Open Access Transmission Tariffs (OATTs) - Evolution and Overview

Presented at
MECL OATT Technical Conference
Sept 22, 2016

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Presentation Outline

- ***Electricity Industry Introduction***
  - Physics, Reliability and Organizational Structure
- ***Transmission Access Issues***
- ***FERC Pro Forma Tariff***
- ***Canadian Utility Actions***

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Nature of Electricity

- ***Electricity can not be stored***
- ***Supply must equal load demanded at all times***
  - Customers set demand
  - Power system must respond
- ***Reserves and Ancillary Services are required***
  - Meet changing demand
  - Backup sudden unexpected loss of supply
- ***Consequence of imbalance could be***
  - Minor frequency or voltage fluctuation
  - Major blackout

Nature of Electricity (2)

- ***Electricity cannot be economically generated and distributed at service voltages (120-240v)***
- ***Efficient transmission requires very high voltages (69-765 kV)***
- ***Central system operator with automatic controls is required***
- ***Primary concerns are***
  - Safety
  - Reliability
  - Cost

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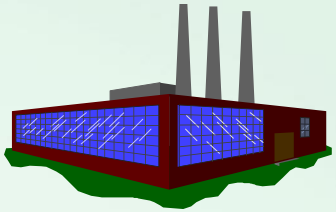
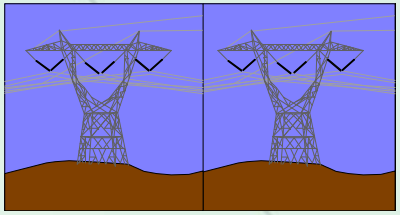
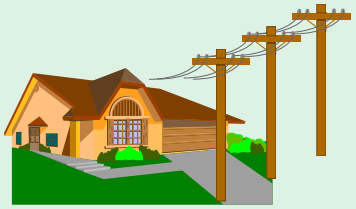
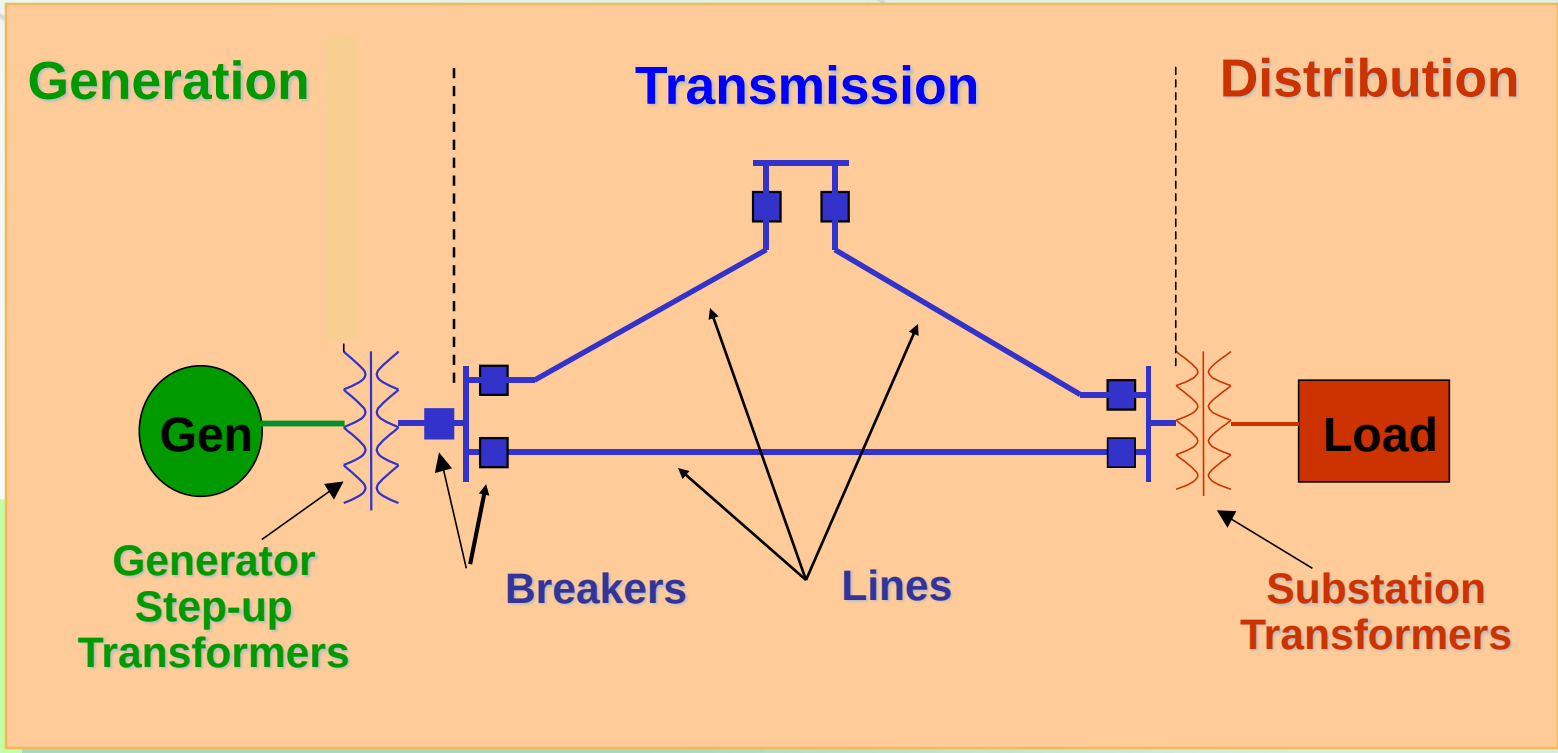
Power System Functions









