

2018 RNA Modeling Assumptions Matrix

1. Resource Adequacy (GE MARS)

#	Parameter	2016 RNA/CRP Study Period: 2017 -2026	2018 RNA Study Years: 2019 (y1)-2028 (y10)
Load Parameters			
1	Peak Load Forecast	Adjusted 2016 Gold Book NYCA baseline peak load forecast. The GB 2016 baseline peak load forecast includes the impact (reduction) of behind-the-meter (BtM) solar at the time of NYCA peak. For the Resource Adequacy load model, the deducted BtM solar MW was added back to the NYCA zonal loads, which then allows for a discrete modeling of the BtM solar resources.	Adjusted 2018 Gold Book NYCA baseline peak load forecast. The GB 2018 baseline peak load forecast includes the impact (reduction) of behind-the-meter (BtM) solar at the time of NYCA peak. For the Resource Adequacy load model, the deducted BtM solar MW was added back to the NYCA zonal loads, which then allows for a discrete modeling of the BtM solar resources.
3	Load Shapes (Multiple Load Shape)	Used Multiple Load Shape MARS Feature 8760 h historical load shapes were used as base shapes for LFU bins: Bin 1: 2006 Bin 2: 2002 Bins 3-7: 2007 Peak adjustments are being performed on a seasonal basis.	Used Multiple Load Shape MARS Feature 8760 h historical load shapes were used as base shapes for LFU bins: Bin 1: 2006 Bin 2: 2002 Bins 3-7: 2007 Peak adjustments are being performed on a seasonal basis.
4	Load Forecast Uncertainty (LFU)	Used prior year LFU bin weight figures	Used updated summer LFU values for the 11 NYCA zones.
Generation Parameters			
1	Existing Generating Unit Capacities	2016 Gold Book values. Used min (DMNC vs. CRIS). Adjusted for RNA inclusion rules.	2018 Gold Book values. Use summer min (DMNC vs. CRIS). Use winter DMNC Adjusted for RNA inclusion rules.
2	Proposed New Units (Non-Renewable)	GB2016 with Inclusion Rules Applied	GB2018 with Inclusion Rules Applied

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3	Retirements, Mothballed units, IIFO	GB2016 with Inclusion Rules Applied	GB2018 with Inclusion Rules Applied
4	Forced and Partial Outage Rates	Five-year (2011-2015) GADS data for each unit represented. Those units with less than five years – use representative data. Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period	Five-year (2013-2017) GADS data for each unit represented. Those units with less than five years – use representative data. Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period
5	Planned Outages	Based on schedules received by the NYISO and adjusted for history	Based on schedules received by the NYISO and adjusted for history
6	Summer Maintenance		Nominal MW
7	Combustion Turbine Derates	Derate based on temperature correction curves	Derate based on temperature correction curves.
8	Landfill gas plants	The landfill gas units are assumed to be 2-state units.	The landfill gas units are assumed to be 2-state units.
9	Existing Wind Units (>5 years of data)	Actual hourly plant output over the period 2011-2015. Probabilistic model is incorporated based on five years of input shapes with one shape per replication being randomly selected in Monte Carlo process	Actual hourly plant output over the period 2013-2017. Probabilistic model is incorporated based on five years of input shapes with one shape per replication being randomly selected in Monte Carlo process
10	Existing Wind Units (<5 years of data)	For existing data, the actual hourly plant output over the period 2011-2015 is used.	For existing data, the actual hourly plant output over the period 2013-2017 is used.
11	Proposed Wind Units	Inclusion Rules Applied to determine the gen status.	Inclusion Rules Applied to determine the gen status.
12	Utility-scale Solar Resources	The 31.5 MW metered solar capacity: probabilistic model chooses from 4 years of production data output shapes covering the period 2012-2015 (one shape per replication is randomly selected in Monte Carlo process.)	The 31.5 MW Upton metered solar capacity: probabilistic model chooses from 5 years of production data output shapes covering the period 2013-2017 (one shape per replication is randomly selected in Monte Carlo process.)

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13	BtM Solar Resources	<p>The large projection of increasing retail (BtM) solar installations over the 10- year period required a discrete model with some level of detailed hourly performance.</p> <p>5 years of hourly historic irradiance data from 18 stations in NY was used to develop the required hourly patterns to discretely model this resource. (One shape per replication is randomly selected in Monte Carlo process.)</p>	<p>The large projection of increasing retail (BtM) solar installations over the 10- year period required a discrete model with some level of detailed hourly performance.</p> <p>New method: 8760 hourly shapes: The shapes are applied during the load adjustment to account for the impact of the BtM generation on both on-peak and off-peak hours. MARS will randomly select a daily shape from the current month for each day of each month of each replication.</p>
14	BTM-NG Program	n/a	<p>New category: These are former load modifiers to sell capacity into the ICAP market. Model as cogen type 2 unit in MARS. Unit capacity set to CRIS value, load modeled with weekly pattern that can change monthly.</p>
15	Small Hydro Resources	<p>Review of 5- years of unit production data over the years 2011 to 2015 with applicable deration: 46% derate applied to all Run-of-River units, calculated by reviewing unit contribution during peak hours of summer months</p>	<p>New method: Actual hourly plant output over the period 2013-2017. Program randomly selects a Hydro shape of hourly production over the 2013-2017 for each model replication.</p>
16	Large Hydro	<p>Probabilistic Model based on 5- years of GADS data.</p> <p>Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period (2011-2015). Methodology consistent with thermal unit transition rates.</p>	<p>Probabilistic Model based on 5- years of GADS data.</p> <p>Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period (2013-2017). Methodology consistent with thermal unit transition rates.</p>
Transaction - Imports / Exports			

