

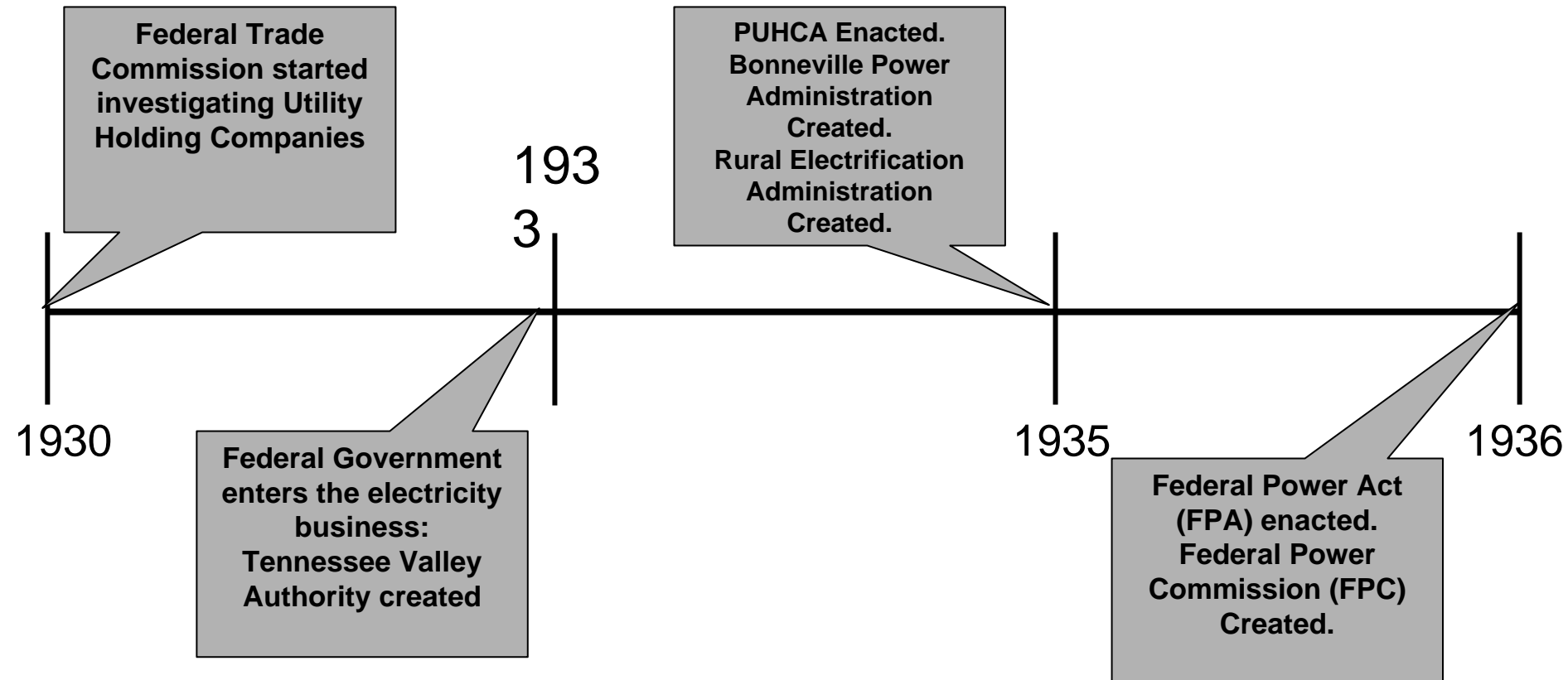
# APPENDIX TO WESTAR ENERGY PRESENTATION

## WHY INTERCONNECTION?

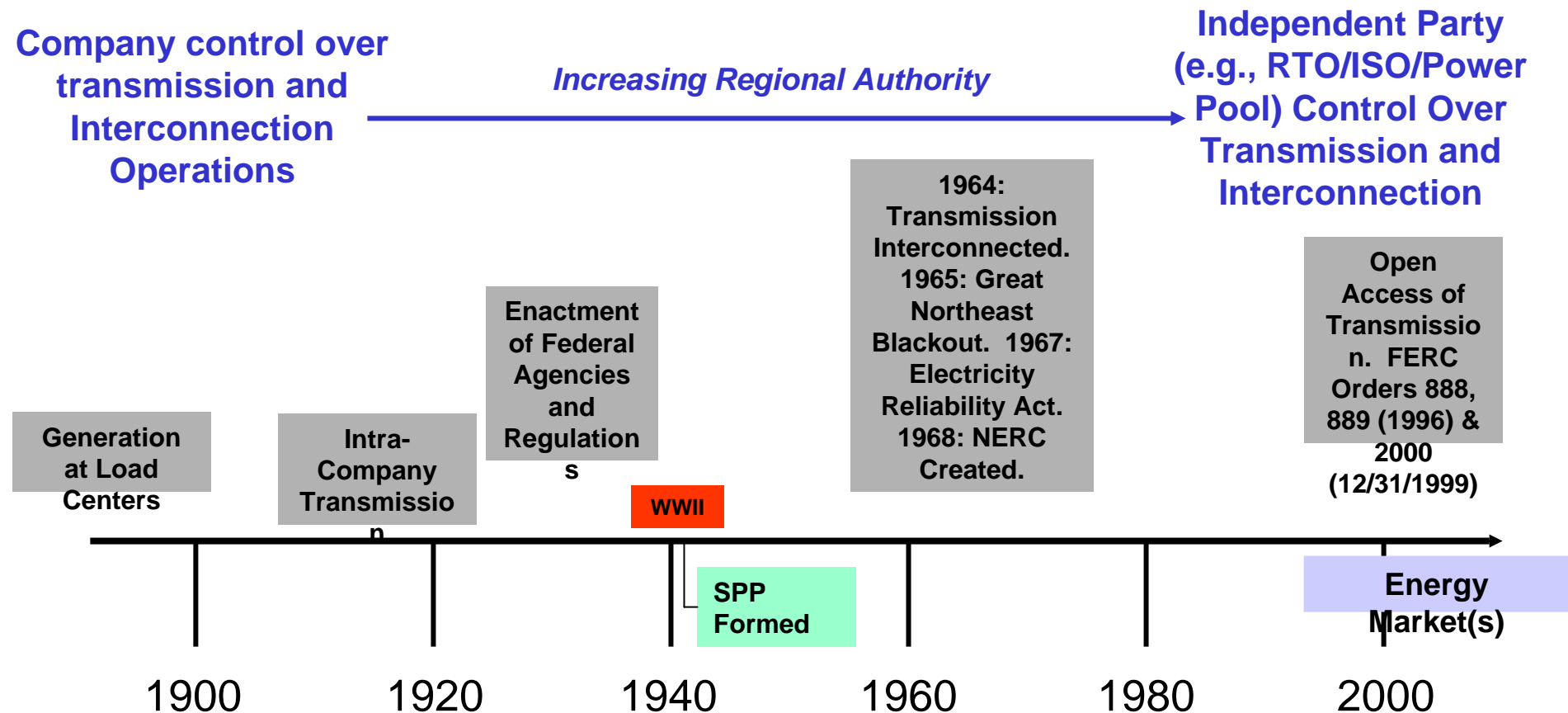
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- In the early 1900s, very small electricity utilities operated as islands (not connected to each other).
- As small utilities combined to form larger utilities (e.g., KGE, KPL, KCPL), level of interconnection increased.
- As utilities grew in size, and number of Interconnections boomed, Federal and State Level regulations were put in place to curb abuse (1930s).
- World War II encouraged utilities to form cooperative organizations/agreements with each other to help the war effort.
- Increased level of interconnection allowed utilities to help each other in need.

