Revising the Procedures for Using Load Forecasts to Calculate ICAP Requirements

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NYISO Load Forecasting Task Force

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Agenda

- **Background**
- **Specifics of Proposal**
  - ***Hours Used for Calculating Each ICAP Requirement***
  - ***Data and Analysis to Be Provided by TOs and ELRRs***
  - ***Data and Analysis to Be Provided by the ISO***
  - ***ISO Review and Dispute Resolution***
- **Illustrative Example**

Plan of Action

My presentation today will summarize the main elements of the Transmission Owners' proposal for revising the procedures for using load forecasts to calculate ICAP requirements.

- **For the purposes of this proposal, the TOs include NYPA and LIPA.**

We hope to bring this proposal before the following meetings:

- **ICAP WG, at its August 25 meeting.**
- **BIC and MC in September.**

We believe this would permit sufficient time to implement these revised procedures for the 2004-05 capability year.

Original Vision

The TOs' experience with the development of ICAP requirements for the 2003-04 capability year led to their joint conclusion that changes in these procedures were needed.

The procedures that the TOs envisioned when the tariff was written were as follows:

- **Each TO would measure the noncoincident peak load within its own Transmission District (TD).**
- **The next year's ICAP requirement for LSEs within that TD would then be calculated by multiplying the product of**
  - ***The TD peak load,***
  - ***One plus the installed reserve req't for the NYCA, adjusted for load diversity across the TDs, expressed as a percentage of peak load, and***
  - ***The regional load growth factor for that TD.***

Similar procedures applied for locational ICAP requirements.

Problems in 2003-04

The ISO is charged with ensuring resource adequacy for the NYCA.

- **Consequently, it has calculated a statewide ICAP requirement based upon its own load forecasts for the NYCA, consistent with the installed reserve margin determined by the NYSRC.**

To the extent that this requirement differs from the requirements that were defined using the TD procedure, the ISO allocated the difference among the LSEs.

- **In previous years, this difference had been small, so it was not cause for concern.**
- **But in 2003-04, there was a difference of about 400 MW.**

Problems in 2003-04

As a result, LSEs (largely the TOs) found themselves needing to procure about 400 MW of ICAP that they had not planned to have to procure.

- **However, this capacity was necessary to meet reliability objectives for the NYCA.**

A secondary problem was that there was not sufficient opportunity to review the ISO's calculations.

Intent of TO Proposal

Consequently, the TOs initiated an effort several months ago to develop revised procedures for using these data to determine ICAP requirements, culminating in this proposal.

The intent of this proposal is:

- **To ensure that each TD's ICAP requirement was based on peak load within that TD, thereby eliminating these unpleasant surprises,**
- **While also ensuring that sufficient capacity is maintained within the NYCA to permit reliability objectives to be met,**
- **And permitting all market participants sufficient opportunity to review the calculation of these requirements before they take effect so that they dispute these calculations if warranted.**

Allocation to LSEs

This proposal is limited to the calculation of total ICAP requirements for LSEs within each TD, and locational ICAP requirements for LSEs within each locality.

- **It does not address the allocation of these requirements among LSEs within each TD or locality.**
- **If this proposal is acceptable, additional work will be needed in this area.**

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Contents of Proposal

The detailed proposal is described in the document that was circulated last week. I will break today's discussion into four parts:

- **Hours Used for Calculating Each ICAP Requirement (§ 1 of the detailed proposal)**
- **Data and Analysis To Be Provided by TOs and ELRRs (§ 2)**
- **Data and Analysis To Be Provided by the ISO (§§ 3,4)**
- **ISO Review and Dispute Resolution (§§ 5,6)**

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Use Shares of Coincident Peak

The TOs propose a change in the procedure used to determine shares of the total NYCA ICAP requirement.

Under the proposal, it would be based on each TD's share of load in the NYCA coincident peak hour, instead of load in each TD in that TD's noncoincident peak hour.

- **Using the same hour to calculate all requirements will make it much easier to define procedures for calculating TD requirements that will be consistent with the requirements one would calculate for the NYCA.**
- **Moreover, since the need for ICAP within the NYCA is driven by total NYCA load in each hour, this approach is more consistent with the principle that costs should be assigned to those causing the need to incur the cost.**

Treatment of Demand Response Programs

The peak load hour would be the hour in which load in the NYCA was highest, after the ISO adds back the effect of all load reduction programs considered by the NYSRC when determining ICAP requirements.

