Independent Electricity Market Operator

18-MONTH OUTLOOK:

An Assessment of the Reliability of the Ontario Electricity System

From April 2004 to September 2005

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Executive Summary

The outlook for Ontario's electricity system over the next 18-months is substantially improved over previous periods. The return to service of three nuclear units and the expected addition of more than 700 MW of generation this year has eased the overall system supply concerns over the short term.

The shutdown of 1150 MW of coal-fired generation at Lakeview Thermal Generating Station (TGS) in Mississauga increases the importance of future transmission and generation improvements in the Toronto area.

Longer term, however, the need remains to address the potential supply shortfalls that could arise as a result of the uncertainty surrounding three Pickering A nuclear units, the lack of investment in generation and the shutdown of coal-fired generation in Ontario by the end of 2007. The provincial government has indicated that it is developing plans to address this situation and is in the process of preparing a Request for Proposals for the addition of 2,500 MW of new electrical generation capacity and/or demand-side management initiatives to be developed as early as 2005.

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 2004 to September 2005. It 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.

Resource Outlook

Since this time last year, TransAlta's 500 MW station at Sarnia, Ontario Power Generation's (OPG's) 515 MW Unit 4 at Pickering A, and Bruce Power's 770 MW Units 3 and 4 have all come into service.

In addition, approximately 750 MW of generation resources are scheduled to be placed in-service during the Outlook period. The new generating resources include Brighton Beach (625 MW), Imperial Oil (98MW) and Kirkland Lake (32 MW).

As a result, the resource outlook is substantially better than in previous reports heading into the upcoming summer. With the expected additional resources, the forecast available resources exceed the planning requirements in all but eleven weeks of the next 18 months.

Under extreme weather conditions, significant imports may continue to be required to help meet demand in Ontario during peak periods.

Transmission Outlook

For the next 12 months, the Outlook related to transmission continues to be similar to previous Outlooks. The transmission system is expected to be adequate to supply demand under the forecast conditions studied in this Outlook. Lakeview, Pickering and Darlington units are required

to provide reactive capability to maintain adequate voltage levels, especially during summer peak demand periods.

The retirement of Lakeview TGS as a coal-fired generating station by April 30, 2005 in accordance with Ontario Regulation 396/01 could result in overloading of the autotransformers at Claireville Transformer Station and in unacceptably low voltages in the western portion of the Greater Toronto Area during heavy load conditions.

Both transmission and generation solutions have been proposed to address these concerns. Hydro One has received approval from the Ontario Energy Board to construct a new Transformer Station to address some of the reliability impacts associated with the shutdown of Lakeview. Those facilities are expected to be in service by the spring of 2005. The remaining voltage support requirements could be addressed through the installation of additional shunt capacitors and related facilities by Hydro One or, if necessary, through conversion of two Lakeview generating units for operation as synchronous condensers. No coal burn is required for synchronous condenser operation.

Ontario Demand Forecast

The IMO demand forecasting model has been updated to reflect actual economic, demand and weather data through to the end of January 2004. Despite the rapid appreciation of the Canadian dollar relative to its American counterpart, the Ontario economy has shown remarkable strength. Lower import prices and higher commodity prices have mitigated some of the potential damage to the Ontario economy from a higher exchange rate. Manufacturing has recently shown signs of strengthening after a year of mixed results. Looking ahead, modest economic growth and, in turn, an increase in overall energy demand, is forecast for 2004. Demand for the year is expected to top 155 TWh up from weather-corrected demand of 151.7 TWh for 2003.

Normal weather summer peak demand is expected to grow by over 2 percent in the next 18 months. The forecasted peak demand for the forthcoming seasons are contained in the following table.

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Summer 2004	23,668	26,355
Winter 2005	24,153	26,122
Summer 2005	24,147	26,825

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1.0 Introduction

This Outlook covers the 18-month period from January 1, 2004 to June 30, 2005. It supersedes the report titled "An Assessment of the Reliability of the Ontario Electricity System from October 2003 to March 2005", dated December 19, 2003. 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 Independent Market Operator (IMO) web site in MS Excel format.

In addition to the comprehensive Outlook, the IMO publishes Interim Updates to the 18-Month Outlook during each month for which a full Outlook is not issued. These updates consist of a spreadsheet which reflects changes to Total Resources, Total Reductions to Resources, and Reserve Above Requirement values for the Planned Resource Scenario. Similar to the full Outlooks, the Interim Updates are posted on the IMO web site. These updates provide Outlook information on a more frequent basis to allow market participants 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 supersede 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 entitled "Ontario Demand Forecast from April 2004 to September 2005" (IMO_REP_0171) (found on the IMO web site at www.theimo.com/imoweb/pubs/marketReports/18Month_ODF_2004mar.pdf describes in detail the 18-month forecast of electricity demand for the Ontario Market used in this Outlook. The demand forecast document 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 entitled "Methodology to Perform Long Term Assessments" (IMO_REP_0044) (found on the IMO web site at www.theimo.com/imoweb/pubs/marketReports/Methodology_RTAA_2004mar.pdf) contains information regarding the methodology used to perform the demand forecasts, resource adequacy assessments and transmission reliability assessments in this Outlook.
- The document entitled "Ontario Transmission System" (IMO_REP_0045) (found on the IMO web site at www.theimo.com/imoweb/pubs/marketReports/OntTxSystem_2004mar.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.

Updates from Previous Outlook

Updates to Forecast Demands

The forecast of demand has been produced using an updated economic forecast, while the forecasting model itself has been re-estimated based on the most recently observed demand, weather and economic data.

The forecasting methodology remains the same as that used in the previous forecast. However, there has been a change in derivation of normal weather. Previously, normal weather was created by taking the average of a combined temperature and humidity index. The impacts of wind and cloud were then added. Now all four weather elements are combined and the median value is used in the normal weather scenario. This change correctly deals with the joint probability of the four weather elements and allows the normal weather scenario to be represented by historical and observable weather conditions. As well, the weather scenarios were updated to include the weather from 2003.

Despite the rapid appreciation of the Canadian dollar versus the U.S. currency the Ontario economy appears to have weathered the impact without any retrenchment. On the plus side, a higher dollar increases the prospect of further growth-inducing interest rate cuts. However, on the negative side, the impact on the cost-competitiveness of Ontario exporters will be more fully revealed in 2004. Overall, the economic outlook for 2004 is slightly improved.

The forecast of total energy demand for 2004 is 155 TWh, up from the previous forecast. Peak demands are, on average, lower than the previous forecast as a result of the experience of 2003, where peak demands were consistently lower than anticipated.

Updates to Resources

Pickering A Unit 4 and Bruce A Units 3 and 4 are all in service. Northland Power's Kirkland Lake generation project has started construction and is expected to be in service in August 2004.

None of the three shutdown Pickering A nuclear units is scheduled to return to service within the timeframe of this report. Unlike previous Outlooks, these units are not considered to be part of the Existing Installed Generation Resources shown in Table 2.1.

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

Updates to Transmission Outlook

The return to service dates for both 230 kV circuit B3N and 230 kV phase angle regulator PS3 on circuit B3N have been updated from February 29, 2004 to September 30, 2004, at the earliest, with a high likelihood this date will be extended.

The expected in-service date for 230 kV phase angle regulator PS4 on circuit L4D has been updated from May 31, 2004 to September 30, 2004.

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 30,501 MW.

The capacity of installed generation resources in Table 2.1 includes Bruce A Units 3 and 4 but does not include Pickering A Units 1 to 3.

None of the three shutdown Pickering A nuclear units is scheduled to return to service within the timeframe of this report.

In accordance with Ontario Regulation 396/01 the four units at Lakeview Thermal Generating Station (TGS) will stop producing power by the end of April 2005, which will then decrease the installed generation resources. This decrease was included under both resource scenarios.

Table 2.1 Existing Installed Generation Resources[1]

Fuel Type	Total Capacity (MW)	Number of Stations
Nuclear	10,831	5
Coal	7,564	5
Oil / Gas	4,364	22
Hydroelectric	7,676	61
Miscellaneous	66	2
Total	30,501	95

2.2 Potential Generation Resource Additions

Table 2.2 summarizes the significant new 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. Generator owners or operators have provided the information regarding the status of their projects and the in-service dates listed in Table 2.2.

[1] In Table 2.1, the number of coal stations will decrease to four with the retirement of the Lakeview TGS.

Table 2.2 Potential Generation Resource Additions in Ontario

Proponent/Project Name	Zone	Fuel Type	Capacity MW	Connection Applicant's Estimated I/S Date
Imperial Oil	West	Gas	98	April 2004
ATCO - Brighton Beach	West	Gas	625	June 2004
Northland Power - Kirkland Lake	Northeast	Gas	32	August 2004
Total			755	

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

2.3 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 for the duration of the study period with the exception of the four coal-fired units (1,148 MW) at the Lakeview TGS which were assumed to cease operation as generators by April 30, 2005 in accordance with Ontario Regulation 396/01. 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 for the duration of the study period with the exception of the four coal-fired units (1,148 MW) at the Lakeview TGS which were assumed to cease operation as generators by April 30, 2005. Additionally, all potential generation additions listed in Table 2.2 were included under this scenario, as well as an amount of 300 MW of price-responsive demand. This scenario is considered more likely to occur than the Existing Resource 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 decreased by the size of Lakeview TGS at the end of April 2005. For the Planned Resource Scenario only, resources are incremented by the generation additions listed in Table 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 2004		Winter Peak 2005		Summer Peak 2005	
		Existing Resource Scenario	Planned Resource Scenario	Existing Resource Scenario	Planned Resource Scenario	Existing Resource Scenario	Planned Resource Scenario
1	Installed Resources (MW)	30,501	31,224	30,501	31,256	29,353	30,108
2	Imports (MW)	0	0	0	0	0	0
3	Total Resources (MW)	30,501	31,224	30,501	31,256	29,353	30,108
4	Total Reductions in Resources (MW)	2,595	2,686	2,674	2,713	2,405	2,498
5	Price-responsive Demand (MW)	0	300	0	300	0	300
6	Available Resources (MW)	27,906	28,838	27,827	28,843	26,948	27,910

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. It also reflects minor unit re-ratings resulting from equipment upgrades, that occurred prior to the publication of this Outlook. Only one of the four Pickering A nuclear units is included in the existing installed generation resources. 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 (line 3) minus Total Reductions in Resources (line 4) plus Price-responsive Demand (line 5).

2.4 Energy Production Capability Forecast

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

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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 2.3 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 the lower boundary of the range, considering the potential for delays to the in-service dates of additional generation capacity. 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 higher boundary of the outcome range.

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 3.5. 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. Reserve Above Requirement levels 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

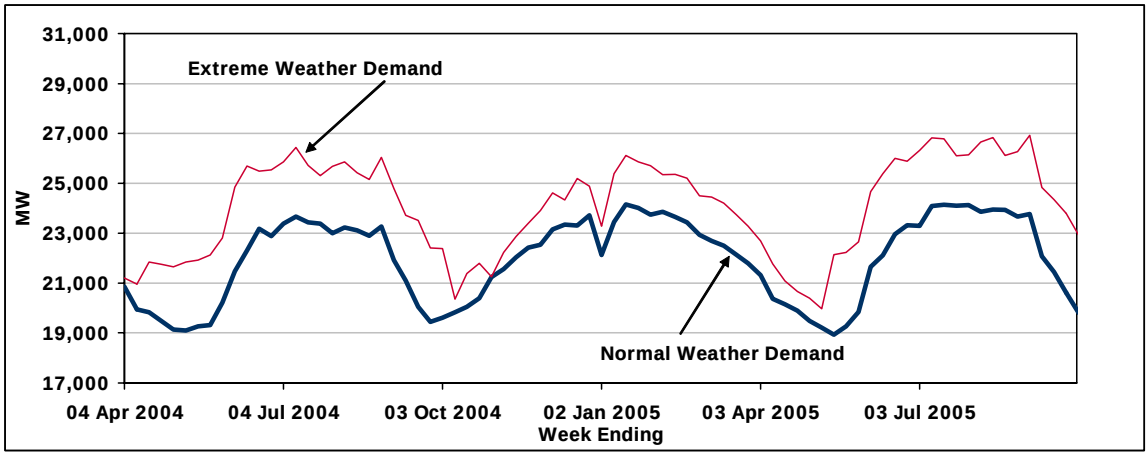


Figure 3.2 shows the Total Reductions in Resources used in the calculation of the Available Resources (as described in Section 2.3).

