Draft – For discussion only

"Tan 45" Anchor versus Free Flowing Equivalent for Establishing Statewide IRM

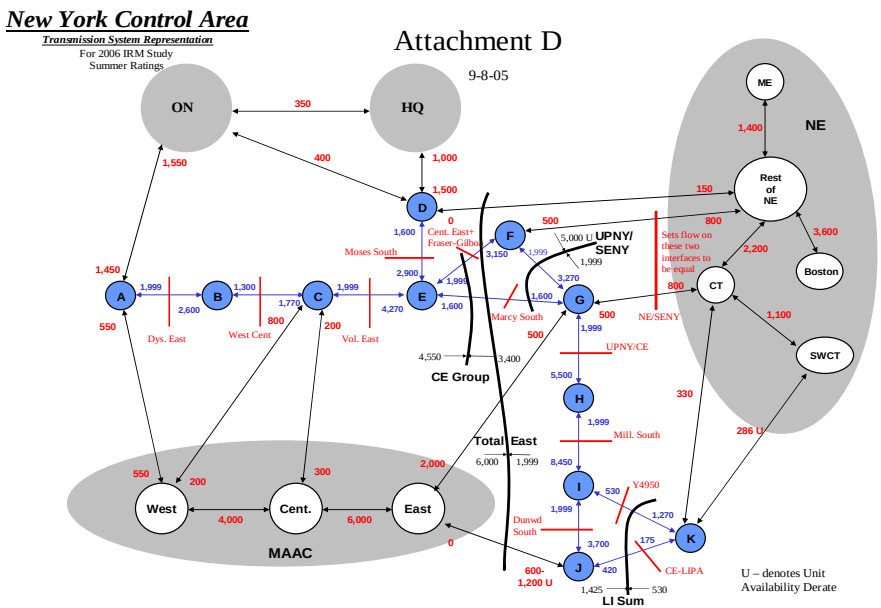
Resource Adequacy Issues Task Force Meeting

August 3, 2006

Principles for Selecting an Anchor

- Compliance with Reliability Rules
- Physical Considerations
  - Feasible
  - Reflective of Current System Configuration
  - Compatible with Zonal LOLE results
- Stability of Anchor Point
  - Avoid small changes in IRM resulting in large changes to LCR
  - Importance of computing IRM/LCR relationship as accurately as possible
- Economic Considerations
  - Minimizes the delivered cost to the New York consumer at an acceptable level of reliability
  - Price signals

Anchoring Mechanism must reflect reality of NY Transmission System as required by NYS Reliability Rules



> " Adequate resource capacity shall exist in the NYCA such that, after due allowances for … NYS Transmission System transfer capability **…** probability **…**no more than once in ten years"
>
> -- NYS Reliability Rule AR-1

> " …LSE capacity obligation shall be distributed to meet locational ICAP requirements, considering the availability and capability of the NYS Transmission System to maintain AR-1 reliability requirements "
>
> -- NYS Reliability Rule AR-2

- Free Flow Anchor disregards the reality of NYS Transmission System
- Free Flow Anchor is unfair to locational area customers that have Existing Transmission Capacity for Native Load (ETCNL) transmission and results in a form of double payment
  - It minimizes the use of transmission resources built for such customers and asks them to pay again in the form of higher locational capacity prices by setting the maximum LCR

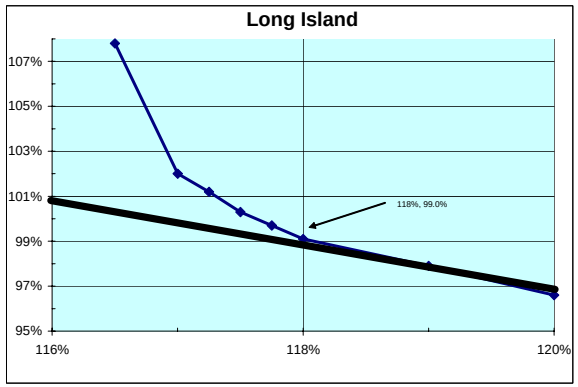
Anchoring Mechanism Must Provide Feasible Requirements to Meet AR-1

"Adequate resource capacity shall exist in the NYCA such…that the probability of disconnecting firm load due to a resource deficiency will be, on the average, no more than once in ten years."

