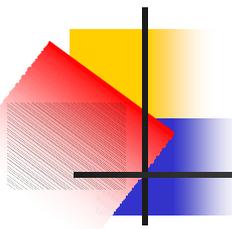


NERC Functional Model

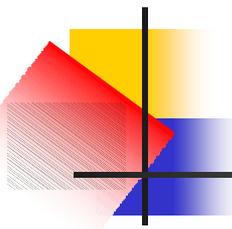
**FERC Technical Conference
Assignment of RTO Characteristics and Functions
February 19, 2002**

**Presented by Don Benjamin
Director of Operations, NERC**

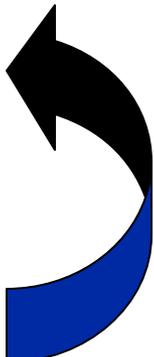


Control Area Criteria Task Force

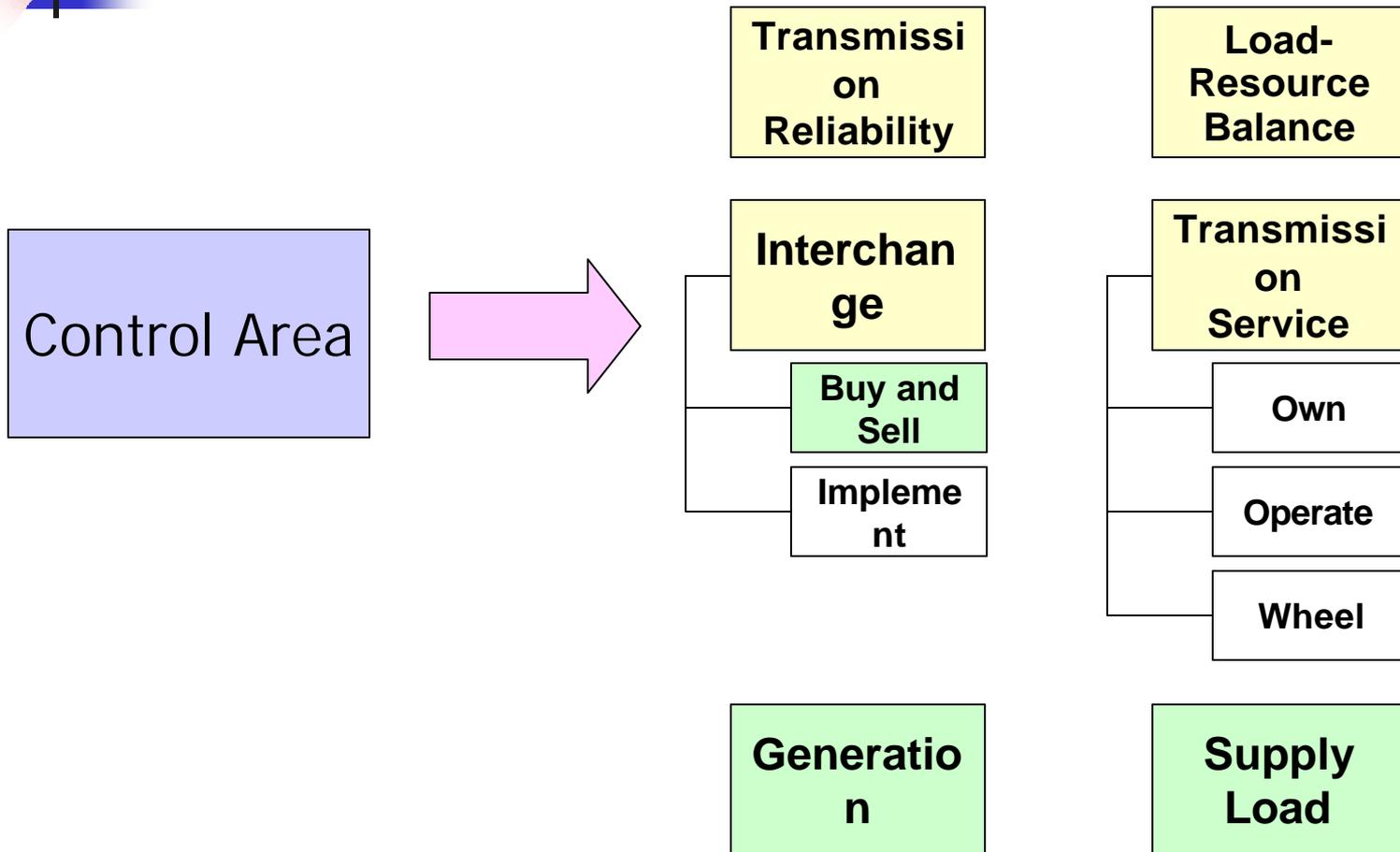
- TXU
- Cinergy
- PJM
- LCRA
- Tampa Electric
- WAPA
- The IMO (Canada)
- Entergy
- PECO Power Team
- Enron
- Sithe Energies
- Ogelthorpe
- Northwest Pwr Pool
- KCP&L
- Michigan Elec Coord Center



