2017 and 2019 CARIS Base Case Assumptions Matrix Comparison

For Discussion at the August 6, 2019 ESPWG

(updates from 2017 in RED)

Parameter	Modeling for 2017 CARIS Base Case	Modeling for 2019 CARIS Base Case
Peak Load	Based on 2017 Load & Capacity Data Report ("Gold Book") Baseline Forecast of Non-Coincident Peak Demand , including impacts of statewide Energy Efficiency programs (Table 1-2b-1)	Based on 2019 Load & Capacity Data Report ("Gold Book") Baseline Forecast of Non-Coincident Peak Demand , including impacts of statewide Energy Efficiency programs (Table 1-3a and 1-3b)
Load Shape Model Energy Forecast	2002 Load Shape. Energy Forecast based on 2017 Load & Capacity Data Report ("Gold Book") Baseline Forecast of Annual Energy, including impacts of statewide Energy Efficiency programs (Table 1-2a)	2002 Load Shape. Energy Forecast based on 2019 Load & Capacity Data Report ("Gold Book") Baseline Forecast of Annual Energy, including impacts of statewide Energy Efficiency programs (Table 1-2)
Load Uncertainty Model	Only Base Level Forecast utilized; the impact of energy or peak forecasts may be utilized in scenarios	Only Base Level Forecast utilized; the impact of energy or peak forecasts may be utilized in scenarios
Generating Unit Capacities	Updated to reflect 2017 Gold Book winter and summer DMNC values	Updated to reflect 2019 Gold Book winter and summer DMNC values
New Units	Updated as per 2017 Gold Book (Application of inclusion rules identified in Reliability Planning Process Manual, Section 3.1.1 and procedures)procedures)	Updated as per 2019 Gold Book (Application of inclusion rules identified in Reliability Planning Process Manual, Section 3.2 and procedures)
Wind Resource Modeling	Units and capacities updated as per 2017 Gold Book. Existing wind resources are modeled based on unit capacities and actual 2015 shapes. New units modeled based on proximate existing	Units and capacities updated as per 2019 Gold Book. Existing wind resources are modeled based on unit capacities and actual 2017 shapes. New units modeled based on proximate existing

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	units.	units.
Non-NYPA Hydro Capacity Modeling	Updated as per 2017 Gold Book; unit output is modeled consistent with historic levels.	Updated as per 2019 Gold Book; unit output is modeled consistent with historic levels.
Special Case Resources	Not utilized in MAPS production cost modeling; incorporated in ICAP Metric calculation	Not utilized in MAPS production cost modeling; incorporated in ICAP Metric calculation
EDRP Resources	N/A for production cost modeling	N/A for production cost modeling
External Capacity – Purchases and Wheel-Throughs	Flows across schedulable and non-schedulable transmission lines are based on economics.	Flows across schedulable and non-schedulable transmission lines are based on economics.
Retirements	Updated as per 2017 Gold Book (Application of inclusion rules; specific assumptions concerning mothball announcement post-CRP; units with completed studies indicating that the unit is required for reliability are retained in the Base Case; units whose studies are pending are retained in the Base Case; others are excluded from the Base Case)	Updated as per 2019 Gold Book (Application of inclusion rules; specific assumptions concerning mothball announcement post-CRP; units with completed studies indicating that the unit is required for reliability are retained in the Base Case; units whose studies are pending are retained in the Base Case; others are excluded from the Base Case; units that have filed compliance plans prior to July 31st 2019 that are in response to regulatory mandates and indicate that the unit will retire will also be excluded.)

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Generator Outages	Scheduled to levelize reserves; as per the maintenance schedules in long term adequacy studies.	Scheduled to levelize reserves; as per the maintenance schedules in long term adequacy studies.
Gas Turbines Ambient Derate	Modeling utilizes summer and winter DMNC ratings for all units.	Modeling utilizes summer and winter DMNC ratings for all units.
Environmental Modeling Externalities Allowances	Allowance costs based on projected RGGI costs. SO_2 and NO_x Allowance Prices reflect CSAPR markets. Detailed allowance costs are provided in the 6/22/17 ESPWG meeting materials.	Allowance costs based on projected RGGI costs. SO_2 and NO_x Allowance Prices reflect CSAPR markets. Detailed allowance costs are provided in the 6/25/19 ESPWG meeting materials.
Commitment and Dispatch Options	Each Balancing Authority commits to serve its own load, firm transactions, and potential transfers Hurdle rates – flat. As presented on 6/22/17 to ESPWG.	Each Balancing Authority commits to serve its own load, firm transactions, and potential transfers Hurdle rates – flat Same. Precise values pending conclusion of benchmarking analysis. Will be reported to ESPWG.
Operating Reserves	Operating Reserves as per NYCA requirements.	Operating Reserves as per NYCA requirements.
Fuel Price Forecast	Annual bases updated to more heavily weight recent trends (2014-075., 2015-0.3, 2016-0.625). Seasonality and spikes	Annual bases updated to more heavily weight recent trends (2016-0.075, 2017-0.3, 2018-0.625). Seasonality and spikes

