FERC Staff Presentation for OPUC Transmission Workshop

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Presentation to the Oregon Public Utility Commission: An Overview of the Federal Energy Regulatory Commission's Regulation of Public Utilities

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Note: The views expressed herein are the author's, and do not necessarily reflect the views of the Commission, individual Commissioners, Commission staff or individual Commission staff members.

What does FERC regulate – writ large?

- Rates and services for electric transmission and electric wholesale power sales – Principally under Parts II and III of the Federal Power Act, 16 USC 824 et seq.
- Certification and decertification of "Qualifying Facilities" ("QFs") and oversight of QF-utility dealings – Principally under the Public Utility Regulatory Policies Act of 1978, 16 USC 796(17)-(18), 824a-3.
- Hydroelectric dam licensing and safety – Principally under Part I of the Federal Power Act, 16 USC 792 et seq.
- Rates and services for natural gas pipeline transportation, certification of new facilities, and abandonment of existing facilities – Principally under the Natural Gas Act, 15 USC 717 et seq.
- Rates and services for oil pipeline transportation – Principally under the Interstate Commerce Act, 49 App. USC 1 et seq. (1988)
- . . .Bearing in mind that FERC is a creature of statute, and can only do what a statute allows it do. *E.g.*, *California Independent System Operator Corporation v. FERC*, 372 F.3d 395, 398-99 (D.C. Cir. 2004).

Drilling down, electrically – what is within FERC's "public utility"-related statutory authority (i.e., FPA Parts II and III)?

- FERC's "bread-and-butter" – regulation of transmission in interstate commerce by public utilities and of sales at wholesale in interstate commerce by public utilities:
  - I.e., rates, terms & conditions of transmission of electric energy in interstate commerce by public utilities – FPA 201, 205, 206 (16 USC 824, 824d, 824e)
    - "Traveling electrons" – which cross state lines
    - "Commingled electrons" – which join the stream of interstate commerce
  - I.e., rates, terms & conditions of sales of electric energy at wholesale in interstate commerce by public utilities – FPA 201, 205, 206 (16 USC 824, 824d, 824e)
    - Includes a sale *to* "any person. . . for resale"
  - FERC has *exclusive* jurisdiction over the "transmission of electric energy in interstate commerce," *and* over the "sale of electric energy at wholesale in interstate commerce," *and* over "all facilities for such transmission or sale of electric energy." FPA 201(b) (16 USC 824(b))
    - Does *not* include "foreign commerce"
    - *But see* Dept. of Energy Delegation Order No. 00-004-00A (May 16, 2006) (authorizing FERC to provide for non-discriminatory open access over facilities in foreign commerce, including regulation of not only access but rates and terms/conditions of service)

The standard by which FERC judges the rates, terms, and conditions of FERC-jurisdictional services

- Rates, terms and conditions *must be* "just and reasonable" and *must be* "not unduly discriminatory or preferential"
- Phrased differently: rates, terms and conditions *cannot be* "unjust or unreasonable" and *cannot be* "unduly discriminatory or preferential"
- What is a "just and reasonable" rate?
  - Cost-justified
  - Market-justified
- What is a "not unduly discriminatory or preferential" rate?
  - Similarly-situated customers must be treated similarly
    - Discrimination *without* a reason is prohibited:
      - E.g., a difference in rates that is not cost-justified
    - Discrimination *with* a reason is allowed
      - E.g., a difference in rates that is cost-justified
  - Differences in treatment are **not** inherently prohibited
- Note: The same standard governs both FPA 205 proceedings, i.e., utility-initiated proceedings, and FPA 206 proceedings, i.e., complaint/FERC-initiated proceedings

What is also within FERC's "public utility"-related statutory authority (i.e., FPA Parts II and III)?

- Corporate activities and transactions by public utilities – mergers and FERC-jurisdictional facility dispositions, securities issuances, interlocking directorates – FPA 203, 204, 305(b) (16 USC 824b, 824c, 825d(b))
- Accounting by public utilities – FPA 301 (16 USC 825)
- Reliability of the bulk-power system, through oversight of the development/approval of and compliance with mandatory reliability standards – FPA 215 (16 USC 824o)
- Prohibition of energy market manipulation – FPA 222 (16 USC 824v)

"Public utility" status is a key to understanding who & what is subject to FERC jurisdiction under FPA Parts II and III

- Most sections in Parts II and III of the FPA provide for FERC authority over the actions of a "public utility"
- A "public utility" is defined by the FPA as "any person who owns *or* operates facilities subject to the jurisdiction of the Commission," i.e., "any person who owns *or* operates" facilities for "the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce" (16 USC 824(e) (emphasis added))
  - Includes not only traditional investor-owned utilities, but also power marketers, regional transmission organizations, and independent system operators
  - Facilities can be "paper facilities," e.g., contracts, books & records, etc.
- "Public utilities" (16 USC 824(e)) are *not* the same as "electric utilities" (16 USC 796(22)) and are *not* the same as "transmitting utilities (16 USC 796(23)) – "EWGs" and "FUCOs" are also different

What is <u>not</u> within FERC's public utility-related statutory authority (i.e., FPA Parts II and III)?
- FPA 201, 16 USC 824 -

- "Local" distribution of electric energy, and the rates, terms and conditions of such distribution
  - What is "local" distribution? It's a Federal Power Act-focused analysis and not purely engineering-focused, and thus also focuses on the functional use of the facilities
  - In the context of Order No. 888, FERC adopted a so-called "7-factor" test:
    - (1) local distribution facilities are normally close in proximity to retail customers
    - (2) local distribution facilities are primarily radial in character
    - (3) power flows into local distribution systems; it rarely, if ever, flows out
    - (4) when power enters a local distribution system, it is not re-consigned or transported on to some other market
    - (5) power entering a local distribution system is consumed in a comparatively restricted geographic area
    - (6) meters are based at the transmission/local distribution interface to measure flows into the local distribution system
    - (7) local distribution systems will be of reduced voltage
- Sales of electric energy to end users (i.e., sales at retail), and the rates, terms and conditions of such sales
- What generation gets built, including the choice, siting and construction of generation (other than hydroelectric generation, which is subject to FERC jurisdiction under Part I of the FPA).
  - But wholesale rate recovery of generation costs, as with wholesale rate recovery of any other cost, is subject to FERC review
- What transmission gets built, including the choice, siting and construction of transmission facilities (with the exception of so-called "backstop" siting authority under FPA 216 (16 USC 824p))
  - But wholesale rate recovery of transmission costs, as with wholesale rate recovery of any other cost, is subject to FERC review

What is not within FERC's public utility-related statutory authority (i.e., FPA Parts II and III)? . . . continued
- FPA 201, 16 USC 824 -

