

SUMMARY OF LESSONS LEARNED FROM 2006-07 IRM STUDY
May 4, 2006

LESSON	ACTION	DATE	POLICY 5 ITEM	TASK FORCE
1. Schedule	Review study timeline and avoid changes to data after deadlines.	June 7	2.2 Timeline	Curt Dahl & Carlos Villalba
2. Sensitivity Cases	Improve procedure and provide enhanced explanations in IRM Study for sensitivity cases.	Status Report June 7	Expand section 2.1 to include unified methodology	General Electric & Bart Franey
3. Defining Tan 45 Anchor Point	The TAN 45 Anchor point should be determined mathematically.	June 7	Expand section 2.1.	ICS
4. Modeling performance & uncertainty of SCRs & other intermittent resources	Work with GE to test various methods of modeling SCRs, hydro and wind power resources.	June 7	Expands section 3.5.2	General Electric & NYISO
5. Modeling of UDRs	Coordinate UDR modeling with other Areas.	June 7	Expands section 3.5.2	NYISO
6. NYISO Staff manpower and computer run time	NYISO to provide an estimate of what they can accomplish with present manpower and computer capabilities.	June 7	Include with item 2.	NYISO
7. Free flow Equivalent IRM	Better define free flow equivalent IRM point on Unified Method curves.	June 7	Include with item 2.	General Electric & NYISO
8. Providing transfer limits	Work with the NYISO to ensure that transfer limit data is verified and available for modeling.	June 7	Is in section 3.5.4.	NYISO
9. Data Base Accuracy	Develop process to ensure database accuracy while protecting data confidentiality.	June 7	Add new section in 3.5.	NYISO & General Electric

NYSRC – ICS

2006 IRM Study Lessons Learned (Roadmap for 2007)

May 4, 2006

1. Locking Timeframe and Project Scope

Concerns:

- As seen with the December UDR (Unforced Deliverability Rights) elections, last-minute changes in the IRM (Installed Reserve Margin) Study process imposed a great burden upon the NYSRC and NYISO. Both organizations struggled to complete the IRM Study in a timely manner as the IRM is prerequisite for capacity procurement during the summer capability period.
- This becomes critical as the IRM must first be approved by the NYSRC Executive Committee (EC) and any change to the IRM must be filed with FERC for approval. Further subsequent analysis of locational requirements and approval by the NYISO Operating Committee (OC), is required.
- Because of schedule slippage, it became impossible to fully update the 2006 IRM Study to reflect all modeling and assumptions changes.

Actions / Resolution:

- Review the timeline in Policy 5 and make appropriate changes.
- The NYSRC and NYISO should be encouraged to adhere to strict deadline to “lock down” modeling and assumptions for the IRM Base Case. If both the NYSRC and NYISO agree upon such date (presently August 1st, according to Policy 5), then it is imperative to inform all stakeholders of the requirement and possible consequences if late-breaking study revisions are forced upon the NYSRC and NYISO.

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2. Sensitivity Case Procedures and Explanation of Results

Concerns:

- The procedure for performing the sensitivity cases was changed late in the process. The revised procedure did provide reasonable results; however, the method used to run the sensitivity cases should be reviewed.
- With the adoption of the Unified methodology and the increasing number of zones modeled showed the need to improve the run time of the GE-MARS program became evident.
- Furthermore, sensitivity analysis provides an excellent mechanism for illustrating the “cause and effect” of how certain performance and/or operating parameters can impact reliability. However, the report did not adequately explain why the IRM Base Case numbers changed.

Actions / Resolution:

- The procedure for performing the sensitivity cases needs to be reviewed to determine if there is a better method. Although the best method is re-do the entire LCR-IRM curve for each sensitivity case, this is not practical. Improving model runs times, however, may allow for more complete sensitivity results.
- This review should consider determination of the impact of the sensitivities (or at least some of the sensitivities). For example, it may be more relevant to simply make

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the sensitivity change to the base case and observe the LOLE change in NYCA and specific zones (as opposed to recalibrating the result to 0.100 LOLE).

- Within the IRM Study, the ICS needs to provide additional explanations of the results of the sensitivity cases to better illustrate “cause and effect”
 - It may be appropriate to classify some sensitivities on a zonal or super-zonal basis.
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3. Defining “TAN 45 Anchor Point”

Concerns:

- The “TAN 45 Anchoring Method” was developed by the ICS as a method to identify the “knee” (where the curve bends) of the IRM-LCR curves using a tangent of 45° line to “mark” the Base Case. During recent ICS meetings, several participants raised concerns over the application of the “TAN 45 Anchor” method.
- Recent comments have indicated that setting the TAN 45 point is based on engineering judgment and suggested the TAN 45 point needs to be mathematically derived using the equation of the best fit curve of the IRM and LCR pair points.
- As the 2006 IRM Study period reached conclusion, several participants offered various mathematical solutions on the Tan 45 issue including regression analysis and scaling to use MW values instead of percentages.
- During 2005, the EC approved the use of the TAN 45 Anchor method for one year only — with the provision that the method will be reevaluated.