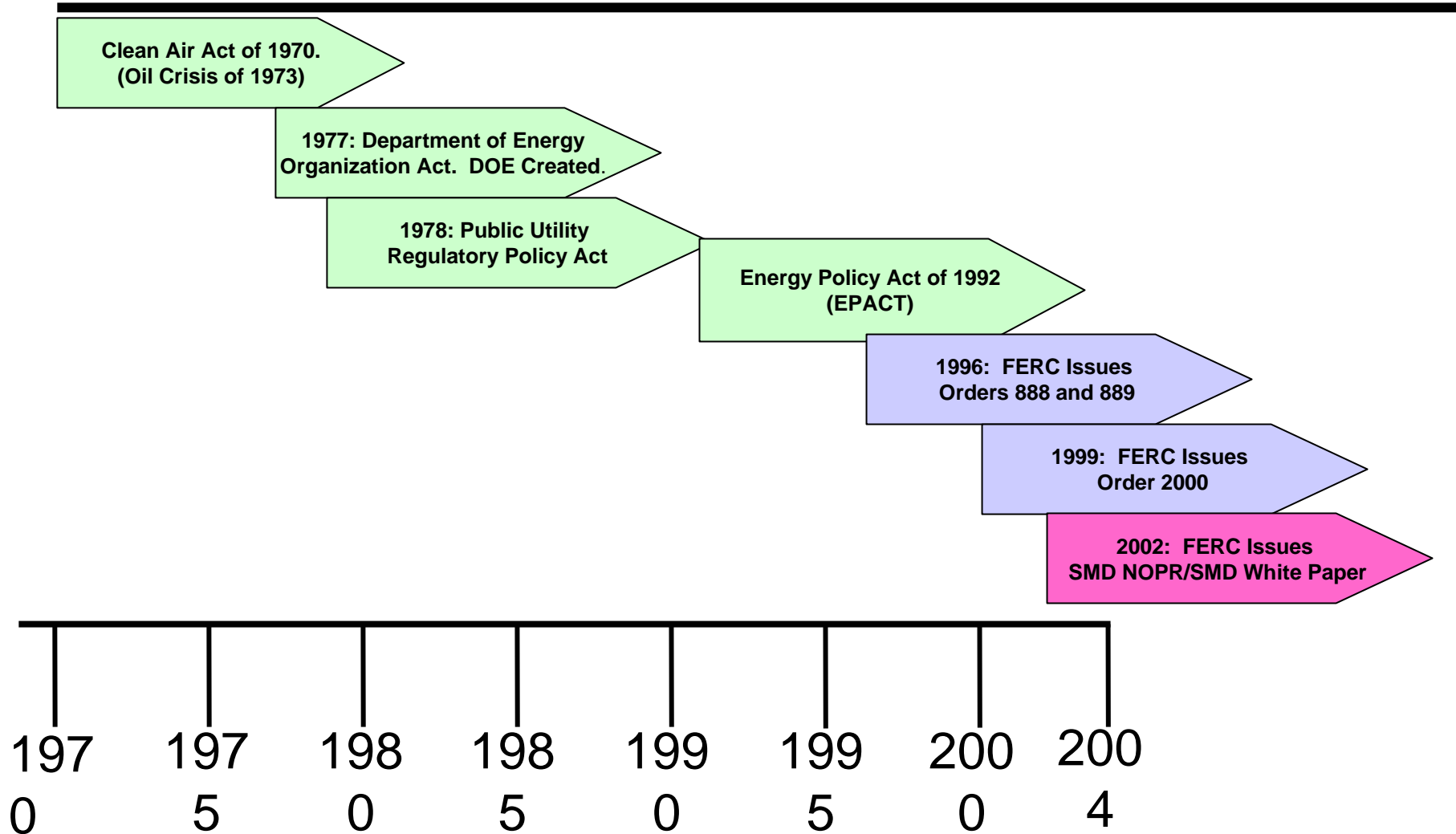
## PRE WWII REGULATION



## THE 30 SECOND HISTORY REVIEW



## EVOLVING FEDERAL ENERGY POLICY



## SUMMARY OF FEDERAL ENERGY POLICY

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- Clear Air Act of 1972: Restricted emissions from Coal Fired Plants.
- Public Utilities Regulatory Policies Act of 1978: Introduced Qualifying Facilities. FERC charged with oversight over QF Interconnection and Transmission Access.

