NPCC SELF CERTIFICATION FORM ON NERC NEAR-TERM ACTIONS TO ASSURE RELIABLE OPERATION

RELIABILITY PRACTICES FOR CONTROL AREAS AND RELIABILITY COORDINATORS

The reliability of the North American bulk electric systems, including the avoidance of future cascading outages, is of paramount importance to NERC and its stakeholders. Pending the outcome of the final report on the August 14, 2003 blackout, NERC emphasizes to all entities responsible for the reliable operation of bulk electric systems the importance of assuring those systems are operated within their design criteria and within conditions known to be reliable through analytic study. If the power system enters an unanalyzed state, system operators must have the authority and the capability to take emergency actions to return the power system to a safe condition.
NERC requested that each entity in North America that operates a Control Area and each NERC Reliability Coordinator review the following list of reliability practices to ensure their organizations are within NERC and regional reliability council standards and established good utility practices.
Each entity is requested to report before December 15, 2003 to NPCC, with a copy to NERC, that such a review has been completed and the status of any necessary corrective actions.

Responsible Reporting Entity:	Independent Electricity Market Operator			
Contact Name:	Paul Murphy			
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Assessment Date: November 2003 Applicable function(s): ☑ Control Area ☑ Reliability Coordinator

The reporting entity certifies to have reviewed and be in compliance with the following reliability practices:

	NERC/NPCC/ AREA RELIABILITY PRACTICES	
1. ☑	**Voltage and Reactive Management:** Ensure sufficient voltage support for reliable operations.	
1.1 ☑	Establish a daily voltage/reactive management plan, assuring an adequate static and dynamic reactive supply under a credible range of system dispatch patterns.	Minimum voltages are established through off-line study simulations and expressed as operating security limits. The outage plan established by the IMO in the day-ahead timeframe meets voltage requirements as necessary to validate operating security limits. Day-ahead and real-time studies are conducted to ensure that pre and post contingency voltages can be maintained and that post contingency voltage decline does not exceed NPCC criteria. The reactive power planning process is documented in procedures.
1.2 ☑	During anticipated heavy load days, or conditions of system stress such as caused by heavy wide-area transfers, ensure all possible VAR supplies are verified and available, and VAR supplies are applied early in the day ahead of load pickup.	The IMO operates within operating security limits that are based on maintaining studied voltage levels. Sufficient reactive resources are maintained through the outage scheduling process to ensure that voltage levels can be maintained from two working days ahead through real time. In addition, the IMO performs ad hoc verification of generators dynamic capability. Market Participants are required to receive IMO's approval for outages or deratings to reactive resources greater than 15 MX. This allows the IMO to verify that sufficient reactive resources are available to meet forecast system conditions. Procedures detail the process employed by the IMO to ensure that sufficient reactive resources are dispatched to

		meet the reactive power demand and that these resources are applied in a timely fashion, as required by the system conditions at the time.
1.3 ☑	Reserve sufficient dynamic reactive supply (e.g. online generation and other dynamic VAR resources) to meet regional operating criteria and system needs.	As documented in 1.1 and 1.2 above and in our procedures, the IMO ensures, through its day ahead and real time reactive power planning process, that sufficient reactive resources are available and dispatched to meet all applicable reliability standards.
1.4 ☑	In accordance with NERC and regional practices maintain voltage schedules of all bulk electric transmission facilities above 95% nominal values and in conformance with regional criteria.	The IMO's operational and reliability standards are established to meet or exceed the NERC and NPCC requirements. These standards are defined in the Ontario market rules and, with respect to voltage variations, they require the system operators, transmitters and generators to maintain appropriate voltage schedules. In practice IMO operates the IMO Controlled Grid well above nominal levels. For example the IMO 230 kV system is generally operated above 238 kV at its critical stations.
1.5 ☑	Report any low voltage limit violations at critical high voltage transmission facilities to the reliability coordinator.	Critical voltages are monitored directly by the IMO. Regardless, market participants are obligated by their agreements with the IMO to notify the IMO when they detect abnormal system conditions or a degradation of their equipment.
1.6 ☑	Ensure all interconnected generators that have, or are required to have, automatic voltage regulation (AVR) are operating under AVR.	Market rules and procedures require that generators equipped with AVRs operate their units with the AVRs in automatic mode, unless the IMO specifically directed them to operate with the AVRs in manual mode. Generators are required to continuously monitor and report to the IMO the status changes of the AVRs installed on critical generation units. Generators are also required to schedule with the IMO any outages or changes in the status of their AVRs.
1.7 ☑	Coordinate potential differences of voltage criteria and schedules between systems and ensure these differences are factored into daily operations.	The IMO coordinates voltage control with the neighbouring control areas in conformity with NPCC B-03, NPCC C-04 and the applicable interconnection agreements.
2. ☑	**Reliability Communications:** Review, and as necessary strengthen, communication protocols between Control Area operators, Reliability Coordinators, and ISOs.	The IMO is the Control Area Operator, Reliability Coordinator, and Independent System Operator for Ontario. The IMO's operating procedures complement NPCC documents C-03 and C-20 establishing the communication protocols among the IMO, market participants and the neighbouring control areas in normal and emergency conditions. System operators are trained to ensure that they understand the importance of timely and effective communication for maintaining the reliability of the IMO-controlled grid and the integrity of interconnections.
2.1 ☑	Share the status of key facilities with other appropriate Control Area operators, Reliability Coordinators, and ISOs.	The IMO adheres to the NERC and NPCC requirements with respect to information sharing among reliability coordinators. Internal operating procedures describe the use of RCIS and SDX facilities to communicate specific

