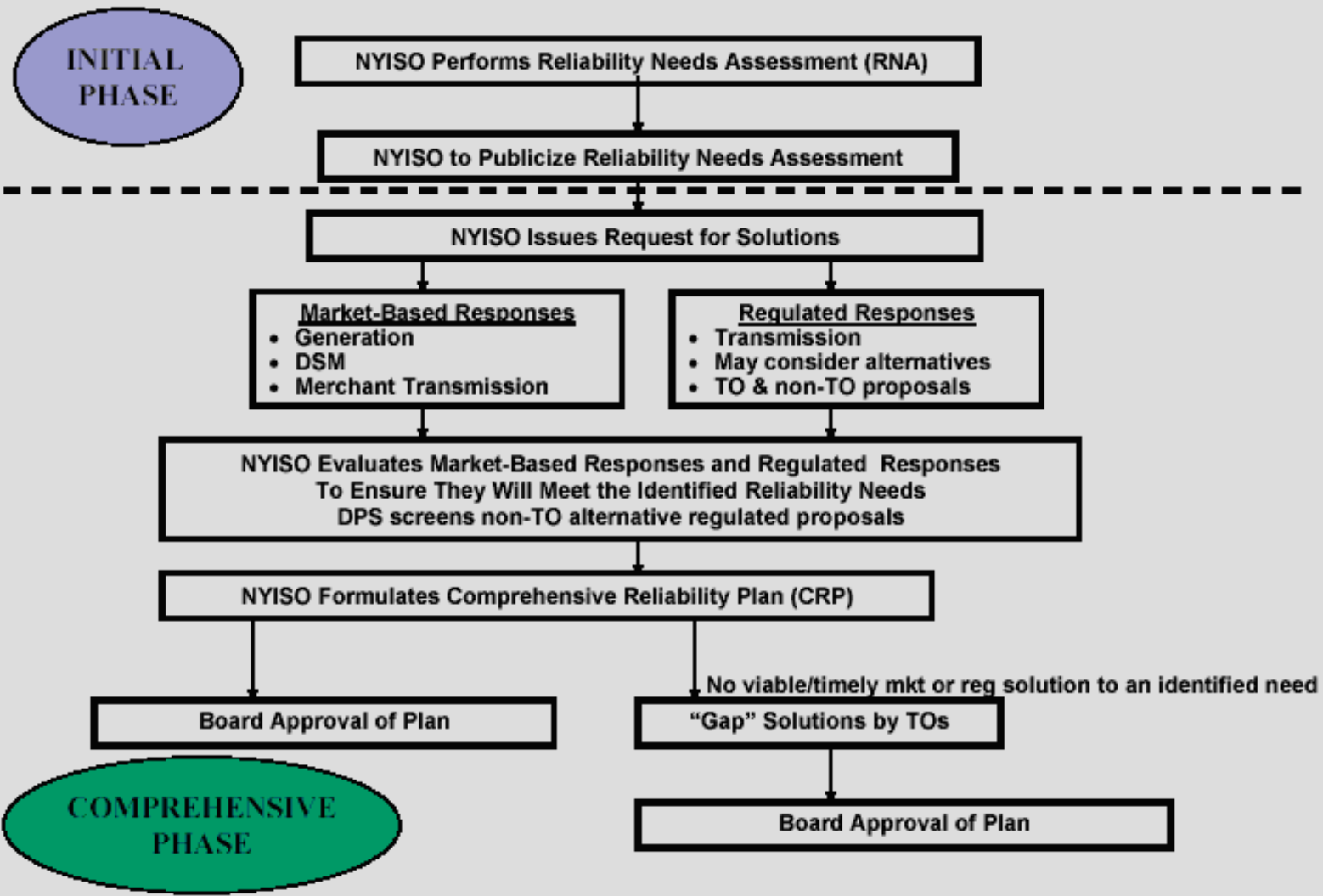


Comprehensive Reliability Planning Process (CRPP) Draft RNA Results

For Discussion Purposes Only

10/27/2005

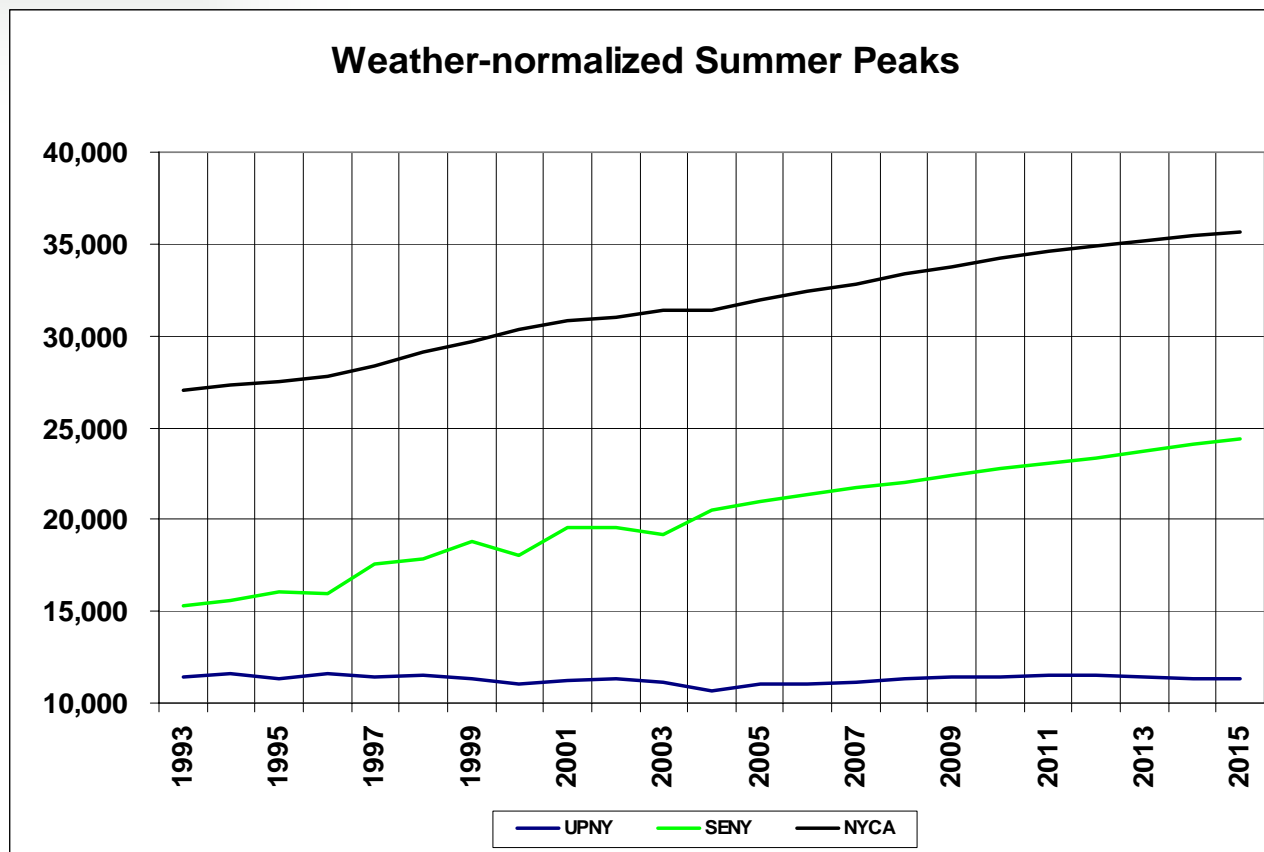
NYISO Reliability Planning Process



NYISO CRPP: Background & Base Case

- **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. 1250 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**

