2010 Reliability Needs Assessment (RNA) Overview

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The Roles of the NYISO

Reliable operation of the bulk electricity grid

- *Managing the flow of power nearly 11,000 circuit-miles of transmission lines from more than 300 generating units*

Administration of open and competitive wholesale electricity markets

- *Bringing together buyers and sellers of energy and related products and services*

Planning for New York's energy future

- *Assessing needs over a 10-year horizon and evaluating the feasibility of projects proposed to meet those needs*

Advancing the technological infrastructure of the electric system

- *Developing and deploying information technology and tools to make the grid smarter*

Topics

- **Reliability Planning**
- **NYISO's Comprehensive System Planning Process (CSPP)**
  - ***Reliability (CRPP)***
  - ***Economics (CARIS)***
- **2010 RNA Results**
- **Next Steps**

Reliability Planning

- **Reliability Need - a violation or potential violation of a Reliability Criteria**
- **Reliability Planning - security and adequacy assessments to meet design and planning reliability criteria**
- **Reliability Criteria are the electric power system planning and operating policies, standards, criteria, rules, etc. of the**
  - ***North American Electric Reliability Council ("NERC")***
  - ***Northeast Power Coordinating Council ("NPCC")***
  - ***New York State Reliability Council ("NYSRC")***
- Adequacy example: Loss of Load Expectation ("LOLE"), or the probability that customers will lose electric service, shall not exceed one day in ten years (or .1 days per year)
- Security example: Ability of the power system to withstand sudden loss of elements and maintain service (contingency)

NYISO's Planning Role

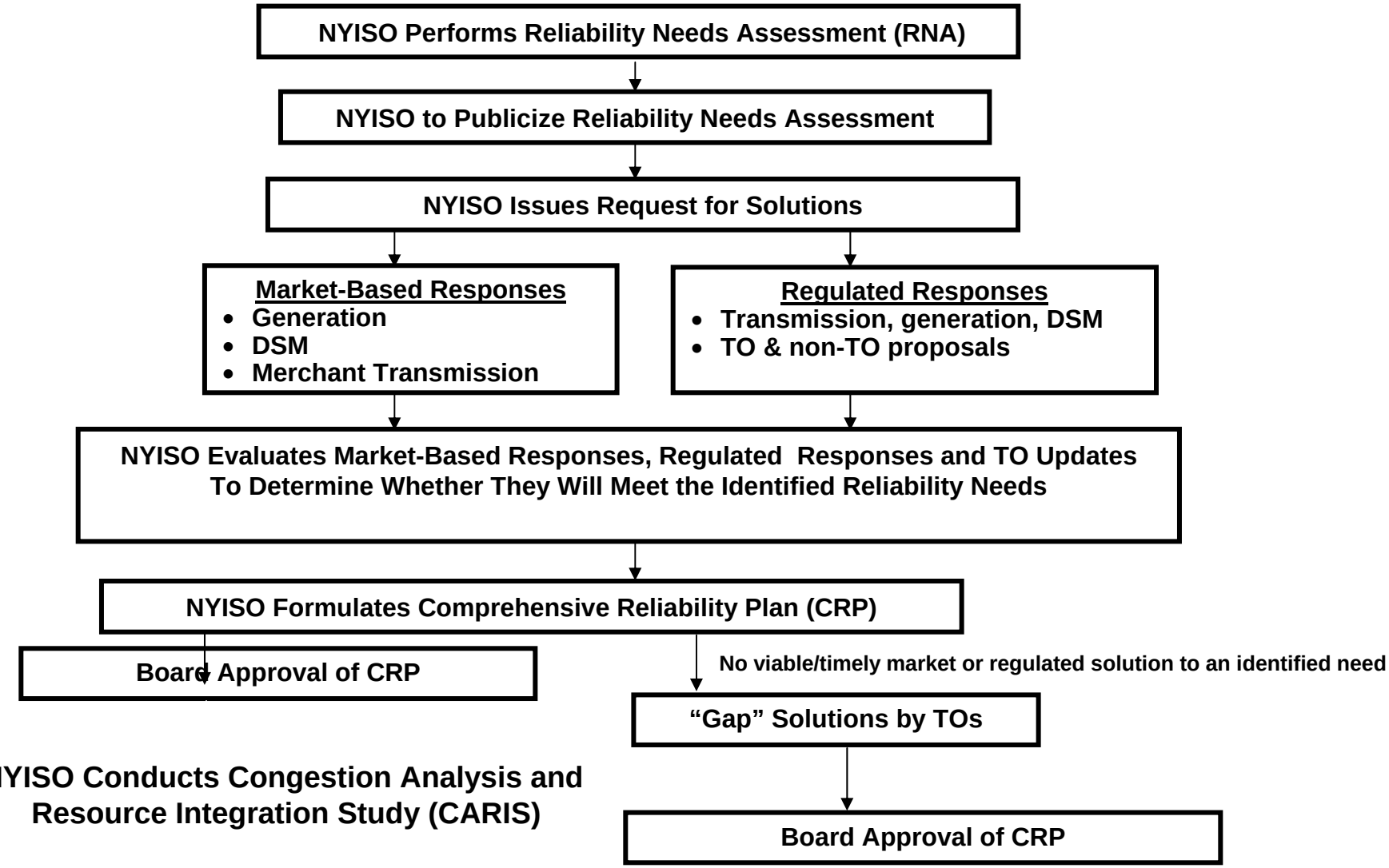
- **Focused on how best to identify reliability needs, enhance efficiency of the power system, and safeguard the transparency and fairness of the markets**
- **Looks ahead to assess New York's electricity needs and evaluate the ability of planned new power facilities and other options to meet those needs**
- **Began an economic planning process in 2009**
- **Engages a diverse array of stakeholders, regulators, public officials, consumer representatives, and energy experts in order to receive vital information and input from a variety of viewpoints**
- **Produces an array of research, studies and reports**

