Independent Electricity Market Operator

18-Month Outlook:

An Assessment of the Reliability of the Ontario Electricity System from April 2003 to September 2004

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Executive Summary

The Independent Electricity Market Operator (IMO) publishes quarterly assessments of the reliability of the Ontario electricity system over the next 18 months. This report presents the IMO assessment of the 18-month period from April 2003 to September 2004. This assessment is based on the IMO's forecast of electricity demand, information provided by Ontario generators on the supply available and the latest information on the configuration and capability of the transmission system.

Updates since the last report

There are several updates in this Outlook from the one published in December 2002, but the overall reliability assessment is not significantly changed.

The demand forecast has increased slightly due to a slightly higher economic outlook for 2003. However, the forecast winter peak demand remains unchanged.

The IMO has been advised that the Bruce A units 4 and 3 are expected to be generating electricity by April 29 and the end of June respectively. Bruce Power has informed the IMO that the key activity milestones are being met, and that while the return to service dates are challenging there remains high confidence that the dates are achievable. The first unit at Pickering A is scheduled to begin generating electricity by the end of June 2003. The IMO continues to recognize the risk, particularly in the early part of the summer that generating units may not return to service on schedule. Any delays will increase the potential for tight supply conditions to occur similar to those experienced last summer.

There have been some updates to the generator outage schedule since the last published report, resulting in some weeks with higher available resources, and some weeks with lower available resources. These updates are indicative of participant responsiveness to the reserve picture presented in the previous Outlook.

Weather impact

Hot and humid weather conditions, such as those experienced by Ontario during last summer, are covered by the Extreme weather scenario. Under this scenario, with no additional generation beyond what is included in the Existing Resource Scenario or with higher than forecast generation unavailability, there could be requirements for between 2,100 MW and 3,600 MW of electricity imports at the time of the weekly peak. Increases in generating capacity or in the price responsiveness of wholesale market participants would decrease the reliance on electricity imports.

Two resource scenarios are considered in this Outlook – an Existing Resource Scenario and a Planned Resource Scenario. These are updates to the scenarios presented in the December 2002 Outlook and are summarized below.

Existing Resource Scenario

The Existing Resource Scenario assumes:

- existing generation in Ontario will be available consistent with the information provided by market participants;
- no additional generation in Ontario will be placed in service during the Outlook period, including new generation projects and nuclear generation returning to service;
- planned outages of generators and transmitters will take place consistent with information provided by market participants; and
- forecast Ontario Demand will be based on normal (average) weather over the past thirty years.

Under the **Existing Resource Scenario**, reserve margins are forecast to be negative for most of the study period, with only a few exceptions. Resource shortfalls are most significant during the fall of 2003 and May and June 2004, when substantial resource reductions are identified based on submitted generator outages. For the fall 2003 period, IMO is conducting reliability studies that consider the specific set of outages, which are scheduled. When those studies are complete in late April, it is expected that the identified reliability requirements will result in further outage adjustments to ease some weeks of shortfall in October and early November 2003.

Negative reserve margins throughout the Outlook period indicate that forecast reserve levels are below planning requirements. As such, planned generator outages during negative margin weeks are at risk of cancellation by the IMO for reliability purposes depending on their priority and the resource adequacy situation at the time their approval is being sought. Given the large number of negative margin weeks in this Scenario, to the extent this Scenario materializes, opportunities for additional planned generator maintenance would be limited and in most weeks imports would be necessary to meet peak demands.

The above results must be assessed considering the risk factors described in the report under Section 3.3 “Resource Adequacy Risks”. During most of the study period, a combination of high demand levels under extreme weather conditions and lower than forecast levels of available resources could lead to significant reliance on imports and upward pressure on wholesale market prices. During the summer of 2002, under such conditions, import levels reached the Ontario coincident import capability of approximately 4,000 MW.

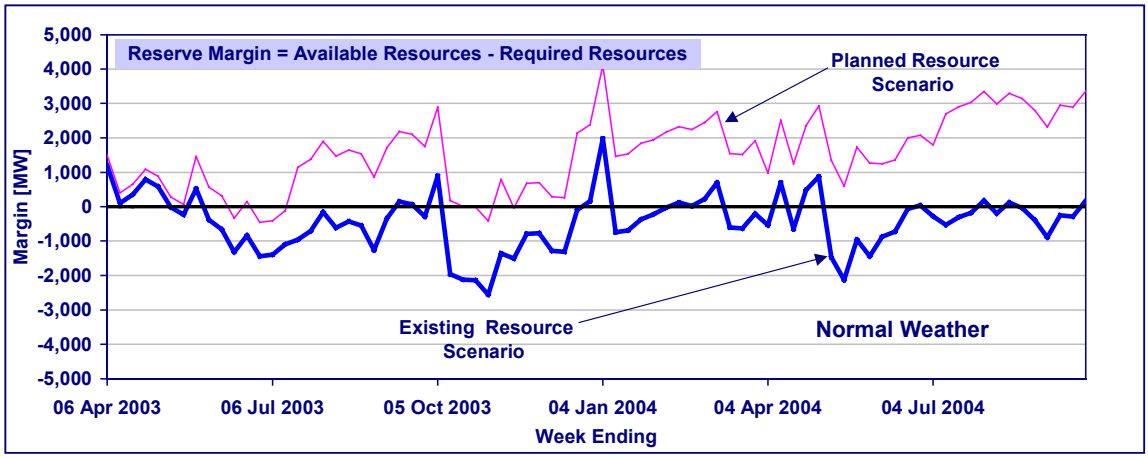
Planned Resource Scenario

The Planned Resource Scenario is similar to the Existing Resource Scenario except that it includes approximately 3,200 MW of additional generation resources that are scheduled to be placed in-service during the Outlook period and 300 MW of price-responsive demand, which was not considered in the Existing Resource Scenario. The generation resources consist of new facilities currently under construction and laid-up nuclear units returning to service, each assumed to be available on the dates provided by market participants.

Under the **Planned Resource Scenario**, the resource adequacy situation is significantly improved when compared to the Existing Resource Scenario. For most of the Outlook timeframe, the forecast available resources exceed the planning requirements. To the extent that this scenario materializes, dependency on imports will diminish and opportunities develop for additional

planned generator maintenance and exports. Again, the risk factors described under Section 3.3 "Resource Adequacy Risks" must be considered.

The following figure illustrates the weekly resource adequacy situation of the Ontario electricity system for the two resource availability scenarios under normal weather conditions. Reserve margins greater or equal to zero mean adequate resources, while reserve margins less than zero mean resources are below planning target levels.

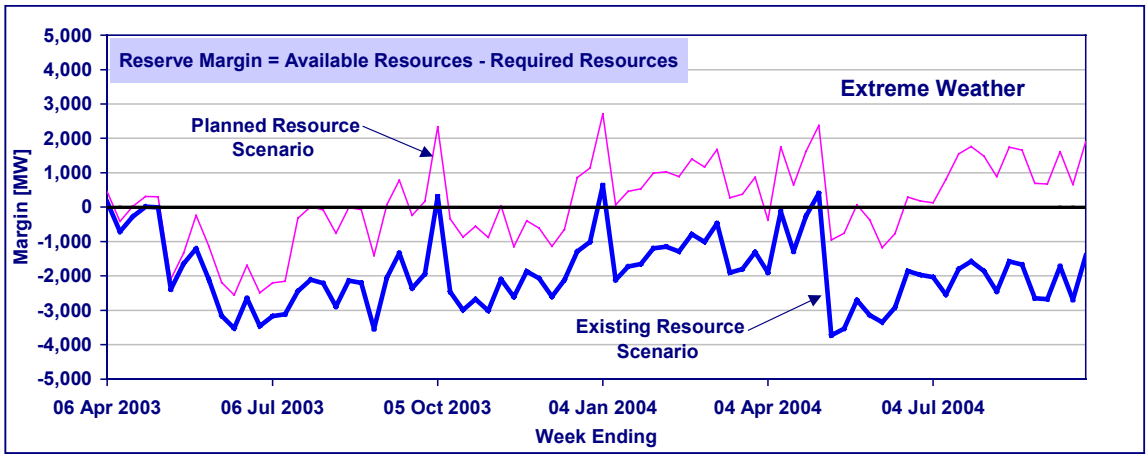


Under any scenario, it is anticipated that market participants will consider the reserve margins in this assessment when they adjust their operational and commercial plans, especially to maximize supply during tight periods.

In order to illustrate the impact of extreme weather on forecast reserve margins during the Outlook period, both the Existing Resource Scenario and the Planned Resource Scenario were re-calculated assuming extreme weather in each week instead of normal weather. The probability of this occurring in every week of the period is extremely small; however, when one looks at an entire summer or winter period, the expectation of at least one occurrence of extreme weather becomes considerably higher.

The magnitude of resource deficiencies, under extreme weather, clearly illustrates there are circumstances under which reliance on interconnected supply would approach the limits of the transmission system.

The results for extreme weather are shown in the following chart.



Ontario Demand Forecast

The IMO demand forecasting model has been updated to reflect actual economic, demand and weather data through to the end of December 2002. A slightly improved economic outlook has raised the forecast of energy and peak demands marginally compared to the previous forecast. Energy demand is expected to be 152.6 TWh for 2003, up from 152.1 TWh in the previous forecast. This represents a 0.6% increase over the weather corrected total for 2002. The seasonal peaks of the forecast horizon are contained in the following table. The Expected Peak, presented here for the first time, accounts for the higher probability of extreme weather occurring over an entire season compared with the weekly probability embedded in the Normal Weather forecast. For a more detailed discussion of demand please see the document titled Ontario Demand Forecast from April 2003 to September 2004 (IMO_REP_0106).

Season	Normal Weather Peak (MW)	Expected Peak (MW)	Extreme Weather Peak (MW)
Summer 2003	23,684	25,580	26,397
Winter 2004	24,112	25,252	25,878
Summer 2004	24,014	25,912	26,710

Transmission Outlook

As in the previous Outlook, the transmission system is expected to be adequate to supply demand under the forecast conditions studied in this Outlook, with some limits on the flexibility for planned outages in the Toronto and Windsor areas. Lakeview, Pickering and Darlington units are required to provide reactive capability to maintain adequate voltage levels, especially during summer peak demand periods. Requirements for specific generating unit availability in the GTA to provide voltage support can also occur during other seasons, in particular as a result of planned outages to entire generating stations close to Toronto.

Without additional generation, some transmission outages will be difficult to schedule or may be recalled on short notice, as was the case last year.

- End of Section -

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1.0 Introduction

This Outlook covers the 18-Month period from April 1, 2003 to September 30, 2004. It supercedes the report titled "An Assessment of the Reliability of the Ontario Electricity System from January 2003 to June 2004", dated December 23, 2002. Its purpose is to advise market participants of the resource and transmission reliability of the Ontario electricity system, and to assess potentially adverse conditions that might be avoided through adjustment or coordination of maintenance plans for generation and transmission equipment.

Section 2 identifies the resources expected to be available during the study period and Section 3 presents an assessment of the adequacy of these resources under the current generation outage program. An assessment of the reliability of the transmission system is presented in Section 4. Overall observations, findings and conclusions are contained in Section 5.

This Outlook presents an assessment of resource and transmission adequacy based on the stated assumptions, and using the described methodology. Readers may envision other possible scenarios, recognizing the uncertainties associated with various input assumptions, and are encouraged to use their own judgement in considering possible future scenarios. This Outlook provides a base upon which updates in assumptions can be considered. The tables contained in the document can be downloaded from the IMO web site in MS Excel format.

Beginning in April 2003, the IMO will publish Interim Updates to the 18-Month Outlook at the end of each month for which a full Outlook is not issued. In other words, the Interim Updates will be published at the end of the first and second months of each quarter. These updates will consist of a spreadsheet which reflects changes to Total Resources, Total Reductions to Resources, and Reserve Margins for one scenario, the Planned Resources Scenario. Similar to the full Outlooks, the Interim Updates will be posted on the IMO web. These updates are intended to give market participants sufficient information on a more frequent basis to better adjust their operational plans and outage schedules.

The reader should be aware that Security and Adequacy Assessments are published on the IMO web site on a weekly and daily basis that progressively supercede information presented in this report.

The contents of this Outlook document focus on the assessment of resource and transmission adequacy. Other supporting information and forecasts are contained in separate documents. These documents will be updated as required.

- The document titled "Ontario Demand Forecast from April 2003 to September 2004" (IMO_REP_0106) (found on the IMO web site at www.theimo.com/imoweb/pubs/marketReports/18Month_ODF_2003apr.pdf) describes in detail the 18-month forecast of electricity demand for the Ontario Market used in this Outlook. The demand forecast document also identifies the assumptions used to determine the forecast and identifies the details regarding peak and energy demand forecasts for the Ontario market and parts thereof. It also contains information regarding variations in demand due to weather, economic growth and calendar day types. Data from the demand forecast document can be downloaded in MS Excel format from the IMO web site.

- The document titled "Methodology to Perform Long Term Assessments" (IMO_REP_0044) (found on the IMO web site at www.theimo.com/imoweb/pubs/marketReports/Methodology_RTAA_2003apr.pdf) contains information regarding the methodology used to perform the demand forecasts, resource adequacy assessments and transmission reliability assessments in this Outlook.
- The document titled "Ontario Transmission System" (IMO_REP_0045) (found on the IMO web site at www.theimo.com/imoweb/pubs/marketReports/OntTxSystem_2003apr.pdf) provides specific details on the transmission system, including the major internal transmission interfaces and interconnections with neighbouring jurisdictions.

Readers are invited to provide comments on this Outlook report or to give suggestions as to the content of future reports. To do so, please contact the IMO Help Centre:

- Toll Free: 1-888-448-7777
- Tel: 905-403-6900
- Fax: 905-403-6921
- E-mail: helpcentre@theIMO.com.

1.1 Updates from Previous Outlook

Updates to Forecast Demands

Compared to the previous demand forecast the only update has been the inclusion of an updated economic outlook. With respect to the forecasting methodology, this forecast uses the same methodology as the previous forecast.

The economic outlook has improved for 2003 and 2004 as Canada's economy has experienced modest growth despite the struggling U.S. economy and political uncertainty.

The economic outlook has pushed up forecast total energy demand both in terms of the growth rate and the levels. The forecast of energy demand is 0.5 TWh higher in 2003, and the summer 2003 peak is 12 MW higher than previously forecast. Otherwise the two forecasts are very similar.

Updates to Resources

The IMO has been advised that the Bruce A units 4 and 3 are expected to be generating electricity by April 29 and the end of June respectively. Two Pickering A nuclear units are identified as returning to service within the current 18-month period. The reactivation of this these units is reflected only in the Planned Resource Scenario.

There have been some updates to the generator outages submitted by market participants.

Updates to Transmission Outlook

The in-service date of the L4D phase shifter has updated from mid-May 2003 to July 30, 2003, thereby delaying the ability to regulate all the Michigan-Ontario interconnection.

The list of transmission projects and planned and forced transmission outages has been updated from the previous 18-Month Outlook.

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2.0 Resources

This section describes the generation resources that were considered in this Outlook based on information available to the IMO.

2.1 Existing Generation Resources Included in the Study

The existing installed generating capacity within Ontario is summarized in Table 2.1. This includes nuclear, coal, oil, gas, hydroelectric, wood and waste-fuelled generation and results in a total capacity of 30,500 MW. The new TransAlta – Sarnia Cogeneration Project (SCP) is included in the existing generation resources.

The capacity of installed generation resources in Table 2.1 does not include Bruce A nuclear units, which are currently being prepared for reactivation. The Bruce A units, together with other additions to generating capacity identified to the IMO, were progressively added to the installed resources, under the Planned Resource Scenario only, as described in Section 2.4.

The four Pickering A nuclear units were included in the list of existing installed generation resources, the last two of which were assumed to be out-of-service for the study period. Only the first two Pickering A units were identified as returning to service within the 18-month period. The reactivation of these units was reflected only in the Planned Resource Scenario.