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Component Ownership

- **Integrated utilities own and control G, T and D assets**
- **Municipal Utilities are usually only D with possible G**
- **Generation ownership**
  - **Used to be primarily by the integrated utilities**
  - **Now more and more is privately held**

Electricity Cost Profile

- **65-75% generation - Mix of competition & regulation**
- **15-30% distribution - Mostly regulated**
- ***7-10% transmission - Regulated "open access"***
  - ***Recovered through Schedules 7, 8 and H of the Tariff***
- ***0.5-2% system/market operations – Regulated***
  - ***Schedule 1 of the Tariff***

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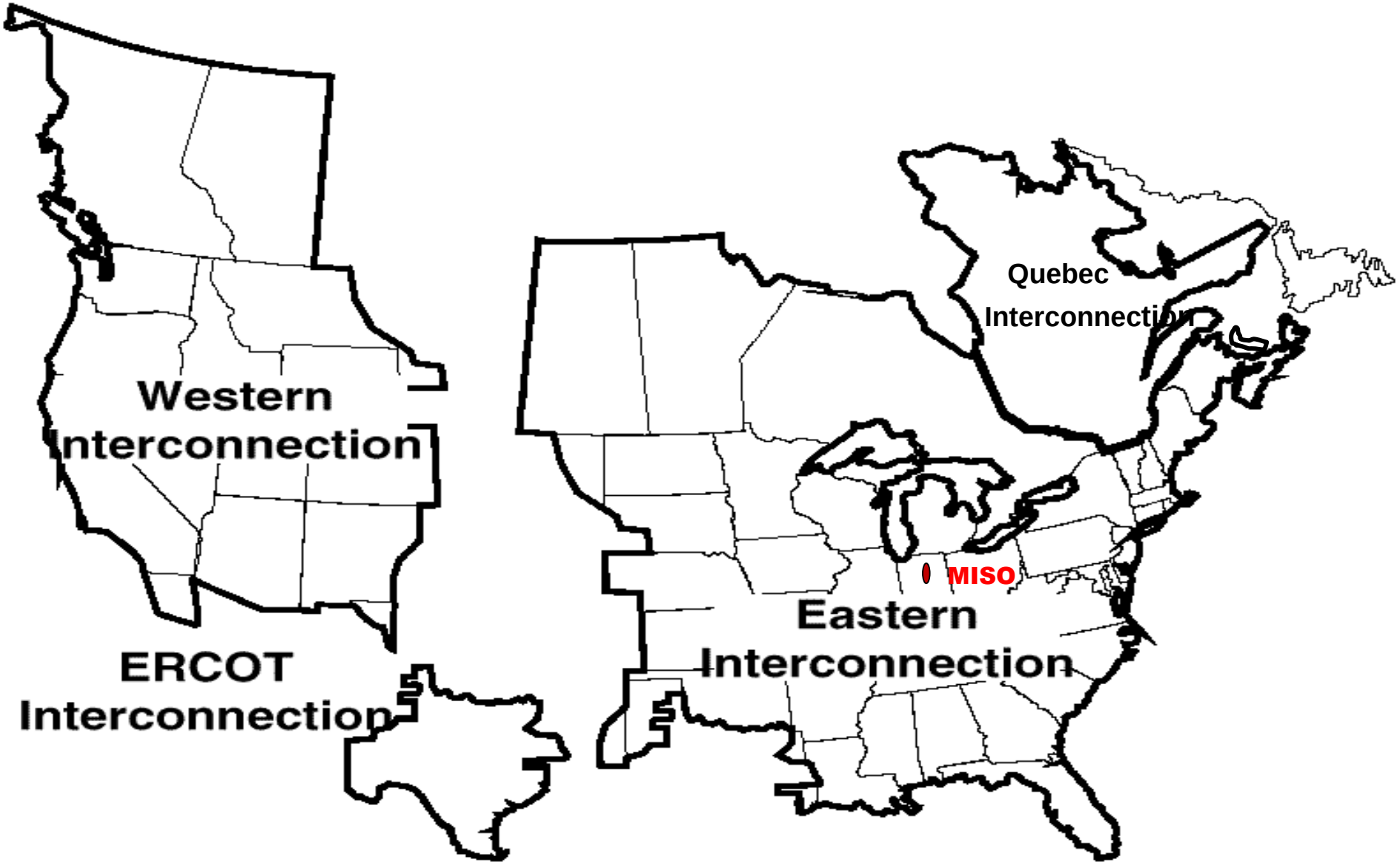
North American Power Systems