## **FEDERAL ENERGY REGULATORY COMMISSION POLICY**

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- Energy Policy Act (EPAAct) of 1992: Among others, this law provided for Open Access to the Transmission Grid.
  - Order 888: Non-Discriminatory Open Access to Transmission Grid.
    - Separation of Transmission Functions from Merchant Functions.
    - Pro-forma Open Access Transmission Tariffs.
    - Independent System Operators.
    - Market-Based Rates Authority if applicant does not possess Market Power.
  - Order 889: Non-Discriminatory Access to Transmission Information
    - OASIS (Open Access Same-time Information System)
  - Order 2000: Continued and reinforced policy of Non-Discriminatory Open Access to Transmission.
    - Regional Transmission Organizations
      - Four minimum characteristics.
      - Eight minimum functions.

## **SOUTHWEST POWER POOL'S EVOLUTION**

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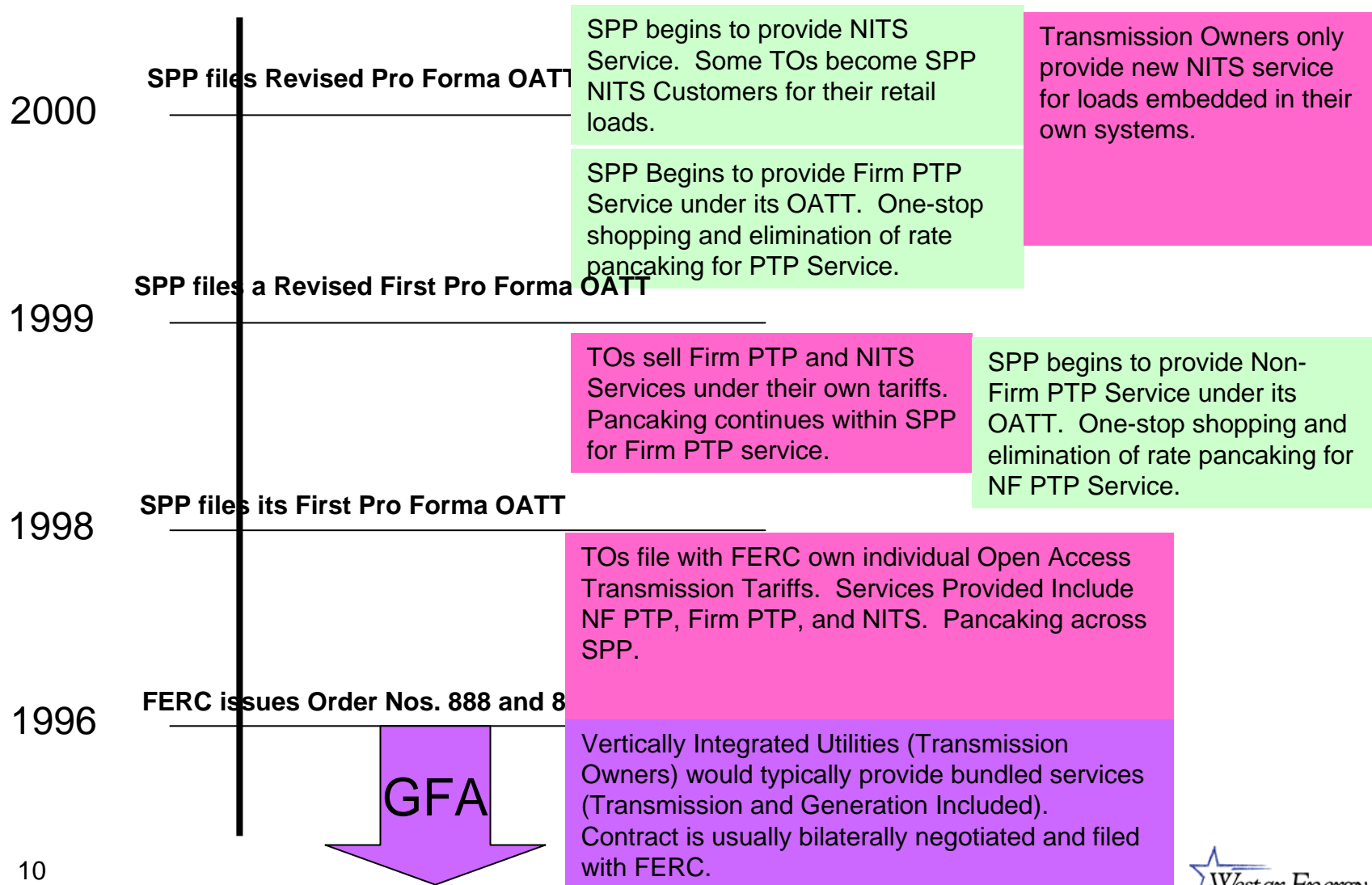
- 1941: 11 Utilities form mutual assistance organization serve critical war efforts.
- 1945: SPP Executive Committee decides to continue SPP existence.
- 1965: SPP becomes a NERC Regional Reliability Council (RRC).
- 1991: Reserve Sharing Group established.
- 1996: FERC issues Orders No. 888 and 889.
  - FERC jurisdictional Transmission Owners file Pro Forma Open Access Transmission Tariff.
  - All transmission service agreements executed prior to Orders No. 888 and 889 were executed bilaterally between Transmission Owners (TO) and Transmission Customers. These contracts become Grandfathered Agreements (GFA).
  - Rate pancaking applied to transactions across SPP footprint.
- 1997: SPP becomes a Reliability Coordinator (RC).