		reliability information with the neighbouring control area operators, reliability coordinators and ISOs. This information generally includes but is not limited to: - equipment status; - system emergencies; - weather advisories; - EEA alerts; - Critical infrastructure protection; and - Critical transmission/generation outages. Outage information is also shared during weekly NPCC conference calls as per NPCC guide C-13.
2.2 ☑	Control Area operators, Reliability Coordinators, and ISOs should conduct periodic conference calls to discuss expected system conditions and notify all neighboring systems of any unusual conditions. Conduct additional calls as needed for system critical days.	The IMO adheres to the NPCC's communication guidelines with respect to weekly and emergency conference calls as described in document C-13. With MISO, the IMO exchanges information about the power system conditions periodically through ad hoc conference calls, as required.
3. ☑	**Failures of System Monitoring and Control Functions:** Review and as necessary, establish a formal means to immediately notify control room personnel when SCADA or EMS functions, that are critical to reliability, have failed and when they are restored.	The IMO systems provide alarms to system operators and the on-shift supporting staff when data acquisition components or functions (communication lines, RTG etc) have failed. The on-shift supporting staff located on site is available 24/7. Where available, measured quantities impacted by such failures switch to the secondary source or appear as failed on the operators displays. Failures to other EMS functions, such as the State Estimator, are also flagged on the operators displays. Contingency procedures are in place that establish the communication protocol used on loss of critical telemetry or EMS functions. Presently some alarm monitoring is performed manually by both IT and Control Room staff. The IMO has initiated discussions with its EMS vendor to automate the monitoring process for application schedule monitoring, application health monitoring, bad telemetry monitoring, and data flat line monitoring. The intent is to automate these measures in Q2 of 2004.
3.1 ☑	Establish an automated method to alert power system operators and technical support personnel when power system status indications are not current, or that alarms are not being received or annunciated.	The IMO systems provide alarms to system operators when telemetry data is not current. Failed quantities are colour coded on station displays and listed on an alarm monitor. Contingency procedures are in place and they establish the communication protocol used on loss of critical telemetry. Last paragraph from 3.0 above also applies here.
3.2 ☑	Determine what backup capabilities can be utilized when primary alarm systems are unavailable. If a backup to failed alarms is not immediately available, then monitoring and control should be transferred in accordance with approved backup plans.	The IMO has implemented failover and fallback EMS systems onsite and at the remote backup site. Furthermore, the IMO makes use of market participants' independent system monitoring equipment to obtain status, flow, voltage and frequency information.
3.3 ☑	Identify and implement procedures to move to 'conservative system operations' when operators are unsure about next contingency outcomes (i.e., unstudied conditions, loss of SCADA or EMS visibility, unexplained or unknown power system conditions).	The IMO market rules and procedures instruct system operators to respond to operating conditions at hand by taking whatever actions are necessary to maintain the power system within prescribed limits. This includes moving to more conservative operating limits when

