

# Forward Capacity Market (FCM)/ Generator Interconnection Process Stakeholder Group

*Stakeholder Meeting No. 2*

*October 11, 2007*

*Springfield, MA*

# Agenda

Welcome and Introductions	10:00 – 10:15
Review Comments on Proposed Mission Statement	10:15 – 10:30
Follow-up to September 27 Meeting	10:30 – 11:00
FERC Generator Interconnection Procedures	11:00 – 12:00
Lunch	12:00 – 1:00
FERC Generator Interconnection Procedures, cont.	1:00 – 2:45
Closing Remarks and Adjournment	2:45 – 3:00

***If time permits, we will be ready to provide some introductory remarks on the FCM Overlapping Impact Test***

# Overview of Process

- ISO New England (ISO), New England Conference of Public Utilities Commissioners (NECPUC) and New England Power Pool (NEPOOL) have agreed to engage in a stakeholder process to look for ways to improve the coordination between the requirements of the FCM and the current Federal Energy Regulatory Commission (FERC)-approved Generator Interconnection Process
- Information regarding this stakeholder process may be found at:

[http://www.iso-ne.com/committees/comm\\_wkgrps/othr/fcm\\_gen/index.html](http://www.iso-ne.com/committees/comm_wkgrps/othr/fcm_gen/index.html)

# Goals

- Provide background and information to stakeholders about the current Queue process and FCM
- Identify and discuss key issues and principles associated with the Queue and FCM
- Develop approaches to address key issues and principles
- Attempt to reach consensus on how to address key issues and principles where possible
- Provide a mechanism for bringing minority position(s) to the appropriate voting NEPOOL committee
- Enhance current processes as appropriate
- File any changes with the Commission by October 2008

# Project Breakdown – Phase I

## *September – December 2007*

- Information sharing and process details
  - Define scope and objectives of the overall process
  - FERC Generator Interconnection Process
  - FCM Resource Qualification Process
  - Establish context/criteria for alternate methodologies given Open Access Transmission Tariff (OATT) principles

# Review of Open Issues

- Review suggested changes to the proposed Mission Statement
  - Overall scope of the Working Group
- Question regarding application of the Overlapping Impact Test and its relationship to Interconnection Queue Order

# Proposed Mission Statement Review

# Using Queue Order in Analyzing Overlapping Interconnection Impacts for the Forward Capacity Market

Robert G. Ethier, Director, Resource Adequacy and Chief Economist

# Overlapping Impacts and the Interconnection Queue

- Where multiple New Generating Resources cannot be qualified for the Forward Capacity Auction (FCA) because they overlap with each other
  - Generators are studied based on their position in the Large/Small Generator Process (L/SGIP) Interconnection Queue
  - L/SGIP Interconnection Queue order is used to choose between the overlapping generators
  - Only L/SGIP Interconnection Queue generators that are seeking qualification for that FCA will be included within the analysis

# ISO Tariff Market Rule 1, Section III.13.1.1.2.3(f)

Where, as a result of the initial interconnection analysis, the ISO determines that because of overlapping interconnection impacts, New Generating Capacity Resources that are otherwise accepted for participation in the Forward Capacity Auction in accordance with the other provisions and requirements of this Section III.13.1 cannot provide the full amount of capacity that they each would otherwise be able to provide (in the absence of the other proposed resources), those New Generating Capacity Resources will be accepted for participation in the Forward Capacity Auction on the basis of their Queue Position, as described in Schedules 22 and 23 of Section II of the Transmission, Markets and Services Tariff, with priority given to resources that entered the queue earlier

# Planning Procedure 10, Section 5.7.1.3

The study generator will be included in the analysis based on their position in the S/LGIP Interconnection Queue..... For example, if the generator under study was the fifth in the Interconnection Queue, the generators that have a higher Interconnection Queue position that are seeking qualification for the Forward Capacity Auction will be included within the analysis.

# Overlapping Impacts within FCM

- Where multiple New Generating Resources cannot be selected because they overlap with each other
  - Interconnection Queue order is used to choose between the overlapping generators
  - A future, separate stakeholder process will re-evaluate this approach

Note: This slide was presented at the Overlapping Interconnection Impacts Conference held in Springfield on July 23, 2007, and this approach will be addressed as part of these stakeholder meetings.

# Discussion Topics – October 11

- FERC Generator Interconnection Procedures
  - Pre-Order 2003 interconnection procedures since 1997
    - Original approach – continuation of past practices
    - Development of New England formal interconnection procedures (PP6)
    - Generator interconnection cost allocation
    - Bucksport order
    - Adoption of Minimum Interconnection Standard (MIS), deferral of “overlapping impacts”
      - Practicalities associated with excessive amounts of proposed generation
      - Facilitation of competitive energy markets
      - Transmission access via bidding (Locational Marginal Price)

# Discussion Topics – October 11 (cont.)

- FERC Generator Interconnection Procedures (cont.)
  - Pre-Order 2003 interconnection procedures since 1997 (cont.)
    - Core Planning Procedures
      - PP3
      - PP5-1
      - PP5-3
      - PP5-6
    - Other Planning Procedures Significant to Generator Interconnection Process
      - Subordinate Proposed Plans (PP5-5)
      - Construction Sequencing (PP8)

# FERC Generator Interconnection Procedures

Richard V. Kowalski, Manager, Transmission Planning

# Original Approach – Continuation of Past Practices – Basis

- “Reliability Standards For The New England Power Pool” – March 1, 1996, Section 3, Area Transmission Requirements
- ... design studies will assume power flow conditions with applicable transfers, load, and resource conditions that reasonably stress the system.....
- ... all **resources** required for reliable and efficient system operation can be dispatched without unacceptable restriction.
- Reliability standards prior to March 1, 1996 (earlier?) referred to “no locked-in” generation
    - Revised to reflect “evolving” interpretations and integration of Public Utility Regulatory Policies Act (PURPA) units
    - Recognition that there was some amount of locked-in generation, but it was acceptable.
    - “No locked-in” functionally replaced with “not often”