- Environmental matters (with the exception of hydroelectric generation-related environmental matters, which are subject to FERC jurisdiction under Part I of the FPA)
  - But wholesale rate recovery of environmental costs, as with wholesale rate recovery of any other cost, is subject to FERC review
- Safety matters (with the exception of hydroelectric generation-related safety matters, which are subject to FERC jurisdiction under Part I of the FPA)
- Under FPA 201(f) (16 USC 824(f)), United States government and its agencies and instrumentalities (including the Bonneville Power Administration) and States and their agencies and instrumentalities (including municipal utilities); But there are certain limited exceptions, e.g., FPA 206(e), 222 (16 USC 824e(e), 824w)
- RUS-financed cooperatives and smaller cooperatives
- *Inter*state v. *Intra*state: Alaska and Hawaii (where, given their electrical isolation, there is no *inter*state...); Electric Reliability Council of Texas (for the same reason, but with certain limited exceptions); Puerto Rico and US Virgin Islands (for the same reason).
- That sellers and buyers may be located within a single state, and that there may be lines between them located within that same state, does *not* divest FERC of jurisdiction given the interconnected nature of the electric grid: "interstate commerce" has been interpreted to give FERC jurisdiction when the transmission system "is interconnected and capable of transmitting [electric] energy across the State boundary, even though the contracting parties and the electrical pathway between them are within one State," i.e., if the transaction is made over the "interconnected interstate transmission grid."
- One further thought to bear in mind: FPA 205 and 206 (16 USC 824d, 824e) are written from the perspective of the seller; that is, FERC has the exclusive authority to review the rates, terms and conditions of "sales" but *not* of "purchases" (prudence of "purchases" are typically state regulated)

Bonneville Power Administration

- As noted in the prior slide, Bonneville – as an arm of the United States government – is exempted from many (but not all) of the requirements of the FPA:
  - Exemptions from FERC oversight include, e.g., FERC review of rates, terms and conditions of service under FPA 205 and 206 (with an exception to the exemption for FERC review of short-term sales made in violation of a tariff or FERC rules in organized markets if the sale is at an unjust and unreasonable rate under FPA 206(e))
  - Exemptions do **not** include, e.g., FERC oversight of reliability under FPA 215 or FERC oversight to prevent/address market manipulation under FPA 222
  - Exemptions also do **not** include FERC's ordering interconnection and transmission under FPA 210, 211, 211A, and 212

Bonneville Power Administration. . . continued

- Separately, under the Pacific Northwest Electric Power Planning and Conservation Act, FERC has limited oversight over Bonneville's rates
  - For regional power and transmission rates:
    - Sufficient to repay the Federal investment
    - Based on Bonneville's total system costs
    - For transmission, equitably allocate transmission costs between Federal and non-Federal power
  - For non-regional, non-firm rates:
    - Recover cost of generation and transmission, including amortization of investment within a reasonable period
    - Encourage widespread use of Bonneville power
    - Lowest possible rates consistent with sound business principles
  - FERC does not have the authority to modify Bonneville's rates – FERC makes an approval/disapproval determination instead
  - Appellate-like review

Order Nos. 888 and 888-A: "Open Access" Transmission

Issue: Undue discrimination in the provision of transmission service. . . .

→ which impedes competitive power markets – bearing in mind that kwh's are fungible

Goal: Non-discriminatory open access transmission service. . . .

→ which promotes competitive power markets – again, bearing in mind that kwh's are fungible

Means: Utilities must file a *Pro Forma* Open Access Transmission Tariff or "OATT," providing "comparable" service to all users of the transmission system, coupled with "functional" (not corporate) unbundling" (18 CFR 35.28(a) & (c))

And . . . Non-public utilities may have "reciprocity" open access transmission tariffs (18 CFR 35.28(a) & (e))

Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, Order No. 888, FERC Stats. & Regs. ¶ 31,036 (1996), *order on reh'g*, Order No. 888-A, FERC Stats. & Regs. ¶ 31,048 (1997), *order on reh'g*, Order No. 888-B, 81 FERC ¶ 61,248 (1997), *order on reh'g*, Order No. 888-C, 82 FERC ¶ 61,046 (1998), *aff'd in relevant part sub nom. Transmission Access Policy Study Group v. FERC*, 225 F.3d 667 (D.C. Cir. 2000), *aff'd sub nom. New York v. FERC*, 535 U.S. 1 (2002)

Order Nos. 888 and 888-A: "Functional Unbundling"

Public utilities must **functionally unbundle**, i.e., separate, their generation and transmission services – they must offer stand-alone transmission service at stand-alone transmission rates

Public utilities must separate their personnel and operations to ensure separation of generation and transmission (18 CFR Part 358)

Order Nos. 888 and 888-A: "Comparability"

Public utilities, broadly speaking, must treat themselves and others **comparably** – they must take transmission service under the same terms and conditions, and under the same rates, as others

Order Nos. 888 and 888-A: Utility Obligation

Every public utility that owns, controls, or operates interstate transmission facilities must offer comparable, non-discriminatory wholesale transmission service

That is, every public utility must file, and provide transmission service under, the *pro forma* open access transmission tariff – which specifies the rates, terms and conditions pursuant to which they will provide transmission service. Changes are allowed only if they are "consistent with or superior to" the *pro forma* open access transmission tariff

Order Nos. 888 and 888-A: *Pro Forma* Tariff

Order Nos. 888 and 888-A's *pro forma* open access transmission tariff provides standardized terms and conditions for two kinds of transmission service:

Network Integration Transmission Service within the transmission provider's control area – which allows the customer to use its resources to serve its network load in a manner comparable to the way that the transmission provider uses the transmission system to serve its native load

Firm and Non-Firm Point-to-Point (i.e., contract path) Transmission Service – which allows the customer to transmit from a designated point of receipt to a designated point of delivery

Order Nos. 888 and 888-A: OASIS

Order Nos. 888 and 888-A require an internet-based transmission capacity posting and reservation system (Open Access Same Time Information System or OASIS) that must be used by all transmission customers including the transmission provider itself when it is the transmission customer – Details of OASIS can be found in Order Nos. 889 and 889-A (18 CFR Part 37)

Order Nos. 888 and 888-A: Reciprocity

Order Nos. 888 and 888-A provide for "reciprocity:" a so-called "safe harbor" pursuant to which transmission customers of FERC-jurisdictional public utilities may *offer to* public utilities comparable, open access transmission service and thus would be entitled *to receive from* public utilities comparable, open access transmission service

Order Nos. 888 and 888-A: Summary

- With a goal of eliminating undue discrimination/preference in the provision of transmission service, all public utilities that own, control or operate jurisdictional transmission facilities are required to provide transmission service under open access transmission tariffs (18 CFR 35.28(a) & (c)) that track the FERC-mandated *pro forma* open access transmission tariff, unless a waiver has been granted
  - Not just third-party customers, but the public utilities themselves must take service pursuant to that tariff
- Non-public utilities may have "reciprocity" open access transmission tariffs (18 CFR 35.28(a) & (e))
  - "Reciprocity" provides a so-called "safe harbor," ensuring that the non-public utility is entitled to transmission service from public utilities