Figure 3.2 Total Reductions in Resources

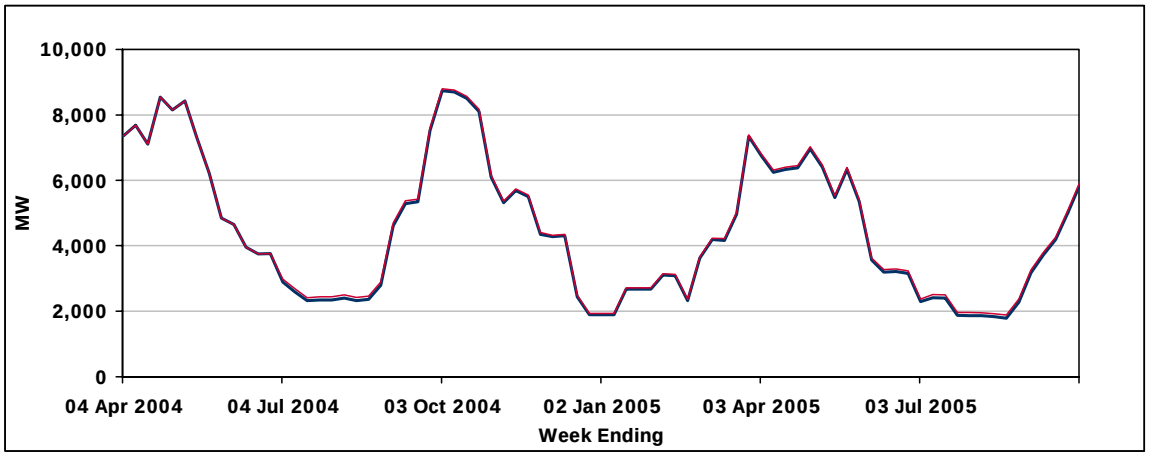


Figure 3.3 provides a comparison between Available Resources, and Required Resources for each week, for the Existing Resource Scenario. The latter quantity is the sum of Demand and Required Reserve, and is based on a probabilistic calculation, which takes into account load forecast uncertainty due to 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

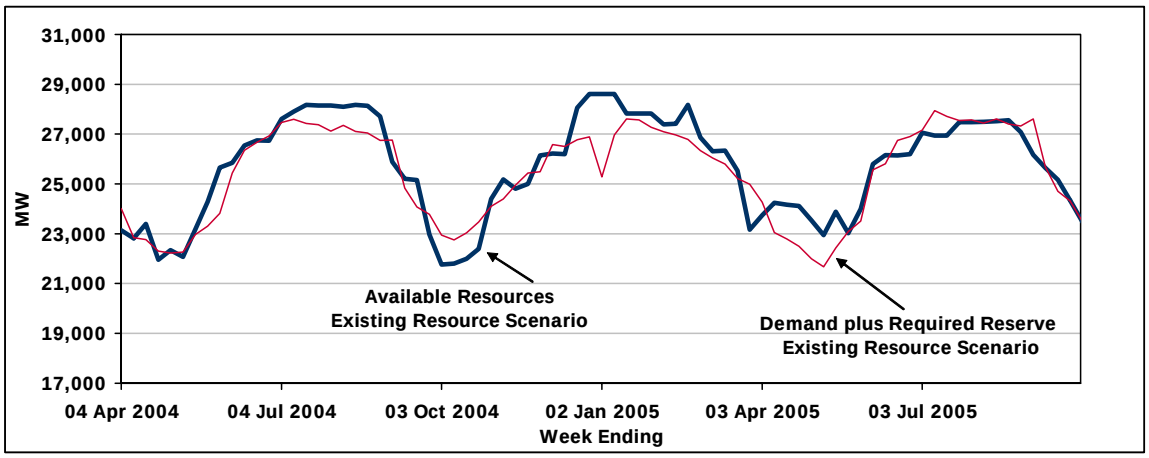
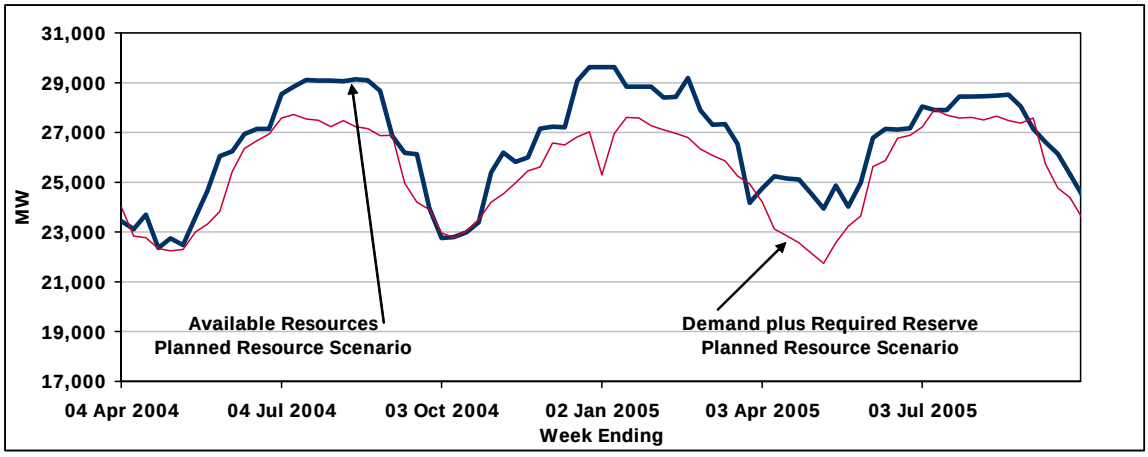
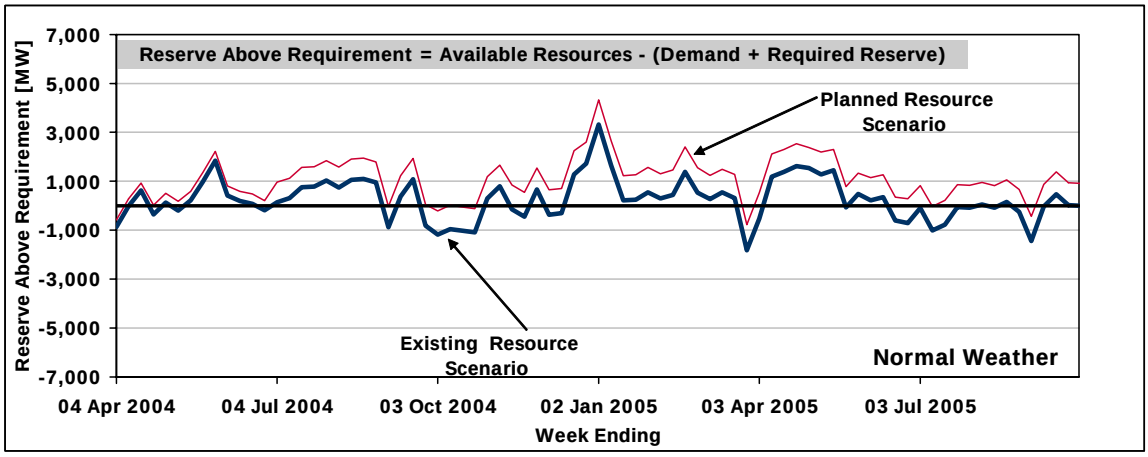


Figure 3.4 Available vs. Required Resources: Planned Resource Scenario



Reserve Above Requirement levels, 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 Above Requirement: Existing Resource Scenario and Planned Resource Scenario



Since this time last year, TransAlta's 500 MW station at Sarnia, Ontario Power Generation's (OPG's) 515 MW Unit 4 at Pickering A, and Bruce Power's 770 MW Units 3 and 4 have all come into service. Under the **Existing Resource Scenario**, the resource outlook is substantially better heading into the upcoming summer. Some reserves are forecast to be below requirements, particularly during the fall of 2004 when there are significant resource reductions due to generator maintenance outages. Also, reserve levels below requirements are forecast for the summer and fall of 2005, when the effect of Lakeview TGS retirement will begin to show. During these weeks some planned generator outages 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.

The results above must be assessed considering the risk factors described in Section 3.3 and the probability of this scenario occurring. 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.

Under the more likely **Planned Resource Scenario**, the resource adequacy situation is significantly improved when compared to the Existing Resource Scenario. For all but eight weeks of the Outlook timeframe, the forecast available resources exceed the planning requirements. To the extent this scenario materializes, opportunities will 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 Above Requirement values in the present Outlook and the forecast reserve above requirement values in the previous Outlook published on December 19, 2003. Under the Existing Resource Scenario, the return to service of Bruce A Unit 3 yields a generally higher supply availability outlook when compared to the previous 18-Month Outlook. Under the Planned Resource Scenario, forecast reserve above requirement levels are, on average, slightly lower in this Outlook than the previous one, due mainly to updates in the generator outage program.

Figure 3.6 Reserve Above Requirement: Existing Resource Scenario vs. Previous Existing Resource Scenario

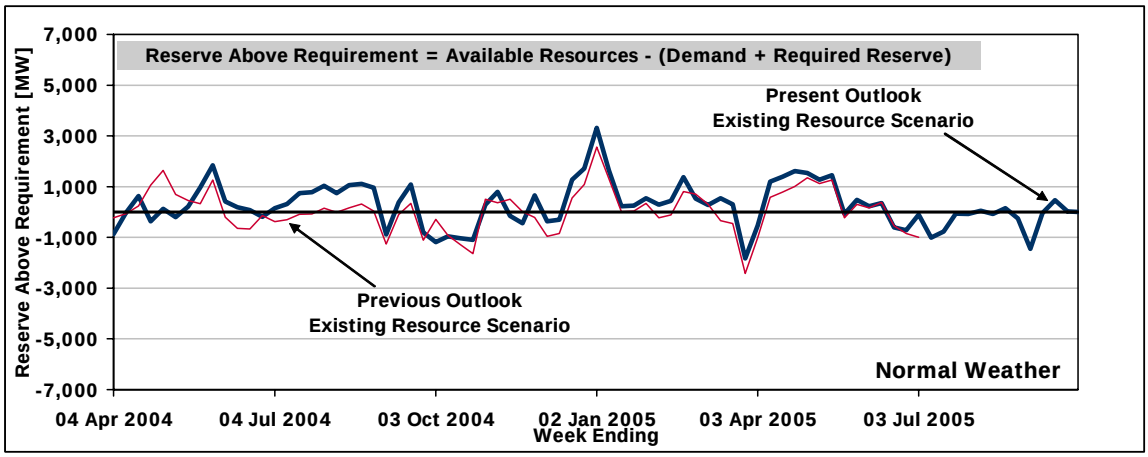
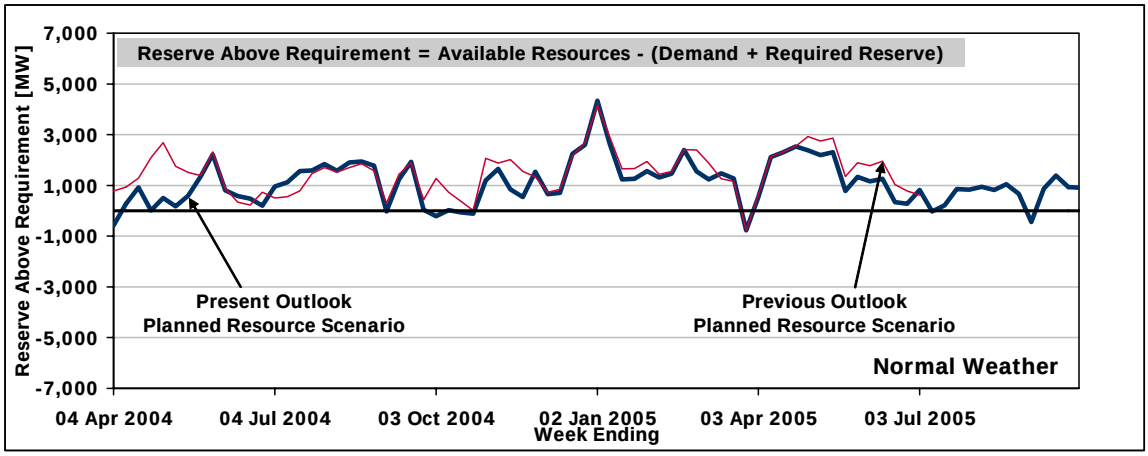