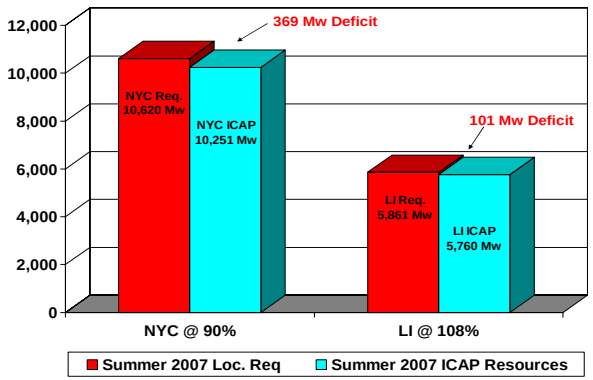
- NYSRC AR1

- Free Flow anchor results in a roughly 10% "step change" in LCRs
- Tan 45 results in realistic requirements compatible with existing and planned "Steel in the Ground" based on historic LCR levels
- Inadequate "Steel in the Ground" to Meet AR-1 Requirements at Free Flow Anchor point
- Unrealistic to permit, finance, design, procure, and build ~500 MW by next summer resulting in likely non-compliance with AR-1&2 under Free Flow (even if uneconomic on emergency basis)

NYCA Locational ICAP Requirements vs. Statewide ICAP Requirements UDR Base Case



2007 Capacity Requirements vs. Installed Capacity[1] for NYC and LI at Free Flow Anchor Point

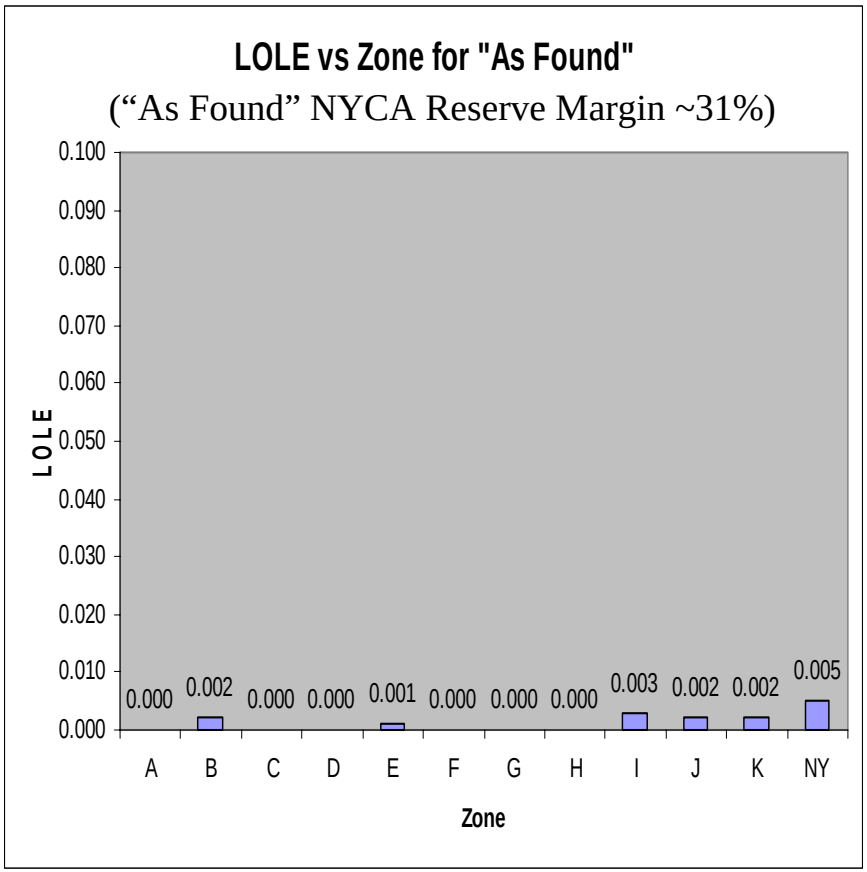


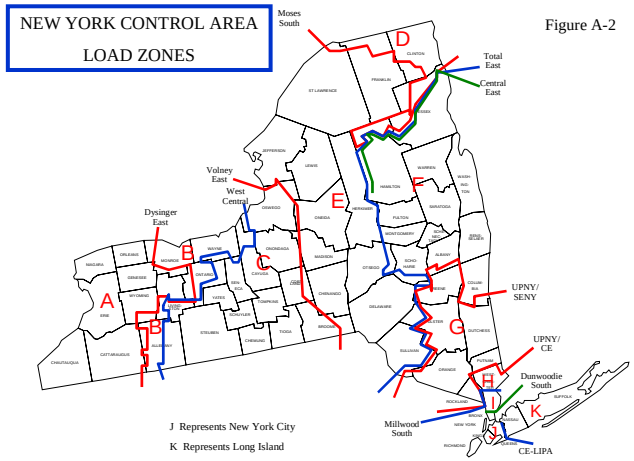
[1] Locational Capacity Requirement levels based on results from NYSRC Technical Study Report "NYCA Installed Capacity Requirement for the period May 2006 through April 2007" approved by Executive Committee March 20, 2006. Load and Capacity information based on 2006 Gold Book.

FFE Gives Counter-Intuitive Results

- To get around the issue of exceeding “steel-in-the-ground” in locational areas, the FFE adjusts the LCRs each year to correspond to existing locational capacity
- The FFE makes use of all existing locational generation resources in meeting the 0.1 LOLE requirement
  - If it cannot do so just with generation resources, it uses the minimum transmission resources necessary to reach 0.1
- The FFE LCR results are counter-intuitive:
  - When locational load increases in the locational areas it will **reduce** the LCRs in order to not exceed “steel-in-the-ground”
  - When new generation is added in the locational areas it will **increase** the LCRs to make use of all the “steel-in-the-ground” (similar to the Cedars issue)
- FFE results will therefore be volatile, tracking load increases and generation additions in the locational areas by adjusting the LCRs

Physical Considerations – Zonal Reliability and "As Found" LOLE [1]

