Overview of System Operations
6 | Balancing Authority and Regulation
Overview

• Regulatory Authorities
  – FERC
  – NERC
  – WECC
  – NAESB

• Evolution of Regulation

• Balancing Authority
  – Definition
  – Responsibilities
Regulatory Authorities

FERC
Federal Energy Regulatory Commission

NERC
North American Electric Reliability Corporation

WECC
Western Electricity Coordinating Council
Federal Energy Regulatory Commission (FERC)

- Established in 1920 as the FPC
- Reorganized in 1977 as FERC
- Independent agency that reports to
- Regulates high voltage interstate transmission of electricity and natural gas transportation
- Transmission Open Access
- Office of Markets & Reliability
How does FERC govern?
Delegated Authority to an Electric Reliability Organization (ERO)

North American Electric Reliability Corporation (NERC)
NERC

• Established in the late 1960’s
• 2007 established as the Electric Reliability Organization (ERO) with oversight from FERC
• Develops and enforces Reliability Standards
• Compliance Enforcement with Sanctions
• Oversees Eight Regional Reliability Entities
• North America including Canada & northern part of Mexico
• Delegates authority to WECC
Mission
To improve the reliability & security of bulk electric system in North America. To achieve that:

- Develops & enforces reliability standards;
- Monitors bulk electric system;
- Assesses future adequacy;
- Audits owners, operators, & users for preparedness;
- Educates & trains industry personnel

NERC relies on diverse & collective expertise of industry participants
How does FERC govern?
Delegated Authority to an Electric Reliability Organization (ERO)

North American Electric Reliability Corporation (NERC)

How does NERC govern?
Delegated Authority to eight Regional Entities (RE)

Western Electricity Coordinating Council (WECC)
WECC

1967
Originally formed 40 power systems, then known as the Western Systems Coordinating Council (WSCC).

2002
Thirty-five years later in 2002, the WSCC became WECC when three regional transmission associations merged.

2007
Designated a Regional Entity for the Western Interconnection
WECC

- Regional Entity (RE) with delegated authority from NERC responsible for compliance and enforcement of NERC standards
- Coordinates the Bulk Electric System (BES) reliability in the Western Interconnection
- Approximately 345 member organizations
- Headquarters in Salt Lake City, Utah
WECC

- Geographically the largest & most diverse of the Eight Regional Entities in NERC.
- Service territory extends from Canada to Mexico & includes provinces of Alberta & British Columbia, northern portion of Baja California, Mexico, & all or portions for 14 Western states in between.
Governance
  Board of Directors
Committees
  Operating Committee (OC)
  Planning Coordination Committee (PCC)
  Market Interface Committee (MIC)

Training & Workshops

Regional Standards Development
  Open / Inclusive / Transparent / Accepted by NERC/FERC

Compliance Enforcement & Audits
WECC Organizational Review

Reliability Standards
Section 5 Delegation Agreement
Exhibit C WECC Bylaws

- Standards Development 5(a)(ii)
- Standards Review & Approval
- Standards Interpretation
- Standards Library

Compliance & Enforcement
Section 6 Delegation Agreement
Exhibit D WECC Bylaws

- Compliance Monitoring
- Compliance Enforcement & Mitigation
- Compliance Audits
- Compliance Tools & Resources
- Compliance Training & Outreach
- Compliance Violation Statistics

Delegated Activities
Section 7 Delegation Agreement
Exhibit E WECC Bylaws

- BES Certification
- BES Registration
- Reliability Assessment & Performance Analysis
- Event Analysis & Reliability Improvement
- Training & Education
- Situational Awareness & Infrastructure Security
The term **WECC** has two connotations:

1. The organization which develops regional reliability standards, reviews and enforces compliance, and promotes electric system reliability through delegated operations and planning activities.

2. The generators, transmission lines, substations, and other physical facilities making up the Western Interconnection.
Mission
WECC is a 501c(4) non-profit Utah corporation with the mission to do the following consistent with its Bylaws:

1. Maintain a reliable electric power system in the Western Interconnection that supports efficient competitive power markets (“Reliability Mission”); and

2. Assure open and non-discriminatory transmission access among Members and provide a forum for resolving transmission access disputes between Members consistent with FERC policies where alternative forums are unavailable or where the Members agree to resolve a dispute using the mechanism provided in the Bylaws (“Transmission Access Mission”).
Evolution of the North American Electric System
Late 1880’s

1889  The first long distance transmission of DC electricity in the United States was switched on at Willamette Falls Station in Oregon City, Oregon.

1890  Destroyed by flood

1891  Replaced with AC power system
Federal Power Commission (FPC) is established. No standards are in place.
1963

North American Power Systems Interconnection Committee (NAPSIC) is formed as an informal voluntary organization. (later to become NERC)
1965

The Great Northeast Blackout
1967

Western Systems Coordinating Council (WSCC) is formed as a trade organization.

(35 years later the WSCC becomes WECC in 2002.)
1968

National Electric Reliability Council (NERC) is formed in response to the 1965 Blackout.