Table 2.1 Existing Installed Generation Resources[1]

Fuel Type	Total Capacity (MW)	Number of Stations
Nuclear	10,836	4
Coal	7,546	5
Oil / Gas	4,416	24
Hydroelectric	7,636	59
Miscellaneous (wind, waste, wood, etc.)	66	2
Total	30,500	94

2.2 External Transactions

An ongoing firm purchase of 200 MW was assumed to be delivered to Ontario for the period from the beginning of the Outlook until October 31, 2003; this purchase was explicitly included in the generation resource scenarios described in Section 2.4. No other firm purchase contracts were identified for the study period. There were no firm sales identified at any point in the study period.

[1] In Table 2.1, the number of nuclear stations will increase to five with the operation of the first Bruce A unit.

2.3 Potential Generation Resource Additions

Table 2.2 summarizes the generation projects in the IMO's Connection Assessment and Approval (CAA) process that are under construction, and are scheduled to be placed in-service within the 18-month study period under the Planned Resource Scenario described in Section 2.4. Generator owners or operators have provided the information regarding the status of their projects and the in-service/restart dates listed in Table 2.2.

Table 2.2 Potential Generation Resource Additions in Ontario

Proponent/Project Name	Zone	Fuel Type	Capacity MW	Connection Applicant's Estimated I/S Date
Bruce Power Inc. - Bruce A G4	Bruce	Nuclear	770	April 2003*
Bruce Power Inc. - Bruce A G3	Bruce	Nuclear	770	June 2003*
ATCO - Brighton Beach	West	Gas	578	March 2004
Imperial Oil	West	Gas	98	April 2004
Total			2,216	

* estimated restart date.

Details regarding the IMO's Connection Assessment and Approval process and the status of all projects in the queue, including copies of available Preliminary Assessment (PA) and System Impact Assessment (SIA) Reports, can be found on the IMO's web site www.theIMO.com under the "Services - Connection Assessments" link.

2.4 Summary of Generation Resource Scenarios

In assessing future resource adequacy, it is necessary to make a number of assumptions regarding the magnitude of generation resources expected to be available for operation. Two resource scenarios were considered in this Outlook: an Existing Resource Scenario and a Planned Resource Scenario. Both resource scenarios were established starting from the existing installed resources shown in Table 2.1.

Under the **Existing Resource Scenario** Ontario generation resources identified in Table 2.1 were assumed to be in-service with the exception of all of the Pickering A nuclear units, which were assumed to be out-of-service for the duration of the study period. Purchases of 200 MW were assumed available up to the end of October 2003. This resource scenario assumed that none of the additional generation resources listed in Table 2.2 would be placed in service over the study period.

Under the **Planned Resource Scenario** existing Ontario generation resources were assumed to be in-service with the exception of the last two of the Pickering A units, which were assumed to be out-of-service for the duration of the study period. The other two Pickering A nuclear units are identified as returning to service within the current 18-month period, first of which was assumed to begin generating electricity by the end of June 2003. A firm purchase of 200 MW was assumed available up to the end of October 2003. Additionally, all potential generation additions listed in Table 2.2 were included under this scenario.

Forecasts of available resources were derived for each of the two resource scenarios described above, using information regarding generator output capabilities, planned outages, allowances for hydroelectric generation production below rated capacity, assumptions for the amount of price-responsive demand, and major transmission interface limitations.

Table 2.3 shows a snapshot of the forecast available resources, under the two scenarios, at the time of the seasonal peak demands over the study period. The installed resources in Table 2.3 start with the values listed in Table 2.1 and are incremented, for the Planned Resource Scenario, by the generation resource additions listed in Table 2.2. Imports consist of the purchases that were assumed to be delivered to Ontario as described in Section 2.2. The total reductions to resources include generator deratings, generator planned outages under each resource scenario, capacity limitations due to transmission interface constraints and allowances for hydroelectric generation production below rated capacity. The total reductions were subtracted and the price-responsive demand was added to the total resources, to obtain the available resources. In this Outlook, an amount of 300 MW of price-responsive demand was assumed to be available only under the Planned Resource Scenario, as shown in Table 2.3.

Table 2.3 Summary of Available Resources

Notes	Description \ Year	Summer Peak 2003		Winter Peak 2004		Summer Peak 2004	
		Existing Resource Scenario	Planned Resource Scenario	Existing Resource Scenario	Planned Resource Scenario	Existing Resource Scenario	Planned Resource Scenario
1	Installed Resources (MW)	30,500	31,270	30,500	32,040	30,500	32,716
2	Imports (MW)	200	200	0	0	0	0
3	Total Resources (MW)	30,700	31,470	30,500	32,040	30,500	32,716
4	Total Reductions in Resources (MW)	4,321	4,344	3,717	3,228	3,328	2,396
5	Price-responsive Demand (MW)	0	300	0	300	0	300
6	Available Resources (MW)	26,379	27,426	26,783	29,112	27,172	30,620

Notes to Table 2.3:

1. Installed Resources (MW): This is the total capacity of the generation resources in Ontario assumed to be installed at the time of the summer and winter peaks in the 18-month time span. Initially, this value includes all generators registered to participate in the IMO-administered markets at the beginning of the 18-month period, except Bruce A nuclear units. Additional generation capacity that was assumed under the applicable resource scenario is progressively included, according to the estimated in-service dates.

2. Imports (MW): Represents the amount of external capacity considered to be delivered to Ontario.

3. Total Resources (MW): This is the sum of Installed Resources (line 1) and Imports (line 2).

4. Total Reductions in Resources (MW): These reductions represent, under each of the two scenarios, the sum of generator deratings, generator planned outages under each resource scenario, generation limitations due to transmission interface constraints and allowances for hydroelectric generation production below rated capacity.

5. Price-responsive Demand: This is the amount of price-responsive demand assumed under each resource scenario.

6. Available Resources (MW): This equals Total Resources (line3) minus Total Reductions in Resources (line 4) plus Price-responsive Demand (line 5).

2.5 Energy Production Capability Forecast

The monthly forecast of energy production capability, as provided by market participants, is included in Appendix A, Table A6.

- End of Section -

3.0 Resource Adequacy Assessment

This section provides an assessment of the adequacy of the resources described in Section 2 to meet the forecast demand. The purpose of the two resource scenarios described in Section 2.4 is to present a range of possible outcomes, in recognition of the uncertainty which exists regarding the future availability of resources. The Existing Resource Scenario, which assumes no generation resource additions and no price-responsive demand, represents one reasonable boundary of the range, considering the potential for delays to the in-service dates of additional generation capacity, especially from nuclear resources. The Planned Resource Scenario, which assumes 300 MW of price-responsive demand and capacity additions based on project status and in-service date estimates, represents the other reasonable boundary of the outcome range. The resource availability situation over the 18-month period covered by this Outlook is expected to be somewhere within the band of these scenarios.

As mentioned in Section 1, the methodology used to carry out this assessment is described in detail in the document titled "Methodology to Perform Long Term Assessments" (IMO_REP_0044). Results of the adequacy assessment, as well as an analysis of risk factors, are described in Sections 3.1 through 3.4. Observations, findings and conclusions are provided in Section 5, and detailed tables of results can be found in Appendix A of this document.

3.1 Weekly Adequacy Assessment

The assessment of weekly adequacy takes into consideration a range of forecast demands based on a probability distribution of historical weather data. Margins have been calculated assuming both normal weather (with an allowance for the probability of experiencing extreme weather) and assuming extreme weather (with no further allowance for weather uncertainty). Figure 3.1 shows the normal and extreme weather demands assumed for each week in the study period.

Figure 3.1 Demand Forecast Range

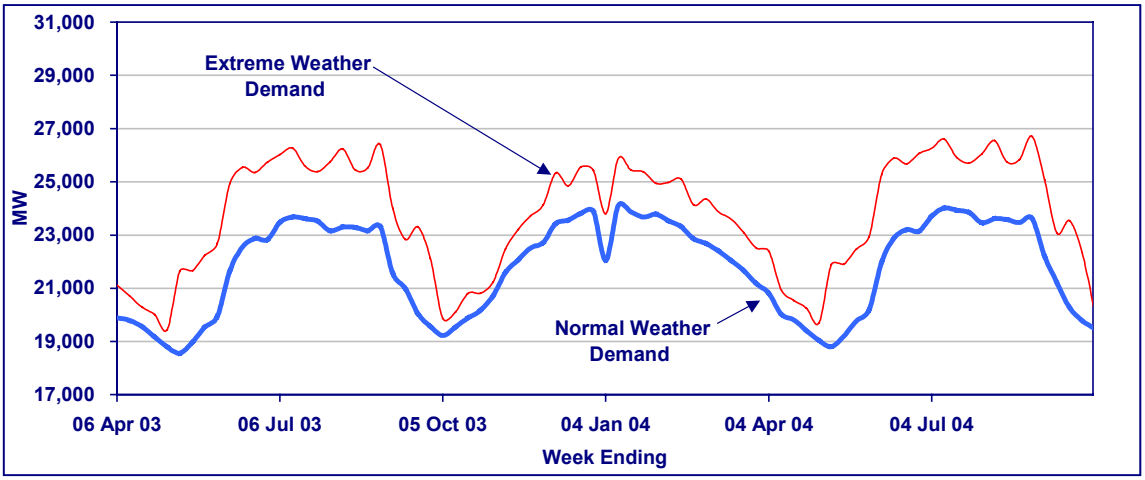


Figure 3.2 shows the Total Reductions in Resources used in the calculation of the Available Resources (as described in Section 2.4).

Figure 3.2 Total Reductions in Resources

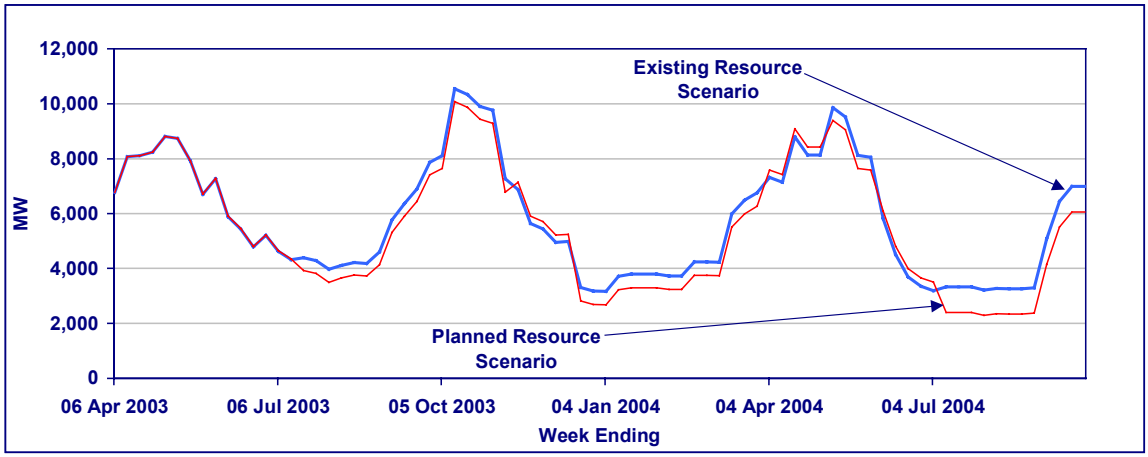


Figure 3.3 provides a comparison between Available Resources, and Required Resources for each week, for the Existing Resource Scenario. The latter quantity is based on a probabilistic calculation, which takes into account load forecast uncertainty due to weather and random generator forced outages. Figure 3.4 provides a similar comparison for the Planned Resource Scenario.

Figure 3.3 Available vs. Required Resources: Existing Resource Scenario

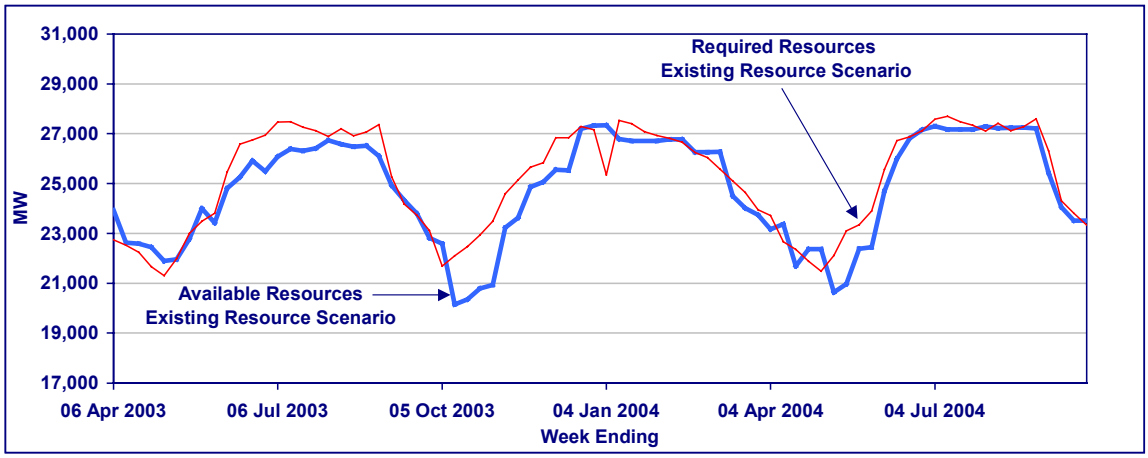
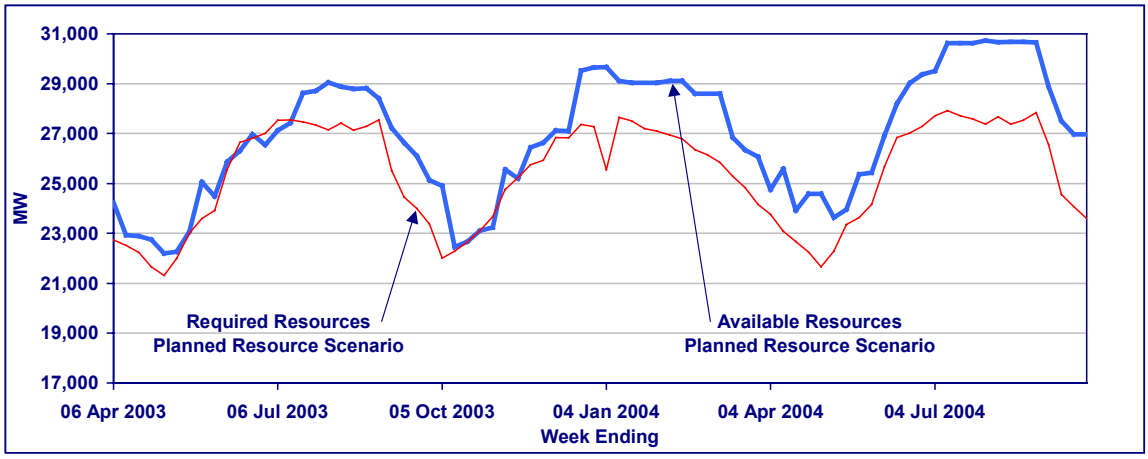
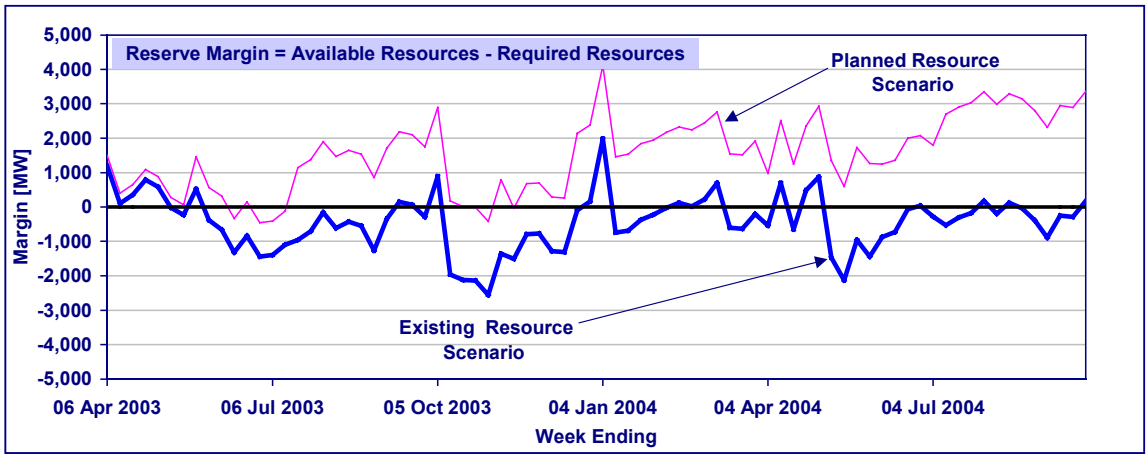


Figure 3.4 Available vs. Required Resources: Planned Resource Scenario



Reserve Margins, which represent the difference between Available Resources and Required Resources, are shown in Figure 3.5 for each resource scenario studied.

