

# WIRAB 101

Western Interconnection Regional Advisory Body

June 10, 2011

Boulder, CO

# Outline

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- I. WSCC Era through 1995
  - 1960-70s: Grid expansion and blackouts
- II. Transition Period 1996-2004
  - WGA Lobbying for Reliability Legislation
- III. Mandatory Reliability Standards Era 2005 - present
  - Section 215 of the Federal Power Act
  - FERC, NERC and WECC Roles
- IV. WIRAB
  - A. Statutory authority
  - B. Origins and structure
  - C. Operations
  - D. Assessments and budgets
  - E. Priorities
- V. NERC priorities
- VI. WECC priorities

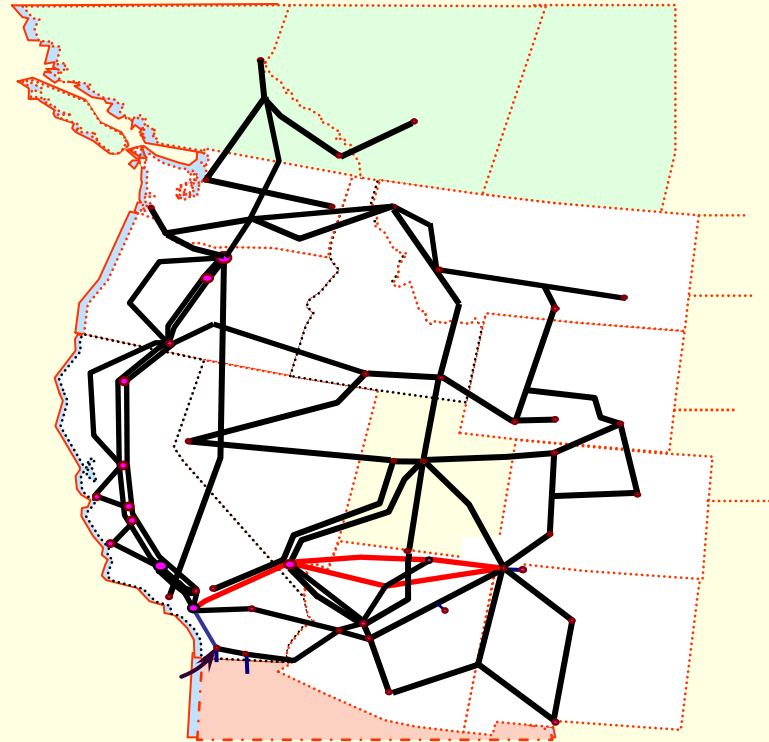
# I. WSCC Era

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- Interconnection of western systems
- Blackouts
- Rise of reliability organizations

# 1963 Four Corners Power Plant

First of the distant coal power plants and associated long distance transmission



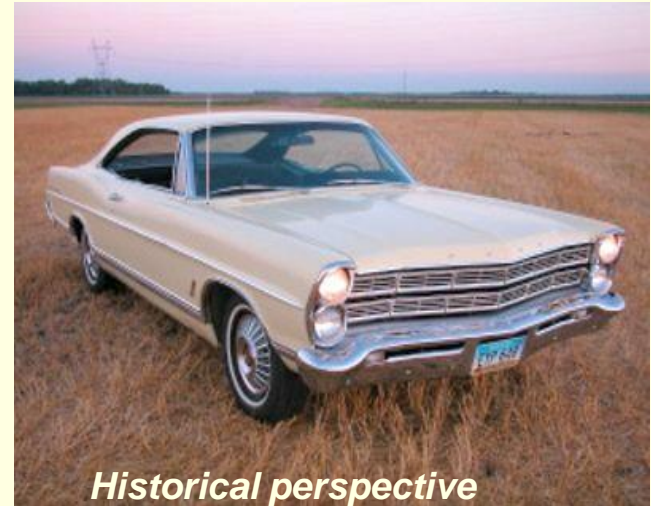
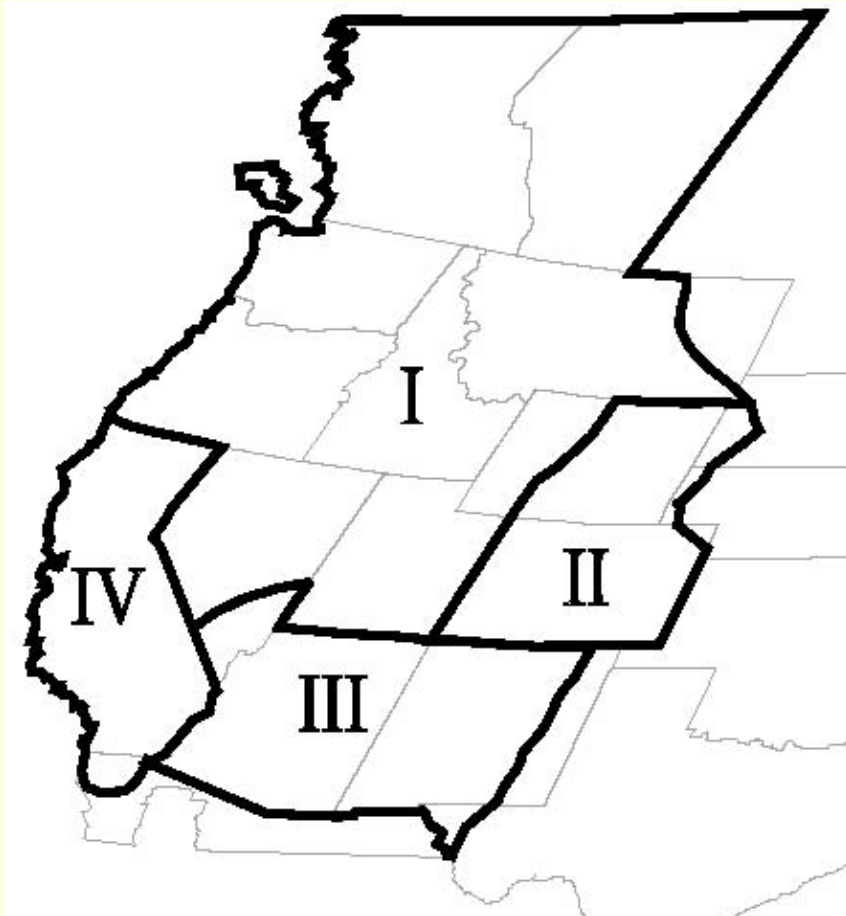
# 1965 Blackout

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# 1967 Western Systems Coordinating Council (WSCC) Formed