## **SOUTHWEST POWER POOL'S EVOLUTION AS TRANSMISSION PROVIDER**

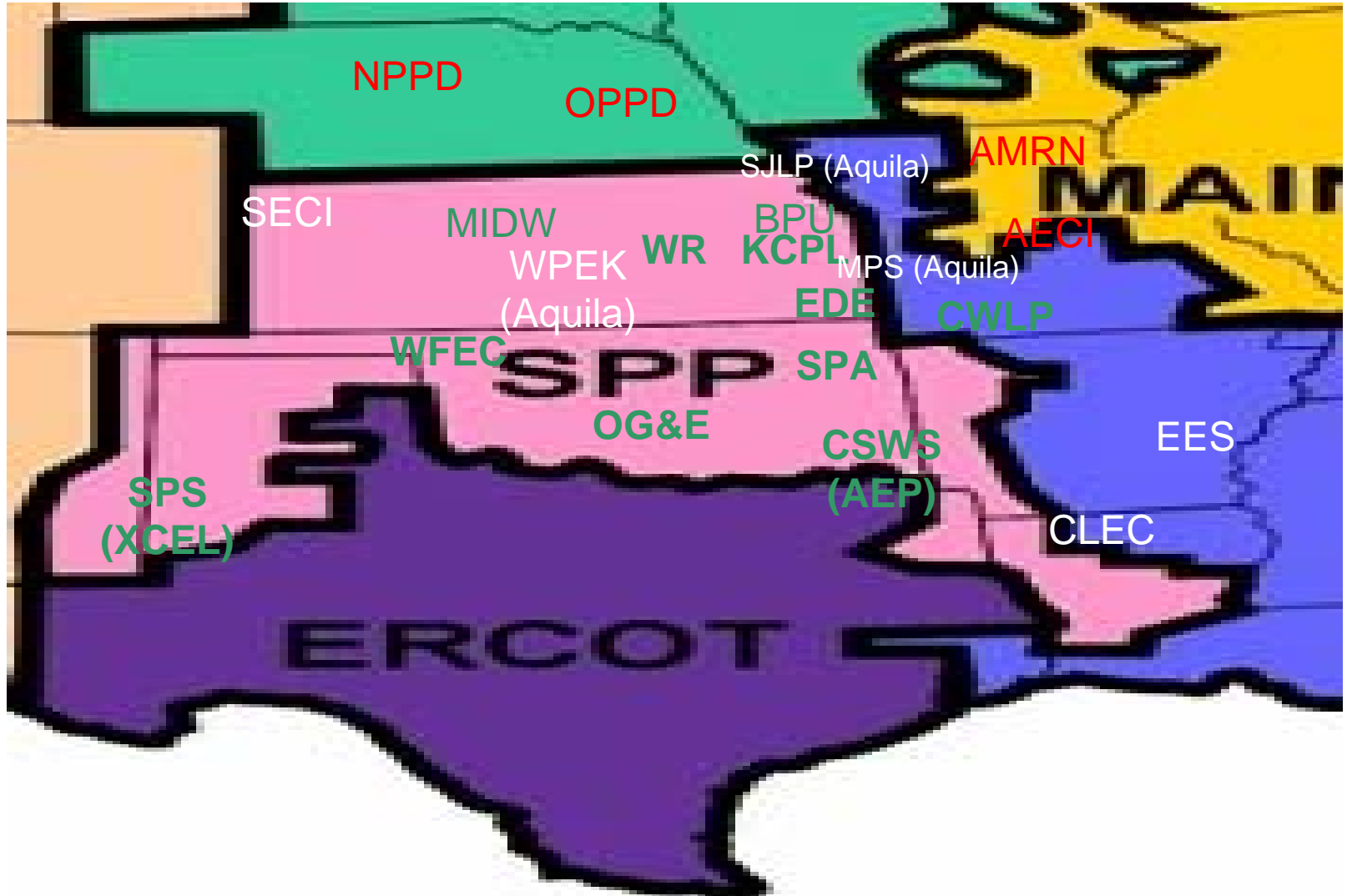
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- 1998: SPP files a Regional Pro Forma OATT; begins to provide Non Firm (NF) Point-to-Point (PTP) Service.
  - Firm and Network Services provided under each TOs' individual Tariffs; Rate pancaking continues for these services.
  - One-stop shopping and elimination of "Rate Pancaking" for NF PTP across SPP.
- 1999: SPP begins to provide Firm PTP Service.
  - Network Service provided under each TOs' individual Tariff; Rate Pancaking continues if Resources are located outside TO' zones.
  - One-stop shopping and elimination of "Rate Pancaking" for Firm and NF PTP Service.
- 2000: SPP begins to provide Network Integration Transmission Service.
- 2004: SPP is conditionally approved as an RTO.