North American Electric Reliability Council/Corporation (NERC)

- ***Formed in 1966 after New York Blackout***
- ***"Promote the reliability of the bulk electric system in North America." – Voluntary basis***
  - Adequacy - will there be enough G&T capacity?
  - Security - will it operate to provide continuous service? (N-1)
- ***Mandatory compliance began in 2007***
  - FERC empowered through "Energy Policy Act" in 2005
  - NERC designated as "Electric Reliability Organization" by FERC
  - MOU's required from provincial authorities with NERC/NPCC
  - In NB NERC standards are subject to NB EUB approval
  - PEI is not "Bulk" but may be in future
  - MECL subject to NERC standards and NPCC criteria via Interconnection Agreement with NB Power

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NERC Reliability Standards

- *Require Automatic Generation Control (AGC) for balancing and frequency control*
- *Require spinning and supplemental (non spinning) reserves for recovery from disturbance contingency*
- *Reliability Coordinator (RC) is responsible to meet the standards for reliable operation*
- *RC sets out obligations of area utilities based on Load Ratio Share*
- *Provision of the services to the RC can be by self supply, purchase from a third party or purchased through the Transmission Tariff*

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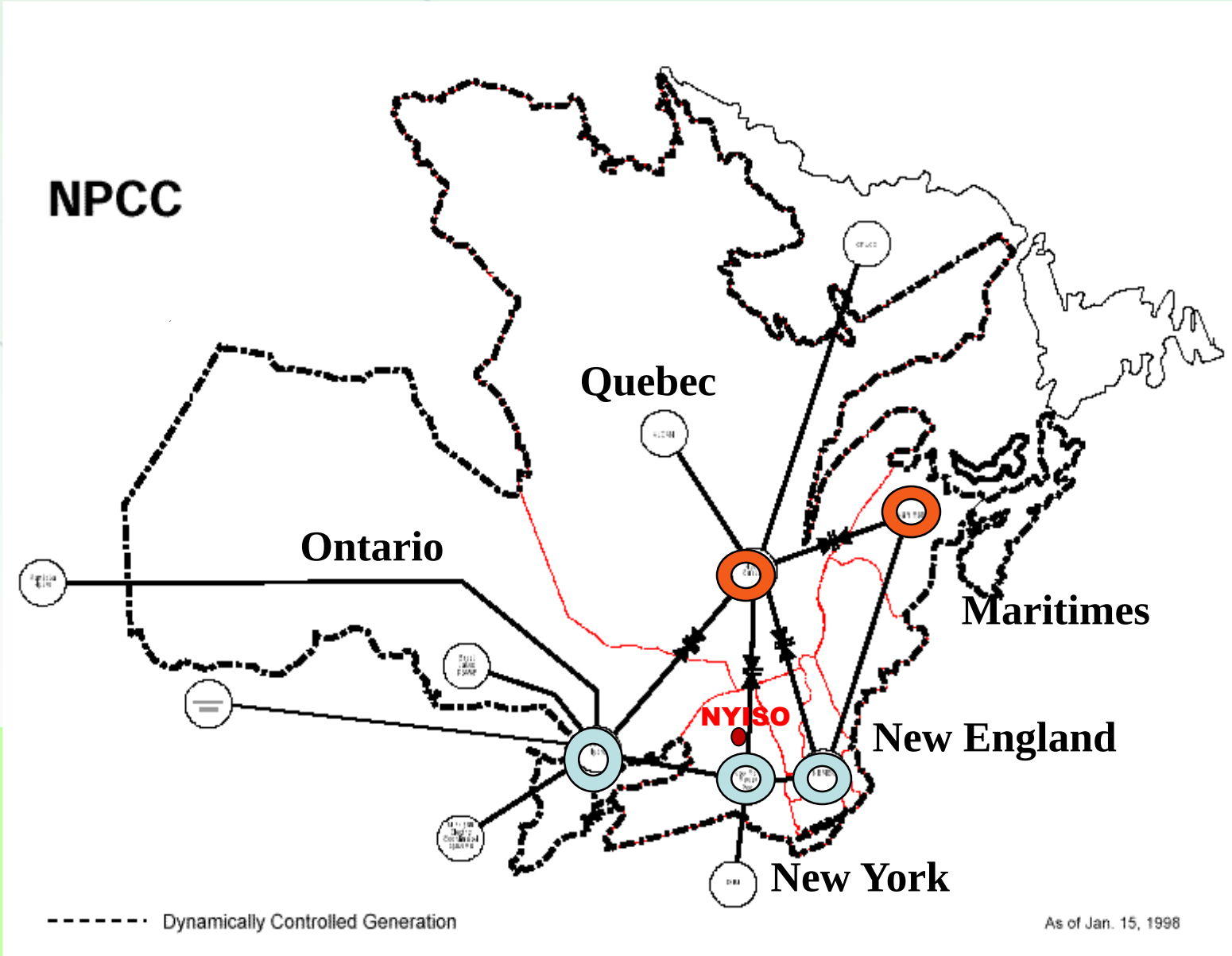
Northeast Power Coordinating Council (NPCC) – 5 Areas