- **Currently, these programs include Special Case Resources, the Emergency Demand Response Program, and voltage reduction.**
- **We need to add back the effects of these programs on load because ICAP requirements would be higher if this response was not taken into account.**

The effects of other demand response programs would not be added back.

- **The ICAP requirement was not reduced to account for these programs.**
- **These are not programs that the ISO monitors, so the ISO would have no good way of calculating the necessary adjustments.**

Locational Peak Hours

Locational ICAP requirements would continue to be calculated based on the peak load hour for each locality.

- **Load in each locality drives locational ICAP requirements, so this again is consistent with cost causation principles.**
- **Peak load for each locality would be determined using procedures analogous to those used to determine peak load for the NYCA.**

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Importance of Consistent Measures

One of the main causes of the 400 MW discrepancy between the NYCA ICAP requirement calculated by the ISO and the sum of the TD requirements was inconsistency in the ways that each TD reported its loads.

The TO proposal has been developed with the intent of ensuring:

- **Consistent procedures for weather normalization.**
- **Consistent treatment of losses.**
- **Consistent treatment of demand response.**

Weather Normalization Procedure

Under the TO proposal:

- **Each TO will report weather-normalized load within its TD for the NYCA peak hour.**
  - ***TOs in localities would also report weather-normalized loads for the locality peak hour.***
- **The weather normalization procedure used by each TO must meet at least a 50th percentile criterion (a.k.a. a 1-in-2 criterion).**
  - ***More stringent criteria would be permitted.***
  - ***Use of a more stringent criterion would only increase the total or locational ICAP requirement for the TD or locality using the more stringent criterion.***

Weather Normalization Procedure

Subject to this constraint, TOs would be permitted to use their own weather normalization procedures.

- **We believe these are likely to be more accurate than weather normalization applied across the NYCA by the ISO.**

However, the TOs also recognize the need for the ISO to ensure that these procedures are not manipulated to lower ICAP requirements.

- **Procedures that will be used to ensure this does not occur are described in § 5.**

Different Methods for Measuring Load

Each TO would also continue to use its current method for measuring load within each TO. Currently, two different methods are used:

- **Some TOs measure load as the sum of real power passing through all of the step-down transformers between the transmission and distribution systems throughout the TD. ("Grid method")**
- **Others measure it as net generation within each TD, plus transmission inflows into that TD, minus net outflows out of that TD. ("Con Ed method")**

The difference between these procedures is that the first does not include transmission losses occurring within the TD in the measure of TD load, while the second does.

- **The procedure used to calculate ICAP requirements will account for this difference.**

No Modification by TOs for Demand Response

Finally, TOs would not modify their loads to add back the effects of any of the ISO-monitored demand reduction programs.

- **The ISO will perform all such adjustments.**

Entities with Load Reporting Responsibilities

In some cases, TOs may not report all load within their TD.

- **Other entities will have responsibility for reporting part of that load to the ISO.**

In this proposal, we refer to such entities as Entities with Load Reporting Responsibilities (ELRRs).

- **Each ELRR will have responsibilities for the region it serves that generally parallel those of the TO.**
- **In cases where there are ELRRs, the TO's responsibility will be to report data for the portion of its TD not served by an ELRR.**

While the detailed proposal is careful to be precise about these details, for the purposes of this presentation we will generally assume that each TO reports all load for its TD (and locality, where relevant).

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Weather Normalization for ELRRs

First, we will discuss the procedures the ISO would use to determine each TD's total ICAP requirement.

Some ELRRs may not report weather-normalized data.

- **In that case, the ISO would weather-normalize those data by multiplying:**
  - ***The peak load reported by the ELRR and***
  - ***The ratio of the weather-normalized load for the relevant TO and the actual load reported by that TO.***
- **So if the TO's weather-normalized load is 2% above actual, the ELRR's weather-normalized load would also be 2% above actual.**

This yields a weather-normalized peak load for each ELRR.

Correction for Intra-TD Losses Reported by Some TOs

Next, the ISO would adjust these weather-adjusted loads to account for losses.

The first step is to deduct intra-TD transmission losses from the load of each TO that used the Con Ed method for reporting load.