# Original Approach – Continuation of Past Practices – Application (pre-1997)

- Studies based on anticipated conditions
  - Vertically integrated utilities
  - Judgment based on past experience
  - There was some locked-in generation
  - Import areas tested up to import limits; there was “locked-out” generation
- Approach seemed adequate at the time
  - Relatively small generation surplus
  - Relatively few new “large” generators

# Illustration of Test Conditions – Import Limits (ANP Blackstone & Bellingham – 1997)

INTERFACE NAME	LIMITS <sup>2</sup> (MW)		INTERFACE FLOWS (MW)						
	Thermal	Stability							
PHASE II Import	variable	variable	600	1500	1200	600	1500	O/S	1200
NB-NE	-	700	0	700	-38	-38		-38	
NY-NE	1300-2400	2200	755	583	662	-13	-708	462	-140
SE-MASS/RI Export	1700-2700	1100-1900	1481	1514	498	1980	1820	1980	1537
EAST-WEST	1900-2500	800-2000	-1396	984	-953	1401	1972	354	2071
CONN Import	1500-2100	2200	70	2200	319	1491	407	-666	458
BOSTON Import	1600-2600	-	2957	2232	2228	1767	1909	1670	
NNE Scobie	-	1150-2550	1000	1585	981	1552	1518	917	1703
<b>LOAD AREA</b>			<b>TOTAL LOAD (MW)</b>						
NEPOOL			22776			17087		11207	

- 1) Geographical Region in New England that generating station is located.
- 2) NEPOOL Transmission Interface limits as published in the FERC 715 Filing for 1997.

NOTE: ANP generation at Bellingham and Blackstone out-of-service.

# Original Approach – Continuation of Past Practices – Application (1997 – mid/late 1998)

- Restated NEPOOL Agreement & NEPOOL Open Access Tariff filed 12/96
- 30,000 MW of interconnection applications received between 2/97 and 8/98
  - Huge Surplus - unprecedented situation in USA
- Old study approach difficult to apply
  - Some locked-in generation considered acceptable (e.g., AEC, Maine Independence Station) early on
  - Market environment replaced old notions of economic dispatch
  - Where do you put more than twice the generation you need?
  - Extensive Transmission Requirements
  - How to study consistently, equitably, and objectively?
  - How to study?

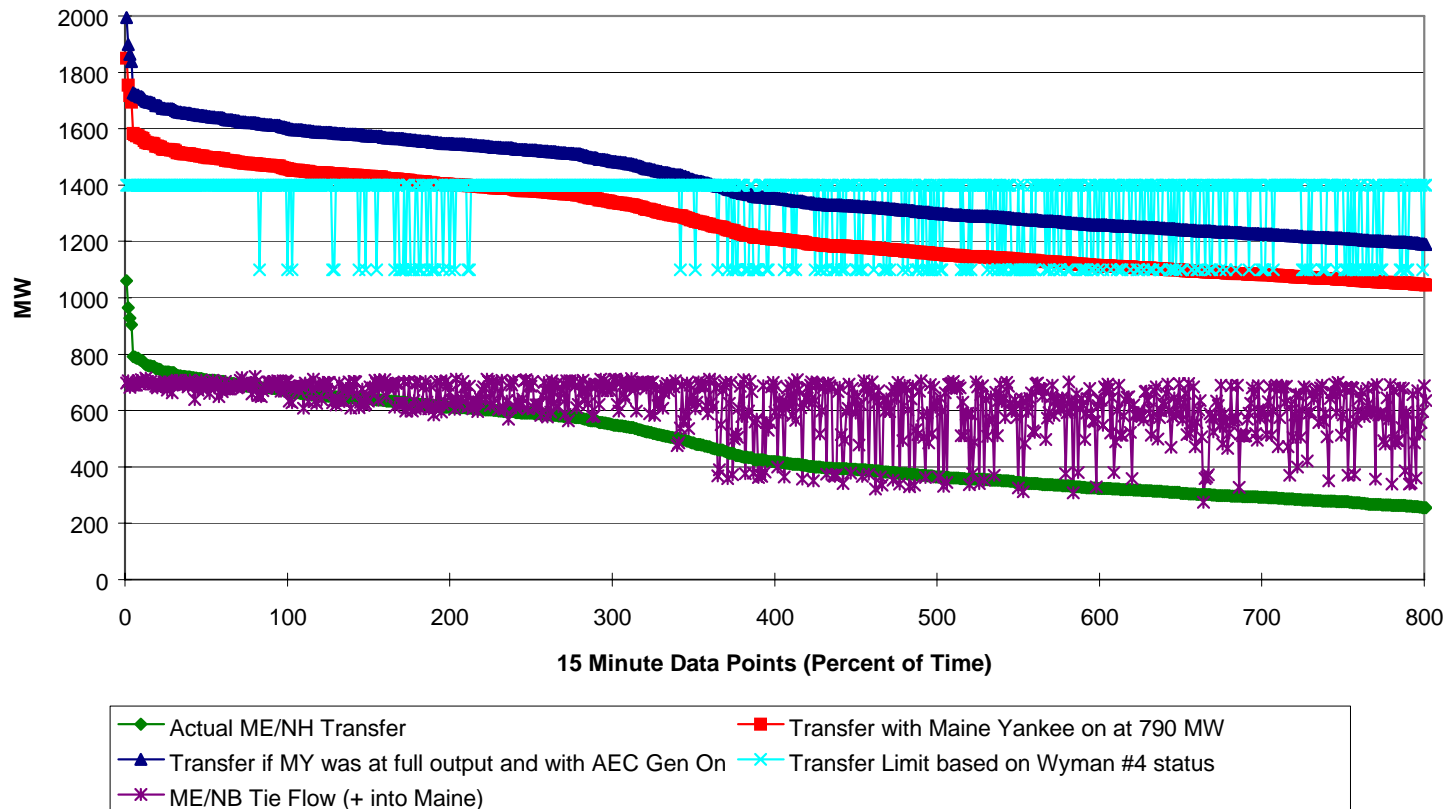
# 30,000 MW of Interconnection Requests 2/97 – 8/98