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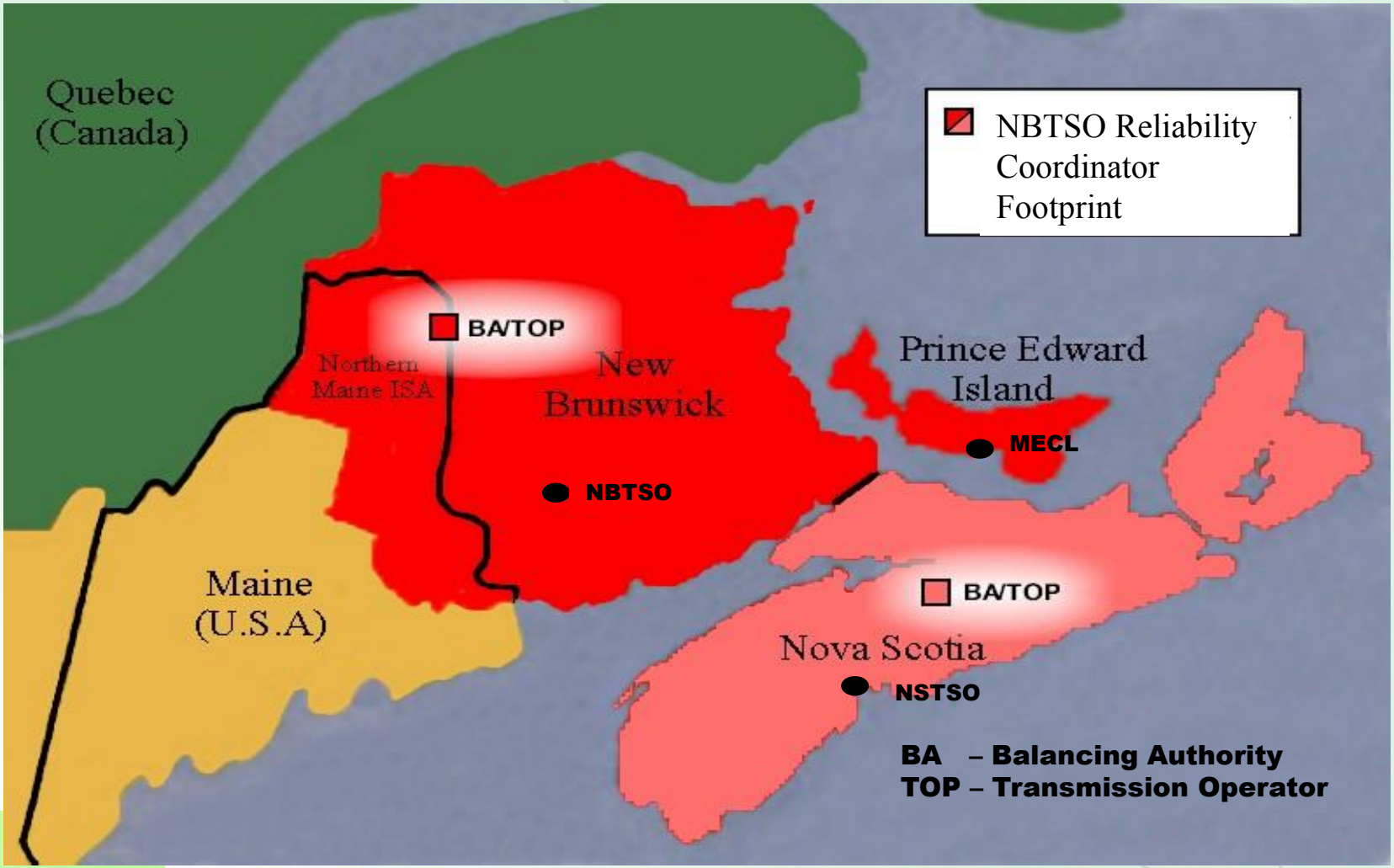
NBTSO is RC of the Maritimes Area