The utilities maintain voluntary NAPSIC operating guidelines.
The nation faces an energy crisis with chronic brownouts and the OPEC embargo (1970’s) calling for a reorganization of the FPC which ultimately happens in 1977 (FERC).
1977
New York Blackout

New York Times Report:

Emergency surgery was performed outdoors on dozens of injured New Yorkers at the Brooklyn Jewish Hospital under spotlights powered by Fire Department generators.

Copyright 2000 The New York Times Company
Federal Energy Regulatory Commission (FERC) is reorganized from the FPC.

FERC is empowered by the Department of Energy (DOE) to propose voluntary standards.
In recognition of Canada’s participation in voluntary compliance, NERC changes its name from:

National Electric Reliability Council

to

North American Electric Reliability Council
NERC for the first time states that conformance to regional reliability policies should be mandatory.
1996

Two major blackouts in the western United States prompt the formation of the (WSCC), Western Systems Coordinating Council.

The WSCC creates a voluntary reliability management system.
Western Systems Coordinating Council (WSCC) Becomes Western Electricity Coordination Council (WECC)
2003
The Great Northeast Blackout
Investigation of the 2003 blackout report concludes:

The single most important recommendation for preventing blackouts is for the U.S. government to make Reliability Standards mandatory and enforceable.
U.S. Legislation Following 2003 Blackout:

- Energy Policy Act of 2005
- Principle feature:
  Mandatory standards with economic sanctions via FERC
The North American Reliability Council (NERC) Becomes The North American Reliability Corporation (NERC)

FERC approves NERC’s reliability standards and delegates authority to enforce compliance.

NERC Reliability standards become mandatory.

NERC delegates authority to 8 regional entities.

WECC is the Western Regional Entity.
2008
South Florida Blackout

"Map of USA highlighting Florida". Licensed under CC BY-SA 3.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Map_of_USA_highlighting_Florida.png#/media/File:Map_of_USA_highlighting_Florida.png
First non-compliance fine was issued to Florida Power and Light (FPL)
2011
Southwest Blackout

Check Your Knowledge: The Interconnected System

• What is FERC and what is their role?
• What is NERC and what is their role?
• What is WECC and what is their role?
• How do these organizations interact?
• How do these organizations impact the electric utility industry?
Balancing Authority
Balancing Authority Overview

Definition

What Is A Balancing Authority (BA)?

• A Balancing Authority is defined by a set of resources and interchange meters.

• Traditional Balancing Authorities have dispatchable generation, load, and interchange.
Western Interconnection Balancing Authorities (38)

AESO - Alberta Electric System Operator
AVA - Avista Corporation
AZPS - Arizona Public Service Company
BANC - Balancing Authority of Northern California
BCHA - British Columbia Hydro Authority
BPAT - Bonneville Power Administration - Transmission
CFE - Comision Federal de Electricidad
CHPD - PUD No. 1 of Chelan County
CISO - California Independent System Operator
DEAA - Arlington Valley, LLC
DOPD - PUD No. 1 of Douglas County
EPE - El Paso Electric Company
GCPD - PUD No. 2 of Grant County
GRID - Gridforce
GRIF - Griffith Energy, LLC
GRMA - Sun Devil Power Holdings, LLC
GWA - NaturEner Power Watch, LLC
HGMA - New Harquahala Generating Company, LLC
IID - Imperial Irrigation District
IPCO - Idaho Power Company
LDWP - Los Angeles Department of Water and Power
NEVP - Nevada Power Company
NWMT - NorthWestern Energy
PACE - PacifiCorp East
PACW - PacifiCorp West
PGE - Portland General Electric Company
PNM - Public Service Company of New Mexico
PSCO - Public Service Company of Colorado
PSEI - Puget Sound Energy
SCL - Seattle City Light
SRP - Salt River Project
TEPC - Tucson Electric Power Company
TIDC - Turlock Irrigation District
TPWR - City of Tacoma, Department of Public Utilities
WACM - Western Area Power Administration, Colorado-Missouri Region
WALC - Western Area Power Administration, Lower Colorado Region
WAUW - Western Area Power Administration, Upper Great Plains West
WWA - NaturEner Wind Watch, LLC
Balancing Authorities
Why Balancing Authorities Are Needed:

- Load and Generation Balancing
- Required for good control of frequency
- Short term balancing called “load-frequency regulation.”
- Longer term balancing is called “load following.”
- Balancing Authorities and their AGC systems coordinate this control.
Balancing Authority Overview

Basic Responsibilities

• Balance Load, Generation, and Net Interchange.
• Control Frequency and Time Error.
• Implement Interchange Transactions.
Balancing Authority Overview

Industry Restructuring

• Balancing Authorities
• Reliability Coordinators
• Transmission Operators
• Independent System Operators (ISO)
• Regional Transmission Organizations (RTO)
Overview

1. How many Balancing Authorities are in the Western Interconnection?

2. What do BAs balance?

3. How does a generation-only BA balance load and generation?