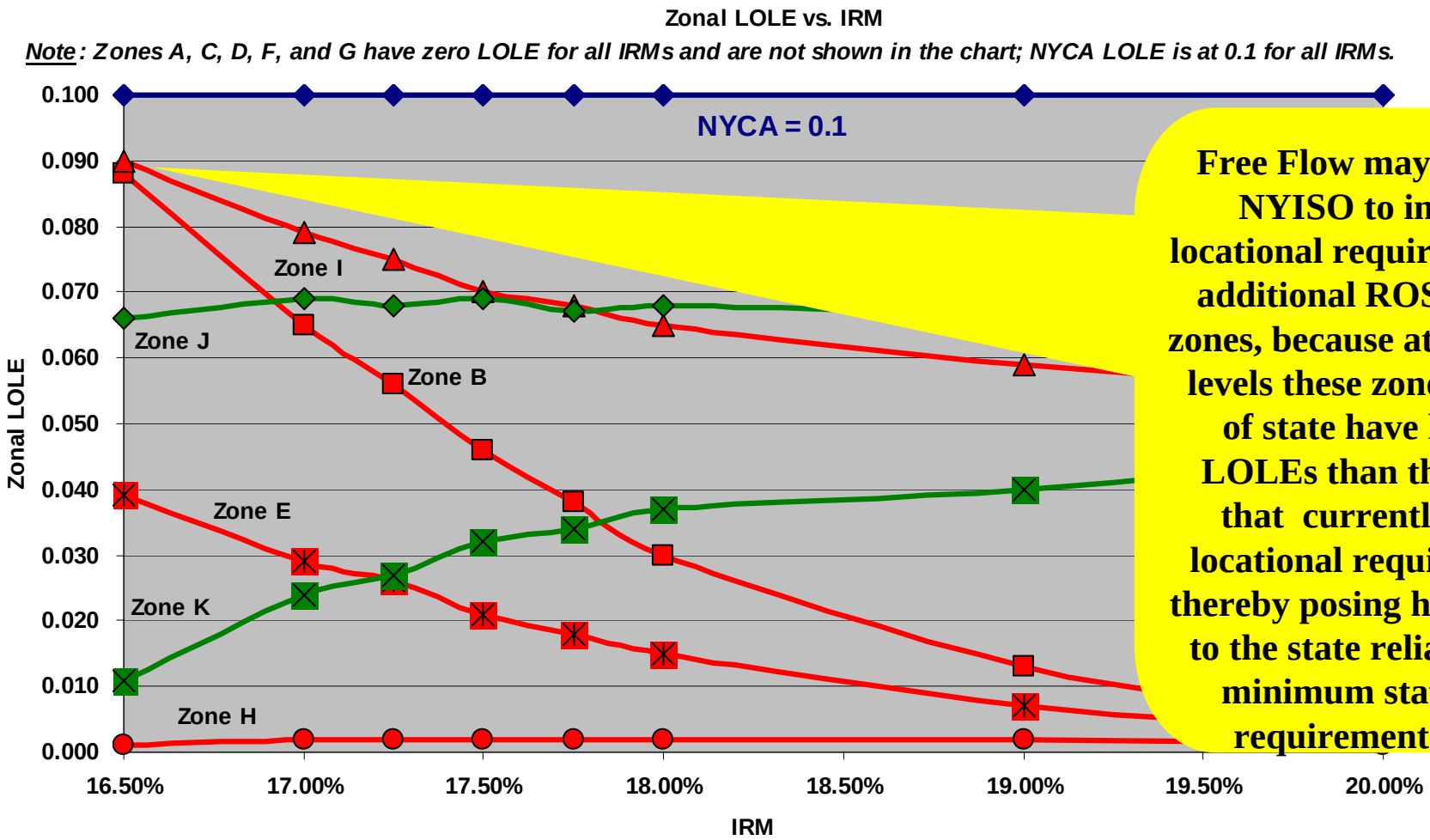




- "As Found" LOLEs for all Zones <<< 0.1; no downstate reliability issue!
- Reliability of Zones J and K comparable to B, E, and I -- all essentially zero LOLE
- To drive the system to 0.1 LOLE, existing NYCA capacity is artificially removed to determine the minimum capacity needed for the state to be at 0.1
- Downstate LOLE is a result of artificial shift , not any real reliability issue

1 From Study Database used for NYSRC Technical Study Report "NYCA Installed Capacity Requirement for the period May 2006 through April 2007" approved by Executive Committee March 20, 2006