## EVOLUTION OF SPP AS A TRANSMISSION PROVIDER



# SOUTHWEST POWER POOL



## FEDERAL ENERGY REGULATORY COMMISSION POLICY

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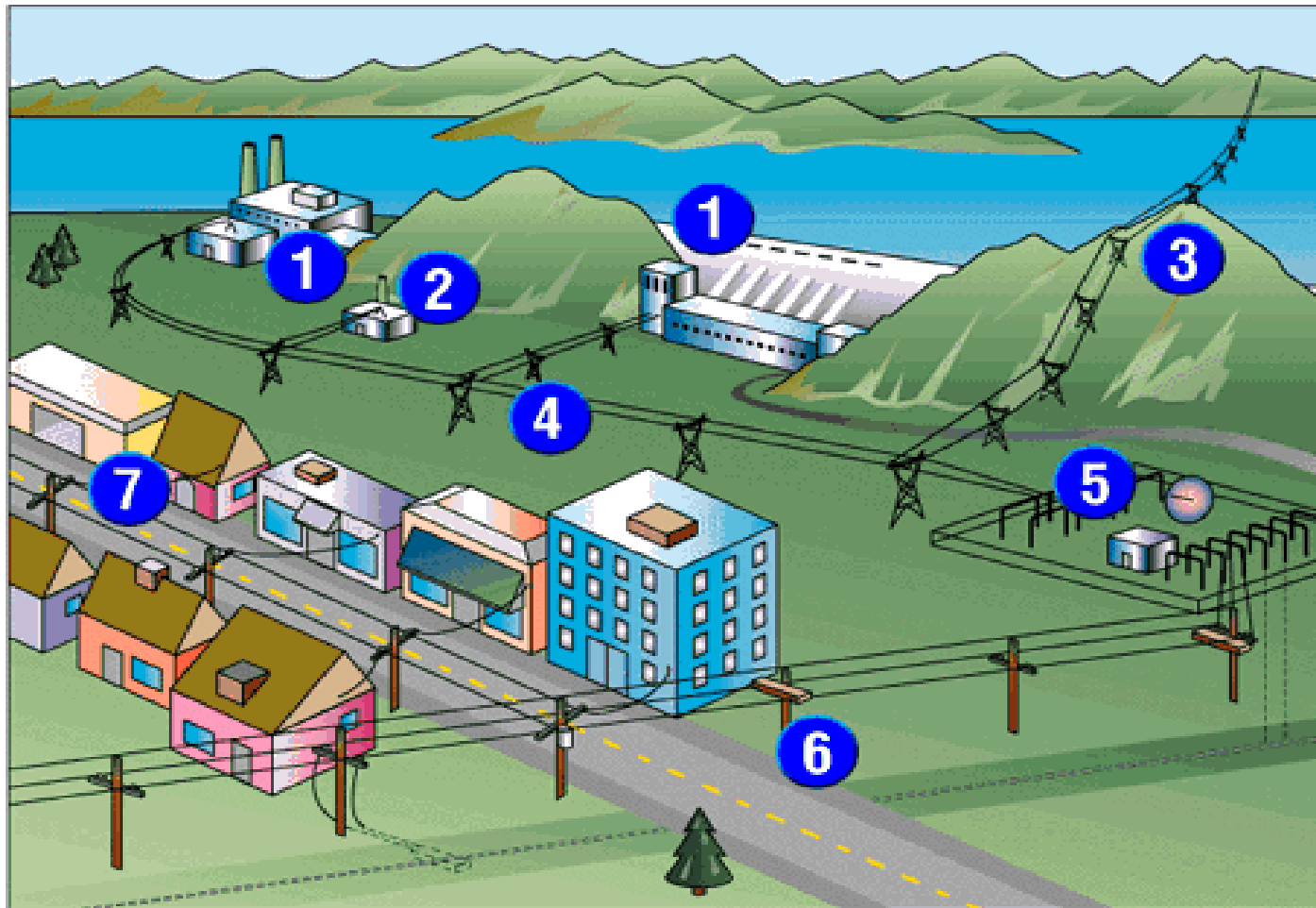
- Directions for the future: The Standard Market Design Docket
  - Issued NOPR on July 31, 2002.
  - Standardized Generation & Transmission Markets for FERC jurisdictional utilities.
  - Minimize Seams issues in prescribing 4 RTO in the US: 3 in the Eastern Interconnect, 1 for the Western Interconnect.
- Issued Whitepaper/Brown-Paper on April 28, 2003.
  - Regional flexibility to implementing RTO, and Transmission & Generation Markets.
  - Emphasized State PUC involvement in critical decisions.

## VERTICALLY INTEGRATED UTILITIES

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- Natural Monopolies.
  - Obligation to serve.
  - Cost based rates.
- Responsible for providing Generation, Transmission, and Distribution.
  - Generation & Dispatch.
  - Transmission and Distribution System and Operations.
  - Intra-State oversight: State PUCs.
  - Inter-State oversight: Federal Power Commission (later Federal Energy Regulatory Commission).
- Control Areas to balance energy supply and demand.
- Regulatory oversight by State PUCs and Municipal leaders (for Municipal utilities).