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*Historical perspective*

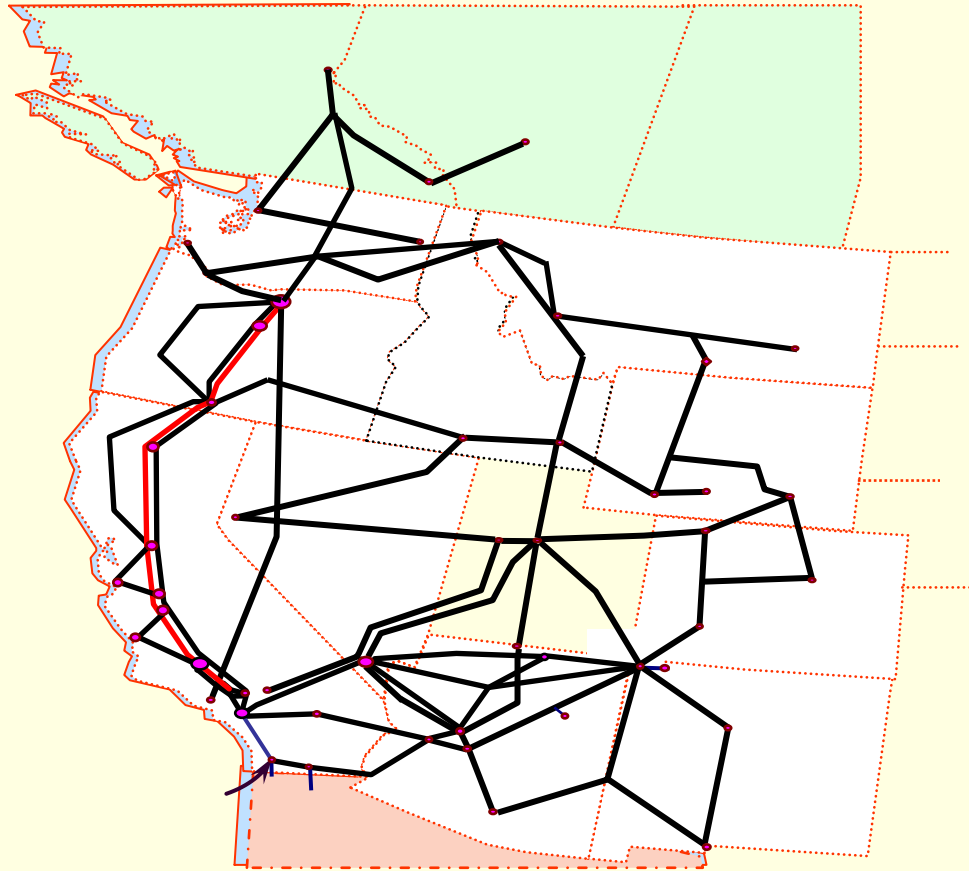
# 1968 NERC Formed

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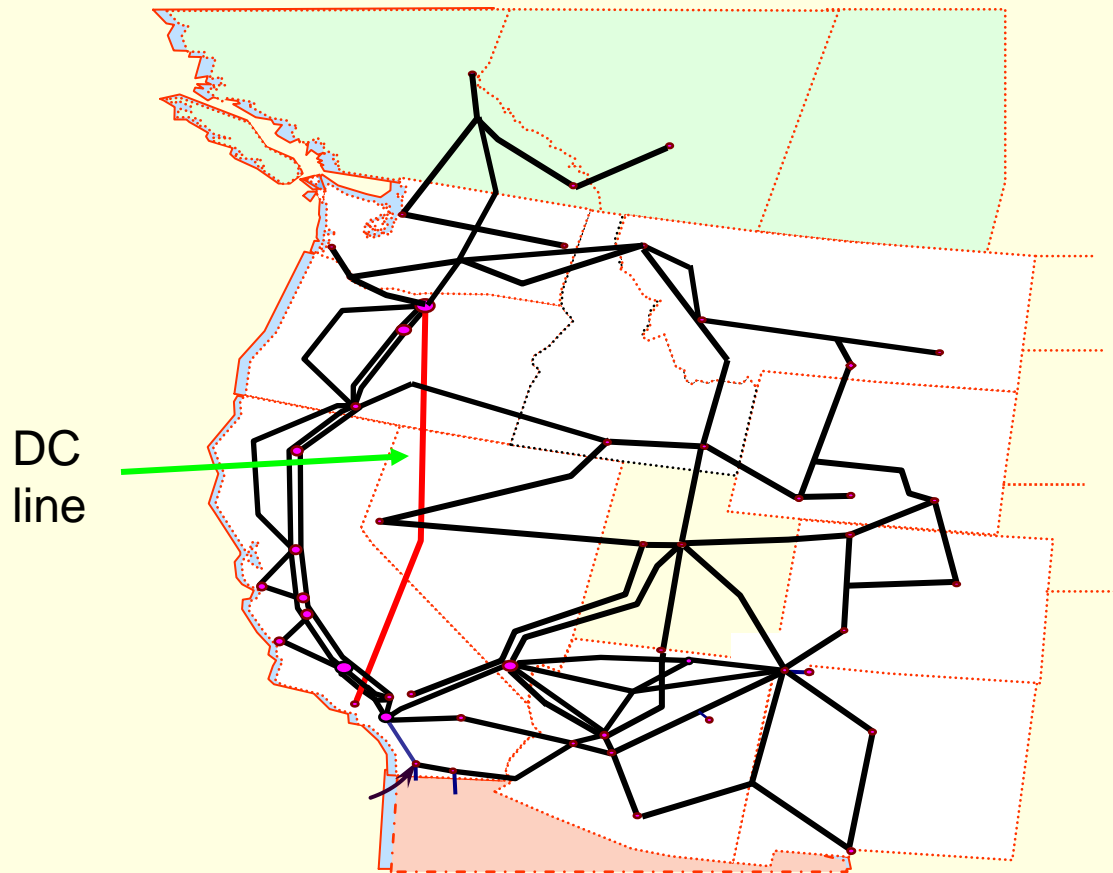
- 1960s North American Power Systems Interconnection Committee developed criteria and guides for reliable operations
- 1968 National Electric Reliability Council (NERC) formed in response to 1965 blackout and funded by contributions from regional councils
- 1981 NERC changed its name to North American Electric Reliability Council in recognition of Canadian participation
- 2001 independent 9-member NERC Board created
- 2006 FERC approves NERC as the ERO

# 1968 Pacific AC Intertie energized

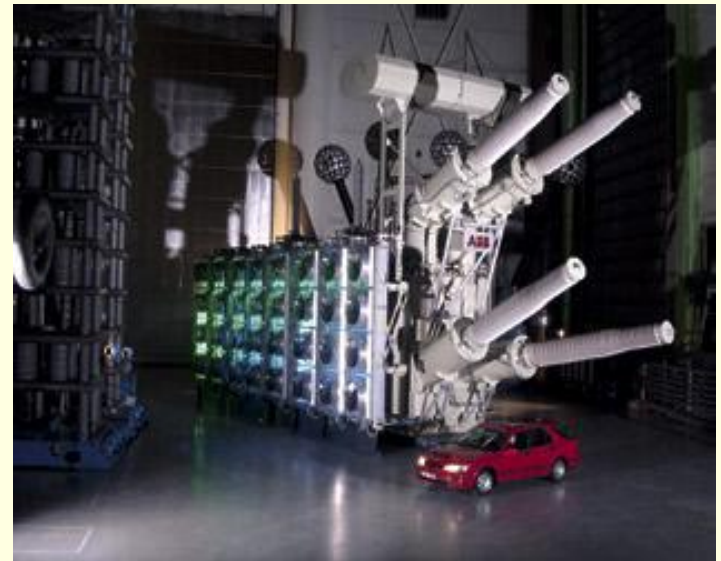
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# 1970 DC line added to Pacific Intertie