Figure 3.5 Reserve Margins: Existing Resource Scenario and Planned Resource Scenario



Under the **Existing Resource Scenario**, reserve margins are forecast to be negative for most of the study period, with only a few exceptions. Resource shortfalls are most significant during the fall of 2003 and May and June 2004, when substantial resource reductions are identified based on submitted generator outages. For the fall 2003 period, IMO is conducting reliability studies that consider the specific set of outages which are scheduled. When those studies are complete in late April, it is expected that the identified reliability requirements will result in further outage adjustments to ease some weeks of shortfall in October and early November 2003.

Negative reserve margins throughout the Outlook period indicate that forecast resource levels are below planning requirements. As such, planned generator outages during negative margin weeks are at risk of cancellation by the IMO for reliability purposes depending on their priority and the resource adequacy situation at the time their approval is being sought. Given the large number of weeks with negative margins in this scenario, to the extent this scenario materializes,

opportunities for additional planned generator maintenance would be limited and in most weeks imports would be necessary.

The above results must be assessed considering the risk factors described in Section 3.3. During most of the study period, a combination of high demand levels under extreme weather conditions and lower than forecast levels of available resources could lead to significant reliance on imports and upward pressure on the wholesale market prices. During the summer of 2002, under such conditions, import levels approached, and occasionally reached, the Ontario coincident import capability of approximately 4,000 MW.

Under the **Planned Resource Scenario**, the resource adequacy situation is significantly improved when compared to the Existing Resource Scenario described above. For most of the Outlook timeframe, forecast available resources exceed requirements. To the extent this scenario materializes, opportunities exist for additional planned generator maintenance and exports. Again, the risk factors described in Section 3.3 must be considered.

Figures 3.6 and 3.7 provide a comparison between the forecast reserve margins in the present Outlook and the forecast reserve margins in the previous Outlook. Further details showing weekly values are provided in Appendix A. When compared to the last Outlook published on December 23, 2002, forecast reserve margins, under both resource scenarios studied, are generally lower for the last nine months of 2003 but have generally improved for the first half of 2004, due mainly to updates in the generator outage program.

Figure 3.6 Reserve Margin: Existing Resource Scenario vs. Previous Existing Resource Scenario

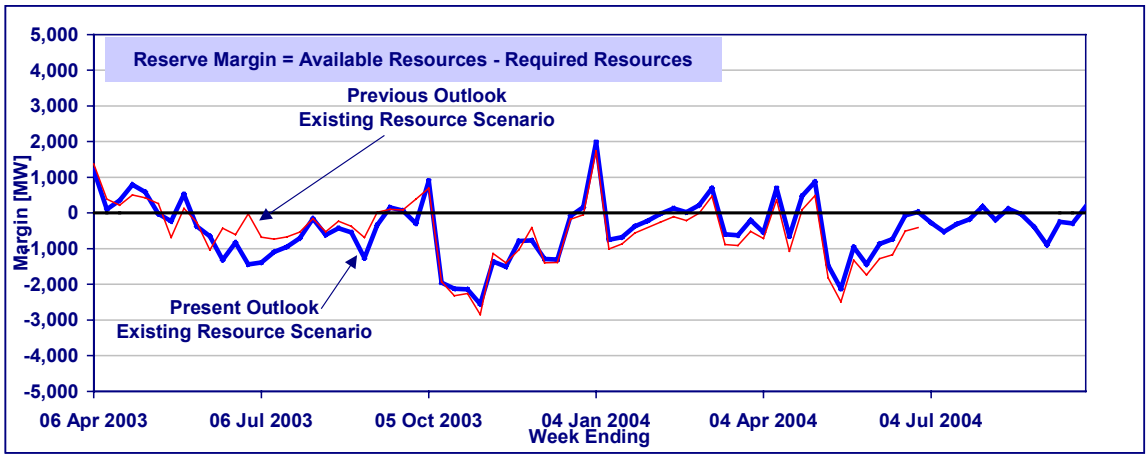
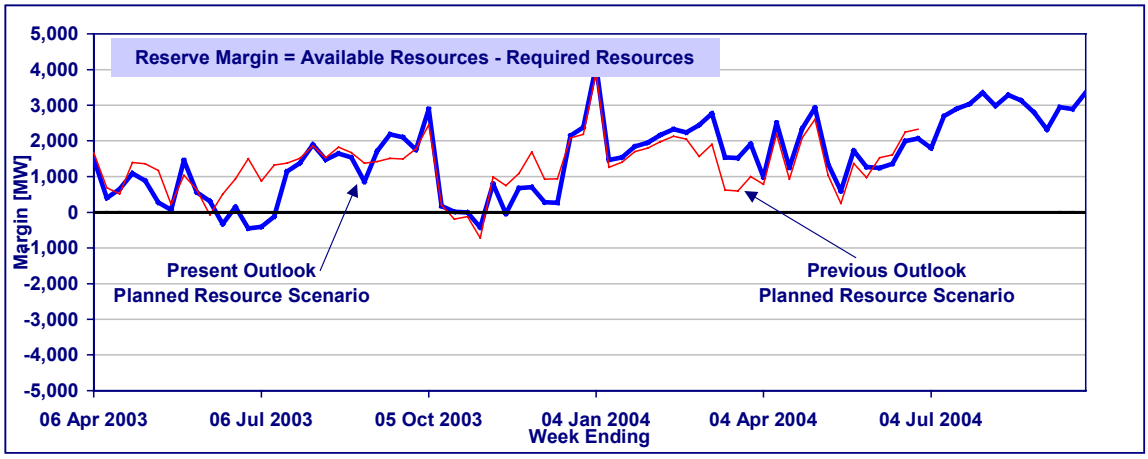


Figure 3.7 Reserve Margin: Planned Resource Scenario vs. Previous Planned Resource Scenario



The IMO will closely monitor the resource situation and implement the necessary control actions, if required, in accordance with the Market Rules. Tight demand/supply balances during periods of negative reserve margins will have several potential market impacts. These include upward pressure on the wholesale market prices and limited opportunities for the IMO to approve the release of generators for planned maintenance. Various responses can be anticipated and would be relied upon in these circumstances, including: for Ontario generators, maximizing their availability to offer into the Ontario market; for marketers, arranging imports to help meet anticipated Ontario requirements; and for consumers, taking measures to reduce their electricity consumption.

3.2 Loss of Load Expectation

A number of simulations were performed to calculate the Loss of Load Expectation (LOLE) during the study period. The simulations started from the two resource scenarios described in Section 2.4 and used the methodology described in Section 2.3 of the document "Methodology to Perform Long Term Assessments" (IMO_REP_0044). The calculations were performed in two steps. In the first step, the resource availability was established based on the same levels that were used in the calculations described in Section 3.1. In the second step, additional resources were made available to Ontario, with the purpose of reducing the LOLE value to the target level. The target LOLE value is equivalent to an annual LOLE of 0.1 days/year. The modeling of additional resources was carried out in accordance with the NPCC resource adequacy criterion, which allows for supplemental capacity in the form of interconnection assistance, outage rescheduling and implementation of emergency operating procedures.

Simulation results indicate that, in order to achieve the target LOLE, additional resources would be required, at least to the level necessary to offset the margin deficiencies under each of the two resource scenarios, shown in Tables A1 and A2 in Appendix A.

3.3 Resource Adequacy Risks

The forecast reserve margins for both the Existing Resource Scenario and the Planned Resource Scenario should be assessed bearing in mind the risks discussed below. Each of these risks, whether considered alone or in combination with the others, could result in lower than forecast reserve margins and the need for high levels of imports or curtailment of planned outages.

3.3.1 Extreme Weather

The Existing Resource Scenario and the Planned Resource Scenario are based on the assumption of normal (average) weather. However, peak demands in both summer and winter typically occur during periods of extreme weather. Unfortunately, the occurrence and timing of extreme weather is impossible to accurately forecast far in advance. As a result, the impact of extreme weather is accounted for probabilistically in the calculation of the required resources for each week of the study period. The impact of extreme weather was demonstrated in August 2002, when Ontario established an all-time peak demand of 25,414 MW. Approximately 1,700 MW of this demand was due to the higher than average heat and humidity.

In order to illustrate the impact of extreme weather on forecast reserve margins during the Outlook period, both the Existing Resource Scenario and the Planned Resource Scenario were re-calculated assuming extreme weather in each week instead of normal weather. The probability of this occurring in every week is infinitesimally small; however the probability of an occurrence in any given week is greater (about 2.5 percent). When one looks at the summer or winter periods, the expectation of at least one occurrence of extreme weather becomes considerably higher. Results for extreme weather are shown in Figures 3.8, 3.9, and 3.10.

The magnitude of resource deficiencies under extreme weather, clearly illustrates there are circumstances under which reliance on interconnected supply would be stretched close to the limits of the transmission system. The risk of even short-duration inability to meet demand during such conditions emphasizes the need for new supply and demand responses within Ontario.

Figure 3.8 Available vs. Required Resources: Existing Resource Scenario Extreme Weather Demand

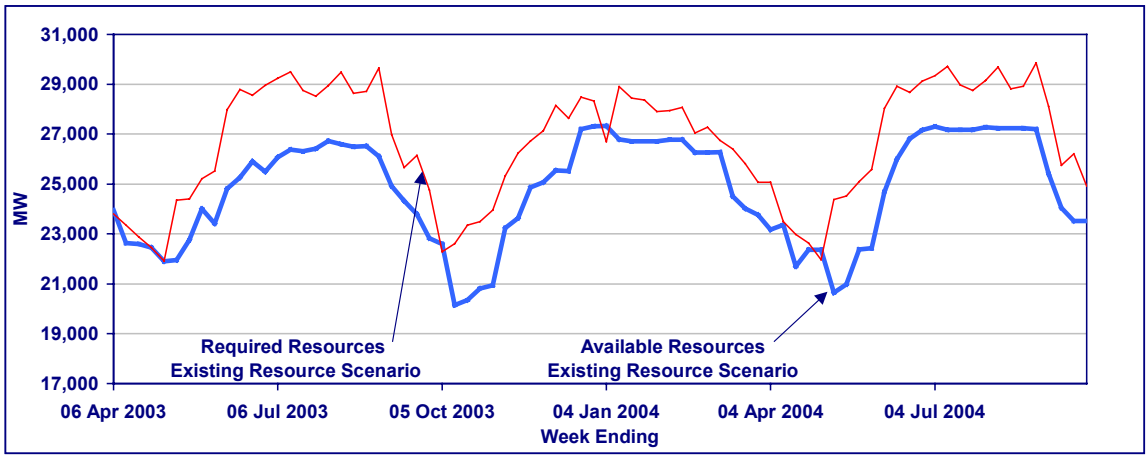


Figure 3.9 Available vs. Required Resources: Planned Resource Scenario Extreme Weather Demand

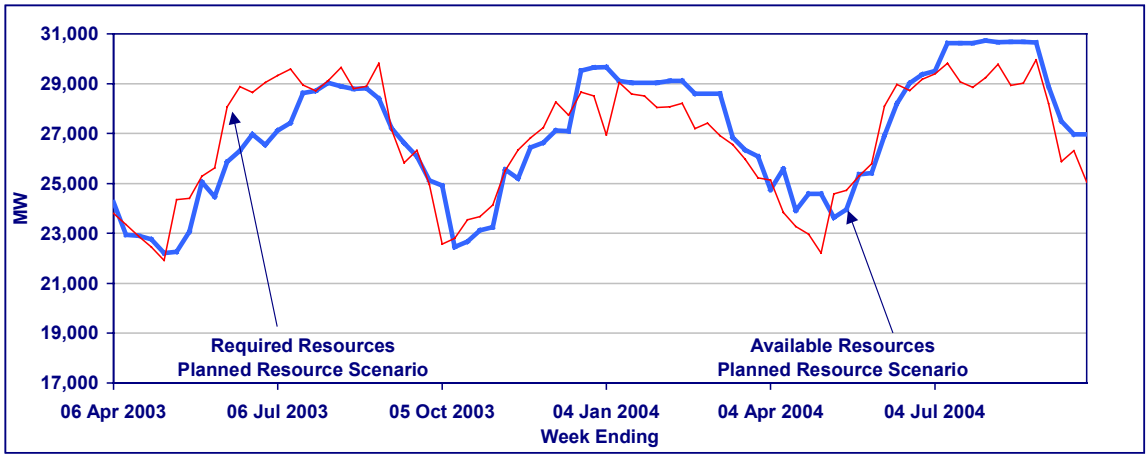
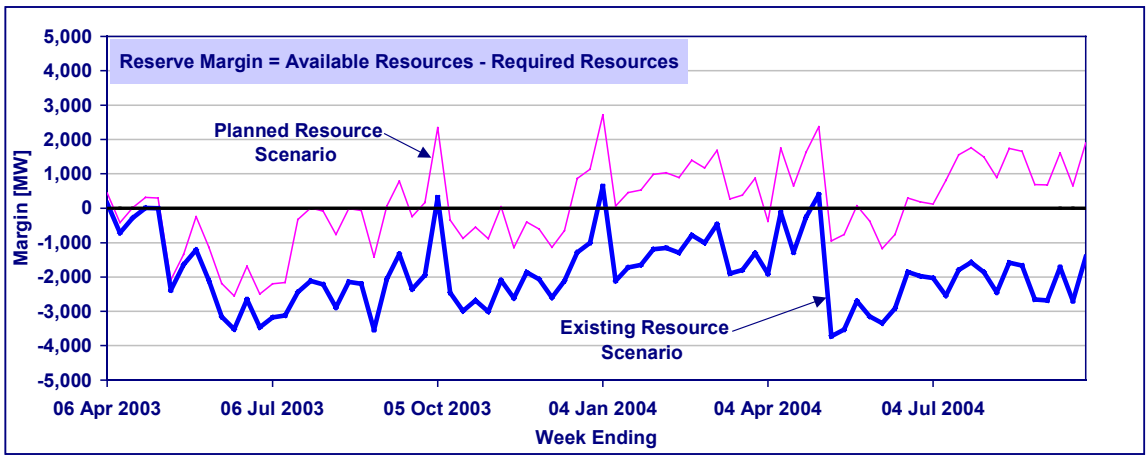


Figure 3.10 Reserve Margin: Existing Resource Scenario and Planned Resource Scenario, Extreme Weather Demand



3.3.2 Generator Return to Service Delays

The majority of additional resources forecast for the study period come from laid-up nuclear units returning to service. The improved demand/supply situation for the Planned Resource Scenario is critically dependent on these units returning to service on schedule. To date, no laid-up nuclear unit has been returned to service in Ontario. Although this history suggests a significant risk associated with return to service dates not being met, current information for some units, including achievement of critical milestone activities, is promising.

3.3.3 Extensions to Generator Planned Outages

A number of large generating units are scheduled to return to service from long duration maintenance outages at the beginning of summer 2003, with others scheduled to return from similar outages just prior to winter 2003/04. Similar to the return of laid-up nuclear units, meeting these schedules is critical to maintaining positive reserve margins. Delays in

commissioning new units or returning generators to service, whether from lay-up or maintenance outages, could once again lead to extensive reliance on imports as has been the case during the summer of 2002.

3.3.4 Higher than Forecast Generator Unavailability

IMO resource adequacy assessments include a probabilistic allowance for random generator forced outages based on generator reliability information provided by market participants, or on industry-wide data for similar facilities. Along with weather-related demand impacts, the impact of generator forced outages is included in the determination of required resources. If the actual amount of generator forced outages is higher than the calculated allowance, reserve margins could be lower than the forecast values.