Order Nos. 890, 890-A, and 890-B

- Improvements in Open Access Transmission, e.g., Transmission Planning
  - Overall, in Order Nos. 890, 890-A, and 890-B, FERC sought to make improvements to its *pro forma* open access transmission tariff, and better achieve the goal of eliminating undue discrimination/preference
  - One principal reform was with respect to transmission planning – with adoption of FERC-mandated coordinated, open and transparent transmission planning
    - Order No. 888 (and 888-A) *pro forma* tariff, in section 28.2, for example, required simply that the transmission provider plan and construct additional transmission facilities so as to be able to serve network customers "on a basis comparable to the Transmission Provider's delivery of its own generating and purchased resources to its Native Load Customers."
    - While FERC encouraged joint planning with customers and other utilities, and also regional planning, FERC did not mandate such planning.
    - To better ensure that planning and construction occur in a non-unduly discriminatory manner, Order No. 890 (and 890-A & B) took a more aggressive approach – mandating coordinated, open and transparent transmission planning on a local and regional level.
    - FERC explained that, in light of a decline in investment relative to load growth resulting in increased congestion and a reduced access to alternative sources of energy, as well as a disincentive to remedy congestion on a non-unduly discriminatory basis, reform of the Order No. 888 (and 888-A) *pro forma* tariff was needed.

Order Nos. 890, 890-A, and 890-B. . . continued

- Improvements in Open Access Transmission, e.g., Transmission Planning (continued)
  - The Commission identified nine planning principles in Order No. 890 that must be satisfied for a transmission provider's planning process to be considered compliant with that order:

    (1) **Coordination** – a process for consulting with transmission customers and neighboring transmission providers;

    (2) **Openness** – planning meetings must be open to all affected parties * ;

    (3) **Transparency** – access must be provided to the methodology, criteria, and processes used to develop transmission plans;

    (4) **Information Exchange** – the obligations of and methods for customers to submit data to transmission providers must be described;

    (5) **Comparability** – transmission plans must meet the specific service requests of transmission customers and otherwise treat similarly-situated customers (e.g., network and retail native load) comparably in transmission system planning;

    (6) **Dispute Resolution** – an alternative dispute resolution process to address both procedural and substantive planning issues must be included;

    (7) **Regional Participation** – there must be a process for coordinating with interconnected systems;

    (8) **Economic Planning Studies** – study procedures must be provided for economic upgrades to address congestion or the integration of new resources, both locally and regionally; and

    (9) **Cost Allocation** – a process must be included for allocating costs of new facilities that do not fit under existing rate structures, such as regional projects.

Order Nos. 1000 and 1000-A

- Regional Transmission Planning
  - Order Nos. 1000, 1000-A, and 1000-B build on Order Nos. 890, 890-A, and 890-B and the Order No. 890/890-A planning principles
  - Order Nos. 1000, 1000-A, and 1000-B are largely process-focused, and don't dictate particular transmission planning results

  - Requires each public utility transmission provider to:
    - Participate in a regional transmission planning process that produces a regional transmission plan
    - FERC supports active state participation in the regional planning process, as well
  - In addition to identifying reliability and economic transmission needs, such processes must provide an opportunity, with stakeholder input, to identify transmission needs that are driven by public policy requirements established by local, state, or federal statutes or regulations, and then to evaluate potential solutions to those needs
    - FERC is *not* seeking to preempt state authority over siting, permitting, or construction
    - FERC is *not* making any statutes or regulations part of the regional plan, but rather requires that they be *considered* in evaluating transmission needs just as reliability and economic concerns are considered when identifying transmission needs
  - Coordinate between neighboring transmission planning regions with respect to interregional transmission facilities
  - Remove from FERC-jurisdictional tariffs and agreements any federal "right of first refusal" (essentially, an incumbency preference) to build new transmission facilities selected in a regional transmission planning process
    - FERC is *not* seeking to preempt state authority over siting, permitting, or construction
    - FERC has clarified that state/local "rights of first refusal" can be recognized in the planning process, and early in that process

Order Nos. 1000 and 1000-A . . . continued

- Each public utility transmission provider must participate in a regional transmission planning process that has:
  - An ex-ante regional cost allocation method to allocate the cost of new transmission facilities selected by the region
  - An ex-ante interregional cost allocation method to allocate the cost of new interregional transmission facilities
  - The cost allocation methods must satisfy 6 (4 discussed here) principles:
    - Allocation of costs roughly commensurate with benefits
    - Method for determining benefits and beneficiaries must be transparent
    - No involuntary allocation of costs to non-beneficiaries
    - Cost allocation should be within (across) the region(s) unless there is a geographically broader voluntary assumption of costs
- Transmission project is eligible for regional cost allocation only if "selected in the regional transmission plan for purposes of cost allocation"
- Non-public utility transmission providers may participate, but are not required to participate (but participation would be a necessary part of a reciprocity tariff)

- Questions?

Introduction to FERC Electric Reliability Program

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Introduction

Four topics to cover:

- Reliability Statute and Jurisdiction
- Certification of the Electric Reliability Organization (ERO).
- Reliability Standard Development
- Compliance/Enforcement

1. Statute and Jurisdiction

August 2005 - EPAct 2005 becomes law

- Amends FPA to include new FPA section 215 - **Mandatory electric reliability regime**
- Purpose: creates an independent "electric reliability organization" (ERO), certified by the Commission, to develop and enforce mandatory reliability standards for "reliable operation" of the nation's bulk-power system
- Commission role: certify the ERO, approve proposed standards, review NERC-imposed penalties, and independent enforcement authority

Statute and Jurisdiction

- What is a Reliability Standard? Defined by statute as:

A requirement approved by the Commission under section 215 of the FPA, to provide for Reliable Operation of the Bulk-Power System. The term includes requirements for the operation of existing Bulk-Power System facilities, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for Reliable Operation of the Bulk-Power System, but the term does not include any requirement to enlarge such facilities or to construct new transmission capacity or generation capacity.

"Reliable Operation" means: operating the elements of the Bulk-Power System within equipment and electric system thermal, voltage, and stability limits so that **instability, uncontrolled separation, or cascading failures** of such system will not occur as a result of a sudden disturbance, including a Cybersecurity Incident, or unanticipated failure of system elements.

Reliability Jurisdiction – Who Must Comply

- Section 215(b) – Commission has jurisdiction over:
  - ERO
  - Regional Entities
  - All “users, owners and operators of the bulk-power system” within the U.S. (other than Alaska and Hawaii)
    - Includes entities in ERCOT
    - Includes 201(f) entities specifically excluded from section 205 jurisdiction (e.g., federal agencies like BPA, municipals, rural coops)

Reliability Jurisdiction – Who Must Comply

- NERC "registers" entities based on functional categories, e.g., transmission owners, transmission providers, generation owners, balancing authorities.
- NERC developed "Registry Criteria" with thresholds to exempt smaller entities with low impact.
- The NERC *Compliance Registry* lists all organizations subject to compliance with approved Reliability Standards.
- Each Reliability Standard identifies the functional entities that must comply.