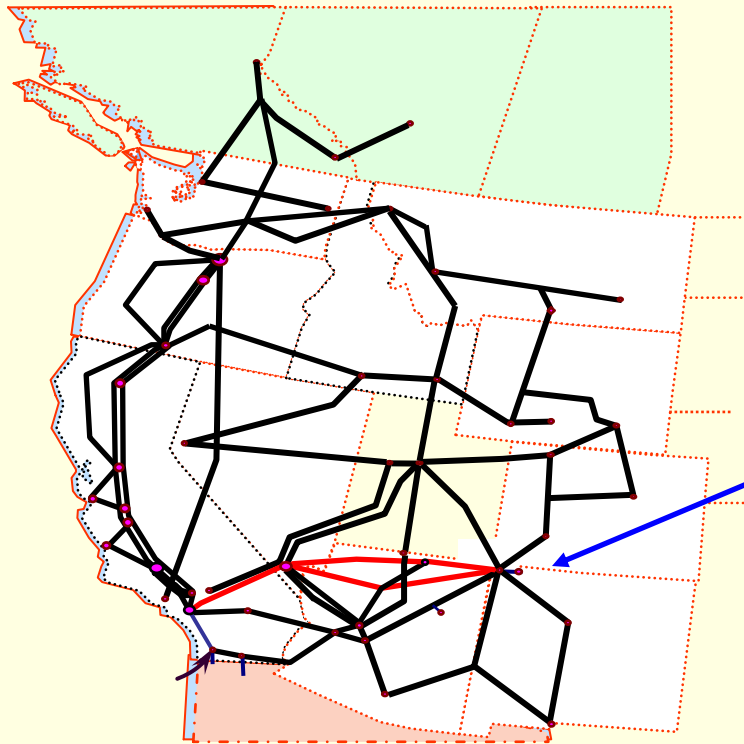


# 1971 Sylmar converter station damaged by Northridge earthquake

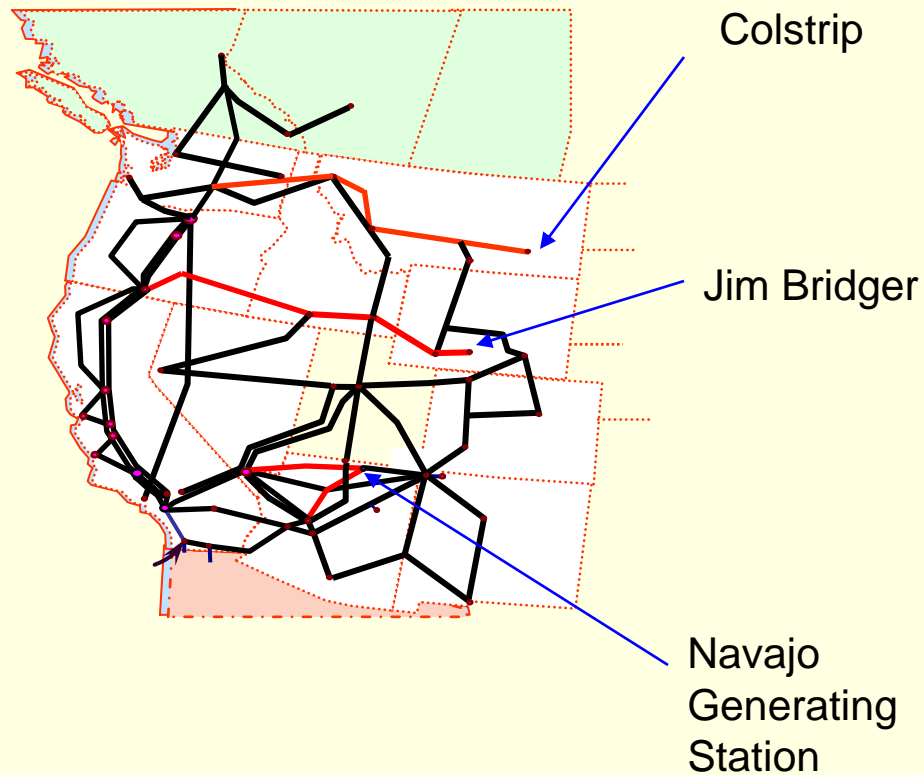


***New converter transformer***

# 1973 San Juan power plant

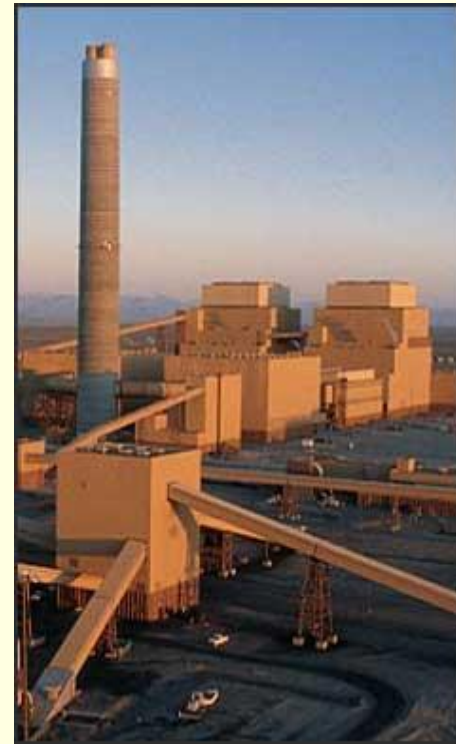
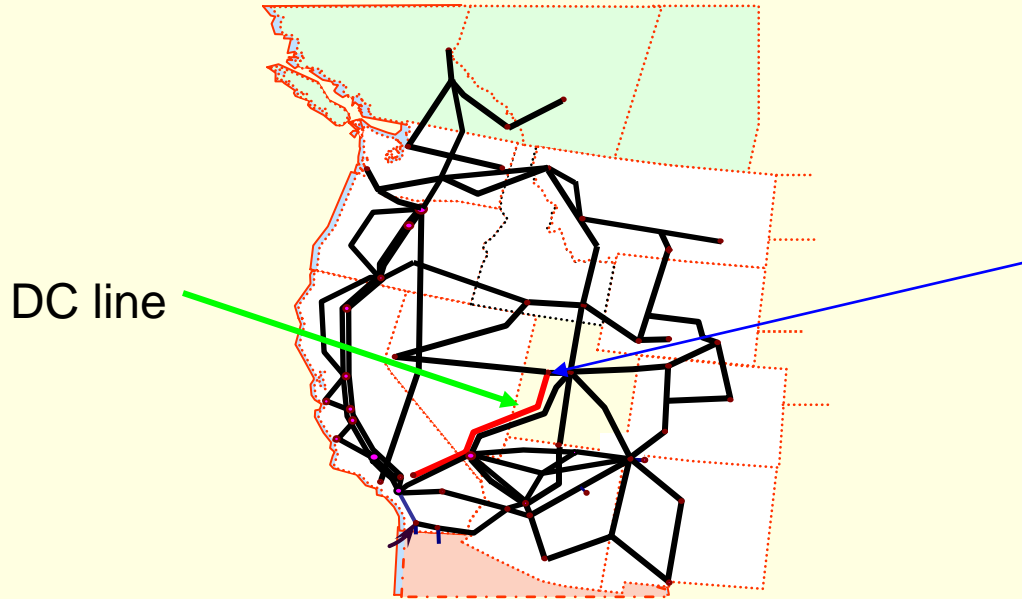


# 1975: Colstrip, Jim Bridger, Navajo Generating Station



# 1986 Intermountain Power Project

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# Transitional Era – 1995-2004

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- WRTA, NRTA, SWRTA formed
- FERC Order 888 on open transmission access
- 1996 Western blackouts
- Security Coordinators established
- WSCC Reliability Management System
- Lobbying effort on federal legislation
- WECC formed
- 2003 Midwest-Northeast blackouts

# RTGs Formed; Expanded Involvement of States/Provinces in Grid Issues

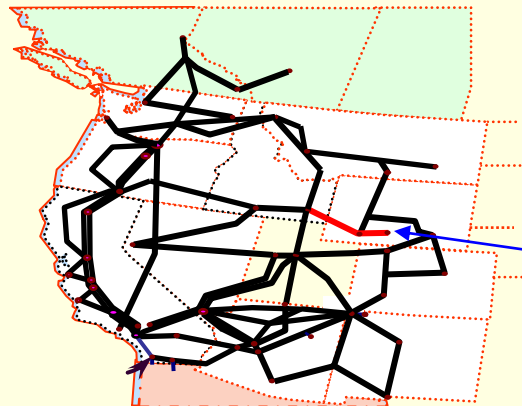
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- 1995 Regional Transmission Groups form to promote open access, transmission planning and dispute resolution
  - Western Regional Transmission Association (WRTA)
  - Southwest Regional Transmission Association (SWRTA)
  - Northwest Regional Transmission Association (NRTA)
- 1996 FERC Order 888 on open transmission access

# July 2-3, 1996 Western Blackout

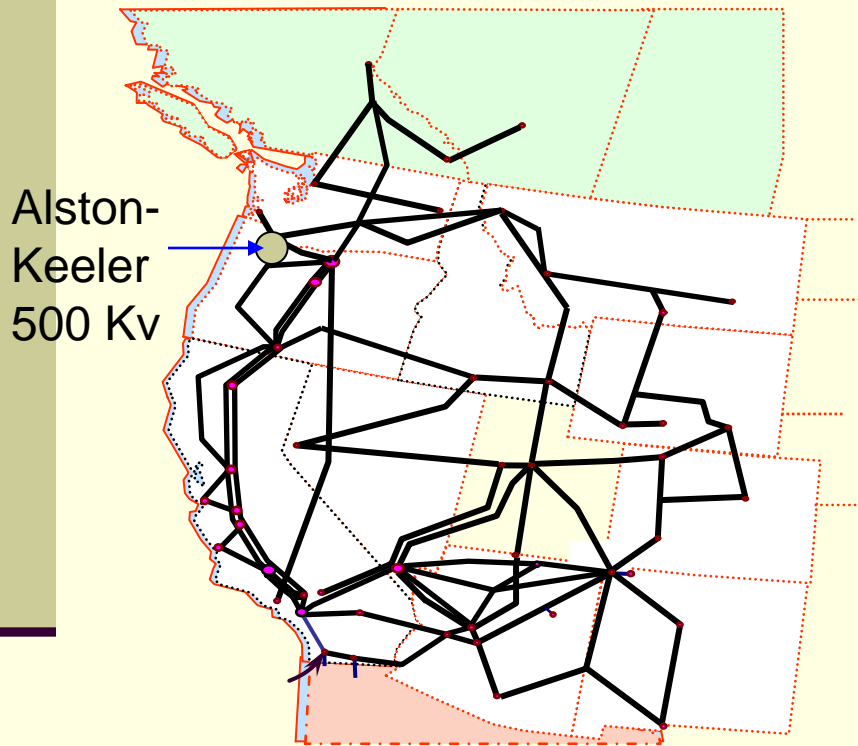
July 2, a 345kV line exiting Jim Bridger coal-fired power plant in southwestern WY tripped, triggering a second line to trip and a special protection system to operate – ultimately the WSCC system became unstable and broke up.