3.3.5 Lower than Forecast Hydroelectric Resources

IMO resource adequacy assessments include forecast amounts of hydroelectric generation provided by market participants. The amount of available hydroelectric generation is greatly influenced both by water-flow conditions on the respective river systems and the way in which water is utilized.

Water-flow conditions are primarily influenced by the amount of precipitation received. To accurately forecast precipitation amounts so far in advance is impossible. Drought conditions over some or all of the study period would lower the amount of generation available from hydroelectric resources.

Experience over the summer of 2002 has also shown that even when sufficient capacity is available, its use can be limited because of a lack of energy due to scheduling decisions. An example of this occurs when peaking hydroelectric generation is operated extensively during the early portion of a week in response to market signals and, as a result, there is insufficient water available in storage reservoirs to support required levels of operation later in the week.

3.4 External Resources

An analysis of historical power flows on Ontario's interconnections for the five years prior to 2002 shows that outside of summer peak demand periods up to 1,800 MW of external generation resources might be expected to be available to Ontario. During Ontario's summer peak demand periods of July and August opportunities for imports still exist and imports are still expected to be available despite the fact that many neighbouring systems are often experiencing their peak demand. This is mainly due to the non-coincidence of the daily peak hours between Ontario and its neighbours and the availability of spare capacity from systems that are not summer peaking. From the same analysis, up to 1,400 MW would be expected to be available based on observations during summer peak months in recent years prior to 2002.

The actual hourly import levels experienced from market opening in May 2002 up to February 11, 2003 indicates an average import level of 1,088 MW for all hours. During the 1,440 hours when Ontario demand exceeded 20,000 MW the average import level was 1,622 MW. During the 225 hours when Ontario demand exceeded 23,000 MW the average import level was

2,371 MW, and occasionally reached the Ontario coincident import capability of approximately 4,000 MW.

Future levels of imports into Ontario will vary depending on several factors, including the availability and willingness of resources in external jurisdictions to supply the Ontario market, and the availability of required transmission capacity.

- End of Section -

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4.0 Transmission Reliability Assessment

This section provides an assessment of the reliability of the Ontario transmission system.

4.1 Transmission Projects

Committed transmission projects summarized in Appendix B by transmission zone represent a subset of the transmission projects in the CAA queue. Only those projects that materially change a connection and/or an electrical characteristic associated with a connection to the IMO-controlled grid, and that have an estimated in-service date within the 18-month period under study are listed.

On July 30, 2003, it is expected that a new 845 MVA phase angle regulator (PAR) for 230 kV circuit L4D will be placed in-service. With the placing in-service of this PAR, all tie lines associated with the Ontario – Michigan interconnection will have phase shifting capability. Full phase shifting control of the interconnection can be utilized when the B3N, L4D and L51D PARs are not operated at their neutral tap.

4.2 Planned Transmission Outages

The principal purpose of the transmission reliability assessment is to forecast any reduction in transmission capacity brought about by specific transmission outages. For a major transmission interface or interconnection, the reduction in transmission capacity due to an outage condition can be expressed as a change in the base flow limit associated with the interface or interconnection. Another purpose of the transmission reliability assessment is to identify the possibility of any security-related events on the IMO controlled grid that could require contingency planning by market participants or by the IMO. As a result, the transmission outages are reviewed to identify transmission system reliability concerns and to highlight those outages that could be rescheduled.

The assessment of transmission outages will also identify any resources that are constrained off due to transmission outage conditions. Transmitters and generators are expected to have a mutual interest in developing an ongoing arrangement to coordinate their outage planning activities. Transmission outages that may affect generation access to the IMO-controlled grid should be coordinated with the generator operators involved, especially at times when reserve margins are negative. Under the Market Rules, where the scheduling of planned outages by different market participants conflicts such that both or all outages cannot be approved by the IMO, the IMO will inform the affected market participants and request that they resolve the conflict. If the conflict remains unresolved, the IMO shall determine which of the planned outages can be approved according to the priority of each planned outage as determined by the Market Rules detailed in Chapter 5, Sections 6.4.13 to 6.4.18.

For this Outlook, transmission outage plans as of the beginning of February 2003 were used.

The IMO's assessment of the impact of the transmission outage plans is shown in Appendix C, Tables C1 to C10. In these tables, each element is assessed individually by indicating the possible impacts and the reduction in transmission interface and/or interconnection limits. The

methodology used to assess the transmission outage plans is described in the IMO document titled "Methodology to Perform Long Term Assessments" (IMO_REP_0044).

In summary, only a few of the planned outages will potentially impact transmission system reliability and available resources. The outages with the highest potential impact are listed below:

East Zone

The IMO is concerned with the September 15, 2003 and September 16, 2003 to September 21, 2003 outages for the Chenaux Project involving the addition of two new 230 kV breakers and the reconnection of transformer T4. These two outages may limit the amount of 115 kV load that can be supported in the Renfrew area. The amount of load that can be supported during these two outages will vary from approximately 55 MW to 115 MW depending on the Chenaux Project outage conditions and the available hydroelectric generation from Chenaux and Quebec. It is estimated the Renfrew area demand could vary from a peak of approximately 110 MW to an off peak value of approximately of 75 MW. In addition, the Renfrew area supply-demand balance required for the duration of these outages may not be met due to energy limitations typically associated with hydroelectric supply. In the approval timeframe of these outages, the IMO may delay or cancel the outages if the hydroelectric production capability is not expected to be sufficient to meet the demand. The IMO also suggests that the transmitter review the September 16, 2003 to September 21, 2003 outage to see if the duration of the outage can be shortened.

As detailed in Table C2, Appendix C, Chenaux generation is constrained off for four of the five Chenaux Project outages.

Northeast Zone

The 115 kV L5H circuit outage from June 2, 2003 to June 20, 2003 will affect the flow limit associated with the Ontario - Quebec North Interconnection. Negative reserve margins are forecast for all weeks in June 2003 under the Existing Resource Scenario, and for some weeks in June 2003 under the Planned Resource Scenario. In the approval timeframe, if the IMO determines that imports are required on this interconnection to maintain supply reliability and that the outage limits this requirement, the IMO may cancel or defer the outage.

The Porcupine Transformer Station outages affecting 500 kV circuits D501P and P502X in May and June 2003 may constrain up to 800 MW of generation. Since negative reserve margins are forecast for most weeks during this time period under the Existing Resource Scenario and some weeks under the Planned Resource Scenario, the IMO may cancel or defer the outages in the approval time frame if any constrained generation is required to maintain supply reliability.

Outages to the 115 kV A9K circuit are scheduled to coincident with some of the D501P and P502X outages. During these coincident outage conditions, the loss of the 115 kV A8K circuit will result in an islanding event where a significant portion of the northeastern transmission system is separated from the remaining Ontario transmission system. The IMO recommends that the transmitter reschedule the A9K outages so that they do not coincident with the D501P and P502X outages.

Northwest Zone

The 230 kV K24F circuit outage from October 6, 2003 to November 28, 2003 will reduce the transfer capability between Ontario and Manitoba, and between Ontario and Minnesota. This outage will also reduce the East-West Transfer East (EWTE) capability by 75 MW, further reducing dispatching flexibility in the Northwest zone and requiring more coordination in the planning of generation and other transmission outages. For most weeks during this outage period, negative reserve margins are forecasted. If imports and/or the full capability of the EWTE interface are required to maintain supply reliability, the IMO may defer or cancel the outage.

Toronto Zone

As detailed in Table C9, Appendix C, several outages are scheduled from April to December 2003 that will result in transmission facilities associated with two Hearn x Leaside 115 kV circuits being out of service at the same time. Depending on the prevailing load levels due to ambient weather conditions, thermal overloading of other 115 kV circuits in the local operating area may occur. In addition, the 115 kV H7L and H11L Hearn x Main 115 kV circuit outages from September 2, 2003 to December 30, 2003 may result in high voltage problems at Main TS under overnight conditions when load levels are lower. The impact of these outages will be reassessed by the IMO at the time their approval is being sought. The IMO will defer or cancel the outages if thermal overloading of other 115 kV circuits is expected to occur. Given the short recall time associated with these outages, the IMO may also release an individual outage but recall it for those periods where thermal overloading is a concern.

West Zone

As detailed in Table C10, Appendix C, several outages are scheduled from April to May 2003 that will reduce the FABC interface limit by up to 600 MW and the BLIP and NBLIP interface limits by up to 900 MW. The reduction of the FABC limit is not considered to be of concern. However, the impact on the BLIP/NBLIP interface will be reassessed in the approval timeframe, considering the specific demand-supply requirements.

The J5D outage, which is scheduled to end the first week of the Outlook period, could also reduce the Ontario – Michigan interconnection flow limit by up to 400 MW for imports to Ontario and exports from Ontario. Positive reserve margins are forecasted for both resource scenarios during the first week of the Outlook period.

The Scott Transformer Station (TS) outages scheduled from April 2003 to June 2003 will allow the transmitter to upgrade station facilities that will remove a 25 kA fault level restriction at the station. For all the Scott outages except the AL25 outage, the 25 kA fault level restriction must be maintained during the outaged conditions. Therefore, during the outaged conditions there will be also a requirement to remove other equipment from service at Scott TS to respect the fault level restriction. Given the various outages and the fault level restriction requirement, at least eighteen different Scott switchyard configurations will be used to complete the upgrades. Each of these configurations will not be detailed in this Outlook. However, during the approval timeframe, the IMO will access each outage and associated switchyard configuration. In summary, there will be a number of switchyard configurations that will lower the reliability of supply to local consumers should a contingency occur. In addition, when the different switchyard configurations involve either 230 kV circuit N6S or N7S being out of service, the TransAlta - Sarnia Cogeneration Project (SCP) may be limited by up to 230 MVA depending on

the ambient weather conditions. Negative reserve margins are forecast for most weeks in May and June under the Existing Resource Scenario. The Scott outages are not expected to materially reduce the Ontario-Michigan transfer capability.

This Outlook has limited the assessment of transmission outages to those outages with a scheduled duration of six days or more and/or to those transmission outages associated with a major project. The IMO recognizes that there are expected to be additional outage requirements and/or changes as time approaches the Outlook study period and that transmission capacity will be impacted by outages with a scheduled duration of five days or less. Prior to approving and releasing an outage, the IMO will reassess the outage for potential system impacts, taking into account all current and forecasted conditions.

4.3 System Voltage and Thermal Limits

As in previous Outlooks, low system voltage concerns in certain sub-areas of the province may limit some generation and transmission outages from being planned during summer peak demand periods. The various system voltage concerns are described below.

In the Windsor area, load growth will continue to stress the capability of the existing system under extreme-weather, summer peak conditions, such that voltages are expected to be near the low end of the acceptable range even with most static reactive sources in-service. In addition, maintaining acceptable voltage levels may require restrictions on the use of the J5D interconnection with Michigan for exports, particularly during summer peak periods. Planned outages to generating units and/or transmission circuits during peak load conditions with coincident purchases from Michigan will require special control actions to prevent post-contingency thermal overloading of transmission facilities. The special control actions could include the splitting of the Windsor 115 kV local area and arming of the Kingsville under-voltage load rejection scheme. Splitting the Windsor area will result in some Windsor 115 kV loads being served by a single supply. Avoiding planned outages in this area is desired; however, with the planned upgrade of some local transmission facilities by the transmitter for the incorporation of the Brighton Beach generation project, some outages may not be avoidable during peak load conditions. The addition of the Brighton Beach generation project by 2004-Q2 will improve the voltage profile in this area.

When peak demands exceeded 25,000 MW in August 2001 and July, August, and September 2002, pre-contingency voltage levels in the Toronto zone were acceptable but with little margin for contingencies. The reactive requirement to maintain voltage levels at or above the minimum required levels was very high. Most static reactive resources and transmission elements were required in-service and the Lakeview, Pickering and Darlington units had to supply higher than normal amounts of reactive power. The high demand for reactive power left significantly lower than normal reactive margin for contingencies. The performance of these units in providing reactive power to maintain acceptable voltage levels in the Toronto zone during summer peak periods is extremely important. Planned outages and restrictions on the use of the reactive capability of the Lakeview, Pickering and Darlington units should be avoided during summer peak periods.

High transmission facility thermal loadings were also observed during the August 2001 and July and August 2002 hot weather conditions. With some local generating facilities operating at less

than full output, the 500/230 kV autotransformers located at the Cherrywood Transmission Station in the Toronto zone were operated at power levels near, but below their continuous ratings.

In the Northwest zone at least one of the two generators, in combination with the condenser, at Thunder Bay is required to be in-service, most of the time, to maintain minimum voltages in the area, at times of peak load. Coincident planned generator outages are a concern since the condenser in service by itself may not be able to maintain minimum voltage requirements. In addition, on loss of the condenser, the Thunder Bay G2 unit is required in service in order to restore the condenser to service. Avoiding planned generator outages during peak load conditions may be required to alleviate this concern. The expected installation of an 80 Mvar shunt capacitor at Birch Transformer Station by 2003-Q4 will result in an improvement of the 115 kV voltage profile in the area and increased reliability in the local peak load supply.

4.4 Forced Outages

There are currently no long-term forced outages with a significant impact on the transmission system reliability that is expected to extend into the 18-month period studied.

- End of Section -

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5.0 Overall Observations, Findings and Conclusions

The following findings and conclusions are based on the results of the assessment carried out for this Outlook.

Resource Adequacy

- Under the Existing Resource Scenario, reserve margins are forecast to be negative for most of the study period, with only a few exceptions. Resource shortfalls are most significant during the fall of 2003 and May and June 2004, when substantial resource reductions are identified based on submitted generator outages. A portion of the reserve shortfall in the fall of 2003 is expected to be mitigated by rescheduling certain generating unit outages to support more critical outage programs.
- Under the Planned Resource Scenario, the resource adequacy situation is significantly improved when compared to the Existing Resource Scenario. For most of the Outlook timeframe, forecast available resources exceed requirements. Opportunities exist for additional planned generator maintenance and exports.
- Results of the resource adequacy assessment are summarized in the matrix below. The different shadings are intended to suggest the degree of concern regarding the supply-demand situation under each resource-weather scenario combination.

	Normal Weather	Extreme Weather
Existing Resources	**- many planned outages at risk - imports required for much of the study period**	**- most planned outages at risk - imports maximized during peak periods - risk of insufficient supply**
Planned Resources	**- opportunities for additional outages/exports - occasional imports may be required**	**- many planned outages at risk - Imports required during peak periods**

- Tight demand/supply balances during periods of negative reserve margins will have several potential market impacts. These include upward pressure on wholesale market prices during peak demand periods and limited opportunities for the IMO to approve the release of generators for planned maintenance. Various responses can be anticipated and relied upon in these circumstances, including: for Ontario generators, maximizing their availability to offer into the Ontario market; for marketers, arranging imports to help meet anticipated Ontario requirements; and for consumers, taking measures to reduce their electricity consumption.
- The magnitude of resource deficiencies under extreme weather, clearly illustrates there are circumstances under which reliance on interconnected supply would be stretched close to the limits of the transmission system. The risk of even short-duration inability to meet demand during such conditions emphasizes the need for additional supply and price-responsive demand within Ontario.

- The majority of additional resources forecast for the study period come from laid-up nuclear units returning to service. An improved demand/supply situation is critically dependent on these units returning to service on schedule. To date, no laid-up nuclear unit has been returned to service in Ontario and there have been past delays in projected return dates. Although this history suggests a significant risk associated with return to service dates not being met, current information for some units, including achievement of critical milestone activities, is promising.
- A number of large generating units are scheduled to return to service from long duration maintenance outages at the beginning of summer 2003, with others scheduled to return from similar outages just prior to winter 2003/04. Similar to the return of laid-up nuclear units, meeting these schedules is critical to maintaining positive reserve margins.
- Higher than forecast generator unavailability, whether caused by higher forced outage rates, delays in commissioning new units or returning generators to service, could once again lead to extensive reliance on imports as was the case during 2002. Under these circumstances, opportunities for planned outages, especially during the summer period, would be very limited.
- Lower than forecast amounts of hydroelectric resources, due to drought conditions over some or all of the study period, or due to scheduling decisions, would reduce the available resource levels and increase the risk of energy shortages.
- Over the 18-month period under study, accounting for the availability of imported regional supply, the Northeast Power Coordinating Council resource adequacy criterion is expected to be met.

