UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York State Reliability Council, LLC) Docket No. ER07-429-000

MOTION FOR LEAVE TO RESPOND AND RESPONSE OF THE NEW YORK STATE RELIABILITY COUNCIL, LLC

Pursuant to Rules 212 and 213 of the Federal Energy Regulatory Commission's ("Commission" or "FERC") Rules of Practice and Procedure, 18 C.F.R. §§ 385.212 and 385.213 (2006), the New York State Reliability Council, LLC ("NYSRC") moves for leave to respond and submits this response to the comments and protests filed in the captioned proceeding.

In support hereof, the NYSRC states as follows:

MOTION FOR LEAVE TO FILE RESPONSE

On January 12, 2007, pursuant to Section 3.03 of the New York State Reliability Council Agreement, the NYSRC submitted a filing to advise the Commission that the NYSRC has revised the Installed Reserve Margin ("IRM") for the New York Control Area ("NYCA") for the capability year beginning on May 1, 2007 and ending April 30, 2008 to be 16.5%, and to request that the Commission accept and approve the filing effective no later than March 1, 2007. The NYSRC requested that the Commission grant any and all waivers of its regulations that it deems necessary to accept and approve the filing effective no later than March 1, 2007.

By this filing, the NYSRC respectfully requests that the Commission grant the necessary waivers of its regulations to permit this response to the comments and protests submitted in this proceeding. The Commission has permitted answers where, as here, the information provided in an answer will narrow the matters at issue, clarify the record, facilitate the Commission's

decisional process and aid in the Commission's understanding of the issues.[1] Under the Commission's Rules of Practice and Procedure and Commission precedent, the NYSRC is entitled to respond to affirmative requests, including affirmative requests for relief, set forth in the pleadings submitted in this proceeding.[2] The NYSRC's response will ensure that the record is complete and accurate to enable the Commission to reach expeditious resolution of these issues.

RESPONSE

Comments Filed by the Public Service Commission of the State of New York

The Public Service Commission of the State of New York ("NYPSC") states that it submitted its comments "in an abundance of caution to preserve . . . New York's existing jurisdiction over the adequacy and reliable operation of the bulk-power system facilities within New York State, in a manner consistent with New York State law and the Federal Power Act."[3] The NYPSC states that it does not take a position on the IRM recently adopted by the NYSRC and notes that it has commenced a state proceeding to review the IRM.[4] The NYPSC further states that its comments are not "intended to question the Agreement between the NYISO and the NYSRC"[5] and are intended "only to be sure the Commission does not act beyond its jurisdiction."[6] In order to gain this assurance, the NYPSC states that the Commission "should 'accept for filing' rather than approve any change in the IRM, subject to the NYPSC

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1 *See, e.g.*, *New York Power Authority v. Consolidated Edison Company of New York, Inc*., 112 FERC ¶ 61,304 at P 41 (2005)("We will accept the . . .[the] reply, . . .[the] response,. . .and [the] answer because these supplemental pleadings serve to narrow the matters at issue in this proceeding and provide information that facilitates our decision-making process.").

2 *See*, *e.g.*, *Iroquois Gas Transmission System, L.P.*, 61 FERC ¶ 61,341, at n.9 (1992); *Seminole Elec. Coop., Inc. v. Fla. Power & Light Co.*, 53 FERC ¶ 61,026, at 61,101 (1990).

3 Notice of Intervention and Comments of the Public Service Commission of the State of New York, Docket No. ER07-429-000 (Feb. 2, 2007), at 2 ("NYPSC Comments").

4 *Id.*

5 *Id.*

6 *Id.*

proceeding."[7] The NYPSC goes on to state that the Commission has recognized that the Federal Power Act ("FPA") "preserves the states' ability to oversee and ensure the adequacy of bulk-power system facilities within their respective jurisdictions, including the setting of an installed reserve margin."[8] The NYPSC further states that "[i]n the alternative, if the setting of installed reserve margins relates to the reliable operation of the bulk power system, which we do not believe to be the case, the FPA preserves the State's ability to act in a manner not inconsistent with Federal reliability standards, and the adoption of an IRM by the NYPSC for the NYCA will not be inconsistent with the FPA."[9]

The NYPSC makes reference to the Commission's decision on March 29, 2000, with respect to the NYSRC decision to reduce the NYCA IRM from 22.0% to 18.0%, the only other occasion when Commission action on the IRM was requested by the NYSRC.[10] The NYPSC notes that in its previous decision the Commission concluded that the revised IRM "did not have any adverse effect on [FERC-]jurisdictional matters."[11]

NYSRC Response

In considering the NYPSC's concern with respect to retaining its jurisdiction over resource adequacy issues in New York State, it is important to review the context in which this filing arises and the limited nature of the action requested of the Commission. The NYISO and the NYSRC were approved by the Commission as part of an overall restructuring of the electricity industry in New York State, in response to a filing submitted by the members of the

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7 *Id.*
8 *Id.*
9 *Id.* at 2-3.
10 *See N.Y. State Reliability Council*, 90 FERC ¶ 61,313 (2000).
11 NYPSC Comments at 3; *N.Y. State Reliability Council*, 90 FERC at 62,036.

New York Power Pool ("NYPP").[12] The fundamental purpose of the NYSRC is to ensure that the newly established competitive wholesale market would not result in a degradation of reliability standards that had been developed over several decades by the NYPP and the NYPSC, partly in response to several blackouts that had severe consequences for the state. Under the structure proposed by the NYPP, the NYISO would agree, pursuant to the terms of the NYISO/NYSRC Agreement,[13] to abide by the reliability rules established by the NYSRC in the NYISO's operation of the bulk power system. Those reliability rules included an annual statewide IRM to be established by the NYSRC. Under the NYISO/NYSRC Agreement, the NYISO is obligated to impose installed capacity requirements on all load serving entities ("LSEs") to ensure that the statewide IRM adopted by the NYSRC is achieved. Section 3.03 of the NYSRC Agreement makes reference to the 22.0% reserve margin adopted by the NYPP and on file with the Commission, and states that any changes in this requirement will be subject to an appropriate filing and Commission approval.[14] Both the NYSRC Agreement and the NYISO/NYSRC Agreement were approved by the Commission.[15]

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[12] *Cent. Hudson Gas & Elec. Corp.*, 83 FERC ¶ 61,352 (1998), *order on reh'g*, 87 FERC ¶ 61,135 (1999); *Cent. Hudson Gas & Elec. Corp.*, 86 FERC ¶ 61,062, *order on reh'g*, 88 FERC ¶ 61,138 (1999).

[13] The NYSRC Agreement and the NYISO/NYSRC Agreement are posted on the NYISO website at the following addresses:
http://www.nyiso.com/public/webdocs/documents/regulatory/agreements/nyiso_agreement/nysrc_agreement.pdf &
http://www.nyiso.com/public/webdocs/documents/regulatory/agreements/nyiso_agreement/iso_nysrc_agreement.pdf.

[14] Section 3.03 of the NYSRC Agreement provides as follows: "The NYSRC shall establish the state-wide annual Installed Capacity requirements for New York State consistent with NERC and NPCC standards. The NYSRC will initially adopt the Installed Capacity requirement as set forth in the current NYPP Agreement and currently filed with FERC. Any changes to this requirement will require an appropriate filing and FERC approval. In establishing the state-wide annual Installed Capacity requirements, consideration will be given to the configuration of the system, generation outage rates, assistance from neighboring systems and Local Reliability Rules. The NYSRC shall develop Reliability Rules, to be implemented by the ISO to ensure that sufficient Operating Capacity is committed on a Day-Ahead basis and remains available to ensure the reliable operation of the NYS Power System during the next day." *See*
http://www.nyiso.com/public/webdocs/documents/regulatory/agreements/nyiso_agreement/nysrc_agreement.pdf.

[15] *Cent. Hudson Gas & Elec. Corp.*, 83 FERC ¶ 61,352 (1998), *order on reh'g*, 87 FERC ¶ 61,135 (1999); *Cent. Hudson Gas & Elec. Corp.*, 86 FERC ¶ 61,062, *order on reh'g*, 88 FERC ¶ 61,138 (1999).

The NYSRC's responsibility to develop the annual statewide IRM, and the NYISO's responsibility to implement the IRM, are the result of an agreement entered into by those two entities in order to assure the members of the former NYPP, who were turning over operational control of their transmission assets to the newly formed NYISO, that adequate reliability standards would be maintained. These requirements were not the result of an assertion of jurisdiction by the Commission, nor were they in any way intended to impinge upon the jurisdiction of the NYPSC to take independent action with respect to resource adequacy in New York, if it should determine that such action is warranted. It should be noted that the NYPSC supported the formation of the NYSRC, including its ability to establish an IRM to be implemented by the NYISO.[16]

It also should be noted that under the NYISO/NYSRC Agreement, the NYPSC acts as the arbitrator of disputes between the NYSRC and the NYISO with respect to matters within the NYPSC's jurisdiction, and the NYPSC staff has the ability to raise on its own motion an issue with respect to an NYSRC Reliability Rule within the NYPSC's jurisdiction and bring the issue to the NYPSC for determination.[17]

The Commission's role with respect to the IRM under the agreements is both limited and appropriate. When the NYSRC was proposed, concern was expressed that it could improperly interfere with the newly established NYISO and wholesale competitive markets, or could be used to favor the commercial interests of individual market participants. In response to those concerns, the limited responsibilities of the NYSRC and its relationship to the NYISO were clearly defined in the NYSRC Agreement and the NYISO/NYSRC Agreement. The

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[16] *See, e.g.*, Supplemental Comments of the New York State Public Service Commission, Docket Nos. ER97-1523, *et al.* (filed May 23, 1997), at 2.

[17] *See* Article 5 of the NYISO/NYSRC Agreement available at: http://www.nyiso.com/public/webdocs/documents/regulatory/agreements/nyiso_agreement/iso_nysrc_agreement.pdf.

establishment of an IRM is an important aspect of maintaining the reliability of the bulk power system in the NYCA. However, as is the case with all reliability rules, the level of IRM will affect the NYISO markets and the commercial interests of various market participants. The NYSRC respectfully suggests that the Commission's review of the revised IRM should be limited to a determination that the NYSRC has acted in conformity with the agreements approved by the Commission and that no valid objection has been raised that would lead the Commission to conclude that the revised IRM would adversely affect the rates, terms, and conditions of jurisdictional transmission and power sales services or any other matter within the Commission's exclusive jurisdiction.[18]

With respect to the NYPSC request that the Commission "accept for filing" rather than "approve" the NYSRC filing, the NYSRC's only concern is that the effect of the Commission's action be unambiguous and consistent with the provisions of Section 3.03 of the NYSRC Agreement. It is important that the Commission's order be clear that the IRM adopted by the NYSRC is binding on the NYISO, pursuant to the agreements approved by the Commission, as of a specified effective date. This clarity is important because, in reliance on the NYSRC's determination and the Commission's order, the NYISO will establish installed capacity requirements for LSEs and will conduct installed capacity auctions.

While Section 3.03 of the NYRC Agreement provides that a change in the IRM must be "filed and approved" by the Commission, in its previous order the Commission used the term "accepted for filing" with respect to the NYSRC filing. The Commission's action, however, followed its consideration of objections raised by parties who protested the NYSRC's determination, and the Commission established an effective date of March 17, as had been

[18] *See N.Y. State Reliability Council*, 90 FERC ¶ 61,313.

requested by the NYSRC. The decision by the Commission was understood by the NYSRC as satisfying the "appropriate filing and FERC approval" language in Section 3.03 of the NYSRC Agreement, and was accepted by the NYISO and market participants as binding on the NYISO and the revised IRM was effectively implemented.

The NYSRC respectfully requests that the Commission approve the revised IRM or, in the alternative, accept the NYSRC filing along with an express statement that the revised IRM will be binding on the NYISO under the Commission-approved agreements as of a specified effective date.

The NYISO has no objection to a statement by the Commission, as suggested by the NYPSC, that its action is not intended to impinge upon the NYPSC's jurisdiction under state law, the FPA, and the terms of the NYISO/NYSRC Agreement to take action with respect to resource adequacy requirements within its jurisdiction if it should determine that such action is warranted.

Protest of Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc. and Central Hudson Gas and Electric Corporation (the "Companies")

In their protest, the Companies take the position that the IRM Study does not support the NYSRC determination to set the IRM at 16.5%, and that the IRM Study requires the retention of the current 18.0% IRM. The numerous contentions made by the Companies[19] in support of their position can be reduced to two basic points:

1. It was not prudent or reasonable for the NYSRC to accept a base case IRM of 16.0% because it has only a 50% chance of meeting the NYSRC's resource

[19] *See* Protest of Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc. and Central Hudson Gas and Electric Corporation, Docket No. ER07-429-000 (Feb. 2, 2007) ("Companies' Protest"). The NYSRC response to the Companies' Protest, including the attached affidavits, also addresses issues raised by the Independent Power Producers of New York, Inc. ("IPPNY") and the Mirant Parties.

adequacy criterion of a loss of load expectation ("LOLE") of one day in ten years; and

2. The NYSRC did not adequately consider the sensitivity cases included in the IRM Study; and the NYSRC is obligated to accept the results of sensitivity studies that would result in a higher IRM and not doing so will create an imprudent and unreasonable risk that the IRM will not meet the one day in ten years LOLE criterion.

These contentions are premised on incorrect representations of the NYSRC's resource adequacy criterion, the meaning and purpose of sensitivity cases in the NYSRC's IRM Study, and well-established NYSRC and NPCC policies and practices with respect to the determination of an IRM. The Affidavit submitted by Alan M. Adamson (attached to this filing as Appendix A) will address contentions related to the NYSRC's resource adequacy criterion, and the Affidavit submitted by Curt J. Dahl (attached to this filing as Appendix B) will address contentions related to the sensitivity cases considered by the NYSRC and the IRM Study process.