Loss of 11,850 MW of load and affected 2 million people in the West. Customers were affected in Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming in the United States; Alberta and British Columbia in Canada; and Baja California Norte in Mexico. Outages lasted from a few minutes to several hours.



Bridger power plant

# August 10, 1996 Western Blackout



This disturbance resulted in the loss of over 28,000 MW of load and affected 7.5 million people in the West. Customers were affected in Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming in the United States; Alberta and British Columbia in Canada; and Baja California Norte in Mexico. Outages lasted from a few minutes to as long as nine hours.

# Response to Western Blackouts

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- Establishment of 3 Security Coordinators (i.e., Reliability Centers)
- Initiate development of Reliability Management System (RMS)
  - WECC Assessment of 14 Operating Requirements
  - Voluntary Participation
    - Contractual Agreement
    - Mandatory Compliance
      - Monetary Sanctions for noncompliance
  - Includes an appeals process
  - While not all WSCC members are signatories, all provide requested information
  - RMS applicable in Canada and Mexico

# Western Governors' Response

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- Support for RMS as a “stop gap” measure
- Begin 7 years of lobbying for federal legislation
- Governors' goals
  - Delegation to WECC
  - Deference to decisions in the Western Interconnection
  - Establishment of Regional Advisory Bodies

# Timeline (1)

<u>Events</u>		<u>Actions of Western Governors</u>
Western Blackouts	1996	
RMS development	1997	WGA resolution 97-03
First federal bill	1998	
	1999	
2000-2001 Western Electricity Crisis	2000	WGA resolution 00-09
	2001	<u>2/01 Energy Summit</u> WGA resolution 01-01 <u>9/01 testimony to DOE</u> <u>10/01 Gov ltr to Vice President</u> <u>10/01 Gov ltr to House</u> <u>11/01 Govs' statement to FERC</u> <u>12/01 Govs' ltr to House</u>

# Timeline 2

## Events

Midwest-Northeast  
blackout

2002

2003

## Actions of Western Governors

1/02 Govs' Ltr to Senate

2/02 Govs' Ltr to House

3/02 Govs' Ltr to DOE on legislation

Govs' Ltr to House and Senate

Govs' Ltr to Sen. Thomas

Govs' press release on legislation

Govs' rebuttal to WSJ editorial

4/02 Govs' support creation of WECC

WGA resolution 02-26

7/02 Govs Ltr to Congress

11/02 Govs' Ltr to Sen. Thomas

12/02 Lead Govs' Ltr to colleagues

3/03 Govs testimony to Senate

4/03 Govs' Ltr to Sen. Domenici

WGA resolution 03-19

WGA resolution 03-27

8/03 Govs' Ltr to Rep. Tauzin on blackout

10/03 Govs' Ltr to WECC

# Timeline 3

## Events

EPA Act enacted

WIEB Board amends  
bylaws to enable creation  
of WIRAB

FERC approves WIRAB

2005

2006

## Actions of Western Governors

6/05 WGA resolution

11/05 Govs' resolution to establish WIRAB

12/05 Statement to FERC on ERO

Governors create WIRAB

3/06 Govs' request to FERC on RAB funding

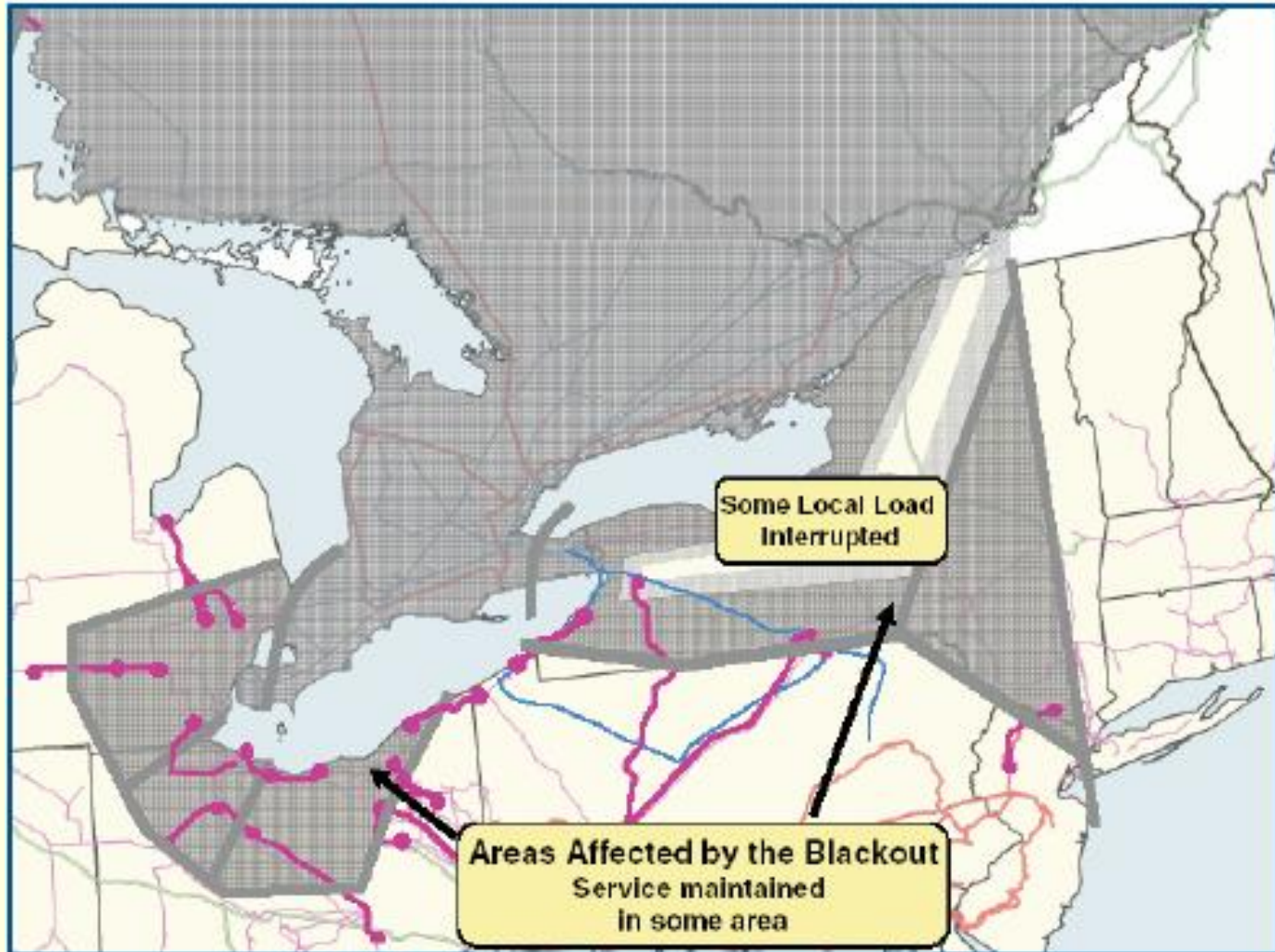
5/06 Govs' statement to Sen. Energy Com. on  
215 implementation

# Evolution of Western Grid Organizations

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- 1999 – Western Interconnection Coordination Forum created
  - Coordinate actions of WRTA, SWRTA, NRTA, WECC, CREPC and RTO discussion groups
- 2002 – WSCC, WRTA, SWRTA merge to form WECC
- 2005 – Western Assessment Group
  - Western industry and CREPC recommend new functions for WECC on transmission expansion planning, resource adequacy, market monitoring, and commercial practices
  - WECC ultimately takes on all except market monitoring

# 2003 Midwest/Northeast Blackout



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## II. Mandatory Standards Era 2005- present

# A. Energy Policy Act 2005

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- Added Section 215 to the Federal Power Act

