2016 RNA Results

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Management Committee Meeting

September 28, 2016

KCC

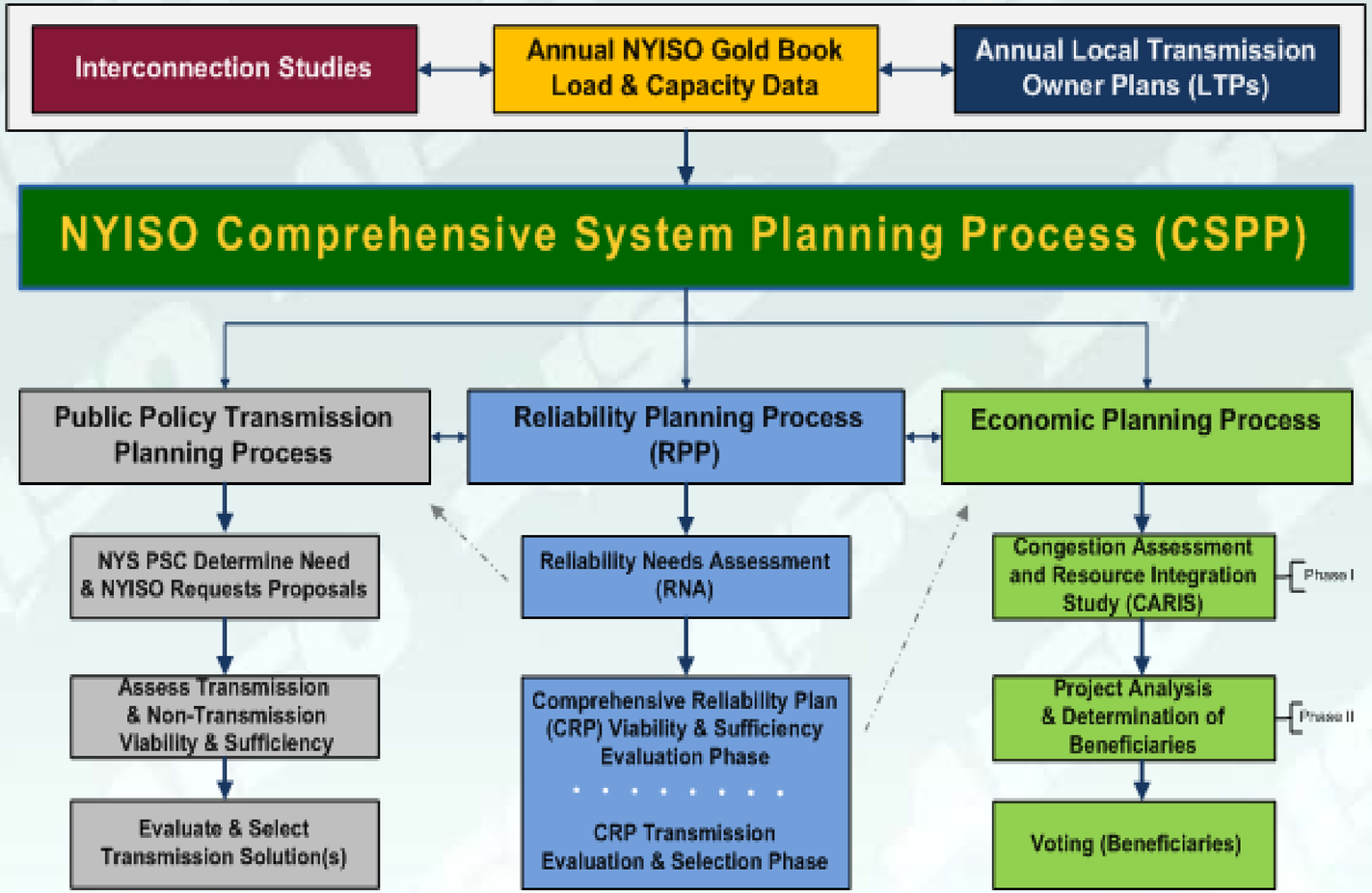
DRAFT – FOR DISCUSSION PURPOSES ONLY

Overview

- **This presentation describes:**
  - ***The Reliability Planning Process***
  - ***The 2016 RNA Major Assumptions***
  - ***The Resource Adequacy (RA) Results***
  - ***The Transmission Security (TS) Results***
  - ***Ministerial changes in the version of RNA Report approved by OC***
- ***Seeking MC concurrence on RNA Report at this September 28, 2016 meeting***

Reliability Planning Process (RPP)

- **The NYISO RPP is a two-year process and an integral part of the NYISO's overall Comprehensive System Planning Process (CSPP).**
- **During the RPP, the NYISO conducts the Reliability Needs Assessment (RNA) and the Comprehensive Reliability Plan (CRP).**