NYSRC Resource Adequacy Criterion

The NYSRC's resource adequacy criterion is set forth in Reliability Rule A-R1, as follows:

> The *NYSRC* shall establish the *IRM* requirement for the *NYCA* such that the probability (or risk) of disconnecting any *firm load* due to *resource* deficiencies shall be, on average, not more than once in ten years. Compliance with this criterion shall be evaluated probabilistically, such that the loss of *load* expectation (LOLE) of disconnecting *firm load* due to *resource* deficiencies shall be, on average, no more than 0.1 day per year. This evaluation shall make due allowance for demand uncertainty, scheduled outages and deratings, forced outages and deratings, assistance over interconnections with neighboring *control areas, NYS Transmission System transfer capability*, and *capacity* and/or *load*

> relief from available *operating procedures*. (Italics in the original).[20]

The criterion set forth in Reliability Rule A-R1 is consistent with the criterion used by the NYPP prior to the formation of the NYISO and with the criterion used by the Northeast Power Coordinating Council ("NPCC"). *See* Adamson Affidavit at 5. Its application by the NYSRC has been consistent since the NYSRC's inception, and is consistent with the NPCC's application of its similar criterion. As Reliability Rule A-R1 states, the resource adequacy criterion is that the probability of disconnecting firm load due to resource deficiencies shall be on average, not more than once in ten years. The Reliability Rule goes on to state that compliance with this criterion shall be evaluated probabilistically, such that the loss of load expectation shall be on average, no more than 0.1 day per year (emphasis added). It is apparent from the clear wording of the Reliability Rule that the criterion does not require near 100% certainty that load will not be disconnected more than once every ten years, but that the probability of such an event occurring, on average, is not more than once every ten years. *See* Adamson Affidavit at 5-10. The IRM Study found that the IRM for the upcoming capability year that satisfies this criterion is 16.0%. That means that with a 16.0%, IRM, on average, the expectation of a disconnection of load would be once every ten years. It also means that with a 16.0% IRM there is an equal probability that the disconnection of load would be higher or lower than once in ten years.

The Companies' Protest misstates the NYSRC's reliability criterion by suggesting that it requires an IRM that provides close to a 100% confidence level of meeting an LOLE of one day in ten years, and that an IRM that, on average, (*i.e.*, a 50% confidence level) results in an LOLE of one day in ten years does not meet the criterion. *See* Companies' Protest at 6 and Sasson Affidavit at paragraph 10. As is clearly demonstrated by the affidavit of Mr. Adamson, the

[20] The NYSRC Reliability Rules are available on the NYSRC website at http://www.nysrc.org.

Companies' contentions are incorrect, and are inconsistent with the clear language of Reliability Rules A-R1 and NYSRC Policy 5-1, which describes the procedures to be used in the development of the IRM.[21] *See* Adamson Affidavit at 6-10.

The IRM Study refers to the range of IRMs around the 16.0% of IRM, from 15.2% to 16.9%, and states that there is a 99.9% confidence level that the LOLE of one day in ten years will be within that range. The Companies incorrectly contend that the NYSRC was obligated to adopt as the base case IRM the 16.9% IRM that as the high end of the 15.2 to 16.9 range. There is no basis for this contention. As explained in Mr. Adamson's Affidavit, the establishment of confidence bounds provide useful information, but it is clear that the resource adequacy criterion is not set at either end of the bounds. *See* Adamson Affidavit at 5, 7. It is important to note that the IRM Study, including the finding that a 16.0% IRM satisfies the NYSRC's resource adequacy criterion, was adopted by the NYSRC's Executive Committee by a unanimous vote, including the representatives of the Companies.[22]

Statements in the Companies' Protest to the effect that a 16.0% IRM has a 50% chance of being "wrong" are incorrect and misleading. *See* Companies' Protest at 6 and Sasson Affidavit at paragraph 10. The fact that a 16.0% IRM results in a probability that the loss of load expectation, on average, will result in a disconnection of not more than once in ten years satisfies the criterion. The Companies' contention that a 16.0 IRM has a 50% chance of being "wrong," therefore, is clearly incorrect.

Neither the NYSRC nor NPCC have interpreted their criterion as requiring a near 100% confidence level. *See* Adamson Affidavit at 5, 8-10. In fact, such a requirement would be

[21] NYSRC Policy 5-1 is attached to this filing as Appendix C and is available on the NYSRC website at http://www.nysrc.org.

[22] *See* Executive Committee Meeting Minutes for Jan. 5, 2007, which are available at the NYSRC website at http://www.nysrc.org.

fundamentally inconsistent with the clear wording of the NYSRC criterion in Reliability Rule A-R1. Furthermore, the Companies have not provided any evidence to demonstrate that the consistent interpretation and application of the NYSRC criterion is incorrect or that a different criterion should be adopted.

NYSRC Consideration of Sensitivity Cases

The 2007 IRM Study includes a number of sensitivity cases. The sensitivity cases are intended to illustrate the potential impact on the IRM if actual events differ from the assumptions included in the base case. The base case, however, represents the NYSRC's best estimate of the various inputs based on experience, advice from NYISO, and the NYSRC's policies for the development of the IRM set forth in Policy 5-1. *See* Dahl Affidavit at 5-6, 8, 10-14. The assumptions upon which the sensitivity cases are based are, by definition, not the assumptions adopted by the NSYRC. Prior to the running of the base case, the Executive Committee approves the specific assumptions that will be used in the base case. Those assumptions were adopted by the Executive Committee at its meetings on August 11, 2006 and October 13, 2006 without opposition, and with the support of the representatives of the Companies.[23]

In their protest, the Companies suggest that the NYSRC is compelled to accept the results of certain sensitivity cases, despite the fact that they are based on assumptions that were not adopted by the NYSRC. *See* Companies' Protest at 7-8 and Sasson Affidavit at paragraph 11. Furthermore, the Companies contend that the NYSRC is obligated to adopt the results of only those sensitivity cases that would increase the IRM, but not the results of sensitivity cases that would reduce the IRM. *See* Sasson Affidavit at paragraph 11. These contentions misrepresent the intended purpose of sensitivity cases, which is to provide the Executive Committee members

[23] *See* Executive Committee meeting minutes available at the NYSRC website at http://www.nysrc.org.

of an understanding of the potential impact on the IRM if actual experience differs from assumptions adopted in the base case. *See* Dahl Affidavit at 13-14. Further, the contention that the NYSRC is obligated to adopt the results of any sensitivity case, and to adopt the results of only those sensitivity cases that would increase the IRM, are without any support in NYSRC's IRM policies and practices, or in basic logic or common sense. The NYSRC has never adopted the results of a specific sensitivity case, as such, and there is no support in NYSRC policies or practices for the contention that the NYSRC must or should adopt the results of any particular sensitivity case.

Sensitivity cases, however, may be used by the Executive Committee members in determining whether the IRM should be set at a level above the IRM determined by the IRM Study to meet the resource adequacy criterion. The extent to which the results of the sensitivity cases have an impact on the final IRM, however, is a matter of judgment to be exercised by the Executive Committee members, based on their consideration of all sensitivity cases, including those that would reduce, as well as increase, the IRM, and other relevant factors.[24] In making its IRM determination the Executive Committee expressly considered "the Technical Study Report results, the modeling and assumption changes made to simulate actual operating conditions and system performance, and the numerous sensitivity studies evaluated."[25] As a result of its consideration of all relevant factors, the NYSRC Executive Committee increased the IRM by 0.5% from the 16.0% base case to 16.5%.

[24] It should be noted that all the members of the Executive Committee have substantial knowledge and/or experience in the reliable operation of bulk power electric systems, as required by Section 4.03 of the NYSRC Agreement, including four members unaffiliated with any NYISO market participant.

[25] NYSRC IRM Resolution, attached to the NYSRC Filing as Appendix B.

Specific Sensitivity Cases Referred to in the Companies' Protest

The Companies refer to several specific sensitivity cases that they contend the NYSRC was obligated to adopt including: (1) a possible degradation in the performance in generation forced outages; (2) a possible extended outage of the Indian Point 2 nuclear plant; and (3) a possible degradation in the effectiveness of the NYISO's Emergency Operating Procedures ("EOPs"). *See* Companies' Protest at 7-11 and Sasson Affidavit at paragraph 12. Each of these sensitivity cases is addressed in Mr. Dahl's Affidavit. As Mr. Dahl demonstrates in his Affidavit, the assumptions included in the IRM Study base case represent the NYSRC's best judgment as to what is most likely to occur. The base case assumptions are balanced and take into consideration actual experience with respect to the factors addressed in the sensitivity cases such as generator forced outage rates and the effectiveness of EOPs. There is no basis for the contention that the NYSRC was obligated to adopt the results of sensitivity cases which used assumptions that were not approved by the NYSRC, and to set aside its best judgment as to what is most likely to occur, based on experience and careful analysis. Further, there is no basis for the contention that the NYSRC should ignore the results of sensitivity cases that indicate that a lower IRM may be appropriate, which may be as or more likely to occur than other sensitivity cases. *See* Dahl Affidavit at 12-14.

The NYSRC IRM Decision is Consistent with Its Past Practice

The Companies contend that the NYSRC IRM decision is not consistent with its past practice because: (1) in the past the NYSRC has given due consideration to the fact that the existing IRM was 18.0%; and (2) in the past the NYSRC has expressed the need to take a conservative approach to setting the IRM. *See* Companies' Protest at 13 and Sasson Affidavit at paragraph 18.

With respect to the first contention, the NYSRC has, in the past, referred to the 18.0% IRM when the IRM Study indicated a base case IRM of between 17.1% and 17.6% and the NYSRC decided to retain the IRM at 18.0%. The NYSRC, however, is not committed to an 18.0% IRM regardless of the results that are developed in the IRM Study. The whole purpose of the IRM Study is to determine the IRM at which the NYSRC's resource adequacy criterion is met. The NYSRC would be failing in its responsibilities if it ignored the results of the IRM Study in either direction. Contrary to the implication in the Companies' Protest, there is nothing sacred about an 18.0% IRM. It was established, and continued, by the NYSRC based on its consideration of the results of the IRM Study and other relevant factors, which often resulted in an adder to the base case IRM. The NYSRC followed a similar practice in its determination to adopt a 16.5% IRM for the 2007-2008 capability year.

In paragraph 18 of his affidavit, Dr. Sasson refers to the NYSRC IRM resolution in 2000 in which the Executive Committee refers to the IRM Study results and other factors and states "which argue for a conservative approach." It should be noted that the statement referred to by Dr. Sasson was in the context of a reduction in the IRM of 4.0%, from 22.0% to 18.0%, and that the IRM Study indicated that a further reduction in the IRM for the 2000 to 2001 capability year was justified. In that context, the Executive Committee was stating that a 4.0% reduction in one year was sufficient. However, the Companies seem to be suggesting that taking a conservative approach means never changing the 18.0% IRM, regardless of the results of the IRM Study.

The Companies also state that "the NYSRC has not presented any evidence that shows that there is a clear and convincing reason to move the IRM up or down from 18.0%." *See* Companies Protest at 13 and Sasson Affidavit at paragraph 20. The "clear and convincing" evidence standard proposed by the Companies does not exist in NYSRC Reliability Rules,

policies or practices. Furthermore, it would, in effect, establish an unjustified presumption in favor of the 18.0% IRM. The NYSRC is obligated to establish an IRM that, based on its technical analysis and expert judgment, will satisfy its resource adequacy criterion. There is nothing in the NYSRC Reliability Rules or its IRM policies that establishes a presumption in favor of the 18.0% IRM, or any other specific IRM. In fact, doing so would be in direct conflict with the NYSRC resource adequacy criterion and the carefully defined IRM Study process.

Protest by National Grid

National Grid's protest objects to the NYSRC's current methodology for establishing the IRM and contends that the Commission should reject the NYSRC's 16.5% IRM determination and adopt a 14.1% IRM, based on National Grid's proposed IRM methodology.[26]

First, it should be noted that National Grid's proposed methodology is inconsistent with NYSRC Policy 5-1 and NYISO policies for the determination of locational capacity requirements ("LCRs"). Furthermore, National Grid's proposed methodology could have significant effects on the level of the IRM and LCRs in the NYCA and on the NYISO's ICAP market. The adoption of a 14.1% IRM based on National Grid's preferred methodology was proposed to the NYSRC Executive Committee at its meeting on January 5, 2007 and was rejected.

It is important to note that National Grid's contention that the current methodology used by the NYSRC and the NYISO to establish the IRM and LCRs was the subject of a separate Commission proceeding.[27] In that proceeding,[28] which is mentioned by National Grid in

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[26] *See* Protest of Niagara Mohawk Power Corporation d/b/a National Grid, Docket No. ER07-429-000 (Feb. 2, 2007) (**"**National Grid Protest").

[27] *See Complaint of Niagara Mohawk Power Corporation d/b/a National Grid v. NYISO and NYSRC*, Docket No. EL06-1-000.

[28] *Id.*

footnote 39 of its protest, the Commission dismissed National Grid's filing without prejudice on the grounds that its contentions have not been adequately considered under the NYSRC and NYISO governance procedures.[29] The Commission, however, directed the NYSRC and the NYISO to submit quarterly reports to keep it informed of the progress in addressing National Grid's concerns. Reports were filed jointly by the NYSRC and the NYISO on September 29, 2006 and December 29, 2006. In addition, a joint NYSRC/NYISO working group, the Resources Adequacy Issues Task Force ("RAITF") was established for the specific purpose of addressing the concerns raised by National Grid in its complaint. The NYSRC, the NYISO and the RAITF are continuing to address those concerns and to submit quarterly reports to the Commission. As noted, the proposals set forth in the National Grid protest differ significantly from NYISO and NYSRC procedures and have not been adopted by the NYSRC, the NYISO or the RAITF. The NYSRC respectfully submits, therefore, that National Grid's contentions in support of significant revisions to NYSRC and NYISO IRM and LCR methodologies should continue to be considered in those forums, as previously determined by the Commission.

Comments by the NYISO

The NYISO has submitted comments in support of the NYSRC's 16.5% IRM determination and of expedited treatment of the NYSRC filing. The NYSRC and the NYISO have worked closely over the past several years to improve the methodologies for determining the IRM and LCRs and to improve the quality of the related technical studies. The Commission's action in this proceeding is of particular importance to the NYISO because of its responsibility to implement the IRM, to establish the related LCRs, and to conduct the ICAP

[29] *Niagara Mohawk Power Corp. v. N.Y. State Reliability Council*, 114 FERC ¶ 61,098 (2006).

auctions. The NYSRC respectfully requests that the Commission accord the NYISO's comments its most careful consideration.

CONCLUSION

For the foregoing reasons the NYSRC respectfully requests that the Commission:

1. Accept this response to the comments and protests filed in this proceeding; and

2. Accept and approve the NYSRC's January 12 filing effective no later than March 1, 2007.

Respectfully submitted,

/s/ Bruce B. Ellsworth

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Dated: February 16, 2007

APPENDIX A

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York State Reliability Council, LLC) Docket No. ER07-429-000

AFFIDAVIT OF ALAN M. ADAMSON

AFFIDAVIT OF ALAN M. ADAMSON

I, Alan M. Adamson, being duly sworn, depose and say:

I. MY BACKGROUND AND EXPERIENCE

1. My name is Alan M. Adamson and my address is 1907 Evva Drive, Schenectady, New York 12303.

2. I hold a Bachelor of Science Degree in Electrical Engineering from Worcester Polytechnic Institute (1957).

3. Since 1999, I have been a consultant for the New York State Reliability Council ("NYSRC") and technical advisor to its Executive Committee, Installed Capacity Subcommittee, Reliability Rules Subcommittee, and Reliability Compliance Monitoring Subcommittee.