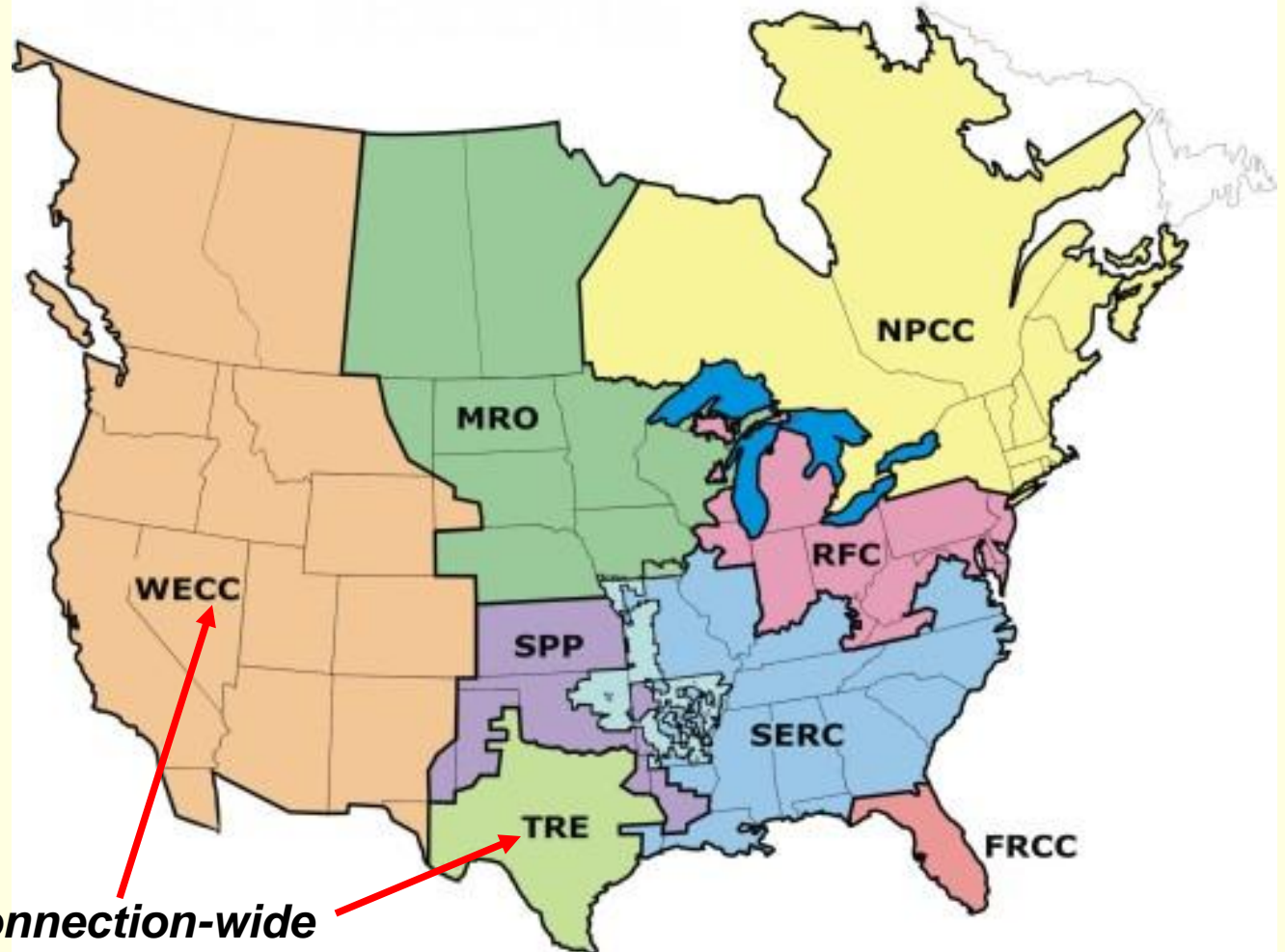
- FERC jurisdiction within the United States over an electric reliability organization (ERO), any regional entities and all users and operators of the “bulk power system” (including public power)
- All users, owners and operators of the bulk power system are required to comply with the reliability standards
- FERC to certify an Electric Reliability Organization
- ERO files proposed standards with FERC
- ERO (with FERC approval) may delegate standards development and enforcement to a Regional Entity
- ERO to rebuttably presume standards proposed by a interconnection-wide Regional Entity to be approved
- Agreements with Canada and Mexico to achieve cross border consistency
- Authorizes creation and role for Regional Advisory Bodies<sub>26</sub>

# Key FERC Reliability Orders

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- Order 672 on ERO rulemaking (Feb. 2, 2006)
- NERC certif. as ERO; WIRAB approved (July 20, 2006)
- Order 693 approves 83 reliability stnds. (Mar. 16, 2007)  
Order 693A approves 8 WECC reg. stnds. (Jun. 8, '07)
- Order 706 approves 8 crit.infra.protec.stnds.(Jan. 18, '08)
- Order 713 modifies interchange and transm. loading relief stnds. (July 21, 2008)
- Order 730 revises stnds. for interchange scheduling and coord. (Dec. 17, 2009)
- Order 743 revised Bulk Electric System def. (Nov.18, '10)
- Order 749 on system restoration stnds.
- <http://www.ferc.gov/legal/maj-ord-reg.asp>