Req. Status <sup>1</sup>	Req. Type <sup>1</sup>	Request Date <sup>2</sup>	Project Name	MW
STATUS	TYPE	N	O	MW
C	G	2/13/1997	Androscoggin Energy Center	157
C	G	4/10/1997	EMI Dighton Power Project	185
C	G	6/12/1997	Rumford Power Associates	265
C	G	6/25/1997	Bridgeport Harbor Station	520
C	G	7/15/1997	ANP Bellingham Energy Project	580
C	G	7/15/1997	ANP Blackstone Energy Project	580
C	G	7/24/1997	Maine Independence	500
C	G	8/15/1997	Berkshire Power	276
C	G	8/22/1997	Milford Power	540
C	G	12/12/1997	Lake Road Generating	810
C	G	12/12/1997	SEI Newington (ConEd)	525
C	G	2/11/1998	AES Londonderry (Granite Ridge)	742
C	G	2/11/1998	Wallingford Power	255
C	G	3/24/1998	Bucksport Energy, L.P.	174
C	G	3/31/1998	Sithe Edgar Station Expansion (Fore River)	1500
C	G	3/31/1998	Sithe Mystic Station Expansion	1750
C	G	3/31/1998	Westbrook Power	520
C	G	4/29/1998	FPLE RISE, LLC (R.I. Hope Energy)	500
C	G	7/17/1998	Kendall Repowering Project	172
W	G	5/9/1997	Brayton Pt	477
W	G	7/22/1997	IDC Bellingham	700
W	G	8/5/1997	Wareham	267
W	G	8/22/1997	Summit Power	272
W	G	9/30/1997	Cabot Power	350
W	G	10/9/1997	South Norwalk	175
W	G	10/24/1997	ANP Gorham	850
W	G	1/13/1998	Sprague Newington (Piscataqua Power)	700

Req. Status <sup>1</sup>	Req. Type <sup>1</sup>	Request Date <sup>2</sup>	Project Name	MW
W	G	1/13/1998	Versaille Energy Center	240
W	G	1/13/1998	White Mountain Cogen.Center	90
W	G	1/14/1998	Livermore Falls	40
W	G	1/20/1998	Housatonic Power	700
W	G	2/16/1998	Meriden Power	544
W	ET	2/19/1998	HQ-Surowiec	600
W	G	2/25/1998	Orrington Generation	700
W	G	2/27/1998	Patriot Power	520
W	G	3/6/1998	S&P Cogeneration	272
W	G	3/13/1998	AES Carpenter	700
W	G	3/18/1998	Newington Energy Center	520
W	ET	3/25/1998	Engage Energy LTF PIP	300
W	G	3/25/1998	Norwich Power Station	500
W	G	3/26/1998	North Smithfield	350
W	G	3/30/1998	Towantic Energy	540
W	G	3/31/1998	Sithe Framingham Station Expansion	750
W	G	3/31/1998	Sithe Medway	540
W	G	4/1/1998	WEG-Norwich	500
W	G	4/2/1998	Wyman A	550
W	G	4/2/1998	Wyman B	550
W	G	4/2/1998	Mason	550
W	G	4/14/1998	FPL Energy (Bedford)	250
W	G	5/8/1998	Rocky River Power	530
W	ET	5/28/1998	CVPS/GMP LTF PIP	600
W	ET	5/28/1998	HQ Highgate2 HVDC	600
W	G	6/1/1998	Glen Charlie Unit One	500
W	G	6/4/1998	Canal 2 Repowering	714
W	G	6/5/1998	Wiscassett	900
W	ET	6/8/1998	Tractebel LTF PIP	300
W	G	7/10/1998	Brockton Power Project	272
W	G	8/18/1998	Campello Power Co.	285
W	G	8/26/1998	Nickel Hill Energy Project	750

# Illustration of Locked-In Generation (AEC Interconnection Study – 1997)

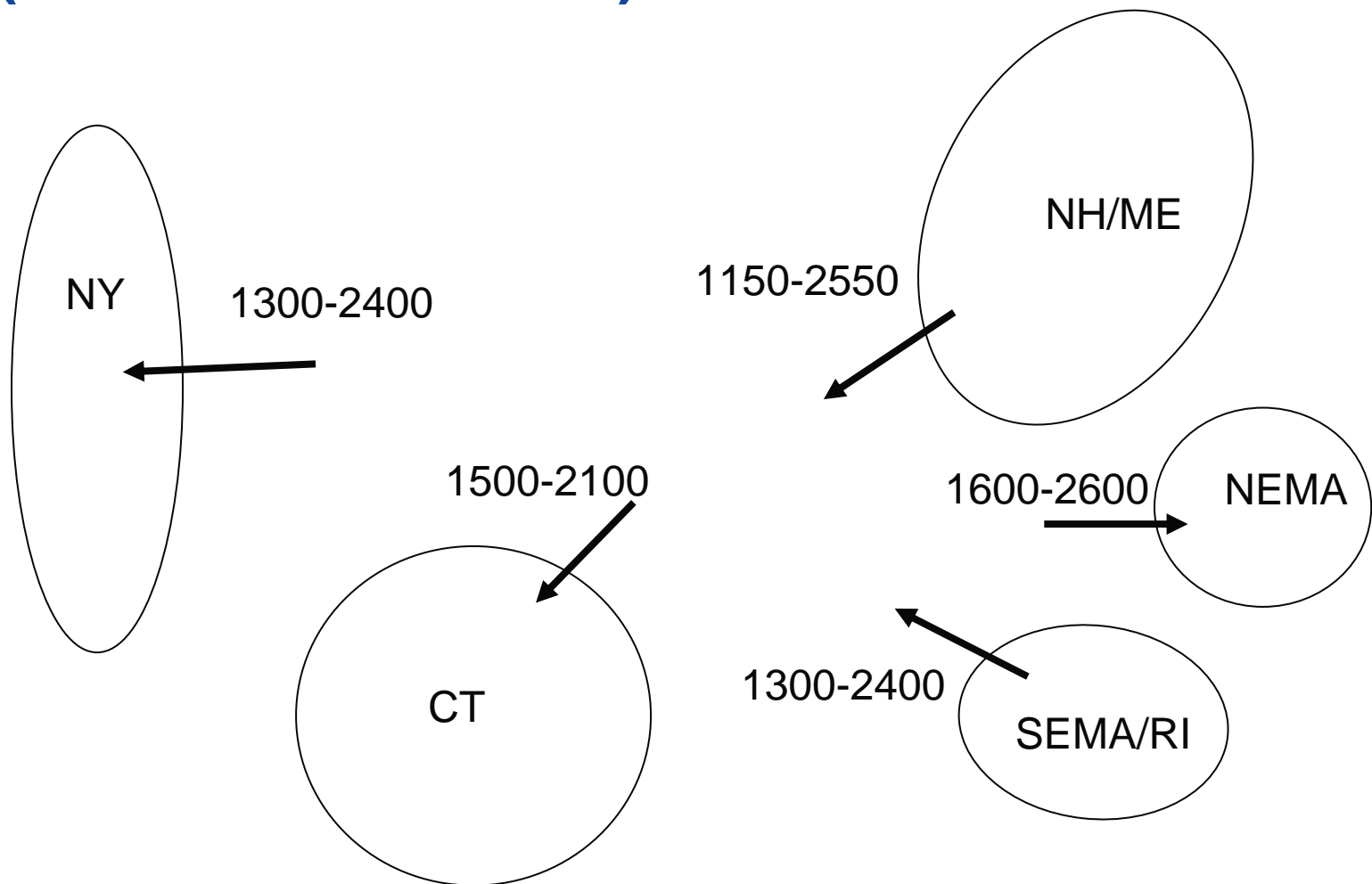
Maine - New Hampshire Transfer  
Highest 200 Hours  
January - June 1997  
(Data in 15-Minutes Intervals)