Base Case Load Growth

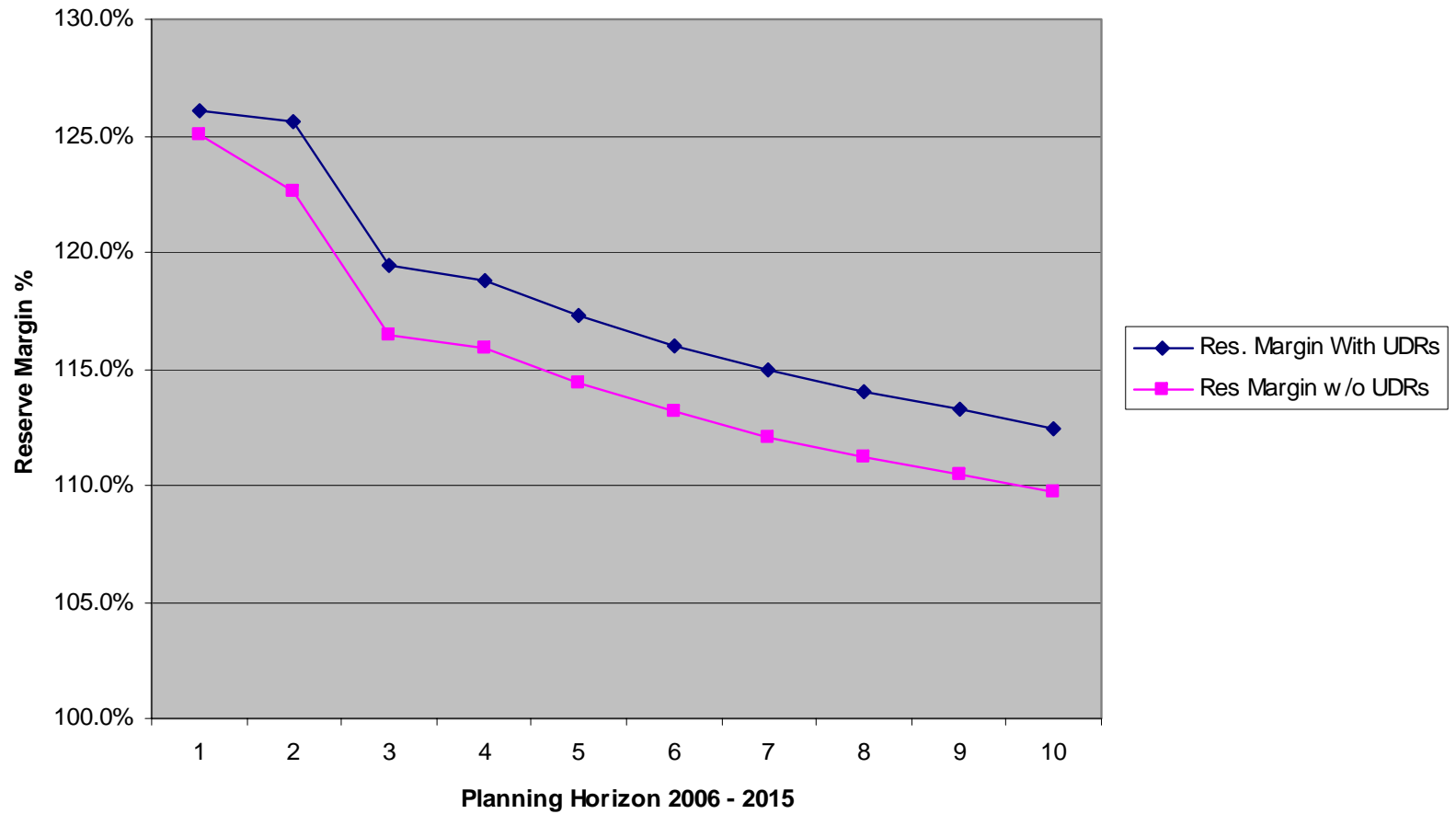


Unit Retirements

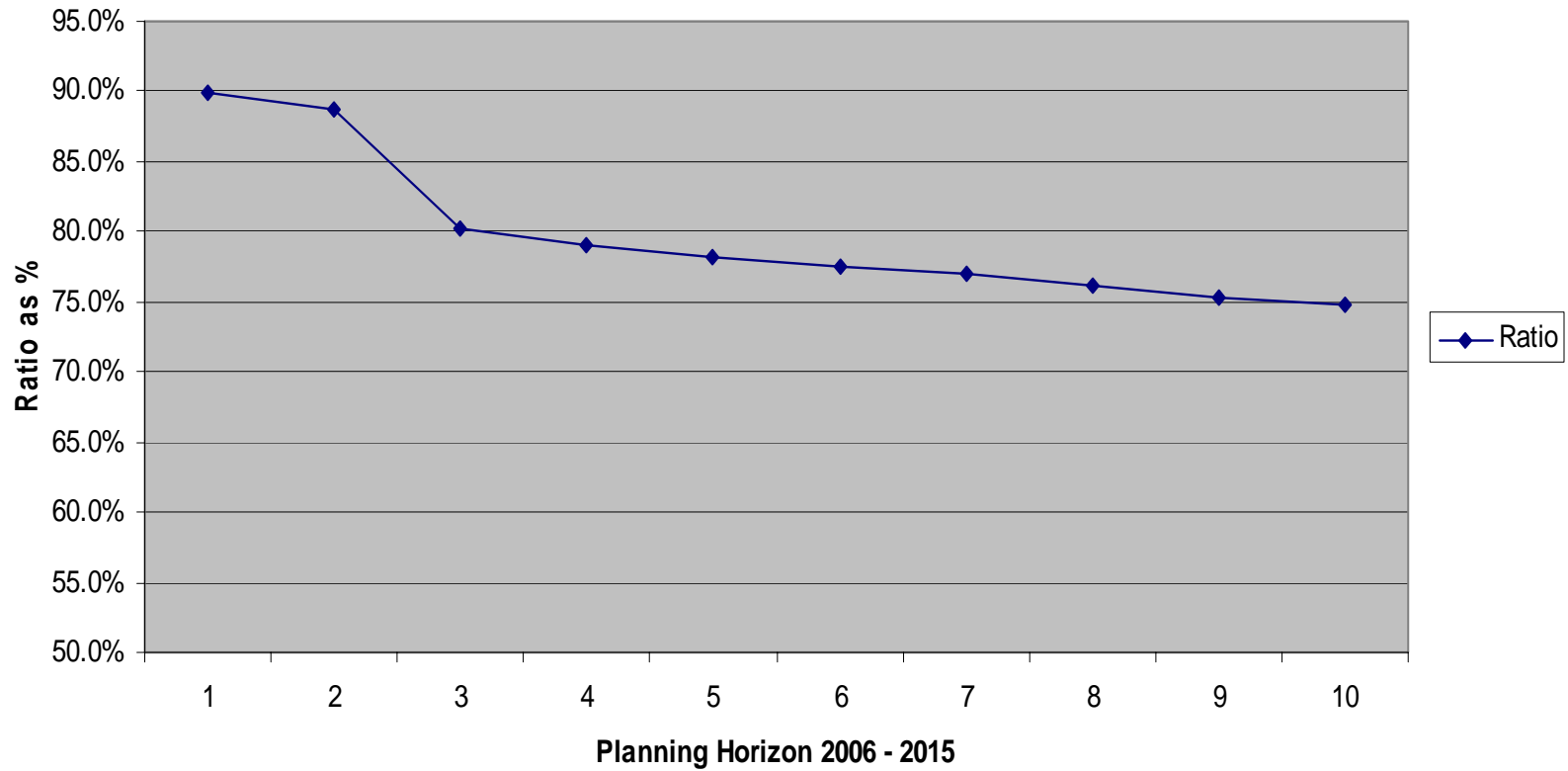
RETIREMENTS

OWNER / OPERATOR	STATION	UNIT	ZONE	DATE	CAPABILITY (kW)		REASON FOR RETIREMENT
					SUMMER	WINTER	
<u>Scheduled Retirements with New Projects</u>							
Consolidated Edison Company of NY, Inc.	Waterside 6,8,9		J	7/1/2005	167200	167800	Station Repowering
New York Power Authority	Poletti 1		J	2/1/2008	885300	885700	Station Replacement
PSEG Power NY	Albany 1,2,3,4		ROS	3/1/2005	312300	364600	Station Replacement
<u>Scheduled Retirements</u>							
NRG Power, Inc.	Huntley 63,64		ROS	11/1/2005	60600	96800	Environmental Restrictions
NRG Power, Inc.	Huntley 65,66		ROS	11/1/2006	166800	170000	Environmental Restrictions
Rochester Gas and Electric Corporation	Russell Station		ROS	12/1/2007	238000	245000	Environmental Restrictions
<u>Planned Retirements</u>							
Mirant Corporation	Lovett 5		ROS	6/1/2007	188500	189700	Company 10-K Report
Mirant Corporation	Lovett 3		ROS	6/1/2008	68500	68500	Company 10-K Report
Mirant Corporation	Lovett 4		ROS	6/1/2008	174000	175500	Company 10-K Report
					2261200	2363600	