# Regional Entities

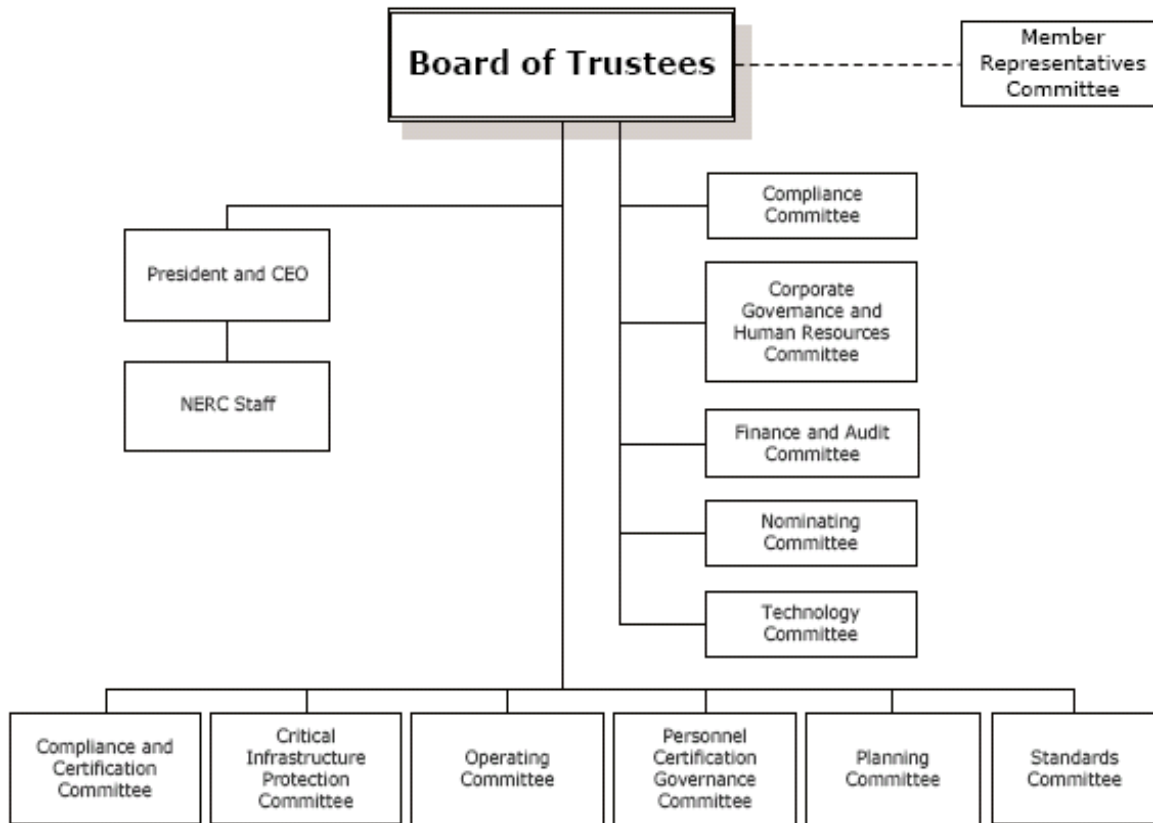


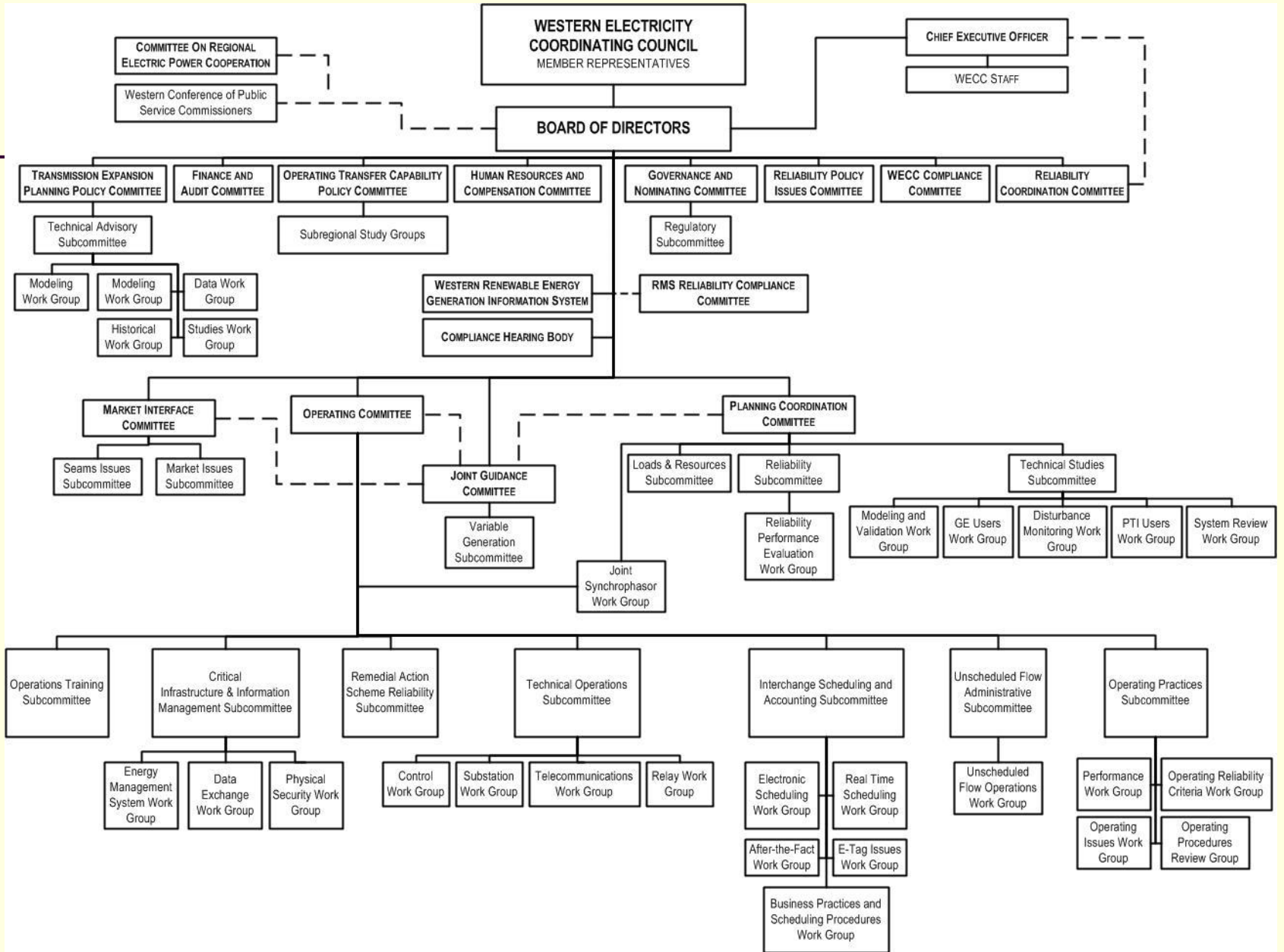
***Interconnection-wide  
Regional Entities***

# 2008 NERC Structure

## NERC Organizational Chart

March 20, 2007





# Relationship between WECC, NERC and NAESB



Section 215



WECC Market Interface Committee



North American Energy Standards Board (NAESB)

# III. WIRAB

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- Statutory Authority
- Structure
- Membership
- Operations
- Budget and staffing
- Meetings
- Advice
- Priorities

# Section 215(j) of the FPA

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“(j) REGIONAL ADVISORY BODIES.—The Commission shall establish a regional advisory body on the petition of at least two-thirds of the States within a region that have more than one-half of their electric load served within the region.

A regional advisory body shall be composed of one member from each participating State in the region, appointed by the Governor of each State, and may include representatives of agencies, States, and provinces outside the United States.

# Section 215(j) cont.

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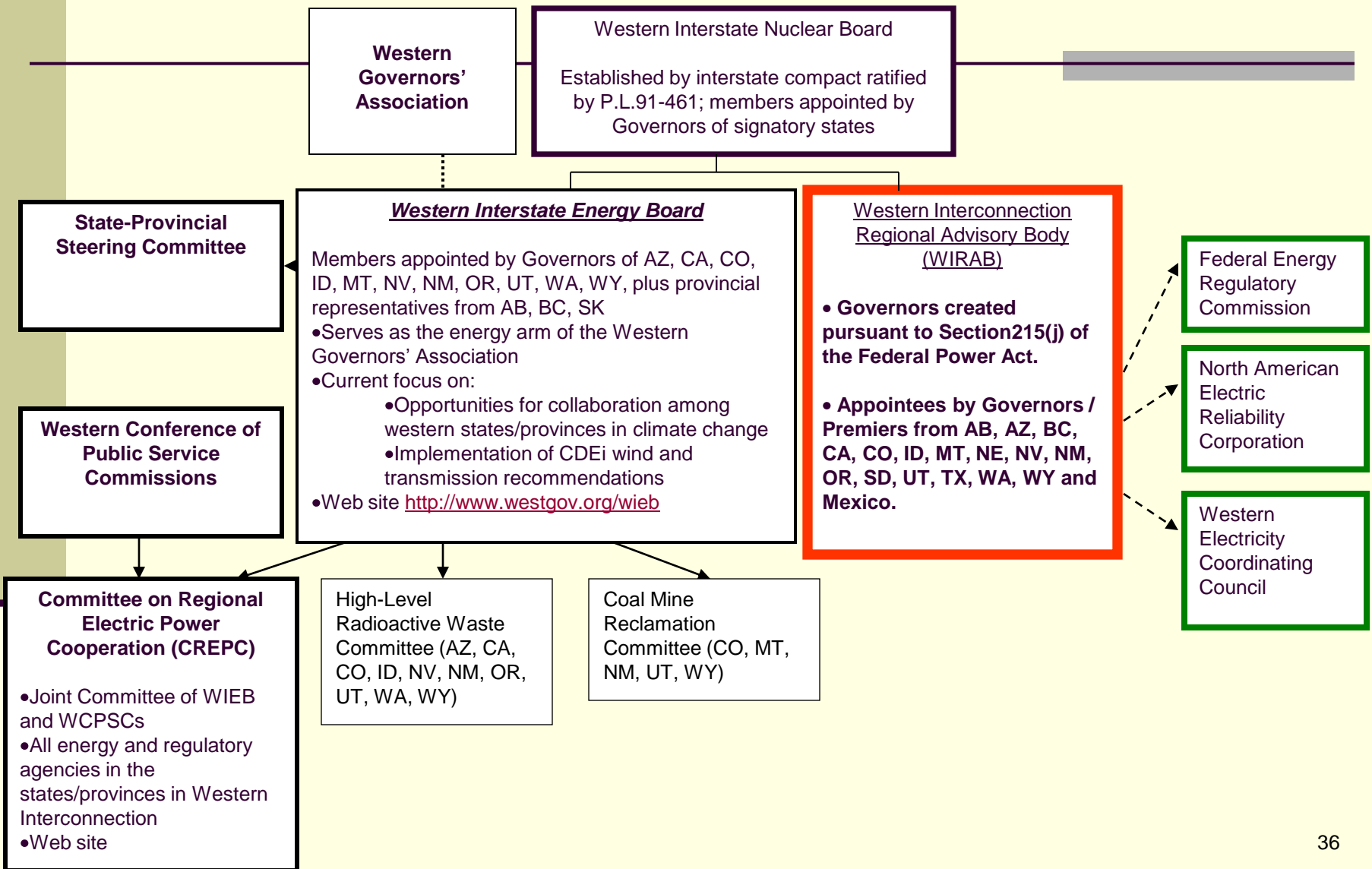
A regional advisory body may provide advice to the Electric Reliability Organization, a regional entity, or the Commission regarding the **governance** of an existing or proposed regional entity within the same region, whether a **standard** proposed to apply within the region is just, reasonable, not unduly discriminatory or preferential, and in the public interest, whether **fees** proposed to be assessed within the region are just, reasonable, not unduly discriminatory or preferential, and in the public interest and any other responsibilities requested by the Commission.

The Commission may give deference to the advice of any such regional advisory body if that body is organized on an Interconnection wide basis.”