Transmission Adequacy

- There are some planned transmission outages that may reduce transmission capacity during the study period. These outages will be reassessed by the IMO during the approval timeframe.
- Avoiding planned outages and maximizing the reactive capability of the Lakeview, Pickering and Darlington units is required to maintain voltage levels above the minimum required levels in the Toronto zone during summer peak conditions.
- Restricting planned outages to transmission facilities in the Windsor area will assist in maintaining adequate voltage levels during summer peak periods
- Rotating reactive resources in the Thunder Bay area will continue to be required to address local voltage concerns.

- End of Section -

Appendix A Resource Adequacy Assessment Details

Table A1 Assessment of Resource Adequacy: Existing Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
06-Apr-03	30,700	6,764	0	23,936	22,737	20.3	4,041	14.3	2,842	1,199
13-Apr-03	30,700	8,075	0	22,625	22,525	14.3	2,833	13.8	2,733	100
20-Apr-03	30,700	8,110	0	22,590	22,238	15.5	3,036	13.7	2,684	352
27-Apr-03	30,700	8,246	0	22,454	21,663	17.2	3,289	13.0	2,498	791
04-May-03	30,700	8,804	0	21,896	21,308	16.5	3,099	13.4	2,511	588
11-May-03	30,700	8,735	0	21,965	21,987	18.3	3,399	18.4	3,421	-22
18-May-03	30,700	7,925	0	22,775	23,005	20.1	3,803	21.3	4,033	-230
25-May-03	30,700	6,700	0	24,000	23,479	22.8	4,462	20.2	3,941	521
01-Jun-03	30,700	7,276	0	23,424	23,804	17.5	3,482	19.4	3,862	-380
08-Jun-03	30,700	5,886	0	24,814	25,469	14.6	3,156	17.6	3,811	-655
15-Jun-03	30,700	5,442	0	25,258	26,576	12.0	2,708	17.9	4,026	-1,318
22-Jun-03	30,700	4,787	0	25,913	26,747	13.3	3,038	16.9	3,872	-834
29-Jun-03	30,700	5,204	0	25,496	26,939	11.7	2,669	18.0	4,112	-1,443
06-Jul-03	30,700	4,627	0	26,073	27,462	11.1	2,594	17.0	3,983	-1,389
13-Jul-03	30,700	4,321	0	26,379	27,471	11.4	2,695	16.0	3,787	-1,092
20-Jul-03	30,700	4,394	0	26,306	27,260	11.4	2,690	15.4	3,644	-954
27-Jul-03	30,700	4,289	0	26,411	27,117	12.3	2,888	15.3	3,594	-706
03-Aug-03	30,700	3,966	0	26,734	26,891	15.4	3,570	16.1	3,727	-157
10-Aug-03	30,700	4,116	0	26,584	27,198	14.1	3,279	16.7	3,893	-614
17-Aug-03	30,700	4,215	0	26,485	26,914	13.7	3,200	15.6	3,629	-429
24-Aug-03	30,700	4,178	0	26,522	27,065	14.5	3,353	16.8	3,896	-543
31-Aug-03	30,700	4,597	0	26,103	27,366	11.9	2,782	17.3	4,045	-1,263
07-Sep-03	30,700	5,771	0	24,929	25,272	15.7	3,375	17.3	3,718	-343
14-Sep-03	30,700	6,359	0	24,341	24,189	16.0	3,358	15.3	3,206	152
21-Sep-03	30,700	6,902	0	23,798	23,732	18.7	3,749	18.4	3,683	66
28-Sep-03	30,700	7,872	0	22,828	23,122	16.6	3,257	18.1	3,551	-294
05-Oct-03	30,700	8,107	0	22,593	21,696	17.5	3,367	12.9	2,470	897
12-Oct-03	30,700	10,551	0	20,149	22,105	3.1	601	13.1	2,557	-1,956
19-Oct-03	30,700	10,342	0	20,358	22,477	2.4	471	13.0	2,590	-2,119
26-Oct-03	30,700	9,906	0	20,794	22,937	3.0	614	13.7	2,757	-2,143
02-Nov-03	30,700	9,764	0	20,936	23,489	1.1	228	13.4	2,781	-2,553
09-Nov-03	30,500	7,263	0	23,237	24,596	7.6	1,638	13.9	2,997	-1,359
16-Nov-03	30,500	6,870	0	23,630	25,137	7.1	1,560	13.9	3,067	-1,507
23-Nov-03	30,500	5,634	0	24,866	25,655	10.4	2,349	13.9	3,138	-789
30-Nov-03	30,500	5,436	0	25,064	25,832	10.3	2,344	13.7	3,112	-768
07-Dec-03	30,500	4,950	0	25,550	26,836	9.1	2,121	14.5	3,407	-1,286
14-Dec-03	30,500	4,979	0	25,521	26,828	8.3	1,959	13.9	3,266	-1,307
21-Dec-03	30,500	3,308	0	27,192	27,279	14.2	3,377	14.6	3,464	-87
28-Dec-03	30,500	3,178	0	27,322	27,157	14.4	3,441	13.7	3,276	165

Note: The reader should be aware that Security and Adequacy Assessments are published on the IMO web site on a weekly and daily basis that progressively supersede information presented in this report.

(Table A1 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
04-Jan-04	30,500	3,168	0	27,332	25,346	23.9	5,274	14.9	3,288	1,986
11-Jan-04	30,500	3,717	0	26,783	27,532	11.1	2,671	14.2	3,420	-749
18-Jan-04	30,500	3,790	0	26,710	27,393	11.9	2,833	14.7	3,516	-683
25-Jan-04	30,500	3,790	0	26,710	27,085	12.8	3,033	14.4	3,408	-375
01-Feb-04	30,500	3,790	0	26,710	26,931	12.3	2,924	13.2	3,145	-221
08-Feb-04	30,500	3,722	0	26,778	26,804	13.8	3,240	13.9	3,266	-26
15-Feb-04	30,500	3,722	0	26,778	26,656	14.8	3,460	14.3	3,338	122
22-Feb-04	30,500	4,238	0	26,262	26,247	14.9	3,403	14.8	3,388	15
29-Feb-04	30,500	4,238	0	26,262	26,040	15.8	3,586	14.8	3,364	222
07-Mar-04	30,500	4,227	0	26,273	25,579	17.3	3,873	14.2	3,179	694
14-Mar-04	30,500	5,994	0	24,506	25,107	11.2	2,458	13.9	3,059	-601
21-Mar-04	30,500	6,484	0	24,016	24,642	10.9	2,351	13.7	2,977	-626
28-Mar-04	30,500	6,759	0	23,741	23,948	12.1	2,567	13.1	2,774	-207
04-Apr-04	30,500	7,325	0	23,175	23,713	11.4	2,365	14.0	2,903	-538
11-Apr-04	30,500	7,137	0	23,363	22,666	16.7	3,337	13.2	2,640	697
18-Apr-04	30,500	8,803	0	21,697	22,350	9.5	1,886	12.8	2,539	-653
25-Apr-04	30,500	8,135	0	22,365	21,883	15.2	2,955	12.7	2,473	482
02-May-04	30,500	8,135	0	22,365	21,487	17.4	3,321	12.8	2,443	878
09-May-04	30,500	9,854	0	20,646	22,116	9.8	1,836	17.6	3,306	-1,470
16-May-04	30,500	9,522	0	20,978	23,104	9.2	1,770	20.3	3,896	-2,126
23-May-04	30,500	8,116	0	22,384	23,339	13.2	2,609	18.0	3,564	-955
30-May-04	30,500	8,055	0	22,445	23,888	11.2	2,259	18.3	3,702	-1,443
06-Jun-04	30,500	5,808	0	24,692	25,563	12.3	2,702	16.3	3,573	-871
13-Jun-04	30,500	4,503	0	25,997	26,726	13.6	3,114	16.8	3,843	-729
20-Jun-04	30,500	3,685	0	26,815	26,878	15.6	3,615	15.9	3,678	-63
27-Jun-04	30,500	3,347	0	27,153	27,121	17.3	4,002	17.2	3,970	32
04-Jul-04	30,500	3,195	0	27,305	27,578	15.2	3,594	16.3	3,867	-273
11-Jul-04	30,500	3,328	0	27,172	27,699	13.2	3,158	15.4	3,685	-527
18-Jul-04	30,500	3,328	0	27,172	27,483	13.5	3,234	14.8	3,545	-311
25-Jul-04	30,500	3,328	0	27,172	27,345	14.0	3,329	14.7	3,502	-173
01-Aug-04	30,500	3,216	0	27,284	27,105	16.3	3,818	15.5	3,639	179
08-Aug-04	30,500	3,272	0	27,228	27,422	15.3	3,613	16.1	3,807	-194
15-Aug-04	30,500	3,264	0	27,236	27,116	15.5	3,650	15.0	3,530	120
22-Aug-04	30,500	3,260	0	27,240	27,272	16.1	3,770	16.2	3,802	-32
29-Aug-04	30,500	3,294	0	27,206	27,599	15.1	3,575	16.8	3,968	-393
05-Sep-04	30,500	5,078	0	25,422	26,314	14.5	3,213	18.5	4,105	-892
12-Sep-04	30,500	6,443	0	24,057	24,306	13.4	2,842	14.6	3,091	-249
19-Sep-04	30,500	6,991	0	23,509	23,803	15.9	3,233	17.4	3,527	-294
26-Sep-04	30,500	6,991	0	23,509	23,329	18.8	3,719	17.9	3,539	180
03-Oct-04	30,500	6,506	0	23,994	22,006	23.1	4,509	12.9	2,521	1,988

Table A2 Assessment of Resource Adequacy: Planned Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
06-Apr-03	30,700	6,764	300	24,236	22,737	21.8	4,341	14.3	2,842	1,499
13-Apr-03	30,700	8,075	300	22,925	22,525	15.8	3,133	13.8	2,733	400
20-Apr-03	30,700	8,110	300	22,890	22,238	17.1	3,336	13.7	2,684	652
27-Apr-03	30,700	8,246	300	22,754	21,663	18.7	3,589	13.0	2,498	1,091
04-May-03	30,700	8,804	300	22,196	21,308	18.1	3,399	13.4	2,511	888
11-May-03	30,700	8,735	300	22,265	21,987	19.9	3,699	18.4	3,421	278
18-May-03	30,700	7,925	300	23,075	23,005	21.6	4,103	21.3	4,033	70
25-May-03	31,470	6,713	300	25,057	23,594	28.3	5,519	20.8	4,056	1,463
01-Jun-03	31,470	7,289	300	24,481	23,917	22.8	4,539	19.9	3,975	564
08-Jun-03	31,470	5,904	300	25,866	25,551	19.4	4,208	18.0	3,893	315
15-Jun-03	31,470	5,460	300	26,310	26,642	16.7	3,760	18.2	4,092	-332
22-Jun-03	31,470	4,805	300	26,965	26,818	17.9	4,090	17.2	3,943	147
29-Jun-03	31,470	5,222	300	26,548	27,005	16.3	3,721	18.3	4,178	-457
06-Jul-03	31,470	4,645	300	27,125	27,532	15.5	3,646	17.3	4,053	-407
13-Jul-03	31,470	4,344	300	27,426	27,543	15.8	3,742	16.3	3,859	-117
20-Jul-03	32,240	3,925	300	28,615	27,470	21.2	4,999	16.3	3,854	1,145
27-Jul-03	32,240	3,820	300	28,720	27,340	22.1	5,197	16.2	3,817	1,380
03-Aug-03	32,240	3,497	300	29,043	27,146	25.4	5,879	17.2	3,982	1,897
10-Aug-03	32,240	3,657	300	28,883	27,413	23.9	5,578	17.6	4,108	1,470
17-Aug-03	32,240	3,756	300	28,784	27,133	23.6	5,499	16.5	3,848	1,651
24-Aug-03	32,240	3,719	300	28,821	27,285	24.4	5,652	17.8	4,116	1,536
31-Aug-03	32,240	4,138	300	28,402	27,547	21.8	5,081	18.1	4,226	855
07-Sep-03	32,240	5,312	300	27,228	25,514	26.3	5,674	18.4	3,960	1,714
14-Sep-03	32,240	5,900	300	26,640	24,454	27.0	5,657	16.5	3,471	2,186
21-Sep-03	32,240	6,443	300	26,097	23,991	30.2	6,048	19.7	3,942	2,106
28-Sep-03	32,240	7,413	300	25,127	23,375	28.4	5,556	19.4	3,804	1,752
05-Oct-03	32,240	7,638	300	24,902	22,011	29.5	5,676	14.5	2,785	2,891
12-Oct-03	32,240	10,082	300	22,458	22,283	14.9	2,910	14.0	2,735	175
19-Oct-03	32,240	9,873	300	22,667	22,655	14.0	2,780	13.9	2,768	12
26-Oct-03	32,240	9,437	300	23,103	23,111	14.5	2,923	14.5	2,931	-8
02-Nov-03	32,240	9,295	300	23,245	23,665	12.3	2,537	14.3	2,957	-420
09-Nov-03	32,040	6,784	300	25,556	24,767	18.3	3,957	14.7	3,168	789
16-Nov-03	32,040	7,143	300	25,197	25,237	14.2	3,127	14.4	3,167	-40
23-Nov-03	32,040	5,907	300	26,433	25,752	17.4	3,916	14.4	3,235	681
30-Nov-03	32,040	5,709	300	26,631	25,929	17.2	3,911	14.1	3,209	702
07-Dec-03	32,040	5,218	300	27,122	26,836	15.8	3,693	14.5	3,407	286
14-Dec-03	32,040	5,247	300	27,093	26,828	15.0	3,531	13.9	3,266	265
21-Dec-03	32,040	2,819	300	29,521	27,375	24.0	5,706	15.0	3,560	2,146
28-Dec-03	32,040	2,689	300	29,651	27,270	24.2	5,770	14.2	3,389	2,381