Why is Functional Model needed?

- The Control Area is no longer the basic operating organization
 - NERC Operating Policies do not reflect the new organizations or merchant functions that are forming
 - Need to define the basic functions and “roll up” into organizations
- ISOs
 - RTOs
 - Transcos
 - Security
 - Balancing
 - Interchange
 - Transmission
- 

"Unbundling" the Control Area



Functional Model

Standards
(NERC)

Compliance
Monitor

Reliability
Authority

Service
Functions

Interchange
Authority

Balancing
Authority

Trans
Service
Provider

Planning
Authority

Planning &
Operating
Functions

Generator

Load-
Serving
Entity

Purchase-
Selling
Entity

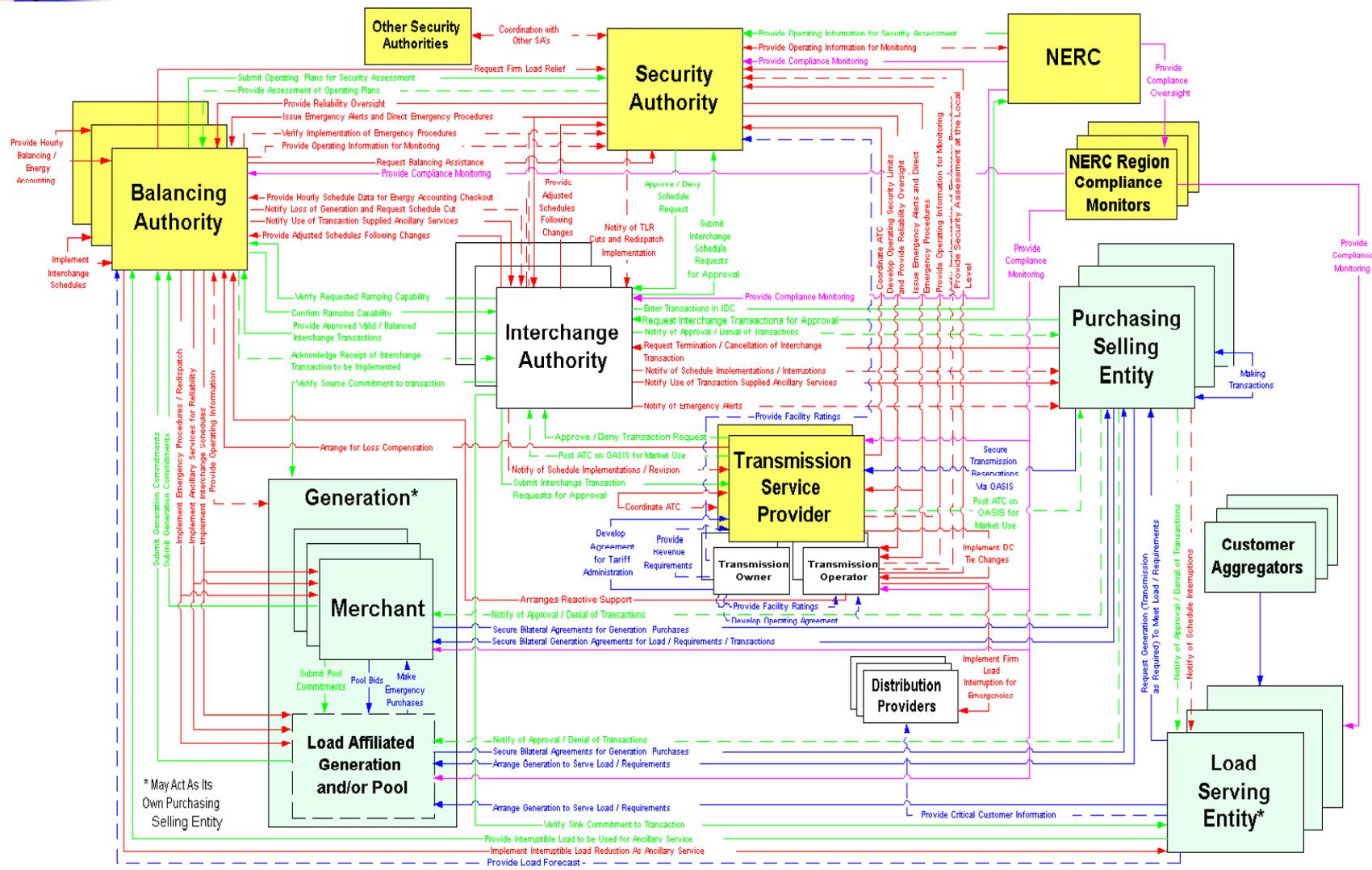
