

IESO SENIOR MANAGEMENT UPDATE

To: Stakeholder Advisory Committee
Date: September 5, 2006
Subject: Summer Reliability Experience

Information Item

Summer 2006 Reliability Improvements (DACP, Intertie Failure Charges and ELRP)

The IESO implemented three major reliability initiatives in preparation for the summer of 2006, including the Day-Ahead Commitment Process (DACP), Day-ahead and Real-time Intertie Failure Charges and the Emergency Load Reduction Program (ELRP). As outlined in this initial assessment, these initiatives contributed favourably to the reliable operation of Ontario's power system during the record setting days of late July and early August. Overall, these initiatives resulted in greater certainty of generator availability, fewer transaction failures and additional flexibility for the IESO in managing the reliability of the system.

Day-Ahead Commitment Process

The DACP was introduced to commit internal resources and import transactions in advance of real-time in an effort to reduce transaction failures and provide certainty for internal and import resources. For the forecasted peak hour on August 1, the IESO economically committed 98.6 percent of its internal resources one day in advance. Although actual peak demand was approximately 700 megawatts (MW) heavier than forecast, the market responded by economically scheduling additional imports to compensate for the difference.

Last summer, prior to the implementation of the DACP, the import transaction failure rate during the peak demand week was much greater. For example, during the week of July 11 to July 15, 2005, the failure rate was 14 percent. During this year's peak week of July 28 to August 3, only three of 218 import transactions scheduled in the DACP failed, resulting in a 1.4 percent failure rate based on failed MW.

The following table indicates the percentage of import transactions scheduled in the DACP (in MWh) during the peak period (hour ending 15 to 19).

Table 1: Import Transactions during Peak Period (2006)

	July 28	July 31	August 1	August 2	August 3
Total Imports (MWh)	3,639	7,242	8,227	8,407	5,142
Day ahead Imports (MWh)	1,539	550	1,931	3,323	400
Percentage	42	8	23	40	8

Day-ahead and Real-time Failure Charges

The following tables compare all intertie transactions for the peak periods (hour ending 15 to 19) from July 11 to July 18, 2005, and July 28 to August 3, 2006. There were fewer import transactions scheduled in 2006 due to an improved internal resource availability including additional installed capacity. The tables illustrate the reduction in failures that has been witnessed with the implementation of the intertie transactions failure charges.

Table 2: Total Import Transactions during Peak Periods, July 11 – July 15, 2005 vs. July 28 – August 3, 2006

	Number of Transactions	Volume (MWh)	Failures within Participants' Control		Failures Outside Participants' Control	
			Number of Transactions	Volume (MWh)	Number of Transactions	Volume (MWh)
2005	514	58,391	40 or 8%	3,244	30 or 6%	1,591
2006	350	40,330	13 or 4%	1,654	21 or 6%	1,365

Table 3: Total Export Transactions during Peak Periods, July 11 – July 15, 2005 vs. July 28 – August 3, 2006

	Number of Transactions	Volume (MWh)	Failures within Participants' Control		Failures Outside Participants' Control	
			Number of Transactions	Volume (MWh)	Number of Transactions	Volume (MWh)
2005	96	7,948	18 or 19%	1,821	1 or 1%	25
2006	314	28,625	12 or 4%	1,210	41 or 13%	3,752

Note: The intertie transactions reported above include those scheduled in the DACP and in the real-time market.

Emergency Load Reduction Program

The ELRP participants were notified on Monday July 31 for potential activation on August 1 and notified on August 2 for potential day-at-hand activation. The timeline for the day-ahead notification was for hour-ending 9 until hour-ending 20 on August 1. The maximum amount of energy offered was 69.1 MW in hour-ending 16. The day-at-hand notification on August 2 was for hour-ending 13 until hour-ending 20 and the maximum amount of energy offered was 42.8 MW for hour-ending 15. Four of the seven ELRP participants submitted offers to participate.

This was the first opportunity for market participants and the IESO to utilize the program and it was a good experience for all involved.

On the first day of notifications, the participants experienced a few complications in the offer process but the second day was seamless. Although the ELRP participants were not actually activated during these periods, the availability of their capacity provides another less impactful control action for the IESO to manage reliability.

System Operation during Peak Week:

Friday July 28:

Peak Hour and Demand: 23,455 MW in hour 17

	Average	Maximum	Minimum
Energy	\$66.54	\$104.77	\$30.07

The most significant system issue was the loading and management of the eastern component of the New York-Ontario interface known as the Adirondack interface. The circulation through Ontario (New York to Michigan) increased throughout the day, until the Adirondack interface became congested into Ontario. Control actions such as manoeuvring the tap positions on the phase shifters and constraining internal resources, which had a “push back” effect on the interface, along with issuing North America Electricity Reliability Council (NERC) transmission loading relief (TLR) procedures were all utilized at different times during the day.