# Acceptable “Locked-In” Generation (Maine Independence Station – 1997; Interconnected Prior to Minimum Interconnection Standard)

RESOURCE	PEAK LOAD (MW)	LIGHT LOAD (MW)
<b>Existing Maine generation</b>		
Hydro	480	480
W. F. Wyman 1-3	220	220
W. F. Wyman 4	620	620
Mason 3-5	100	100
NUG thermal	260	260
Internal Combustion	50	50
New Brunswick-Maine Import	700	700
Existing Maine generation & import capability	2430	2430
Maine retail & wholesale customer load	1620	700
Existing Maine supply in excess of demand	810	1730
<b>Proposed Maine generation, through MIS</b>		
Androscoggin Energy Center	150	150
Rumford Power Associates	260	260
Maine Independence Station	520	520
Proposed Maine supply in excess of demand	1740	2660
ME-NH transfer capability	1400	1400
<b>Potential “locked-in” generation</b>	<b>340</b>	<b>1260</b>

# Where Do You Put 30,000 MW? (based on 1997 info)



# Estimated Minimum New 345 kV Facilities With 8,000 MW of Incremental NH & ME Generation (Unpublished study)

- Chester - Orrington 2
- Orrington - Maxcys 2,3
- Maxcys - ME Yankee 2,3
- ME Yankee - Surowiec 2,3
- ME Yankee - Buxton 2
- Surowiec - Buxton 2,3
- Wyman - S. Gorham 2
- S. Gorham - Buxton 2,3
- S. Gorham - S. Forrest 1,2
- S. Gorham - ANP 1,2
- Buxton - Scobie 2,3,4,5
- VT Yankee - Scobie 2
- Scobie - Sandy Pond 2,3
- Sandy Pond - Millbury 3
- VT Yankee - Northfield 2
- Seabrook - Ward Hill 2,3
- Ward Hill - Tewksbury 2
- Additionally – 2,500-3,000 MVAR of reactive devices

# Development of New England Formal Interconnection Procedures

- 3/1/97 - NEPOOL Regional Transmission Planning Committee (RTPC) & ISO developed informal procedures to fill tariff “gap” regarding interconnection. Transmission upgrade cost responsibilities unclear
- Process designed which paralleled FERC pro-forma tariff approach for long-term firm transmission service. Application for NEPOOL interconnection study sent to ISO New England; may also be local network tariff application requirements
- Formalized Procedure 4/10/98 - Planning Procedure No. 6 – “Procedures for the Establishment and Study of NEPOOL Interconnection”
- Interconnection first addressed by NEPOOL Open Access Tariff on November 1, 1998 (July 22 compliance filing)

# Informal Interconnection Procedures

- 3/1/97 - NEPOOL Regional Transmission Planning Committee (RTPC) & ISO developed informal procedures to fill tariff “gap” regarding interconnection
  - Based on order of studies, same as in the past
  - Informal interconnection list developed (the “rumored” queue)
  - Lack of formal procedures became deficiency as list grew
- Transmission upgrade cost responsibilities unclear
  - Interconnection not addressed in 1996 FERC Pro-forma OATT
  - Who pays for interconnection costs?
    - Direct connection costs
    - Network upgrades, not required but for interconnection
    - Location, Location, Location

# Development of Formal Interconnection Procedures

- Process designed which paralleled FERC pro-forma tariff approach for long-term firm transmission service. Application for NEPOOL interconnection study sent to ISO New England; may also be local network tariff application requirements
  - Formal application with application fee
  - First come, first served, based on application date
  - Interconnection application not complete until any necessary local transmission service applications filed
  - Studies based on FERC Pro-forma for Transmission Service
    - System Impact Study (Planning study)
    - Facilities Study (Detailed Engineering & Cost Estimation)
  - Interconnection Agreement with interconnecting Transmission Owner
- Formalized Procedure 4/10/98 - Planning Procedure No. 6 – “Procedures for the Establishment and Study of NEPOOL Interconnection”
- Interconnection first addressed by NEPOOL Open Access Tariff on November 1, 1998 (July 22 compliance filing)

# Planning Procedure No. 6 – “Procedures for the Establishment and Study of NEPOOL Interconnection”

- Application Process
- Material Modification
- Study Process
- Expedited Interconnection
- NEPOOL 18.4 review
- Interconnection Agreement
- Decision to exclude external milestones
- Subsequently added
  - Map showing location of project
  - Site control