Physical Considerations - Zonal LOLEs vs. IRM - Illustrative Example [1]



Free Flow may require NYISO to impose locational requirements to additional ROS NYCA zones, because at this IRM levels these zones in rest of state have higher LOLEs than the zones that currently have locational requirements thereby posing higher risk to the state reliability at minimum statewide requirement level.

1 Based on results of NYSRC Technical Study Report "NYCA Installed Capacity Requirement for the period May 2006 through April 2007" approved by Executive Committee March 20, 2006

IRM / LCR Curve

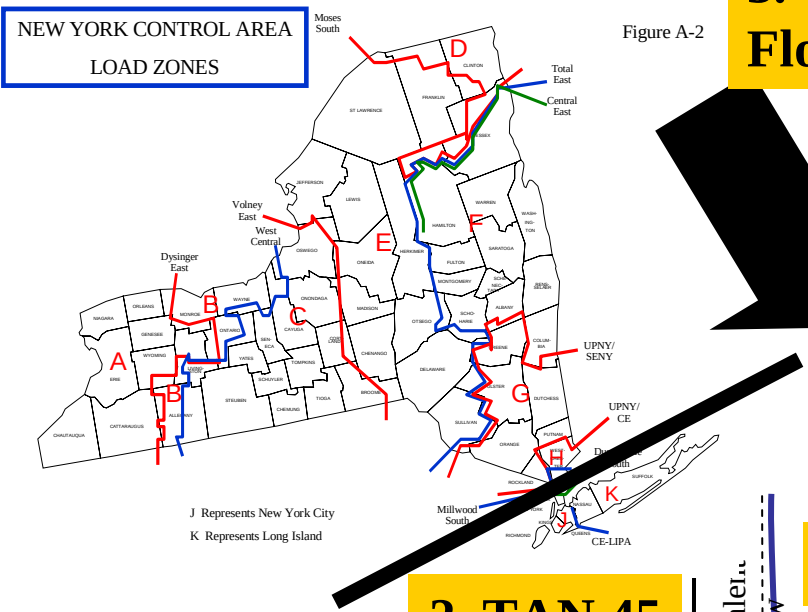
THREE POSSIBILITIES :