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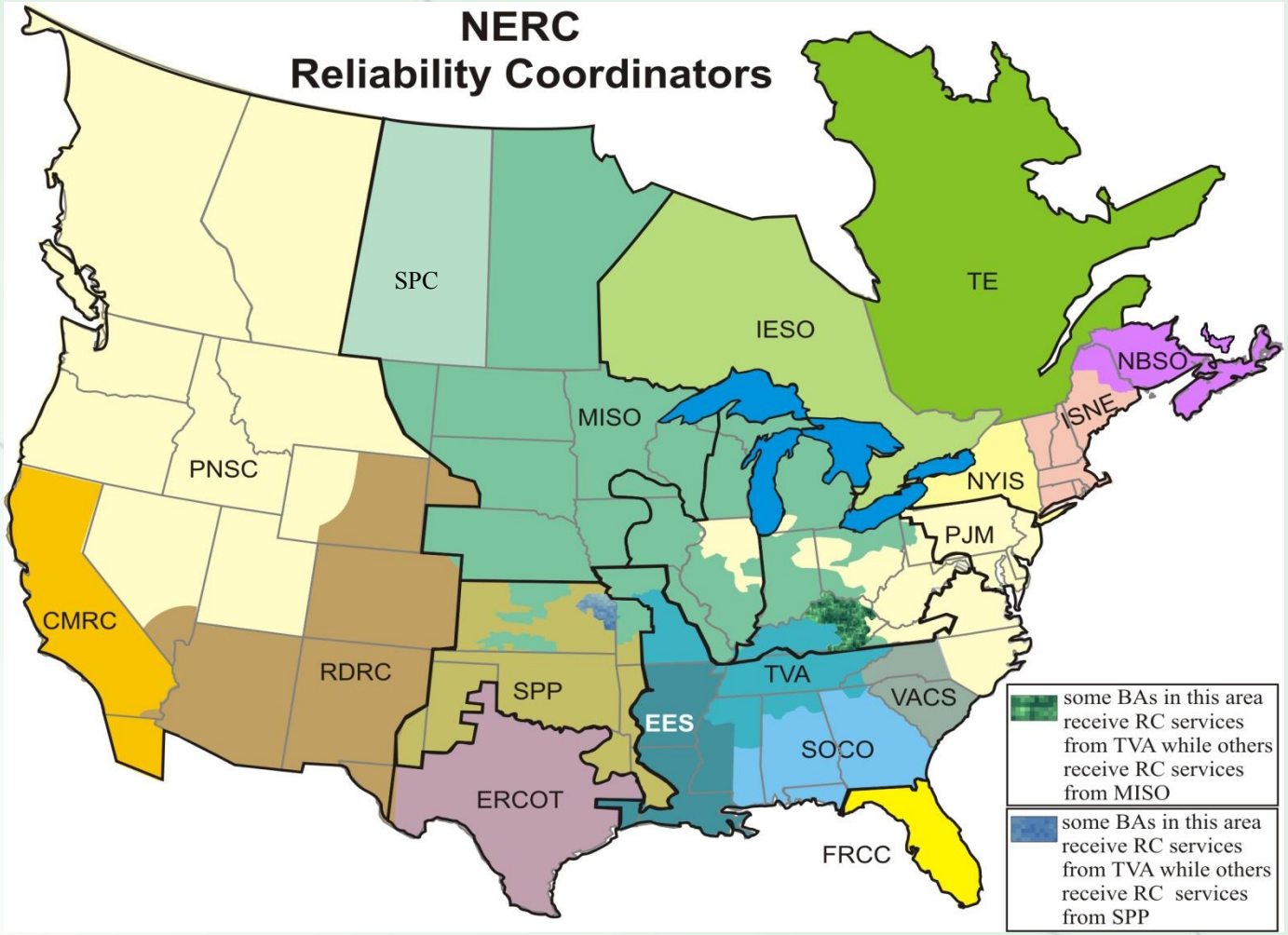
NBTSO – One of 18 Reliability Coordinators



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Presentation Outline

- ***Electricity Industry in General***
- ***Transmission Access Issues***
  - Evolution and Regulation
- ***FERC Pro Forma Tariff***
- ***Canadian Utility Actions***

Traditional Transmission Access

- ***Utility that owned the transmission controlled any access***
- ***Access required contractual agreements***
- ***Examples***
  - MECL contract path for Dalhousie and Pt Lepreau generation ownership
  - NB Power contract with MEPCO for Coleson Cove and Pt Lepreau sales into and through Maine to Massachusetts utilities

US Federal Power Act (FPA)

- ***Federal Energy Regulatory Commission (FERC) is empowered to regulate the FPA***
  - Applies to "public utilities" but not Federal Power Authorities (Bonneville Power) or Co-operatives (EMEC)
- ***US government amended the FPA in 1992***
  - Provide for competition in electricity supply at "Wholesale"
    - "Wholesale" defined as "purchase for resale"
  - Primarily provides Municipal utilities access to other supplies
  - Transmission must be available on a "non-discriminatory open access" basis

FERC Transmission Pricing Policy Statement - 1994

- ***Transmission pricing is to "*be just and reasonable and not unduly discriminatory or preferential"**
- ***Utilities can develop proposals for open access pricing that meet the following principles***
  - Meet the traditional **revenue requirement**
  - Reflect **comparability** (Provide access on same basis as self)
  - Promote economic efficiency
  - Promote fairness
  - Be practical
- ***To be "Conforming" the first two principles are mandatory***

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Inter-Provincial Transmission Access

- ***Electricity regulation in Canada is provincial jurisdiction.***
  - NEB is not equivalent to FERC - authority is for exports only
- ***Interprovincial Trade Agreement***
  - Followed from FPA and FERC actions
  - Federal/Provincial "Energy Committee" assisted by utility representatives was formed
  - Work toward cross territory transmission access
  - No agreement because of off shore oil and natural gas issues
- ***Electricity trade was mainly north-south with US***
  - Many Canadian utilities responded to FERC Order 888 reciprocity rules to improve US market access