Reliability Jurisdiction – What Facilities Must Comply

- Facilities and control systems necessary for operating an interconnected electric transmission network (or any portion); and
- Electric energy from generation facilities needed to maintain transmission system reliability.
- "Local distribution" facilities explicitly excluded
- General Rule: transmission > 100 kv and generation > 20 MW

2. Certification of NERC as the ERO

Section 215(c) authorizes the Commission to certify one entity as the ERO if it is has the ability to develop and enforce reliability standards, and has rules that:

- Assure independence from industry
- Equitably allocate dues among end users
- Provide for due process and openness in developing standards
- Provide for fair and impartial procedures for enforcement
- Take steps to gain recognition in Canada and Mexico

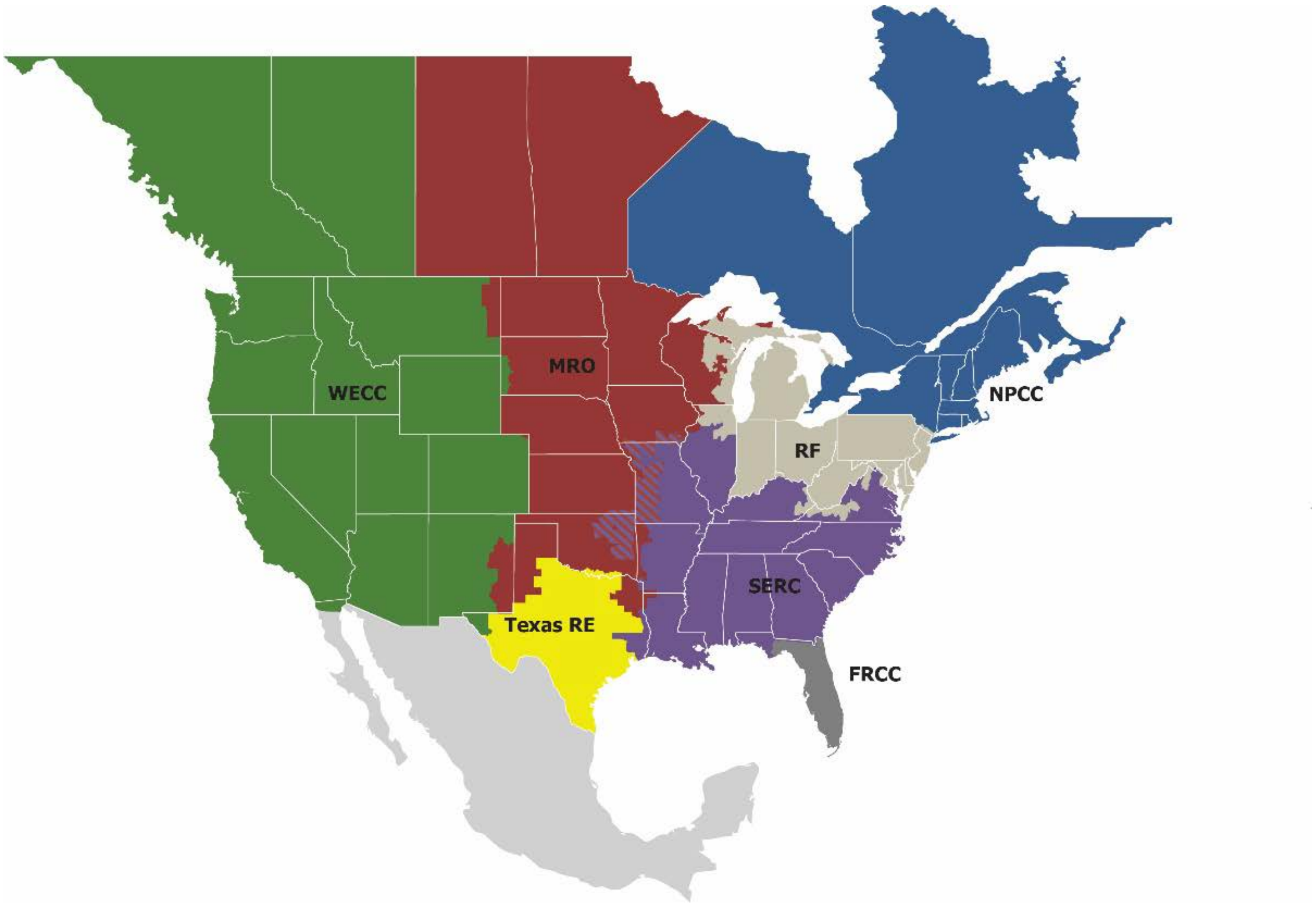
NERC as the ERO

Feb. 2006 - Order No. 672 implements section 215, provides additional detail on expectations of ERO.

