

**REVIEW OF U.S. – CANADA POWER SYSTEM OUTAGE TF REPORT,  
FINAL REPORT OF THE IMPLEMENTATION OF THE  
TASK FORCE RECOMMENDATIONS  
(September 2006)**

**Prepared by the NYSRC Reliability Rules Subcommittee**

**Background**

The “Final U.S. – Canada Power System Outage Task Force Report” (TF Report) documents the status of the implementation of the Task Force’s recommendations by various national reliability organizations. With this report the Task Force (TF) considers its mandate to be completed. The NYSRC Reliability Rules Subcommittee (RRS) was requested by the NYSRC Executive Committee to review this report and provide highlights and conclusions.

Progress has been made on all 46 of the TF recommendations. The TF report provides detailed descriptions of actions taken by organizations such as NERC, FERC, DOE, the US and Canadian governments, and regional reliability councils. Also provided are descriptions of actions remaining to fully implement each of the TF recommendations. In the Appendix of this report we have summarized key actions from the TF Report, supplemented with specific NPCC, NYISO, and NYSRC actions. The reference sources of the NPCC and NYISO actions include the periodic blackout recommendation status reports prepared by each of these organizations, which have been monitored on an on-going basis by the NYSRC.

**Actions by National Organizations**

A review of the Appendix shows that several of the TF recommendations from a national prospective are not yet fully implemented, several of which cover the need to modify certain existing NERC standards and to prepare new standards. The October 20, 2006 FERC NOPR on mandatory reliability standards addresses FERC’s concern that many of the standards that have been adopted by NERC continue to include deficiencies identified in the Blackout Report. These standards are expected to be further enhanced by the new ERO, followed by final approval for enforcement by FERC. The NYSRC is participating in this process.

**Actions by NPCC and the NYISO**

NPCC and the NYISO have implemented actions based on several TF recommendations, the highlights of which are shown in the Appendix.

One of the most significant actions in response from a regional standpoint to the Blackout was the *NPCC August 14, 2003 Northeast Blackout Study*, approved by NPCC in November 2005. This study performed dynamic simulations conducted replicating the August 14, 2003 sequence of events and the dynamic performance of the NPCC systems through the formation and collapse of the islands within NPCC. As a result of the conclusions of this study, as well that of several other NPCC blackout studies, NPCC developed a series of recommendations that are currently being addressed by NPCC task forces. RRS is monitoring the progress of the task forces.

## **Actions by the NYSRC**

Soon after the Blackout event, the NYSRC initiated a series of actions to determine whether the NYISO was in compliance with NYSRC Reliability Rules and NERC and NPCC Standards. The NYSRC looked at the time periods leading up to the Blackout, during the Blackout event, and during system restoration; and whether modifications to the existing Reliability Rules were warranted. The NYISO was requested to furnish frequent status reports of the progress of its own Blackout investigations, and to provide a self-assessment as to whether or not the NYISO was in compliance with the NYSRC Reliability Rules and NERC and NPCC Standards during the period of the Blackout.

The NYSRC concurred with the NYISO self-assessment which concluded that NYISO was in full compliance with all applicable NYSRC Reliability Rules and NERC and NPCC Standards during the period of the August 14, 2003 system disturbance.

In addition, the NYSRC voluntarily initiated a series of actions related to seven TF recommendations, highlights of which are shown in the Appendix. They are as follows:

