Draft 2020 RNA Models Assumptions Matrix

1. Resource Adequacy (GE MARS)

#	Parameter	2018 RNA/CRP (2018 GB) Study Period: 2019 -2028	2020 RNA/CRP (2020 GB) Study Period: 2021 -2030
Load Parameters			
1	**Peak** Load Forecast	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.	Similar method
3	Load **Shapes** (Multiple Load Shapes)	Used Multiple Load Shape MARS Feature 8,760 hour historical load shapes were used as base shapes for LFU bins: Bin 1: 2006 Bin 2: 2002 Bins 3-7: 2007 Peak adjustments on a seasonal basis. For the BtM Solar adjustment, the BtM shape is added back to account for the impact of the BtM generation on both on-peak and off-peak hours.	Similar method
4	Load Forecast Uncertainty (**LFU**)	Used updated summer LFU values for the 11 NYCA zones.	To be updated
Generation Parameters			
1	**Existing** Generating Unit Capacities	2018 Gold Book values. Use summer min (DMNC vs. CRIS). Use winter min (DMNC vs. CRIS). Adjusted for RNA inclusion rules.	Similar method

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2	**Proposed New Units Inclusion** Determination	GB2018 with Inclusion Rules Applied	Similar method
3	Retirement, Mothballed Units, IIFO	GB2018 with Inclusion Rules Applied	Similar method
4	Forced and Partial Outage Rates	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 For new units or units that are in service for less than three years, NERC 5-year class average EFORd data are used.	Similar method
5	Planned Outages	Based on schedules received by the NYISO and adjusted for history	Similar method
6	Summer Maintenance	Nominal 50 MW (25 in J and 25 in K)	None
7	Combustion Turbine Derates	Derate based on temperature correction curves For new units: used data for a unit of same type in same zone, or neighboring zone data.	Similar method
8	**Existing Landfill Gas Plants**	**New method:** Actual hourly plant output over the period 2013-2017. Program randomly selects a LFG shape of hourly production over the 2013-2017 for each model replication. Probabilistic model is incorporated based on five years of input shapes, with one shape per replication randomly selected in the Monte Carlo process.	Similar method
9	Existing **Wind** Units (>5 years of data)	Actual hourly plant output over the period 2013-2017. Probabilistic model is incorporated based on five years of input shapes	Similar method

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		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 2013-2017 is used. For missing data, the nameplate normalized average of units in the same load zone is scaled by the unit's nameplate rating.	Similar method
11	Proposed **Land based Wind** Units	Inclusion Rules Applied to determine the generator status. The nameplate normalized average of units in the same load zone is scaled by the unit's nameplate rating.	Similar method
12	Existing **Utility-scale Solar Resources**	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.)	Similar method
13	Projected **BtM Solar Resources**	The large projection of increasing retail (BtM) solar installations over the 10- year period require a discrete model with detailed hourly performance. **New method:** A 8,760 hourly shape was created by using NREL's PV Watt[1] tool. MARS will randomly select a daily shape from the current month for each day of each month of each replication.	TBD

[1] NREL's PVWatts Calculator, credit of the U.S. Department of Energy (DOE)/NREL/Alliance (Alliance for Sustainable Energy, LLC).

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14	Existing **BTM-NG Program**	**New category:** These are former load modifiers to sell capacity into the ICAP market. Modeled as cogen type 2 unit in MARS. Unit capacity set to CRIS value, load modeled with weekly pattern that can change monthly.	Similar method
15	Existing Small Hydro Resources	**New method:** Actual hourly plant output over the period 2013-2017. Program randomly selects a hydro shape of hourly production over the 5-year window for each model replication. The randomly selected shape ismultiplied by their current nameplate rating.	Similar method
16	Existing Large Hydro	Probabilistic Model based on 5 years of GADS data. 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.	Similar method
Transaction - Imports / Exports			
1	Capacity Purchases	Grandfathered Rights and other awarded long-term rights Modeled using MARS explicit contracts feature.	Similar method
2	Capacity Sales	These are long-term contracts filed with FERC. Modeled using MARS explicit contracts feature. Contracts sold from ROS (Zones: A-F). ROS ties to external pool are derated by sales MW amount	Similar method

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3	FCM Sales	Model sales for known years Modeled using MARS explicit contracts feature. Contracts sold from ROS (Zones: A-F). ROS ties to external pool are derated by sales MW amount	Similar method
4	UDRs	Updated with most recent elections/awards information (VFT, HTP, Neptune, CSC)	Similar method
5	Wheel-Through Contract	n/a	**New category:** 300 MW HQ through NYISO to ISO-NE. Modeled as firm contract. Reduced the transfer limit from HQ to NYISO by 300 MW and increased the transfer limit from NYISO to ISO-NE by 300 MW.
Topology			
1	Interface Limits	Developed by review of previous studies and specific analysis during the RNA study process	Similar method
2	New Transmission	Based on TO- provided firm plans (via Gold Book 2018 process) and proposed merchant transmission; inclusion rules applied	Similar method
3	AC Cable Forced Outage Rates	All existing cable transition rates updated with data received from ConEd and PSEG-LIPA to reflect most recent five-year history	Similar method
4	UDR unavailability	Five-year history of forced outages	Similar method
Emergency Operating Procedures			
1	Special Case Resources	SCRs sold for the program discounted to historic availability ("effective capacity"). Summer values calculated from the latest available July registrations, held constant for all years of study. 5 calls/month	Similar method but with 15 calls/year Note: also, combined the two SCR steps (generation and load zonal MW)
2	EDRP Resources	2018 Gold Book with effective capacity modeled. Resources sold for the program and discounted to historic availability.	Not modeled: the values are less than 2 MW.

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		Summer values calculated from July 2018 registrations and forecast growth. Values held constant for all years of study.	
3	Other EOPs	Based on TO information, measured data, and NYISO forecasts	Similar method
External Control Areas			
1	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.	Similar method
2	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.	Similar method
3	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.	Similar method
4	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.	Similar method
5	Reserve Sharing	All NPCC Control Areas indicate that they will share reserves **equally** among all members before sharing with PJM.	Similar method
6	NYCA Emergency Assistance Limit	Implemented a statewide limit of 3,500 MW	Similar method
Miscellaneous			

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1	MARS Model Version	Version 3.22.6	TBD

2. 2020 RNA: Transmission Security Studies Assumptions

Parameter	2020 RNA Transmission Security Studies Modeling Assumptions	Source
Peak Load	NYCA baseline coincident summer peak forecast, which already includes EE and DG (including solar) reductions	2020 Gold Book
Load Model	ConEd: voltage varying Rest of NYCA: constant power	2020 FERC 715 filing
System Representation	Per updates received through Databank process (Subject to RNA base case inclusion rules)	NYISO RAD Manual, 2020 FERC 715 filing
Inter-area Interchange Schedules	Consistent with ERAG MMWG interchange schedule	2020 FERC 715 filing, MMWG
Inter-area Controllable Tie Schedules	Consistent with applicable tariffs and known firm contracts or rights	2020 FERC 715 filing
In-City Series Reactors	Consistent with ConEdison operating protocol Note: series reactors on 71, 72, M51, and M52 are modeled by-passed with Y49, 41, and 42 series reactors modeled in-service	2020 FERC 715 filing, Con Edison 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	2020 FERC 715 filing
Switched Shunts	Allowed to adjust pre-contingency; fixed post-contingency	2020 FERC 715 filing
Fault Current analysis settings	Per Fault Current Assessment Guideline	NYISO Fault Current Assessment Guideline