4. Prior to 1999, I had more than 27 years of professional experience with the New York Power Pool ("NYPP"). While at the NYPP, I served as Director of Planning from 1979 through 1998. In that capacity I directed the planning of the NYPP bulk power system to ensure meeting NYPP reliability, economic, and environmental objectives. This included directing multi-area loss of load expectation ("LOLE") reliability studies for establishing state-wide, local area, and NYPP member system resource capacity and reserve requirements for meeting NPCC and NYPP reliability criteria. Of interest to this proceeding, I managed preparation of specifications for a prototype version of what now is known as the GE-MARS multi-area reliability program. The MARS program is presently used by the NYSRC and the NYISO to perform LOLE studies for determining IRM requirements. Prior to becoming the NYPP Director of

Planning, I served as Supervisor of Generation Planning where I was responsible for performing generation planning studies involving reliability and economic analyses, including LOLE studies. Before joining the NYPP, I was employed at the Long Island Lighting Company ("LILCO") where I held various positions in the LILCO Planning Department.

5. During my career at NYPP, I served on over 20 NYPP, NPCC, Inter-Control Area, North American Electric Reliability Council ("NERC") and Institute of Electrical and Electronics Engineers ("IEEE") committees, including serving as chairman on many. I served on and chaired the NPCC Task Force on the Coordination of Planning for many years. Among other responsibilities, this task force oversees assessments on resource adequacy for the control areas within NPCC. I am currently a member of two NPCC working groups, NPCC CP-8 - Review of Resource and Transmission Adequacy Working Group, and CP-9 - Review of NERC Standards Working Group.

6. I have published many technical papers, and several on electric system probability analysis.

II. INTRODUCTION AND PURPOSE OF MY AFFIDAVIT

On January 12, 2007, the NYSRC submitted a filing to the Commission that advised the Commission that the NYSRC had adopted a revised Installed Capacity Requirement ("ICR") for the New York Control Area ("NYCA") for the capability year beginning on May 1, 2007 and ending April 30, 2008. The revised ICR translates to a required Installed Reserve Margin ("IRM") of 16.5%. This IRM represents a change from the 18.0% adopted by the NYSRC for the 2006-2007 capability year.

The primary input for the NYSRC decision to adopt the IRM of 16.5% was a technical study, the New York Control Area Installed Capacity Requirement for the Period May 2007 through April 2008 ("2007 IRM Study"), which was included in Appendix A of the NYSRC filing in this proceeding. The 2007 IRM Study demonstrated that "maintaining the NYCA installed reserve margin of 16.0% over the forecasted NYCA 2007 summer peak season will achieve applicable NYSRC and NPCC reliability criteria for base case study assumptions." (*see* page 3 of the 2007 IRM Study). The 2007 IRM Study was unanimously approved by the NYSRC Executive Committee ("Executive Committee") on January 5, 2007. The base case assumptions that were used for calculating the base case 16.0% IRM were included in the 2007 IRM Study, and previously approved by the Executive Committee during 2006, also without objection.

Starting with the base case 2007 IRM Study results, as in most previous years, Executive Committee members applied an "adder" to account for sensitivity case results, along with other relevant factors, to arrive at the final 16.5% IRM that was adopted by the NYSRC (*see* NYSRC IRM Resolution, included as Appendix B in the NYSRC filing, and page 2 of the 2007 IRM Study). At its January 5, 2007 meeting, one of the factors considered by Executive Committee members in arriving at the 0.5% adder to the 16.0% base case result was a confidence bounds or levels analysis that was included in the 2007 IRM Study (*see* pages 1 and 16). In consideration of these factors, the Executive Committee adopted a 16.5% IRM.

On February 2, 2007 Consolidated Edison of New York, Inc., Orange and Rockland Utilities, Inc., and Central Hudson Gas and Electric Corporation (the "Companies") filed a protest which contends that the 16.5% IRM for the 2007-2008 capability year adopted by the NYSRC should be rejected, and that the 18.0% IRM previously adopted for the 2006-2007

capability year should be retained instead. The protest makes several erroneous claims to justify this contention.

The specific areas covered in my affidavit relate to the NYSRC resource adequacy criterion, the proper interpretation of the criterion, and the conduct of reliability studies for calculating an IRM that fully complies with the criterion. My affidavit points out flaws and misleading and inconsistent statements in the protest that lead to its erroneous conclusion that an 18.0% IRM should be retained.

The protest claims that 16.9% IRM is the minimum IRM required to comply with the NYSRC resource adequacy criterion; and then claims that a 1.0% adder is necessary to properly account for in the results of certain sensitivity case results. The result is 17.9%, or the 18.0% IRM proposed in the protest. My affidavit is mainly limited to challenging the contention in the Companies' Protest that the Executive Committee was required to adopt a 16.9% IRM, instead of a 16.0% IRM, as the case base result in order to satisfy the NYSRC resource adequacy criterion.

The affidavit of Curt Dahl, attached to this filing as Appendix B, addresses assertions by the Companies that the NYSRC's adopted IRM of 16.5% for the 2007-2008 capability year fails to properly account for certain sensitivity scenarios. I have read Mr. Dahl's affidavit and agree with his conclusions.

III. THE NYSRC RESOURCE ADEQUACY CRITERON

The foundation for calculating the NYCA IRM requirement rests on meeting the NYSRC resource adequacy criterion, set forth in the NYSRC's Reliability Rule A-R1 (*see* NYSRC Reliability Rules Manual available on the NYSRC's website at http://www.nysrc.org). The base case IRM must comply with this rule. Reliability Rule A-R1 states:

> The NYSRC shall establish the IRM requirement for the NYCA such that the probability (or risk) of disconnecting any firm load

> due to resource deficiencies shall be, on average, not more than once in ten years. Compliance with this criterion shall be evaluated probabilistically, such that the loss of load expectation (LOLE) of disconnecting firm load due to resource deficiencies shall be, on average, no more than 0.1 day per year. This evaluation shall make due allowance for demand uncertainty, scheduled outages and deratings, forced outages and deratings, assistance over interconnections with neighboring control areas, NYS Transmission System emergency transfer capability, and capacity and/or load relief from available operating procedures.

LOLE is the average number of days in which the daily peak is expected to exceed available resource capacity. The LOLE, therefore, indicates the expected number of days on which a loss of load or deficiency will occur. The above NYSRC resource adequacy criterion is consistent with the resource adequacy criterion used by the former NYPP and with the current NPCC resource adequacy criterion (*see* Exhibit 1 hereto). Every NPCC Area or sub-region must comply with all requirements in this standard; compliance is reviewed annually by NPCC.

There is one requirement that appears in both the NYSRC and the NPCC criterion that is relevant to the statements made in the protest. Both criteria state as follows: "…the LOLE of disconnecting firm load due to resource deficiencies shall be <u>on average</u> no more than 0.1 days per year…." (emphasis added). In my long experience with LOLE studies, it has always been recognized that there is some uncertainty associated with most study assumptions, and that the LOLE could be affected by these uncertainties. It has also been recognized that these uncertainties could be examined by determining appropriate confidence bounds on the LOLE. Dr. Roy Billinton, who is regarded as one of, if not the most, respected experts in North America in the application of power system probability techniques, agrees that it could be helpful to calculate confidence bounds. However, the expected or average value of the LOLE parameter is nevertheless used as the criterion for capacity requirement evaluation (*see* Roy Billinton and Ronald Allan, "Reliability Evaluation of Power Systems," 1984). Thus, the term "on average"

has been understood for many years to mean that a 50% probability of meeting a 0.1 days per year LOLE satisfies the criterion for maintaining adequate reliability.

With the advent of Monte Carlo simulations, such as used in General Electric (GE) - MARS for NYSRC IRM studies, confidence bounds can be determined for that application as well (*see* 2007 IRM Study at 16). As with uncertainties associated with study assumptions, confidence bounds associated with Monte Carlo simulations are not required to be considered in meeting NYSRC and NPCC resource adequacy criteria, since a 50% probability of meeting 0.1 days per year LOLE satisfies the NYSRC and NPCC resource adequacy criteria.

Further, the above NYSRC and NPCC interpretation concerning the average LOLE is consistent with the interpretation used in the electric industry for computing LOLE. The GE MARS Program that is used for IRM studies nationwide, reports LOLE results that are literally the "average LOLE" (the sum of the LOLE for each replication divided by the number of replications). A calculation of this average is shown on pages 1and 2 of the GE MARS Use Manual.

IV. THE PROTEST MISINTERPRETES THE LOLE CRITERION AND ITS PROPER APPLICATION

The protest misinterprets the NYSRC resource adequacy criterion, and proposes a criterion that is more stringent then actually required. The Companies contend that the application of this more stringent IRM criterion would result in a 16.9% base case IRM. The interpretation of the criterion as presented in the protest, however, ignores express language of Reliability Rules A-R1which states that "…the LOLE of disconnecting firm load due to resource deficiencies shall be <u>on average</u> no more than 0.1 days per year" (emphasis added).

The protest in several places, mainly in Section IIIA and in paragraph 10 of Dr. Sasson's affidavit, states that the NYSRC base case IRM of 16.0% does not comply with the NYSRC

resource adequacy criterion. For example, on page 6 of the protest it is stated that "an IRM premised on the statistical midpoint within the base case range (that is, 16.0%) does not comply with Reliability Rule A-R1 because the probability is high that it will not meet the one day in ten years criteria." The protest further claims that an IRM of 16.9% "provides the required level of certainty that the criterion is met."

The basis for the above claims is the Companies' contention that meeting the LOLE criterion requires close to a 100% assurance that a 0.1 days per year LOLE is met. On the contrary, as pointed out above, the criterion actually requires a 50% chance (i.e., "on average") of meeting 0.1 days per year LOLE, not a close to a 100% chance, as the protest insists. The representation of the criterion by the Companies is much more stringent that the actual criterion and therefore misrepresents the NYSRC criterion.

The protest states on pages 4 and 5 that "the base case is more than a single data point" and that "the Technical Study (2007 IRM Study) uses a range of numbers to represent the base case." This is a misrepresentation of the 2007 IRM Study, which refers to only one base case IRM, not a range of base case IRMs. The 2007 IRM Study concludes that a single base case IRM of 16.0% meets the NYSRC resource adequacy criterion.

The protest's misrepresentation of the criterion is based on an incorrect application of the error analysis described in the 2007 IRM Study. The error analysis determines the confidence bound for the 2007 IRM Study which showed that there is a 99.7% probability that the base case result is within a range of 15.2% to 16.9%. The protest incorrectly contends that, based on this range, a 99.7% certainty of meeting the 0.1 days per year LOLE is required by the criterion, (*i.e.*, a 16.9% IRM), the upper range of the confidence bound, and anything less does not meet the criterion. As demonstrated above, a 50% probability of meeting 0.1 days per year fully meets

the criterion. Confidence ranges, however, may be considered by the Executive Committee, along with sensitivity cases and other factors, in their evaluation of whether an adder to the base case IRM is appropriate.

One of the protest's consistent contentions is that a 16.0% IRM "represents a 50% likelihood of meeting the required reliability criterion." *See* page 5 of the protest and paragraph 10 of Dr. Sasson's affidavit. Similar statements are made throughout the protest. This contention is clearly incorrect because either the IRM satisfies the NYSRC adequacy criterion or it does not, and the statement that there is a 50% likelihood of meeting the criterion distorts the fact that a 50% probability of meeting the LOLE satisfies the criterion.

Dr. Sasson's affidavit correctly states that he made a presentation to the Executive Committee in 2004 in which he discussed the calculation of confidence bounds. However, I do not recall, nor did the minutes of that meeting mention, that Dr. Sasson suggested at the meeting that an IRM having less than a 99%+ confidence of meeting 0.1 days per year would not meet the NYSRC resource adequacy criterion. If he had made such a statement, Dr. Sasson would certainly have been challenged by other Executive Committee members, based on the clear wording of Reliability Rule A-R1 and the consistent NYSRC and NPCC interpretation of the criterion to the contrary.

I also would like to point out an inconsistency in Dr. Sasson's contention that only the IRM value at the upper range in the confidence bound meets the NYSRC resource adequacy criterion. The error analysis for the 2006 IRM Study showed an IRM confidence bound range of 17.6 to 18.5%, with an 18.0% mid-point (base case) having a 50% confidence value. The upper range 18.5% value had a 99.7% confidence level of meeting a 0.1 days per year LOLE. The 2006 IRM Study showed a base case IRM result of 18.0%. During Executive Committee

discussion of the appropriate final IRM, "Dr. Sasson noted that the 18.0% IRM lies within the error band of 3.0 sigma with a 17.8% mid-point. Following discussion, Dr. Sasson moved for approval of 18.0% for 2006-07." S*ee* minutes of the January 31, 2006 Committee meeting. The 18.0% IRM was the mid-point of the confidence bound range, not at the upper range 99.7% confidence point (that is, 18.5%) a point Dr. Sasson now insists is necessary to meet the NYSRC resource adequacy criterion.

To sum up, the protest incorrectly states that a base case IRM of 16.0% represents only a 50% likelihood of meeting the NYSRC resource adequacy and that a 16.9% IRM with close to a 100% chance of meeting the LOLE of one day in ten years as needed to satisfy the NYSRC resource adequacy criterion. In fact, the 16.0% IRM fully complies with this criterion.

NPCC assesses the resource adequacy of its Areas annually to ensure that their resource plans meet NPCC criteria. Nowhere in the NPCC resource adequacy criterion, in the NPCC practices, or in the NPCC Document B-8, Guide for Area Review of Resource Adequacy, is there a requirement for NPCC Areas to show in their reliability studies a confidence bound analysis that shows that its capacity plan has close to a 100% probability of meeting 0.1 days per year LOLE. Moreover, my review of recent NPCC Area reliability assessments for the New York, New England, Ontario, Quebec, and the Maritimes Areas do not reveal that any of these Areas perform confidence bound studies to determine the IRMs necessary to achieve close to a 100% chance of meeting 0.1 days per year LOLE; nor that NPCC has found them delinquent or in non-compliance for not providing such an analyses. Furthermore, my discussions with NPCC staff confirm no such confidence bound requirement, and no requirement that an NPCC Area must show close to a 100% certainty of the meeting a LOLE of 0.1 days per year to be in compliance with the NPCC criterion.