- *Enhance NYSRC Reliability Rules on System Restoration.* Review of a NYISO System Restoration Working Group report shows that, although NYISO operations during system restoration on August 14-15, 2003 were in compliance with NYSRC Reliability Rules, the existing system restoration rules should be modified to make them more stringent and specific, and to implement recommendations of the NYISO System Restoration Working Group. Accordingly, in 2005 System Restoration Rule modifications, including rules related to system restoration training, were adopted. A NYISO compliance review with respect to these modified Rules is scheduled for the Fall of 2006. This action is related to TF Recommendations #19 and #29.
- *Enhance other NYSRC Reliability Rules.* Several rules were adopted covering disturbance monitoring, system modeling, and control center communications that are related to TF Recommendations #24, #26 and #28. In addition, the NYSRC is actively following the progress of an NYISO operating reactive study, which will provide input to development of a new rule (PRR #8) covering reactive load and resource power factor requirements. This action is related to TF Recommendation #23.
- *Identify possible “defensive strategies” that may be implemented in the event a problem develops on a neighboring system.* The NYSRC’s interest in exploring defensive strategies was initiated immediately following the events of August 14, 2003. The objective is the mitigation of the impact of major system disturbances on the NYCA, with particular emphasis on events originating outside of the NYCA. Subsequently, representatives of the NYSRC Executive Committee held a series of meetings with the key operations and planning staff of the NYISO to further explore defensive strategies possibilities and develop a course of action.

The Defensive Strategies Working Group (DSWG) was formed comprising representatives of NYCA Transmission Owners, the NYISO, the NY PSD, the NPCC, and members of the NYSRC Executive Committee. The NPCC representatives included

members of the NPCC Task Force on System Studies (TFSS) as well as the SS-38 Working Group (a subgroup of the TFSS) that performed the dynamics studies of the August 14, 2003 blackout. It was noted that the SS-38 Blackout Study Plan includes a “Task 5” which is designed to explore blackout mitigation measures. The DSWG worked with the SS-38 representatives to provide input to the Task 5 study scope.

The DSWG plan is to continue to monitor the SS-38 work and have input with regard to representing the interests of the NYCA. The Task 5 work is targeted for completion in the summer of 2007. In addition, the NYSRC Executive Committee through the DSWG will continue to keep abreast of new technology applications that might have application for defensive strategies.

This work is related to TF Recommendation #21.

- *Review the NYS PSC Blackout Final Report and Monitor the Implementation of Recommendations by the NYISO and Market Participants.* As part of the NYSRC 2006 Reliability Monitoring Compliance Program, the NYISO has been requested to update the NYSRC on actions for implementing PSC Blackout Report recommendations.

## **Conclusions**

Much has been accomplished by national and regional reliability organizations, including the NYSRC in the three years since the Blackout, although there is still more to be completed. From a national standpoint, future work remains related to the development of mandatory and enforceable NERC standards. In addition, the NYSRC has learned valuable lessons from the 2003 Blackout which it is in the process of implementing.

First, despite the fact that the origin of the Blackout was in the Midwest and that the NYCA had stronger reliability standards and was in full compliance with these standards during the period of the Blackout, New York was still seriously impacted. This experience illustrates that weaker reliability standards and compliance requirements in any Region could adversely affect the reliability in another Region, even if the affected Region has adopted more stringent standards. This is why the NYSRC must continue to carefully review proposed NERC reliability standards to ensure, in particular, that they do not result in weakening of national criteria that may impact the reliability of the NYCA, its neighboring systems, and the interconnected systems as a whole. Therefore, the NYSRC must continue to work with the NYISO and NPCC to be pro-active concerning the preparation of comments to NERC and FERC and in the balloting process when such concerns arise.

Second, it is imperative that defensive strategies continue to be evaluated. Those strategies that prove functional and feasible should be considered for eventual implementation to ensure the reliability of NYCA in the event reliability issues develop in a neighboring system, such as what happened in August 2003.