1. **Move from the "as found" towards the FFE. Remove generation from ROS till you reach 0.1. The transmission into the locational areas are quite underutilized**

2. **Move from the "as found" towards the TAN 45 where you balance use of existing transmission and resources**

3. **Move from the "as found" towards the Max Flow Equiv (the other extreme). To do this you remove resources in the locational areas till the point you have fully utilized the transmission capabilities into the locational areas.**

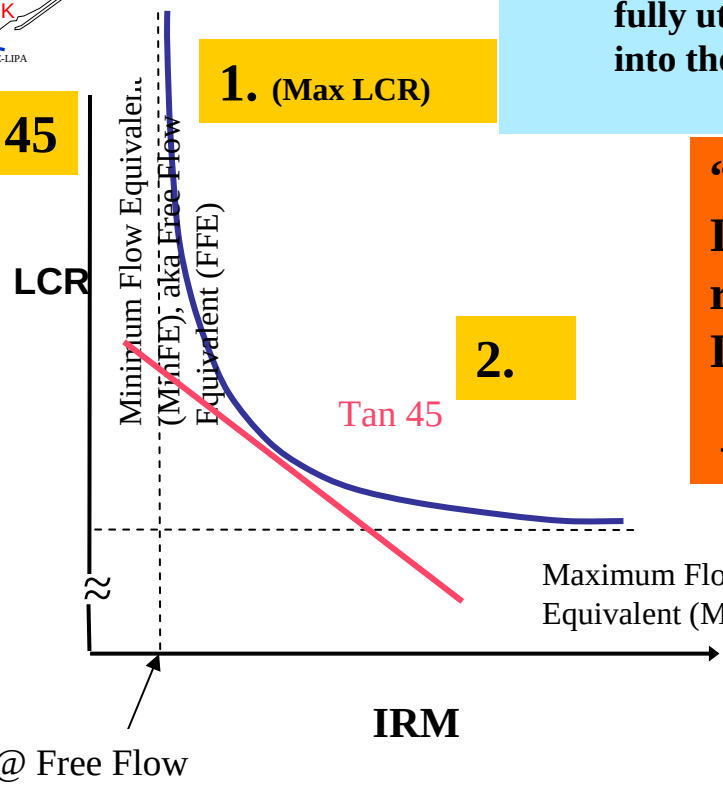
3. "Maximum Flow"



2. TAN 45

1. (Max LCR)

1. "Free Flow" or "Minimum Flow"

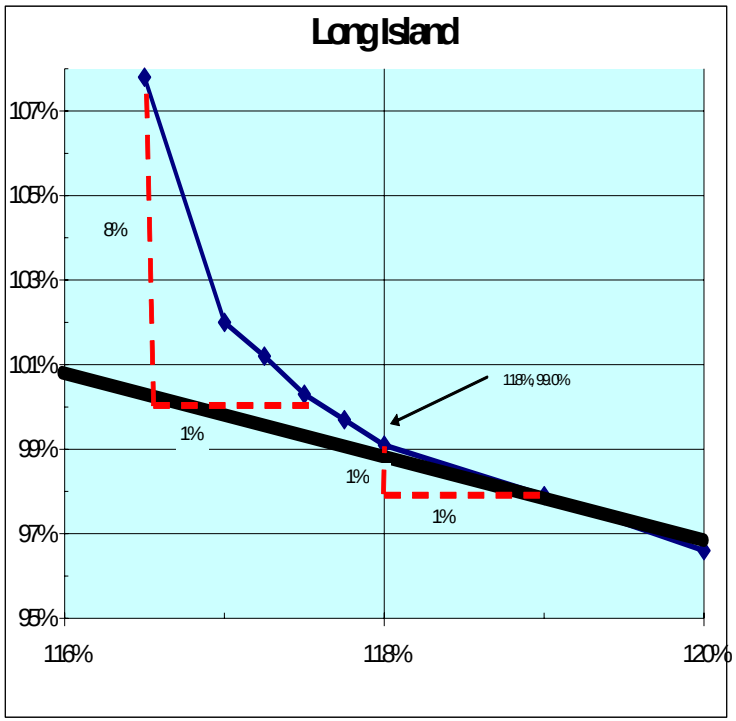


"Minimum locational ICAP requirements are recognized in the NYSRC IRM Study Basecase"