(Table A2 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
04-Jan-04	32,040	2,679	300	29,661	25,545	34.5	7,603	15.8	3,487	4,116
11-Jan-04	32,040	3,228	300	29,112	27,645	20.7	5,000	14.7	3,533	1,467
18-Jan-04	32,040	3,301	300	29,039	27,504	21.6	5,162	15.2	3,627	1,535
25-Jan-04	32,040	3,301	300	29,039	27,200	22.7	5,362	14.9	3,523	1,839
01-Feb-04	32,040	3,301	300	29,039	27,092	22.1	5,253	13.9	3,306	1,947
08-Feb-04	32,040	3,233	300	29,107	26,939	23.7	5,569	14.5	3,401	2,168
15-Feb-04	32,040	3,233	300	29,107	26,781	24.8	5,789	14.9	3,463	2,326
22-Feb-04	32,040	3,749	300	28,591	26,349	25.1	5,732	15.3	3,490	2,242
29-Feb-04	32,040	3,749	300	28,591	26,145	26.1	5,915	15.3	3,469	2,446
07-Mar-04	32,040	3,738	300	28,602	25,838	27.7	6,202	15.4	3,438	2,764
14-Mar-04	32,040	5,505	300	26,835	25,292	21.7	4,787	14.7	3,244	1,543
21-Mar-04	32,040	5,995	300	26,345	24,826	21.6	4,680	14.6	3,161	1,519
28-Mar-04	32,040	6,270	300	26,070	24,156	23.1	4,896	14.1	2,982	1,914
04-Apr-04	32,040	7,593	300	24,747	23,768	18.9	3,937	14.2	2,958	979
11-Apr-04	32,716	7,427	300	25,589	23,081	27.8	5,563	15.3	3,055	2,508
18-Apr-04	32,716	9,093	300	23,923	22,675	20.8	4,112	14.5	2,864	1,248
25-Apr-04	32,716	8,425	300	24,591	22,241	26.7	5,181	14.6	2,831	2,350
02-May-04	32,716	8,425	300	24,591	21,661	29.1	5,547	13.7	2,617	2,930
09-May-04	32,716	9,387	300	23,629	22,283	25.6	4,819	18.5	3,473	1,346
16-May-04	32,716	9,055	300	23,961	23,360	24.7	4,753	21.6	4,152	601
23-May-04	32,716	7,649	300	25,367	23,636	28.3	5,592	19.5	3,861	1,731
30-May-04	32,716	7,588	300	25,428	24,163	26.0	5,242	19.7	3,977	1,265
06-Jun-04	32,716	6,098	300	26,918	25,671	22.4	4,928	16.7	3,681	1,247
13-Jun-04	32,716	4,814	300	28,202	26,846	23.2	5,319	17.3	3,963	1,356
20-Jun-04	32,716	3,996	300	29,020	27,025	25.1	5,820	16.5	3,825	1,995
27-Jun-04	32,716	3,658	300	29,358	27,285	26.8	6,207	17.9	4,134	2,073
04-Jul-04	32,716	3,506	300	29,510	27,716	24.5	5,799	16.9	4,005	1,794
11-Jul-04	32,716	2,396	300	30,620	27,920	27.5	6,606	16.3	3,906	2,700
18-Jul-04	32,716	2,396	300	30,620	27,715	27.9	6,682	15.8	3,777	2,905
25-Jul-04	32,716	2,396	300	30,620	27,586	28.4	6,777	15.7	3,743	3,034
01-Aug-04	32,716	2,284	300	30,732	27,381	31.0	7,266	16.7	3,915	3,351
08-Aug-04	32,716	2,350	300	30,666	27,677	29.9	7,051	17.2	4,062	2,989
15-Aug-04	32,716	2,342	300	30,674	27,382	30.1	7,088	16.1	3,796	3,292
22-Aug-04	32,716	2,338	300	30,678	27,537	30.7	7,208	17.3	4,067	3,141
29-Aug-04	32,716	2,372	300	30,644	27,845	29.7	7,013	17.8	4,214	2,799
05-Sep-04	32,716	4,142	300	28,874	26,554	30.0	6,665	19.6	4,345	2,320
12-Sep-04	32,716	5,507	300	27,509	24,559	29.7	6,294	15.8	3,344	2,950
19-Sep-04	32,716	6,055	300	26,961	24,067	33.0	6,685	18.7	3,791	2,894
26-Sep-04	32,716	6,055	300	26,961	23,598	36.2	7,171	19.2	3,808	3,363
03-Oct-04	32,716	5,570	300	27,446	22,328	40.9	7,961	14.6	2,843	5,118

Table A3 Demand Forecast Range For Required Resources Calculation

Week Ending Day	Ontario Demand Normal Weather MW	Ontario Demand Extreme Weather MW
06-Apr-03	19,895	21,125
13-Apr-03	19,792	20,706
20-Apr-03	19,554	20,281
27-Apr-03	19,165	20,008
04-May-03	18,797	19,447
11-May-03	18,566	21,639
18-May-03	18,972	21,665
25-May-03	19,538	22,236
01-Jun-03	19,942	22,686
08-Jun-03	21,658	24,940
15-Jun-03	22,550	25,546
22-Jun-03	22,875	25,355
29-Jun-03	22,827	25,740
06-Jul-03	23,479	26,023
13-Jul-03	23,684	26,270
20-Jul-03	23,616	25,591
27-Jul-03	23,523	25,386
03-Aug-03	23,164	25,749
10-Aug-03	23,305	26,239
17-Aug-03	23,285	25,448
24-Aug-03	23,169	25,531
31-Aug-03	23,321	26,397
07-Sep-03	21,554	24,001
14-Sep-03	20,983	22,836
21-Sep-03	20,049	23,306
28-Sep-03	19,571	22,128
05-Oct-03	19,226	19,865
12-Oct-03	19,548	20,106
19-Oct-03	19,887	20,807
26-Oct-03	20,180	20,819
02-Nov-03	20,708	21,230
09-Nov-03	21,599	22,477
16-Nov-03	22,070	23,210
23-Nov-03	22,517	23,723
30-Nov-03	22,720	24,143
07-Dec-03	23,429	25,330
14-Dec-03	23,562	24,851
21-Dec-03	23,815	25,552
28-Dec-03	23,881	25,424

(Table A3 continued)

Week Ending Day	Ontario Demand Normal Weather MW	Ontario Demand Extreme Weather MW
04-Jan-04	22,058	23,803
11-Jan-04	24,112	25,878
18-Jan-04	23,877	25,443
25-Jan-04	23,677	25,375
01-Feb-04	23,786	24,943
08-Feb-04	23,538	24,976
15-Feb-04	23,318	25,105
22-Feb-04	22,859	24,143
29-Feb-04	22,676	24,351
07-Mar-04	22,400	23,865
14-Mar-04	22,048	23,603
21-Mar-04	21,665	23,090
28-Mar-04	21,174	22,513
04-Apr-04	20,810	22,388
11-Apr-04	20,026	20,944
18-Apr-04	19,811	20,541
25-Apr-04	19,410	20,257
02-May-04	19,044	19,697
09-May-04	18,810	21,888
16-May-04	19,208	21,906
23-May-04	19,775	22,479
30-May-04	20,186	22,935
06-Jun-04	21,990	25,276
13-Jun-04	22,883	25,883
20-Jun-04	23,200	25,683
27-Jun-04	23,151	26,067
04-Jul-04	23,711	26,257
11-Jul-04	24,014	26,604
18-Jul-04	23,938	25,914
25-Jul-04	23,843	25,708
01-Aug-04	23,466	26,053
08-Aug-04	23,615	26,552
15-Aug-04	23,586	25,751
22-Aug-04	23,470	25,834
29-Aug-04	23,631	26,710
05-Sep-04	22,209	25,082
12-Sep-04	21,215	23,072
19-Sep-04	20,276	23,539
26-Sep-04	19,790	22,351
03-Oct-04	19,485	20,127

Table A4 Assessment of Resource Adequacy: Extreme Weather, Existing Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
06-Apr-03	30,700	6,747	0	23,953	23,807	13.4	2,828	12.7	2,682	146
13-Apr-03	30,700	8,060	0	22,640	23,356	9.3	1,934	12.8	2,650	-716
20-Apr-03	30,700	8,097	0	22,603	22,881	11.5	2,322	12.8	2,600	-278
27-Apr-03	30,700	8,237	0	22,463	22,452	12.3	2,455	12.2	2,444	11
04-May-03	30,700	8,794	0	21,906	21,908	12.6	2,459	12.7	2,461	-2
11-May-03	30,700	8,739	0	21,961	24,352	1.5	322	12.5	2,713	-2,391
18-May-03	30,700	7,937	0	22,763	24,404	5.1	1,098	12.6	2,739	-1,641
25-May-03	30,700	6,703	0	23,997	25,206	7.9	1,761	13.4	2,970	-1,209
01-Jun-03	30,700	7,282	0	23,418	25,524	3.2	732	12.5	2,838	-2,106
08-Jun-03	30,700	5,880	0	24,820	27,981	-0.5	-120	12.2	3,041	-3,161
15-Jun-03	30,700	5,436	0	25,264	28,786	-1.1	-282	12.7	3,240	-3,522
22-Jun-03	30,700	4,790	0	25,910	28,564	2.2	555	12.7	3,209	-2,654
29-Jun-03	30,700	5,207	0	25,493	28,957	-1.0	-247	12.5	3,217	-3,464
06-Jul-03	30,700	4,632	0	26,068	29,241	0.2	45	12.4	3,218	-3,173
13-Jul-03	30,700	4,319	0	26,381	29,501	0.4	111	12.3	3,231	-3,120
20-Jul-03	30,700	4,387	0	26,313	28,760	2.8	722	12.4	3,169	-2,447
27-Jul-03	30,700	4,288	0	26,412	28,524	4.0	1,026	12.4	3,138	-2,112
03-Aug-03	30,700	3,971	0	26,729	28,943	3.8	980	12.4	3,194	-2,214
10-Aug-03	30,700	4,112	0	26,588	29,477	1.3	349	12.3	3,238	-2,889
17-Aug-03	30,700	4,212	0	26,488	28,630	4.1	1,040	12.5	3,182	-2,142
24-Aug-03	30,700	4,179	0	26,521	28,717	3.9	990	12.5	3,186	-2,196
31-Aug-03	30,700	4,597	0	26,103	29,644	-1.1	-294	12.3	3,247	-3,541
07-Sep-03	30,700	5,782	0	24,918	26,975	3.8	917	12.4	2,974	-2,057
14-Sep-03	30,700	6,378	0	24,322	25,654	6.5	1,486	12.3	2,818	-1,332
21-Sep-03	30,700	6,911	0	23,789	26,151	2.1	483	12.2	2,845	-2,362
28-Sep-03	30,700	7,877	0	22,823	24,769	3.1	695	11.9	2,641	-1,946
05-Oct-03	30,700	8,100	0	22,600	22,290	13.8	2,735	12.2	2,425	310
12-Oct-03	30,700	10,551	0	20,149	22,611	0.2	43	12.5	2,505	-2,462
19-Oct-03	30,700	10,342	0	20,358	23,356	-2.2	-449	12.3	2,549	-2,998
26-Oct-03	30,700	9,890	0	20,810	23,493	0.0	-9	12.8	2,674	-2,683
02-Nov-03	30,700	9,758	0	20,942	23,955	-1.4	-288	12.8	2,725	-3,013
09-Nov-03	30,500	7,263	0	23,237	25,332	3.4	760	12.7	2,855	-2,095
16-Nov-03	30,500	6,870	0	23,630	26,246	1.8	420	13.1	3,036	-2,616
23-Nov-03	30,500	5,634	0	24,866	26,731	4.8	1,143	12.7	3,008	-1,865
30-Nov-03	30,500	5,436	0	25,064	27,135	3.8	921	12.4	2,992	-2,071
07-Dec-03	30,500	4,950	0	25,550	28,155	0.9	220	11.2	2,825	-2,605
14-Dec-03	30,500	4,979	0	25,521	27,639	2.7	670	11.2	2,788	-2,118
21-Dec-03	30,500	3,308	0	27,192	28,478	6.4	1,640	11.5	2,926	-1,286
28-Dec-03	30,500	3,178	0	27,322	28,332	7.5	1,898	11.4	2,908	-1,010

(Table A4 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
04-Jan-04	30,500	3,168	0	27,332	26,696	14.8	3,529	12.2	2,893	636
11-Jan-04	30,500	3,717	0	26,783	28,905	3.5	905	11.7	3,027	-2,122
18-Jan-04	30,500	3,790	0	26,710	28,439	5.0	1,267	11.8	2,996	-1,729
25-Jan-04	30,500	3,790	0	26,710	28,366	5.3	1,335	11.8	2,991	-1,656
01-Feb-04	30,500	3,790	0	26,710	27,903	7.1	1,767	11.9	2,960	-1,193
08-Feb-04	30,500	3,722	0	26,778	27,934	7.2	1,802	11.8	2,958	-1,156
15-Feb-04	30,500	3,722	0	26,778	28,071	6.7	1,673	11.8	2,966	-1,293
22-Feb-04	30,500	4,238	0	26,262	27,048	8.8	2,119	12.0	2,905	-786
29-Feb-04	30,500	4,238	0	26,262	27,271	7.9	1,911	12.0	2,920	-1,009
07-Mar-04	30,500	4,227	0	26,273	26,743	10.1	2,408	12.1	2,878	-470
14-Mar-04	30,500	5,994	0	24,506	26,409	3.8	903	11.9	2,806	-1,903
21-Mar-04	30,500	6,484	0	24,016	25,816	4.0	926	11.8	2,726	-1,800
28-Mar-04	30,500	6,739	0	23,761	25,064	5.5	1,248	11.3	2,551	-1,303
04-Apr-04	30,500	7,325	0	23,175	25,079	3.5	787	12.0	2,691	-1,904
11-Apr-04	30,500	7,137	0	23,363	23,491	11.6	2,419	12.2	2,547	-128
18-Apr-04	30,500	8,803	0	21,697	22,984	5.6	1,156	11.9	2,443	-1,287
25-Apr-04	30,500	8,135	0	22,365	22,628	10.4	2,108	11.7	2,371	-263
02-May-04	30,500	8,135	0	22,365	21,963	13.6	2,668	11.5	2,266	402
09-May-04	30,500	9,854	0	20,646	24,377	-5.7	-1,242	11.4	2,489	-3,731
16-May-04	30,500	9,522	0	20,978	24,515	-4.2	-928	11.9	2,609	-3,537
23-May-04	30,500	8,116	0	22,384	25,090	-0.4	-95	11.6	2,611	-2,706
30-May-04	30,500	8,068	0	22,432	25,581	-2.2	-503	11.5	2,646	-3,149
06-Jun-04	30,500	5,808	0	24,692	28,041	-2.3	-584	10.9	2,765	-3,349
13-Jun-04	30,500	4,503	0	25,997	28,913	0.4	114	11.7	3,030	-2,916
20-Jun-04	30,500	3,685	0	26,815	28,673	4.4	1,132	11.6	2,990	-1,858
27-Jun-04	30,500	3,347	0	27,153	29,124	4.2	1,086	11.7	3,057	-1,971
04-Jul-04	30,500	3,195	0	27,305	29,339	4.0	1,048	11.7	3,082	-2,034
11-Jul-04	30,500	3,328	0	27,172	29,717	2.1	568	11.7	3,113	-2,545
18-Jul-04	30,500	3,328	0	27,172	28,970	4.9	1,258	11.8	3,056	-1,798
25-Jul-04	30,500	3,328	0	27,172	28,749	5.7	1,464	11.8	3,041	-1,577
01-Aug-04	30,500	3,221	0	27,279	29,143	4.7	1,226	11.9	3,090	-1,864
08-Aug-04	30,500	3,268	0	27,232	29,684	2.6	680	11.8	3,132	-2,452
15-Aug-04	30,500	3,261	0	27,239	28,818	5.8	1,488	11.9	3,067	-1,579
22-Aug-04	30,500	3,260	0	27,240	28,909	5.4	1,406	11.9	3,075	-1,669
29-Aug-04	30,500	3,294	0	27,206	29,859	1.9	496	11.8	3,149	-2,653
05-Sep-04	30,500	5,075	0	25,425	28,106	1.4	343	12.1	3,024	-2,681
12-Sep-04	30,500	6,462	0	24,038	25,751	4.2	966	11.6	2,679	-1,713
19-Sep-04	30,500	6,991	0	23,509	26,209	-0.1	-30	11.3	2,670	-2,700
26-Sep-04	30,500	6,991	0	23,509	24,920	5.2	1,158	11.5	2,569	-1,411
03-Oct-04	30,500	6,506	0	23,994	22,546	19.2	3,867	12.0	2,419	1,448

