Comparison of Unified Method Analysis with Tariff ICAP Metric

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Background

- **Tariff designates a specified methodology for calculating the "ICAP metric", the impact (in MWs) on the NYCA ICAP requirement due to generic and actual economic projects**
  - ***OATT, Attachment Y, Section 31.3.1.3.5.6.1***
- **ESPWG, as part of the 2011 CARIS 1 Lessons Learned discussion, requested NYISO staff perform a follow-on analysis**
  - ***Compare "ICAP metric" to a metric calculated using the Unified Method analysis, currently employed in IRM Development***
  - ***Unified Method is described in the NYSRC Policy 5 (http://www.nysrc.org/pdf/Policies/Policy%205-6%20Final%206-11-12.pdf)***
- **The results presented here are illustrative and strictly for the purpose of this exercise. Note that there are significant modeling differences between the 2013 RNA/CRP and the 2013 IRM cases.**

Methodologies

- **Tariff Method**
  - ***The ICAP metric, in the form of a megawatt impact, will be computed for both generic and actual economic project proposals based on a methodology that: (1) determines the base system LOLE for the applicable horizon year; (2) adds the proposed project; and (3) calculates the LOLE for the system with the addition of the proposed project. If the system LOLE is lower than that of the base system, the ISO will reduce generation in all NYCA zones proportionally (i.e., based on proportion of zonal capacity to total NYCA capacity) until the base system LOLE is achieved. That amount of reduced generation is the NYCA megawatt impact. (NYISO OATT, Attachment Y, Section 31.3.1.3.5.6.1)***
- **Unified Method**
  - ***A procedure to develop a curve that relates the statewide Installed Reserve Margin (IRM) and the Minimum Locational Capacity Requirements (LCRs). The anchor point on the curve is selected by applying a tangent of 45 degrees ("Tan 45") at the bend (or "knee") of the curve. (NYSCR, Policy 5, Attachment A and B)***

Unified Method Complications

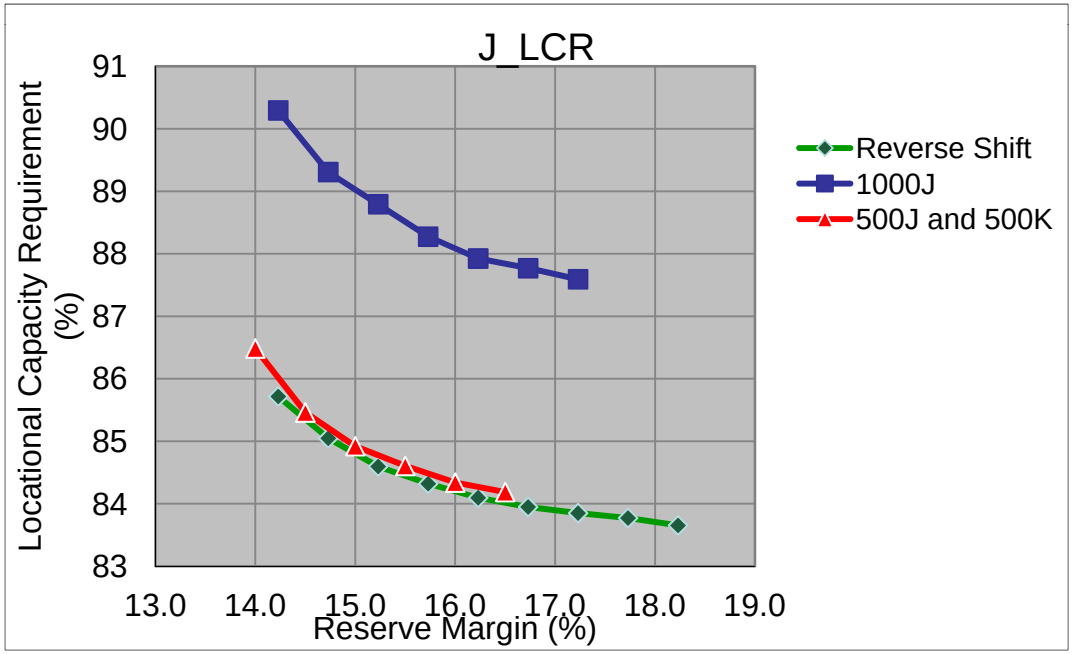
- **Current practice moves generation from Zones J and K to upstate zones.**
- **Lower reserve % in J and K in 2020 poses difficulty to complete the TAN45 curve for the Base Case.**
- **Determining equilibrium point would therefore require introduction of new practice to overcome the projected base case system with insufficient generation in J and K.**
- **Three distinct approaches were considered.**

Potential Solutions to Development of Base Case Requirements

- **Two solutions entailed completing the TAN45 curve for the Base Case:**
  - ***Reverse shift (shifting capacity from upstate to J and K)***
    - **Although provided for in the NYSRC Policy 5, the "reverse shift" has never been implemented or tested.**
  - ***Adding generic generation downstate (1000 MWs in J; 500 MWs in J and 500 MWs in K)***
- **Third solution entailed calculating the IRM and LCR values coincident with the ICL of the system when it reaches an LOLE of 0.1 (mid-2020).**
  - ***ICL is defined as the total installed capacity in the respective control area or locality divided by its respective peak demand.***
  - ***Consistent with NYISO tariff and CARIS procedures.***

Completing the TAN45 Curve for the Base Case

- **Completing the TAN45 Curves for Base Case utilizing the "reverse shift" and two "generic capacity addition" solutions resulted in significantly different curves.**