Parameter	Modeling for 2017 CARIS Base Case	Modeling for 2019 CARIS Base Case
	based on three-year history (2012-2016). Calculated natural price forecasts based on blends of hub price forecasts for four hubs (A-E, F-I, J and K). Utilized unit capacities and reported pricing hubs to weight price forecasts. Fuel oil and coal price forecasts are developed utilizing the EIA's annual forecast of national delivered prices. Regional bases are derived using EIA Form 923 data. The seasonality for fuel oils is based on an analysis of New York Harbor Ultra-Low Sulfur Diesel (ULSD) prices. Coal has no seasonality. Illustrative fuel costs are presented in the 8/28/17 ESPWG meeting materials.	based on three-year history (2014-2018). Calculated natural price forecasts based on blends of hub price forecasts for four hubs (A-E, F-I, J and K). Utilized historic unit production and reported pricing hubs to weight price forecasts. Fuel oil and coal price forecasts are developed utilizing the EIA's annual forecast of national delivered prices. Regional bases are derived using EIA Form 923 data. The seasonality for fuel oils is based on an analysis of New York Harbor Ultra-Low Sulfur Diesel (ULSD) prices. Coal has no seasonality. Illustrative fuel costs are presented in the 8/06/2019 ESPWG meeting materials.
Cost Curve Development (including heat rates and emission rates)	Unit heat rates (and emission rates) developed from vendor supplied data, USEPA CAMD fuel input and emissions data matched with NYISO production data for NYCA and USEIA production data for non NYCA units.	Unit heat rates (and emission rates) developed from vendor supplied data, USEPA CAMD fuel input and emissions data matched with NYISO production data for NYCA and USEIA production data for non NYCA units.
Local Reliability Rules	List and develop appropriate nomograms. Fuel burn restrictions, operating restrictions and exceptions, commitment/dispatch limits	List and develop appropriate nomograms. Fuel burn restrictions, operating restrictions and exceptions, commitment/dispatch limits

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Energy Storage Gilboa PSH Lewiston PSH	Scheduling checked to conform to historical operations.	Scheduling checked to conform to historical operations.
Transmission System Model		
Power Flow Cases	As per CRP.	As per CRP.
Interface Limits Monitored/contingency pairs Nomograms Joint, Grouping Unit Sensitive Voltage	Data from the results of internal and external planning studies; vendor-supplied data; operational voltage studies; operational limits; transfer limit analysis for critical interfaces.	Data from the results of internal and external planning studies; vendor-supplied data; operational voltage studies; operational limits; transfer limit analysis for critical interfaces.
New Transmission Capability	Updated as per 2017 Gold Book (Application of base case inclusion rules)	Updated as per 2019 Gold Book (Application of base case inclusion rules)
Internal Controllable Lines (PARs,DC,VFT)	Optimized in simulation.	Optimized in simulation.
Neighboring Systems		
Outside World Area Models Fuel Forecast	Power flow data from CRP, "production" data developed by NYISO with vendor and neighbor input. Fuel forecasts developed utilizing same methodology as NYCA fuel forecasts.	Power flow data from CRP, "production" data developed by NYISO with vendor and neighbor input. Fuel forecasts developed utilizing same methodology as NYCA fuel forecasts.
External Capacity And Load Forecast	Neighboring systems modeled consistent with reserve margins in the RNA/CRP analysis. Neighboring systems data reviewed and held at required reserve margin.	Neighboring systems modeled consistent with reserve margins in the RNA/CRP analysis. Neighboring systems data reviewed and held at required reserve margin.

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System representation in Simulation	HQ modeled as fixed hourly schedule, synchronized with all other external injections. Full Representation/Participation: NYISO ISONE IESO PJM Classic & AP,AEP,CE,DLCO, DAY, VP, EKPC Proxy Bus Injection: HQ-NYISO, HQ-NE-ISO, NB-NEISO, HQ – IESO Transmission Only/Zeroed Out: MECS,FE,SPP, MAR, NIPS,OVEC,TVA, FRCC,SERC,ERCOT,WECC	HQ modeled as fixed hourly schedule, synchronized with all other external injections. Full Representation/Participation: NYISO ISONE IESO PJM Classic & AP, AEP, CE, DLCO, DAY, VP, EKPC Proxy Bus Injection: HQ-NYISO, HQ-NE-ISO, NB-NEISO, HQ – IESO Transmission Only/Zeroed Out: MECS,FE,SPP, MAR, NIPS,OVEC,TVA, FRCC,SERC,ERCOT,WECC
External Controllable Lines (PARs,DC,VFT, Radial lines)	Western ties to carry 32% of PJM-NYISO AC Interchange + 20% of RECO Load 5018 line to carry 32% of PJM-NYISO AC Interchange + 80% of RECO Load PAR ABC to carry 21% of PJM-NYISO AC Interchange + 400 MW OBF (note: OBF to 0 as of 6/1/2021) PAR JK to carry 15% of PJM-NYISO AC Interchange - 400 MW OBF (note: OBF	B and C modeled as out of service. Current JOA modeled under these outage conditions. Western ties to carry 46% of PJM-NYISO AC Interchange + 20% of RECO Load 5018 line to carry 32% of PJM-NYISO AC Interchange + 80% of RECO Load PAR A to carry 7% of PJM-NYISO AC Interchange + 100 MW OBF (note: OBF to

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	to 0 as of 6/1/2021) Norwalk (-200MW, +200MW) L33,34 (-300MW, +300MW) PV20 (0MW, +150MW) Neptune (0MW, +660MW) CSC (0MW, +330MW) CSC and Neptune optimized subject to "cost of use" HTP (0, 660) Linden VFT (-315,315)	0 as of 11/1/2019) PAR JK to carry 15% of PJM-NYISO AC Interchange - 100 MW OBF (note: OBF to 0 as of 11/1/2019) Norwalk (-200MW, +200MW) L33,34 (-300MW, +300MW) PV20 (0MW, +150MW) Neptune (0MW, +660MW) CSC (0MW, +330MW) CSC and Neptune optimized subject to "cost of use" HTP (0, 660) Linden VFT (-315,315)