Table A5 Assessment of Resource Adequacy: Extreme Weather, Planned Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
06-Apr-03	30,700	6,747	300	24,253	23,807	14.8	3,128	12.7	2,682	446
13-Apr-03	30,700	8,060	300	22,940	23,356	10.8	2,234	12.8	2,650	-416
20-Apr-03	30,700	8,097	300	22,903	22,881	12.9	2,622	12.8	2,600	22
27-Apr-03	30,700	8,237	300	22,763	22,452	13.8	2,755	12.2	2,444	311
04-May-03	30,700	8,794	300	22,206	21,908	14.2	2,759	12.7	2,461	298
11-May-03	30,700	8,739	300	22,261	24,352	2.9	622	12.5	2,713	-2,091
18-May-03	30,700	7,937	300	23,063	24,404	6.5	1,398	12.6	2,739	-1,341
25-May-03	31,470	6,716	300	25,054	25,293	12.7	2,818	13.8	3,057	-239
01-Jun-03	31,470	7,295	300	24,475	25,613	7.9	1,789	12.9	2,927	-1,138
08-Jun-03	31,470	5,898	300	25,872	28,066	3.7	932	12.5	3,126	-2,194
15-Jun-03	31,470	5,454	300	26,316	28,870	3.0	770	13.0	3,324	-2,554
22-Jun-03	31,470	4,808	300	26,962	28,651	6.3	1,607	13.0	3,296	-1,689
29-Jun-03	31,470	5,225	300	26,545	29,042	3.1	805	12.8	3,302	-2,497
06-Jul-03	31,470	4,650	300	27,120	29,326	4.2	1,097	12.7	3,303	-2,206
13-Jul-03	31,470	4,342	300	27,428	29,585	4.4	1,158	12.6	3,315	-2,157
20-Jul-03	32,240	3,918	300	28,622	28,945	11.8	3,031	13.1	3,354	-323
27-Jul-03	32,240	3,819	300	28,721	28,710	13.1	3,335	13.1	3,324	11
03-Aug-03	32,240	3,502	300	29,038	29,117	12.8	3,289	13.1	3,368	-79
10-Aug-03	32,240	3,653	300	28,887	29,648	10.1	2,648	13.0	3,409	-761
17-Aug-03	32,240	3,753	300	28,787	28,803	13.1	3,339	13.2	3,355	-16
24-Aug-03	32,240	3,720	300	28,820	28,889	12.9	3,289	13.2	3,358	-69
31-Aug-03	32,240	4,138	300	28,402	29,816	7.6	2,005	13.0	3,419	-1,414
07-Sep-03	32,240	5,323	300	27,217	27,150	13.4	3,216	13.1	3,149	67
14-Sep-03	32,240	5,919	300	26,621	25,831	16.6	3,785	13.1	2,995	790
21-Sep-03	32,240	6,452	300	26,088	26,328	11.9	2,782	13.0	3,022	-240
28-Sep-03	32,240	7,418	300	25,122	24,950	13.5	2,994	12.8	2,822	172
05-Oct-03	32,240	7,631	300	24,909	22,567	25.4	5,044	13.6	2,702	2,342
12-Oct-03	32,240	10,082	300	22,458	22,801	11.7	2,352	13.4	2,695	-343
19-Oct-03	32,240	9,873	300	22,667	23,542	8.9	1,860	13.1	2,735	-875
26-Oct-03	32,240	9,421	300	23,119	23,673	11.1	2,300	13.7	2,854	-554
02-Nov-03	32,240	9,289	300	23,251	24,136	9.5	2,021	13.7	2,906	-885
09-Nov-03	32,040	6,784	300	25,556	25,513	13.7	3,079	13.5	3,036	43
16-Nov-03	32,040	7,143	300	25,197	26,347	8.6	1,987	13.5	3,137	-1,150
23-Nov-03	32,040	5,907	300	26,433	26,833	11.4	2,710	13.1	3,110	-400
30-Nov-03	32,040	5,709	300	26,631	27,238	10.3	2,488	12.8	3,095	-607
07-Dec-03	32,040	5,218	300	27,122	28,260	7.1	1,792	11.6	2,930	-1,138
14-Dec-03	32,040	5,247	300	27,093	27,743	9.0	2,242	11.6	2,892	-650
21-Dec-03	32,040	2,819	300	29,521	28,658	15.5	3,969	12.2	3,106	863
28-Dec-03	32,040	2,689	300	29,651	28,513	16.6	4,227	12.2	3,089	1,138

(Table A5 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-Responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Margin MW
04-Jan-04	32,040	2,679	300	29,661	26,946	24.6	5,858	13.2	3,143	2,715
11-Jan-04	32,040	3,228	300	29,112	29,050	12.5	3,234	12.3	3,172	62
18-Jan-04	32,040	3,301	300	29,039	28,584	14.1	3,596	12.4	3,141	455
25-Jan-04	32,040	3,301	300	29,039	28,511	14.4	3,664	12.4	3,136	528
01-Feb-04	32,040	3,301	300	29,039	28,048	16.4	4,096	12.5	3,105	991
08-Feb-04	32,040	3,233	300	29,107	28,079	16.5	4,131	12.4	3,103	1,028
15-Feb-04	32,040	3,233	300	29,107	28,217	15.9	4,002	12.4	3,112	890
22-Feb-04	32,040	3,749	300	28,591	27,197	18.4	4,448	12.7	3,054	1,394
29-Feb-04	32,040	3,749	300	28,591	27,418	17.4	4,240	12.6	3,067	1,173
07-Mar-04	32,040	3,738	300	28,602	26,919	19.9	4,737	12.8	3,054	1,683
14-Mar-04	32,040	5,505	300	26,835	26,561	13.7	3,232	12.5	2,958	274
21-Mar-04	32,040	5,995	300	26,345	25,966	14.1	3,255	12.5	2,876	379
28-Mar-04	32,040	6,250	300	26,090	25,219	15.9	3,577	12.0	2,706	871
04-Apr-04	32,040	7,593	300	24,747	25,127	10.5	2,359	12.2	2,739	-380
11-Apr-04	32,716	7,427	300	25,589	23,842	22.2	4,645	13.8	2,898	1,747
18-Apr-04	32,716	9,093	300	23,923	23,276	16.5	3,382	13.3	2,735	647
25-Apr-04	32,716	8,425	300	24,591	22,968	21.4	4,334	13.4	2,711	1,623
02-May-04	32,716	8,425	300	24,591	22,211	24.9	4,894	12.8	2,514	2,380
09-May-04	32,716	9,387	300	23,629	24,583	8.0	1,741	12.3	2,695	-954
16-May-04	32,716	9,055	300	23,961	24,723	9.4	2,055	12.9	2,817	-762
23-May-04	32,716	7,649	300	25,367	25,296	12.9	2,888	12.5	2,817	71
30-May-04	32,716	7,601	300	25,415	25,788	10.8	2,480	12.4	2,853	-373
06-Jun-04	32,716	6,098	300	26,918	28,096	6.5	1,642	11.2	2,820	-1,178
13-Jun-04	32,716	4,814	300	28,202	28,966	9.0	2,319	11.9	3,083	-764
20-Jun-04	32,716	3,996	300	29,020	28,727	13.0	3,337	11.9	3,044	293
27-Jun-04	32,716	3,658	300	29,358	29,176	12.6	3,291	11.9	3,109	182
04-Jul-04	32,716	3,506	300	29,510	29,390	12.4	3,253	11.9	3,133	120
11-Jul-04	32,716	2,396	300	30,620	29,814	15.1	4,016	12.1	3,210	806
18-Jul-04	32,716	2,396	300	30,620	29,069	18.2	4,706	12.2	3,155	1,551
25-Jul-04	32,716	2,396	300	30,620	28,858	19.1	4,912	12.3	3,150	1,762
01-Aug-04	32,716	2,289	300	30,727	29,243	17.9	4,674	12.2	3,190	1,484
08-Aug-04	32,716	2,346	300	30,670	29,780	15.5	4,118	12.2	3,228	890
15-Aug-04	32,716	2,339	300	30,677	28,934	19.1	4,926	12.4	3,183	1,743
22-Aug-04	32,716	2,338	300	30,678	29,017	18.8	4,844	12.3	3,183	1,661
29-Aug-04	32,716	2,372	300	30,644	29,955	14.7	3,934	12.2	3,245	689
05-Sep-04	32,716	4,139	300	28,877	28,202	15.1	3,795	12.4	3,120	675
12-Sep-04	32,716	5,526	300	27,490	25,876	19.2	4,418	12.2	2,804	1,614
19-Sep-04	32,716	6,055	300	26,961	26,309	14.5	3,422	11.8	2,770	652
26-Sep-04	32,716	6,055	300	26,961	25,062	20.6	4,610	12.1	2,711	1,899
03-Oct-04	32,716	5,570	300	27,446	22,875	36.4	7,319	13.7	2,748	4,571

Table A6 Energy Production Capability Forecast

Month	Forecast Energy Production Capability Existing Resource Scenario (GWh)	Forecast Energy Production Capability Planned Resource Scenario (GWh)
Apr 2003	13,549	13,553
May 2003	14,384	14,873
Jun 2003	15,214	15,699
Jul 2003	16,239	17,320
Aug 2003	15,802	17,110
Sep 2003	13,579	14,862
Oct 2003	11,700	13,063
Nov 2003	13,883	14,831
Dec 2003	16,436	17,665
Jan 2004	16,804	18,188
Feb 2004	15,594	16,892
Mar 2004	15,285	16,685
Apr 2004	13,726	15,031
May 2004	13,585	15,416
Jun 2004	15,633	16,910
Jul 2004	16,259	18,355
Aug 2004	16,019	18,173
Sep 2004	13,397	15,496

- End of Section -

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Appendix B Transmission Projects

East Zone	Projected I/S Date
Port Hope TS & Sidney TS: Install auto "switch off" capability on five low voltage shunt capacitor banks.	2003-Q2
Sidney TS: Replace low voltage capacity bank circuit breaker SC1Q.	2003-Q3

Niagara Zone	Projected I/S Date
Murray TS: Install three new feeder breakers.	2003-Q2
Niagara-on-the-Lake TS: New 42 MVA 110/28 kV transformer station.	2003-Q2
Winona TS: New transformer station connected to 115 kV circuit Q2AH.	2003-Q2
Norfolk TS: Replace transformers with two 83.3 MVA units.	2003-Q4
Norfolk TS: String second 115 kV circuit on the existing double circuit tower from Vanessa Jct. To Norfolk TS.	2003-Q4
Kalar TS: New 115/14.2 kV transformer station off lines A36N & A37N.	2004-Q2

Northeast Zone	Projected I/S Date
Hearst TS: Replace low voltage transformer breaker.	2003-Q2
Porcupine TS: Replace 230 kV breaker T7L91.	2003-Q2
Porcupine TS: Refurbish and replace 500 kV transformer and breaker disconnect switches.	2003-Q2
Chenaux TS: Add two new 230 kV breakers. Reconnect T4 transformer.	2003-Q3
Wawa TS: Install reactive compensation; 4 x 40 Mvar.	2003-Q4

Northwest Zone	Projected I/S Date
NW Ontario: New 115 kV line to supply the First Nations community.	2003-Q3
Birch TS: Install 80 Mvar shunt capacitor.	2003-Q4

Ottawa Zone	Projected I/S Date
Albion TS: Replace 230 kV transformer disconnect switches.	2003-Q2
Albion TS: Replace 230 kV rod gaps with metal oxide surge arresters.	2003-Q4
Hawthorne TS: Add one 250 MVA 230/115 kV autotransformer and one new double circuit line from Hawthorne to Blackburn Jct..	2003-Q4
Merivale TS: Replace 115 kV breakers L1LT22, L1L5, L3L12 and associated disconnect switches.	2003-Q4

Southwest Zone	Projected I/S Date
Bronte TS: Install two new feeders.	2003-Q2
Dundas TS: New transformer station connected to 115 kV double circuit B12/B13.	2003-Q2
Winona TS: New transformer station connected to 115 kV circuit Q2AH.	2003-Q2
Goderich TS: Replace capacitor bank circuit breaker SC1B.	2003-Q3
Kenilworth TS: Replace 115 kV transformer disconnect and grounding switches.	2003-Q3
St. Mary TS: Refurbish 115 kV station.	2003-Q3
Kenilworth TS: Replace 115 kV rod gaps with metal oxide surge arresters.	2003-Q4
Mohawk TS: Replace low voltage capacitor banks SC2 and SC3.	2003-Q4
Nanticoke TGS: Replace station service transformers.	2003-Q4
St. Mary TS: Add three new feeders.	2003-Q4
Niagara West TS: New transformer station with two 50/67/83 MVA transformers.	2004-Q1
Caledonia TS: Add two new 75/125 MVA 230/115 kV autotransformers and re-supply Norfolk TS off these new autotransformers.	2004-Q2
Kitchener: Build new 230/14.2 kV transformer station.	2004-Q2

(Appendix B continued)

Toronto Zone	Projected I/S Date
Fairchild TS: Replace low voltage bus tie breaker.	2003-Q2
Glengrove TS: Replace T2 transformer.	2003-Q2
Hearn TGS: Install 125 MVar 115 kV capacitor bank.	2003-Q2
Manby TS: Replace 115 kV and 230 kV transformer disconnect switches.	2003-Q3
Richview TS: Replace 230 kV breaker disconnect switches.	2003-Q3
Strachan TS: Replace 115 kV grounding switch and transformer disconnect switch.	2003-Q3
Glengrove TS: Refurbish 115 kV station.	2003-Q4
Leaside TS: Replace 115 kV line disconnect switch.	2003-Q4
Manby TS: Replace 115 kV and 230 kV rod gaps with metal oxide surge arresters.	2003-Q4
Runnymede TS: Replace low voltage capacitor banks SC3 and SC4.	2003-Q4
Strachan TS: Replace 115 kV rod gaps with metal oxide surge arresters.	2003-Q4
Cecil TS: Increase station capacity.	2004-Q2
Leaside TS: Install 125 Mvar capacitor bank.	2004-Q2
Pickering A NGS: Refurbish 230 kV switchyard - G1.	2004-Q2
Markham: New transformer station connected to 230 kV circuits C11R and C12R.	2004-Q3

West Zone	Projected I/S Date
Scott TS: Replace 230 kV breaker AL25 and upgrade existing facilities for the TransAlta Project.	2003-Q2
Kent TS: Install new 125 MVA 230/115 kV autotransformer.	2003-Q4
London Highbury TS: Replace low voltage capacitor bank SC2.	2003-Q4
Keith TS: Install new/upgrade existing facilities for incorporation of the ATCO Project.	2004-Q1
Belle River TS: Install new 41MVA 115/27.6 kV transformer.	2004-Q2
Windsor Area: Enhance Windsor Area Overload Protection Scheme.	2004-Q2

- End of Section -

Appendix C Planned Transmission Outages

The following tables list the planned transmission outages by transmission zone, for transmission outages with an expected duration of six days or greater, and/or for those transmission outages associated with a major project.

Table C1 Bruce Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
3/31/03 8:00 AM	5/9/03 4:30 PM	Bruce A TS.T4L560	DWW	5 Day	FABC NBLIP	FABC - No reduction in Limit; affects G/R arming requirements. NBLIP - 1000 or 500 MW depending on the Bruce and Longwood reactor availability
5/20/03 8:00 AM	6/27/03 4:30 PM	Bruce A TS.EL560	DWW	5 Hour	FABC NBLIP	FABC - No reduction in Limit; affects G/R arming requirements. NBLIP - 1000 or 500 MW depending on the Bruce and Longwood reactor availability
9/3/03 8:00 AM	10/10/03 4:30 PM	Bruce A TS.T28L562	DWW	5 Hour	FABC NBLIP	FABC - No reduction in Limit; affects G/R arming requirements. NBLIP - 1000 or 500 MW depending on the Bruce and Longwood reactor availability

Table C2 East Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
2/28/03 8:30 AM	4/11/03 8:30 AM	Dobbin TS.20-P20	CWW	4 Hour		
4/7/03 8:00 AM	5/23/03 4:00 PM	D6_CHALKRIVER	CWW	4 Hour	The maximum amount of load that can be supplied from Chenaux is approximately 90MW.	
5/5/03 7:00 AM	5/16/03 4:30 PM	Northbrooke DS.74B1S-12, Lodgeroom DS.38B1S-14	CNW	4 Hour		
5/20/03 8:00 AM	6/13/03 4:00 PM	Northbrooke DS.74B1S-12, Lodgeroom DS.38B1S-14	CNW	4 Hour		
7/7/03 7:00 AM	8/1/03 4:00 PM	X21	CNW	4 Hour		
8/5/03 7:00 AM	8/15/03 4:00 PM	X21	CNW	4 Hour		
8/18/03 7:00 AM	8/29/03 4:00 PM	X22	CNW	4 Hour		
9/2/03 7:00 AM	9/26/03 4:00 PM	X22	CNW	4 Hour		

Table C2 East Zone (continued)

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
9/15/03 7:00 AM	9/15/03 6:00 PM	Chenaux TS.A4_BUS, Chenaux TS.A1A4, Chenaux TS.4-X1P, Chenaux TS.A1-A2, Chenaux TS.A3-A4, Chenaux TS.4X6, Chenaux TS.4X1P, Chenaux TS.4X2Y	DNW	0 Non-Recallable	All Chenaux generation is constrained off. Limits the amount of load that can be supported in the Renfrew area from Des Joachims. Approximately 55 and 75 MW of load can be supplied without and with generation support from Quebec, respectively. Renfrew area demand estimated at a peak of 110 MW to an off peak of 75 MW.	
9/16/03 7:00 AM	9/21/03 6:00 PM	X1P, Chenaux TS.A3-A4, Chenaux TS.A1-A2, Chenaux TS.4X6, Chenaux TS.4X1P, Chenaux TS.4-X1P	CWW	24 Hour	Chenaux G5 to G8 generation is constrained off. Limits the amount of load that can be supported in the Renfrew area from Des Joachims. Approximately 55 and 75 MW of load can be supplied without and with generation support from Quebec, respectively. With no Quebec support, approx. 95 MW can be supplied with generation support from Chenaux G1 to G4. With Quebec and Chenaux support, approx. 115 MW can be supplied. Renfrew area demand estimated at a peak of 110 MW to an off peak of 75 MW. Hydroelectric production capability is a concern.	
9/22/03 7:00 AM	9/26/03 6:00 PM	Chenaux TS.A3-A4, Chenaux TS.A1-A2, Chenaux TS.4X2Y, Chenaux TS.A1A4	CWW	24 Hour	Chenaux G1 to G4 generation is constrained off.	
9/22/03 7:00 AM	11/7/03 11:00 AM	Chenaux TS.A1-A2	CWW	0 Non-Recallable	September 22-26: Covered by outage above. September 26-November 7: No impact.	
11/11/03 7:00 AM	11/11/03 11:00 AM	Chenaux TS.T4, Chenaux TS.A1-A2, Chenaux TS.4X6	DNW	4 Hour	Chenaux G5 to G8 generation is constrained off.	