I also investigated whether any NERC Regions have practices or requirements for considering confidence bounds analysis for assuring near to 100% assurance of meeting a given LOLE level. For my review I referred to the NERC report, Resource and Transmission Adequacy Recommendations (June 2004). The report surveyed existing resource adequacy criteria and practices of the NERC Regions and ISOs/RTOs, and determined that most of these entities use a probabilistic approach to resource adequacy. I then reviewed information provided to NERC by individual Regions and ISOs/RTOs concerning their practices and criteria. My review could not find a single North American entity that indicated in their responses to NERC that it uses the criteria interpretation advocated in the protest.

In conclusion, there is no basis for the contention in the protest that close to a 100% probability of meeting a LOLE of 0.1days per year is required for complying with the NYSRC criterion. Furthermore, there is no evidence that NPCC, NPCC Areas, or that any other NERC Region and ISOs/RTOs have adopted this practice. Therefore, it is my opinion that a 16.0% IRM for the 2007-2008 capability year fully complies with the NYSRC, as well as the NPCC resource adequacy criterion.

V. REPRESENTATIVES OF THE COMPANIES DID NOT RAISE THE CONTENTIONS IN THEIR PROTEST DURING THE IRM STUDY PROCESS

When I reviewed the protest for the first time, I was surprised to read assertions that were not previously raised by representatives of the Companies during discussions of the development of the 2007 IRM Study at the Executive Committee and subcommittee meetings. I attended virtually every Executive Committee and Installed Capacity Subcommittee (ICS) meeting during the time when the 2007 IRM Study was developed. None of the assertions discussed in the protest were raised during these meetings. Of note:

- The Companies' representatives voted to approve the base case assumptions for the 2007 IRM Study, which were unanimously approved by the Executive Committee.
- The Companies' representatives voted to approve the 2007 IRM Study on January 5, 2007, including the 16.0% base case IRM, which was unanimously approved by the Executive Committee.
- NYSRC Policy 5-1 outlines the resource adequacy criterion reliability, procedures, practices, and responsibilities for conducting NYSRC IRM studies. The 2007 IRM Study was conducted entirely in accordance with Policy 5-1. Policy 5-1 was revised during 2006, and the revision was approved by the Executive Committee.
- On a slightly different track, the protest alleges on page 1: "the NYSRC failed to account for certain key facts" and "[the Executive Committee] failed to properly consider several key scenarios." There are simply no facts presented in the protest to support these statements. Based on my extensive involvement in the development of the IRM Study and in NYSRC committee meetings, it is my opinion that the Executive Committee considered all relevant factors and prudently exercised its responsibilities when it voted to adopt a 16.5% IRM (*see* Exhibit B of the Companies' Protest, minutes of the January 5, 2007 Executive Committee meeting).

VI. SUMMARY

I have pointed out in my affidavit several facts that demonstrate that the contentions in the Companies' Protest related to the base case IRM of 16.0% are in error:

1. An IRM of 16.0% for the 2007-2008 capability year fully achieves both NYSRC and NPCC resource adequacy criteria.
2. Compliance with NYRC criterion requires a 50% probability that an LOLE of 0.1 day per year will be achieved, and not a probability of close to 100%, as alleged in the protest.
3. The Companies' contentions distort the NYSRC and NPCC resource adequacy criteria, and would impose a more stringent criterion that is inconsistent with long-standing NYSRC and NPCC policy and practice.
4. The correct base case IRM is 16.0%, not 16.9% as alleged in the protest.
5. The contentions raised by the Companies in the protest were not raised during the 2007 IRM Study process, despite the fact that the Companies' representatives had ample opportunity to do so when their contentions would have been subjected to review and comment by all of the NYSRC participants and the NYISO.

This concludes my affidavit.

EXHIBIT 1
NPCC RESOURCE ADEQUACY CRITERION*

Each Area's probability (or risk) of disconnecting any firm load due to resource deficiencies shall be, on average, not more than once in ten years. Compliance with this criterion shall be evaluated probabilistically, such that the loss of load expectation (LOLE) of disconnecting firm load due to resource deficiencies shall be, on average, no more than 0.1 day per year. This evaluation shall make due allowance for demand uncertainty, scheduled outages and deratings, forced outages and deratings, assistance over interconnections with neighboring Areas and Regions, transmission transfer capabilities, and capacity and/or load relief from available operating procedures.

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* Section 3.0 of NPCC Document A-2, Basic Criteria for Design and Operation of Interconnected Power Systems, May 6, 2004.

Signed: _____

Printed name: ALAN M. ADAMSON

Dated: FEB. 15, 2007

Subscribed and sworn before me, a notary public in GUILDERLAND N.Y. on this 15TH day of FEBRUARY 2007.

_____
Notary Public

My commission expires: _____

DELA WILLIAMS DEGADJOR
Notary Public State of New York
#01DE6059704
Qualified in Albany County
Commission Expires June 4th, 2007

APPENDIX B

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York State Reliability Council, LLC	**)**	**Docket No. ER07-429-000**

AFFIDAVIT OF CURT J. DAHL

AFFIDAVIT OF CURT J. DAHL

I, Curt J. Dahl, being duly sworn, depose and say:

1. My name is Curt J. Dahl, and I am Manager, System Planning at KeySpan Energy. My business address is 175 East Old Country Road, Hicksville, New York.

2. I hold a Masters of Science in Electrical Engineering from Polytechnic Institute of New York (1997), a Masters of Business Administration from Hofstra University (1993), and a Bachelors in Electrical Engineering from Polytechnic Institute of New York (1987). In addition, I am a Registered Professional Engineer in New York State.

3. I have twenty (20) years of professional experience with KeySpan Energy and one of its predecessors, Long Island Lighting Company ("LILCO"), in which I have held various technical and managerial positions in the areas of bulk transmission planning, resource planning, special system studies, and subtransmission planning. I have been Manager, System Planning for KeySpan Energy since 1997. From 1994 to 1997, I was a Supervisor in the LILCO Generation Planning group where I was responsible for preparing financial studies recommending capital enhancements to power plants and involved in open access and market power issues, assisted in the development of emission compliance strategies, and negotiating energy and capacity agreements. From 1992 to 1994, I was Supervisor of the LILCO Subtransmission Planning group, where I developed short- and long-term expansion plans for the Long Island subtransmission system. From 1987 to 1991, I worked in the LILCO Transmission Planning Group where I was responsible for developing capital expansion plans for the Long Island bulk power system including interconnection requirements for various generation projects.

4. Under a Management Services Agreement ("MSA"), dated as of June 26, 1997, KeySpan Energy manages and operates LIPA's transmission and distribution system on Long

Island, among other things. As an instrumentality of the State of New York and a public power agency, the Long Island Power Authority and its operating subsidiary, LIPA, provide electric service to nearly 1.1 million customers, representing approximately 2.8 million people in Nassau and Suffolk counties, and the Rockaway Peninsula in the Borough of Queens, New York City.

5. In my position as Manager, System Planning, I am responsible for directing KeySpan's overall coordination of Electric Transmission, Distribution, and Resource Planning activities on LIPA's behalf pursuant to the terms of the MSA. In this role, I am responsible for assisting LIPA in planning the electric resources, transmission, and interconnected systems (*i.e.* tie lines to the Consolidated Edison and Northeast Utilities systems and PJM Interconnection ("PJM")) on Long Island and for the overall coordination of the various elements that constitute the local power system. My responsibilities include analysis of the existing system to optimize performance, safety, reliability and environmental effects, and providing recommendations for future changes required to adequately serve customer load at the least cost. I am directly responsible for developing capital expansion plans for the Long Island bulk transmission system and determining the system requirements to accommodate future Long Island resources including merchant plants and interconnections. I also am responsible for transmission operations support, long range transmission planning, and preparation of system impact studies resulting from proposals furnished by municipal electric systems within the geographic area served by LIPA and others which may affect the bulk transmission system.

6. In addition to my responsibilities as Manager, System Planning, I represent LIPA on several NYISO, NYSRC, NPCC, and NERC committees and serve as Chairman of the New York State Reliability Council ("NYSRC") Installed Capacity Subcommittee ("ICS") and Chairman of the NYISO Resource Adequacy Issues Task Force (RAITF). I represent NYSRC

on the NERC Resource Adequacy Assessment Standard Authorization Request (SAR) Drafting Committee. I have been Chairman of the NYSRC ICS committee for six years. The NYSRC establishes New York Control Area ("NYCA") installed capacity requirements consistent with Northeast Power Coordinating Council ("NPCC") Standards and NYSRC Reliability Rules. As Subcommittee Chairman, I am responsible for leading a group which prepares technical studies for updating the New York Control Area installed capacity requirement and recommends to the NYSRC Executive Committee procedures for calculating installed capacity requirements, appropriate computer models, representation of interconnected control areas, and other appropriate reliability modeling assumptions. Such analyses are conducted in accordance with NYSRC and NYISO/NYSRC Agreements and procedures established by the NYSRC Executive Committee. A technical report (the "IRM Study") is then prepared, in accordance with NYSRC Reliability Rules, by the ICS covering the studies for updating the NYCA installed capacity requirement, ICS also performs other technical studies as specified by the NYSRC Executive Committee.

Summary of Affidavit Findings

On February 2, 2007, Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc., and Central Hudson Gas and Electric Corporation (the "Companies") submitted a protest challenging the NYSRC decision to adopt an installed reserve margin (IRM) of 16.5%. My affidavit and conclusions reached herein are based on my extensive experience in system planning in New York State as well as my detailed involvement in the calculation of the NYSRC's IRM values through participation in, and chairing, the NYSRC ICS. The purpose of my affidavit is to respond to erroneous and misleading statements in the protest regarding the

conduct of the 2007-2008 IRM Study and assertions in the protest that the IRM Study does not support a change in the IRM to 16.5% and should remain at 18.0%.

I have reviewed the Companies' Protest and the accompanying affidavit of Dr. Mayer Sasson and offer the following conclusions:

1) In his affidavit Dr. Sasson misrepresents the IRM study results, in particular the purpose and results of the sensitivity testing, including, the impact of changes in generator forced outage rates, the impact of an extended outage at the Indian Point 2 nuclear plant ("IP2"), and the effectiveness of Emergency Operation Procedures ("EOPs").

2) Dr. Sasson raises in his affidavit issues that were not raised or considered in the NYSRC committee process despite his active participation in that process.

3) The NYSRC decision to adopt an IRM of 16.5% is prudent and is supported by IRM Study.

The affidavit of Alan Adamson, attached to this filing as Appendix A, addresses assertions by the Companies that the IRM Study base case finding that a 16.0% IRM is in compliance with the NYSRC resource adequacy criterion was incorrect and that a 16.9% IRM is needed to comply with the criterion. I have read Mr. Adamson's affidavit and agree with his conclusions.

DISCUSSION

The Companies' Protest asserts that the NYSRC analysis does not support a 16.5% IRM because "the NYSRC did not properly conduct its review of the complete Technical Study" and "did not properly account for any of the key sensitivity scenarios in approving a 1.5% reduction in the IRM" (Sasson Affidavit at p. 11).

The Companies' Protest goes on to state the NYSRC downplayed the importance of certain sensitivity analyses "likely to occur" which highlighted the impact that certain conditions, such as the impact an extended outage of the largest plant in the state would have on the ability to meet the resource adequacy criterion. Specifically, the protest states: "the NYSRC's proposed IRM fails to account for various sensitivity scenarios which could impact reliability within the NYCA, including the changes in generator forced outage rates, an outage at IP2, and the effect of emergency operating procedures" (Companies' Protest at 8). It concludes by stating: "the NYSRC has not presented any evidence that shows there is a clear and convincing reason to move the IRM up or down from 18%" (Companies' Protest at 13) and that "16.5% IRM is neither prudent nor consistent with past practice" (Companies' Protest at 13).

The purpose of my affidavit is to address these contentions and to point out numerous inconsistencies and errors in the Companies' assertions. I will address each one of these issues in detail below.

A. The Companies' assertion that generator outage rates "are likely to increase" from the level represented for 2007 in the IRM Study (Companies' Protest at 8-9)

In their protest, the Companies allege that the generator outages rates used in the IRM Study reflect a number of large units at their best ever rates, and therefore some degradation is likely. The protest goes on to express concern that "a significant number of wind generators are coming on line next year with expected forced outage rates higher than the system average." Companies' Protest at 8-9.

I will start by noting that the issue of generator forced outage rates was not a contentious issue in this year's IRM Study. The outage rate analysis on pp. 8-9 of the protest was never raised in the IRM Study process and was never recommended to the NYSRC for adoption.

Furthermore, NYSRC procedures for performing IRM studies are completely transparent and well documented in NYSRC Policy 5-1 entitled "PROCEDURE FOR ESTABLISHING NEW YORK CONTROL AREA INSTALLED CAPACITY REQUIREMENTS."[30] Policy 5-1 (at 9) stipulates unit performance rates to be used in IRM Study as "derived from the collection of forced and partial outages that occur over the most recent five-year period." In fact, Companies' representatives approved the NYSRC policy to use a five-year historical period starting in 2004 after close review of NYCA availability trends for 1999-2003 indicated that average performance of generating units had shown a strong trend of improvement in recent years.[31]

A review of this same NYCA availability data based on an additional two years of experience shows that the 2001-2005 performance has been consistent from year to year (*see* figure A-4 in the IRM Study). There is no reason to expect a degradation in unit performance rates in 2007. In fact, as stated on page 9 of the 2007 IRM Study, which was approved by the Companies' representatives, the relatively recent implementation of the ICAP demand curve provides a great financial incentive for generator owners to maintain unit performance and improve reliability. In addition, the conversion of ICAP to UCAP by the NYISO provides a further financial incentive to decrease the forced outage rates while improving reliability (IRM Study at 9).

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[30] As recently as November 16, 2006 Con Edison and Central Hudson approved of NYSRC Policy 5-1. As stated in November 16, 2006 NYSRC Executive Committee meeting minutes "Mr. Clagett moved for approval of the modified Policy 5. The motion was seconded by Mr. Smith and approved by the Committee members in attendance or on the phone (10-0-2 abstentions – National Grid and NYSEG/RG&E). Further the use of 5 year history to determine forced outage rate is unchanged previous IRM Studies going back to 2004.