– NYSRC Policy 5.0

Anchor Mechanism Must be Stable

NYCA Locational ICAP Requirements vs. Statewide ICAP Requirements
UDR Base Case

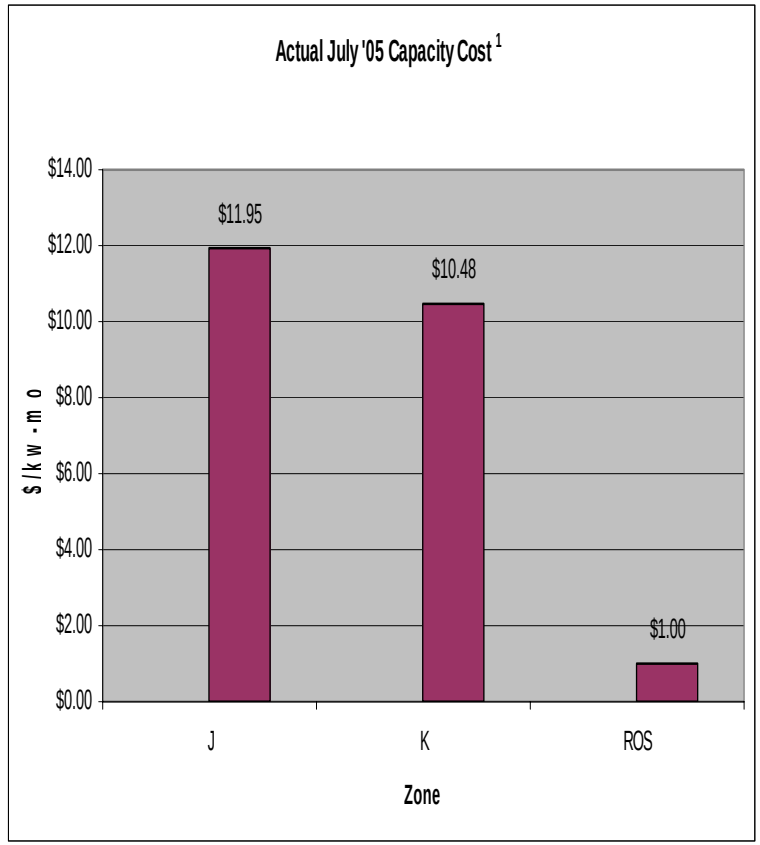


- A mere half a percent change in IRM (from 16.5% to 17.0%) will change LCRs by almost 10% .
  - ✓Tan 45 highly Stable; by definition is the point at which any input data uncertainty, errors, GE-MARS program convergence deviations, and other as yet unidentified program anomalies are equally allocated on both parameters by the same percentage magnitude
  - ✓Free Flow highly unstable at the resulting extreme point resulting in assumption uncertainties that have a small effect on the IRM would have a large effect on the LCR.
  - ✓A significant number of IRM study changes each year result in an IRM impact of half a percent or more

- From a Reliability perspective Tan 45 minimizes exposure to deviations in assumptions and provides most accurate determination of IRM and LCR.