Actions / Resolution

- The final TAN 45 Method should be fully discussed in the appendices section of the IRM report.
 - The ICS should prepare a white paper critiquing the performance of the TAN 45 methodology used in the 2006 IRM Study.
 - In response to the one-year trial period for the TAN 45 a white paper should be prepared to compare pros and cons of the TAN 45 Method versus the Free Flow Equivalent Method. For the TAN 45 Method a consistent mathematical determination for the TAN 45 anchoring point should be specified.
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4. Modeling Performance and Uncertainty of SCRs & Other Intermittent Resources

Concerns:

- During 2005, actual performance of SCRs (Special Case Resources) in several Zones was far less than was expected or projected for the IRM Study.
- Of great concern to the ICS and statewide reliability was the lackluster performance of the downstate SCRs on 27-Jul 2005 given the relative importance of those locational resources.
- Recent SCR program rules changes include the development of seasonal versus 12-month performance factors and revising APMD (Average Peak Monthly Demand) calculations to be based on the hours from noon to 8 pm. All such measures are designed to tighten SCR performance standards. In addition, stakeholders proposed the creation of a 30-minute Demand Response (SCR-like) program in addition to the current 4-hour SCR program.
- The SCR/EDRP sensitivity case attributed a suspiciously large impact on the IRM to these resources as a result of the way sensitivity cases were run. (See Issue # 2).
- The modeling of SCRs and other intermittent resources such as the different types of hydro units (run of river and storage units) and wind power should be reviewed.

- Modeling these resources using a 100% availability derated resource may not provide an accurate representation of the contribution to reliability.

Actions / Resolution:

- The ICS should reassess the current method used to factor in the expected performance of SCRs, hydro and wind power.
- This reassessment should include consideration of changing derates applied to the SCRs to basing the expected performance of SCRs on a multi-year history, such as 5 years as in the case of generator performances.
- Hydro units should be grouped by type (run of river vs. controlled).
- The reassessment should also look at applying a probabilistic representation rather than using a derated capacity representation.

5. Modeling UDRs

Concerns:

- The Cross Sound Cable (CSC) was modeled as UDRs (Unforced Deliverability Rights) because of LIPA's UDR election based on its contract for 345 MW of capacity from the 600 MW Bear Swamp hydroelectric pumped storage facility in Massachusetts.
- Modeling the CSC as UDRs (instead of being available fully for emergency assistance) created significant impact to the 2006 IRM Study — a change that resulted in a 0.5% increase in the 2006 IRM Base Case, from 17.5% to 18.0%. This change created a result that had to be further analyzed and explained within the report.
- Another concern is that the need for coordination with the neighboring control area on the modeling of the UDRs – this will become more important with the potential of also having to model the Neptune Cable as UDRs in the upcoming 2007 IRM Study.

Actions / Resolution:

- The ICS and NYISO should coordinate the modeling of the CSC with ISO-NE as part of the Joint NYSRC/NYISO/ISO-NE Tie Benefit Analysis.
- The ICS and NYISO should also coordinate with PJM the modeling of the Neptune Cable.
- The ICS should reaffirm the UDR model to be utilized for the 2007 IRM Study.

6. NYISO Staff Manpower and Computer Runtime

Concerns:

- With the adoption of the unified methodology, time considerations for sensitivity runs, and increasing number of zones modeled, there is a need to improve the run time of the GE-MARS program.
- The NYISO's limited staff resources that were dedicated to the preparation, GE-MARS modeling and IRM evaluations were stretched to the breaking point during the 2006 IRM Study.
- Due to the number of projects on the ICS / NYISO docket, there are major concerns about the NYISO's capability of completing these studies. Besides the 2007 IRM Study, there are the "Upstate-Downstate Superzone Study" and the "New York – New England Tie Benefits Study" — just to name two of the larger studies.

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Actions / Resolution:

- The ISO should provide an estimate of what they can accomplish with existing manpower and computer resources.
- Efforts should be made to ensure that both adequate staff and computing power are available for the 2007-2008 study.
- See

7. Determining the Free-Flowing Equivalent IRM

Concerns:

- Due to time and resource restrictions, insufficient evaluation was conducted in determining the free-flowing equivalent IRM with associated LCR levels for Zone J and K.
- During 2005, National Grid (NGrid) filed a complaint with FERC arguing that the current methodology should be replaced with a free-flowing equivalent IRM construct.

Actions / Resolution:

- The NYSRC Executive Committee (EC) approved a work scope for the ICS' proposed "Upstate-Downstate Superzone Study". The ICS through the Resource Adequacy Issues Task Force (RAITF) is proceeding with this evaluation.
- With respect to evaluating the IRM/LCR curves, using MW value scaling may better help define the "left side" of the curves where the system approaches the free-flowing equivalent IRM value.
- Refer Issue #3 with regards to preparing a white paper.

8. Confirming Interface Transfer Limits

Concerns:

- In meetings leading up to finalization of the 2006 IRM Study, a number of questions were raised regarding the consistency of thermal and voltage limits at interfaces when compared to the NYISO's Reliability Needs Assessment (RNA) report.

Actions / Resolution:

- The NYISO should reevaluate all interface transfer limits and make necessary changes on the NYS Transmission System Representation map in accordance with time line developed under Issue # 1.
- Refer to issue 5 for modeling of UDRs.

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10. Database Accuracy

Concerns:

- A database error was found late in the IRM_LCR process. Is the database undergoing sufficient review to ensure that errors can be found and corrected in a timely manner?

Actions / Resolution:

- The ICS should create a task force to examine this issue and make appropriate recommendations on this issue.

- Wherever possible (where data confidentiality will not be violated), the NYISO should share its database with the ICS participants for additional review. Ultimately, the NYISO is responsible for protecting data confidentially.
- A separate, independent and qualified entity, such as GE, should be retained by the NYSRC / NYISO to review the database.