## A TYPICAL VERTICALLY INTEGRATED UTILITY

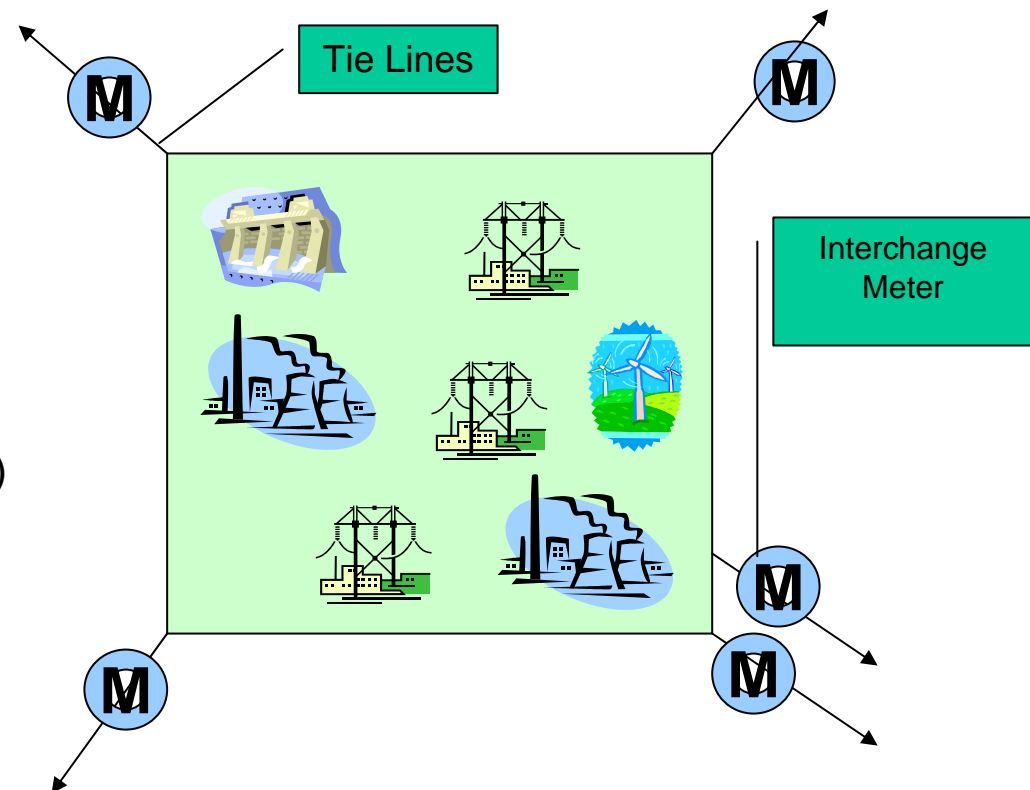


Control  
Area  
Boundary

1. Generation (Thermal and Hydro). 2. Independent Power Producers/Co-Generators. 3. Interconnection to other Utilities. 4. High Voltage Transmission Lines. 5. Substations connecting 14 Transmission Line to Distribution System. 6. Distribution System supplying electricity to end-user(s).

## CONTROL AREA

- Definition: An Electrical System bound by Interchange Tie Meters that provides certain functions
- Service Provided by a Control Area:
  - Interchange Tie Line Metering
  - Load and Generation Balancing (Regulation Service)
  - Frequency Response (one frequency for entire Interconnect)
  - Local reliability monitoring
  - NERC and FERC Reporting
  - Inadvertent Energy Management
  - Schedule Management
  - Checkouts with neighboring Control Areas.



## REGIONAL RELIABILITY COUNCILS (RRC) & NERC

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- |      |  |
|------|--|
| 1996 | FRCC becomes an RRC.   |
| 1972 | MAPP becomes an RRC.   |
| 1970 | ERCOT and SERC form RRCs.  |
| 1968 | North American Electric Reliability Council (NERC) created.          |
| 1967 | Electric Reliability Act of 1967. ECAR, MAAC, and WSCC form as RRCs. |
| 1965 | Great Northeast Blackout. NPCC and SPP become RRCs.                  |
| 1964 | MAIN is formed as an RRC.  |

## NERC & RELIABILITY COUNCILS

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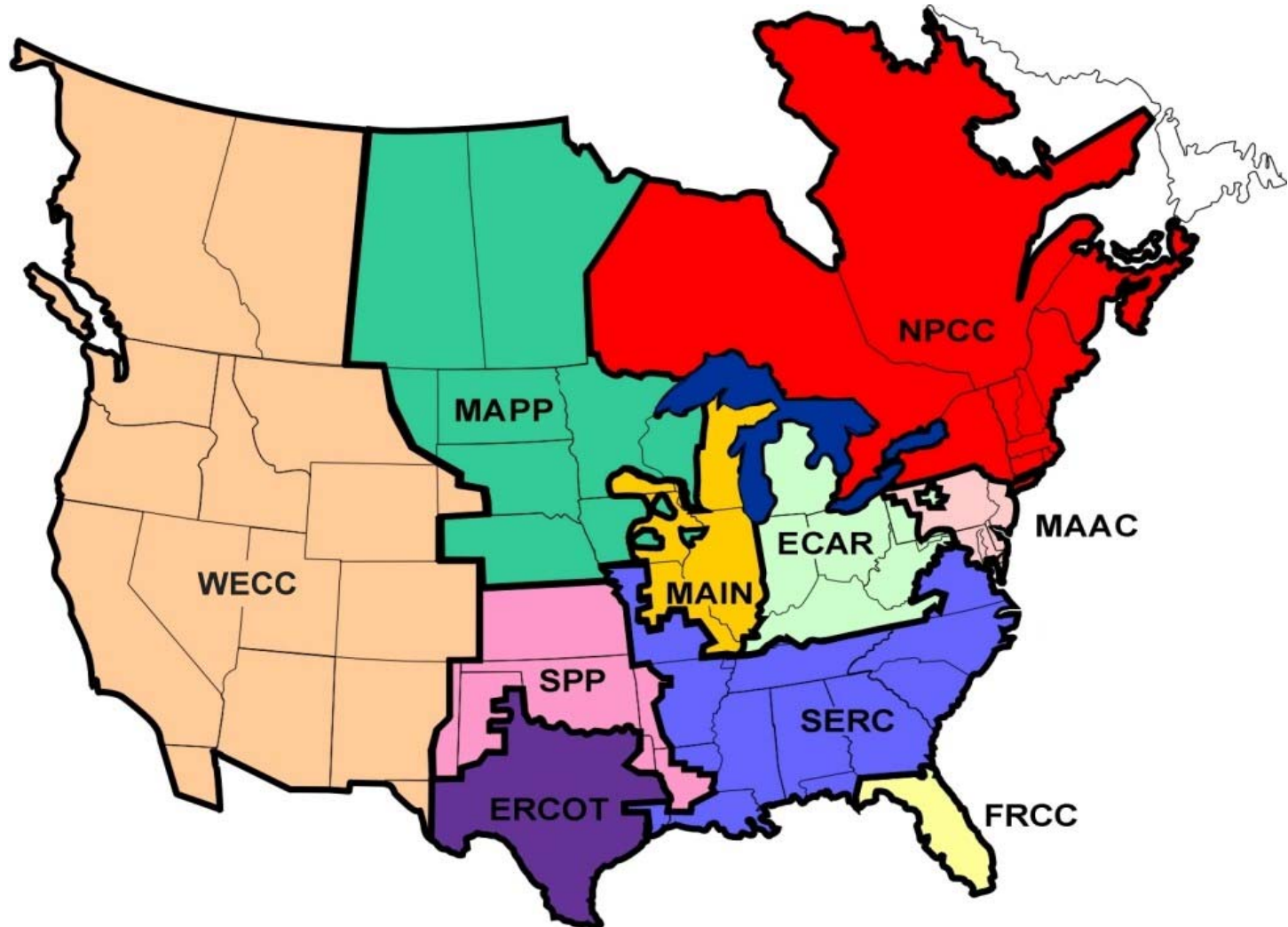
### NERC