# **APPENDIX**

**Final U.S. – Canada Blackout Report  
Implementation of Report Recommendations**

<b>Report Recommendation</b>	<b>Responsible Entities**</b>	<b>Key Actions Taken</b>	<b>NYSRC Actions Taken</b>
1. Make reliability standards mandatory and enforceable, and to provide appropriate penalties for non-compliance.	US and Canadian Governments, US Congress, FERC, NERC	<b>Fully Implemented</b> Congress passed and the President signed into law the <i>Energy Policy Act of 2005</i> (2005). The US and Canada established a Bilateral Group to provide a coordinated oversight of the ERO (2005).	
2. Develop a regulator-approved funding mechanism for NERC and the Regional Reliability Councils, to ensure their independence from the parties they oversee.	FERC, DOE, NERC, US and Canadian Authorities	<b>Not Yet Fully Implemented</b> The Bilateral Group have had public workshops on funding. As part of the regulatory process to establish an ERO, the ERO is required to propose a funding mechanism.	
3. Strengthen the institutional framework for reliability management in North America.	FERC, DOE, NERC	<b>Not Yet Fully Implemented</b> FERC will use the ERO self-assessments as a possible metric for gauging the adequacy of the ERO's performance. Certification of an ERO and completion of the ERO self-assessment three years after certification. The roles of RRC's with delegated authority to function as RE's will be an important aspect of the transition from voluntary to mandatory standards.	
4. Clarify that prudent expenditures and investments for bulk system reliability (including investments in new technologies) will be recoverable through transmission rates.	FERC, US States, Canadian authorities. NYISO	<b>Fully Implemented</b> FERC issued a policy statement on reliability issues that affirmed the continuation of its policy of approving applications to recover the prudently incurred costs necessary to ensure system reliability. <b>NYISO Actions</b> FERC approved establishment of a separate rate mechanism for recovery of regulated transmission costs incurred in accordance with the NYISO CRPP.	
5. Track implementation of recommended actions to improve reliability.	DOE, FERC, authorities in Canada	<b>Fully Implemented</b>	
6. FERC should not approve the operation of new RTOs or ISOs until they have met minimum functional requirements for reliability coordinators.	FERC, Canadian authorities	<b>Fully Implemented</b> FERC has mandated that an ISO or RTO must meet all minimum functional requirements in order to fulfill its responsibility as reliability coordinator for the area within its footprint.	
7. Require any entity operating as part of the bulk power system to be a member of a regional reliability council if it operates within the council's footprint.	FERC, Canadian authorities	<b>Fully Implemented</b> The 2005 Energy Act requires compliance with reliability standards by all parties whose actions affect the BPS, but does not require membership in the ERO or a RC.	

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8. Shield operators who initiate load shedding pursuant to approved guidelines from liability or retaliation.	US and Canadian authorities	<b>Fully Implemented</b> Some regulators have expressed the view that there is appropriate protection against liability suits for parties that have shed load according to approved guidelines. Version 0 standard requirements for load shedding provide adequate protection against claims.	
9. Integrate a “reliability impact” consideration into the regulatory decision-making process.	FERC and Canadian authorities	<b>Fully Implemented</b> FERC has established the Division of Reliability to ensure the integration of reliability and market consideration in FERC decision making.	
10. Establish an independent source of reliability performance information.	EIA, NEB, NERC	<b>Not Yet Fully Implemented</b> All parties need to agree on what data should be collected. This will require attention from various agencies over the next several years.	
11. Establish requirements for collection and reporting of data needed for post-blackout analyses.	FERC, EIA, NERC	<b>Not Yet Fully Implemented</b> NERC has approved <i>Blackout Disturbance and Response Procedures</i> and initiated a standard that will establish requirements for time-synchronized disturbance monitoring equipment.	
12. Commission an independent study of the relationships among industry restructuring, competition, and reliability.	DOE	<b>Fully Implemented</b> Although the Blackout Report did not identify restructuring as one of the causes of the Blackout, some participants have argued that this was a contributing factor. Discussion papers have been invited.	
13. DOE should expand its research programs on reliability-related tools and technologies.	DOE	<b>Fully Implemented</b>	
14. Establish a standing framework for the conduct of future blackout and disturbance investigations.	FERC, EIA, NERC	<b>Not Yet Fully Implemented</b> See Recommendation #11.	
15. Correct the direct causes of the August 14, 2003 blackout.	NERC, EnergyFirst, NPCC, NYISO	<b>Not Yet Fully Implemented</b> A reliability study did not identify any needed upgrades for 2004. NERC requested each appropriate entity to review list of reliability practices to ensure they meeting NERC standards and established good utility practices. All entities responded. Many improvements to MISO’s operating tools, operator training, and communications protocols and procedures were documented by NERC. ReliabilityFirst will continue to implement all blackout recommendations and re-examination of dynamics data. <b>NPCC Actions:</b> NPCC verified that the NYISO meets identified mitigation measures. <b>NYISO Actions</b>	<b>Completed</b> RCMS reviewed and approved an NYISO self-assessment which concluded that the NYISO was in full compliance with the NYSRC Reliability Rules during the time period leading up to the blackout, during the blackout, and during system restoration.