NYISO Comprehensive System Planning Process (CSPP)

Objectives of the CSPP

- **Comprehensive System Planning Process (CSPP) is conducted in steps:**
  1. **Reliability Needs Assessment (RNA)**
  2. **Comprehensive Reliability Plan (CRP)**
  3. **Congestion Analysis and Resource Integration (CARIS)**
- **RNA evaluates the reliability needs of NY Bulk Power Transmission System and identifies needs and any factors and issues that might adversely impact the reliability of the system**
- **RNA also provides an analysis of historic congestion**
- **CRP provides a process whereby all proposed solutions to identified needs are proposed, evaluated and planned in a timely manner**
- **NYISO Board-approved CRP provides the basis for the next step, CARIS**
- **CARIS is a process for conducting economic studies to evaluate proposed solutions to identified congestion**

Reliability Planning: CRPP



Market-Based Approach

- **The NYISO strives to achieve market-based solutions whenever possible**
  - ***Market design & rules***
  - ***Planning process***
- **This approach has been generally supported by the NYS PSC and most other stakeholders and market participants**
  - ***NYISO utilizes an open and transparent process for stakeholder participation***
- **NYISO markets and locational pricing signals provide the benefits of competition while achieving the intended results**
  - ***Except for wind power (which must be sited on basis of geography and climate), almost all of the new merchant generation & transmission has been built or is proposed for the Southeast NY region – where demand is greatest***
- **Developers and investors can assess normal market risks reasonably well**
  - ***Risk of regulatory intervention is less certain***
  - ***This uncertainty can have a chilling effect on the market***

Comprehensive Reliability Planning Process (CRPP)

- **A formal, transparent, long-term (10-year) planning process for the NYISO**
  - ***Provides for both market-based & regulated backstop solutions***
    - **All resources are considered on a comparable basis (Transmission, Generation & Demand Response)**
    - **Preference is given to market-based solutions**
  - ***Addresses roles of NYISO, FERC and NYS PSC***
  - ***Addresses cost allocation and cost recovery issues***
  - ***Provides a commitment to investigate cause of potential market failure and to modify market rules as needed***
  - ***NYISO-TO Agreement addresses TOs' rights and obligations under the CRPP***
- **Meets NYISO Objective**
  - ***Upgrades built when needed for reliability***

Reliability Needs Assessment
(1) Key Ideas

- **The NYISO prepares a RNA to identify Bulk Power System Reliability Needs, not solve them.**
- **"Reliability Need" defined as a violation or potential violation of a Reliability Criteria**
- **"Reliability Criteria" are the electric power system planning and operating policies, standards, criteria, rules, etc. of the**
  - ***North American Electric Reliability Council ("NERC")***
  - ***Northeast Power Coordinating Council ("NPCC")***
  - ***New York State Reliability Council ("NYSRC")***
- **For example: Loss of Load Expectation ("LOLE"), or the probability that customers will lose electric service, shall not exceed one day in ten years (or .1 days per year)**