		uncertain about the evolution of system conditions. System operators are authorised and trained to develop more conservative or new operating security limits for out of scope system conditions.
3.4 ☑	Ensure all critical computer and communication systems have a backup power supply, and the backup supply is periodically tested.	The IMO's procedures specify the backup power supply standard requirements for critical computer and communication systems components. This year, the IMO participated in the pilot program established by NPCC to conduct a trial test in which market participants had to self-certify their compliance with section 4.10 of NPCC A-03. This involved monitoring the testing of critical components associated with the key facilities in each control area's restoration plan. Critical computer and communication facilities located at the IMO's main and backup control centres have backup power supply and this is tested monthly, as documented in the applicable procedures. These backup power facilities performed exceptionally well on August 14, 2003. The backup power facilities at one transmitter's main control center did not perform well on August 14/03, and corrective steps have since been implemented.
3.5 ☑	Ensure that system operators have a clear understanding of the impact to their energy management system control functions whenever their transaction tagging and scheduling systems fail. Identify and implement appropriate contingency procedures for loss of real-time ACE and AGC control.	The IMO's system operators are trained to respond to the loss of electronic tagging service as described in NERC Appendix 3A3. Contingency operation issues are understood and addressed in the IMO's procedures. The IMO has provided specific instructions describing the required response from the control room staff.
4. ☑	**Emergency Action Plans:**	
4.1 ☑	Ensure that emergency action plans and procedures are in place to safeguard the system under emergency conditions by defining actions operators may take to arrest disturbances and prevent cascading. Actions might include but should not be limited to acting immediately to reduce transmission loading, ordering redispatch, requiring maximum reactive output from interconnected resources, and shedding load without first implementing normal operating procedures.	The IMO's operating procedures and specifically the Emergency Operating State Control Actions list describe the actions that the system operators will implement during emergency conditions to maintain the security of the power system. These actions include: - reducing transactions to relieve the loading on selected flowgates; - redispatching and reconfiguring resources; - requesting emergency assistance such as voltage support from interconnected resources; and - shedding load pre-contingency to respect limits.

4.2 ☑	Ensure operators know, not only that they have the authority to shed load under emergencies, but that, in addition, they are expected to exercise that authority to prevent cascading	The IMO's authority to take whatever appropriate actions are necessary to keep the power system in balance and within studied limits, including shedding firm load is stipulated in the market rules. Furthermore, our operating procedures detail the specific instructions to be implemented by system operators to maintain the system within applicable limits. The job descriptions of the operating staff specifically indicate as one of their key responsibilities the obligation to approve the use and, when required, to implement the Emergency Operating State Control Actions list, which includes shedding load to maintain system security and prevent cascading outages. System operators are trained to ensure that they understand the control actions required to maintain the security of the power system and prevent cascading outages.
5. ☑	**Training for Emergencies:** Ensure that all operating staff are trained and certified, if required, and practice emergency drills that include criteria for declaring an emergency, prioritized action plans, staffing and responsibilities, and communications.	In 2001, the IMO initiated a program of annual exercises to simulate restoration from a widespread blackout. This program involves our market participants. The third blackout exercise has just been completed and all parts of Ontario have been covered. Ontario market rules require all market participants to prepare an emergency response plan. Furthermore, market rules require that all restoration participants exercise their restoration plan annually. All system operators and part of the off-shift supporting staff are NERC certified. Furthermore, they participate in mandatory training on voltage control, communications, TLRs, Ontario Power System Restoration Plan etc. In 2002 the number of scheduled training days exceeded 20 days per system operator.
6. ☑	**Vegetation Management:** Ensure high voltage transmission line rights of way are free of vegetation and other obstructions that could contact an energized conductor within the normal and emergency ratings of each line.	The IMO issued a letter to transmitters requesting them to review their vegetation management procedures and, if necessary, implement corrective actions to ensure that high voltage transmission line rights of way are free of vegetation and other obstructions that could contact an energized conductor within the normal and emergency ratings of each line. All IMO Transmitters have responded and self-certified they have a vegetation management program in place that ensures their rights of way are clear of obstructions and vegetation that could contact an energized conductor within the normal and emergency ratings of high voltage transmission lines. All Transmitters have procedures in place for managing vegetation on a defined clearing cycle.
7. ☑	**Corrective Actions** (if applicable)	Presently some alarm monitoring is performed manually by both IT and Control Room staff. The IMO has initiated discussions with its EMS vendor to automate the monitoring process for application schedule monitoring, application health monitoring, bad telemetry monitoring,

		and data flat line monitoring. The intent is to automate these measures in Q2 of 2004. Work is underway to better consolidate documentation describing certain operating practices used by the IMO.

Additional Comments:

Certified by: Dave Goulding

Signature of Authority: I understand that this information is being provided as per NERC requirements "Near-Term Actions to Assure Reliable Operations."

Title: President and CEO

Date of Certification: December 12, 2003