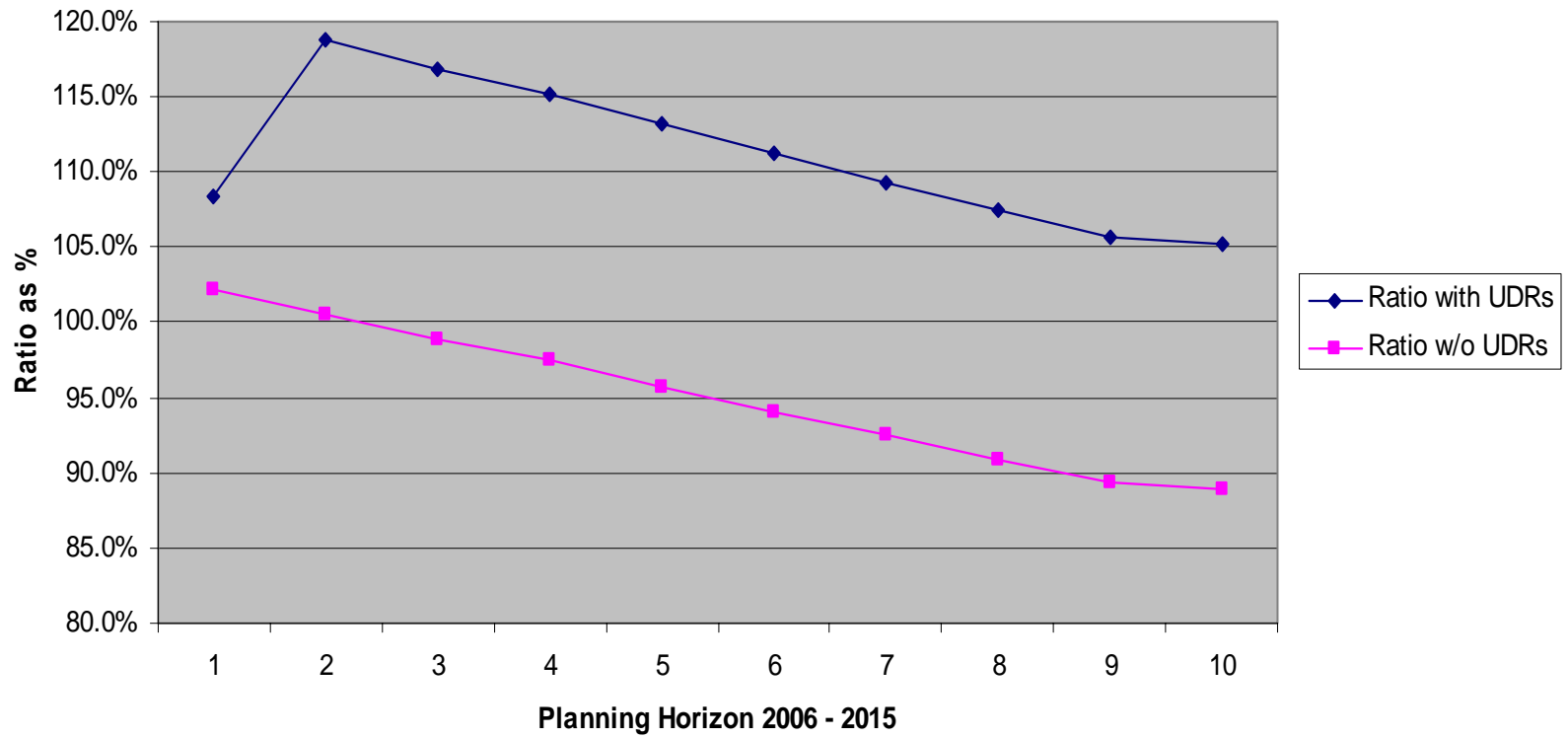
NYCA Base Case Reserve Margin



Zone J Base Case Resource to Load Ratio



Zone K Base Case Resource to Load Ratio



Primary Analysis Tools

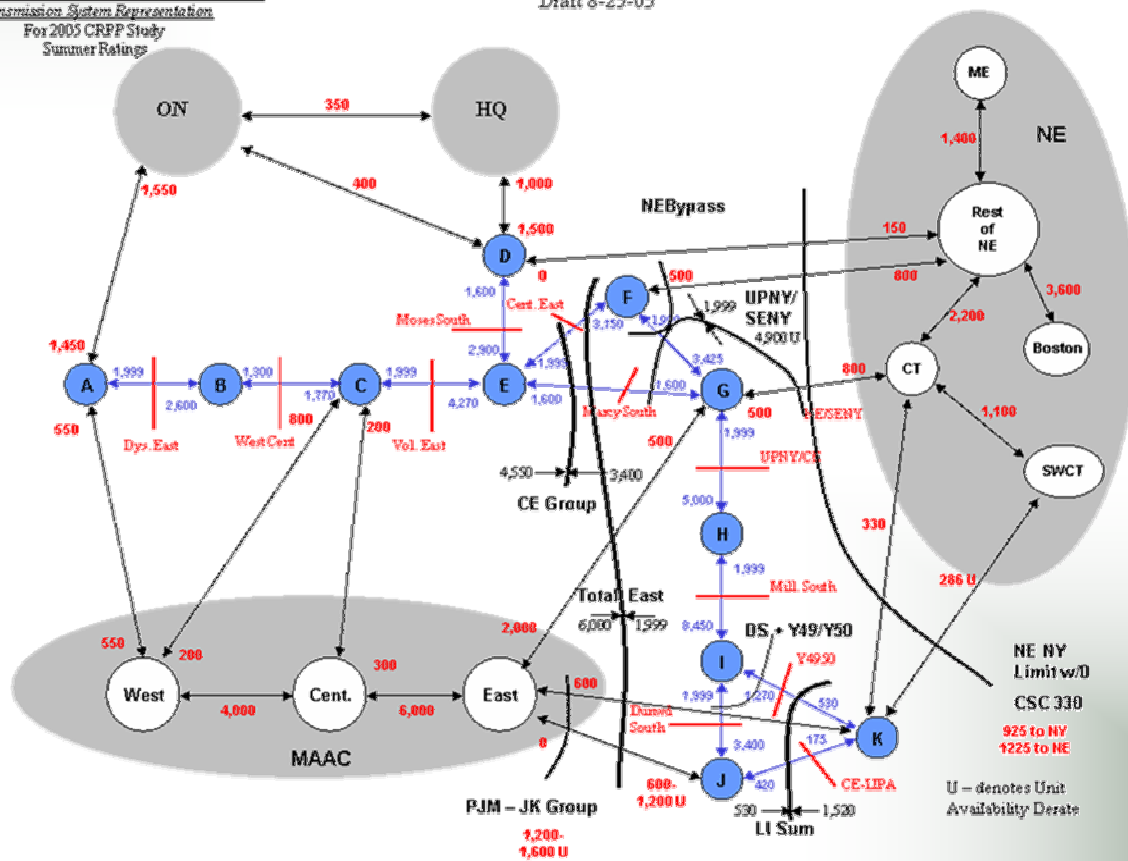
- **GE Multi-Area Reliability Simulation (MARS) model to evaluate resource adequacy – the 1 in 10 criteria**
- **PSS/E used to conduct power flow analysis to evaluate the security of the transmission system based on thermal, voltage, and stability criteria and to determine transfer limits.**
- **Transfer limits are used in the MARS model which uses a linear programming transportation model to simulate delivery of capacity via the transmission system to meet resource adequacy requirements.**
- **MARS is a probabilistic model which uses Monte Carlo simulation and does not use a network model.**

MARS Transmission Topology

New York Control Area

Transmission System Representation
For 2005 CRPP Study
Summer Ratings

Draft 8-25-05



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 SENY are being limited by voltage constraints rather than thermal constraints.**

Base Case Findings Cont.

