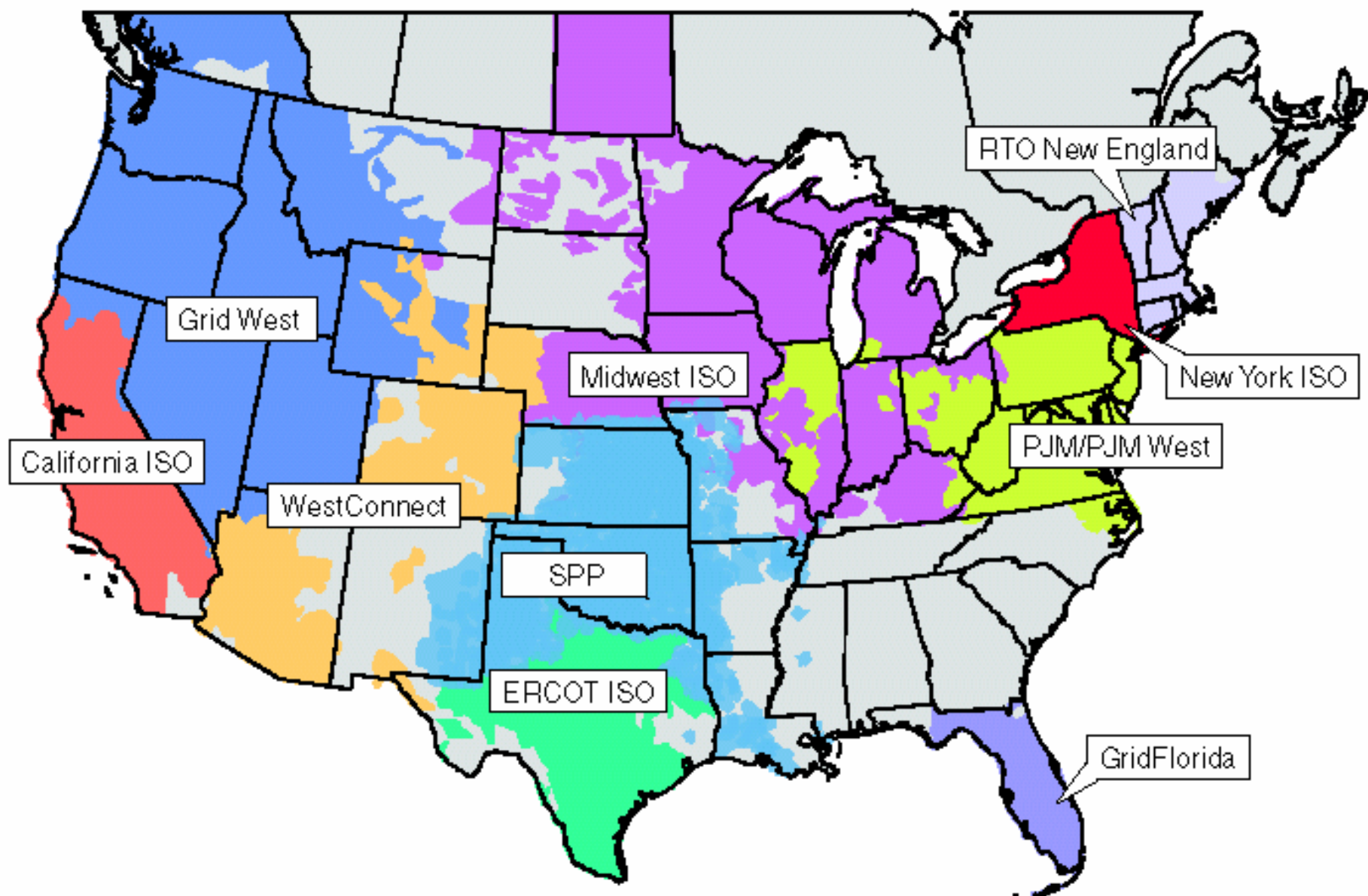
# RTO Benefits

- One transmission tariff for all regional transmission customers.
  - Eliminates pancake rates
- More efficient use of transmission and generation network
  - Reduced production costs
  - Maximized use of transmission grid
- Improved larger-scale expansion planning
- Increased grid reliability



# Approved RTOs and Existing ISOs

Utility Participation as of June 2004



Note: Map includes service territories of transmission-dependent utilities.