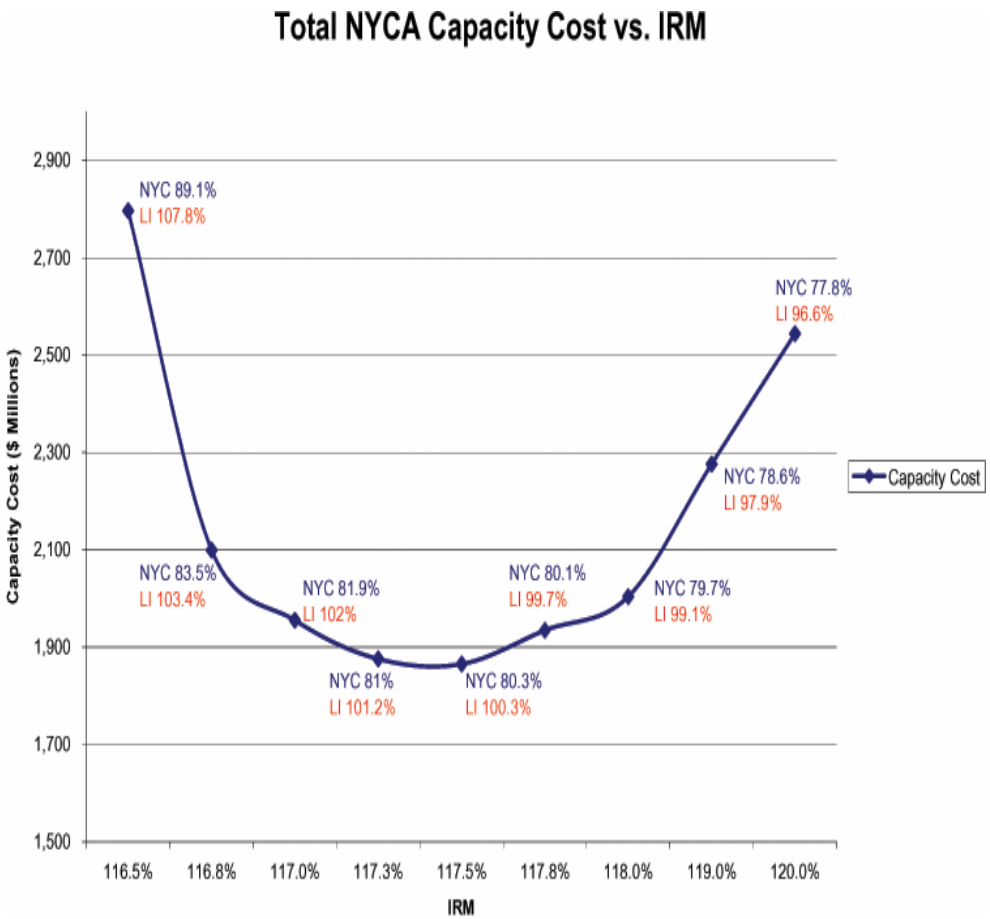
Anchor Point Should Send Appropriate Market Signals

- LOLEs in constrained zones must be higher than LOLEs in unconstrained zones
- Market Stability
  - An Unstable Anchoring point such as Free Flow will send volatile market signals which may increases risk premium and may deter long term investment
  - Free Flow may reduce liquidity in Locationally constrained zones and impact ability to negotiate bilateral as pricing goes up and down.
  - Tan 45 is consistent with Demand Curve in that produces less volatility in results.
- NYC and LI capacity prices already order of magnitude higher than Rest of NYCA and close to cost of new entry



[1] Consistent with market trends

All Things Equal Anchor Point Should not Result in Unreasonable Consumer Costs



- Tan 45 results in NYCA capacity costs that are in the vicinity of NYCA minimum costs.
- Free Flowing Anchor Maximizes NY Capacity Costs – by almost a Billion Dollars~!!
- This is unjust and discriminatory.
- The Free Flow is inconsistent with the LBMP-based energy market where statewide bid production costs are minimized.

Conclusions

Tan 45 should be adopted as the NYSRC IRM/LCR Anchoring Mechanism and used for 2007-08 IRM and future studies, based on the following:

- To satisfy NYSRC Reliability Rules AR-1 and AR-2
- Feasibility of Resulting Requirements
- Reflects a Balanced use of Actual System Configuration and Available Transfer Capability
- Stability of the TAN 45 Anchor Point
- Accuracy in determining of IRM/LCR Relationship
- To minimize NYCA Capacity Costs and thus the delivered costs to the consumers of the State overall and not one specific zone.
- To send appropriate price signals

Preponderance of evidence from Reliability and Economic perspectives supports use of Tan 45 as the Anchoring approach

Appendix 1 – NYSRC Reliability Rules

AR-1 - "Adequate resource capacity shall exist in the NYCA such that, after due allowances schedule outages and deratngs, forced outages and deeratings, assistance from neighboring systems, NYS Transmission System transfer capability , uncertainty of load forecasts, and capacity and/or load relief from Emergency Operating Procedures, the probability of disconnecting firm load due to a resource deficiency will be , on the average, no more than once in ten years."

AR-2 - " … LSE capacity obligation shall be distributed to meet locational ICAP requirements, considering the availability and capability of the NYS Transmission System to maintain A-R1 reliability requirements "

IRM / LCR Curve