Reliability Needs Assessment
(2) Steps in the Process

- **RNA evaluates bulk power system needs over a *five-year period*, and a *ten-year period***
- **Base Case model represents New York System and assesses whether facilities meet all reliability criteria for resource adequacy and transmission adequacy in each year for five years**
- **Considers changes on the system, such as growth in consumption over time**
- **Studies facilities' thermal, voltage, stability, and short circuit characteristics**
- **RNA does not identify specific facilities needed, but states needs in terms of failure to meet reliability criteria, such as 1 day in 10 years LOLE**
- **Evaluates system over 2nd five years to see if reliability criteria are met - more hypothetical given forecasting uncertainties**

Reliability Needs Assessment
(3) Stakeholder Inputs are Critical

- **Market Participants provide data inputs for NYISO studies**
- **Transmission Owners submit plans for their own bulk and non-bulk power systems to the NYISO**
- **NYISO considers Transmission Owners' plans in preparing the RNA, and ultimately the Comprehensive Reliability Plan (CRP)**
- **NYISO develops and studies alternative scenarios that account for unexpected, but possible changes *(e.g., additional growth in consumption beyond forecast)***

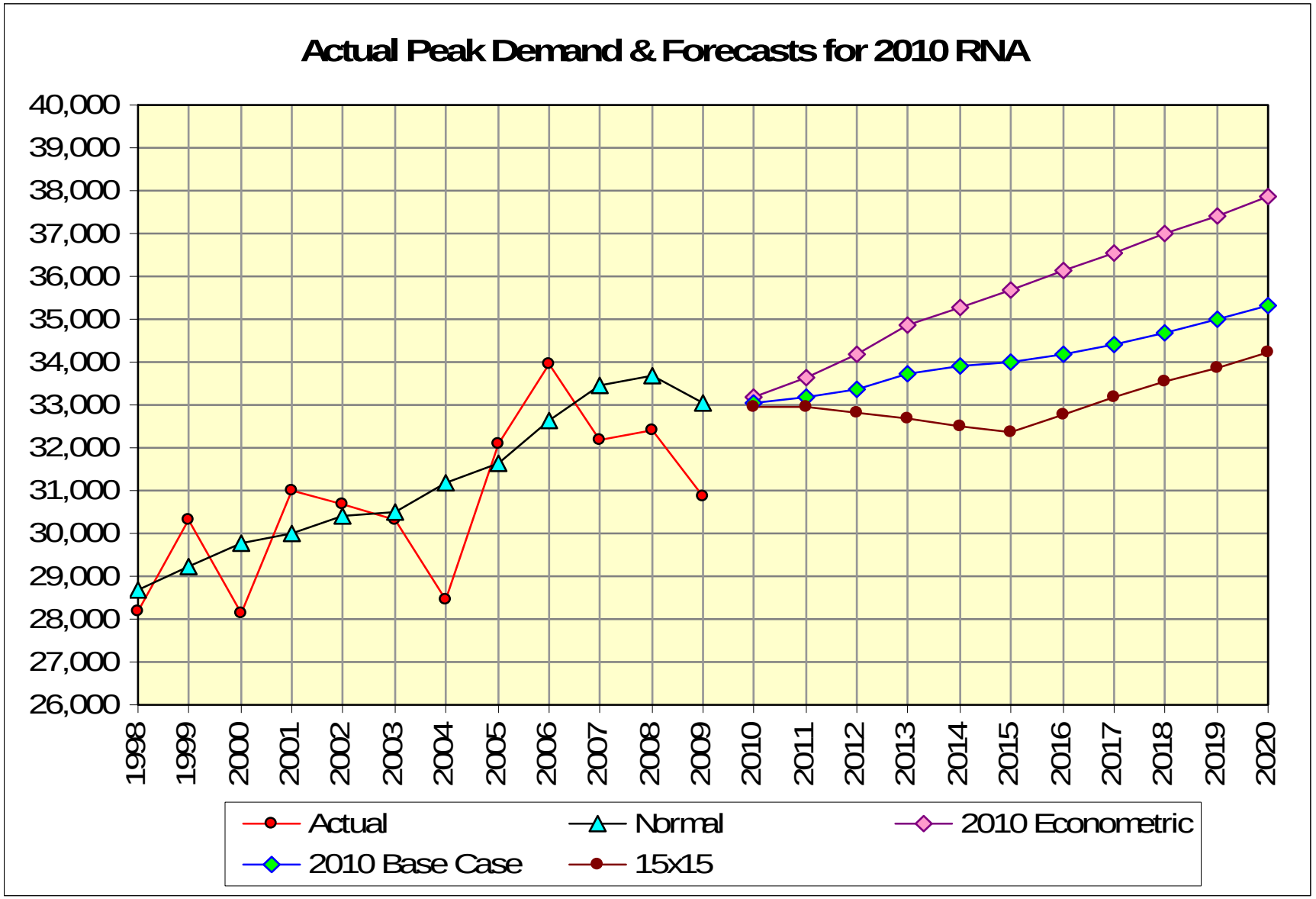
2010 RNA Results

2010 RNA Topics

- Drivers of the 2010 RNA
- RNA Scenarios
- Emerging Issues
- RNA Risk Factors
- RNA Results
- Recommendations
- RNA Conclusions

No Identified Reliability Needs

- **Drivers of the 2010 RNA**
  - ***2010 RNA Load Forecast***
  - ***Generation Units***
    - **Additions and Retirements**
  - ***Special Case Resource (SCR) Forecast and Reserve Margins***



RNA Load and Capacity Comparison - 2009 & 2010

	2009 RNA Horizon Year 2018	2010 RNA Year 2018	Year 2018 Delta MW	2010 RNA Horizon Year 2020
NYCA Load	35,658	34,672	-986	35,334
SCR	2084	2210	126	2251
Capacity without SCRs	40,452	41,239	787	41,239
Unit Retirements	1272	983	-289	983

NYCA Load and Resource Margins 2011 to 2020