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FERC Orders 888 & 889 Issued in 1996

- ***Order 888 introduced the Pro-Forma Tariff***
  - All "Public Utilities" had to file an OATT in 60 days
  - Alternatives had to be "*equal or superior to the Pro Forma*"
  - Reciprocity requirement for *"non-public utilities"*
- ***Order 889 required functional separation of Merchant and Transmission operations***
  - Code of Conduct defined separation requirements
  - Transmission availability and reservations are to be achieved through **O**pen **A**ccess **S**ame-time **I**nformation **S**ystem (OASIS)
- ***Orders challenged in legal system but FERC jurisdiction upheld in 2000 by Court of Appeals***
  - *"Open access is the essence of Orders 888 and 889. … we uphold them in nearly all aspects."*

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Presentation Outline

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- ***Transmission Access***
- ***FERC Pro Forma Tariff***
  - Services and Reciprocity
- ***Canadian Utility Actions***

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Pro Forma OATT

- ***Defines the services available***
  - Transmission Services and Ancillary Services
- ***Specifies operating terms and conditions for***
  - Scheduling requirements, differentiation of service firmness, curtailment priority, and information exchange, etc
- ***Sets out the rights and obligations of the Transmission Provider for***
  - Provision of service and expansion of the transmission system
- ***Sets out the rights and obligations of the Transmission Customer for***
  - Service availability, payment requirements and reciprocity

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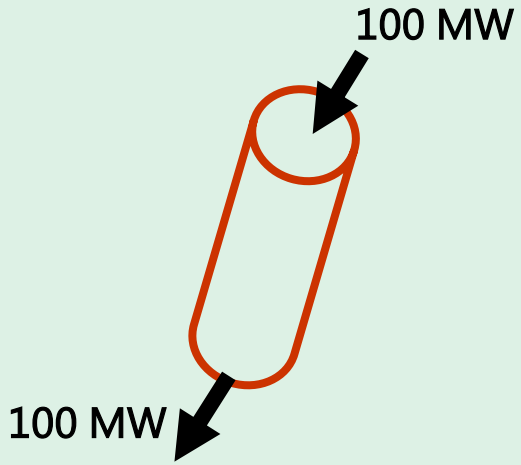
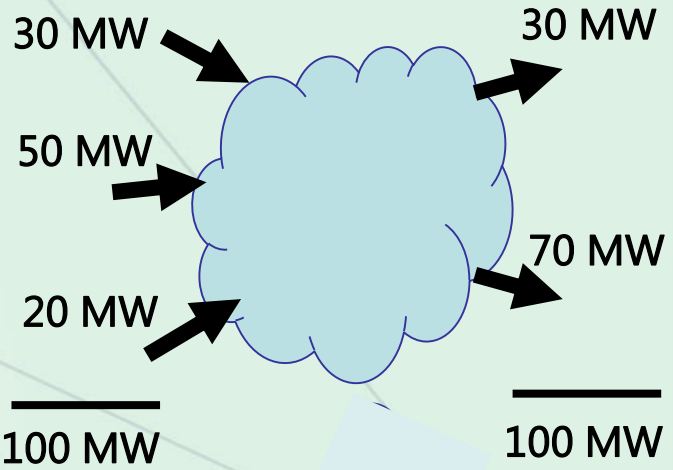
Transmission Services

- ***Point-to-Point Service***
  - From Point of Receipt to Point of Delivery
  - Firm or Non-Firm
  - Long-term or short-term
  - Contract path analogous to a pipe



- ***Network Service***
  - Multiple sources to multiple loads
  - Supports economic dispatch
  - Long-term only
  - System analogous to a cloud



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Ancillary Services

- ***Compulsory operational services from the Transmission Provider (TP)***
  - System Control and Dispatch, and Voltage Control
- ***Capacity based ancillary services (CBAS) from generators needed for reliability***
  - Spinning and Supplemental (10/30 Min) Operating Reserves
  - Load Following and Frequency Regulation (AGC)
  - Can be self supplied, purchased from third party or the TP
  - May not be required for Pt-to-Pt dependent on load served
- ***Energy Imbalance service to settle scheduling imbalances***
  - Payments for shortfalls, credits for surpluses
  - Penalties to encourage accurate schedules