[31] In the IRM Study dated December 10, 2004, which covers the IRM for the period May 2005 through April 2006, the decision was made to utilize the 5 year historical average forced outage rates. As described on page 22 of the report in the unit performance section, "Through 2003, the NYSRC IRM studies utilized a 10-year period. In 2004, close review of NYCA availability trends indicated that average performance of generating units improved in recent years (*See* Figure A-5). Therefore, the NYSRC decided to base the 2005 IRM study on a five-year historical period." Con Edison and Central Hudson approved incorporation of this change into the 2004 study base case and subsequent IRM Studies.

Although the Companies raise higher outage rate concerns, they fail to quantify the higher outage rates they are recommending or to provide credible support for an outage rate different from that used in the IRM Study. It is not reasonable or acceptable to arbitrarily use poorer industry rates for projecting rates for generators in the NYCA, as suggested by the Companies. The assumptions used in the IRM Study base case were approved by the NYSRC Executive Committee with the support of the Companies' representatives.[32] To do so would reduce the incentive for New York generators to improve their performance and would be inconsistent with approved NYSRC procedures for establishing the IRM. The Companies also fail to mention up to several hundred MW of additional generator capacity derating beyond the forced outage rates assumed for gas turbines and combined cycle facilities based on ambient temperature levels (*see* IRM Study at 29) which make it comparison to industry forced outage rates inapposite. Given the above, it is my opinion that it is at least equally likely that generator outage rates will be better than estimated given the financial incentives for generator performance in the NYISO markets, and that scenario should be considered equally likely.

Lastly, the Companies' Protest expresses concern that "a significant number of wind generators are coming on line next year with expected forced outage rates higher than the system average rates" (Companies' Protest at 8-9). However, the 2007 IRM study assumptions approved by the Executive Committee without opposition modeled the capacity from wind resources derated by approximately 88%. Page 2 of the approved assumptions matrix clearly indicates wind resources for the 2007 base case representation were "Derived from hourly wind

[32] At the August 11, 2006 meeting, the Executive Committee voted unanimously to approve the assumptions (including forced outage rates based on 5 year history) used for the 2007 IRM Study base case, excluding the Transmission Model. At its October 13, 2006 meeting, the Executive Committee voted to again to re-approve the assumptions package (again, including forced outage rates based on 5 year history) and the Transmission model for the 2007 IRM Study base case. At the January 5, 2007 meeting, the Executive Committee voted unanimously to approve the 2007 IRM Study with the base case forced outage rates based on 5 year history.

data with average Summer Peak Hour capacity factor of 11.4%." This is further documented on page 24 of the 2007 IRM Study: "Wind generators are modeled as an hourly load modifier … Characteristics of this data indicate an overall 30% capacity factor with a capacity factor of approximately 11% during the summer peak hours." The suggested concern regarding wind generators, therefore, has been explicitly addressed in the 2007 IRM Study base case.

B. The Indian Point 2 sensitivity showing a 1.0% IRM increases was not considered by the Executive Committee in determining the final IRM

The Companies assert that despite the fact that the Indian Point 2 year 2000 outage dropped out of the 2001-2005 5-year average, consistent with NYSRC Policy 5-1, its potential IRM impact should have been adopted by the Executive Committee in determining the final IRM. The Companies also state that the Executive Committee was not made aware of the result of this sensitivity until the January 5, 2007 conference call and it is unlikely its members understood its full impact.

If this issue were of concern to the Companies, they had the opportunity to raise it during the IRM Study process. However, the Companies' representatives supported approval of the IP2 outage rate assumptions (5 year average) used for the base case. Furthermore, as I will discuss below, this sensitivity case was not among the sensitivity studies approved by the Executive Committee on November 10, 2006. [33] This was due to the fact that this sensitivity case was not requested by the Companies' representatives until on or about December 22, 2006.

As indicated above, NYSRC procedures for performing the IRM Study are transparent and well documented in NYSRC Policy 5-1. Policy 5-1 (at 9) states the forced

[33] The official listing of 2007-08 IRM Study Sensitivity Cases recommended by ICS and unanimously approved by the Executive Committee including both Con Edison and Central Hudson did not include the IP2 sensitivity. As stated in the November 10, 2006 Executive Committee meeting minutes "Mr. Clagett moved for Committee approval of the sensitivity cases. The motion was seconded by Mr. Haake and approved unanimously (12-0) "

outage rate used in IRM studies for generating units such as IP 2 are "derived from the collection of forced and partial outages that occur over the most recent five-year period."

Further, the IP2 case which the Companies point to as a basis for the 1% IRM increase is actually based on an extraordinary one year regulatory outage (not equipment failure) which occurred several years ago. This one outage, if taken over a 5 year period, would suggest a forced outage rate of over 20% for IP2 which is several times greater than the industry average for nuclear units of 4.77% quoted in Dr. Sasson's own testimony. It is not reasonable to conclude that the Companies or the NYSRC have the ability to predict with certainty the reoccurrence of a one-year regulatory outage at IP2. In fact, there is no reason to expect IP2 forced outage rates will increase in 2007 especially since, as mentioned previously, the demand curve provides great financial incentive for generator owners to maintain and improve forced outage performance.

For this reason, it is important to consider not only higher than base case forced outage rates but lower forced outage rates as well, which would result in a lower IRM. Also, rather than cherry picking just one outage event involving one unit as the Companies do in the IP2 sensitivity case, it is far more reasonable to discuss the impact of using last year's forced outage assumptions for all units. The impact of using 2000-2004 forced outage assumptions (including the extraordinary outage of IP2 in the year 2000), rather than the 2001-2005 average used in the IRM Study base case, shows a 0.4% impact on the IRM (Table 2, page 10 of the IRM Study). But again, I believe there is no basis for using last year's outage rates in this year's IRM Study given the requirements of Policy 5-1 and the great financial incentives for generator owners to improve unit performance.

Lastly, regarding the Companies' assertion that NYSRC did not have sufficient time to consider risk of outage of IP2 and the full impact and meaning of this "important scenario" and "an impact that needed to be considered carefully." It is true that Executive Committee was not made aware of the IP2 sensitivity case results until the January 5, 2007 conference call. However, as noted, that is because the Companies' representatives did not request this sensitivity case until on or about December 22, 2006. During the January 5, 2007 Executive Committee meeting, Dr. Sasson and I both discussed the IP 2 sensitivity case extensively and made the Executive Committee aware of its potential impact. The Executive Committee also was well-aware of Policy 5-1 which clearly describes the basis upon which forced outage rates will be considered in the IRM Study. There is no basis, therefore, for concluding that Executive Committee members did not fully understand this sensitivity case during the meeting.

C. Reduced EOP effectiveness would increase the IRM

The Companies criticize the base case assumptions for Emergency Operating Procedures (EOPs) (Companies' Protest at 10-11). They contend that EOP assumptions do not account for EOP failures and the EOP values are too optimistic (Companies' Protest at 10-11). Specifically, the Companies reference a scenario where no voltage reduction actions are assumed as increasing IRM by 2.2% and state that this sensitivity is "a proxy for evaluating the effect of a reduced amount of other EOPs" and suggest public appeals may not be made frequently enough to have a "solid basis for estimating customer response" (Companies' Protest at 11). The Companies conclude by stating that "incorporating the uncertainties associated with all the EOPs taken together can drastically increase the IRM." Companies' Protest at 11 and Sasson Affidavit at paragraph 12.

I will start by saying the issue of EOPs was not a contentious issue in this year's IRM Study. These issues were never raised by the Companies' representatives in the IRM Study process. Moreover, their contentions are incorrect. Base case assumptions do account for EOP failures. As noted, the Companies' representatives supported the adoption the EOP outage assumptions used for the base case.[34]

NYSRC IRM procedures for modeling EOPs are documented in Policy 5-1. In describing EOPs, Policy 5-1 (at 10) states: "The NYISO recommends to ICS the EOP steps and related capacity values to be represented in the base case, based on operating experience with these measures." The role of the NYISO in providing EOP steps also is described on page 30 of the IRM Study, which states: "The steps listed below were provided by the NYISO based on experience." IRM Study at 30. It is therefore misleading to suggest that EOP modeling recommendations provided by NYISO are not representative of operational experience and do not account for EOP failures given the NYISO's responsibility to ensure the reliable operation of the NYS bulk power system.

It also is incorrect to suggest there are substantial uncertainties associated with all the EOPs that can drastically increase the IRM. Nearly all the uncertainties associated with the EOPs are already considered in the base case model. For example, Policy 5-1 (at 9) stipulates the estimate for Special Case Resources (SCRs) and Emergency Demand Response Program (EDRP) "is based on NYISO projections for the coming capability period." Policy 5-1 (at 9) further states: "due to the possibility that some of the potential SCR and EDRP program capacity

[34] At its August 11, 2006 meeting, the Executive Committee voted unanimously to approve the assumptions (including EOP outage assumption) used for the 2007 IRM Study base case, excluding the Transmission Model. At its October 13, 2006 meeting, the Executive Committee voted to again to re-approve the assumptions package (again, including EOP outage assumption) and Transmission model for the 2007 Study base case. At the January 5, 2007 meeting, the Executive Committee voted unanimously to approve the 2007 IRM Study with the NYISO recommended EOP modeling assumptions.

may not be available during peak periods, NYISO projections are discounted based on previous experience with these programs as well as any operating limitations." This year's IRM Study included an 8% derating for SCRs and a 55% derating for EDRPs based on NYISO's operating experience which was included in the assumptions approved by the Executive Committee, including the Companies' representatives. It also should be noted that these EOPs are further derated in the off-peak months (*see* IRM Study at 29).

Another EOP is emergency assistance. I would like to specifically point out sensitivity cases 7 and 8 from the IRM Study. The purpose of these two cases is to show the impact of additional emergency assistance. Case 7 shows that decreasing the reserve margins of external areas by 10% increases the NYCA IRM from 16.0% to 16.9% (a change of 0.9%). However, Case 8 shows that, if the IRM levels from neighboring control areas are just 10% greater than the base case, the NYCA IRM would be only 12.2% (a change of 3.8%). Moving this one parameter equally by 10% around the base case assumption proves there is much more "downside" potential than "upside" associated with EOPs. Further, higher external IRMs is a more likely outcome given that the results of the 2007 and prior NPCC assessments show that more assistance to New York is more likely than assumed in our base case.[35]

Lastly, with respect to the uncertainty of NYCA public appeals, it should be pointed out that public appeals account for only 2% of the 4,000 MW of EOPs listed in table A-2 at p. 31 of IRM Study.

Given the above, it is my opinion that the Executive Committee considered all of the IRM Study results in its decision and acted reasonably in adopting a 16.0% base case IRM and a final IRM of 16.5% .

---

[35] Since 2002, the "NPCC Interregional Long Range Adequacy Overview**"** has shown actual LOLE levels of adjacent Control Areas to be less than the 0.1 specified under Policy 5-1. This shows that they have had more surplus capacity for emergency transfers to the NYCA than assumed in the IRM Study.

D. The Executive Committee did not properly take into account the sensitivity cases in the IRM Study (Companies' Protest at 3)

The Companies contend that the Executive Committee did not give due consideration of sensitivities when they voted for the final IRM, "Nor was it made with due consideration of the various sensitivity scenarios that were contained in the technical report" (Companies' Protest at 13).

This assertion suggests that the Executive Committee members did not diligently exercise their responsibilities, and is totally unfounded.

In response, I offer the following:

1. Policy 5-1 (at 13) clearly provides that the Executive Committee has the responsibility to "Establish and approve the NYCA IRM requirement for the next capability year. This decision should consider base case and sensitivity case results shown in the technical IRM Study, as well as considering other issues that may impact NYCA IRM requirements."

2. January 5, 2007 Executive Committee meeting minutes state that "Mr. Mager commented about the high quality of ICS's technical study that provided a base case result of 16.0% and sensitivity cases, which includes some conservatism." This general comment and the fact that many individual Executive Committee members considered sensitivity cases in selecting the final IRM was noted in the final Executive Committee meeting minutes.

3. The Executive Committee's IRM resolution states: "WHEREAS, in light of the Technical Study results, the modeling and assumption changes made to simulate actual operating conditions and system performance, and the numerous sensitivity studies evaluated…."

4. The Executive Summary of the IRM Study, unanimously approved by the Executive Committee, states: "The base case and sensitivity case results, along with other

relevant factors, will be considered by the NYSRC Executive Committee for the determination of the final NYCA IRM requirement for the 2007 Capability Year."

5. Policy 5-1 (at 13) also describes the role of the NYSRC Executive Committee to "Review and approve final IRM Study prepared by ICS." It is clear that the sensitivity case results are in the IRM Study, that the Executive Committee has a responsibility to consider these results and that those results were in fact considered.

6. Policy 5-1 (at 7-8) describes the purpose of sensitivity cases as follows: "In addition to running a base case using the input assumptions described below, a number of sensitivity studies are run to show the IRM requirement outcomes for different assumptions. The results of these sensitivity cases are used, along with the base case IRM Study results, by the Executive Committee to establish the final NYCA IRM requirement. In addition, sensitivity analysis provides a mechanism for illustrating 'cause and effect' of how certain performance and/or operating parameters can impact reliability."

7. The 16.5% IRM, including the 0.5% adder, adopted by the Executive Committee reflects its determination with respect to the entire IRM Study, including sensitivity cases and other factors that could justify a higher or lower IRM.

E. The NYSRC failed to demonstrate or present evidence that the IRM should be changed from 18.0%.The IRM should remain at 18%

The protest states "the NYSRC has not presented any evidence that shows there is a clear and convincing reason to move the IRM up or down from 18%. (Companies' Protest at 13).

This assertion is totally unfounded.

The IRM Study explains the factors that caused a reduction in the IRM from 18.0% (*see* Table 2 of the IRM Study). These factors include a new and improved version of the

GE-MARS program (minus 1.2%); an updated NYS Transmission Representation & System Operating Limits (minus 0.3%); updated generating unit forced outage rates (minus 0.4%); and updated SCR and EDRP capacity and other EOPs (minus 0.2%). The largest factor in the decrease in the IRM was the new version of the GE-MARS program, which corrected an error that affected the probabilistic regional evaluations in the IRM Study for the 2006-2007 capability year. The Companies' Protest totally ignores these factors that justify a reduction in the IRM.

This concludes my affidavit.

Signed: _____

Printed name: CURT DAHL

Dated: February 15, 2007

Subscribed and sworn before me, a notary public in Nassau County on this 15 day of February 2007.