2016 RNA: Process Background

- **The RNA evaluates the adequacy and security of the Bulk Power System over a ten-year Study Period *(2017 to 2026 for this RNA),* and identifies Reliability Needs.**
  - ***Resource adequacy is the ability of the electric systems to supply the aggregate electricity demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system elements.***
  - ***Transmission security is the ability of the power system to withstand disturbances, such as short circuits or unanticipated loss of system elements, and continue to supply and deliver electricity.***

2016 RNA Major Assumptions

- **Local Transmission Owner Plans (LTPs):**
  - ***Proposed firm transmission projects meeting the RNA inclusion rules are modeled in the 2016 RNA Base Cases***
- **Assumed Deactivations:**
  - ***2,573 MW new deactivations since the 2014 CRP (including Ginna, FitzPatrick, Dunkirk 1, 3, 4, Huntley 67, 68, among others)***
- **Assumed Generation Additions:**
  - ***1,080 MW (including CPV Valley)***
- **Load Forecast:**
  - ***2016 Gold Book (year 5 comparison on the next slide)***

2016 RNA: Load and Resources Comparison for Year 5 (2021)

The net change in capacity less load shows a MW surplus under the 2016 RNA Base Case resources assumptions that is mainly due to the reduction in the baseline load forecasts.

2016 RNA vs. 2014 CRP

Year 2021	2014 CRP	2016 RNA	Delta
Total Capacity without SCRs	41,193	39,899	-1,294
SCRs	1,189	1,248	59
Baseline Peak Load	35,765	33,555	-2,210
Surplus (Resources – Load)	**6,617**	**7,592**	**Net change in surplus 975**

2016 RNA: Resource Adequacy Results

- **Loss of Load Expectation (LOLE) Criterion**
  - ***LOLE must be less than one day in ten years, or 0.1 days per year***
- **Base Case LOLE Results from 2017 through 2026**
  - ***LOLE was between 0.02 to 0.05 for the entire 10-year RNA Study Period***
- **Resource Adequacy Conclusion:**
  - ***The LOLE criterion was met for each of the 10 years, and there are no resource adequacy Reliability Needs.***

2016 RNA: Scenarios

- **Scenarios are variations on the preliminary RNA Base Case to assess the impact of possible changes in key study assumptions**
  - ***Scenarios suggest how the timing, location, or degree of violations of Reliability Criteria on the NYCA system could change***
  - ***Scenarios do not identify additional Reliability Needs***

- **The following 8 scenarios were performed in the 2016 RNA:**
  - ***High (Econometric) Load Forecast - RA only***
  - ***Zonal Capacity at Risk - RA only***
  - ***Indian Point Energy Center (IPEC) Plant Retirement - RA only***
  - ***90/10 Forecasted Load -TS only***
  - ***No Coal - RA only***
  - ***No Nuclear - RA only***
  - ***Continued Forward Capacity Sales to External Control Areas - RA only***
  - ***Western NY Public Policy Transmission Need –TS only***

2016 RNA RA: Zonal Capacity at Risk Scenario

- **Identifies the maximum level of zonal MW capacity that can be removed without causing NYCA LOLE violations or exceeding the zonal capacity.**
  - ***The zones at risk assessment does not evaluate the impact of removing capacity on transmission security or on the transfer capability of the transmission system; thus, in reality, reliability issues at specific transmission locations are likely to occur at lower amounts of capacity removal.***
  - ***The reported zonal quantities differ by zone because the location of resource removal can have different impacts due to existing transfer limitations between zones.***

2016 RNA RA Scenarios: Zonal Capacity at Risk Results

Maximum zonal MW that can be removed without causing a NYCA LOLE violation:

Load Zones	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Zone A	1,100	850	850	1,100	1,050	1,050	950	950	900	850
Zone B[1]	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR
Zone C	1,400	1,450	1,450	2,000	1,900	1,800	1,700	1,550	1,500	1,250
Zone D[1,2]	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR
Zone E[1]	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR
Zone F	1,400	1,450	1,450	2,050	1,950	1,850	1,700	1,550	1,500	1,250
Zone G	1,150	1,350	1,300	1,650	1,600	1,500	1,400	1,300	1,250	1,050
Zone H	1,150	1,350	1,300	1,650	1,550	1,550	1,400	1,300	1,250	1,000
Zone I[1]	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR	EZR
Zone J	950	1,050	1,000	1,150	1,150	1,100	1,050	1,000	950	850
Zone K	750	800	800	900	850	800	750	650	600	500

[1] EZR = Exceeds Zonal Resources

[2] Includes Capacity Imports from External Area(s)

Zonal Groups	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Zones A-F	1,500	1,500	1,450	2,100	1,950	1,900	1,700	1,550	1,500	1,250
Zones G-I	1,150	1,350	1,300	1,650	1,600	1,550	1,400	1,300	1,250	1,000