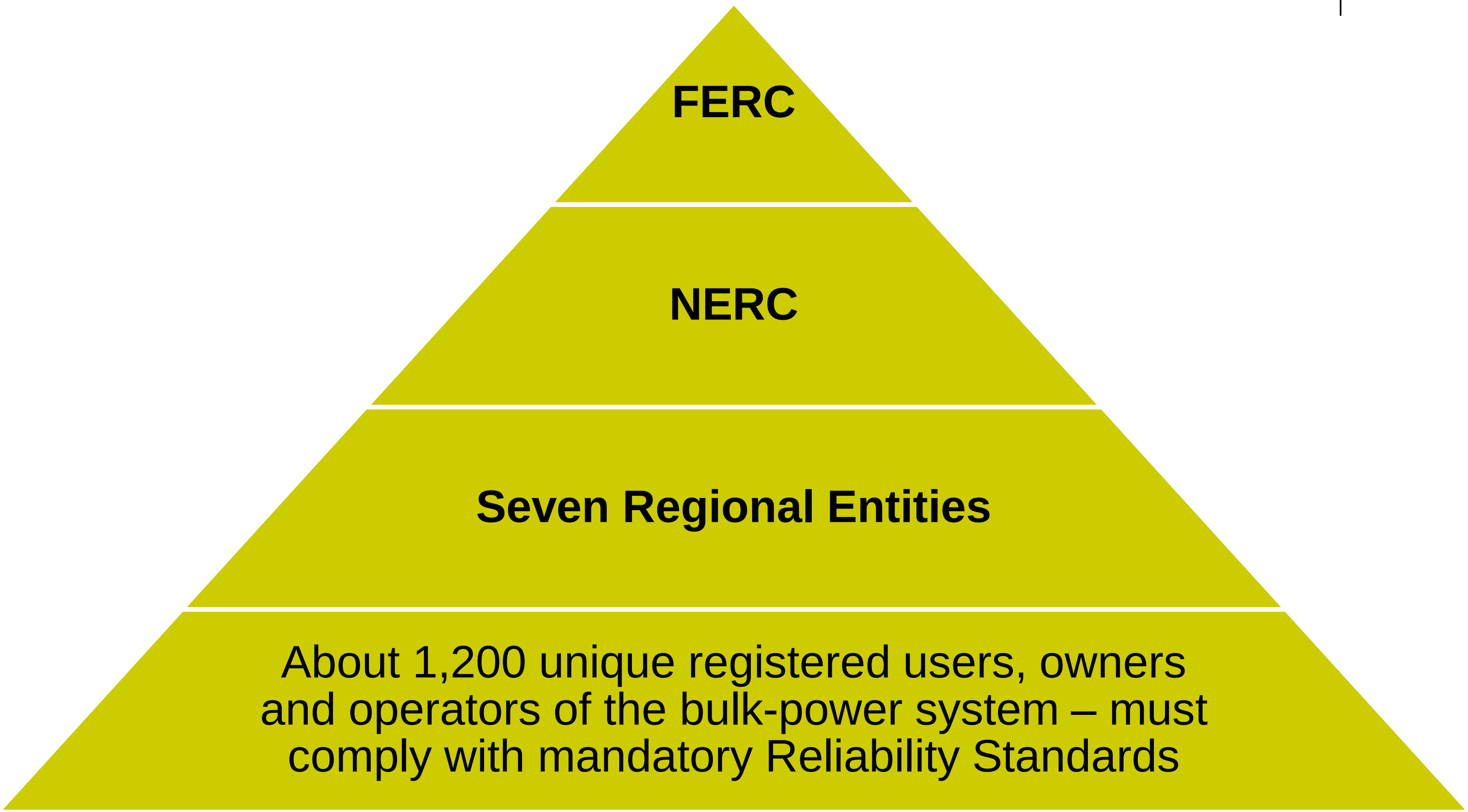
July 2006 - NERC certified as ERO, found to meet section 215(c) criteria. Periodic Assessment required

April 2007 - Commission approves NERC delegation of enforcement authority to eight regional entities per 215(e) of FPA.

NERC as the ERO



NERC as the ERO – Hierarchy



3. Reliability Standards: NERC Role

- NERC as the ERO develops Reliability Standards using an open and transparent process.
  - Standards are developed by a drafting team of industry experts and others (NERC staff, vendors, etc.). Meetings are open.
  - After opportunity for comment, stakeholders vote (66% supermajority required).
  - Majority vote by the NERC Board of Trustees (BOT).
  - NERC process typically lasts about one year, depends on complexity.
  - Once approved by BOT, submitted to FERC in petition for approval.
- 105 Reliability Standards in Currently in Effect
  - Grouped in categories based on subject matter, e.g., planning, balancing load and energy, critical infrastructure, emergency operations.

Reliability Standards FERC Role

- FERC provides notice and opportunity for comment.
- FERC action on proposed Reliability Standard:
  - Approve the entire Reliability Standard
  - Remand the entire Reliability Standard
  - Directing future modifications of an existing Reliability Standard or creation of a new Reliability Standard to address a specific matter.
- FERC cannot write Reliability Standards. Must remand to NERC to develop revisions when appropriate.
- 30 days for rehearing after final rule issues

Reliability Standards Legal Parameters

- Section 215(i) includes “Savings Provisions” that define the scope of Reliability Standards
  - Reliability Standards only apply to the Bulk-Power System (i.e., not local distribution)
  - Reliability Standards may not “order the construction of additional generation or transmission capacity” or “set and enforce compliance with standards for adequacy or safety of electric facilities or services”
  - State reliability rules are allowed provided they are “not inconsistent with any reliability standard”

Reliability Standards:
Reliability Standard BAL-001-2 (Example)

Standard BAL-001-2 – Real Power Balancing Control Performance

A. Introduction

1. **Title:** **Real Power Balancing Control Performance**
2. **Number:** **BAL-001-2**
3. **Purpose:** To control Interconnection frequency within defined limits.
4. **Applicability:**

   4.1. Balancing Authority

   4.1.1 A Balancing Authority receiving Overlap Regulation Service is not subject to Control Performance Standard 1 (CPS1) or Balancing Authority ACE Limit (BAAL) compliance evaluation.

   4.1.2 A Balancing Authority that is a member of a Regulation Reserve Sharing Group is the Responsible Entity only in periods during which the Balancing Authority is not in active status under the applicable agreement or the governing rules for the Regulation Reserve Sharing Group.

   4.2. Regulation Reserve Sharing Group
5. **(Proposed) Effective Date:**

   5.1. First day of the first calendar quarter that is twelve months beyond the date that this standard is approved by applicable regulatory authorities, or in those jurisdictions where regulatory approval is not required, the standard becomes effective the first day of the first calendar quarter that is twelve months beyond the date this standard is approved by the NERC Board of Trustees, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

B. Requirements

R1. The Responsible Entity shall operate such that the Control Performance Standard 1 (CPS1), calculated in accordance with Attachment 1, is greater than or equal to 100 percent for the applicable Interconnection in which it operates for each preceding 12 consecutive calendar month period, evaluated monthly. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

R2. Each Balancing Authority shall operate such that its clock-minute average of Reporting ACE does not exceed its clock-minute Balancing Authority ACE Limit (BAAL) for more than 30 consecutive clock-minutes, calculated in accordance with Attachment 2, for the applicable Interconnection in which the Balancing Authority operates.*[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

C. Measures

M1. The Responsible Entity shall provide evidence, upon request, such as dated calculation output from spreadsheets, system logs, software programs, or other evidence (either in hard copy or electronic format) to demonstrate compliance with Requirement R1.

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4. Compliance and Enforcement

- The ERO may impose penalties for violations of reliability standards. (FPA section 215(e))
  - Up to $1 million per day per violation
  - The entity must receive notice and opportunity for a hearing.
    - 99 percent settle
    - Penalties discovered by self report, audit, incident investigation
  - The penalty must be filed with the Commission.
- The Commission…
  - has 30 days to choose to review the penalty.
    - 30 day window for alleged violator or Commission to seek review.
  - Has independent enforcement authority.

The NERC Compliance Program

- Regional Entities conduct audits, investigations, and self-certifications to identify possible violations.
  - Entities self report approximately 78% of noncompliance.
- NERC has due process, including hearings
  - 99 percent of penalty cases settle.
- NERC has enforcement discretion (not all noncompliance receives a penalty) – although all possible violation information still goes to the Commission (even zero dollar penalties).
- NERC "Sanction Guidelines" inform penalty amount, e.g.,
  - Role of senior management in compliance programs;
  - Prompt detection, cessation, and reporting of violations; and
  - Remediation efforts.
- All noncompliance must be mitigated and remediated.