Figure 3.7 Reserve Above Requirement: Planned Resource Scenario vs. Previous Planned Resource Scenario



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 2.3 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 consistent with 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 of 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, approximately to the level necessary to offset the reserve 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 levels 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 levels and the need for higher 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 modeled 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 levels 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 become significant. This emphasizes the continued need for reliable supply and demand responses within Ontario.

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

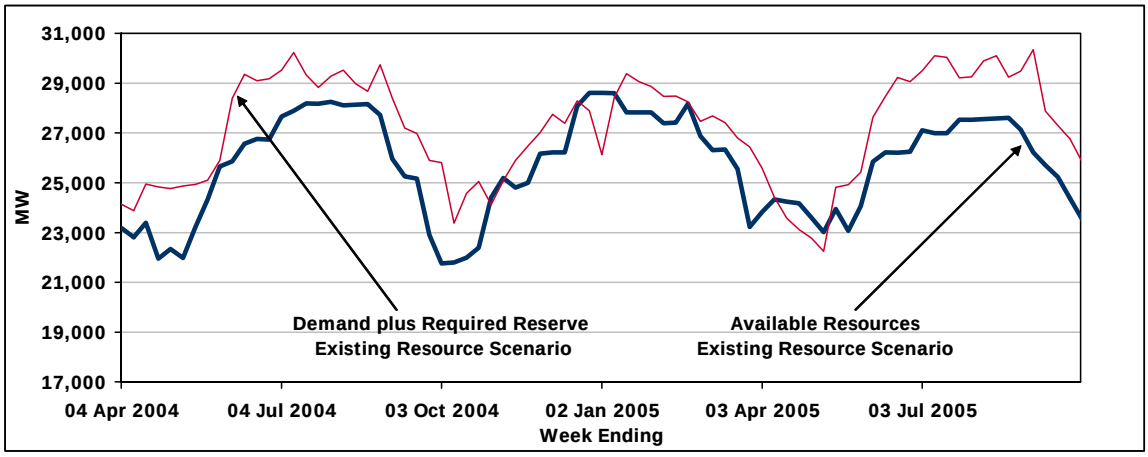


Figure 3.9 Available vs. Required Resources: Planned Resource Scenario Extreme Weather Demand

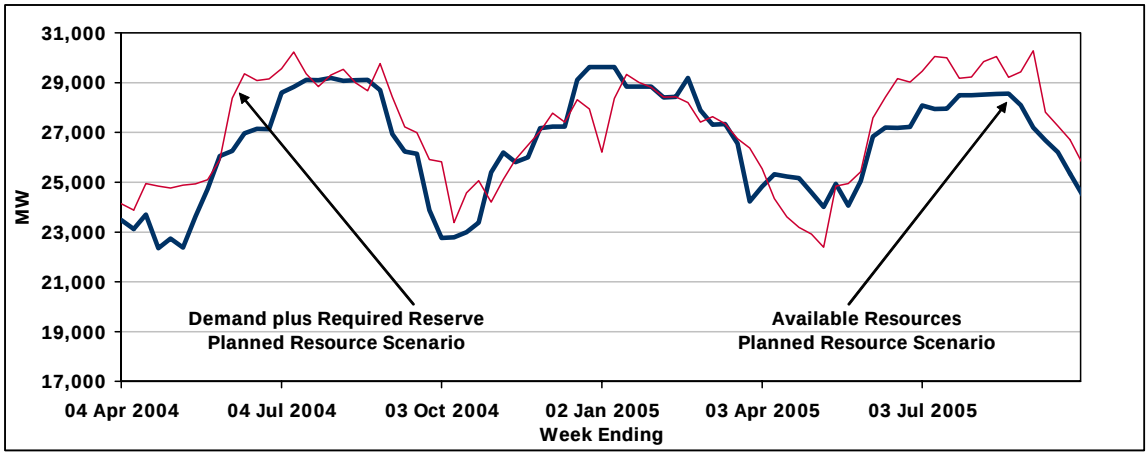
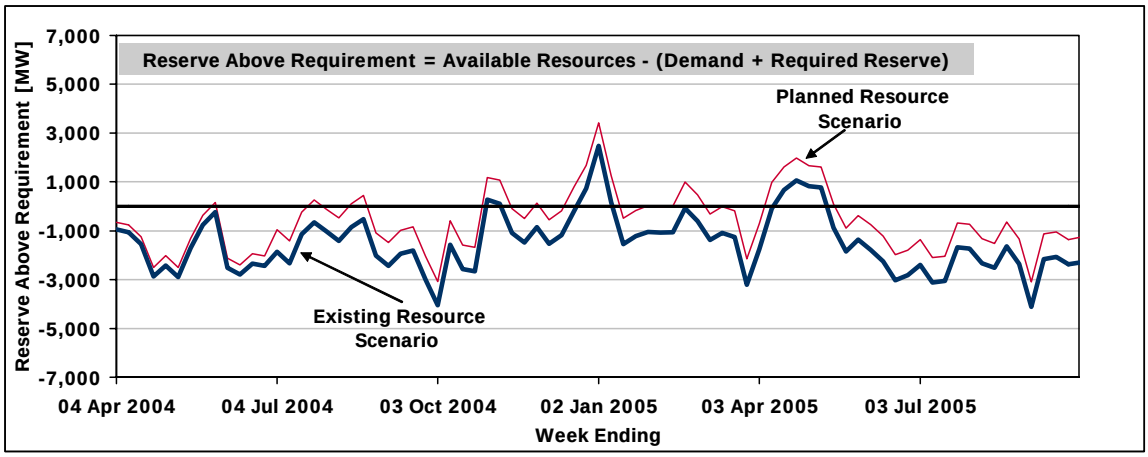


Figure 3.10 Reserve Above Requirement: Existing Resource Scenario and Planned Resource Scenario, Extreme Weather Demand



3.3.2 New Generation In-Service Risks

The return to service of Pickering A Unit 4 and Bruce A Units 3 and 4 is a significant development. However, more new generating capacity is needed, as well as price-responsive demand. For the 18-month period under study, the improved demand-supply situation for the Planned Resource Scenario is dependent on the new generation projects coming into service on schedule.

3.3.3 Extensions to Generator Planned Outages

A number of large generating units are scheduled to return to service from outage at the beginning of summer 2004, with numerous others scheduled to return from future planned outages prior to winter 2004/05 and summer 2005. Meeting these schedules is critical to maintaining adequate reserve levels. Delays in returning generators to service from maintenance outages could lead to reliance on imports.

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.

It should be noted that the reduced flexibility in scheduling maintenance outages, which could happen under the Existing Resource Scenario, would have a negative impact on the long-term reliability of affected generating units, and could increase the number of forced outage occurrences. If the actual amount of generator forced outages is higher than the forecast allowance, actual reserve levels could be lower than forecast.

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 by 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 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 24, 2004 indicates an average import level of 1,164 MW for all hours. During the 3,044 hours when Ontario demand exceeded 20,000 MW the average import level was 1,544 MW. During the 338 hours when Ontario demand exceeded 23,000 MW the average import level was 2,293 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 either within or outside of Ontario.

3.5 Energy Conservation and Peak Reduction through Price-Responsive Demands

The IMO has been identifying the suitability of demand-side initiatives as part of the supply picture for several years and believes demand reductions and demand shifting should be vigorously pursued in Ontario, as clean and potentially less expensive ways to reduce future supply requirements. The application of such conservation measures is virtually unrestricted in location.

Programs would improve the supply-demand balance in two main ways:

- Demand reduction through technological or process efficiency improvements would have beneficial effects on the environment and reduce the need for generation capacity additions through years.
- Shifting the time of use from peak to off-peak periods through demand-response programs would achieve peak demand reductions, influencing electricity prices downward and improving utilization rates of generation resources.

- 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 Connection Assessments and Approval queue. Only those projects that have an estimated in-service date within the 18-month period under study are listed.

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 should be rescheduled or changed. As an example, a change in an outage may include reducing the scheduled duration or recall time.

The assessment of transmission outages will also identify any resources that are forecast to be constrained due to transmission outage conditions. The identification of a constrained resource is generally not reflected in the assessment of weekly resource adequacy, which is detailed in Section 3.1, since there is typically sufficient outage scheduling flexibility to avoid constraining off resources when such resources are needed for reliability. 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 the forecast of reserve is deficient. Under the Market Rules, where the scheduling of planned outages by different market participant's 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 2004 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).

Generally, 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

A transmission outage in the Chenaux area involving the addition of two new 230 kV breakers and the reconnection of transformer T4 is scheduled from September 11, 2004 to September 19, 2004. During this outage Chenaux units G5 to G8 are forecast to be constrained.

Northeast Zone

The 230 kV H24S circuit outage from May 3, 2004 to July 9, 2004 affects the flow limit associated with the Ontario – Quebec North Interconnection. Reserves are forecast to be below requirements for the first week of the outage period in May for the Existing Resource Scenario, and for the last full week in June under the Existing Resource Scenario. In the outage approval timeframe, if the IMO determines that imports are required on this interconnection to maintain supply reliability and that an outage limits this requirement, the IMO may cancel or defer the outage.

Northwest Zone

There are several scheduled 115 kV and 230 kV circuit outages in the Outlook period that will reduce the flow limit between Ontario and Manitoba by between 50 MW and 250 MW, and in some cases, will reduce the flow limit between Ontario and Minnesota by between 25 MW and 100 MW. These outages will also in some cases reduce the East-West Transfer East (EWTE) and East-West Transfer West (EWTW) capabilities by 50 MW and 75 MW and by 50 MW and 100 MW, respectively. The lower EWTE/EWTW capabilities may reduce generator dispatching flexibility and require more coordination in the planning of generation and other transmission outages in the Northeast and Northeast zones.

Under the Existing Resource Scenario, reserves are forecast to be below requirements for some weeks in April, May, June and September of 2004 and for most weeks in October of 2004. Under the Planned Resource Scenario, reserves are forecast to be below requirements for most weeks in October of 2004. If imports and/or the full capabilities of the EWTE/EWTW interface are required to maintain supply reliability, the IMO may defer or cancel the outages. However, since all of the scheduled outages have a relatively short recall time of eight hours or less, the IMO may release the outages but recall an outage if a concern materializes.