2016 RNA RA Scenarios: NYCA LOLE Results

Scenario	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Base Case	0.04	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.04
Capacity Continuing to Sell to ISO-NE	0.04	0.03	0.03	0.04	0.04	0.04	0.05	0.06	0.06	0.07
No Coal	0.06	0.07	0.07	0.04	0.05	0.05	0.06	0.06	0.07	0.07
High Load Forecast	0.09	0.10	**0.11**	**0.10**	**0.12**	**0.13**	**0.15**	**0.18**	**0.21**	**0.24**
Retirement of IPEC Gen.	**0.21**	**0.15**	**0.15**	**0.13**	**0.14**	**0.15**	**0.17**	**0.18**	**0.19**	**0.22**
No Nuclear	**0.36**	**0.28**	**0.28**	**0.23**	**0.23**	**0.25**	**0.26**	**0.28**	**0.30**	**0.33**

Bold indicates a violation of the 0.1 LOLE criterion

2016 RNA: Transmission Security Results

Kevin DePugh

Manager, Transmission Studies

Management Committee Meeting

September 28, 2016

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Overview

- **This presentation addresses the transmission security (TS) results of:**
  - ***Reliability Needs identified in the preliminary and final RNA Base Case analysis***
  - ***The Western NY Public Policy Scenario***
  - ***The 90/10 Forecasted Load Scenario***

Preliminary RNA Base Case TS Results

- **Several TS violations found**
- **Results were presented to ESPWG**
- **System and LTP updates were provided in response**
- **Final RNA Base Case was developed by incorporating system and LTP updates**

System & LTP Updates provided between preliminary and final RNA Base Cases

- **Model Corrections**
  - ***Rating corrections in Long Island and Central Areas***
  - ***Corrections to one line impedance, one bus load, and one transformer voltage in the Central Area***
- **LTP updates that met the inclusion rules**
  - ***Stolle-Gardenville (66 line) 230kV rating increase***
  - ***Clay-Pannell (#1 & #2) 345kV rating increase***

Transmission Security: Final Thermal Results

- **Only two TS-related Reliability Needs remain in the final Base Case (both beginning in 2017):**
  - ***NYSEG's Oakdale 345/115 kV transformer, and***
  - ***LIPA's East Garden City to Valley Stream (EGC to VS) 138 kV line.***

TS Scenarios

- **Scenarios are for information**
  - ***Reliability Needs (RN) are only identified through the final RNA Base Case analysis, not through Scenarios***
- **Scenarios were performed on the preliminary RNA Base Case**

TS Scenarios: Western NY Public Policy

- **Goal of Western NY Public Policy is to relieve constraints in Western NY, including access to full output of Niagara and additional imports from Ontario.**
  - ***Multiple transmission projects have been proposed in the Public Policy Transmission Planning Process for the Western NY Public Policy Transmission Need.***
- **To simulate a generic transmission solution to the Western NY Public Policy Transmission Need, the constraints in the Niagara area were relaxed.**

TS Scenarios: Western NY Public Policy

- **Violations (also identified in the preliminary Base Case):**
  - ***Elbridge 345/115 transformer, Clay-Lockheed Martin 115 kV line, Clay – Woodard 115 kV line, and EGC-VS 138 kV.***
- **Observations, focused on this scenario impacts on the two RN:**
  - **The Oakdale 345/115 kV transformer RN is eliminated**
  - **The EGC-VC 138 kV line continues to be in violation of the Reliability Criteria**

TS Scenarios: 90/10 Forecasted Load

- **The 90/10 peak load forecast represents an extreme weather condition**
- **Scenario Results:**
  - ***Existing overloads identified in the preliminary Base Case in the Western and Central area are exacerbated by approximately 10%***
  - ***Several new overloads occur on the 230 kV system in the Western area***
  - ***New overloads occur on 345/115kV and 230/115kV transformers in the Central area***
  - ***2 additional overloads occur on Long Island***

OC Action

- **On September 19, 2016, the Operating Committee unanimously:**
  - ***concurred with the RNA Report,***
  - ***recommended that the Management Committee concur with the RNA Report, and***
  - ***recommended Board approval with revisions as discussed at the OC meeting.***
- **On September 20, 2016, the NYISO advised the OC Chair about ministerial changes to remove the use of redlined text that identified changes in Figure 2-1 and to strike the language, "(additions in red font)," from the paragraph discussing Figure 2-1 on page 4 of the RNA Report.**

2016 RNA: Next Steps

- **If approved by MC, submit RNA Report to Board for Approval**
- **After RNA is approved by the Board:**
  - ***The NYISO will request updates to the Transmission Owner's LTPs before issuing a solicitation, if necessary, for regulated backstop, market-based, and alternative regulated solutions to meet the Reliability Needs identified in the RNA.***
  - ***The Responsible Transmission Owner(s) will report to stakeholders information regarding any updates in its LTPs that could affect the Reliability Needs.***
- **The Comprehensive Reliability Plan (CRP) will identify all projects and plans necessary to maintain reliability for the 10-year planning horizon.**

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:

- ***Maintaining and enhancing regional reliability***
- ***Operating open, fair and competitive wholesale electricity markets***
- ***Planning the power system for the future***
- ***Providing factual information to policy makers, stakeholders and investors in the power system***

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