- **The ISO would do this using its estimate of transmission losses occurring within that TD for the NYCA peak load hour.**
- **The ISO would weather-normalize these losses using a 50th percentile criterion.**
  - ***This is necessary because the load from which these losses are being deducted has been weather-normalized.***
- **No deduction is necessary for TOs that used the Grid method.**

This yields the weather normalized lossless load for each TD.

Allocation of Transmission Losses

The second step allocates NYCA-wide transmission losses to each TD, in proportion to its weather-normalized lossless peak load.

- **Thus, TDs with low loads that happen to be in areas with lots of transmission are not required to carry a disproportionate share of ICAP requirements.**
- **This approach also ensures that all losses within the NYCA will be included in the determination of the ICAP requirement of one, and only one, TD.**
  - ***Distribution losses are already included in loads.***
  - ***The ISO will need to coordinate with the TOs to ensure a consistent definition of transmission and distribution losses.***

This yields the weather normalized load including an allocated share of transmission losses for each TD.

Calculation of ICAP Requirement

Finally, the ISO would add back the effect of ISO-monitored demand response programs on load in each TD during the peak hour.

- **This yields the adjusted actual peak load for that TD.**
- **The adjusted actual peak load would then be multiplied by:**
  - ***One plus the installed reserve for the NYCA, expressed as a percentage of peak load, and***
  - ***The regional load growth factor for that TD,***
- **To yield the ICAP requirement for that TD.**

Losses and Locational ICAP Requirements

The ISO would follow similar procedures to determine each locational ICAP requirement.

The primary difference pertains to losses. The ISO will not adjust the loads reported for each locality's peak load hour to account for intra-locality losses, because:

- **Locational ICAP requirements are based on load including transmission losses in the locality.**
- **All TOs and ELRRs in each of the current localities use the Con Ed method for reporting transmission losses.**
- **Therefore, the sum of the loads reported by the TOs and ELRRs is consistent with the measure of load on which locational ICAP requirements are based.**

Calculation of Locational ICAP Requirement

So to determine the adjusted actual peak load for each locality, the ISO will simply:

- **Weather-normalize the load reported by ELRRs for localities, if necessary, and**
- **Add back the effects of ISO-monitored demand reduction programs on each locality's peak load.**

This would then be multiplied by:

- **The locational installed capacity requirement for that locality, expressed as a percentage of peak load, and**
- **The regional load growth factor for that locality,**

To yield the ICAP requirement for that locality.

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ISO Review

This process is partly based upon:

- **Weather normalization performed by the TOs.**
- **Regional load growth factors estimated by the TOs.**

In each case, the ISO will ensure that the data or analysis provided by the TOs are reasonable.

- **Such a procedure already exists for the calculation of regional load growth factors.**

Review of Regional Load Growth Factors

Under that procedure:

- **The ISO develops criteria to assess whether the regional load growth factors provided by a TO are reasonable.**
- **If the growth factors do not meet these criteria, the ISO and the affected TOs work together to resolve the difference.**
- **If they cannot resolve the difference, the ISO may impose its own regional load growth factor.**
- **The TO then may elect to take the issue to expedited dispute resolution.**
- **If the ISO agrees to accept growth factors that are not consistent with its criteria, any other market participants may take the issue to expedited dispute resolution.**

This procedure seems to work well, so it will continue in place.

Review of Weather Normalization

A similar procedure will be developed to deal with weather normalization.

- **The ISO will develop criteria to assess whether the weather normalization performed by a TO is reasonable.**
- **If the normaliaztion does not meet these criteria, the ISO and the affected TOs would work together to resolve the difference.**
- **If they cannot resolve the difference, the ISO could impose its own method for weather-normalizing (using a 50th percentile criterion).**
- **The TO then may elect to take the issue to expedited dispute resolution.**
- **If the ISO agrees to accept weather normalization that is not consistent with its criteria, any other market participants may take the issue to expedited dispute resolution.**

Posting, Notification and Disputes

Finally, the ISO will post the results of its calculations.