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		The NYISO voltage criterion was found to be well above the guidelines recommended. The NYISO completed an Alternate Control Center and restoration drills. The NYISO Emergency Response Plan was reviewed by NPCC. NYISO system operators completed five days of emergency preparedness training. The NYISO has emergency operating agreements with neighboring control areas.	
16. Establish enforceable standards for maintenance of electrical clearances in right-of-way areas.	NERC, RRC's, TOs	<b>Fully Implemented</b> <i>A Transmission Vegetation Management Program Standard</i> was adopted. NERC requires TOs to make vegetation procedures and documentation of work completed available to RRC's and NERC. RRC's have established reporting requirements.	
17. Strengthen the NERC Compliance Enforcement Program.	NERC, FERC, RRC's, NYISO	<b>Not Yet Fully Implemented</b> NERC requires reporting of confirmed violations of standards. NERC adopted Version 0 Standards and new standards. Violation risk factors are being developed. <b>NPCC Actions</b> NPCC reported no significant NYISO violations to date. <b>NYISO Actions</b> A NERC Audit occurred in 2004.	<b>Completed.</b> The NYSRC approved the "NYISO Response to the Blackout" requested by the NYSRC, including the self-assessment described under Recommendation 15. RCMS is monitoring NYISO implementation of PSC Blackout Report recommendations.
18. Support and strengthen NERC's Reliability Readiness Audit Program.	NERC	<b>Not Yet Fully Implemented</b> NERC conducted a number of audits in 2004 and 2005. NERC will assess and rank the importance of outstanding audit recommendations and take action to ensure they are quickly implemented. <b>NYISO Actions</b> A NERC Audit occurred in 2004.	<b>Completed.</b> RCMS reviewed NERC's July 2004 NYISO readiness audit report and found no rule violations.
19. Improve near-term and long-term training and certification requirements for operators, reliability coordinators, and operator support staff.	NERC	<b>Not Yet Fully Implemented</b> NERC is addressing this recommendation in a training and certification program. A System Personnel Training SAR has been prepared. Will be fully implemented when NERC approves standards for modeling and analysis requirements, certification requirements, and the overall operator training program.	<b>Completed</b> RRS included enhanced NYISO operator restoration training requirements in PRR 76, System Restoration Rules. This rule was adopted in 2005.
20. Establish clear definitions for normal, alert and emergency operational system conditions. Clarify roles, responsibilities, and authorities of reliability	NERC	<b>Not Yet Fully Implemented</b> NERC has developed definitions of normal, alert, and emergency conditions to use in a pilot program for reporting	