Completing the TAN45 Curve for the Base Case

- **2020 Base Case Requirements**

	IRM	J LCR	K LCR
Reverse Shift	15.40	84.48	105.21
Generic Generation: 1000MW in J	15.46	88.54	100.09
Generic Generation: 500 MW in J and 500 MW in K	15.35	84.66	105.78

- **Results are sensitive to the underlying assumptions and the method employed to complete the TAN45 curve.**

Determining Base Case IRM/LCRs Utilizing Single Point

- **IRM and LCR could be determined by the installed capacity level (ICL) for the year that NYCA reaches/exceeds 0.1 LOLE**
  - ***NYISO OATT, Attachment Y, Section 31.3.1.3.5.6.2 : "determining the future proxy Locational Minimum Installed Capacity Requirement or Minimum Installed Capacity Requirement for the NYCA as the actual amount of Installed Capacity in the Locality or the NYCA for the year that NYCA reaches 0.1 LOLE"***
  - ***NYISO OATT, Attachment Y, Section 31.3.1.3.2 : "…scale back market-based solutions to the minimum needed to meet the identified Reliability Needs, if more have been proposed than are necessary to meet the identified Reliability Needs."***

Analysis Inputs

- **Base Case**
  - ***Utilizing Single Point Approach***
  - ***Year 2020 MARS database in 2012 RNA with load increased until NYCA LOLE reaches 0.1.***
  - ***Gowanus Barges 1 & 4 in service***
- **Project Case - Transmission:**
  - ***Base case + 800MW increase on UPNY-SENY transfer limit (including 400MW increase on F to G transfer limit)***
  - ***With solutions incorporated, there are then sufficient resources to complete the TAN45 curve***
- **Project Case - Generation:**
  - ***Base case + 1000MW generation in Zone G (900MW summer capacity)***
  - ***With solutions incorporated, there are then sufficient resources to complete the TAN45 curve***
- **Utilize the "as projected" Base Case system, reflecting forecasted load growth, known retirements and additions**
  - ***No generic generator additions***

MW Impact Calculations

- **NYCA: IRM difference * Peak Load**

- **Localities: LCR difference * Peak Load**

Transmission Solution

TAN45 Method	IRM	J_LCR	K_LCR
Base (Single Point)	19.66%	83.58%	103.61%
Project (TAN45 Analysis)	15.31%	81.19%	100.31%
Diff	-4.35%	-2.39%	-3.30%
Load	35,619	12,772	5,916
ICAP MW Impact	(1,550)	(305)	(195)

MW Impact	NYCA	NYC	LI
Tariff Method	(1,255)	(317)	(171)
TAN45 Method	(1,550)	(305)	(195)

Generation Solution

TAN45 Method	IRM	J_LCR	K_LCR
Base (Single Point)	19.66%	83.58%	103.61%
Project (TAN45 Analysis)	15.41%	80.87%	100.77%
Diff	-4.25%	-2.71%	-2.84%
Load	35,619	12,772	5,916
ICAP MW Impact	(1,514)	(346)	(168)

MW Impact	NYCA	NYC	LI
Tariff Method	(1,490)	(368)	(199)
TAN45 Method	(1,514)	(346)	(168)

Summary

- **Inability to complete the Base Case TAN45 curve without new procedures**
- **Multiple Base Case curves were completed using two methods (“reverse shift” and generic capacity additions)**
- **Base Case IRM and LCRs were developed, consistent with the NYISO Tariff and CARIS procedures, whereby a single point from the horizon year was utilized at which the system was at 0.1 LOLE.**
- **The Base Case curves developed using the ‘reverse shift” and generic capacity additions generated dissimilar results to the method which is consistent with the NYISO Tariff and to the MW Impact method**
- **The single point method results were consistent with the results from the CARIS MW Impact method**

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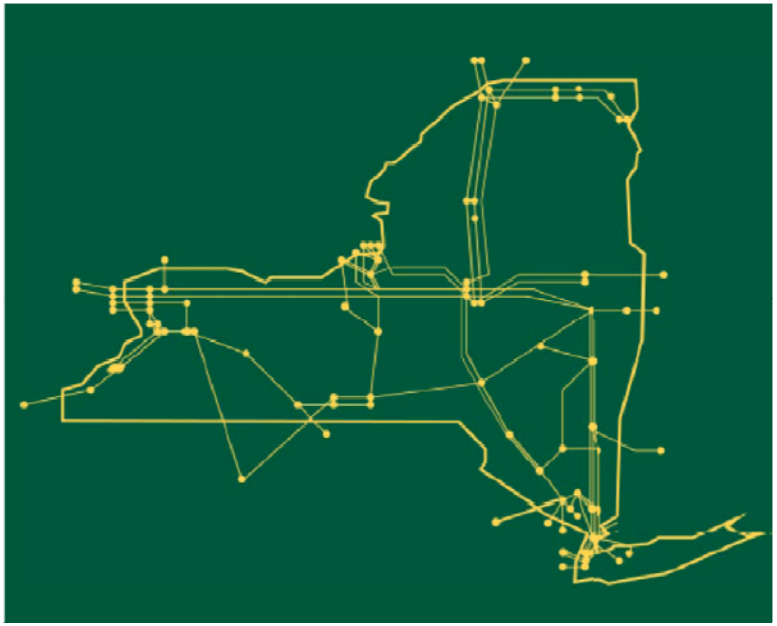

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