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17	Capacity Purchases	Grandfathered Rights and other awarded long-term rights including 20 MW CRIS potentially awarded to HQUS in CY15, additional to the existing 1,090 MW. Modeled using MARS explicit contracts feature.	Grandfathered Rights and other awarded long-term rights Modeled using MARS explicit contracts feature.
18	Capacity Sales	These are long-term contracts filed with FERC. Modeled as equivalent contracts sold from ROS (surplus zones: A,C,D,F). ROS ties to external pool are derated by sales MW amount	These are long-term contracts filed with FERC. Modeled using MARS explicit contracts feature. Contracts sold from ROS (surplus zones: A,C,D,F). ROS ties to external pool are derated by sales MW amount
19	FCM Sales	Modeled as equivalent contracts sold from ROS (surplus zones: A,C,D,F). ROS ties to external pool are derated by the sales MW amount	Model sales for known years Modeled using MARS explicit contracts feature. Contracts sold from ROS (surplus zones: A,C,D,F). ROS ties to external pool are derated by sales MW amount
20	UDRs	Updated with most recent information.	Updated with most recent information
Topology			
21	Interface Limits	Developed by review of previous studies and specific analysis during the RNA study process	Developed by review of previous studies and specific analysis during the RNA study process
22	New Transmission	Based on TO- provided firm plans (via Gold Book 2016 process) and proposed merchant transmission; inclusion rules applied	Based on TO- provided firm plans (via Gold Book 2018 process) and proposed merchant transmission; inclusion rules applied
23	AC Cable Forced Outage Rates	All existing cable transition rates updated with info received from ConEd and PSEG-LIPA to reflect most recent five-year history	All existing cable transition rates updated with info received from ConEd and PSEG-LIPA to reflect most recent five-year history

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24	UDR unavailability	reflected as part of the AC cables calculation	Five year history of forced outages
Emergency Operating Procedures			
25	Special Case Resources	SCRs sold for the program discounted to historic availability ('effective capacity'). Final Base Cases summer values calculated from the July 2016 registrations, held constant for all years of study	SCRs sold for the program discounted to historic availability ('effective capacity'). Final Base Cases summer values will be calculated from the July 2018 registrations, held constant for all years of study
26	EDRP Resources	2016 Gold Book with effective capacity modeled Those sold for the program discounted to historic availability. Summer values calculated from July 2016 registrations and forecast growth. Values held constant for all years of study.	2018 Gold Book with effective capacity modeled Those sold for the program discounted to historic availability. Summer values will be calculated from July 2018 registrations and forecast growth. Values held constant for all years of study.
27	Other EOPs	Based on TO information, measured data, and NYISO forecasts	Based on TO information, measured data, and NYISO forecasts
External Control Areas			
28	PJM	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. PJM is a 5-zone model. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. PJM is a 5-zone model. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.
29	ISONE	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.
30	HQ	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.

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31	IESO	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.	As per RNA Procedure External model (load, capacity, topology) provided by PJM/NPCC CP-8 WG. LOLE of pool adjusted to be between 0.10 and 0.15 days per year by adjusting capacity pro-rata in all areas.
32	Reserve Sharing	All NPCC Control Areas indicate that they will share reserves equally among all members before sharing with PJM.	All NPCC Control Areas indicate that they will share reserves equally among all members before sharing with PJM.
33	NYCA Emergency Assistance Limit	No specific NYCA-wide limit	Implemented a statewide limit of 3500 MW
Miscellaneous			
34	MARS Model Version	Version 3.20.5	Version 3.22.4

2. Transmission Security Studies

Parameter	2018 RNA Transmission Security Studies Modeling Assumptions	Source
Peak Load	NYCA baseline coincident summer peak forecast, which already includes EE and DG (including solar) reductions	2018 Gold Book
Load model	ConEd: voltage varying	2018 FERC 715 filing
	Rest of NYCA: constant power	
System representation	Per updates received through Databank process (Subject to RNA base case inclusion rules)	NYISO RAD Manual, 2018 FERC 715 filing
Inter-area interchange schedules	Consistent with ERAG MMWG interchange schedule	2018 FERC 715 filing, MMWG
Inter-area controllable tie schedules	Consistent with applicable tariffs and known firm contracts or rights	2018 FERC 715 filing
In-city series reactors	Consistent with ConEdison operating protocol (All series reactors in-service for summer)	2018 FERC 715 filing, ConEd protocol
SVCs, FACTS	Set at zero pre-contingency; allowed to adjust post-contingency	NYISO T&D Manual
Transformer & PAR taps	Taps allowed to adjust pre-contingency; fixed post-contingency	2018 FERC 715 filing
Switched shunts	Allowed to adjust pre-contingency; fixed post-contingency	2018 FERC 715 filing
Fault current analysis settings	Per Fault Current Assessment Guideline	NYISO Fault Current Assessment Guideline