➤ Steps Taken to Quantify Reliability Needs

- **Goal is Not to Identify Specific Locations/Plans**
- **Scaling of MVAR Load**
- **Insertion of Reactive Compensation, Active and Reactive**
- **Capacity Additions**
- **Resource Adequacy Tested By Varying Transfer Limits**

Reliability Needs: Voltage Constrained Transfer Limits

- First year of need would be 2008
- Compensatory MW in excess 2000 MW required by 2010
- MARS LOLE results were as follows:

AREA OR POOL	2006	2007	2008	2009	2010
AREA-A	0.000	0.000	0.000	0.000	0.000
AREA-B	0.000	0.000	0.000	0.000	0.000
AREA-C	0.000	0.000	0.000	0.000	0.000
AREA-D	0.000	0.000	0.000	0.000	0.000
AREA-E	0.000	0.000	0.000	0.000	0.000
AREA-F	0.000	0.000	0.000	0.000	0.000
AREA-G	0.000	0.000	0.000	0.000	0.020
AREA-H	0.000	0.000	0.000	0.006	0.008
AREA-I	0.001	0.001	0.021	0.078	0.212
AREA-J	0.001	0.002	0.455	0.794	2.540
AREA-K	0.021	0.001	0.026	0.071	0.184
NYCA	0.022	0.004	0.463	0.818	2.583

Reliability Needs (Cont.): Thermally Constrained Transfer Limits

- First year of need would be 2009 with I – J at 3450.
- Compensatory MW of approx. 1250 MW required by 2010
- MARS LOLE results were as follows:

AREA OR POOL	2006	2007	2008	2009	2010
AREA-A	0.000	0.000	0.000	0.000	0.000
AREA-B	0.000	0.000	0.000	0.000	0.000
AREA-C	0.000	0.000	0.000	0.000	0.000
AREA-D	0.000	0.000	0.000	0.000	0.000
AREA-E	0.000	0.000	0.000	0.000	0.000
AREA-F	0.000	0.000	0.000	0.000	0.000
AREA-G	0.000	0.000	0.000	0.001	0.017
AREA-H	0.000	0.000	0.001	0.001	0.007
AREA-I	0.000	0.001	0.038	0.088	0.505
AREA-J	0.000	0.001	0.055	0.124	0.583
AREA-K	0.021	0.002	0.029	0.070	0.309
NYCA	0.021	0.003	0.073	0.160	0.752

Reliability Needs (Cont.): Thermally Constrained Transfer Limits

- **First year of need remains at 2009 with I – J at 3700.**
- **NYCA LOLE for 2010 drops from .752 to .652.**
- **MARS LOLE results were as follows:**

AREA OR POOL	2009	2010
AREA-A Thru AREA-E	0.000	0.000
AREA-F	0.000	0.000
AREA-G	0.002	0.013
AREA-H	0.001	0.007
AREA-I	0.088	0.494
AREA-J	0.980	0.480
AREA-K	0.067	0.304
NYCA	0.136	0.652

Reliability Needs (Cont.): M29 Scenario

- **NYCA LOLE for 2010 drops from .752 to .628.**
- **MARS LOLE results were as follows:**

AREA OR POOL	Without M29		With M29	
	2007	2010	2007	2010
AREA-A				
AREA-B				
AREA-C				
AREA-D				
AREA-E				
AREA-F				
AREA-G		.017		.019
AREA-H		.007	.002	.007
AREA-I	.001	.505	.001	.916
AREA-J	.001	.583	.001	.404
AREA-K	.002	.309	.003	.337
NYCA	.003	.752	.003	.628

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 2010 – 2011 timeframe.**
- **The NYISO is recommending that the OC approve the draft RNA and requesting that the ESPWG and TPAS support that recommendation.**