_____
Notary Public

My commission expires: NOV. 24, 2010

LINDA J. MINERVINI
Notary Public, State of New York
No. 4878232
Qualified in Suffolk County
Commission Expires Nov. 24, 20 10

APPENDIX C

NYSRC POLICY 5-1

NEW YORK STATE RELIABILITY COUNCIL, L.L.C.
("NYSRC")
POLICY NO. 5–1

PROCEDURE FOR ESTABLISHING
NEW YORK CONTROL AREA
INSTALLED CAPACITY REQUIREMENTS

Approved by NYSRC Executive Committee – November 10, 2006
Date Issued: November 14, 2006

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Section 1: Introduction

The reliable supply of electric services within the New York Control Area (NYCA) depends on adequate and dependable generation and transmission facilities. This policy focuses on the supply of electricity; specifically, the process that will be followed by the New York State Reliability Council (NYSRC) for determining and setting the amount of resource capacity required to ensure an acceptable level of service reliability in the NYCA.

The general requirements and obligations concerning NYCA resource adequacy and Installed Capacity Requirements (ICR) are defined in the New York State Reliability Council (NYSRC) Agreement and the New York Independent System Operator (NYISO)/NYSRC Agreement. Under these Agreements the NYSRC is responsible for calculating and establishing the amount of resource ICR to meet NYSRC Reliability Rules. In compliance with this obligation, the NYSRC Executive Committee approves an NYCA required Installed Reserve Margin (IRM) requirement for the following May through April capability year. The ICR relates to the IRM through the following equation:

$$ICR = (1 + IRM\%/100) \times \text{Forecasted NYCA Peak Load}$$

The final NYCA IRM requirement, as approved by the NYSRC Executive Committee, is the basis for various installed capacity analyses conducted by the NYISO. These NYISO analyses include the determination of the capacity obligation of each Load Serving Entity (LSE) on a Transmission District basis, as well as Locational Installed Capacity Requirements, for the following capability year. These NYISO analyses are conducted in accordance with NYSRC Reliability Rules and Procedures.

Section 2: Overview of the Reliability Calculation Process

This section provides an overview of the NYSRC reliability calculation process, including the major modeling parameters for establishing statewide IRM requirements, a timeline for this process, and reporting requirements for the technical IRM study (IRM Study).

2.1 Calculation Process

The reliability calculation process for determining the NYCA IRM requirement utilizes a probabilistic approach. This technique calculates the probabilities of outages of generating units, in conjunction with load and transmission models, to determine the number of days per year of expected capacity shortages. The General Electric Multi-Area Reliability Simulation (MARS) is the primary computer program used for this probabilistic analysis. The result of the calculation is termed Loss of Load Expectation (LOLE), which provides a consistent measure of system reliability. The relationship between MARS and the various models used in the NYCA IRM calculation process is depicted in Figure 2-1. The Installed Capacity Subcommittee (ICS) of the NYSRC has the responsibility of monitoring these studies and preparing reports for establishing NYCA ICR.

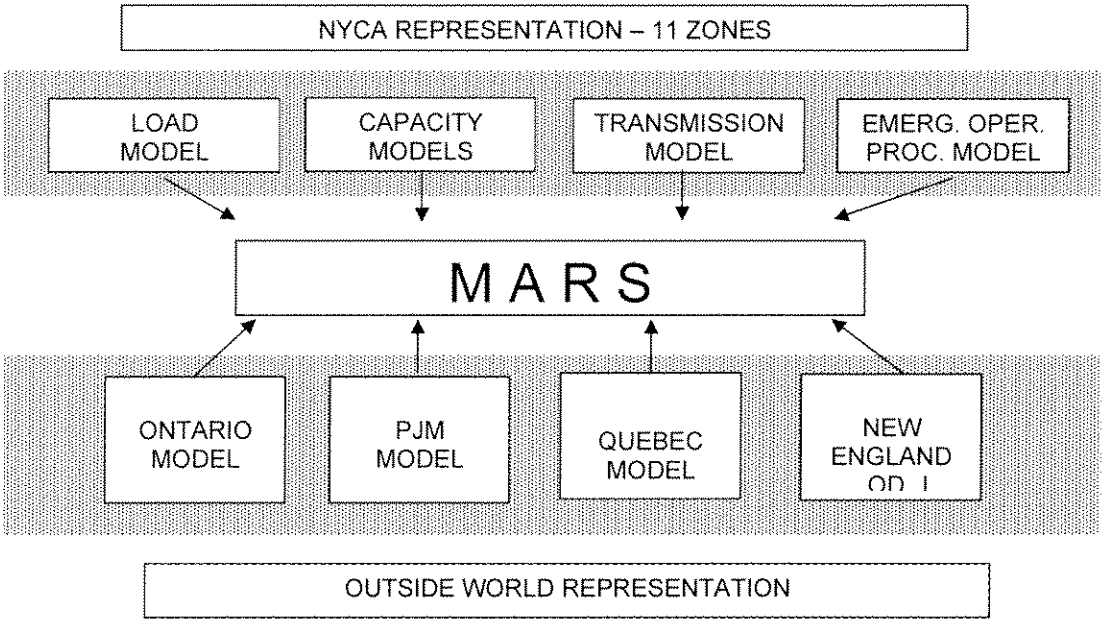

Figure 2-1: Relationship between MARS and the Models Used In the IRM Requirement Calculation Process

2.2 Timeline

A timeline for establishing NYCA IRM requirements is shown in Figure 2-2. This timeline is based on providing the NYISO with next year's NYCA IRM requirement by January, when the NYISO, under its installed capacity and procurement process, is required to begin its studies for determining the following summer's LSE capacity obligations.

DAY	YEAR	EVENT/DEADLINE
Jan. 1	Y-1	
Mar. 1		ICS, with support from the NYISO and Market Participants, begin development of IRM Study database.
June1		NYISO completes transmission model. GE provides latest MARS executable for ICS benchmarking
July 1		NYISO completes benchmarking tests for new MARS version.
Aug. 1		ICS completes database assumption matrix and submits to the Executive Committee for review and approval.
Sept. 15		ICS completes preliminary base case.
Oct. 1		NYISO completes final NYCA load forecast and ICS identifies sensitivity tests to be examined.
Oct, 15		ICS completes final base case.
Nov. 1		ICS completes sensitivity testing and IRM Study draft, and submits to the Executive Committee for review and comment.
Dec. 15		Executive Committee approves final IRM Study and establishes the NYCA IRM requirement for Year Y.
Jan. 1	Y	

Y represents year for which NYCA ICR is established

Figure 2-2: NYCA IRM Requirement Study Time

The basic steps in the process of establishing NYCA IRM requirements are:

- *March 1* – The ICS begins the process of developing base case input data and modeling assumptions and approves the MARS computer program version to be used.
- *June 1* – The NYISO completes the transmission model and submits it to ICS for review.
- *July 1* - If a new MARS version is to be used in the IRM study, the NYISO completes benchmarking tests and submits results to ICS for review.
- *August 1* – ICS finalizes initial base case input data and modeling assumptions and transmits this information to the NYSRC Executive Committee for review and approval.
- *September 15* – ICS completes the preliminary base case following modeling review and benchmarking.
- *October 1* – The NYISO completes its final forecast and submits to ICS. This forecast replaces the preliminary forecast in the initial base case assumptions. ICS identifies sensitivity tests to be examined.
- *October 15* – ICS completes the final base case. These results are submitted to the Executive Committee review.
- *November 1* – ICS completes sensitivity testing and draft NYCA ICR technical report and submits report to the NYSRC Executive Committee for review and comment at its November meeting.
- *December 15* – NYSRC Executive Committee approves the IRM Study and establishes the NYCA IRM requirement for the following capability year based on the analysis in the report, considering base case as well as sensitivity case results, and other factors. The NYSRC Executive Committee also prepares an IRM resolution and issues a letter to the NYISO CEO, which specifies the NYCA IRM requirement for the next capability period.

Adherence to this schedule is required to support NYSRC annual filing with FERC to advise FERC of the annual state-wide IRM requirement for the New York control area for the following capability year and to seek FERC approval of any revision to the IRM requirement.

2.3 IRM Study Reporting Requirements

In accordance with the NYSRC Reliability Rules, the NYSRC prepares the IRM Study, a technical report providing the assumptions, procedures, and results of analyses for determining NYCA IRM requirements. Drafts of this report are posted on the NYSRC web site and comments from all market participants are solicited during the NYCA IRM determination process in accordance with NYSRC Openness Policy 2.

Section 3: Reliability Calculation

This section contains the criterion used for establishing the required NYCA IRM level, a description of the reliability calculation, including the primary computer program used, and a description of the input data and models used in the reliability calculation.

3.1 NYSRC Resource Adequacy Criterion

The acceptable LOLE reliability level in the NYCA is stated in the NYSRC Reliability Rules. NYSRC Reliability Rule A-R1, *Statewide Installed Reserve Margin Requirements*, states:

> *The NYSRC shall establish the IRM requirement for the NYCA such that the probability (or risk) of disconnecting any firm load due to resource deficiencies shall be, on average, not more than once in ten years. Compliance with this criterion shall be evaluated probabilistically, such that the loss of load expectation (LOLE) of disconnecting firm load due to resource deficiencies shall be, on average, no more than 0.1 day per year. This evaluation shall make due allowance for demand uncertainty, scheduled outages and deratings, forced outages and deratings, assistance over interconnections with neighboring control areas, NYS Transmission System transfer capability, and capacity and/or load relief from available operating procedures.*

This Rule is consistent with the NPCC Resource Adequacy Standard and may be modified from time to time, as appropriate, in accordance with the NYSRC open process procedure for modifying NYSRC Reliability Rules (NYSRC Policy 1). The NYS Transmission System transfer capability in the above Reliability Rule is represented using emergency transfer limits.

3.2 Computer Program Used for Reliability Calculation

The primary tool used in the probabilistic analysis for establishing NYCA IRM requirements is a General Electric computer program called the Multi-Area Reliability Simulation (MARS). This program includes a detailed load, generation, and transmission representation for 11 NYCA zones (A through K), as well as the four external Control Areas (Outside World Areas) interconnected to the NYCA (see Section 3.3 for a description of these zones and Outside World Areas).

A sequential Monte Carlo simulation forms the basis for MARS. The Monte Carlo method provides a fast, versatile, and easily expandable program that can be used to fully model many different types of generation and demand-side options.

The MARS program calculates the standard reliability indices of daily and hourly LOLE (days/year and hours/year) and Loss of Energy Expectation (LOEE in MWh/year). The use of sequential Monte Carlo simulation allows for the calculation of time-correlated measures such as frequency (outages/year) and duration (hours/outage). The program also calculates the need for initiating Emergency Operating Procedures (EOPs), expressed in days/year (see Section 3.5.3).

In addition to calculating the expected values for the reliability indices, MARS also produces probability distributions that show the actual yearly variations in reliability that the NYCA could be expected to experience.

In determining the reliability of the NYCA there are several types of randomly occurring events that must be taken into consideration. Among these are the forced outages of generating units and transmission capacity. Monte Carlo simulation models the effects of such random events. Deviations from the forecasted loads are captured by the use of a load forecast uncertainty model.

Monte Carlo simulation approaches can be categorized as "non-sequential" and "sequential". A non-sequential simulation process does not move through time chronologically or sequentially, but rather considers each hour to be independent of every other hour. Because of this, non-sequential simulation cannot accurately model issues that involve time correlations, such as maintenance outages, and cannot be used to calculate time-related indices such as frequency and duration.

A sequential Monte Carlo simulation, the approach used by the MARS program, steps through the year chronologically, recognizing the fact that the status of a piece of equipment is not independent of its status in adjacent hours. Equipment forced outages are modeled by taking the equipment out of service for contiguous hours, with the length of the outage period being determined from the equipment's mean time to repair. The sequential simulation can model issues of concern that involve time correlations, and can be used to calculate indices such as frequency and duration. It also models transfer limitations between individual areas.

Because the MARS Program is based on a sequential Monte Carlo simulation, it uses state transition rates, rather than state probabilities, to describe the random forced outages of the thermal units. State probabilities give the probability of a unit being in a given capacity state at any particular time, and can be used if one assumes that the unit's capacity state for a given hour is independent of its state at any other hour. Sequential Monte Carlo simulation recognizes the fact that a unit's capacity state in a given hours is dependent on a given state in previous hours and influences its state in future hours. It thus requires additional information that is contained in the transition rate data.

If an updated MARS software version becomes available by June 1, prior to the initiation of an IRM Study, ICS should consider its use for conducting the study. The decision to select a new MARS version depends on desirable improvements in the reliability calculation process or correction of program errors in the new version. If there is a decision to utilize a new MARS version, it must be tested and benchmarked by the NYISO to ensure that it produces acceptable results. Such tests normally compare results for reasonableness with study results from a previous MARS version using the same assumptions. If a new MARS version becomes available after commencement of an IRM Study, it may be considered for use for the following IRM study.

3.3 NYCA Zones and Outside World Representation

Figure 3-1 depicts the NYCA Zones and Outside World Areas Representation in MARS.