Toronto Zone

The Hearn x Leaside 115 kV outages from March 1, 2004 to April 16, 2004 and from April 19, 2004 to May 28, 2004 and the Cecil x Esplanade 115 kV outage from October 4, 2004 to December 10, 2004 may, depending on the prevailing load levels, result in the thermal overloading of other 115 kV circuits in the local operating area. The impact of these outages will be reassessed by the IMO at the time their approval is being sought. The IMO may 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 the outages, but recall them for those periods where thermal overloading is a concern.

Transmission outages associated with separating the paired Cherrywood T14 and T15 autotransformers are a concern. The combined Cherrywood T14 and T15 outage from April 5, 2004 to April 7, 2004 will result in a separation of the Cherrywood 500 kV and 230 kV systems on loss of the paired Cherrywood T16 and T17 autotransformers. Depending on load levels and the number of Pickering units in-service, the following problems may arise:

- Thermal overloads of the Claireville 500/230 kV transformers.
- 230 kV voltage declines at Cherrywood.
- Maintaining minimum 230 kV voltages at Cherrywood and Leaside.
- Shut down of Pickering G4 if Pickering 230 kV voltage drops below 226 kV.

In the outage approval timeframe, the IMO will reassess the outage and implement any necessary control actions required to minimize these concerns. This could include deferring the outage to a better outage period. Without appropriate operating control actions, the Cherrywood T14 autotransformer outages from April 7, 2004 to April 23, 2004 could also, depending on the same factors from above, result in the thermal overloading of Cherrywood T15 for the loss of paired Cherrywood T16 and T17. Likewise, the transmission outage for separating the paired Cherrywood T16 and T17 autotransformers from April 26, 2004 to April 27, 2004 could result in the thermal overloading of remaining autotransformer for the loss of Cherrywood T14 or T15. Control actions could range from pre-contingency load transfers to post-contingency load shedding.

The Manby East ‘E’ bus outage from November 7, 2004 to November 20, 2004 will leave the Fairbank, Runnymede and Wiltshire loads vulnerable to a supply interruption on loss of the Manby East ‘D’ bus. Some load could be transferred to Leaside supply, pre-contingency, thereby removing the exposure of a supply interruption for this load. Post-contingency, the Fairbank, Runnymede and Wiltshire loads could also be transferred to Leaside supply. However, depending on the load levels to be transferred, the 115 kV L14W and L15W cable ampacities may be limiting and may require off-loading Bridgman T6 and T13 transformers.

The assessment of transmission outages for this Outlook has been limited to those outages with a scheduled duration of greater than five days or to those outages associated with a project where at least one outage has a scheduled duration of greater than five days. 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, Thermal Limits and Supply Reliability

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 during peak load conditions is desired. The addition of the ATCO-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. The recent addition of a 125 Mvar, 115 kV capacitor at the Hearn Switching Station and the planned addition of a 125 Mvar, 115 kV capacitor at the Leaside Transformer Station by 2004-Q2 will improve the voltage profile in this area under summer peak conditions.

Under 2002 summer peak conditions, loadings on the 230/115 kV Burlington autotransformers in the Southwest zone were also high. For a contingency involving the loss of one autotransformer, the post-contingency loading on the remaining three autotransformers would have been at levels near the 10-Day Limited Time Ratings. The planned addition by Hydro One of 125 Mvar, 115 kV capacitor bank at Burlington TS by 2004-Q2 will help alleviate this concern and provide additional voltage support in the area.

Historically, in the Northwest zone at least one of the two generators, in combination with the condenser, at Thunder Bay have been required in-service, most of the time at winter peak load conditions, to maintain minimum voltages in the area. Coincident planned generator outages had also been a concern since the condenser, in service by itself, may not have been able to maintain minimum voltage requirements. In addition, on loss of the condenser, the Thunder Bay G2 unit was required in service in order to restore the condenser to service. Recently however, with the addition of an 80 Mvar shunt capacitor at Birch TS, the need for the Thunder Bay generating and

condensing units to maintain voltage levels has reduced. The units now provide redundant voltage support.

4.3.1 Impact of Lakeview Thermal Generating Station (TGS) Shutdown

The IMO has been notified by Ontario Power Generation that, in accordance with Ontario Regulation 396/01, the Lakeview TGS will stop producing power by the end of April 2005. The Lakeview facility currently has four 300 MW units in service.

A number of generation and transmission proposals have been identified to address potential reliability impacts associated with the shutdown of Lakeview.

These impacts include potential loss of load associated with overloading of transformers at the Claireville Transformer Station, and lower than acceptable voltages in the western portion of the Greater Toronto Area (GTA) during heavy load conditions with all transmission elements in service. These load levels could occur as early as June 2005. The risk to supply reliability increases significantly for contingency conditions or when transmission elements are out of service.

Hydro One has received approval from the OEB to construct a new Parkway Transformer Station (TS) to address some of the initial reliability impacts associated with the shutdown of Lakeview. To address the overloading of transformers at Claireville, Hydro One plans to install an initial 500/230 kV autotransformer at Parkway TS by May 1, 2005. However, this autotransformer will not address the reactive power support required to maintain an acceptable voltage profile throughout the western portion of the GTA.

To help address the voltage support concerns, Hydro One plans to install shunt capacitors with a reactive power capability of approximately 800 Mvar at Burlington, Richview and John TS's before 2005.

In addition, there are other alternatives to address voltage support concerns at times of possible extreme-weather loads for the summer 2005, should up to four generating units be unavailable at Nanticoke TGS, Pickering Nuclear Generating Station (NGS) and Darlington NGS. These three generating stations are critical to the supply to the GTA. The alternatives include a further 300 Mvar shunt capacitor bank to be installed on the 230 kV system at Trafalgar TS and an ability to avoid automatic low voltage control or, if necessary, the conversion of two of the existing generating units at Lakeview TGS to synchronous condenser operation. Synchronous condenser operation does not involve the burning of coal. Either of these two alternatives would provide the additional reactive support, but would need to be in-service by May 2005.

It is critical that all of the above work be completed by April 30, 2005, to improve the reliability of the GTA during the summer of 2005.

4.4 Forced Outages

Due to a forced outage, 230 kV circuit B3N (Scott Transformer Station x Bunce Creek, Michigan) is expected to be unavailable until September 30, 2004, at the earliest, with a high likelihood that this date will be extended. The B3N outage increases the upper limit of the Ontario – Michigan import limit by 200 MW in the summer and by 300 MW in the winter. The Ontario – Michigan export limit decreases by approximately 500 MW in the summer and in the

winter. The 230 kV PS3 phase angle regulator (PAR) on circuit B3N in Michigan is also unavailable until September 30, 2004.

The 230 kV PS51 PAR on circuit L51D is also unavailable until September 30, 2004 but does not affect the import and export limits of the Ontario – Michigan interconnection.

- End of Section -

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

- Since this time last year, TransAlta's 500 MW station at Sarnia, OPG's 515 MW Unit 4 at Pickering A, and Bruce Power's 770 MW Units 3 and 4 have all come into service. Under the **Existing Resource Scenario**, the resource outlook is substantially better heading into the upcoming summer. Some reserves are below requirements, particularly during the fall of 2004 when there are significant resource reductions due generator maintenance outages. Also, reserve levels below requirements are forecast for the summer and fall of 2005, when the effect of Lakeview TGS retirement will begin to show. During these weeks some planned generator outages 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.
- Under the **Planned Resource Scenario**, the resource adequacy situation is significantly improved when compared to the Existing Resource Scenario. For all but eight weeks of the Outlook timeframe, the forecast available resources exceed the planning requirements. To the extent this scenario materializes, 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 Scenario	Extreme Weather Scenario
Existing Resource Scenario	**- some planned outages at risk - imports required during many peak periods**	**- most planned outages at risk - significant imports required during many peak periods - risk of insufficient supply**
Planned Resource Scenario	**- opportunities for additional outages/exports exist in most weeks - eight weeks when reserves are lower than required**	**- many planned outages at risk - imports required during some weekly peak periods**

- Tight demand/supply balances during periods when reserves are below required levels could 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.
- The magnitude of resource deficiencies under extreme weather emphasizes the continued need for reliable supply and price-responsive demand within Ontario.

- The return to service of Pickering A Unit 4 and Bruce A Units 3 and 4 is a significant development. However, more new generating capacity is needed, as well as price-responsive demand. For the 18-month period under study, the improved demand-supply situation for the Planned Resource Scenario is dependent on the new generation projects coming into service on schedule.
- A number of large generating units are scheduled to return to service from outage at the beginning of summer 2004, with numerous others scheduled to return from planned outages prior to winter 2004/05 and summer 2005. Meeting these schedules is critical to maintaining adequate reserve levels.
- High generator unavailability, whether caused by higher forced outage rates, delays in commissioning new units or returning generators to service, could lead to extensive reliance on imports. 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

- Some transmission outages will be difficult to schedule without reliability impacts or may be recalled on short notice.
- 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 2004 peak conditions.
- Restricting planned outages to transmission facilities in the Windsor area will assist in maintaining adequate voltage levels during summer peak periods
- The addition of the new capacitor bank at Birch TS significantly reduces the need for rotating reactive resources in the Thunder Bay area to address local voltage concerns.
- The retirement of Lakeview Thermal Generating Station as a coal-fired generating station on April 30, 2005 in accordance with Ontario Regulation 396/01 could result in the thermal overloading of some existing transmission facilities and in unacceptable voltage profiles in the western portion of the GTA during system peak conditions if needed transmission and generation reinforcements are not available.

- 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 Above Requirement MW
04-Apr-04	30,501	7,362	0	23,139	24,013	11.0	2,288	15.2	3,162	-874
11-Apr-04	30,501	7,682	0	22,819	22,837	14.4	2,873	14.5	2,891	-18
18-Apr-04	30,501	7,104	0	23,397	22,769	18.0	3,568	14.8	2,940	628
25-Apr-04	30,501	8,546	0	21,955	22,311	12.7	2,472	14.5	2,828	-356
02-May-04	30,501	8,154	0	22,347	22,224	16.7	3,202	16.1	3,079	123
09-May-04	30,501	8,427	0	22,074	22,271	15.6	2,981	16.6	3,178	-197
16-May-04	30,501	7,307	0	23,194	22,980	20.4	3,930	19.3	3,716	214
23-May-04	30,501	6,221	0	24,280	23,301	25.7	4,959	20.6	3,980	979
30-May-04	30,501	4,847	0	25,654	23,812	26.9	5,437	17.8	3,595	1,842
06-Jun-04	30,501	4,650	0	25,851	25,435	20.4	4,387	18.5	3,971	416
13-Jun-04	30,501	3,960	0	26,541	26,351	18.9	4,227	18.1	4,037	190
20-Jun-04	30,501	3,756	0	26,745	26,669	15.4	3,569	15.1	3,493	76
27-Jun-04	30,501	3,760	0	26,741	26,933	16.9	3,862	17.7	4,054	-192
04-Jul-04	30,501	2,891	0	27,610	27,466	18.1	4,227	17.5	4,083	144
11-Jul-04	30,501	2,595	0	27,906	27,594	17.9	4,238	16.6	3,926	312
18-Jul-04	30,501	2,321	0	28,180	27,426	20.2	4,739	17.0	3,985	754
25-Jul-04	30,501	2,348	0	28,153	27,374	20.4	4,775	17.1	3,996	779
01-Aug-04	30,501	2,348	0	28,153	27,121	22.4	5,159	18.0	4,127	1,032
08-Aug-04	30,501	2,403	0	28,098	27,355	21.0	4,873	17.8	4,130	743
15-Aug-04	30,501	2,327	0	28,174	27,110	21.9	5,062	17.3	3,998	1,064
22-Aug-04	30,501	2,362	0	28,139	27,037	22.9	5,245	18.1	4,143	1,102
29-Aug-04	30,501	2,797	0	27,704	26,753	19.1	4,433	15.0	3,482	951
05-Sep-04	30,501	4,619	0	25,882	26,762	18.1	3,965	22.1	4,845	-880
12-Sep-04	30,501	5,291	0	25,210	24,827	19.4	4,103	17.6	3,720	383
19-Sep-04	30,501	5,344	0	25,157	24,076	25.5	5,112	20.1	4,031	1,081
26-Sep-04	30,501	7,525	0	22,976	23,787	18.2	3,538	22.4	4,349	-811
03-Oct-04	30,501	8,738	0	21,763	22,949	11.0	2,152	17.0	3,338	-1,186
10-Oct-04	30,501	8,703	0	21,798	22,756	10.0	1,975	14.8	2,933	-958
17-Oct-04	30,501	8,500	0	22,001	23,032	9.8	1,956	14.9	2,987	-1,031
24-Oct-04	30,501	8,111	0	22,390	23,480	9.8	1,994	15.1	3,084	-1,090
31-Oct-04	30,501	6,101	0	24,400	24,110	14.9	3,158	13.5	2,868	290
07-Nov-04	30,501	5,313	0	25,188	24,395	16.8	3,623	13.1	2,830	793
14-Nov-04	30,501	5,692	0	24,809	24,957	12.6	2,769	13.2	2,917	-148
21-Nov-04	30,501	5,503	0	24,998	25,438	11.5	2,577	13.5	3,017	-440
28-Nov-04	30,501	4,354	0	26,147	25,488	16.0	3,609	13.1	2,950	659
05-Dec-04	30,501	4,286	0	26,215	26,576	13.3	3,068	14.8	3,429	-361
12-Dec-04	30,501	4,309	0	26,192	26,501	12.2	2,852	13.5	3,161	-309
19-Dec-04	30,501	2,447	0	28,054	26,771	20.4	4,750	14.9	3,467	1,283
26-Dec-04	30,501	1,891	0	28,610	26,891	20.6	4,891	13.4	3,172	1,719

