Reliability Needs Assessment Conference

2005 Reliability Needs Assessment

William A. Lamanna
NYISO Process

INITIAL PHASE

NYISO Performs Reliability Needs Assessment (RNA)

NYISO to Publicize Reliability Needs Assessment

NYISO Issues Request for Solutions

Market-Based Responses
- Generation
- DSM
- Merchant Transmission

Regulated Responses
- Transmission
- May consider alternatives
- TO & non-TO proposals

NYISO Evaluates Market-Based Responses and Regulated Responses To Ensure They Will Meet the Identified Reliability Needs
DPS screens non-TO alternative regulated proposals

NYISO Formulates Comprehensive Reliability Plan (CRP)

No viable/timely mkt. or reg. solution to an identified need

Board Approval of Plan

“Gap” Solutions by TOs

Board Approval of Plan

COMPREHENSIVE PHASE
NYISO CRPP: RNA Preparation

- NYISO Performs RNA Over Ten Year Study Period
- Two Five Year Periods to Recognize Project Lead Times
- System Model for first Five Year Base Case
  - Baseline Defined Similar to ATRA
  - Evaluate Resource and Transmission Adequacy for Each Year
- Second Five Year Period System Model
  - Develop Model from Many Sources Specified
  - Resource & Transmission Adequacy Evaluated for Each Year
  - Fault Duty Assessment Performed for Tenth Year Only
NYISO CRPP: Data Preparation For Base Case

- Ten Year Zonal Load Forecast Developed (LFWG)
  - Base, Low, and High Forecast Developed
  - Includes Demand Side Management
- Ten Year Forecast of SCRs and EDRP with Stakeholder Input
  - Special Case Resources Constant over Ten Year Period
  - Emergency Demand Response Program Resources
- External Capacity Resources
  - Coordinate with Neighbors Through Regional Process
  - Coordinate with Present External Capacity Resources
NYISO CRPP: Input and Preparation For Base Case

- Input Sources and Development of Base Case
  - NYISO 2005 Load and Capacity Report
  - Projects Screened for Base Case Treatment
  - Projects Not in Base Case Assessed in Scenario Analysis
  - Retirements Identified
  - Input Data Solicited in General Requests, Specific Requests, and Individual Meetings
- NYISO Databank Process and Base Case Review
- NPCC and NERC Database Process
NYISO CRPP: Proposed Scenario Analysis

- Directly from Attachment Y - Load Forecast Uncertainty, Fuel Price and Availability, New Resources, Retirements, Transmission Changes, and Environmental Regulation Impacts

- Reviewed From the Initial Planning Process (IPP) Report

- Developed from Stakeholder Input

- Consultant and NYISO Developed New Drivers and Potential Scenarios for Testing

- Includes Projects that Failed Baseline Inclusion at Start Of Process

- Goal is to Test Robustness of Plan and Potential Procedure and Rules Modifications
Definition of NYISO Zones

Zones G – K Comprise SENY
Zones A – I Comprise ROS
From 1994 through 2004 load growth for the NYCA averaged approx. 1.2%.

However, load growth in SENY (G-K) has averaged approx. 2.8% while UPNY (A-F) has experienced neg. load growth.

Load growth in SENY through 2004 totals close to 5,000 MW while the net capacity additions for SENY total approx. 1,250 MWs.

The CRP base case has statewide load growth which averages about 1.2% with modest growth in UPNY and slightly less than 2% in SENY.

The CRP base case installed resources increase through 2007 but decline thereafter.

Resources are approximately at 2004 levels by 2008.

Neptune LI-PJM Tie included in base case at 660 MW.
Base Case Load Growth

Weather-normalized Summer Peaks

UPNY  SENY  NYCA
# Unit Retirements

## Retirements

<table>
<thead>
<tr>
<th>OWNER / OPERATOR</th>
<th>STATION</th>
<th>UNIT</th>
<th>ZONE</th>
<th>DATE</th>
<th>SUMMER</th>
<th>WINTER</th>
<th>REASON FOR RETIREMENT</th>
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<tr>
<td><strong>Scheduled Retirements with New Projects</strong></td>
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<td>Consolidated Edison Company of NY, Inc.</td>
<td>Waterside 6,8,9</td>
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<td>167200</td>
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<td>Poletti 1</td>
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<td>ROS</td>
<td>3/1/2005</td>
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<td>364600</td>
<td>Station Replacement</td>
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<td><strong>Scheduled Retirements</strong></td>
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**Total:** 2261200 2363600
# Future Projects in Baseline

## Projects Under Construction

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<tr>
<th>OWNER / OPERATOR</th>
<th>STATION</th>
<th>UNIT</th>
<th>ZONE</th>
<th>DATE</th>
<th>CAPABILITY (kW)</th>
<th>UNIT TYPE</th>
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<td>NYPA 500 MW Project</td>
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<td>SCS Energy, LLC</td>
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Total: 2197800 kW

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NYCA Base Case Reserve Margin

Reserve Margin %

Planning Horizon 2006 - 2015

Res. Margin With UDRs
Res. Margin w/o UDRs
Zone J Base Case Resource to Load Ratio

Planning Horizon 2006 - 2015

Ratio as %
Zone K Base Case Resource to Load Ratio

Planning Horizon 2006 - 2015

Ratio as %

- Ratio with UDRs
- Ratio w/o UDRs
Base Case Findings

- This reliability needs assessment for the baseline system for the first Five Year period indicates that the forecasted system does not meet reliability criteria. Therefore, because of continued load growth and no resource additions, the second Five Year period does not meet reliability criteria.

- The demands that are increasingly being placed on the transmission system in conjunction with other system changes have resulted in voltage criteria violations at much lower transfer levels than had been previously observed.

- The result is that transfers into and through SENY are being limited by voltage constraints rather than thermal constraints.
Steps Taken to Quantify Reliability Needs

- Goal is Not to Identify Specific Locations/Plans
- Goal is to be Flexible in Market Responses
- Insertion of Reactive Compensation, Active and Reactive
- Capacity Additions as Compensatory MWs for Demonstration
- Resource Adequacy Tested By Varying Transfer Limits
Reliability Needs: Voltage Constrained Transfer Limits

- First Year of Need Is 2008
- Resource Adequacy Violations Significantly Above Criteria
- Compensatory MW of Approximately 1750 MW required by 2010
- Voltage Limits Sensitive to MVAR Demand and Losses
- Compensatory Actions Do Not Have to be MW Additions, Transmission Reinforcements/MVAR Compensation Work
- Increasing Transfer Limits Reduces Compensatory MWs and Delays Year of Need
- Transfer Limits Can be Increased in Increments
Reliability Needs (Cont.): Transfer Limit Sensitivity & M29 Scenario

- Increase in Transfer Limits Sensitivity Showed a Significant Decrease in Compensatory MWs of over 500 MW

- Equivalent LOLE Reduction was From 2.43 Days/Year to 0.752 Days/Year

- M29 Addition Impacts Key Transfer Limit into NYC by Over 300 MWs

- Equivalent LOLE Reduction was From 0.752 Days/Year to 0.628 Days/Year

- Increasing Transfer Limits has Diminishing Returns Effect on LOLE
Conclusions and Recommendations

- Compensatory MW are indicative of potential needs to solve reliability criteria violations.

- The type of solutions and their location and resultant transfer levels will determine the overall needs necessary to meet reliability criteria.

- Request for solutions should target needs for the 2008 – 2011 timeframe.

- The Solutions Phase is Underway, But is Still Open to All Three Solution Types