Merchant
Functions

Transmissi
on
Owner

Transmissi
on
Operator

Distributio
n
Provider

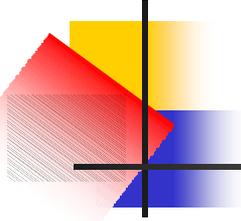
Function Relationships



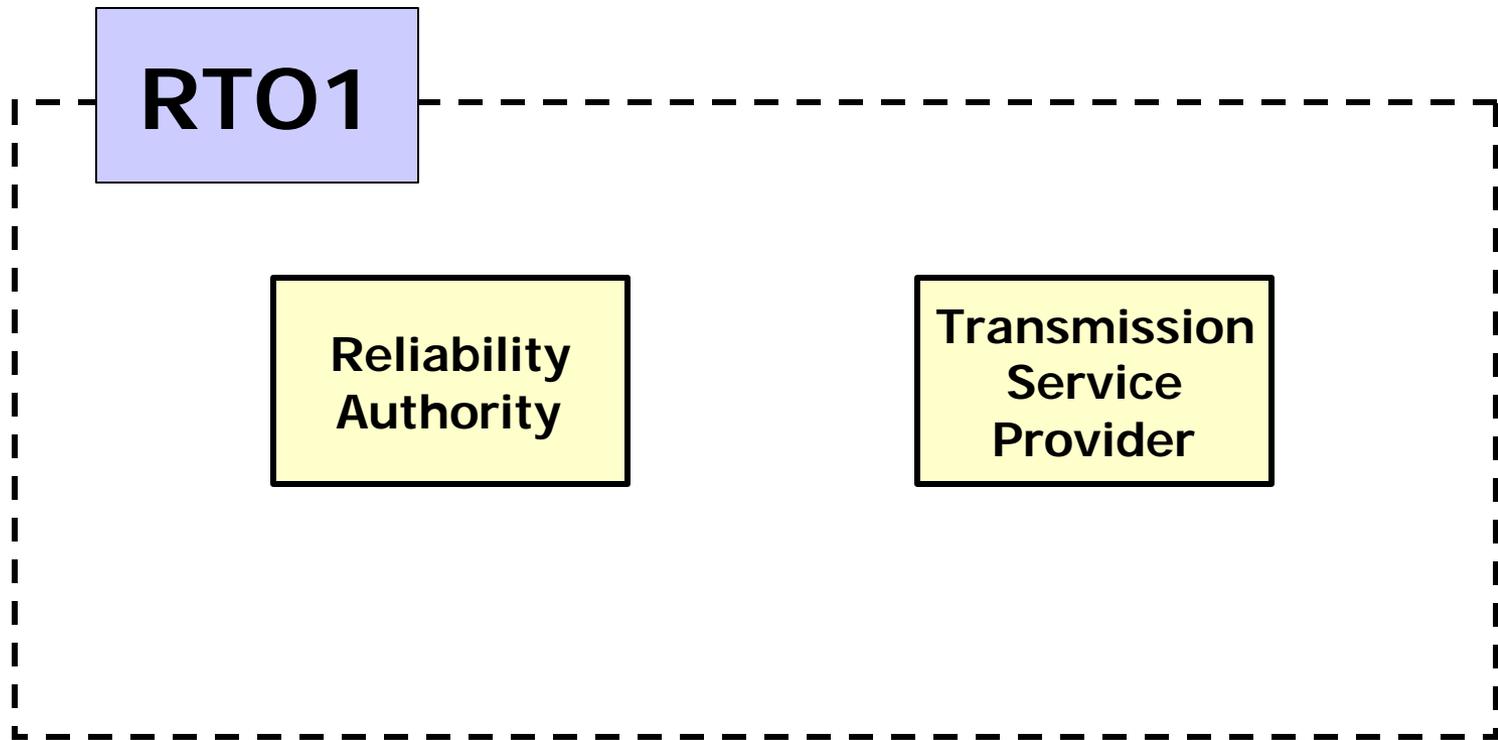
Timeframes

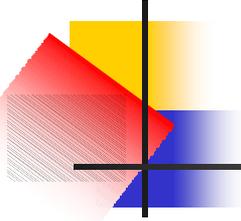
Functional Model

<i>Markets</i>	<i>Market Interface</i>	<i>Physical Implementation</i>
<ul style="list-style-type: none">• Contract with generators and loads• Conduct financial trades• Acquire/build resources	<ul style="list-style-type: none">• Reserve Transmission• Request transactions• Request IOS• Respond to congestion	<ul style="list-style-type: none">• Implement transactions• Maintain reliability• Maintain balance• Respond to emergencies