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 Above Requirement MW
02-Jan-05	30,501	1,891	0	28,610	25,286	29.3	6,485	14.3	3,161	3,324
09-Jan-05	30,501	1,896	0	28,605	26,962	22.0	5,161	15.0	3,518	1,643
16-Jan-05	30,501	2,674	0	27,827	27,607	15.2	3,674	14.3	3,454	220
23-Jan-05	30,501	2,674	0	27,827	27,577	15.9	3,816	14.9	3,566	250
30-Jan-05	30,501	2,674	0	27,827	27,277	17.2	4,077	14.9	3,527	550
06-Feb-05	30,501	3,109	0	27,392	27,102	14.8	3,535	13.6	3,245	290
13-Feb-05	30,501	3,084	0	27,417	26,971	15.9	3,761	14.0	3,315	446
20-Feb-05	30,501	2,327	0	28,174	26,794	20.2	4,740	14.3	3,360	1,380
27-Feb-05	30,501	3,629	0	26,872	26,337	17.2	3,938	14.8	3,403	535
06-Mar-05	30,501	4,187	0	26,314	26,039	15.9	3,616	14.7	3,341	275
13-Mar-05	30,501	4,166	0	26,335	25,790	17.0	3,835	14.6	3,290	545
20-Mar-05	30,501	4,969	0	25,532	25,226	15.3	3,392	13.9	3,086	306
27-Mar-05	30,501	7,338	0	23,163	24,982	6.3	1,363	14.6	3,182	-1,819
03-Apr-05	30,501	6,758	0	23,743	24,267	11.3	2,418	13.8	2,942	-524
10-Apr-05	30,501	6,251	0	24,250	23,056	19.1	3,881	13.2	2,687	1,194
17-Apr-05	30,501	6,337	0	24,164	22,782	19.9	4,007	13.0	2,625	1,382
24-Apr-05	30,501	6,384	0	24,117	22,498	21.3	4,227	13.1	2,608	1,619
01-May-05	30,501	6,965	0	23,536	21,995	20.8	4,046	12.9	2,505	1,541
08-May-05	29,353	6,406	0	22,947	21,667	19.5	3,738	12.8	2,458	1,280
15-May-05	29,353	5,473	0	23,880	22,428	26.1	4,946	18.5	3,494	1,452
22-May-05	29,353	6,329	0	23,024	23,095	19.5	3,758	19.9	3,829	-71
29-May-05	29,353	5,358	0	23,995	23,514	20.9	4,146	18.5	3,665	481
05-Jun-05	29,353	3,563	0	25,790	25,566	19.1	4,136	18.1	3,912	224
12-Jun-05	29,353	3,192	0	26,161	25,811	18.3	4,050	16.7	3,700	350
19-Jun-05	29,353	3,212	0	26,141	26,746	13.9	3,184	16.5	3,789	-605
26-Jun-05	29,353	3,158	0	26,195	26,910	12.3	2,867	15.4	3,582	-715
03-Jul-05	29,353	2,291	0	27,062	27,163	16.2	3,766	16.6	3,867	-101
10-Jul-05	29,353	2,418	0	26,935	27,944	11.8	2,846	16.0	3,855	-1,009
17-Jul-05	29,353	2,405	0	26,948	27,718	11.6	2,801	14.8	3,571	-770
24-Jul-05	29,353	1,875	0	27,478	27,537	14.0	3,373	14.2	3,432	-59
31-Jul-05	29,353	1,869	0	27,484	27,567	14.0	3,365	14.3	3,448	-83
07-Aug-05	29,353	1,860	0	27,493	27,445	15.2	3,632	15.0	3,584	48
14-Aug-05	29,353	1,829	0	27,524	27,605	14.9	3,575	15.3	3,656	-81
21-Aug-05	29,353	1,792	0	27,561	27,410	15.2	3,633	14.6	3,482	151
28-Aug-05	29,353	2,276	0	27,077	27,332	14.4	3,412	15.5	3,667	-255
04-Sep-05	29,353	3,180	0	26,173	27,615	10.1	2,405	16.2	3,847	-1,442
11-Sep-05	29,353	3,713	0	25,640	25,679	16.2	3,568	16.3	3,607	-39
18-Sep-05	29,353	4,187	0	25,166	24,702	17.3	3,712	15.1	3,248	464
25-Sep-05	29,353	5,004	0	24,349	24,324	18.2	3,743	18.0	3,718	25
02-Oct-05	29,353	5,873	0	23,480	23,485	18.6	3,674	18.6	3,679	-5

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 Above Requirement MW
04-Apr-04	30,501	7,362	300	23,439	24,013	12.4	2,588	15.2	3,162	-574
11-Apr-04	30,501	7,682	300	23,119	22,837	15.9	3,173	14.5	2,891	282
18-Apr-04	30,501	7,104	300	23,697	22,769	19.5	3,868	14.8	2,940	928
25-Apr-04	30,599	8,546	300	22,353	22,332	14.7	2,870	14.6	2,849	21
02-May-04	30,599	8,154	300	22,745	22,244	18.8	3,600	16.2	3,099	501
09-May-04	30,599	8,427	300	22,472	22,292	17.7	3,379	16.8	3,199	180
16-May-04	30,599	7,307	300	23,592	23,001	22.5	4,328	19.4	3,737	591
23-May-04	30,599	6,221	300	24,678	23,321	27.7	5,357	20.7	4,000	1,357
30-May-04	30,599	4,847	300	26,052	23,832	28.9	5,835	17.9	3,615	2,220
06-Jun-04	30,599	4,650	300	26,249	25,442	22.3	4,785	18.5	3,978	807
13-Jun-04	30,599	3,960	300	26,939	26,358	20.7	4,625	18.1	4,044	581
20-Jun-04	30,599	3,756	300	27,143	26,665	17.1	3,967	15.1	3,489	478
27-Jun-04	30,599	3,760	300	27,139	26,940	18.6	4,260	17.8	4,061	199
04-Jul-04	31,224	2,982	300	28,542	27,586	22.1	5,159	18.0	4,203	956
11-Jul-04	31,224	2,686	300	28,838	27,717	21.8	5,170	17.1	4,049	1,121
18-Jul-04	31,224	2,412	300	29,112	27,547	24.2	5,671	17.5	4,106	1,565
25-Jul-04	31,224	2,439	300	29,085	27,495	24.4	5,707	17.6	4,117	1,590
01-Aug-04	31,224	2,439	300	29,085	27,240	26.5	6,091	18.5	4,246	1,845
08-Aug-04	31,256	2,496	300	29,060	27,478	25.1	5,835	18.3	4,253	1,582
15-Aug-04	31,256	2,420	300	29,136	27,234	26.1	6,024	17.8	4,122	1,902
22-Aug-04	31,256	2,455	300	29,101	27,159	27.1	6,207	18.6	4,265	1,942
29-Aug-04	31,256	2,890	300	28,666	26,880	23.2	5,395	15.5	3,609	1,786
05-Sep-04	31,256	4,698	300	26,858	26,886	22.5	4,941	22.7	4,969	-28
12-Sep-04	31,256	5,370	300	26,186	24,954	24.1	5,079	18.2	3,847	1,232
19-Sep-04	31,256	5,423	300	26,133	24,201	30.4	6,088	20.7	4,156	1,932
26-Sep-04	31,256	7,604	300	23,952	23,911	23.2	4,514	23.0	4,473	41
03-Oct-04	31,256	8,801	300	22,755	22,967	16.0	3,144	17.1	3,356	-212
10-Oct-04	31,256	8,766	300	22,790	22,767	15.0	2,967	14.9	2,944	23
17-Oct-04	31,256	8,563	300	22,993	23,048	14.7	2,948	15.0	3,003	-55
24-Oct-04	31,256	8,174	300	23,382	23,500	14.6	2,986	15.2	3,104	-118
31-Oct-04	31,256	6,164	300	25,392	24,196	19.5	4,150	13.9	2,954	1,196
07-Nov-04	31,256	5,364	300	26,192	24,533	21.5	4,627	13.8	2,968	1,659
14-Nov-04	31,256	5,743	300	25,813	24,966	17.1	3,773	13.3	2,926	847
21-Nov-04	31,256	5,554	300	26,002	25,452	16.0	3,581	13.5	3,031	550
28-Nov-04	31,256	4,405	300	27,151	25,605	20.5	4,613	13.6	3,067	1,546
05-Dec-04	31,256	4,325	300	27,231	26,576	17.6	4,084	14.8	3,429	655
12-Dec-04	31,256	4,348	300	27,208	26,501	16.6	3,868	13.5	3,161	707
19-Dec-04	31,256	2,486	300	29,070	26,817	24.7	5,766	15.1	3,513	2,253
26-Dec-04	31,256	1,930	300	29,626	27,029	24.9	5,907	14.0	3,310	2,597

