



## Michigan PSC-Capacity Needs Forum Midwest ISO-IESO Seams Issues August 25, 2005



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# ○ Midwest ISO-IESO Interim Coordination Agreement

- In effect since 7/1/2004
- Focus on reliable operation of interconnected transmission system
- Establishes a structure and framework for functions related to the reliability of interconnected operation between the parties
- This agreement is unlike the seams agreement MISO has with PJM, MAPP, SPP and TVA that were all derived from the original MISO-PJM JOA
- It is based on the coordination agreements that the IESO maintains with NYISO, MP and MH

# ○ Functions to be Addressed under Interim Coordination Agreement

- Coordinate operations of interconnection
- Adopt, enforce and comply with reliability standards
- Communication of system conditions
- Emergency assistance
- Scheduling transmission service
- Voltage and reactive support
- Information exchange and confidentiality
- Security coordination and reliability assessment of outages

# Interim Coordination Agreement vs Other Seams Agreements

- Many of these are the same functions that are contained in other MISO seams agreements
- The two exceptions are not having a market to market congestion management process and a coordinated planning process
- The current operation of the MH and MP interfaces and the future operation of the Michigan-Ontario interface limits parallel path flows which reduces the need for coordination
- Later slides provide more details on current operations versus future operations of the Michigan-Ontario interface

**Under the Interim Coordination Agreement framework MISO and IESO have developed four joint operating instructions:**

- **CI-Coordination of Outages**
- **C2-Operations of the Michigan-Ontario Tie Lines**
- **C3-Michigan-Ontario Interface Voltage Control**
- **C4-Emergency Assistance**

## ○ CI-Coordination of Outages

- Defines notification requirements, describes minimum information to be exchanged and explains how outage conflicts can be managed and resolved
- Applies to planned outages, forced outages, and system tests
- List of critical facility outages that must be coordinated are given in Appendix B
- Where outage conflicts are found, will work together to resolve the conflicts

## ○ C2-Operations of Michigan-Ontario Tie Lines (Draft)

- Interface transfer capability based on NPPC Document A-2. Will use emergency transfer capability when an emergency has been declared (IESO will no longer respect double element contingencies when in emergency)
- Ratings are the responsibility of the asset owner
- Annual studies between MISO, IESO and owners to establish transfer capabilities
- Maximum NSI shall follow NERC reliability standard

## **C-3 Michigan-Ontario Interface Voltage Control (Draft)**

- Normal operation-no net transfer of reactive power. Each area supplies one-half of the reactive power loss of the tie
- Upon mutual agreement, reactive power may be exchanged to relieve high or low voltage conditions
- When voltage is decaying or spiking, MISO or IESO will take all possible actions to correct the problem
- If these steps are insufficient, the adjacent RC will be requested to provide assistance (switching in or out internal transmission lines and implementing load supply voltage reductions, if effective)
- If all else fails, the affected RC sheds non-dispatchable load

## ○ C-4 Emergency Assistance (Draft)

- MISO and IESO will provide assistance when either party requires assistance due to generation deficiencies
- Emergency assistance actions may include system voltage reductions, dispatch of additional generation, increased net intertie ramp rate, increased transfer limits, etc.
- To transact emergency energy between MISO and IESO, may use IESO-DECO Emergency Energy Transaction Agreement
- Manitoba and Minnesota emergency energy transactions with IESO will continue to be direct bilateral transactions
- Emergency energy transactions will typically be for minimum of 30 minutes and maximum of 2 hours. Subsequent emergency energy transactions are by mutual agreement of the participating parties

# Principles for PAR Operations

(These principles apply when all PARs are in-service.)

1. Will be used when an RC declares an emergency operating state
2. Will be used to relieve constraints within ITC and METC areas or within IESO area
3. Will be used to facilitate DOE permit policy of schedule equals actual flow across interface
4. Will be used to minimize the frequency of tap changes to allow for expected generation shifts during schedule changes

## ○ Use of PARs to Limit Violations

- The PARs will normally be operated to schedule equals actual per DOE permit
- If a System Operating Limit (SOL) violation occurs on the Michigan-Ontario interface or within Michigan or Ontario, the PARs will be operated to relieve the constraint
- Once a violation has been corrected, the PARs shall be readjusted such that schedule equals actual

## ○ Current Status of B3N

- 230 kV circuit between Bunce Creek Station (Marysville, MI) and Sarnia-Scott Station (Sarnia, Ontario) equipped with an in-line voltage regulating autotransformer (236 kV/126 kV) and an in-line PAR, both rated at 675 MVA
- Has been out of service for over 2 years. Restoration of the line is dependent on an agreement between Hydro One and the First Nations on land right-of-way issues
- ITC will replace the failed B3N PAR once an agreement has been approved by the Hydro One BOD and signed by First Nations

## ○ Current Status of J5D

- 230 kV circuit between J. Clark Keith Station (Windsor, Ontario) and Waterman Station (Detroit, MI) with in-line PAR, voltage regulating transformer rated at 500 MVA
- Currently in-service and regulating flows

## ○ Current Status of L4D and L51D

- 1 x 345 kV (L4D) circuit and 1 x 230 kV (L51D) circuit between Lambton Generation Station (Courtright, Ontario) and St. Clair Generation Station (Marine City, MI), equipped with in-line voltage regulating autotransformers and PARS (Nameplate - 845 MVA, based on PAR rating)
- PARS in-service on neutral tap for restricted use to mitigate emergency events only (shedding firm load anywhere in the interconnected systems or preventing a 5% voltage reduction in Michigan or Ontario)
- L4D and L51D PARS are tested weekly to ensure readiness of controls, equipment and personnel

# ○ Anticipated Future Operation of Michigan-Ontario Interface

- Once all PARs are declared available for normal operation and can be used to regulate interface flows, will use PARs to hold schedule to actual
- This will eliminate parallel flows between the two systems (only scheduled flows will occur)
- With no parallel flows, there is no need for a congestion management process to manage parallel flows between the two systems. There is still a need to manage scheduled flows using TLR

# Likely Future Operations of Michigan-Ontario Interface

- IESO often experiences 1000-1200 MW of circulation through their system (Lake Erie Effect)
- The PARs can regulate about 600 MW of circulation in either direction (CW or CCW). When the circulation exceeds 600 MW, the PARs will be at maximum tap (only regulating the first 600 MW)
- The circulation greater than 600 MW will appear as parallel flows with schedule no longer equal actual
- For these situations, MISO and IESO will need some form of congestion management process
- MISO and IESO continue discussions on the form this congestion management process should take

## ○ For more information

- Visit Midwest ISO website

<http://www.midwestiso.org>

See Seams Agreements (IMO)

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