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coordinators and control areas under each condition.		RCIS in 2006. It has been noted that these definitions are not consistent with those in use by ISOs and RTOs.	
21. Make more effective and wider use of system protection measures.	NERC, NPCC, NYISO	<p><b>Not Yet Fully Implemented</b>  NERC completed review of Zone 3 relay loadability. A relay loadability SAR was developed.</p> <p><b>NPCC Actions</b>  NPCC developed a white paper on the merits of controlled separation.</p> <p><b>NYISO Actions</b>  NYISO responded to Zone 3 review on schedule.</p>	<p><b>Not Yet Completed</b>  A team of NYSRC Unaffiliated Members is working with NYISO staff to explore Defensive Strategies. Several meetings have been held and more are planned for 2007.</p>
22. Evaluate and adopt better real-time tools for operators and reliability coordinators.	NERC, NYISO	<p><b>Not Yet Fully Implemented</b>  NERC will consider keeping <i>best practices</i> updated and forming a permanent working group. The Eastern Interconnection Phasor Project will be implemented.</p> <p><b>NYISO Actions:</b>  Wide Area ACE displays were installed in the control room in 2004.</p>	
23. Strengthen reactive power and voltage control practices in all NERC regions.	NERC	<p><b>Fully Implemented</b>  NERC adopted standards on Voltage and Reactive Control and Generator Operation for Maintaining Network Voltage Schedules.</p>	<p><b>Not Yet Completed</b>  PRR #8, a rule for reactive load and resource PF requirements, will be developed. This rule is awaiting NYISO Reactive Study completion and modifications of NERC &amp; NPCC standards.</p>
24. Improve quality of system modeling data and data exchange practices.	NERC	<p><b>Fully Implemented</b>  NERC has adopted and are field testing several standards that address system modeling, data reporting, and data verification requirements.</p>	<p><b>Completed</b>  RRS prepared PRRs 73, 74, and 77 for rules for the improvement of system modeling data that were adopted in 2005.</p>
25. NERC should reevaluate its existing reliability standards development process and accelerate the adoption of enforceable standards.	NERC	<p><b>Fully Implemented</b>  NERC has adopted the Version 0 standards and made revisions to its Standards Process Manual.</p>	<p><b>On-Going</b>  The NYSRC has been active in the NERC standards development program.</p>
26. Tighten communications protocols, especially for communications during alerts and emergencies. Upgrade communication system hardware where appropriate.	NERC	<p><b>Fully Implemented</b>  NERC installed a new conference bridge and approved a new set of hotline procedures for reliability coordinator hot-line calls. NERC is also upgrading the RCIS and enhanced the SDX facility.</p> <p><b>NPCC Actions</b>  NPCC protocols exist.</p>	<p><b>Completed.</b>  PRR 67, a rule for Control Center Communications, was adopted in 2004.</p>
27. Develop enforceable standards for transmission	NERC,	<b>Fully Implemented</b>	<b>On-Going</b>

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line ratings. (NERC #13)	NPCC	NERC has adopted standards on facility ratings methodology, transfer capability methodology, and for establishing and communicate transfer capabilities. <b>NPCC Actions</b> NPCC is addressing the NPCC BPS and related definitions and which facilities are considered BPS in A-10.	RRS is monitoring development of NPCC A-10 and considering new definitions for “Bulk Power System” and “Local Area”.
28. Require use of time-synchronized data recorders.	NERC, FERC, RRCs, CAs, TOs	<b>Not Yet Fully Implemented</b> NERC has adopted the required use of data recorders synchronized by signals from the GPS. New standards are being developed by NERC to define regional disturbance monitoring equipment installation, data reporting, and real-time monitoring and recording of system performance. <b>NPCC Actions</b> A-5 was revised to require all recorders to be GPS synchronized.	<b>Completed</b> PRR 69, which proposed RuleC-R5 requiring disturbance recording devices, was adopted in 2005.
29. Evaluate and disseminate lessons learned during system restoration.	NERC, NPCC, NYISO	<b>Fully Implemented</b> NPCC and other regions prepared reports on how their systems were restored during the blackout, including recommendations for improving restoration. All regions are reviewing their blackstart and restoration plans. <b>NPCC Actions</b> NPCC issued a Restoration Report on the 8/14/03 blackout and has revised A-3 to recognize restoration issues. <b>NYISO Actions</b> NYISO issued a Restoration Report on the blackout.	<b>Completed</b> RCMS & RRS reviewed NPCC and NYISO Restoration Reports to examine the need to expand existing system restoration rules. As a result, RRS has prepared PRR 76 to enhance NYSRC System Restoration Rules, G-1, 2, 3, and 4. These rules were adopted in 2005.
30. Clarify criteria for identification of operationally critical facilities, and improve dissemination of updated information on unplanned outages.	NERC, NPCC	<b>Not Yet Fully Implemented</b> NERC has developed a draft document that establishes the criteria for identifying critical facilities which can affect the reliability of neighboring systems and to improve sharing of information about unplanned outages of such facilities. This document has yet to be approved. <b>NPCC Action</b> NPCC protocols exist.	
31. Clarify that the transmission loading relief (TLR) process should not be used in situations involving an actual violation of an Operating Security Limit. Streamline the TLR process.	NERC	<b>Not Yet Fully Implemented</b> NERC has revised several operating policies, which were incorporated into a transmission relief standard IRO-006-1 to address this recommendation. This standard must be approved by FERC.	
32. Implement NERC IT standards.	NERC, CAs, RCs	<b>Not Yet Fully Implemented</b> Cyber security standards have been adopted by NERC, but await approval by FERC. These standards also cover	