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 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 Above Requirement MW
02-Jan-05	31,256	1,930	300	29,626	25,291	33.9	7,501	14.3	3,166	4,335
09-Jan-05	31,256	1,935	300	29,621	26,962	26.4	6,177	15.0	3,518	2,659
16-Jan-05	31,256	2,713	300	28,843	27,607	19.4	4,690	14.3	3,454	1,236
23-Jan-05	31,256	2,713	300	28,843	27,577	20.1	4,832	14.9	3,566	1,266
30-Jan-05	31,256	2,713	300	28,843	27,277	21.4	5,093	14.9	3,527	1,566
06-Feb-05	31,256	3,148	300	28,408	27,102	19.1	4,551	13.6	3,245	1,306
13-Feb-05	31,256	3,123	300	28,433	26,971	20.2	4,777	14.0	3,315	1,462
20-Feb-05	31,256	2,366	300	29,190	26,794	24.6	5,756	14.3	3,360	2,396
27-Feb-05	31,256	3,668	300	27,888	26,337	21.6	4,954	14.8	3,403	1,551
06-Mar-05	31,256	4,238	300	27,318	26,080	20.4	4,620	14.9	3,382	1,238
13-Mar-05	31,256	4,217	300	27,339	25,856	21.5	4,839	14.9	3,356	1,483
20-Mar-05	31,256	5,020	300	26,536	25,257	19.9	4,396	14.1	3,117	1,279
27-Mar-05	31,256	7,389	300	24,167	24,934	10.9	2,367	14.4	3,134	-767
03-Apr-05	31,256	6,809	300	24,747	24,209	16.1	3,422	13.5	2,884	538
10-Apr-05	31,256	6,314	300	25,242	23,123	23.9	4,873	13.5	2,754	2,119
17-Apr-05	31,256	6,400	300	25,156	22,850	24.8	4,999	13.4	2,693	2,306
24-Apr-05	31,256	6,447	300	25,109	22,566	26.2	5,219	13.5	2,676	2,543
01-May-05	31,256	7,028	300	24,528	22,143	25.9	5,038	13.6	2,653	2,385
08-May-05	30,108	6,469	300	23,939	21,742	24.6	4,730	13.2	2,533	2,197
15-May-05	30,108	5,536	300	24,872	22,570	31.4	5,938	19.2	3,636	2,302
22-May-05	30,108	6,392	300	24,016	23,236	24.7	4,750	20.6	3,970	780
29-May-05	30,108	5,421	300	24,987	23,650	25.9	5,138	19.2	3,801	1,337
05-Jun-05	30,108	3,626	300	26,782	25,624	23.7	5,128	18.3	3,970	1,158
12-Jun-05	30,108	3,271	300	27,137	25,871	22.7	5,026	17.0	3,760	1,266
19-Jun-05	30,108	3,291	300	27,117	26,771	18.1	4,160	16.6	3,814	346
26-Jun-05	30,108	3,237	300	27,171	26,886	16.5	3,843	15.3	3,558	285
03-Jul-05	30,108	2,370	300	28,038	27,222	20.4	4,742	16.9	3,926	816
10-Jul-05	30,108	2,511	300	27,897	27,924	15.8	3,808	15.9	3,835	-27
17-Jul-05	30,108	2,498	300	27,910	27,697	15.6	3,763	14.7	3,550	213
24-Jul-05	30,108	1,968	300	28,440	27,581	18.0	4,335	14.4	3,476	859
31-Jul-05	30,108	1,962	300	28,446	27,609	17.9	4,327	14.5	3,490	837
07-Aug-05	30,108	1,953	300	28,455	27,506	19.3	4,594	15.3	3,645	949
14-Aug-05	30,108	1,922	300	28,486	27,662	18.9	4,537	15.5	3,713	824
21-Aug-05	30,108	1,885	300	28,523	27,474	19.2	4,595	14.8	3,546	1,049
28-Aug-05	30,108	2,369	300	28,039	27,371	18.5	4,374	15.7	3,706	668
04-Sep-05	30,108	3,259	300	27,149	27,583	14.2	3,381	16.1	3,815	-434
11-Sep-05	30,108	3,792	300	26,616	25,741	20.6	4,544	16.6	3,669	875
18-Sep-05	30,108	4,266	300	26,142	24,760	21.9	4,688	15.4	3,306	1,382
25-Sep-05	30,108	5,083	300	25,325	24,383	22.9	4,719	18.3	3,777	942
02-Oct-05	30,108	5,952	300	24,456	23,548	23.5	4,650	18.9	3,742	908

Table A3 Demand Forecast Range For Required Resources Calculation

Week Ending Day	Ontario Demand Normal Weather MW	Ontario Demand Extreme Weather MW
04-Apr-04	20,851	21,201
11-Apr-04	19,946	20,957
18-Apr-04	19,829	21,849
25-Apr-04	19,483	21,751
02-May-04	19,145	21,653
09-May-04	19,093	21,841
16-May-04	19,264	21,925
23-May-04	19,321	22,124
30-May-04	20,217	22,803
06-Jun-04	21,464	24,852
13-Jun-04	22,314	25,694
20-Jun-04	23,176	25,490
27-Jun-04	22,879	25,540
04-Jul-04	23,383	25,857
11-Jul-04	23,668	26,430
18-Jul-04	23,441	25,717
25-Jul-04	23,378	25,301
01-Aug-04	22,994	25,678
08-Aug-04	23,225	25,862
15-Aug-04	23,112	25,418
22-Aug-04	22,894	25,148
29-Aug-04	23,271	26,036
05-Sep-04	21,917	24,792
12-Sep-04	21,107	23,719
19-Sep-04	20,045	23,505
26-Sep-04	19,438	22,404
03-Oct-04	19,611	22,390
10-Oct-04	19,823	20,357
17-Oct-04	20,045	21,379
24-Oct-04	20,396	21,791
31-Oct-04	21,242	21,262
07-Nov-04	21,565	22,226
14-Nov-04	22,040	22,875
21-Nov-04	22,421	23,394
28-Nov-04	22,538	23,917
05-Dec-04	23,147	24,625
12-Dec-04	23,340	24,329
19-Dec-04	23,304	25,191
26-Dec-04	23,719	24,879

(Table A3 continued)

Week Ending Day	Ontario Demand Normal Weather MW	Ontario Demand Extreme Weather MW
02-Jan-05	22,125	23,285
09-Jan-05	23,444	25,385
16-Jan-05	24,153	26,122
23-Jan-05	24,011	25,858
30-Jan-05	23,750	25,707
06-Feb-05	23,857	25,344
13-Feb-05	23,656	25,356
20-Feb-05	23,434	25,215
27-Feb-05	22,934	24,502
06-Mar-05	22,698	24,444
13-Mar-05	22,500	24,206
20-Mar-05	22,140	23,750
27-Mar-05	21,800	23,279
03-Apr-05	21,325	22,699
10-Apr-05	20,369	21,774
17-Apr-05	20,157	21,083
24-Apr-05	19,890	20,659
01-May-05	19,490	20,394
08-May-05	19,209	19,970
15-May-05	18,934	22,140
22-May-05	19,266	22,233
29-May-05	19,849	22,650
05-Jun-05	21,654	24,671
12-Jun-05	22,111	25,388
19-Jun-05	22,957	26,002
26-Jun-05	23,328	25,880
03-Jul-05	23,296	26,322
10-Jul-05	24,089	26,825
17-Jul-05	24,147	26,779
24-Jul-05	24,105	26,105
31-Jul-05	24,119	26,142
07-Aug-05	23,861	26,655
14-Aug-05	23,949	26,831
21-Aug-05	23,928	26,118
28-Aug-05	23,665	26,271
04-Sep-05	23,768	26,923
11-Sep-05	22,072	24,830
18-Sep-05	21,454	24,354
25-Sep-05	20,606	23,802
02-Oct-05	19,806	22,915

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 Above Requirement MW
04-Apr-04	30,501	7,317	0	23,184	24,136	9.4	1,983	13.8	2,935	-952
11-Apr-04	30,501	7,682	0	22,819	23,881	8.9	1,862	14.0	2,924	-1,062
18-Apr-04	30,501	7,104	0	23,397	24,938	7.1	1,548	14.1	3,089	-1,541
25-Apr-04	30,501	8,546	0	21,955	24,827	0.9	204	14.1	3,076	-2,872
02-May-04	30,501	8,154	0	22,347	24,772	3.2	694	14.4	3,119	-2,425
09-May-04	30,501	8,526	0	21,975	24,874	0.6	134	13.9	3,033	-2,899
16-May-04	30,501	7,272	0	23,229	24,936	6.0	1,304	13.7	3,011	-1,707
23-May-04	30,501	6,165	0	24,336	25,094	10.0	2,212	13.4	2,970	-758
30-May-04	30,501	4,845	0	25,656	25,892	12.5	2,853	13.6	3,089	-236
06-Jun-04	30,501	4,633	0	25,868	28,385	4.1	1,016	14.2	3,533	-2,517
13-Jun-04	30,501	3,935	0	26,566	29,358	3.4	872	14.3	3,664	-2,792
20-Jun-04	30,501	3,747	0	26,754	29,099	5.0	1,264	14.2	3,609	-2,345
27-Jun-04	30,501	3,768	0	26,733	29,172	4.7	1,193	14.2	3,632	-2,439
04-Jul-04	30,501	2,839	0	27,662	29,526	7.0	1,805	14.2	3,669	-1,864
11-Jul-04	30,501	2,612	0	27,889	30,223	5.5	1,459	14.4	3,793	-2,334
18-Jul-04	30,501	2,317	0	28,184	29,328	9.6	2,467	14.0	3,611	-1,144
25-Jul-04	30,501	2,329	0	28,172	28,834	11.4	2,871	14.0	3,533	-662
01-Aug-04	30,501	2,247	0	28,254	29,276	10.0	2,576	14.0	3,598	-1,022
08-Aug-04	30,501	2,393	0	28,108	29,521	8.7	2,246	14.2	3,659	-1,413
15-Aug-04	30,501	2,367	0	28,134	28,980	10.7	2,716	14.0	3,562	-846
22-Aug-04	30,501	2,344	0	28,157	28,671	12.0	3,009	14.0	3,523	-514
29-Aug-04	30,501	2,773	0	27,728	29,744	6.5	1,692	14.2	3,708	-2,016
05-Sep-04	30,501	4,534	0	25,967	28,405	4.7	1,175	14.6	3,613	-2,438
12-Sep-04	30,501	5,241	0	25,260	27,204	6.5	1,541	14.7	3,485	-1,944
19-Sep-04	30,501	5,333	0	25,168	26,976	7.1	1,663	14.8	3,471	-1,808
26-Sep-04	30,501	7,599	0	22,902	25,904	2.2	498	15.6	3,500	-3,002
03-Oct-04	30,501	8,738	0	21,763	25,805	-2.8	-627	15.3	3,415	-4,042
10-Oct-04	30,501	8,703	0	21,798	23,373	7.1	1,441	14.8	3,016	-1,575
17-Oct-04	30,501	8,500	0	22,001	24,570	2.9	622	14.9	3,191	-2,569
24-Oct-04	30,501	8,111	0	22,390	25,050	2.8	599	15.0	3,259	-2,660
31-Oct-04	30,501	6,101	0	24,400	24,124	14.8	3,138	13.5	2,862	276
07-Nov-04	30,501	5,313	0	25,188	25,090	13.3	2,962	12.9	2,864	98
14-Nov-04	30,501	5,692	0	24,809	25,898	8.5	1,934	13.2	3,023	-1,089
21-Nov-04	30,501	5,503	0	24,998	26,477	6.9	1,604	13.2	3,083	-1,479
28-Nov-04	30,501	4,335	0	26,166	27,017	9.4	2,249	13.0	3,100	-851
05-Dec-04	30,501	4,285	0	26,216	27,750	6.5	1,591	12.7	3,125	-1,534
12-Dec-04	30,501	4,285	0	26,216	27,397	7.8	1,887	12.6	3,068	-1,181
19-Dec-04	30,501	2,411	0	28,090	28,286	11.5	2,899	12.3	3,095	-196
26-Dec-04	30,501	1,891	0	28,610	27,883	15.0	3,731	12.1	3,004	727