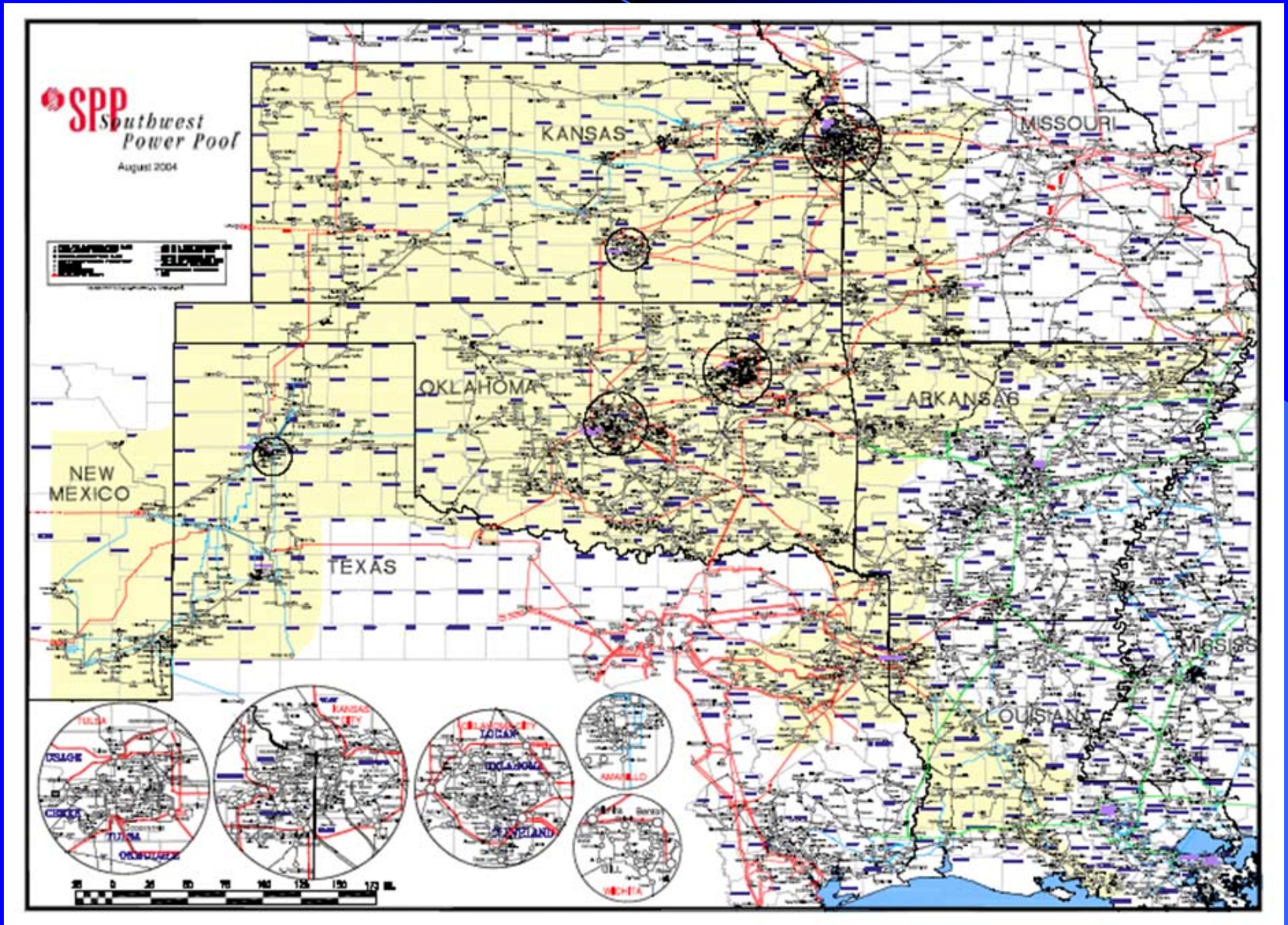
# Southwest Power Pool

# Southwest Power Pool

- **1941: Formed to serve defense needs**
- **1968: Joined as NERC Regional Council**
- **1980: Telecommunications network**
- **1991: Operating Reserve Sharing**
- **1994: Incorporated**
- **1997: Security Coordination**
- **1998: Tariff Administration**
- **2001: Regional Scheduling**
- **2004: FERC Approved RTO**
- **2007: Energy Imbalance Market**



# SPP Footprint





# SPP Services

- **Reliability Coordinator**

- 24/7 System Operations Center
- Coordinates real-time and emergency operations
- Approves planned outages
- Maintains regional black start plan
- Coordinates operations between SPP and other regions

# SPP Services

- **Transmission Tariff Administration**
  - SPP Tariff provides “one-stop” shopping for regional transmission service
  - Maintains consistent rates, terms and conditions
  - Centralized coordination of schedules
  - Independent administration
  - SPP processes 15,000 transactions/month

# SPP Services

- **Transmission Planning & Operating Studies**
  - Reliability assessment studies
  - Regional transmission modeling
  - Aggregate studies include transmission requests
    - Includes firm transmission service requests by generator or load serving entity customers.
  - SPP Transmission Expansion Plan
    - Reliability Projects
    - Economic Projects

# SPP Transmission Expansion Plan

- Expansion Plan creates detailed list of projects across entire SPP region
  - Reliability-based (majority)
    - Necessary to fulfill NERC Reliability Stds
    - Funding mechanism allows shared cost:
      - 1/3 funded by all members
      - 2/3 funded by benefiting members
  - Economic-base (minority)
    - Result of firm transmission requests, increase capacity
    - Based only on market transactions and not reliability requirements.

# Current SPP Expansion Plan

- \$1.4B reliability-based transmission investments over the next 10 years
- 6 economic projects totaling \$142M
- Kansas utilities are included in a host of SPP expansion plan projects.

# Transmission Rates

- State regulated retail rates provide the majority of transmission revenues and cost recovery for utilities.
- Additional transmission revenues are realized through the SPP tariff by users in the wholesale market.

# Questions ?

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