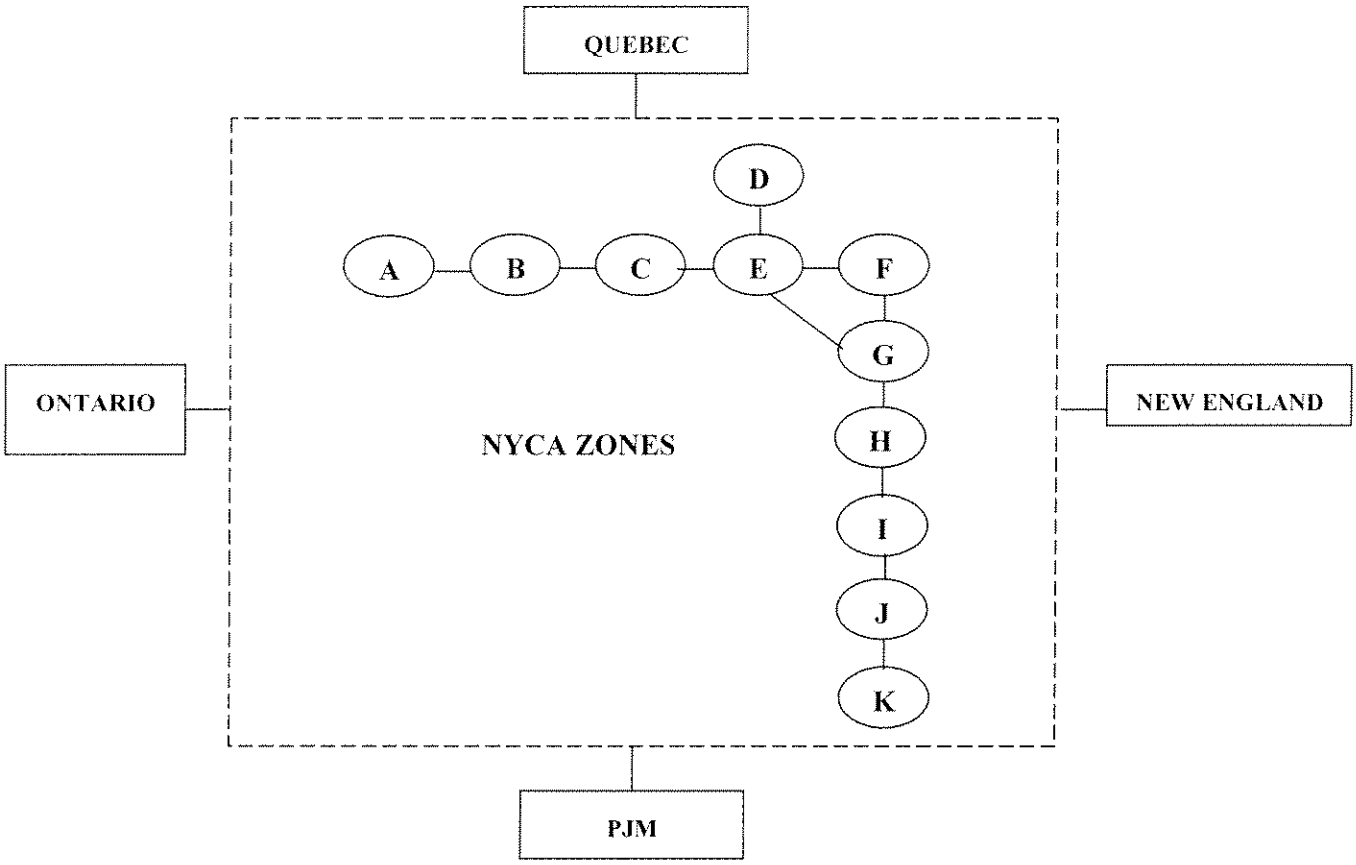

Figure 3-1: Simplified MARS Representation of NYCA
Z & O W

3.4 Conduct of the MARS Analysis

The base case is developed by starting with the previous year's base case and inputting base case changes one parameter at a time. The LOLE results of each of these pre-base case simulations are reviewed to confirm that the reliability impact of the change is reasonable and explainable.

3.4.1 Unified Method for Establishing IRM Requirements

The procedure utilized for establishing NYCA IRM requirements is termed the *Unified Method* because it provides a coordinated approach that is also used by the NYISO for its analysis of Locational Capacity Requirements (LCRs). The Unified Method establishes a graphical relationship between NYCA IRM and the LCRs as depicted graphically in Figure 3-2.

Under this method capacity is removed from zones west of the Central-East interface that have excess capacity when compared to their forecast peaks until a study point IRM is reached. At this point, capacity is shifted from Zones J and K into the same zones as above until the 0.1

LOLE criterion is violated. Doing this at various IRM points yields a curve such as depicted in Figure 3-2, whereby all points on the curve meet the NYSRC 0.1 days/year LOLE criterion. Furthermore, all LCR "point pairs" for NYC and LI curves along the IRM axis represent a 0.1 LOLE solution for NYCA. Appendix A provides a detailed description of the Unified Method.

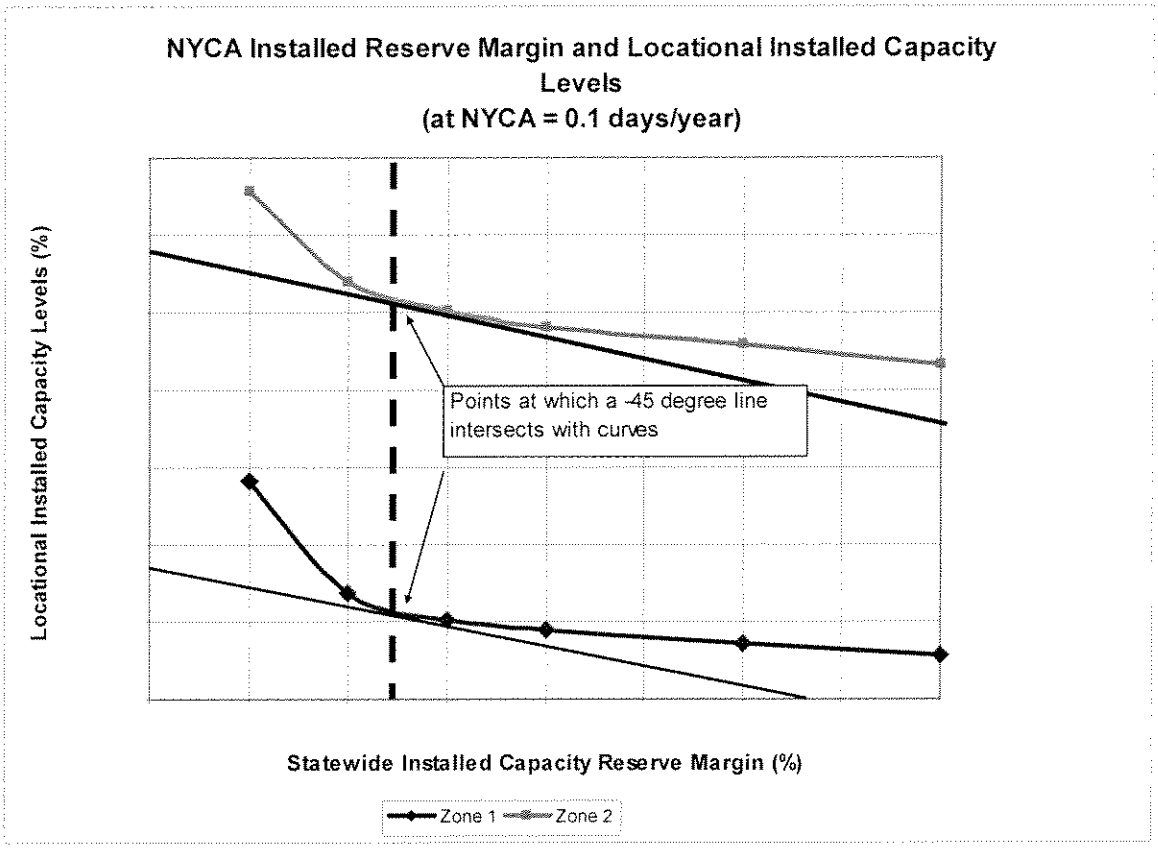

Figure 3-2: Unified Curve and IRM Anchor Point

3.4.2 Base Case IRM Anchoring Methodology

This method establishes base case NYCA IRM requirements and related minimum LCRs from IRM/LCR curves established by the Unified Method described in Section 3.4.1. The *anchor point* on the curve in Figure 3-2 is selected by applying a tangent of 45 degrees ("Tan 45") analysis at the bend (or "knee") of the curve. Points on the curve on either side of the "Tan 45" point may create disproportionate changes in LCR and IRM, since small changes in LCR can introduce larger changes in IRM Requirements and vice versa. Appendix B describes the mathematical analysis for selecting Tan 45 points on the curves. Alternative anchoring methods will be periodically evaluated.

3.4.3 Sensitivity Analysis

In addition to running a base case using the input assumptions described below, a number of sensitivity studies are run to show the IRM requirement outcomes for different assumptions. The

results of these sensitivity cases are used, along with the base case IRM Study results, by the Executive Committee to establish the final NYCA IRM requirement. In addition, sensitivity analysis provides a mechanism for illustrating "cause and effect" of how certain performance and/or operating parameters can impact reliability.

3.5 Input Data and Models

This section describes the load, capacity, and transmission models that are input to the MARS program for determining NYCA IRM requirements.

3.5.1 NYCA Load Model

The NYCA load model consists of the forecast NYCA and zone peak loads for the next capability year, and load shape and load uncertainty models.

Peak Loads
The NYISO provides peak and zone load forecasts for the next capability period. The NYISO will provide a preliminary load forecast to ICS for use as part of an initial data base. Following the summer period the NYISO develops a final forecast recognizing actual load conditions experienced during this most recent summer. This forecast should be available by October 1 (see Section 2.2).

Load Shape Model
The load shape that is input to the MARS program consists of an 8,760 hour chronological model. The appropriate load shape model used for the IRM study is developed by ICS after reviewing historical NYCA load shapes, weather characteristics, and trends from the past ten or more years. From this review, ICS adopts a *typical* year for the analysis after consultation with the NYISO. The load shapes for the 11 zones are hourly aggregates of sub-zone loads. Sub-zone loads are developed by applying appropriate weights to the transmission district load shapes.

Load Forecast Uncertainty Model
The load forecast uncertainty (LFU) model captures the impacts of weather and economic conditions on future loads. The MARS program calculates the LOLE at each of seven load levels (three loads lower and three loads higher than the forecast peak). Each load level is assigned a probability based on historical data. The MARS program calculates a weighted-average LOLE after evaluating the reliability at all seven load levels. The NYISO develops the load uncertainty model, with review and approval by ICS. Recognizing the unique LFU nature of individual NYCA zones, the LFU model is subdivided into four separate areas: New York City, Long Island, Westchester, and the rest of New York State.

3.5.2 NYCA Capacity Model

The capacity model input to MARS incorporates the several types of resource capacity used to serve load in the NYCA. This section describes how each resource type is modeled in MARS.

Generating Units

The capacity model includes all NYCA generating units, including new and planned units, as well as units that are physically outside New York State. This model requires the following input data:

Unit Ratings. The rating for each generating unit is based on its Dependable Maximum Net Capability (DMNC). The source of DMNC ratings is seasonal tests required by procedures in the NYISO Installed Capacity Manual. The annual NYCA Load and Capacity Report, issued by the NYISO, is the source of those generating units and their ratings included in the capacity model.

Unit Performance. Performance data for all generating units in the model includes forced and partial outages, which are modeled by inputting a multi-state outage model that is representative of the "equivalent demand forced outage rate" (EFORd) for each unit represented. The source of this data is outage data collected by the NYISO from generator owners using availability data reporting requirements in the NYISO Installed Capacity Manual. The multi-state model for each unit is derived from the collection of forced and partial outages that occur over the most recent five-year period. The appropriate historic time period should be periodically evaluated. The performance projection for a new or planned unit should be based on NYCA experience with similar units or NERC class-averages for the type and size of the unit.

A second performance parameter to be modeled for each unit is scheduled maintenance. This parameter includes both planned and maintenance outage components. The planned outage component is obtained from the generator owners, and where necessary, extended so that the scheduled maintenance period equals the historical average using the same period used to determine EFORd averages.

Combustion Turbine and Combined Cycle Units. Models of combustion turbine and combined cycle deratings due to temperature in excess of DMNC test conditions are developed based on two parameters. The first parameter relates NYCA load to temperature, while the second parameter relates combustion turbine deratings to temperatures above DMNC conditions.

Hydro Units. The Niagara and St. Lawrence hydroelectric projects are modeled with a probability capacity model that is based on historical water flows and unit performance. The remaining hydro facilities are represented in MARS with a hydro derate model. This model represents hydro deratings in accordance with recent historical hydro water conditions.

Special Case Resources (SCRs) and Emergency Demand Response Program (EDRP)

Special Case Resources (SCRs) are loads capable of being interrupted on demand, and distributed generators, rated at 100 kW or higher, that are not visible to the NYISO's Market Information System. The Emergency Demand Response Program (EDRP) is a separate program that allows registered interruptible loads and standby generators to participate on a voluntary basis and be paid for their ability to restore operating reserves.

The capacity from these programs is based on NYISO projections for the coming capability period. Due to the possibility that some of the potential SCR and EDRP program capacity may not be available during peak periods, NYISO projections are discounted based on previous experience with these programs as well as any operating limitations. Both EDRP and SCR programs are modeled as EOP steps with a maximum number of calls per month so designated. SCRs, however, because of their obligatory nature, are considered capacity resources in setting

the IRM, while EDRP, like other EOP steps such as voltage reductions, are not considered capacity resources.

External Installed Capacity from Contracts
An input to the study is the amount of NYCA installed capacity that is assumed located outside NYCA. Some of this capacity is grandfathered. The NYISO recommends the amount of external capacity to be used in the base case based on projections for the coming capability period and NYISO Installed Capacity Manual procedures.

Sales
The NYISO recommends to ICS the inter-area capacity transactions to be modeled in the study.

Unforced Capacity Deliverability Rights (UDRs)
UDRs are capacity rights that allow the holder/owner to receive the Locational Capacity Benefit derived by the NYCA from the addition of a new incremental controllable transmission project that provides a transmission interface to a NYCA locality or zone. The owner/holder of these UDR facility rights must designate how they will be treated by the NYSRC and NYISO in the NYCA IRM and LCR studies, in accordance with the time schedule specified in the NYISO ICAP Manual. The NYISO calculates the actual UDR award based on the transfer capability of the facility and other data.

The holder/owner of the UDR facility currently has the option on an annual basis of selecting the MW quantity of UDRs (ICAP) it plans on utilizing for capacity contracts over its controllable line which counts towards meeting locational and installed capacity requirements, with any remaining capability on the controllable line used to support emergency assistance.

3.5.3 Emergency Operating Procedures (EOPs)

The NYISO initiates emergency steps when its operating reserve levels approach critical levels. Such EOPs are modeled in IRM studies. The EOP steps consist of those load control and generation supplements that can be implemented before load must be disconnected due to capacity shortages. Load control measures include implementation of SCR and EDRP programs, public appeals to reduce demand, and voltage reduction. Generation supplements could include emergency purchases and cutting operating reserves. The benefit from each of these emergency steps can either be expressed as a percentage of load or in MW. The NYISO recommends to ICS the EOP steps and related capacity values to be represented in the base case, based on operating experience with these measures.

3.5.4 Transmission System Model

The transmission system is modeled through emergency transfer limits in the interfaces between pairs of NYCA zones, or between NYCA zones and Outside World Areas. These emergency transfer limits are developed in accordance with NYSRC Reliability Rules E-R1, 2 and 3, Thermal, Voltage and Stability Assessments, respectively. The transfer limits are specified for each direction of the interface. Forced outage rates on cable interfaces in southeast New York are modeled in the same manner as generating unit outages, through the use of transition rates. These outage rates are determined and provided by the transmission owners. Certain interfaces are grouped to reflect the maximum simultaneous flow through these interfaces. The NYISO updates

the transmission system model annually in accordance with the IRM database schedule in Section 2.2.