(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 Above Requirement MW
02-Jan-05	30,501	1,891	0	28,610	26,135	22.9	5,325	12.2	2,850	2,475
09-Jan-05	30,501	1,896	0	28,605	28,431	12.7	3,220	12.0	3,046	174
16-Jan-05	30,501	2,674	0	27,827	29,374	6.5	1,705	12.5	3,252	-1,547
23-Jan-05	30,501	2,674	0	27,827	29,052	7.6	1,969	12.4	3,194	-1,225
30-Jan-05	30,501	2,674	0	27,827	28,873	8.3	2,120	12.3	3,166	-1,046
06-Feb-05	30,501	3,109	0	27,392	28,467	8.1	2,048	12.3	3,123	-1,075
13-Feb-05	30,501	3,084	0	27,417	28,478	8.1	2,061	12.3	3,122	-1,061
20-Feb-05	30,501	2,327	0	28,174	28,249	11.7	2,959	12.0	3,034	-75
27-Feb-05	30,501	3,629	0	26,872	27,470	9.7	2,370	12.1	2,968	-598
06-Mar-05	30,501	4,187	0	26,314	27,687	7.7	1,870	13.3	3,243	-1,373
13-Mar-05	30,501	4,166	0	26,335	27,413	8.8	2,129	13.3	3,207	-1,078
20-Mar-05	30,501	4,952	0	25,549	26,803	7.6	1,799	12.9	3,053	-1,254
27-Mar-05	30,501	7,278	0	23,223	26,438	-0.2	-56	13.6	3,159	-3,215
03-Apr-05	30,501	6,676	0	23,825	25,579	5.0	1,126	12.7	2,880	-1,754
10-Apr-05	30,501	6,166	0	24,335	24,424	11.8	2,561	12.2	2,650	-89
17-Apr-05	30,501	6,263	0	24,238	23,575	15.0	3,155	11.8	2,492	663
24-Apr-05	30,501	6,321	0	24,180	23,117	17.0	3,521	11.9	2,458	1,063
01-May-05	30,501	6,903	0	23,598	22,771	15.7	3,204	11.7	2,377	827
08-May-05	29,353	6,335	0	23,018	22,246	15.3	3,048	11.4	2,276	772
15-May-05	29,353	5,409	0	23,944	24,819	8.2	1,804	12.1	2,679	-875
22-May-05	29,353	6,279	0	23,074	24,916	3.8	841	12.1	2,683	-1,842
29-May-05	29,353	5,292	0	24,061	25,421	6.2	1,411	12.2	2,771	-1,360
05-Jun-05	29,353	3,501	0	25,852	27,631	4.8	1,181	12.0	2,960	-1,779
12-Jun-05	29,353	3,129	0	26,224	28,474	3.3	836	12.2	3,086	-2,250
19-Jun-05	29,353	3,148	0	26,205	29,229	0.8	203	12.4	3,227	-3,024
26-Jun-05	29,353	3,106	0	26,247	29,062	1.4	367	12.3	3,182	-2,815
03-Jul-05	29,353	2,242	0	27,111	29,501	3.0	789	12.1	3,179	-2,390
10-Jul-05	29,353	2,365	0	26,988	30,100	0.6	163	12.2	3,275	-3,112
17-Jul-05	29,353	2,361	0	26,992	30,041	0.8	213	12.2	3,262	-3,049
24-Jul-05	29,353	1,822	0	27,531	29,210	5.5	1,426	11.9	3,105	-1,679
31-Jul-05	29,353	1,823	0	27,530	29,255	5.3	1,388	11.9	3,113	-1,725
07-Aug-05	29,353	1,799	0	27,554	29,892	3.4	899	12.1	3,237	-2,338
14-Aug-05	29,353	1,769	0	27,584	30,101	2.8	753	12.2	3,270	-2,517
21-Aug-05	29,353	1,749	0	27,604	29,241	5.7	1,486	12.0	3,123	-1,637
28-Aug-05	29,353	2,222	0	27,131	29,482	3.3	860	12.2	3,211	-2,351
04-Sep-05	29,353	3,128	0	26,225	30,336	-2.6	-698	12.7	3,413	-4,111
11-Sep-05	29,353	3,640	0	25,713	27,877	3.6	883	12.3	3,047	-2,164
18-Sep-05	29,353	4,118	0	25,235	27,305	3.6	881	12.1	2,951	-2,070
25-Sep-05	29,353	4,977	0	24,376	26,753	2.4	574	12.4	2,951	-2,377
02-Oct-05	29,353	5,844	0	23,509	25,806	2.6	594	12.6	2,891	-2,297

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 Above Requirement MW
04-Apr-04	30,501	7,317	300	23,484	24,136	10.8	2,283	13.8	2,935	-652
11-Apr-04	30,501	7,682	300	23,119	23,881	10.3	2,162	14.0	2,924	-762
18-Apr-04	30,501	7,104	300	23,697	24,938	8.5	1,848	14.1	3,089	-1,241
25-Apr-04	30,599	8,546	300	22,353	24,853	2.8	602	14.3	3,102	-2,500
02-May-04	30,599	8,154	300	22,745	24,770	5.0	1,092	14.4	3,117	-2,025
09-May-04	30,599	8,526	300	22,373	24,882	2.4	532	13.9	3,041	-2,509
16-May-04	30,599	7,272	300	23,627	24,933	7.8	1,702	13.7	3,008	-1,306
23-May-04	30,599	6,165	300	24,734	25,103	11.8	2,610	13.5	2,979	-369
30-May-04	30,599	4,845	300	26,054	25,897	14.3	3,251	13.6	3,094	157
06-Jun-04	30,599	4,633	300	26,266	28,380	5.7	1,414	14.2	3,528	-2,114
13-Jun-04	30,599	3,935	300	26,964	29,352	4.9	1,270	14.2	3,658	-2,388
20-Jun-04	30,599	3,747	300	27,152	29,085	6.5	1,662	14.1	3,595	-1,933
27-Jun-04	30,599	3,768	300	27,131	29,158	6.2	1,591	14.2	3,618	-2,027
04-Jul-04	31,224	2,930	300	28,594	29,554	10.6	2,737	14.3	3,697	-960
11-Jul-04	31,224	2,703	300	28,821	30,233	9.1	2,391	14.4	3,803	-1,412
18-Jul-04	31,224	2,408	300	29,116	29,355	13.2	3,399	14.2	3,638	-239
25-Jul-04	31,224	2,420	300	29,104	28,847	15.0	3,803	14.0	3,546	257
01-Aug-04	31,224	2,338	300	29,186	29,304	13.7	3,508	14.1	3,626	-118
08-Aug-04	31,256	2,486	300	29,070	29,539	12.4	3,208	14.2	3,677	-469
15-Aug-04	31,256	2,460	300	29,096	28,992	14.5	3,678	14.1	3,574	104
22-Aug-04	31,256	2,437	300	29,119	28,674	15.8	3,971	14.0	3,526	445
29-Aug-04	31,256	2,866	300	28,690	29,771	10.2	2,654	14.4	3,735	-1,081
05-Sep-04	31,256	4,613	300	26,943	28,427	8.7	2,151	14.7	3,635	-1,484
12-Sep-04	31,256	5,320	300	26,236	27,219	10.6	2,517	14.8	3,500	-983
19-Sep-04	31,256	5,412	300	26,144	26,985	11.2	2,639	14.8	3,480	-841
26-Sep-04	31,256	7,678	300	23,878	25,914	6.6	1,474	15.7	3,510	-2,036
03-Oct-04	31,256	8,801	300	22,755	25,827	1.6	365	15.4	3,437	-3,072
10-Oct-04	31,256	8,766	300	22,790	23,381	12.0	2,433	14.9	3,024	-591
17-Oct-04	31,256	8,563	300	22,993	24,577	7.6	1,614	15.0	3,198	-1,584
24-Oct-04	31,256	8,174	300	23,382	25,056	7.3	1,591	15.0	3,265	-1,674
31-Oct-04	31,256	6,164	300	25,392	24,207	19.4	4,130	13.9	2,945	1,185
07-Nov-04	31,256	5,364	300	26,192	25,115	17.8	3,966	13.0	2,889	1,077
14-Nov-04	31,256	5,743	300	25,813	25,908	12.8	2,938	13.3	3,033	-95
21-Nov-04	31,256	5,554	300	26,002	26,496	11.2	2,608	13.3	3,102	-494
28-Nov-04	31,256	4,386	300	27,170	27,038	13.6	3,253	13.1	3,121	132
05-Dec-04	31,256	4,324	300	27,232	27,781	10.6	2,607	12.8	3,156	-549
12-Dec-04	31,256	4,324	300	27,232	27,413	11.9	2,903	12.7	3,084	-181
19-Dec-04	31,256	2,450	300	29,106	28,308	15.5	3,915	12.4	3,117	798
26-Dec-04	31,256	1,930	300	29,626	27,950	19.1	4,747	12.3	3,071	1,676

(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 Above Requirement MW
02-Jan-05	31,256	1,930	300	29,626	26,205	27.2	6,341	12.5	2,920	3,421
09-Jan-05	31,256	1,935	300	29,621	28,369	16.7	4,236	11.8	2,984	1,252
16-Jan-05	31,256	2,713	300	28,843	29,330	10.4	2,721	12.3	3,208	-487
23-Jan-05	31,256	2,713	300	28,843	29,006	11.5	2,985	12.2	3,148	-163
30-Jan-05	31,256	2,713	300	28,843	28,820	12.2	3,136	12.1	3,113	23
06-Feb-05	31,256	3,148	300	28,408	28,414	12.1	3,064	12.1	3,070	-6
13-Feb-05	31,256	3,123	300	28,433	28,424	12.1	3,077	12.1	3,068	9
20-Feb-05	31,256	2,366	300	29,190	28,196	15.8	3,975	11.8	2,981	994
27-Feb-05	31,256	3,668	300	27,888	27,421	13.8	3,386	11.9	2,919	467
06-Mar-05	31,256	4,238	300	27,318	27,634	11.8	2,874	13.1	3,190	-316
13-Mar-05	31,256	4,217	300	27,339	27,346	12.9	3,133	13.0	3,140	-7
20-Mar-05	31,256	5,003	300	26,553	26,744	11.8	2,803	12.6	2,994	-191
27-Mar-05	31,256	7,329	300	24,227	26,371	4.1	948	13.3	3,092	-2,144
03-Apr-05	31,256	6,727	300	24,829	25,540	9.4	2,130	12.5	2,841	-711
10-Apr-05	31,256	6,229	300	25,327	24,351	16.3	3,553	11.8	2,577	976
17-Apr-05	31,256	6,326	300	25,230	23,613	19.7	4,147	12.0	2,530	1,617
24-Apr-05	31,256	6,384	300	25,172	23,188	21.9	4,513	12.2	2,529	1,984
01-May-05	31,256	6,966	300	24,590	22,921	20.6	4,196	12.4	2,527	1,669
08-May-05	30,108	6,398	300	24,010	22,392	20.2	4,040	12.1	2,422	1,618
15-May-05	30,108	5,472	300	24,936	24,852	12.6	2,796	12.3	2,712	84
22-May-05	30,108	6,342	300	24,066	24,950	8.2	1,833	12.2	2,717	-884
29-May-05	30,108	5,355	300	25,053	25,428	10.6	2,403	12.3	2,778	-375
05-Jun-05	30,108	3,564	300	26,844	27,590	8.8	2,173	11.8	2,919	-746
12-Jun-05	30,108	3,208	300	27,200	28,417	7.1	1,812	11.9	3,029	-1,217
19-Jun-05	30,108	3,227	300	27,181	29,161	4.5	1,179	12.2	3,159	-1,980
26-Jun-05	30,108	3,185	300	27,223	29,018	5.2	1,343	12.1	3,138	-1,795
03-Jul-05	30,108	2,321	300	28,087	29,454	6.7	1,765	11.9	3,132	-1,367
10-Jul-05	30,108	2,458	300	27,950	30,044	4.2	1,125	12.0	3,219	-2,094
17-Jul-05	30,108	2,454	300	27,954	29,990	4.4	1,175	12.0	3,211	-2,036
24-Jul-05	30,108	1,915	300	28,493	29,175	9.2	2,388	11.8	3,070	-682
31-Jul-05	30,108	1,916	300	28,492	29,222	9.0	2,350	11.8	3,080	-730
07-Aug-05	30,108	1,892	300	28,516	29,840	7.0	1,861	12.0	3,185	-1,324
14-Aug-05	30,108	1,862	300	28,546	30,058	6.4	1,715	12.0	3,227	-1,512
21-Aug-05	30,108	1,842	300	28,566	29,208	9.4	2,448	11.8	3,090	-642
28-Aug-05	30,108	2,315	300	28,093	29,430	6.9	1,822	12.0	3,159	-1,337
04-Sep-05	30,108	3,207	300	27,201	30,287	1.0	278	12.5	3,364	-3,086
11-Sep-05	30,108	3,719	300	26,689	27,817	7.5	1,859	12.0	2,987	-1,128
18-Sep-05	30,108	4,197	300	26,211	27,255	7.6	1,857	11.9	2,901	-1,044
25-Sep-05	30,108	5,056	300	25,352	26,705	6.5	1,550	12.2	2,903	-1,353
02-Oct-05	30,108	5,923	300	24,485	25,747	6.9	1,570	12.4	2,832	-1,262