- Overall responsibility for planning and operations standards.
- Coordination of Interconnection Operation.
- Not for profit Organization.
- Voluntary adherence to Standards.

### Regional Reliability Councils (RRC)

- Regional coordination of Interconnection Operations.
- Regional Standards, Planning Coordination.
- Compliance Monitoring and Auditing.
- Regional Transmission System Monitoring and Emergency Response Coordination.
- Voluntary, Not-for-Profit Organizations.
- Some cases, the Reliability Council also became Regional Transmission Provider (e.g., SPP, MAPP).

## NERC REGIONS



## RESERVATION PATH VS. POWER FLOW

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Please refer to Slide 8 of the presentation.

Transmission Customer (TC) requests 100 MWs of PTP service from A to Y.

- Because the Transmission System between A and Y are highly Interconnected and includes Transmission for all other Control Areas, power will actually flow over all the connected systems.
- Kirchoff's Law: Electricity will follow the path of least resistance.
- The Contract Path A-X will actually result in power flowing in all directions.
- SPP will examine all relevant flowgates, e.g. A-B, A-X, A-C, B-A, B-C, B-X, B-E, E-B, E-D, E-F, E-Y, C-A, C-B, C-F, F-E, F-C, F-Y, D-X, D-E, D-Y.
- SPP will only approve the request if the request would not cause any of the relevant flowgates to exceed operating limits.

## BACKGROUND: NETWORK & LOOP FLOWS

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Please refer to Slide 9 of the presentation

- Control Areas are highly interconnected between own load and resources.
- Control Areas are highly interconnected with other Control Areas.
- Interconnected system results in one Control Area Generation to Load flows “looping” over neighboring Control Area. True for entire Eastern and Western Interconnects.
- So called “Contract Path” PTP transactions also “loop” through neighboring system(s).
- Areas A and C must treat Neighbor B’s loop flow on their (A and C) systems with the same respect and they would for their own generation to own load flows.
- Neighbor B must reciprocate.
- Loop Flows for network service have always existed.
- Treatment of PTP Loop Flow depends on transaction priority.

## BACKGROUND: TLR LEVELS

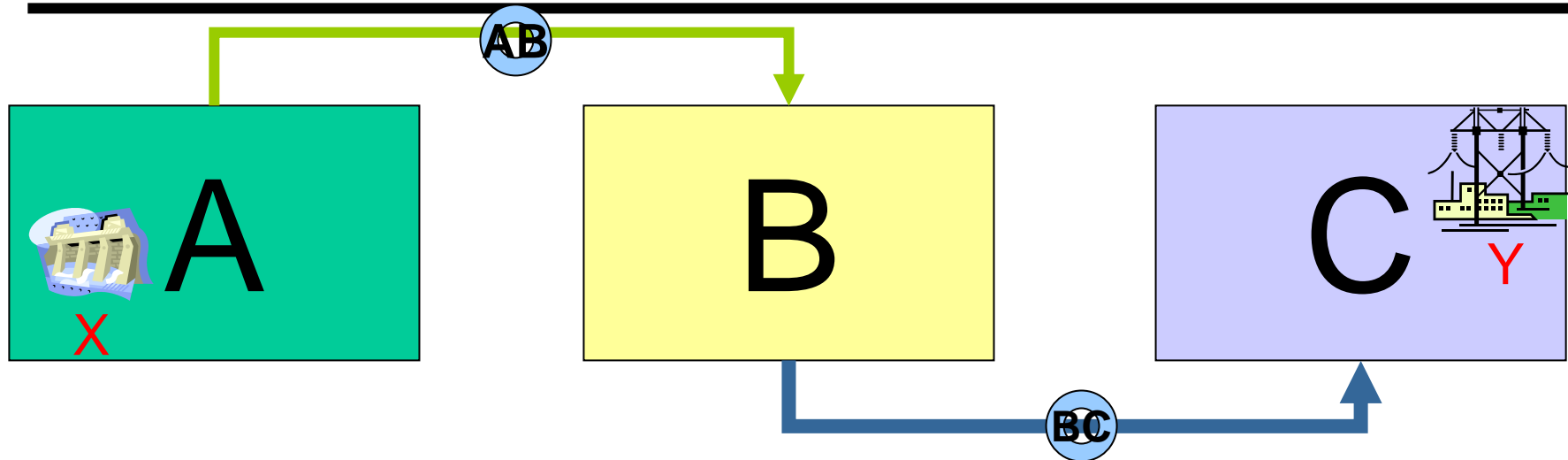
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Please refer to Slide 13 of the presentation.

System Operators utilize different levels of TLR to manage Overload.