Report Recommendation	Responsible Entities**	Key Actions Taken	NYSRC Actions Taken
		Recommendations 33, 34, 35, 41, 43, and 44	
33. Develop and deploy IT management procedures.	NERC, CAs, RCs	<b>Not Yet Fully Implemented</b> See Recommendation 32. <b>NYISO actions</b> Meets DOE criteria.	
34. Develop corporate-level IT security governance and strategies.	CAs, RCs	<b>Not Yet Fully Implemented</b> See Recommendation 32. <b>NYISO Actions</b> IT risk management procedure and security responsibility matrix implemented.	
35. Implement controls to manage system health, network monitoring, and incident management.	NERC, CAs, RCs	<b>Not Yet Fully Implemented</b> See Recommendation 32.	
36. Initiate U.S.-Canada risk management study.	Fed. Gov. agencies	<b>Fully Implemented</b>	
37. Improve IT forensic and diagnostic capabilities.	NERC, CAs, RCs	<b>Not Yet Fully Implemented</b> The ERO will review new technologies for implementing this recommendation on an on-going basis. <b>NYISO Actions</b> Meets DOE criteria.	
38. Assess IT risk and vulnerability at scheduled intervals.	NERC, IT, EMS personnel	<b>Not Yet Fully Implemented</b> The ERO will develop security guidelines on an on-going basis. The Cyber Security standards also address this recommendation. <b>NYISO Actions</b> Meets DOE criteria.	
39. Develop capability to detect wireless and remote wireline intrusion and surveillance.	NERC, CAs, RCs	<b>Fully Implemented</b> NERC has developed a guideline on Cyber Security – Intrusion Detection and Cyber Security Standards. <b>NYISO Actions</b> Meets DOE criteria.	
40. Control access to operationally sensitive equipment	NERC, CAs, RCs	<b>Fully Implemented</b> NERC has developed the guideline, Physical Security – Substations and will continue to new security guidelines. <b>NYISO Actions</b> Uses an electronic card access system that limits entry to sensitive areas.	
41. NERC should provide guidance on employee background checks.	NERC	<b>Not Yet Fully Implemented</b> See Recommendation 32. <b>NYISO Actions</b> Completed review.	
42. Confirm NERC ES-ISAC as the central point for	Private and	<b>Fully Implemented</b>	

Report Recommendation	Responsible Entities**	Key Actions Taken	NYSRC Actions Taken
sharing security information and analysis.	public sectors	This issue has been confirmed.	
43. Establish clear authority for physical and cyber security.	NERC, Corporations, NYISO	<b>Not Yet Fully Implemented</b> See Recommendation 32. <b>NYISO Actions</b> Established Chief Administrative Officer position in 2003 responsible for assuring development of enterprise wide physical and cyber security programs.	
44. Develop procedures to prevent or mitigate inappropriate disclosure of information.	NERC, NYISO	<b>Not Yet Fully Implemented</b> See Recommendation 32. <b>NYISO Actions</b> Required polices existing in NYISO manuals.	
45 & 46. Canadian nuclear recommendations.		<b>Fully Implemented</b>	

\* The sources for the information in this summary include: (1) *Final Report on the Implementation of the Task Force Recommendations*, prepared by the U.S. – Canada Power System Outage Task Force (September 2006); (2) *NPCC Tasks Related to NPCC/NERC U.S. Canadian TF Recommendations Related on the Blackout* (September 28, 2006); and (3) *Blackout Investigation – NYISO Follow-Up – DOE Final Report April 2004* (October 23, 2006).

\*\* Entities identified in above Report 1, plus NPCC and NYISO as appropriate.