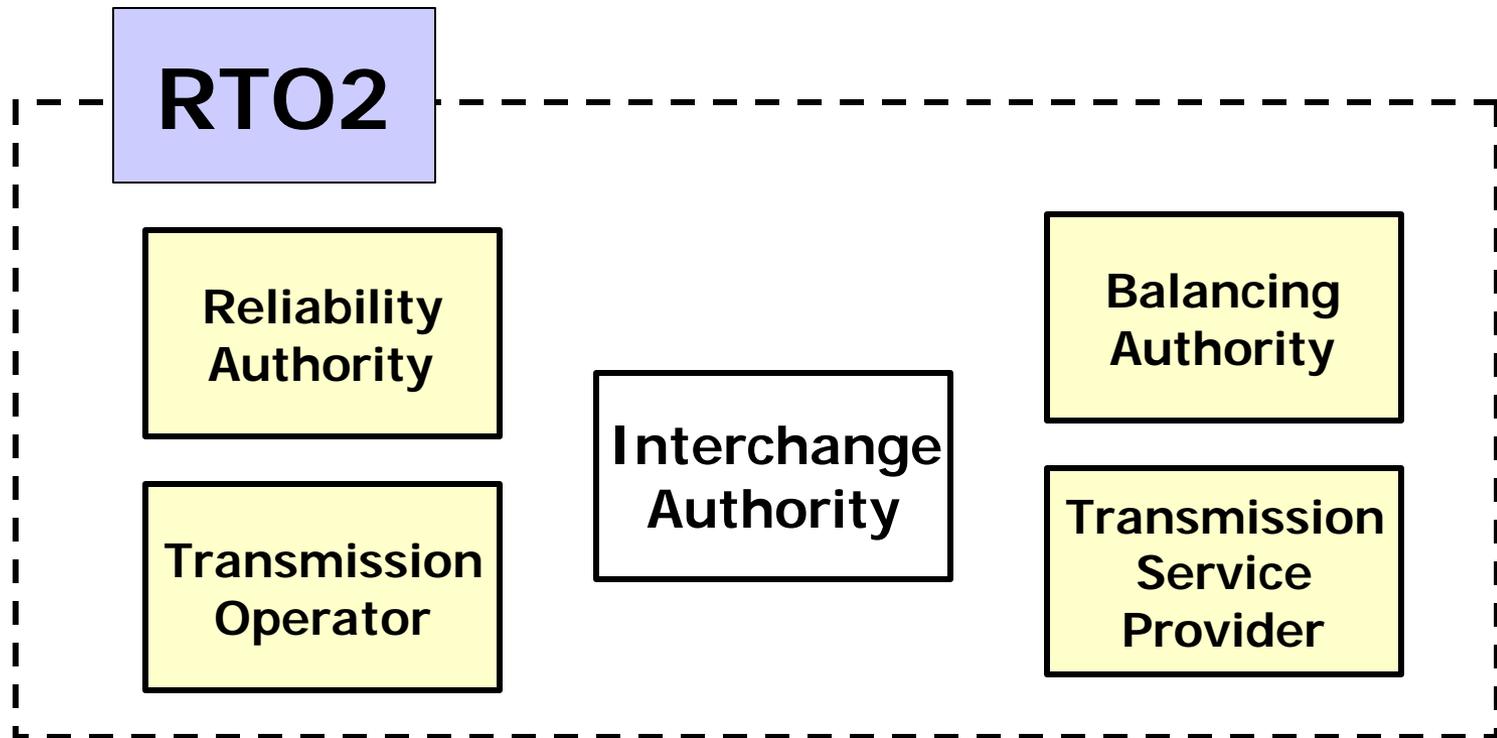


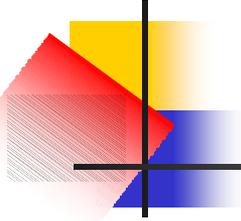
“Rolling Up” into Organizations



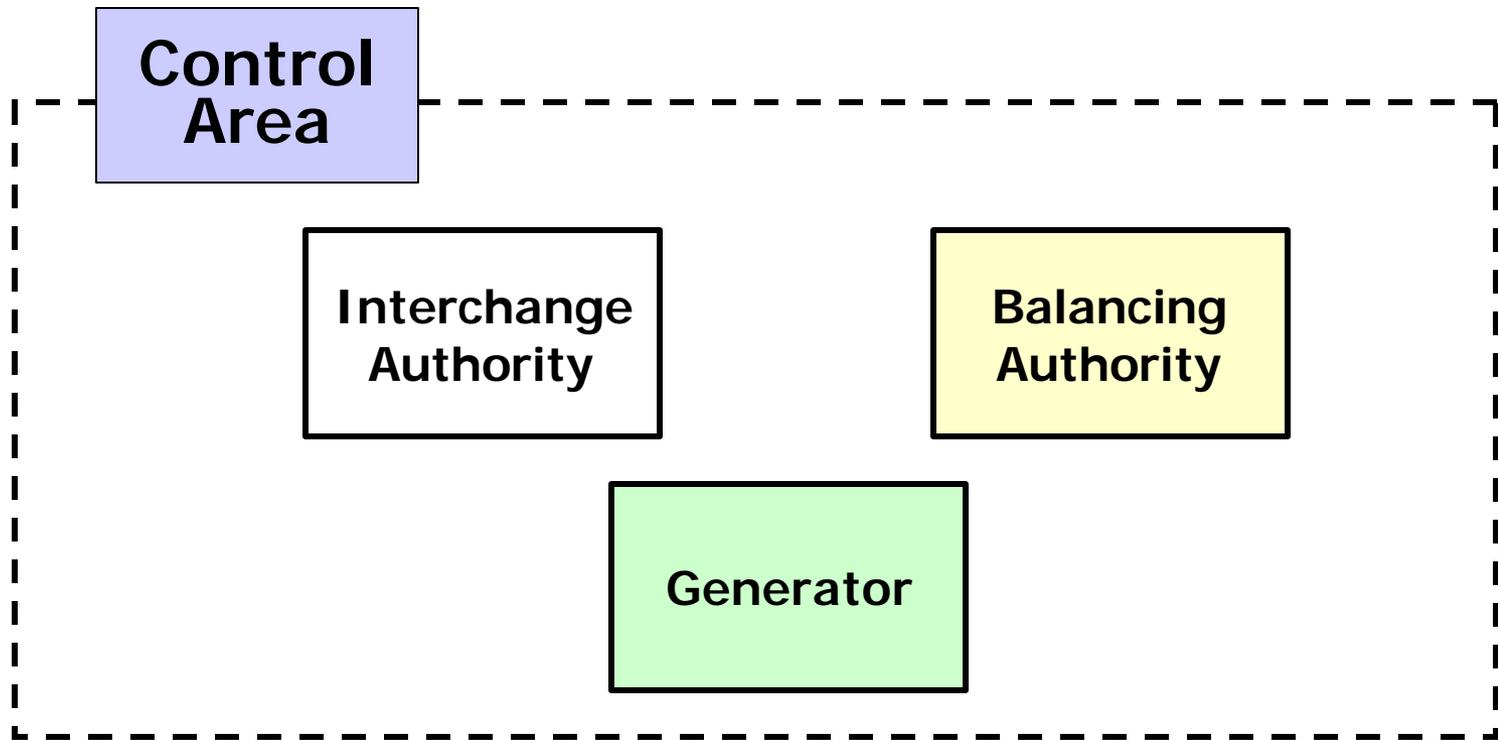


“Rolling Up” into Organizations





“Rolling Up” into Organizations



Implementing the Functional Model

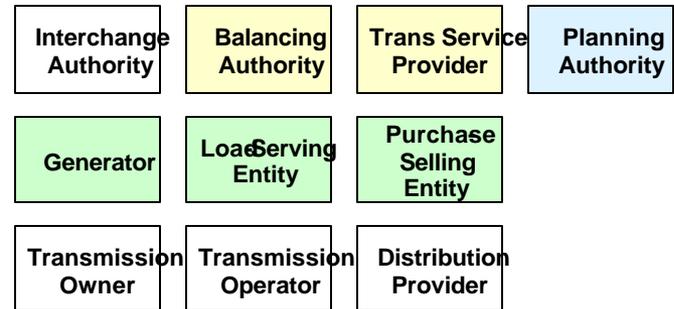
Standard Model

Standard
The BA shall Ensure that Load and Generation...

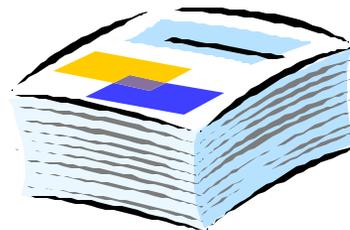
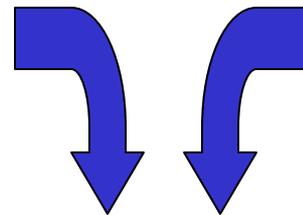
Functional Model

Standards (NERC)
 Compliance Monitor

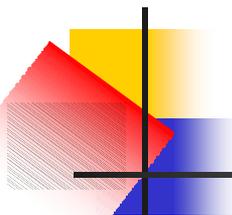
Reliability Authority



Certification



NERC Organization Standards



Mapping to RTOs

Operations

RTO Function	Functional Model
Reliability Authority	Reliability Authority