# WIRAB Formation

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- August 2005 – EPAct signed
- November 2005 – Western Governors adopt resolution establishing WIRAB
- February 2006 – Western Interstate Nuclear Compact Bylaws amended to:
  - Establish WIRAB as an “advisory committee” to Western Interstate Nuclear Board
  - Establish WIRAB as separate from WIEB Board
  - Provide for WIEB state/provincial Board member to become WIRAB member unless alternative designated
  - Provide that all states, provinces and Mexico in Western Interconnection are eligible to participate in WIRAB
- February 2006 – Western Governors petition FERC for clarification of its interpretation of Section 215(j)
- March 2006 – FERC clarifies position on Regional Advisory Body funding
- April 2006 – First WIRAB meeting
- July 2006 – FERC approves WIRAB



# Membership

- AB – Ian McKay, DOE
- AZ – Vacant
- BC – Les MacLaren, Ministry of Energy
- CA – Bill Chamberlain, CEC
- CO – Morey Wolfson, Energy Office
- ID – Marsha Smith, PUC
- Mexico – Marcos Valenzuela, CFE
- MT – Tom Kaiserski, DOC
- NE – Tim Texel, Power Review Board
- NV – Rebecca Wagner, PUC, ***WIRAB Vice Chair***
- NM – Vacant
- OR – John Savage, PUC ***WIRAB Chair***
- SD – Brian Rounds, PSC
- TX – Donna Nelson, PUC
- UT – Vacant
- WA – Tony Usibelli, DOC
- WY – Shawn Reese, Gov's Office

# WIRAB Voting Shares: 2008 (for 2010)

		Net Energy to Load (NEL) (1000 MWh)	Percent of Western Interconnection
1	Alberta	57,547	6.77%
2	Arizona	81,189	9.55%
3	British Columbia	61,692	7.26%
4	California	291,449	34.30%
5	Colorado	55,122	6.49%
6	Idaho	25,228	2.97%
7	Mexico-Baja Norte	11,146	1.31%
8	Montana	10,526	1.24%
9	Nebraska	753	0.09%
10	Nevada	38,333	4.51%
11	New Mexico	13,998	1.65%
12	Oregon	53,277	6.27%
13	South Dakota	1,951	0.23%
14	Texas	7,560	0.89%
15	Utah	29,223	3.44%
16	Washington	94,246	11.09%
17	Wyoming	16,566	1.95%
	Total	849,805	100.00%

# WIRAB Voting Shares: 2008 (for 2010)

Re NEL, disrib in US re retail sales:			
		<b>2006</b>	<b>2008</b>
		(for 2008)	(for 2010)
1	Alberta	6.80%	6.66%
2	Arizona	9.36%	9.47%
3	British Columbia	7.26%	7.22%
4	California	33.60%	33.28%
5	Colorado	6.29%	6.42%
6	Idaho	2.91%	2.97%
7	Mexico: WECC	1.31%	1.27%
8	Montana	1.73%	1.85%
9	Nebraska	0.09%	0.06%
10	Nevada	4.42%	4.37%
11	New Mexico	2.32%	2.33%
12	Oregon	6.14%	6.11%
13	South Dakota	0.31%	0.30%
14	Texas	1.33%	1.30%
15	Utah	3.37%	3.50%
16	Washington	10.86%	10.83%
17	Wyoming	1.91%	2.07%
	SUM	100.00%	100.00%

# WIRAB Section 215(j) Duties

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- Provide advice to FERC, NERC and WECC regarding:
  - Standards
  - Fees
  - Governance
  - Any other subjects FERC requests advice on
- Criteria for offering advice:
  - “Just, reasonable, not unduly discriminatory or preferential, and in the public interest.”
- FERC may give deference to WIRAB’s advice since it is an advisory body organized on an Interconnection-wide basis

# WIRAB Voting Rules

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Official actions of the WIRAB shall be taken only upon the affirmative vote of at least one-half of the members of the WIRAB ***and*** those members casting affirmative votes must represent at least one-half of the electric energy consumed among the states and provinces participating in the WIRAB.

# WIRAB Operating Procedures (1)

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## WIRAB Meetings

- The WIRAB shall annually elect a chair and vice-chair.
- Efforts will be made to provide seven days notice of WIRAB meetings, including conference calls. Meetings will be posted on the WIRAB web site.
- Notice of WIRAB meetings shall include the proposed meeting agenda and appropriate background information.
- Summaries of WIRAB meetings will be posted on the WIRAB web site.
- WIRAB will maintain a listserv and will notify parties interested in receiving information on WIRAB meetings.

# WIRAB Operating Procedures (2)

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## Requests for Presentations to the WIRAB

- The WIRAB will accept written submissions from entities outside State and Provincial governments. By invitation, the WIRAB may invite additional briefings at WIRAB meetings.
- The WIRAB will consider all suggestions by member States and Provinces.
- The WIRAB will invite suggestions from the Western Electricity Coordinating Council (WECC) on topics the WIRAB should address.
- WIEB and/or WIRAB staff will provide WIRAB briefings as resources are available.

# WIRAB Operating Procedures (3)

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## Formal Advice from the WIRAB

- Written submissions to the FERC, NERC, and WECC, will be signed by the WIRAB Chair
- Submissions will include:
  - A statement of the issue;
  - A statement regarding the WIRAB's jurisdiction related to the issue;
  - The WIRAB recommendation(s); and
  - Minority reports as needed.
- Proposed advice verbally agreed to at a WIRAB meeting shall be reduced to writing and circulated to WIRAB members for approval. WIRAB members shall have seven days (or less if all Members agree to respond more quickly) to review the written advice.

# WIRAB

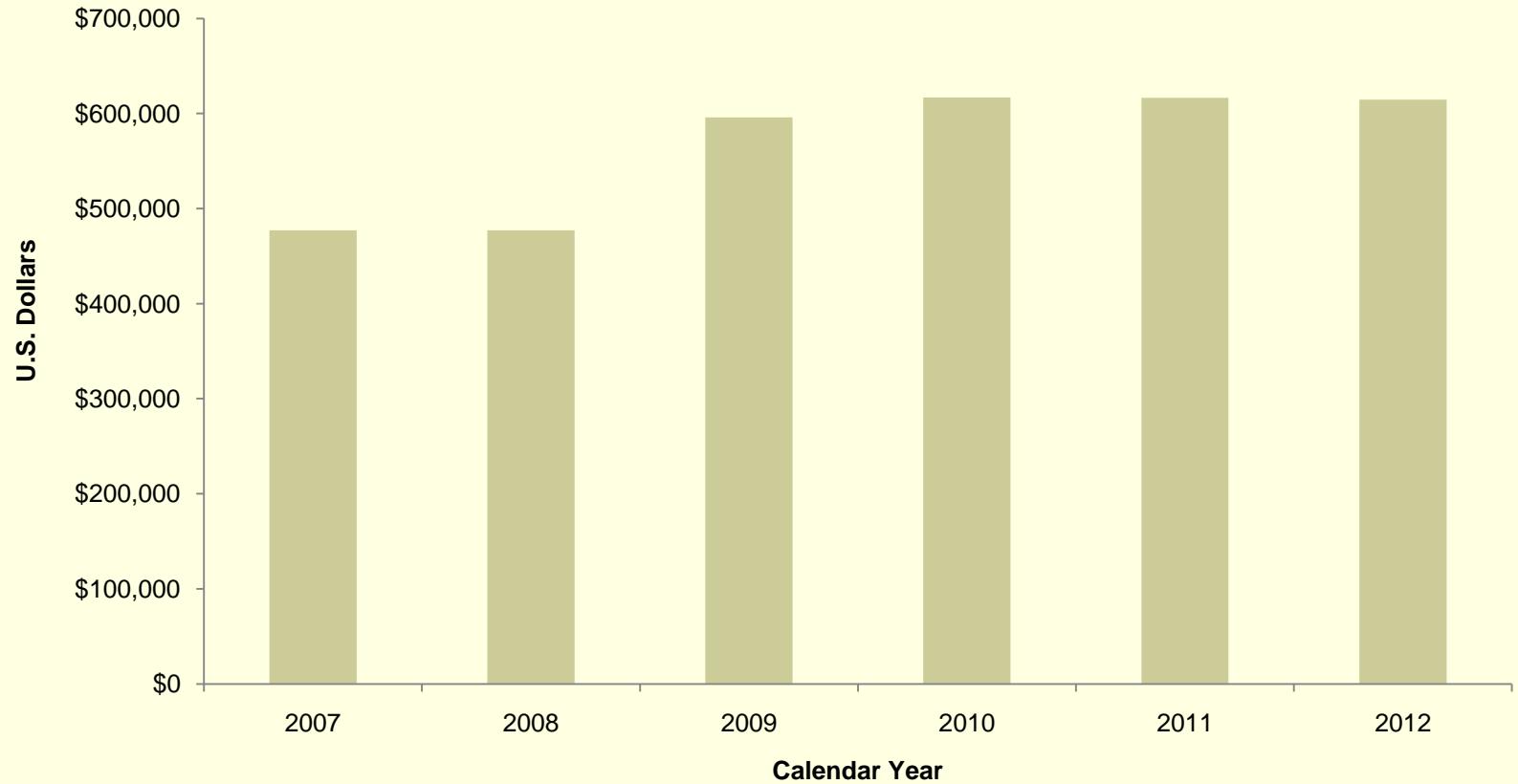
Assessment  
Budget  
Staffing

# Assessments

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- WIRAB financed by same mechanism as NERC and WECC
  - Net energy for load
- In U.S.
  - Assessments approved by FERC
  - Presented as part of NERC consolidated budget submissions in August
- In Canada and Mexico
  - Assessments are voluntary
- International allocations in 2011
  - Canada \$85,073
  - Mexico \$8014
  - U.S. \$523,383