Due to timing considerations and the lack of available control actions, the IESO purchased 200 MW of emergency energy from 16:20 until 17:00 from Trans Energie (Quebec) at Beauharnois to help relieve the Adirondack interface loading issues. From 16:20 until 22:40, a TLR was also issued on the interface to help manage the interface flow, curtailing 50 megawatt hours (MWh) of IESO import transactions from New York. A total of 48 transactions across the Eastern Interconnection were curtailed for 600 MW of relief over

the period. To achieve the relief, a total of 4,311 MWh of transactions were also curtailed by our neighbours using the TLR process.

Monday July 31:

Peak Hour and Demand: 25,866 MW in hour 17

	Average	Maximum	Minimum
Energy	\$94.26	\$319.78	\$29.05

Monday was anticipated to be very similar to Friday, but at 11:18, the Lennox G1 and G2 units experienced turbine runback operation. Total generation loss was 970 MW, which is beyond Ontario's single largest contingency. Although the IESO recovered from the failure in a timely fashion it operated with a deficient quantity of 10 minute operating reserve from 11:28 until 12:05. Once again, circulation issues created Adirondack loading concerns and the IESO purchased 461 MWh of emergency energy from TransEnergie at Beauharnois from hour-ending 15 to hour-ending 20.

A TLR was issued on the Adirondack interface at 12:05 requesting 100 MW of relief due to the Lennox unit trips and subsequent loadings on the Adirondack interface. The TLR was in effect until 21:45 and resulted in 25 MW of curtailed import transactions in hour-ending 14.

At 14:36 the IESO implemented a 3 percent voltage reduction in the east and Ottawa zones due to the Adirondack interface loading issue. At 14:40 the voltage reduction was increased to 5 percent to achieve more relief. Approximately 70 MW of relief was observed, but the limit violation continued. Emergency condition limits (reduced level of security with increased transfer limits) were declared on the Adirondack interface until 16:15 and the voltage reduction was completed at 17:00.

New concerns regarding the loading on the Ontario-Michigan interface were managed starting in hour-ending 11 with local control actions in Ontario, such as constraining Lambton generation. External local control actions, such as biasing generation in Midwest Independent System Operator (MISO), were also utilized in lieu of a TLR on the Ontario-Michigan interface. This coordinated approach was used to avoid potential large import transaction curtailments for MISO as it was relying on these imports for reliability.

Similar actions were taken when the Frontier interface, the Niagara component of the New York-Ontario interface, became congested. Generation from Beck and Nanticoke was constrained in order not to curtail MISO import transactions. A NERC Energy Emergency Alert 1 (EEA 1) was issued from 12:00 to 20:24.

Tuesday August 1:

Peak Hour and Demand: 27,005 MW in hour 16

	Average	Maximum	Minimum
Energy	\$127.23	\$257.60	\$31.79

The IESO issued a TLR on the Adirondack interface from 6:15 until 22:48 however no transaction curtailments were requested during this period. In order to manage the interface loading, control actions such as manually constraining TransEnergie imports at Beauharnois were implemented throughout the day. A TLR was issued on the Frontier interface from 8:17 until 22:48 and no transaction curtailments were requested during this period. A decision was made to bias generation at Beck rather than elevate the TLR, due to the amount of transactions that would have been required to be curtailed on the interconnection and given the tight supply situations in MISO and PJM. The IESO issued a public appeal and the ELRP participants were put on day-ahead notification (hour ending 8 to 20). A NERC EEA 1 was issued from 7:30 until 20:25.

Wednesday August 2:

Peak Hour and Demand: 25,696 MW in hour 17

	Average	Maximum	Minimum
Energy	\$118.34	\$353.92	\$30.26

The IESO issued a public appeal in the morning however the heat wave broke late in the afternoon with the passing of a cold front. Primary demand ran significantly lighter than the previous day. Circuit X503E (500 kV circuit Hanmer x Essa) tripped during the passing of the cold front and subsequent thunderstorm and remained unavailable for almost 2 weeks. With this circuit out of service, approximately 600 MW of capacity is bottled. A TLR was issued on the Queenston Flow West (QFW), Adirondack and Frontier interfaces without curtailments. Prior to the break in the weather the ELRP participants were put on notification day-at-hand (hour-ending 12 to 20).

During the heat wave, the performance of market participants and generation and transmission resources was excellent. In addition to the specific reliability initiatives discussed, other initiatives and ongoing programs also contributed to the successful management of the record setting demand during the week of July 28 to August 3, 2006. Previous transmission enhancements, generation development and process improvements such as those targeting dispatch issues all helped make this year's "peak week" more manageable for both the market participants and the IESO. Although no one initiative can be singled out, the collection of initiatives implemented prior to this summer have at least in this initial assessment met many, if not all, of their intended outcomes.