# Generator Interconnection Cost Allocation

- 2/97 OATT – Cost allocation unclear
- Category A (10/1/98 – 10/28/98)
  - 50% or greater: Generator Interconnection Related Upgrades
- Category B (10/29/98 – 6/22/99)
  - 50% or greater: Generator Interconnection Related Upgrades
- “62.5%” (not filed)
- Category C (current)
  - Pro-forma – 100% of Generator Interconnection Related Upgrades

# Issues Associated with the Initial Process

(“White Paper” – Memo to R. Chapman, NEC Chair – Aug/Sep ‘98)

- Long study response time with sequential studies and full integration
- No threshold requirements in addition to application date
- Transmission (mandatory) upgrade cost uncertainty - large upgrades and considerable project interdependencies due to full integration
- Generation construction schedule vs. Application Date
- Interconnection delay due to completion of local and full integration upgrades
- 1st come-1st served in combination with full integration, may discourage development in preferred areas
- Questionable “need” for all transmission upgrades associated with full integration
- Full integration transmission “requirement” vs. ability to construct
- Lengthy study process vs. state siting processes

# Bucksport Complaint

- ...request that Bucksport's placement in ... queue... effective as of the date... filed its initial application seeking access to the NEPOOL PTF grid...
- ...also request that Bucksport be allowed to interconnect with the NEPOOL PTF subject to: 1) Payment of upgrade costs to preserve reliability of the local PTF and non-PTF system; and 2) the use of economic redispatch in lieu of paying for PTF upgrade costs until such time as NEPOOL implements a congestion management plan.

# Bucksport Order

- FERC Orders: Bucksport Complaint, NEPOOL July 22 Compliance Tariff
  - “One stop shopping” interconnection application to ISO-NE
  - Full integration assumptions “unreasonable and unacceptable”
  - Generators in past matched/integrated with load; in future will sell to power exchange
  - Alternative to first-come, first-served application is acceptable
  - Decision on transmission cost sharing deferred to Congestion Management System (“CMS”) development

# Minimum Interconnection Standard NEPOOL Compliance Filing – November 13, 1998

- “Minimum Interconnection Standard” defines new acceptable interconnection level - No degradation of transmission system capability
- Enhanced Interconnection - Elective study of optional transmission upgrades for system penetration (Prelude to CMS)
- “Full integration” is subjective and has been inconsistently defined and applied - practically, not a specifically electable option
- All MIS studies to be completed before Enhanced (except for studies already beyond MIS)

# Minimum Interconnection Standard

- No degradation in transmission capability (one-for-one displacement of existing/proposed generation acceptable)
- All reliability standards must be met
- ISO can still operate and maintain the system
- “Compromise” standard
  - Not “plug and play”; more stringent than FERC “Energy Interconnection”
  - Does not assure incremental capacity to serve load
  - Assures not to degrade load-serving capability of the system with the new generator
  - Awaiting CMS development and means to measure capacity deliverability

# Enhanced Study

- Applicant's specification of study conditions/system penetration
  - “Full integration” not an electable option
- Replaced by more general “Elective Expansion”

# Core Planning Procedures

- Procedures for the Establishment and Study of NEPOOL Interconnection (PP6) (not currently active)
- Reliability Standards For The New England Area Bulk Power Supply System (PP3)
- Procedure For Review Of Governance Participant's Proposed Plans (Section I.3.9 Applications: Requirements, Procedures And Forms) (PP5-1)
  - Guidelines For Conducting And Evaluating Proposed Plan Application Analyses (PP5-3)
  - Scope Of Study For System Impact Studies Under The Minimum Interconnection Standard (PP5-6)

# Reliability Standards For The New England Area Bulk Power Supply System (PP3)

- Resource Adequacy
- **Area Transmission Requirements**
  - **Stability Assessment**
  - **Steady State Assessment**
  - **Fault Current Assessment**
- Transmission Transfer Capability
  - Normal Transfers
  - Emergency Transfers
- **Extreme Contingency Assessment**
- Extreme System Conditions Assessment

# Area Transmission Requirements

- Stability Assessment
  - System must remain stable with adequate damping
  - Also required with “slower” protection operation where adverse impact outside local area
  - Specific contingencies enumerated
- Steady State Assessment
  - Maintain voltages, line & equipment loadings within normal limits pre-disturbance and within applicable emergency limits following contingencies
  - Specific contingencies enumerated (same as for stability assessment)
- Fault Current Assessment
  - Ensure equipment capabilities are adequate for fault current levels with all facilities in service
  - All operating conditions

# Extreme Contingency Assessment

- Performed as a Measure of System Strength
- Plans/Procedures developed, where appropriate, to reduce probability of occurrence, or to mitigate consequences
- Specific contingencies enumerated
  - Loss of entire stations, major load center
  - Loss of entire Transmission Right-of-way
  - **Fault on all 3 phases with delayed fault clearing**
  - Failure of Special Protection System following “normal” contingencies
  - Common mode failure of fuel delivery system

# Procedure For Review Of Governance Participant's Proposed Plans (Section I.3.9 Applications: Requirements, Procedures And Forms) (PP5-1)

- Review to determine that the implementation of a Participant's proposed plan will not have a significant adverse effect upon the reliability or operating characteristics of its system or of the systems of one or more other Participants
- PP5-1 describes the administrative process for the review and approval

# Guidelines for Conducting and Evaluating Proposed Plan Application Analyses (PP5-3)

- Guideline to identify the types and degree of study needed to support a Participant's Proposed Plan
  - Level 0 analysis – Proposed Plan Application (PPA) not required
  - Level I analysis – PPA for information only
  - Level II analysis – As appropriate, testing such as load flow, short circuit, transient network analysis
  - Level III analysis – As appropriate, Level II analysis + stability analysis
- Guidelines for study conditions & reporting

# Scope of Study for System Impact Studies Under the Minimum Interconnection Standard (PP5-6)

- Guidance for scope and assumptions for study consistent with Minimum Interconnection Standard
- Identify upgrades required to meet
  - PP3
  - No more than one-for-one displacement
  - Does not diminish transfer capability across line or relevant interface
- Types of analyses (all)
- Conditions for Analyses
- System Configuration
- Operational Considerations
- Identification of Related Upgrades