Base Case Load Forecast

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Peak Load										
NYCA	33,160	33,367	33,737	33,897	34,021	34,193	34,414	34,672	34,986	35,334
Zone J	**11,775**	**11,815**	**11,925**	**11,995**	**12,065**	**12,120**	**12,218**	**12,298**	**12,404**	**12,510**
Zone K	**5384**	**5432**	**5455**	**5470**	**5489**	**5554**	**5586**	**5631**	**5685**	**5771**
Resources										
NYCA										
Capacity (1)	**40,447**	**40,647**	**41,338**	**41,239**	**41,239**	**41,239**	**41,239**	**41,239**	**41,239**	**41,239**
SCR (2)	**2065**	**2091**	**2151**	**2165**	**2171**	**2180**	**2193**	**2210**	**2230**	**2251**
Total	42,512	42,738	43,489	43,404	43,410	43,419	43,432	43,449	43,469	43,490
Res./Load Ratio	**128.2%**	**128.1%**	**128.9%**	**128.0%**	**127.6%**	**127.0%**	**126.2%**	**125.3%**	**124.2%**	**123.1%**
Zone J										
Capacity	**10,332**	**10,332**	**10,332**	**10,332**	**10,332**	**10,332**	**10,332**	**10,332**	**10,332**	**10,332**
SCR	**569**	**571**	**576**	**580**	**583**	**586**	**591**	**594**	**600**	**605**
Total	10,901	10,903	10,908	10,912	10,915	10,918	10,923	10,926	10,932	10,937
Res./Load Ratio	**92.6%**	**92.3%**	**91.5%**	**91.0%**	**90.5%**	**90.1%**	**89.4%**	**88.8%**	**88.1%**	**87.4%**
Zone K										
Capacity	**6311**	**6311**	**6311**	**6311**	**6311**	**6311**	**6311**	**6311**	**6311**	**6311**
SCR	**188**	**189**	**190**	**191**	**191**	**193**	**195**	**196**	**198**	**201**
Total	6499	6500	6501	6502	6502	6504	6506	6507	6509	6512
Res./Load Ratio	**120.7%**	**119.7%**	**119.2%**	**118.9%**	**118.5%**	**117.1%**	**116.5%**	**115.6%**	**114.5%**	**112.8%**

RNA Scenarios

Load Forecast Scenarios	Other Scenarios
◆***Base Case Load Forecast***	◆***Indian Point Plant Retirements***
◆***Econometric Load Forecast (Gold Book)***	◆***Imports and Wheel Throughs***
	◆***Environmental***
	◆***High Wind Penetration***
	◆***Zones at Risk***

Emerging Issues

An array of emerging environmental initiatives may impact reliability and costs to consumers. In New York State, the issues are driven by:

- ***New environmental standards (SOx, NOx, Carbon, etc.)***

Air and BTA Programs Combined Affected Capacity (MW) by Assigned Impact Excluding Category 1									
Super Zones	2	3	4	5	6	7	8	Total	LOLE Threshold Note
A-B-C-D-E-F	1647	2203	999	591	561	1030	73	7102	1
G-H-I	136	2189	0	1772	529	0	233	4857	2
J-K	862	0	382	2942	499	1778	187	6649	3
Total	2645	4391	1380	5304	1589	2807	492	18,609	

2010 RNA Risk Factors

- **Risk Factors**
  - *Failure to fully implement EEPS*
  - *Unexpected Unit Retirements*
  - *Projects under construction*
  - *Higher load demands*

RNA Summary

- **RNA Base Case shows no reliability needs for the ten year period. Therefore, no request for solutions will be issued.**
- **However, CRP report will be developed**
  - ***Scenarios show sensitivity of needs to input data***
  - ***Need starting point for CARIS***
  - ***Need to monitor projects in the Base Case and prior solutions***
- **The NYISO will address any newly identified reliability need in the subsequent RNA or, if necessary, issue a request for a Gap solution**

Recommendations

- **Based on the findings of the RNA, NYISO has developed recommendations to continually monitor system conditions to determine the impact of changes in system conditions:**
  - ***The determination of no reliability needs may change***
  - ***The actual performance of energy efficiency initiatives and the impact on demand***
  - ***Continued demand response and SCR participation in the NYISO market***
  - ***Transmission Owner plans***
  - ***Changes in environmental regulations and the impact on unit performance***
  - ***Market based project development***
  - ***Unexpected resource retirements***

Conclusions

- **New York's wholesale electricity markets have been highly responsive to the NYISO planning process by providing solutions of all types to previously identified needs**
- **Over 8,000 MW of generation added in NYCA since markets start-up**
  - ***Over 80% sited in SENY, where demand is greatest***
- **1,290 MW of transmission added**
  - ***Cross Sound Cable: 330 MW - Connecticut to Long Island***
  - ***Neptune: 660 MW - PJM to Long Island***
  - ***Linden VFT: 300 MW - NJ to New York City***
- **Demand Response has increased to over 2,200 MW**
- **CRPP has produced sufficient market-based resources and avoided need for regulated backstop solutions**

Next Steps

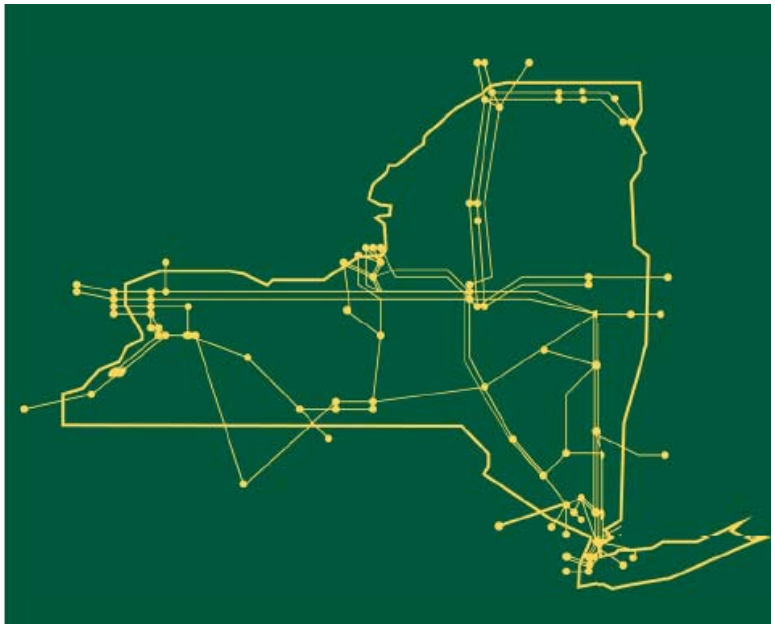
Comprehensive Reliability Plan (CRP)

- **Contains RNA findings, including identification of plan risk factors, recommendations and actions**
- **Considers all solutions and plans**
  - ***market-based***
  - ***regulated backstop***
  - ***alternative regulatory solutions***
  - ***Transmission Owners' plans***
- **Transmission Owners continue to plan for their own bulk and local system needs, and NYISO considers those plans in crafting CRP**
- **Sets base case and foundation for CARIS**

Market Monitor Review

- **Independent Market Advisor -- Potomac Economics -- assesses whether competitive markets are working properly**
- **Market Advisor reviews RNA and CRP**
- **Determines *"whether market rule changes are necessary to address an identified failure, if any, in one of the NYISO's competitive markets"***

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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