- **It will notify market participants of this posting, giving them sufficient time to review the results.**
- **In the event that a market participant believes that the ISO has performed some aspect of this calculation incorrectly, it could discuss this with the ISO.**
- **If necessary, the market participant could elect to take the issue to expedited dispute resolution.**

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	Calculation of Total Installed Capacity Requirement	TD 1	TD 2	TD 3	TD 4	NYCA
1	Actual Peak Load Reported by TO Serving TD	9100	5500	9688.6	5320	
2	Weather-Normalized Load Reported by TO Serving TD	9000	5400	9650	5200	
3	Does This Load Include Transmission Losses?	N	Y	Y	Y	
4	Loads Within TD Reported by ELRRs	1000	0	502	0	
5	Are ELRR Loads Weather-Normalized?	Y	NA	N	NA	
6	Do These Loads Include Transmission Losses?	N	NA	Y	NA	
7	Weather-Normalized Loads Within TD for ELRRs	1000	0	500	0	
8	ISO Weather-Normalized Estimate of Transmission Losses During Peak Hour in Portion of TD Not Served by ELRRs	710	400	140	200	1450
9	ISO Estimate of Losses Included in Weather-Normalized Load Reported by TO Serving TD	0	400	140	200	
10	Weather-Normalized Lossless Peak Load for TO	9000	5000	9510	5000	
11	ISO Weather-Normalized Estimate of Transmission Losses During Peak Hour in Areas of TD Served by ELRRs	40	0	10	0	50
12	ISO Estimate of Losses Included in Weather-Normalized Load for ELRRs in TD	0	0	10	0	
13	Weather-Normalized Lossless Peak Load for ELRRs in TD	1000	0	490	0	
14	Weather-Normalized Lossless Peak Load for TD	10000	5000	10000	5000	30000
15	ISO Allocation of Losses to TD	500	250	500	250	1500
16	Load Reduction Due to SCR, EDRP and Voltage Reduction	100	50	50	0	200
17	Adjusted Actual Peak Load for TD	10600	5300	10550	5250	31700
18	Regional Load Growth Factor for TD	2.0%	0.0%	1.0%	0.5%	
19	Forecasted Peak Load for TD	10812.0	5300.0	10655.5	5276.3	
20	Installed Reserve Margin for NYCA (as a % of NYCA Peak Load)					18%
21	Total Installed Capacity Requirement	12758.2	6254.0	12573.5	6226.0	37811.6

Explanation of Calculations for Total Installed Capacity Requirement

[1] through [6]: provided by TO or ELRR
[7] = [4] unless [5] = "N", in which case [7] = [4] * [2] / [1]
[8]: provided by ISO
[9] = [8] unless [3] = "N", in which case [9] = 0
[10] = [2] - [9]
[11]: provided by ISO
[12] = [11] unless [6] = "N", in which case [12] = 0
[13] = [7] - [12]
[14] = [10] + [13]
[15] = ([14] / sum of [14] for all TOs) * sum of [8] and [11] for all TOs
[16]: provided by ISO
[17] = [14] + [15] + [16]
[18]: determined through RLGF process
[19] = [17] * (1 + [18])
[20]: determined by NYSRC
[21] = [19] * (1 + [20])

	Calculation of Locational Installed Capacity Requirements	**Locality 1 (inside TD 3)**	**Locality 2 (same as TD 4)**
1	Actual Peak Load Reported by TO Serving Locality	8952.3	5320
2	Weather-Normalized Load Reported by TO serving Locality	8820	5200
3	Loads Within TD Reported by ELRRs	406	0
4	Are ELRR Loads Weather-Normalized?	N	NA
5	Weather-Normalized Loads Within Locality for ELRRs	400	0
6	Total Weather-Normalized Load Within Locality	9220	5200
7	Load Reduction Due to SCR, EDRP and Voltage Reduction	45	0
8	Adjusted Actual Peak Load for Locality	9265	5200
9	Regional Load Growth Factor for Locality	1.0%	0.5%
10	Forecated Peak Load for Locality	9357.7	5226.0
11	Installed Reserve Requirement for Locality (as a % of Locality Peak Load)	80%	95%
12	Locational Installed Capacity Requirement	7486.1	4964.7
13	Difference Between Total and Locational ICAP Requirements for TD Containing Locality	5087.4	1261.3

Explanation of Calculations for Locational Installed Capacity Requirement

[1] through [4]: provided by TO or ELRR
[5] = [3] unless [4] = "N", in which case [5] = [3] * [2] / [1]
[6] = [2] + [5]
[7]: provided by ISO
[8] = [6] + [7]
[9]: determined through RLGF process
[10] = [8] * (1 + [9])
[11]: determined by ISO
[12] = [10] * [11]