Reciprocity Obligations

- ***Any "Non-Public Utility" that uses the OATT of the Transmission Provider must agree to provide reciprocal open access to its (or its affiliate's) transmission system***
- ***To sell power at market prices in the US requires a Power Marketing Authorization (PMA) license from FERC with two conditions***
  - Demonstrate there is no market power
  - Provide open access on any affiliate's transmission system that is "*equal or superior to the Pro Forma*"

Pro Forma Evolution

- ***Many enhancements through Order 890 in 2007***
  - Long Term increased from one to five years
  - Generator and Energy imbalance penalties specified
  - Coordinated & transparent transmission planning process needed
  - Penalties on TP for failures to meet study deadlines
  - Transparency in Available Transfer Capability (ATC) determination
  - Designation of Network Resources required
  - Conditional firm Point-to-Point service added
  - Pre-confirmed transmission requests possible
- ***Other changes through various orders***
  - NAESB standards adopted by reference (676)
  - Remove cap on pricing of transmission resales (739)
  - Introduce intra-hour scheduling (764)
  - Standardize small generator interconnection (2003, 2006, 661, 792)
  - Regional transmission planning and cost allocation (1000)
  - Enhance and separate Standards of Conduct from OATT (717)

Presentation Outline

- *Electricity Industry in General*
- *Transmission Access*
- *FERC Pro Forma Tariff*
- ***Canadian Utility Actions***
  - Marketing Subsidiaries and Tariffs

FERC PMA Licenses

- ***Every Utility in Canada with competitive generation assets now has achieved or is pursuing a PMA to sell at market prices in the United States***
  - Many did it immediately in 1996
    - Hydro Quebec, Manitoba Hydro, Trans Alta and BC Hydro
  - Other utilities plus Canadian marketers took longer
    - Ontario Power Generation, Brookfield Renewable Power, Algonquin Power, Sask Power, Emera (NS Power), NB Power
  - Now in the process is Nalcor
    - An OATT with a PMA is expected by the time the Muskrat Falls and associated transmission projects come on line

Canadian Pro Forma OATTs

- ***Only the Transmission utilities in Ontario and Alberta will not have Pro Forma based OATTs***
  - Those provinces have large bid based markets with independent operators (IESO, AESO)
  - Tariff development began in those provinces prior to Order 888
  - There is province wide open access in both but it is not based on the FERC pro Forma
  - The Tariffs in each province are accepted as “equal or superior” to the Pro Forma by FERC
    - External access to their markets reflects reciprocity
    - PMAs have been granted to affiliates in each province
      - TransAlta and Brookfield (Great Lakes Power)

Canadian Pro Forma OATTs (2)

- ***Every Canadian Pro Forma based OATT has been initially modeled on Order 888***
  - All have been modified since to meet changes in Order 890 and other FERC orders except NS Power and Sask Power
  - None are identical to the current FERC Pro Forma
- ***Each have minor variations such as***
  - Network Billing Determinants on Non-Coincident Peak loads
    - NB Power, NS Power
  - Point-to-Point Discounts for exports
    - Manitoba Hydro, BC Hydro
  - Open seasons for new Transmission capability
    - NB Power
  - Functional allocation of costs

Canadian Pro Forma OATTs (3)

Cost Allocation by Function

Jurisdiction	Substation Step-Down Transformers	Load-Serving Radial Lines	Transmission Network	Generator Connection Assets	Generator Step-Up Transformers
British Columbia	D	D	T	G	G
Alberta	D	D	T	G	G
Saskatchewan	D	T	T	G	G
Manitoba	D	D	T	G	G
Ontario	T	T	T	T	T
Quebec	T	T	T	T	T
New Brunswick	D	T	T	G	G
Nova Scotia	D	T	T	G	G
FERC	D	D/T	T	G	G
MECL Application	D	T	T	G	G

"D" means that the associated costs are allocated directly to Distribution or to an in province Transmission service that is separate from the OATT

"T" means that the associated costs are allocated to transmission and collected via the OATT

"G" means that the associated costs are directly allocated to Generators

Questions

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