# Other Planning Procedures Significant to Generator Interconnection Process

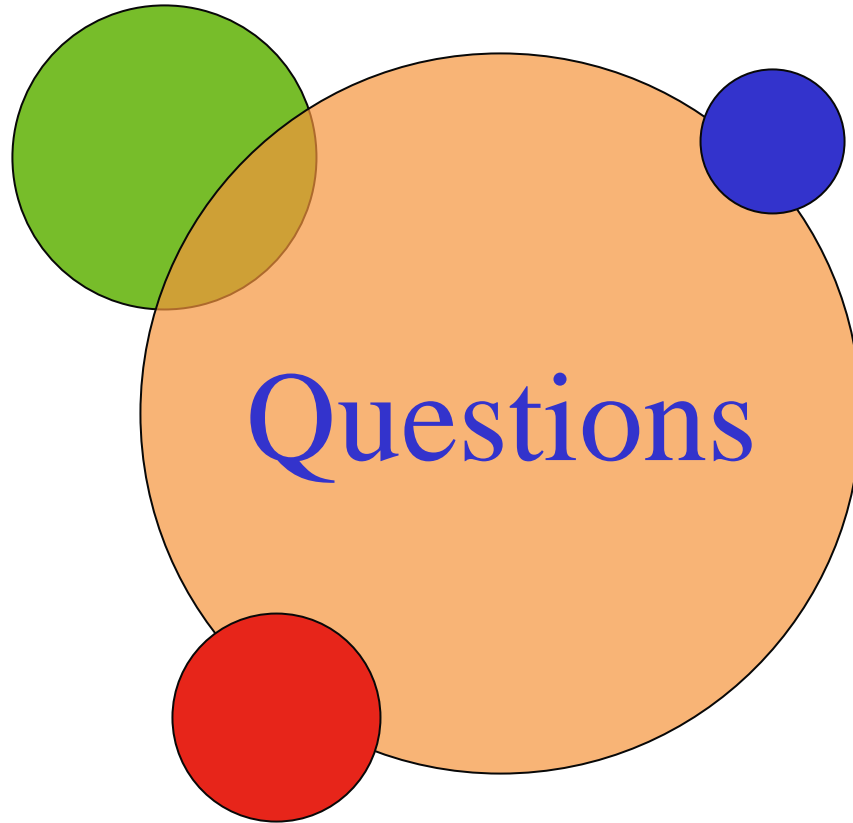
- Subordinate Proposed Plans (PP5-4)
- Construction Sequencing (PP8)

# Subordinate Proposed Plans (PP5-4)

- Interconnection studies normally performed in the order of application; cumulative study assumptions and project development
- Allows applicant to elect to proceed with construction out of sequence with prior-queued resources, take risk with respect to prior-queued resources
- Does not alter cost responsibility based on original/final queue position
- Maintains objectives
  - Consistent with Section I.3.9 of the Tariff,
  - Compliant with Planning Procedure 3 “Reliability Standards for the New England Area Bulk Power Supply System” and all other applicable standards,
  - Defines responsibilities when resources are constructed in a sequence different from queue
  - Allows a construction sequence that reduces interconnection and operational delays
  - Continuing obligation for studies, operational limits, or financial support for transmission upgrades.

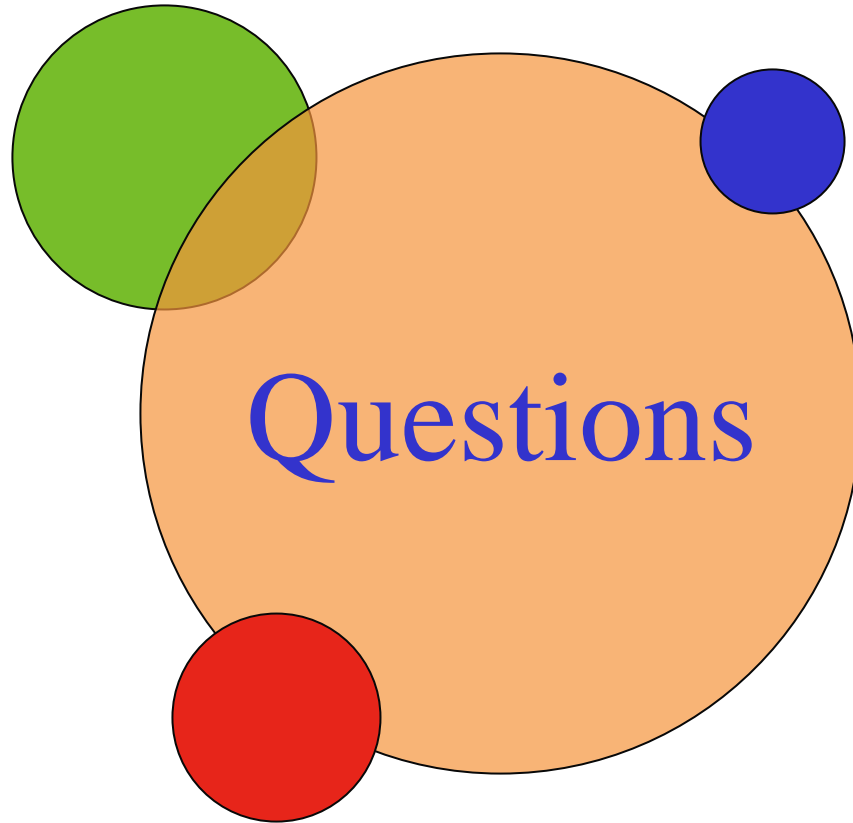
# Construction Sequencing (PP8)

- Actual construction may not synch with queue
- Four general construction sequence variations
  - Consistent with queue without common upgrades
  - Consistent with queue with common upgrades
  - Not consistent with queue without common upgrades
  - Not consistent with queue with common upgrades



# Future Meeting Dates in 2007

- Thursday October 25 – Publick House – Sturbridge, MA
  - Continue information sharing and process details
  - Identify key principles
- Tuesday November 6 – Double Tree Hotel – Westborough, MA
  - Continue information sharing and process details
  - Identify key principles
- Tuesday November 27 – Double Tree Hotel – Westborough, MA
  - Wrap up information sharing and process details presentations
  - Agree on full set of key principles for alternative development
  - Focus on next steps in the process
- December – Meeting Date To Be Determined
  - Continue next steps on how FCM and Queue can be better coordinated
  - Set up early 2008 meeting dates