Enforcement – FERC's Role

- FERC review of NOPs submitted by NERC
  - Typically on monthly basis
  - Few formal reviews
- FERC OER staff conducts investigations
  - Typically larger events
  - Team with NERC and Regional Entities
- FERC OER staff conducts audits
  - Observes NERC audits
  - Leads in some CIP audits

- Questions?

Interconnection Services:

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Note: The views expressed herein are the author's, and do not necessarily reflect the views of the Commission, individual Commissioners, Commission staff or individual Commission staff members.

FERC Interconnection Policies

- Large Generator Interconnection Procedures
  - Larger than 20 megawatts
  - Order No. 2003 issued in July 2003, followed by Order Nos. 2003-A, 2003-B, and 2003-C

- Small Generator Interconnection Procedures
  - Up to 20 megawatts
  - Order No. 2006 issued in May 2005, followed by 2006-A and 2006-B
  - Order No. 792 issued November 2013

FERC Interconnection Policies – Cont.

- Grid Interconnection Rules for large wind generators (over 20 MW)
  - Order No. 661 issued in May 2005
- Integration of Variable Energy Resources
  - Order No. 764 issued in June 2012
- Reactive Power Requirements for Non-Synchronous Generation (LGIP and SGIP)
  - Order No. 827 issued June 2016
- Requirements for Frequency and Voltage Ride Through Capability of Small Generating Facilities
  - Order No. 828 issued July 21, 2016
- Reform of Generator Interconnection Procedures and Agreements
  - Order No. 845 issued April 2018

Order No. 2003

- Non-discriminatory, standardized procedures (LGIP) and agreement (LGIA) for interconnecting large generators

- Incorporated into Open Access Transmission Tariffs

- Allows RTOs and ISOs more flexibility to customize the LGIA and LGIP

- Generator pays for all Interconnection Facilities (those facilities between the generator and the point of interconnection with the transmission provider's system that are only for the generator's use)

Order No. 2003 – cont.

- Cost of Network Upgrades (modifications to the transmission system) needed to accommodate the generator are initially funded by the generator, with the amount refunded over time

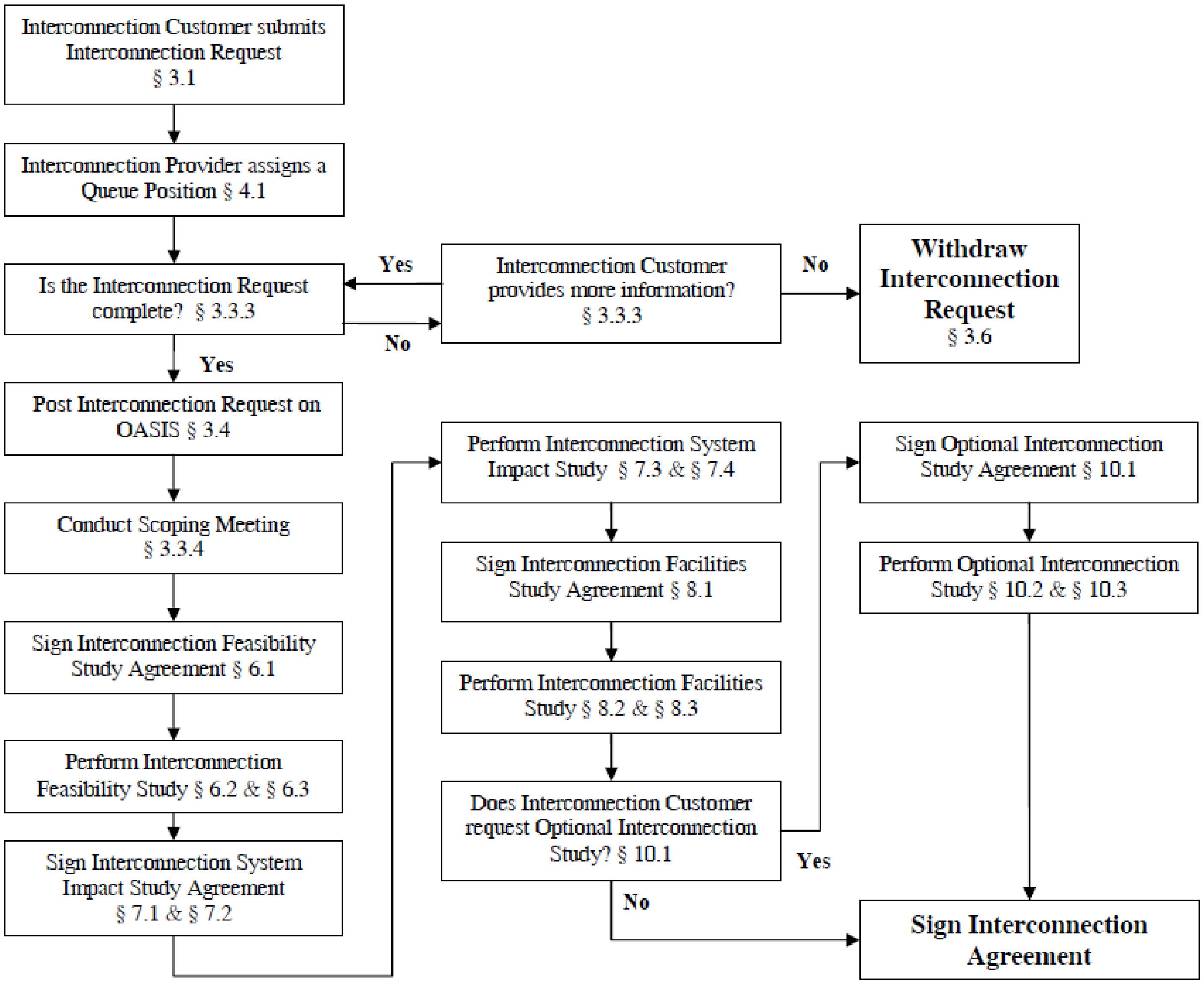
- Standardized application process, milestones, deadlines and study procedures

- Allows Interconnection Customers (mainly generators) to take interconnection service separately from transmission service

Studies required by Order No. 2003

- **Feasibility Study** - preliminary feasibility analysis within 45 days
- **System Impact Study** – comprehensive analysis of reliability impacts, using a stability analysis, power flow and short-circuit analyses within 90 days
- **Facilities Study** – identify needed Interconnection Facilities and Network Upgrades, including costs and timing to be completed in 90 to 180 days
- **Optional Interconnection Study** – sensitivity analysis of various assumptions specified by the Interconnection Customer

Flow Chart of the Large Generating Facility Interconnection Process (App. A to Order No. 2003)