3.5.5 Locational Capacity Requirements

The MARS model used in the IRM study provides an assessment of the adequacy of the NYCA transmission system to deliver energy from one zone to another for meeting load requirements. Previous studies have identified transmission constraints into certain zones that could impact the LOLE of these zones, as well as the statewide LOLE. To minimize these potential LOLE impacts and to ensure that sufficient energy and capacity are available in that zone and that NYSRC Reliability Rules are met these zones require a minimum portion of their NYCA ICAP requirements to be electrically located within the zone, (i.e., locational ICAP). Locational ICAP requirements are currently applicable to two transmission constrained zones, New York City and Long Island, and are normally expressed as a percentage of each zone's annual peak load.

These locational ICAP requirements, recognized by NYSRC Reliability Rule A-R2 and established by the NYISO in accordance with the NYSRC/NYISO Agreement and the NYISO's tariff, complement the statewide IRM requirement. The Locational Installed Capacity Requirements Study performed by NYISO determines LSEs requirements for affected zones. As with the IRM Study, the NYISO utilizes the Unified Method for these analyses (see Section 3.4.1) while using nominally the same data base. Differences between these databases, if any, are described in the annual NYISO Locational Installed Capacity Study in accordance with NYSRC Reliability Rules A-R1 and A-R2.

3.5.6 Outside World Area Load and Capacity Models

The reliability of NYCA depends on a large extent on emergency assistance from the Outside World Areas in NPCC and PJM, based on reserve sharing agreements. Therefore, load and capacity models of the Outside World Areas are represented in the MARS analyses. The load and capacity models for New England, PJM, Ontario, and Quebec are based on data received from the Outside World Areas, as well as NPCC sources.

The primary consideration for developing the final load and capacity models for the Outside World Areas is to avoid overdependence on the Outside World Areas for emergency capacity support. For this purpose, a rule is applied whereby an Outside World Area's LOLE cannot be lower than its own LOLE criterion, its isolated LOLE cannot be lower than that of the NYCA, and its IRM can be no higher than that Area's minimum requirement. Another consideration for developing models for the Outside World Areas is to recognize internal transmission constraints within the Outside World Areas that may limit emergency assistance to the NYCA. This recognition is considered either explicitly, or through direct multi-area modeling providing there is adequate data available to accurately model transmission interfaces and load areas within these Outside World Areas.

As with the NYCA, an appropriate historical year is chosen for selecting the Outside World Area load shapes. This decision should depend on what year is chosen to represent NYCA's load shape, review of the years chosen by NPCC and PJM for their studies, and other factors. In order to avoid overdependence from emergency assistance from Outside World Areas, the day of an

Outside World Area's highest and second and third highest summer loads should be specified in the load model to match the same load sequence as that of NYCA.

3.5.7 Data Base Accuracy

It is critical that the data base used for IRM studies undergo sufficient review by the NYSRC and NYISO in order to verify its accuracy. To accomplish this objective, ICS develops an appropriate method for reviewing the data base, respecting confidentiality issues (see Section 3.6).

3.6 Data Base Confidentiality

A confidentially agreement is in place to prevent disclosure of market sensitive data and data confidentially. FERC Order 889 Code of Conduct rules apply to NYSRC representatives with access to IRM Data Base. From time to time changes in the confidentially agreement may be made.

Section 4: Responsibilities

This section describes the responsibilities for providing and developing input data and modeling assumptions, conducting the NYCA IRM studies, and establishing the required IRM as described in Section 3. There are four entities having such responsibilities: ICS, Transmission Owners, NYISO, and the NYSRC Executive Committee.

4.1 Installed Capacity Subcommittee

The ICS has the overall responsibility of managing studies and preparing reports for establishing NYCA installed capacity requirements. Specific responsibilities include:

- Develop and approve all modeling and database assumptions to be used in the reliability calculation process. These assumptions include load models, representation of NYPA generating units and other types of resource capacity, emergency operating procedures, transmission representation, and Outside World Area models (see Section 3.5).
- Approve the version of the MARS program to be used for the study (see Section 3.2).
- Manage conduct of MARS cases for developing the final base case, including benchmarking requirements.
- Specify sensitivity tests to be run (see Section 3.4.2).
- Together with NYISO staff, review and ensure database accuracy (see Section 3.5.7).
- Ensure that the timeline requirements in Section 2.2 are met.
- Arrange for supplemental computer facilities as needed.
- Prepare status reports and the IRM Study for NYSRC Executive Committee review.
- Coordinate above activities with NYISO staff.

4.2 NYISO

The NYSRC relies on the NYISO to provide sufficient technical and computer support for the IRM Study effort. The basis for this support is provided in the NYISO/NYSRC Agreement. The

NYISO leases the MARS computer program used for the reliability calculation studies. The NYISO utilizes the same program and NYSRC assumptions from the IRM Study for its own study of LSE locational capacity requirements.

- Conduct MARS studies for the IRM Study as requested by ICS.
- Develop load, capacity, transmission, and EOP models and supporting data for consideration by ICS for use in the IRM study. This information should be provided to ICS so as to allow the timeline requirements in Section 2.2 to be met. The NYISO should make recommendations to ICS concerning the application of these models in the IRM Study.
- Together with ICS, review and ensure database accuracy.
- Benchmark new versions of MARS.
- Obtain technical support for the application of MARS for IRM studies from General Electric as required.

4.3 Market Participants

Market Participants are knowledgeable concerning load information, planned resource capacity additions, and how transmission should be represented in IRM studies. Market Participants have the responsibility to provide such information to the NYISO for use in the IRM studies.

4.4 NYSRC Executive Committee

The NYSRC Executive Committee has the responsibility of approving the final IRM requirements for the next capability year.

- Review and approve data and modeling assumptions for use in IRM Study.
- Review and approve final IRM Study prepared by ICS.
- Establish and approve the NYCA IRM requirement for the next capability year. This decision should consider base case and sensitivity case results shown in the technical IRM report, as well as considering other issues that may impact NYCA IRM requirements.
- To the extent practicable, ensure that the schedule for the above approvals allow that the timeline requirements in Section 2.2 are met.
- Notify the NYISO of the NYCA IRM requirements and meet with NYISO management as required to review IRM Study results.
- Make IRM requirement study results available to state and federal regulatory agencies and to the general public.

APPENDIX A
Unified Methodology Description

1.0 Introduction

1.1. Appendix A describes a procedure to develop the statewide Installed Reserve Margin (IRM) versus Minimum Locational Capacity Requirements (LCRs) curves. Within the New York Control Area (NYCA) there are currently two zones identified as localities to which this procedure would apply. They are the New York City and Long Island zones.

2.0 Initial Conditions

2.1. A Multi-Area Reliability Simulation (MARS) base case database exists for the upcoming capability year.

2.2. Localities in the NYCA have been identified.

2.3. Any capacities that have been added, removed, or shifted as a result of arriving at a base case for the IRM study should be reset to the "as found" case for purposes of this procedure. This procedure should start with 'as forecast' capacities, and 'as forecast' loads.

3.0 Procedure for setting starting capacities

3.1. Add or remove capacity from zones west of the Total East Interface that have excess capacity reserves (capacity rich zones), proportional to their existing excess capacity, until the statewide capacity to peak load ratio equals a desired IRM study point.

3.1.1. The recommended method for adding or removing capacity in the MARS model, in this case, is to add or remove an amount of capacity proportional to the existing capacity of each unit in the subject zone.

3.1.1.1.This can be accomplished using the MARS table - 'UNT_MXCP'.

3.1.2. Verify that the correct amount of capacity was added/removed in the above step by performing a single iteration of the model and checking total capacity from the 07 output file.

3.1.3. Verify that the correct IRM study point was reached using the above information. Repeat step 3.1 as necessary until the study point is achieved.

3.2. Simulate the year for as many replications as needed until the LOLE converges within a standard error of 0.05 days/year. (Note: Based on previous studies the NYCA model converges in around 1500 replications)

3.2.1. Note the total NYCA LOLE risk and the risk in all NYCA zones.

4.0 Find the initial target capacity for the first study locality

Note that the initial target capacity is the maximum capacity that can be added/removed from the localities before the NYCA LOLE risk is 0.1 days/year.

4.1. Using the case from Section 3.2, add or remove a trial amount of capacity from the first study locality using the method expressed in section 3.1.

4.2. If capacity is removed in the above step, add the same amount of capacity to the capacity rich zones identified above in Section 3.1, proportional to their existing excess capacity. If capacity was added in the above step, remove the same amount of capacity to the capacity rich zones identified above in Section 3.1. Performing this step has the effect of shifting capacity from/to the localities.

4.3. Simulate the year for as many replications as needed until the LOLE converges within a standard error of 0.05 days/year.

4.4. If the NYCA system LOLE is below 0.100, remove capacity from the subject locality (adding it to the capacity rich zones) and repeat the steps in Sections 4.1 through 4.3, until the NYCA system LOLE approaches 0.100 days/year.

4.5. If the NYCA system LOLE is above the 0.100, add capacity from the subject locality (subtracting it the capacity rich zones) and repeat the steps in Sections 4.1 through 4.3, until the NYCA system LOLE approaches 0.100 days/year.

4.6. Once the LOLE has approached 0.100 days/year within a standard error of 0.05 days/year, note the amount of capacity shifted. This is the initial target capacity.

4.6.1. If 0.100 LOLE cannot be achieved by shifting capacity to or from the subject locality, the study point is not solvable and should be discarded.

4.7. Repeat the steps in Section 4.1 through 4.6 for a second locality and note the amount of capacity shifted as the initial target capacity for that locality.

5.0 Find the initial target capacities for other localities

5.1. Prior to proceeding to the next step, reset any capacities shifted during the above step.

5.2. Repeat step 4 for each identified locality and note the amount of capacity shifted as the initial target capacity for that zone

6.0 Determine the capacity multiplier for each locality

The capacity multiplier is the target capacity of the locality in question divided by the sum of all the target capacities. For example, suppose there are only two localities. From zone one, the LOLE approaches 0.100 when 300 MW are removed. From zone two, the LOLE approaches

0.100 when 100 MW are removed. The capacity multiplier for zone one is 300/400 or 0.75, while the capacity multiplier for zone two is 100/400 or 0.25.

7.0 Find the final adjusted capacities

7.1. Prior to proceeding to the next step, reset any capacities added or removed during the above step, i.e., use the case from Section 3.2.

7.2. Estimate a total amount of (trial) perfect capacity to be added or removed from the two localities.

7.2.1. Use the capacity multipliers to divide the above trial capacity between the two localities.

7.3. If capacity is removed in the above step, add the same amount of capacity to the capacity rich zones identified above in Section 3.1, proportional to their existing excess capacity. If capacity was added in the above step, remove the same amount of capacity to the capacity rich zones identified above in Section 3.1.

7.4. Simulate the year for as many replications as needed until the LOLE converges within a standard error of 0.05 days/year.

7.5. If the NYCA system LOLE is below 0.100, remove more capacity from the locality zones (adding it to the capacity rich zones) and repeat the steps in Sections 7.1 through 7.5, until the NYCA system LOLE approaches 0.100 days/year.

7.6. If the NYCA system LOLE is above the 0.100, remove less capacity from the locality zones (adding less to the capacity rich zones) and repeat the steps in Sections 7.1 through 7.5, until the NYCA system LOLE approaches 0.100 days/year.

7.7. Once the LOLE reaches 0.100 days/year within a standard error of 0.05 days/year, note the amount of capacity removed from each identified locality. These are the final adjusted capacities.

8.0 Determining the minimum locational requirements (MLCRs)

8.1. For each identified locality, divide its final adjusted capacity by its peak load forecast. This, expressed as a percentage, is its MLCR for the IRM point being studied.

9.0 Determining more points on the LCR-IRM curve

9.1. Repeat the steps in Sections 3 through 8 for each IRM point desired.

10.0 The LCR-IRM curves

10.1. Graph the LCR-IRM curves for the points studied above.

APPENDIX B

Selection of TAN 45 Points on the IRM/LCR Curves Established by the Unified Methodology

The IRM Anchoring Method identifies the NYCA IRM Requirements and related MLCR from IRM/LCR curves established by the Unified Methodology. The *anchor point* on the curve is selected by applying a tangent of 45 degrees ("Tan 45") analysis at the bend (or "knee") of the curve as shown on Figure B-1 below. Based on these curves, extreme points on the curve on either side of the "Tan 45" point may create disproportionate changes in LCR and IRM, since small changes in LCR can introduce larger changes in IRM Requirements and vice versa.

A regression analysis is utilized to best fit the IRM/LCR curves and determine the TAN45 point, rather than a visual inspection of the curves. The best curve fit is a multi-order polynomial with an R^2 of 1, which indicates a "perfect" fit.

Using this second order polynomial fit analysis, the anchor points are developed such that a single IRM is determined to satisfy reliability criteria for both locational zones.

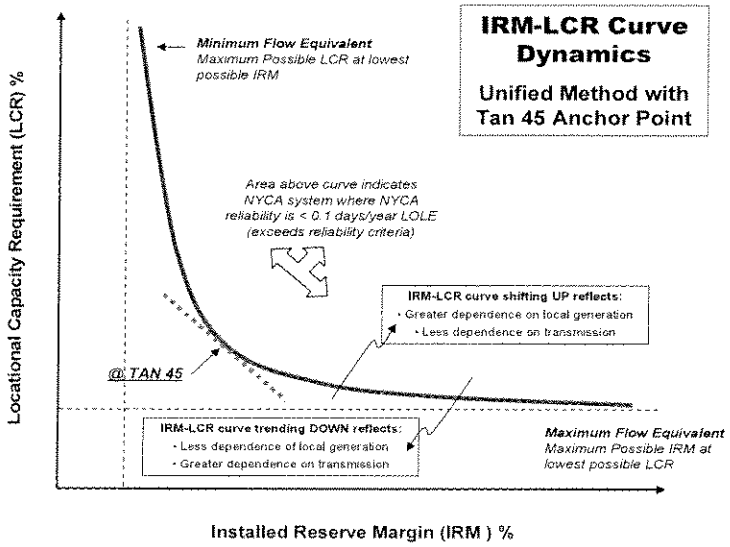

Figure B-1: IRM-LCR Unified Method Curve Dynamics With Tan 45 Anchor Point

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list in this proceeding in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure.

Dated at Washington, D.C. this 16th day of February, 2007.

/s/ Claire M. Brennan
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