# FCM Qualification Interconnection Analysis

Al McBride  
Principal Engineer

# From the Settlement Agreement...

“While a full and completed System Impact Study (SIS) is not a requirement to participate in the FCA, at a minimum, initial interconnection analysis is required. The ISO and the Reliability Committee shall work out specifics with respect to the performance of such initial interconnection analysis and selection criteria (including auction details) for multiple projects when only a subset of such projects can be selected in the FCA due to overlapping interconnections impacts”. SA II.B.3.c

# Initial Interconnection Analysis

- ISO shall perform an initial interconnection analysis and shall determine the amount of capacity that the resource could provide
- Include, but not limited to, a power flow analysis and a short circuit analysis
- If the ISO determines that the interconnection facilities and upgrades identified can not be implemented before the start of the Capacity Commitment Period, the New Generating Capacity Resource's summer Qualified Capacity may be adjusted or the Resource may not qualify

Market Rule 1 - Section III.13.1.1.2.3

# ISO-NE Planning Procedure 10

- Approved by the NEPOOL Participants Committee in September 2007
- Contains Procedures for the following
  - Base Case Development & Network Topology
  - Standard for Direct Connect Review
  - Standard for Initial Interconnection Analysis
  - Standard for Overlapping Impact Analysis
  - Guideline for determining if upgrades can be completed in time for the Commitment Period (Appendix F)

# Direct Connect Review

- Ability to connect the resource to the point of common coupling (Interconnection Point)
- Focus is on cases of longer distances
  - Uncertainty of actual Interconnection Point
  - Right-of-way issues
  - Land Ownership Issues
  - Terrain/Obstacles
  - Permittability

# Interconnection Analysis

- Assess the ability to interconnect by the start of the Capacity Commitment Period subject to a Minimum Interconnection Standard
  - Thermal Power Flow Analysis
  - Short Circuit Analysis
- Uses Large Generator Interconnection Procedure result whenever available
- For the FCM, if qualification is restricted due to Initial Interconnection Analysis, the threshold is
  - Where the upgrade(s) cannot be completed in time for the Commitment period
  - Where upgrades can be completed in time, the generator will be qualified and the generator will be responsible for the upgrades

# Overlapping Impacts within FCM

- New Qualified Capacity must be incrementally useful – must provide an additional capacity benefit
- New Generation is analyzed for Overlapping Interconnection Impacts during qualification
- For the FCM, if qualification is restricted due to overlapping impacts, the threshold is
  - Where the upgrade(s) cannot be completed in time for the Commitment period
  - Where upgrades can be completed in time, the generator will be qualified and the generator will be responsible for the upgrades
  - If applicable the resource may be partially qualified to participate in the FCA up to the amount that the resource can operate without fixing the observed violations

# Overlapping Impacts within FCM, *cont.*

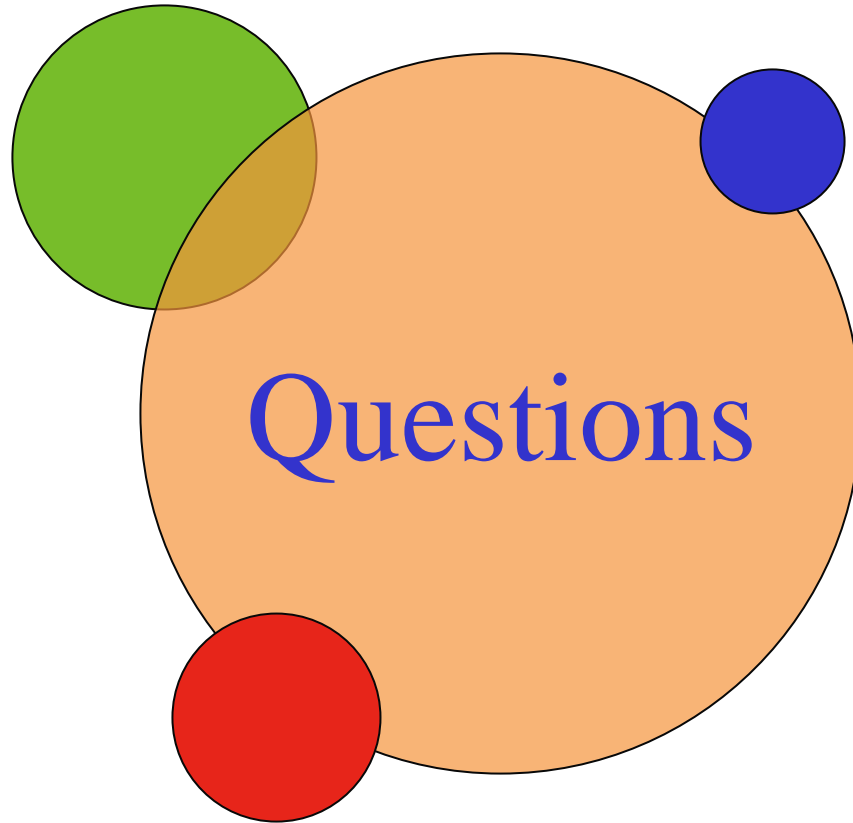
- Where multiple New Generating Resources cannot be selected because they overlap with each other
  - Interconnection Queue order is used to choose between the overlapping generators
  - For example, if the generator under study was the fifth in the Interconnection Queue, the generators that have a higher Interconnection Queue position that are seeking qualification for the Forward Capacity Auction will be included within the analysis
  - The new unit under study, will be responsible for those overloads within or neighboring the Load Zone to which it is electrically connected but will not be responsible for upgrading interfaces that form the boundaries between existing Load Zones
  - An ongoing, stakeholder process is underway to reevaluate the interaction of the generation Interconnection Queue and FCM Qualification