Physically operate	Transmission Operator
Implement curtailments	Reliability Authority
Impact studies	Planning Authority Reliability Authority
Equipment Ratings	Transmission Owner

Mapping to RTOs

Operations (cont.)

RTO Function	Functional Model
Manages congestion	Reliability Authority
Addresses parallel flows	Reliability Authority

Mapping to RTOs

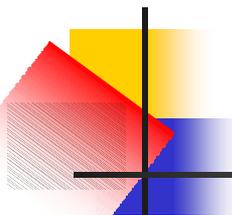
Short-term Reliability

RTO Function	Functional Model
Implement Interchange	Interchange Authority
Redispatch generation	Reliability Authority Balancing Authority
Approve Trans Maintenance	Reliability Authority
Emergency plan	Reliability Authority

Mapping to RTOs

Tariff Administration

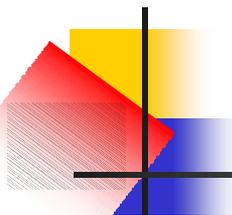
RTO Function	Functional Model
Administers tariff	Transmission Service Provider
Processes interconnection requests	Planning Authority(?)



Mapping to RTOs

OASIS, TTC, ATC

RTO Function	Functional Model
Maintains OASIS site	Transmission Service Provider
Calculates TTC	Planning Authority
Calculates ATC	Transmission Service Provider
Inputs for TTC and ATC	Reliability Authority Transmission Owner



Mapping to RTOs

Ancillary Services

RTO Function	Functional Model
Balancing (not balancing market)	Balancing Authority
Procures Interconnected Operations Services	Balancing Authority

Mapping to RTOs

Planning

RTO Function	Functional Model
Develops plan	Planning Authority
Coordinates plan	Planning Authority