Steps in the Process

Interconnection Request

- Technical information needed from generator to do interconnection studies
  - Location
  - Type of generator, equipment specifications
  - Type of interconnection service
    - Energy Resource Interconnection Service or
    - Network Resource Interconnection Service

Energy Resource Interconnection Service

- Generator eligible to deliver output using existing firm or non-firm transmission capacity on an "as available" basis
- Short circuit/fault duty, steady state (thermal and voltage) and stability analyses
- Studies identify
  - upgrades required to accommodate full output of generator and
  - maximum allowed output without upgrades
- Does not convey transmission service

Network Resource Interconnection Service

- Allows generator to be designated as a network resource, up to its full output
- Transmission provider's system studied at peak load and under a variety of stressed conditions
- Ensure that with the generator at full output, aggregate generation in the area is deliverable to aggregate of load in the area
- Study consistent with transmission provider's reliability criteria and procedures
- Does not convey transmission service

Interconnection Studies

- The transmission provider performing the studies
  - uses existing studies to the extent practicable
  - coordinates with affected neighbors
  - upon request, provides supporting documentation, workpapers and relevant power flow, short circuit and stability databases
  - can hire a subcontractor to perform the studies

Types of Analysis

- Three general types of analysis used in interconnection studies:
  - Power flow study – steady state voltage & thermal limits
  - Short circuit study – fault current from generator
  - Stability study – dynamic stability limits

Feasibility Study

- Power flow and short circuit analysis
- Study provides
  - a list of facilities required for interconnection,
  - a non-binding good faith estimate of cost responsibility, and
  - a non-binding good faith estimated time to construct

System Impact Study

- Short circuit analysis, stability analysis, and power flow analysis
- Study provides:
  - Requirements or potential impediments to providing requested interconnection service,
  - Preliminary indication of cost and length of time to correct any problems identified
  - List of facilities required as a result of the interconnection request
  - Non-binding good faith estimate of cost responsibility
  - Non-binding good faith estimate of time to construct

Facilities Study

- Specifies and estimates cost of equipment, engineering, procurement and construction needed to implement conclusions of the system impact study
- Identifies
  - electrical switching configuration of connection equipment, (transformer, switchgear, meters, other station equipment)
  - nature and estimated cost of transmission provider's interconnection facilities and network upgrades necessary for the interconnection
  - estimate of the time required to complete construction and installation of such facilities

Most Recent Activity – Order No. 845

- To improve certainty for interconnection customers:
  - remove a limitation on an interconnection customer’s ability to construct interconnection facilities and stand alone network upgrades; and
  - require that all transmission providers establish more-accessible interconnection dispute resolution procedures
- To improve transparency and to promote more informed interconnection decisions:
  - require transmission providers to outline and make public a method for determining contingent facilities;
  - require transmission providers to list the study processes and assumptions for forming the network models used for interconnection studies;
  - revise the definition of “Generating Facility” to explicitly include electric storage resources; and
  - establish reporting requirements for aggregate interconnection study performance.

Most Recent Activity – Order No. 845 cont.

- To enhance the efficiency of the interconnection process:
  - require transmission providers to allow an interconnection customer to request a level of interconnection service that is lower than its generating facility capacity;
  - require transmission providers to allow for provisional interconnection agreements that provide for limited operation of a generating facility prior to completion of the full interconnection process;
  - require transmission providers to create a process for the use of surplus interconnection service; and
  - require transmission providers to set forth a procedure to assess and, if necessary, study changes in an interconnection customer's proposed technology that occur during the interconnection process to determine if such changes would constitute a material modification.
- Note that rehearing requests have not yet been addressed

Ancillary Services:
Background and Specifics

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Note: The views expressed herein are the author's, and do not necessarily reflect the views of the Commission, individual Commissioners, Commission staff or individual Commission staff members.

Background

- Prior to Order No. 888, no standard definition of Ancillary Services (or other services necessary for reliable interconnected operations)
  - Most of the nuts and bolts of reliably operating the system were probably handled by vertically integrated utilities as part of bundled retail service (and thus, probably paid for by retail customers)
- Order 888 proceeding kicked off substantial discussion of this issue (which is worth reading)

Interconnected Operations Services vs. Ancillary Services

- In Order 888 proceeding, Commission and parties discussed:
  - the set of services/actions necessary to support interconnected operations (and gave them the label ***"Interconnected Operations Services"***)
  - The subset of IOS necessary to support open access transmission service (labeled ***"Ancillary Services"***)

Interconnected Operations Services (NERC position in 888 proceeding)

1. system control and dispatch
2. accounting
3. regulation
4. energy imbalance
5. frequency response
6. back-up supply
7. operating reserve-spinning and supplemental
8. real power losses
9. reactive supply from generation
10. restoration (a.k.a., blackstart)
11. facilities use
12. reactive supply from transmission sources

Order No. 888 Ancillary Services

1. Scheduling, System Control and Dispatch
2. Reactive Supply and Voltage Control from Generation Sources
3. Regulation and Frequency Response
4. Energy Imbalance
5. Operating Reserve – Spinning Reserve
6. Operating Reserve – Supplemental Reserve

Order No. 890 Changes

- Added one new ancillary service to the OATT:
  - Schedule 9 (Generator Imbalance)
- Modified the other AS Schedules to allow provision by non-generator resources:
  - E.g., Reactive Supply and Voltage Control from Generation and Other Sources

Interconnected Operations Services vs. Ancillary Services concluded

- the Commission did not intend for Ancillary Services provided under the OATT to address all of the needs of interconnected operations
- Nevertheless, the term ancillary service is sometimes used more broadly today to refer to almost anything other than bulk power sales or transmission service

Specific Ancillary Service Definitions

Umbrella Definition: "Those services that are necessary to support the transmission of capacity and energy from resources to loads while maintaining reliable operation of the Transmission Provider's Transmission System in accordance with Good Utility Practice."

Specific Ancillary Service Definitions:

Schedule 1 – Scheduling, System Control and Dispatch Service

"This service is required to schedule the movement of power through, out of, within, or into a Control Area."

Schedule 2 – Reactive Supply and Voltage Control from Generation or Other Sources Service

"In order to maintain transmission voltages on the Transmission Provider's transmission facilities within acceptable limits, generation facilities and other non-generation resources capable of providing this service that are under the control of the control area operator are operated to produce (or absorb) reactive power."

Ancillary Service Definitions Continued

Schedule 3 – Regulation and Frequency Response Service

“Regulation and Frequency Response Service is necessary to provide for the continuous balancing of resources (generation and interchange) with load and for maintaining scheduled Interconnection frequency at sixty cycles per second (60 Hz). Regulation and Frequency Response Service is accomplished by committing on-line generation whose output is raised or lowered (predominantly through the use of automatic generating control equipment) and by other non-generation resources capable of providing this service as necessary to follow the moment-by-moment changes in load.”

Schedule 4 – Energy Imbalance Service

“Energy Imbalance Service is provided when a difference occurs between the scheduled and the actual delivery of energy to a load located within a Control Area over a single hour.”