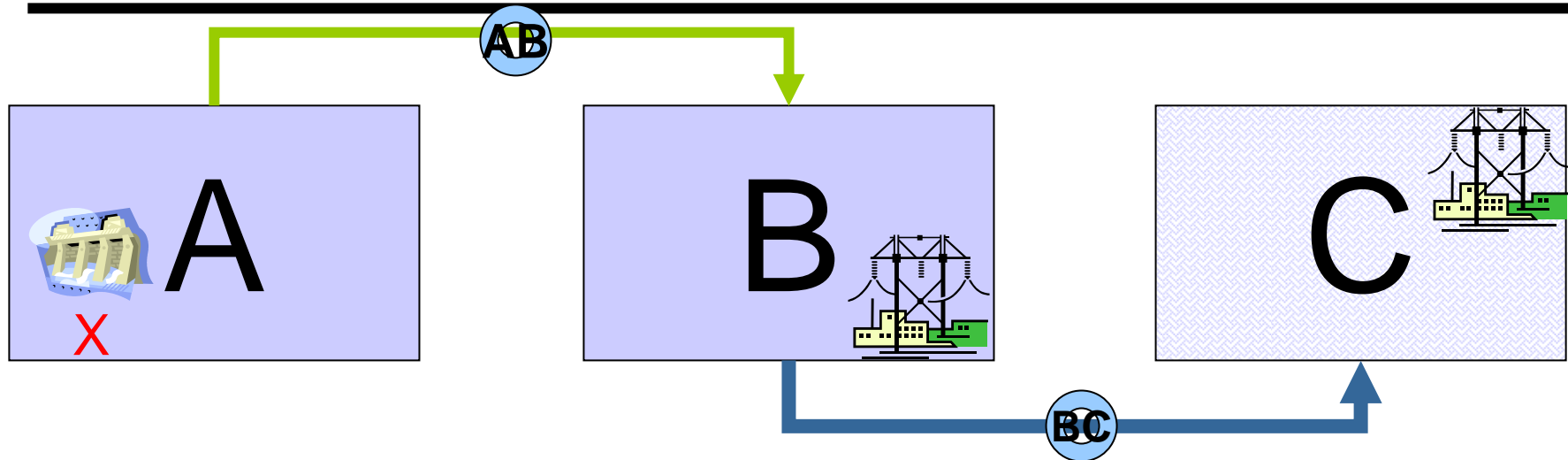
- TLR Level 1: Monitor specific flowgate(s) for potential problem.
- TLR Level 2: Transitional level between level 1 and 3 (30 minutes max).
  - Decision to increase TLR Level or not.
- TLR Level 3: Curtail Non-firm Transaction(s), according to priority level of schedules, to mitigate overload.
- TLR Level 4: Reconfiguration of the Transmission System.
- TLR Level 5: Curtail Firm PTP Transactions, re-dispatch generation to avoid load shedding, shed load as last resort.
- TLR Level 6: Emergency Condition.
- TLR Level 0: Conclusion or Emergency and/or TLR Events.

## BACKGROUND: RATE PANCAKING IN PTP TRANSACTIONS



- Transmission Customer wants to purchase 50 MW from Generator X inside Transmission Owner A's area to use for the Load Y inside Transmission Owner C's area.
- TO A is not connected to TO C, however TO B is connected to Both.
- Each TO has their own Open Access Transmission Tariff.
- Therefore, Transmission Customer must possess three rights to move power from X to Y: X to Interconnect Point AB on TO A, AB to BC through TO B, and Interconnect Point BC to Y on TO C's area. Transmission Customer must also pay three separate transmission access charges.

## BACKGROUND: RATE PANCAKING IN NETWORK SERVICE



- A, B, and C are SPP members and have placed their Transmission Facilities under the SPP OATT.
- A and B are SPP NITS Customers, but C is its own NITS Customer.
- If B wants to purchase economy power from Generator X in A's area, it does NOT have to pay an additional PTP charge (provided adequate ATC is available)
- If B wants to designate Generator X as a its Network Resource, it can do so and NOT pay additional transmission charges (subject to deliverability feasibility).
- If C wants to purchase economy power for Generator X and/or designate X as a network resource, it will need to purchase and pay for PTP service from A to the BC interface.

## BACKGROUND: GLOSSARY

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- ATC: Available Transfer Capacity.
- AFC: Available Flowgate Capability.
- Flowgate: A set of monitored Transmission Elements.
- Resource Plan: Control Area Operator's 7-day plan for unit commitment and load forecast. Submitted to SPP Daily.
- Reservation: A SPP approved right to "move" power from a source Control Area to a sink Control Area.
- Schedules: NERC Tags created against confirmed rights indicating power movement.
- Reservation Path: A Control Area to Control Area path established for Reservations and Schedules only; e.g., WR-SPS. Does not indicate actual power flow.

## BACKGROUND: GLOSSARY

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- **FERC:** Federal Energy Regulatory Commission. An independent agency within the Department of Energy (DOE) that, among other responsibilities, regulates the transmission and wholesale sales of electricity in interstate commerce. Its predecessor, the Federal Power Commission, was formed in the 1930s as a part of the Federal Power Act (FPA).
- **NERC:** The North American Electric Reliability Council. Formed in 1968 by the electric power industry in response to political pressure for reform following the 1965 Northeast Blackout. Charged with promoting the reliability of electric supply through the development of standards. NERC consists of nine Regional Reliability Councils, including the SPP.

## BACKGROUND: GLOSSARY

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- **PANCAKING:** The financial result of an energy transaction that crosses more than one transmission provider. In the opposite extreme, there would be one price from one provider, coast to coast.
- **RTO: Regional Transmission Organization.** An organization that is independent from all generating and power marketing interests and has exclusive responsibility for electric transmission grid operations, short-term electric reliability, and transmission services within a multi-state region. To achieve these objectives, the RTO manages the transmission facilities owned by different companies as one, large contiguous system, with one tariff applied to all the load served.