Table C3 Essa Zone

No outages to analyze.

Table C4 Niagara Zone

No outages to analyze.

Table C5 Northeast Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
4/14/03 9:00 AM	5/9/03 5:00 PM	Pinard TS.PL20	CWW	0 Non-Recallable		
05/20/03 08:00 AM	05/23/03 06:00 PM	Porcupine TS.H2_BUS, Porcupine TS.T4, Porcupine TS.T8	CNW	8 Hour		Up to 800 MW of Northeast genration may be constrained off.
05/23/03 06:00 PM	06/06/03 04:00 PM	Porcupine TS.H2-BC	CWW	4 Hour		
05/26/03 08:00 AM	05/26/03 12:00 PM	P502X, Porcupine TS.P502X_Terminal	DNW	4 Hour		Up to 800 MW of Northeast genration may be constrained off.
05/26/03 12:00 PM	06/06/03 08:00 AM	Porcupine TS.H1_BUS, Porcupine TS.T7, Porcupine TS.T3	CWW	0 Non-Recallable		
6/2/03 5:00 AM	6/13/03 6:00 PM	A9K_ANSONVILLE	CWW	4 Hour		
6/2/03 5:00 AM	6/20/03 6:00 PM	L5H_NORTHBAY	CWW	4 Hour	Ontario - Quebec North Interconnection	Mode 2 on H4Z 5 MW Mode 3 on D4Z 15 MW
06/06/03 08:00 AM	06/06/03 12:00 PM	P502X, Porcupine TS.P502X_Terminal	DNW	4 Hour		Up to 800 MW of Northeast genration may be constrained off.
06/06/03 12:00 PM	06/06/03 04:00 PM	Porcupine TS.H2_BUS	DNW	4 Hour		
06/09/03 08:00 AM	06/09/03 12:00 PM	P502X, Porcupine TS.P502X_Terminal	DNW	4 Hour		Up to 800 MW of Northeast genration may be constrained off.
06/09/03 12:00 PM	06/13/03 12:00 PM	Porcupine TS.L01L02	CNW	0 Non-Recallable		
06/09/03 12:00 PM	06/20/03 12:00 PM	Porcupine TS.L01L02	CWW	24 Hour		
06/13/03 12:00 PM	06/13/03 04:00 PM	P502X, Porcupine TS.P502X_Terminal	DNW	4 Hour		Up to 800 MW of Northeast genration may be constrained off.
06/16/03 08:00 AM	06/20/03 04:00 PM	Porcupine TS.D501P_Terminal	DNW	3 Hour		Up to 800 MW of Northeast genration may be constrained off.
6/23/03 5:00 AM	7/4/03 6:00 PM	A9K_KIRKLANDLAKE	CWW	4 Hour		
06/23/03 08:00 AM	06/27/03 04:00 PM	Porcupine TS.H2L501	CNW	8 Hour		
06/23/03 08:00 AM	06/27/03 04:00 PM	Porcupine TS.D501P_Terminal	DNW	3 Hour		Up to 800 MW of Northeast genration may be constrained off.

Table C6 Northwest Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
2/17/03 9:00 AM	4/3/03 7:00 PM	K3D_RABBITLAKE	CWW	4 Hour		
3/31/03 9:00 AM	5/29/03 6:00 PM	T1M_TERRACEBAY	CWW	4 Hour		
4/14/03 5:00 AM	4/25/03 6:00 PM	K6F_RABBITLAKE	CWW	4 Hour		
4/22/03 9:00 AM	5/2/03 5:00 PM	K7K	CWW	4 Hour		
6/23/03 12:01 AM	6/29/03 11:59 PM	Thunder Bay C1	CWW	0 Non-Recallable		
9/8/03 5:00 AM	10/3/03 6:00 PM	A6P	CWW	8 Hour		
9/15/03 8:00 AM	11/14/03 4:00 PM	T1M_TERRACEBAY	CWW	4 Hour		
10/6/03 5:00 AM	11/28/03 6:00 PM	K24F	CWW	4 Hour	OMTE OMTW EWTE MPFN	OMTE - 50MW OMTW - 250 MW EWTE - 75 MW MPFN - 25 MW

Table C6 Northwest Zone (continued)

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
12/15/03 12:01 AM	12/21/03 11:59 PM	Thunder Bay C1	CWW	0 Non-Recallable		
4/19/04 5:00 AM	5/2/04 6:00 PM	K24F	CWW	8 Hour	OMTE OMTW EWTE MPFN	OMTE - 50MW OMTW - 250 MW EWTE - 75 MW MPFN - 25 MW
5/10/04 5:00 AM	5/23/04 6:00 PM	K23D	CWW	8 Hour	OMTE OMTW EWTE MPFN	OMTE - 50MW OMTW - 250 MW EWTE - 75 MW MPFN - 25 MW
5/31/04 7:00 AM	6/13/04 6:00 PM	A21L	CWW	8 Hour	OMTE EWTE EWTW	OMTE - 70 MW EWTE - 75 MW EWTW - 50 MW
6/14/04 12:01 AM	6/27/04 11:59 PM	Thunder Bay C1	CWW	0 Non-Recallable		
6/21/04 5:00 AM	7/4/04 6:00 PM	A22L	CWW	8 Hour	OMTE EWTE EWTW	OMTE - 70 MW EWTE - 75 MW EWTW - 50 MW
9/13/04 5:00 AM	9/26/04 6:00 PM	D26A	CWW	8 Hour	OMTE OMTW EWTE EWTW MPFN	OMTE - 70 MW OMTW - 250 MW EWTE - 75 MW EWTW - 50 MW MPFN - 50 MW

Table C7 Ottawa Zone

No outages to analyze.

Table C8 Southwest Zone

No outages to analyze.

Table C9 Toronto Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
3/16/03 6:00 PM	4/19/03 5:00 AM	Manby West TS.T3	CWW	1 Week		
3/20/03 5:00 AM	5/19/03 6:00 PM	Cecil TS.T3	CWW	35 Hour		
3/25/03 5:00 AM	4/11/03 5:00 PM	Pickering A SS.T1L6, Pickering A SS.AT1_BUS	CWW	10 Day		
3/26/03 5:00 AM	3/31/03 6:00 PM	H1L, Leaside TS.H1L_Terminal, Hearn SS.P7_BUS	CWW	3 Hour		
4/1/03 5:00 AM	4/30/03 6:00 PM	Glengrove TS.T2, Glengrove TS.T1_115, Glengrove TS.T1, Glengrove TS.T1_115	CWW	3 Week		
4/12/03 5:00 AM	4/21/03 6:00 PM	H2JK_HEARN (Including All Terminals), Hearn SS.A1_BUS	CWW	3 Hour		
4/28/03 5:00 AM	5/3/03 6:00 PM	H7E (Including All Terminals), Hearn SS.A3_BUS	CWW	3 Hour		

Table C9 Toronto Zone (continued)

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
4/29/03 2:00 AM	5/30/03 6:00 PM	H11L_LEASIDE	CWW	4 Hour	Circuits H6LC and H8LC also out of service (o/s) May 5-10 and May 19-24, respectively. Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits could occur.	
5/5/03 5:00 AM	5/10/03 6:00 PM	H6LC (Including All Terminals)	CWW	3 Hour	The Leaside H11L terminal also o/s. Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits could occur.	
5/12/03 5:00 AM	5/17/03 6:00 PM	H5E (Including All Terminals)	CWW	3 Hour		
5/19/03 5:00 AM	5/24/03 6:00 PM	H8LC (Including All Terminals)	CWW	3 Hour	The Leaside H11L terminal also o/s. Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits could occur.	
6/2/03 5:00 AM	6/7/03 6:00 PM	H3L, Leaside TS.H3L_Terminal, Hearn SS.P7_BUS	CWW	3 Hour		
8/25/03 7:00 AM	8/30/03 2:30 PM	Pickering B SS.T8P	CWW	8 Hour		
9/2/03 5:00 AM	12/30/03 6:00 PM	H11L_HEARN	CWW	10 Hour	The Hearn H7L terminal also o/s. Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits and high voltage problems at Main TS could occur.	
9/2/03 5:00 AM	12/30/03 6:00 PM	H7L_HEARN	CWW	10 Hour	The Hearn H11L terminal also o/s. Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits and high voltage problems at Main TS could occur.	
9/8/03 5:00 AM	9/13/03 2:00 PM	R13K, Richview TS.H2_BUS, Richview TS.T7	CWW	8 Hour		
9/15/03 4:00 AM	9/20/03 2:00 PM	R15K, Richview TS.H1_BUS, Richview TS.T1	CWW	8 Hour		
9/22/03 4:00 AM	9/27/03 2:00 PM	R1K, Richview TS.A2_BUS, Richview TS.T8	CWW	8 Hour		
9/29/03 4:00 AM	10/4/03 2:00 PM	R2K, Richview TS.A1_BUS, Richview TS.T2	CWW	8 Hour		
11/3/03 5:00 AM	11/28/03 6:00 PM	Lakeview SS.T8_230, Lakeview SS.T7_230, Lakeview SS.L24CR_Terminal, Lakeview SS.RSS4_BUS	CWW	48 Hour		

Table C10 West Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
3/27/03 5:00 AM	4/5/03 6:00 PM	J5D	CWW	24 Hour	FABC BLIP NBLIP Ontario - Michigan Interconnection	FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW Ontario - Michigan Interconnection - Up to 400 MW for imports depending on Lambton and TransAlta - SRCP generation; up to 400 MW for exports
3/31/03 7:00 AM	4/3/03 6:00 PM	L27N, N21W, Sarnia Scott TS.HL27, Sarnia Scott TS.N21W_Terminal	CNW	6 Hour	FABC BLIP NBLIP	FABC - up to 600 MW BLIP - 900 MW NBLIP - 900 MW
4/4/03 7:00 AM	4/4/03 6:00 PM	Sarnia Scott TS.H_BUS, Sarnia Scott TS.HL27	DNW	4 Hour		
4/5/03 5:00 AM	4/8/03 6:00 PM	Keith TS.C21J_Terminal, Keith TS.T11, Keith TS.T23, Keith TS.AL5	CWW	0 Non-Recallable	FABC BLIP NBLIP	April 5 with J5D o/s: FABC - up to 300 MW BLIP - 700 MW NBLIP - 700 MW April 5-8: FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
4/5/03 5:00 AM	4/16/03 6:00 PM	Keith TS.23-C21J	CWW	3 Day	FABC BLIP NBLIP	April 5-8: Covered by outage above. April 8-16: FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
4/7/03 7:00 AM	4/7/03 6:00 PM	Sarnia Scott TS.A_BUS, Sarnia Scott TS.HL27	DNW	4 Hour	FABC BLIP NBLIP	FABC - up to 600 MW BLIP - 900 MW NBLIP - 900 MW
4/8/03 7:00 AM	4/10/03 6:00 PM	Sarnia Scott TS.H_BUS, Sarnia Scott TS.HL27, Sarnia Scott TS.HL22	CNW	4 Hour		
4/11/03 7:00 AM	4/11/03 6:00 PM	Sarnia Scott TS.A_BUS, Sarnia Scott TS.HL22	DNW	4 Hour		FABC - up to 600 MW BLIP - 900 MW NBLIP - 900 MW
4/14/03 7:00 AM	4/15/03 6:00 PM	N22W, Sarnia Scott TS.H_BUS, Sarnia Scott TS.HL22, Sarnia Scott TS.HL27	CNW	4 Hour	FABC BLIP NBLIP	FABC - up to 600 MW BLIP - 900 MW NBLIP - 900 MW
4/14/03 7:15 AM	4/22/03 6:00 PM	Kent TS.T2	CWW	4 Hour		

Table C10 West Zone (continued)

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
4/16/03 5:00 AM	4/16/03 6:00 PM	Keith TS.C21J_Terminal, Keith TS.T11, Keith TS.AL5	DNW	0 Non-Recallable	FABC BLIP NBLIP	FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
4/22/03 7:00 AM	4/25/03 6:00 PM	L25N, Sarnia Scott TS.L25N_Terminal, Sarnia Scott TS.N7S_Terminal	CNW	6 Hour	FABC BLIP NBLIP	FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
4/23/03 7:15 AM	4/29/03 6:00 PM	Highbury TS.T3	CWW	4 Hour		
4/28/03 7:00 AM	4/29/03 6:00 PM	Sarnia Scott TS.A_BUS, Sarnia Scott TS.AL25	CNW	4 Hour		
4/30/03 7:00 AM	5/2/03 6:00 PM	L23N, Sarnia Scott TS.N7S_Terminal	CNW	4 Hour	FABC BLIP NBLIP	FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
4/30/03 7:15 AM	5/6/03 6:00 PM	Highbury TS.T4	CWW	4 Hour		
5/5/03 7:00 AM	5/9/03 6:00 PM	Sarnia Scott TS.N6S_Terminal, Sarnia Scott TS.L23N_Terminal	CNW	4 Hour	FABC BLIP NBLIP	FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
5/6/03 5:00 AM	5/16/03 6:00 PM	Keith TS.PSR5	CWW	1 Day		
5/12/03 7:00 AM	5/14/03 6:00 PM	Sarnia Scott TS.H_BUS, Sarnia Scott TS.HL23, Sarnia Scott TS.T5	CNW	4 Hour		
5/15/03 7:00 AM	5/15/03 6:00 PM	Sarnia Scott TS.B3N_Terminal, Sarnia Scott TS.N6S_Terminal	DNW	4 Hour	Ontario - Michigan Interconnection	FABC - up to 100 MW BLIP - 500 MW NBLIP - 500 MW
5/16/03 7:00 AM	5/22/03 6:00 PM	B3N, Sarnia Scott TS.B3N_Terminal, Sarnia Scott TS.L23N_Terminal, Sarnia Scott TS.N6S_Terminal, Sarnia Scott TS.A_BUS, Sarnia Scott TS.T6	CWW	6 Hour	FABC BLIP NBLIP Ontario - Michigan Interconnection	FABC - up to 600 MW BLIP - 900 MW NBLIP - 900 MW
5/26/03 7:00 AM	5/27/03 6:00 PM	Sarnia Scott TS.H_BUS, Sarnia Scott TS.AL25, Sarnia Scott TS.HL23	CNW	4 Hour	FABC BLIP NBLIP	FABC - up to 400 MW BLIP - 700 MW NBLIP - 700 MW
5/28/03 7:00 AM	6/4/03 6:00 PM	Sarnia Scott TS.AL25	CWW	0 Non-Recallable		

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