Schedule 5 – Operating Reserve – Spinning Reserve Service

“Spinning Reserve Service is needed to serve load immediately in the event of a system contingency. Spinning Reserve Service may be provided by generating units that are on-line and loaded at less than maximum output and by non-generation resources capable of providing this service.”

Ancillary Service Definitions Continued

Schedule 6 – Operating Reserve – Supplemental Reserve Service

"Supplemental Reserve Service is needed to serve load in the event of a system contingency; however, it is not available immediately to serve load but rather within a short period of time. Supplemental Reserve Service may be provided by generating units that are on-line but unloaded, by quick-start generation or by interruptible load or other non-generation resources capable of providing this service."

Schedule 9 – Generator Imbalance Service (Added in Order No. 890)

"Generator Imbalance Service is provided when a difference occurs between the output of a generator located in the Transmission Provider's Control Area and a delivery schedule from that generator to (1) another Control Area or (2) a load within the Transmission Provider's Control Area over a single hour."

RTO/ISO Ancillary Service Markets

- While RTO/ISO OATTs still include the required AS schedules, they do not use organized markets for each of the OATT AS
  - E.g.-PJM operates markets only for “Synchronized Reserve” (equivalent to spinning) and Regulation
- They also sometimes redefine an OATT AS in their markets
  - E.g.- CAISO split its Regulation market into separate Reg-up and Reg-down markets

Thank you

Questions?

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Open Access Same-Time Information System (OASIS)

Background and Specifics

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Note: The views expressed herein are the author's, and do not necessarily reflect the views of the Commission, individual Commissioners, Commission staff or individual Commission staff members.

Background (until 1996) Before Order Nos. 888 and 889

- No Standardization
- Each public utility transmission provider had its own method and requirements for customers to request transmission service
- No Required Transparency
- A public utility transmission provider did not have to disclose how it calculated the amount of transmission service available
- A public utility transmission provider could share information between its transmission and merchant generation functions and affiliates without having to share same information with transmission customers.

Order No. 889 Created the OASIS Requirement

- All public utility transmission providers must create an on-line portal called an Open Access Same-Time Information System or OASIS.
- Each transmission provider's OASIS must provide current and potential open access transmission customers with information about available transmission capacity, prices, and other information.
- Information on OASIS must be presented in a standardized form using standard terms.
- All customers, including the transmission provider itself, must obtain information about and request transmission service over the transmission provider's transmission system using OASIS.

http://www.oasis.oati.com/pge/

Network and Application Access | OATI OASIS

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Keyword

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OATI webSmartOASIS TRANSFORMING THE BUSINESS OF ENERGY

Production Node Login

PGE Transmission

Transmission Preschedulers & ATF 503-464-8802

Balancing Authority Operators (Realtime) 503-464-8650

Market Disruption Notice for January 1, 2019:

On January 1, 2019, the California Independent System Operator (CAISO), who is the Market Operator for the Western Energy Imbalance Market (EIM), experienced a market disruption for Hours Ending (HE) 23 through 24. PGE's Temporary Schedule 4, 4R, 10, and 11 will apply for these affected hours.

PGE has elected not to apply penalty pricing to the Energy Imbalance Cost (EIC) for these affected hours. The EIC will be equal to the Mid-C hourly Powerdex price. This waiver is appropriate since no party could anticipate the market disruption or take action to address or avoid it.

If you have questions or concerns, please contact us at PGETSettlements@pgn.com. We appreciate your business and look forward to continuing to serve you.

(Posted 1/11/2019)

ESS Meter Data Inconsistencies Identified

In May 2018, PGE's new Meter Data Management (MDM) system came online and as part of the due diligence in commissioning the system, some minor meter data inconsistencies were identified. These inconsistencies apply only to the Electricity Service Suppliers (ESS) and impact ESS imbalance and ESS network charges. PGE is currently in the process of tabulating corrected meter data and recalculating imbalance and network charges for the impacted customers. Affected ESSs will be notified in early 2019 with specifics regarding this adjustment.

(posted: 12/27/2018)

4th Quarter Customer & Annual Network Operating Committee Meetings

PGE Transmission & Reliability Services' has scheduled the Quarterly Customer Meeting and the Annual Network Operating Committee Meeting for Tuesday, **December 12th**, 2018, **from 1:00 to 2:00 PM** to discuss PGE transmission-related issues. This will be an in-person and WebEx meeting. For those planning to attend in person, the meeting will be

Requesting Transmission Service

- All customers must request transmission service using OASIS – including the transmission provider itself.
- The method for requesting transmission service on OASIS is standardized for all transmission providers.
- All transmission rates are posted and all customers pay the same rate – any discount for a specific service offered to one customer must be posted on OASIS and offered to all similarly situated customers
- A public utility must share all relevant information with all customers at the same time on OASIS

Types of Transmission Service

- Three Types of Transmission Service
  - Non-Firm Point-to-Point
  - Firm Point-to-Point
  - Network Integration Transmission Service (NITS)
- Each transmission provider uses the same transmission services that it offers to customers and abides by the same rates, terms and conditions for its own service as it requires of other customers

Point-to-Point Transmission Service

- Point-to-Point Transmission Service
  - From a specified point of receipt (where power will enter the transmission system) to a specified point of delivery
  - Customer must reserve a specific quantity of service in MWs
  - If power is to be delivered to a different transmission system (through and out), then Point-to-Point service must be used.
- Firm vs Non-Firm
  - Firm Point-to-Point transmission service always has a priority over non-firm point-to-point transmission service.
  - All long-term Firm Point-to-Point transmission service will have equal reservation priority with native load customers and Network Integration Transmission service customers.

Network Integration Transmission Service (NITS)

- Allows a customer to integrate, economically dispatch and regulate its current and planned network resources to serve its network load in a manner comparable to that in which the transmission provider utilizes its transmission system to serve its native load;
- Customer specifies all resources on the transmission provider's system and all load on transmission provider's system.

What Transmission Service is Available?

- Order No. 889 and later Order No. 890 required transparency about how a transmission provider calculates available transmission capacity.
- A transmission provider must post on OASIS a description of how it calculates available transmission capacity.
- All transmission providers must use standard terms with identical definitions.

Standards of Conduct

- First established in Order No. 889
  - Designed to prevent employees of a public utility and its affiliates engaged in wholesale merchant functions (wholesale sales of electricity for resale in interstate commerce) from obtaining preferential access to pertinent transmission-related information.
  - In many cases, compliance with Standards of Conduct requires posting information on OASIS.
- Revised and updated after Order No. 889 – for example in 2008 in Order No. 717

OASIS – The One Stop Shop

- OASIS is meant to be the place for customers to request transmission service, find information about a transmission providers' transmission system, and obtain other information about transmission service

Thank you

Questions?

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