# Initial Interconnection Analysis

- Analysis of New Capacity under FCM differs from the Interconnection Request (IR) process and does not bypass the LGIP/SGIP
- LGIP/SGIP is more time-consuming than Initial Interconnection Analysis and may identify problems/costs not revealed by Initial Interconnection Analysis
- All New Capacity must complete the LGIP/SGIP before becoming interconnected
- An LGIP/SGIP IR may be submitted at anytime before, during or after the FCM Qualification process
  - Submitting an IR earlier in the process will provide more detailed information to the Project Sponsor regarding necessary interconnection and network transmission upgrades and their cost

# Initial Interconnection Analysis Compared with LGIP/SGIP Analysis

FCM Market Element	Interconnection Analysis under FCM	Potential System Impact Scope of Analysis Required before the project can Interconnect
<b>New Generating Capacity – Never Previously Listed</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity – Capacity Addition to Existing Capacity</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal,</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity – Re-powering Modification to Existing Capacity</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal (if greater MW)</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity – Modifications to comply with Environmental Regulations</b>	<ul style="list-style-type: none"> <li>• None (provided no change in capacity or major electrical equipment)</li> </ul>	<ul style="list-style-type: none"> <li>• None (provided no change in capacity or major electrical equipment)</li> </ul>



# FCM Qualification Interconnection Analysis

Al McBride  
Principal Engineer

# From the Settlement Agreement...

“While a full and completed System Impact Study (SIS) is not a requirement to participate in the FCA, at a minimum, initial interconnection analysis is required. The ISO and the Reliability Committee shall work out specifics with respect to the performance of such initial interconnection analysis and selection criteria (including auction details) for multiple projects when only a subset of such projects can be selected in the FCA due to overlapping interconnections impacts”. SA II.B.3.c

# Initial Interconnection Analysis

- ISO shall perform an initial interconnection analysis and shall determine the amount of capacity that the resource could provide
- Include, but not limited to, a power flow analysis and a short circuit analysis
- If the ISO determines that the interconnection facilities and upgrades identified can not be implemented before the start of the Capacity Commitment Period, the New Generating Capacity Resource's summer Qualified Capacity may be adjusted or the Resource may not qualify

Market Rule 1 - Section III.13.1.1.2.3

# ISO-NE Planning Procedure 10

- Approved by the NEPOOL Participants Committee in September 2007
- Contains Procedures for the following
  - Base Case Development & Network Topology
  - Standard for Direct Connect Review
  - Standard for Initial Interconnection Analysis
  - Standard for Overlapping Impact Analysis
  - Guideline for determining if upgrades can be completed in time for the Commitment Period (Appendix F)

# Direct Connect Review

- Ability to connect the resource to the point of common coupling (Interconnection Point)
- Focus is on cases of longer distances
  - Uncertainty of actual Interconnection Point
  - Right-of-way issues
  - Land Ownership Issues
  - Terrain/Obstacles
  - Permittability

# Interconnection Analysis

- Assess the ability to interconnect by the start of the Capacity Commitment Period subject to a Minimum Interconnection Standard
  - Thermal Power Flow Analysis
  - Short Circuit Analysis
- Uses Large Generator Interconnection Procedure result whenever available
- For the FCM, if qualification is restricted due to Initial Interconnection Analysis, the threshold is
  - Where the upgrade(s) cannot be completed in time for the Commitment period
  - Where upgrades can be completed in time, the generator will be qualified and the generator will be responsible for the upgrades

# Overlapping Impacts within FCM

- New Qualified Capacity must be incrementally useful – must provide an additional capacity benefit
- New Generation is analyzed for Overlapping Interconnection Impacts during qualification
- For the FCM, if qualification is restricted due to overlapping impacts, the threshold is
  - Where the upgrade(s) cannot be completed in time for the Commitment period
  - Where upgrades can be completed in time, the generator will be qualified and the generator will be responsible for the upgrades
  - If applicable the resource may be partially qualified to participate in the FCA up to the amount that the resource can operate without fixing the observed violations

# Overlapping Impacts within FCM, *cont.*

- Where multiple New Generating Resources cannot be selected because they overlap with each other
  - Interconnection Queue order is used to choose between the overlapping generators
  - For example, if the generator under study was the fifth in the Interconnection Queue, the generators that have a higher Interconnection Queue position that are seeking qualification for the Forward Capacity Auction will be included within the analysis
  - The new unit under study, will be responsible for those overloads within or neighboring the Load Zone to which it is electrically connected but will not be responsible for upgrading interfaces that form the boundaries between existing Load Zones
  - An ongoing, stakeholder process is underway to reevaluate the interaction of the generation Interconnection Queue and FCM Qualification

# Initial Interconnection Analysis

- Analysis of New Capacity under FCM differs from the Interconnection Request (IR) process and does not bypass the LGIP/SGIP
- LGIP/SGIP is more time-consuming than Initial Interconnection Analysis and may identify problems/costs not revealed by Initial Interconnection Analysis
- All New Capacity must complete the LGIP/SGIP before becoming interconnected
- An LGIP/SGIP IR may be submitted at anytime before, during or after the FCM Qualification process
  - Submitting an IR earlier in the process will provide more detailed information to the Project Sponsor regarding necessary interconnection and network transmission upgrades and their cost

# Initial Interconnection Analysis Compared with LGIP/SGIP Analysis

FCM Market Element	Interconnection Analysis under FCM	Potential System Impact Scope of Analysis Required before the project can Interconnect
<b>New Generating Capacity – Never Previously Listed</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity – Capacity Addition to Existing Capacity</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal,</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity – Re-powering Modification to Existing Capacity</b>	<ul style="list-style-type: none"> <li>• Thermal</li> <li>• Short-Circuit</li> <li>• Overlapping Interconnection Impacts</li> <li>• Identify Violations</li> <li>• Determination whether upgrades can be implemented in time for the Commitment Period</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal (if greater MW)</li> <li>• Short-Circuit</li> <li>• Voltage</li> <li>• Stability</li> <li>• Identify Violations</li> <li>• Develop Solutions &amp; Costs</li> </ul>
<b>New Generating Capacity – Modifications to comply with Environmental Regulations</b>	<ul style="list-style-type: none"> <li>• None (provided no change in capacity or major electrical equipment)</li> </ul>	<ul style="list-style-type: none"> <li>• None (provided no change in capacity or major electrical equipment)</li> </ul>