# Budgets



# Budget Cycle

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- Calendar year budget (like NERC and WECC)
- Budget cycle
  - May/June – WIRAB approves proposed budget which is submitted to NERC
  - August – NERC files consolidated NERC, Regional Entity (e.g., WECC), and WIRAB budget with FERC
  - October – FERC approves budgets and associated assessments on U.S. entities
  - December – WECC bills parties in Canada, Mexico and U.S. for assessments for NERC, WECC and WIRAB
  - January (and later) – Parties pay assessments to WECC which sends money to NERC which remits monies due to WIRAB

# Proposed 2012 “status quo” budget

	2011 Adopted Budget	Estimated 2011 Expenses	Proposed 2012 Budget
Labor	\$ 235,500	\$ 150,000	\$ 245,900
Meetings	\$ 10,000	5,000	11,000
Travel	\$ 25,000	20,000	27,000
Conference Calls	\$ 2,500	2,000	2,500
Consultants	<u>\$ 75,000</u>	<u>75,000</u>	<u>75,000</u>
	\$ 348,000	\$ 252,000	361,400
Indirect Expense	\$ 268,470	162,000	253,277
<b>TOTAL</b>	<b>\$ 616,470</b>	<b>414,000</b>	<b>\$ 614,677</b>

# WIRAB Staffing

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- Equivalent of 2.5 FTE

# WIRAB Meetings

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- Conference call meetings
  - Posting agendas
  - Inviting public comment
  - Preparing meeting summaries approved by WIRAB
- At least one face-to-face meeting annually
- Webinars

# Significant past WIRAB advice

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- On funding western reliability centers (Mar. 12, 2007)
- On RCC Charter (Dec. 17, 2007)
- On WECC reliability standards (Feb. 8, 2007)
- On WECC Tier 1 standards (Apr. 17, 2007)
- On proposed NERC reliability standards (Jun. 3, 2007)
- On FERC NOPR re CIP standards (Oct. 16, 2007)
- On 2008 NERC Consolidated Budget (Sep. 21, 2007)
- On WECC 2008 amended budget (Feb. 4, 2008)
- On 2009 NERC Business Plan & Budget (Oct. 1, 2008)
- On NERC 3-year self-assessment (Mar. 3 & May 29, 2009)
- On proposed standard BAL-002-WECC-1 (Sept. 24, 2010)
- On FERC penalty guidelines (Jun. 14, 2010)

# Evolving Scope of Section 215

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- The scope of WIRAB's activities does not extend beyond scope of activities under Section 215
- In 2006, WIRAB interpreted scope narrowly
  - Governance
  - Fees
  - Standards
- More recently WIRAB interpreting scope of activities commensurate with range of NERC and WECC activities funded under Section 215

# WIRAB continuing priorities

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- Meet statutory obligations regarding review of:
  - NERC/WECC budgets/fees
  - Standards
  - Governance
- Pursue long-term WIRAB goals to --
  - Evaluate whether consumers are getting a “bang-for-the-buck” being spent on reliability;
  - Promote comity between the U.S., Canada and Mexico; and
  - Promote transparency

# WIRAB new priorities

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1. Promote reliability of a changing power grid that includes significantly more variable wind and solar generation
2. Promote the evaluation and deployment of new cost-effective technologies to improve reliability and make more efficient use of the grid
3. Expand WECC's role in flagging challenges to the Western Interconnection
4. Educate states/provinces about cyber-security threats and responses, and identify actions that states/provinces can take to improve cyber-security

# 1. Promote reliability of a changing power grid that includes significantly more variable wind and solar generation

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- Advocate that WECC evaluate, as part of transmission planning, the reliability impacts of large amounts of wind and solar and identify and promote reforms to address impacts
- Advocate that WECC evaluate the institutional changes and costs to support a Western Energy Imbalance Market (EIM) or become the EIM market operator
- Evaluate and promote system flexibility
  - Promote tools and metrics to assess system flexibility (comparable to those for evaluating resource adequacy) and economic value of increased flexibility
  - Promote grid and institutional changes to improve system flexibility, such as sub-hourly scheduling, forecasting, Balancing Authority collaboration, etc.

## **2. Promote the evaluation and deployment of new cost-effective technologies to improve reliability and make more efficient use of the grid**

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- Collaborate with other interested parties in holding a forum on new transmission-related technologies, including storage, that should be evaluated by WECC
- Provide “advice” on WECC’s role in promoting the evaluation and deployment of new technologies

### 3. Expand WECC's role in flagging challenges to the Western Interconnection

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- For example:
  - Promote expanded analysis of the reliability impacts of power plant retirements or repowerings
  - Examine the growing reliance of natural gas in the Western power system and develop “advice” on the reliability impacts at the interface of the Western natural gas and electricity systems
  - Current Northwest overproduction of hydro and wind and implications for grid operations and expansion

## **4. Educate states/provinces about cyber-security threats and responses, and identify actions that states/provinces can take to improve cyber-security**

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- Identify state/provincial cyber-security activities
- Share information on cyber-security among states/provinces on:
  - State/provincial actions
  - Actions at WECC, NERC, FERC and Congress and implications for states/provinces

# NERC President's Top Priority Issues for BPS Reliability (Jan. 7, 2011)

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## Review of Actual System Events

### **1. Misoperations of relay protection and control systems –**

Nearly all major system failures..... have misoperations of relays or automatic controls as a factor contributing to the propagation of the failure.

**2. Human errors by field personnel –** Field personnel.....often are switching equipment in and out of service and aligning alternative configurations. Risks can be introduced when field personnel operate equipment in a manner that reduces the redundancy of the bulk power system, sometimes even creating single points of failure that would not exist normally.

**3. Ambiguous or incomplete voice communications –** System operators and reliability coordinators are comfortable with informal communications with field and power plant personnel and neighboring systems.....(T)here is often a sense of awkwardness when personnel transition from conversational discussion to issuing reliability instructions.

# NERC President's Top Priority Issues (Cont.)

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**4. Right-of-way maintenance** – The August 14, 2003 blackout highlighted effective vegetation management programs as a key recommendation for avoiding future cascading failures.

## Forward-Looking Issues

**5. Changing resource mix** – Industry's knowledge of the characteristics of the bulk power system comes from nearly a century of operational experience with the existing resource mix. However, integration of these new resources results in operating characteristics significantly different from conventional steam production facilities.

**6. Integration of new technologies** – Integration of .....new technologies introduces changes to the operating characteristics of the bulk power system (and) requires changes in the way the bulk power system is planned and operated to maintain reliability.

# NERC President's Top Priority Issues (Cont.)

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**7. Preparedness for high impact, low frequency events –** (T)he greatest concern is being prepared for possible events that could debilitate the bulk power system for extended periods, such as widespread, coordinated physical/cyber attacks or geomagnetic storms.

**8. Non-traditional threats via cybersecurity vulnerabilities –** (T)he traditional physical separation between the industrial control system/SCADA environment and the business and administrative networks.....is rapidly changing, predominantly due to the efficiencies that can be achieved by leveraging shared networks and resources. So now even physically separated environments are susceptible.

# WECC priorities

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- Transition operational authority from the WECC Board to WECC Management
  - Allow more Board focus on strategic issues
- Establish a leadership role throughout the region by coordinating and supporting organizations that affect WECC's mission
  - Address the vulnerabilities that could impact reliability
- Produce and distribute credible data, information, and analysis
  - Present options with analyses on Board and Committee issues that include staff recommendations

# WECC priorities

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- Execute WECC's authority under the NERC Delegation Agreement successfully
  - Ensure that the Western Interconnection is represented in reliability matters
  - Ensure that the Reliability Standards are consistently monitored and enforced