Table A6 Energy Production Capability Forecast

Month	Forecast Energy Production Capability Existing Resource Scenario (GWh)	Forecast Energy Production Capability Planned Resource Scenario (GWh)
Apr 2004	13,791	13,821
May 2004	15,556	15,637
Jun 2004	16,361	16,541
Jul 2004	17,323	17,705
Aug 2004	17,009	17,407
Sep 2004	13,962	14,381
Oct 2004	13,985	14,428
Nov 2004	15,315	15,751
Dec 2004	17,392	17,851
Jan 2005	17,504	17,963
Feb 2005	15,398	15,813
Mar 2005	15,214	15,664
Apr 2005	14,482	14,910
May 2005	15,128	15,534
Jun 2005	16,018	16,436
Jul 2005	16,950	17,373
Aug 2005	16,694	17,117
Sep 2005	14,369	14,787

- End of Section -

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Appendix B Transmission Projects

East Zone	Projected I/S Date
Chenaux TS: Add two new 230 kV breakers. Reconnect T4 transformer.	2004-Q4
Mountain Chute - Chenaux SPS: Modify the SPS to include the new breakers.	2004-Q4
Kingston-Gardiner TS: Add 2nd transformer station.	2005-Q1

Essa Zone	Projected I/S Date
Owen Sound TS: Replace transformer T5 230 kV disconnect switch.	2004-Q2
Midhurst TS: Expand existing transformer station.	2004-Q4
Stayner TS: Replace 44 kV, 10 MX, SC3 shunt capacitor.	2004-Q4

Niagara Zone	Projected I/S Date
Bloomsburg TS: New 115/27.6 kV transformer station connected to A1N.	2004-Q2
Kalar TS: New 115/14.2 kV transformer station off lines A36N and A37N.	2004-Q2

Northeast Zone	Projected I/S Date
GLP Transmission Reinforcement Stage1: Remove from service 115 kV circuit No.3 Sault.	2004-Q2
Trout Lake TS: Install new 230 kV surge arresters.	2004-Q2
Dymond TS: Replace 44 kV, 10 Mvar SC3 shunt capacitor.	2004-Q4
Upgrade 115 kV circuit Gartshore #2.	2004-Q4

Northwest Zone	Projected I/S Date
Fort William TS: Install in-line switches for circuits Q4B and Q5B.	2004-Q2
Red Lake: Install new 115 kV surge arresters.	2004-Q2
North Caribou Lake: Add new supply point.	2005-Q2

Ottawa Zone	Projected I/S Date
Albion TS: Replace 230 kV rod gaps with metal oxide surge arresters.	2004-Q2
Hawthorne TS: Add one 250 MVA 230/115 kV autotransformer and one new double circuit line from Hawthorne to Blackburn Jct.	2004-Q2
Ottawa Area: Add 115 kV breaker to W6MC and motorize existing disconnect on C7MB.	2004-Q2
Hawthorne TS: Replace SC11 capacitor bank.	2004-Q4
Upgrade 115 kV circuit H9A.	2004-Q4

Southwest Zone	Projected I/S Date
Bronte TS: Install two new feeders.	2004-Q2
Goderich TS: Replace capacitor bank circuit breaker SC1B.	2004-Q2
Kenilworth TS: Replace 115 kV line disconnect and grounding switches.	2004-Q2
Kenilworth TS: Replace 115 kV rod gaps with metal oxide surge arresters.	2004-Q2
Kenilworth TS: Replace 115 kV transformer disconnect and grounding switches.	2004-Q2
Mohawk TS: Replace low voltage capacitor banks SC2 and SC3.	2004-Q2
Nanticoke TGS: Replace station service transformers.	2004-Q2
St. Marys TS: Add two new feeders.	2004-Q2
Burlington TS: Add 125 Mvar 115 kV capacitor bank.	2004-Q2
Caledonia TS: Add two new 75/125 MVA 230/115 kV autotransformers and re-supply Norfolk TS off these new autotransformers.	2004-Q2
Halton TS: Install two additional 27.6 kV breakers.	2004-Q2
Detweiler TS: Replace 115/230 kV autotransformer T3.	2004-Q2
Kitchener: Build new 230/14.2 kV transformer station.	2004-Q3
Beach TS: Install surge arresters on T4 and T7.	2004-Q4
Burlington TS: Install 230 kV, 300 Mvar shunt capacitor.	2004-Q4
Upgrade 115 kV circuits D7G & D9G.	2005-Q2

(Appendix B continued)

Toronto Zone	Projected I/S Date
Glengrove TS: Refurbish 115 kV station.	2004-Q2
Glengrove TS: Replace T2 transformer.	2004-Q2
Leaside TS: Install series reactors on 13.8 kV capacitor banks SC1 and SC2.	2004-Q2
Richview TS: Replace 230 kV breaker disconnect switches.	2004-Q2
Runnymede TS: Replace low voltage capacitor banks SC3 and SC4.	2004-Q2
Strachan TS: Replace 115 kV grounding switch and transformer disconnect switch.	2004-Q2
Thorton TS: Install new 230 kV surge arresters.	2004-Q2
Cherrywood TS: Reterminate 500/230 kV autotransformers.	2004-Q2
Kleinburg TS: Install two additional 27.6 kV breakers.	2004-Q2
Leaside TS: Install 125 Mvar shunt capacitor.	2004-Q2
Strachan TS: Replace 115 kV rod gaps with metal oxide surge arresters.	2004-Q2
Markham: New transformer station connected to 230 kV circuits C11R and C12R.	2004-Q3
Pickering A NGS: Refurbish 230 kV switchyard - G1.	2004-Q3
Wiltshire TS: Replacement of transformer T6.	2004-Q3
Hearn SS: Install 125 Mvar shunt capacitor.	2004-Q4
John TS, Richview TS: Install, respectively, 230 kV, 412 Mvar and 115 kV, 99.5 Mvar shunt capacitor banks.	2004-Q4
Manby West TS: Install surge arresters on T3 and T4.	2004-Q4
Manby West TS: Replace T4 with like unit.	2004-Q4
Richview TS: Replace 230 kV rod gaps with surge arresters.	2004-Q4
Lakeview SS: Replace 230 kV circuit breakers L24T7 and L24T8.	2005-Q2
Leaside TS: Install second 125 Mvar shunt capacitor.	2005-Q2
Mississauga TS: New transformer station.	2005-Q2
Parkway TS - Build new transformer station with one 750 MVA, 500/230 kV autotransformer.	2005-Q2
Vaughan MTS #1: Add new 3rd transformer.	2005-Q2

West Zone	Projected I/S Date
Lambton TS: Modify low voltage supply to Terra Nitrogen.	2004-Q2
London Highbury TS: Replace low voltage capacitor bank SC2.	2004-Q2
London Highbury TS: Install New 115 kV surge arresters.	2004-Q2
Kent TS: Install new 230 kV surge arresters.	2004-Q2
Windsor Area: Enhance Windsor Area Overload Protection Scheme.	2004-Q2
Belle River East DS: Build new 115/27.6 kV distribution station.	2004-Q2
Kent TS: Install new 125 MVA 230/115 kV autotransformer.	2004-Q4
Tilsonburg TS: Replace three transformers with like units.	2004-Q4

- 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 greater than five days, and/or for those transmission outages associated with a major project.

Table C1 Bruce Zone

No outages to analyze.

Table C2 East Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
6/14/04 7:00 AM	6/25/04 3:00 PM	Lennox TS.KL520	CWW	8 Hour		
9/11/04 6:00 PM	9/19/04 7:30 PM	Chenaux TS.T4, Chenaux TS.4X1P, Chenaux TS.A1-A2, Pembroke TS.6X6-D6 -I/S, Chenaux TS.4X6, Chenaux TS.4-X1P, Chenaux TS.A3-A4	CWW	0 Non-Recallable	Chenaux units G5-G8 will be constrained.	
9/13/04 7:00 AM	9/19/04 7:30 PM	X1P	CWW	24 Hour		
9/20/04 7:30 PM	11/13/04 12:00 PM	Chenaux TS.A1-A2	CWW	0 Non-Recallable		
10/25/04 8:00 AM	10/30/04 4:00 PM	Dobbin TS.HL27	CWW	4 Hour		

Table C3 Essa Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
11/10/03 7:00 AM	11/15/04 2:30 PM	Essa TS.SS3-X	CWW	12 Hour		

Table C4 Niagara Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
5/10/04 5:00 AM	5/21/04 11:00 AM	Q30M (Including All Terminals)	DWW	1 Hour	FABC FETT QFW	FABC: up to 100 MW FETT: 250 MW QFW: approximately 450-550 MW

Table C5 Northeast Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
6/16/03 12:35 PM	6/16/04 11:59 PM	Agimak T2, Agimak T1	CNW	0 Non-Recallable		
11/24/03 9:01 AM	4/1/04 3:00 PM	Inco Frd Stobie CTS 230FS2T2	CWW	0 Non-Recallable		
1/5/04 8:01 AM	4/5/04 4:00 PM	Inco #4 CTS 69CC4D5	CWW	1 Hour		
4/5/04 7:00 AM	4/29/04 1:00 PM	Dymond TS.SC3	CWW	0 Non-Recallable		
5/3/04 7:00 AM	7/9/04 6:00 PM	H24S_MARTINDALE	CWW	4 Hour	Ontario-Quebec North Interconnection	Mode 2 H4Z (imports) - 30 MW Mode 3 D4Z (imports) - 15 MW
5/10/04 10:00 AM	6/4/04 2:00 PM	Pinard TS.PL20	CWW	0 Non-Recallable		
5/31/04 8:00 AM	7/2/04 4:00 PM	Otto Holden TS.T3	CWW	12 Hour	Ontario-Quebec North Interconnection	Mode 3 H4Z (exports) - 55 MW
6/7/04 10:00 AM	7/2/04 2:00 PM	Pinard TS.PL22	CWW	0 Non-Recallable		
9/6/04 7:00 AM	10/28/04 6:00 PM	S22A	CWW	8 Hour	OMTW EWTE EWTW	OMTW - 0 MW EWTE - 50 MW EWTW - 0 MW
12/24/04 6:00 AM	12/31/04 7:00 PM	S21N (all)	CWW	1 Day		

Table C6 Northwest Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
3/1/04 9:15 AM	4/1/04 4:15 PM	M2D_DRYDEN	CWW	2 Hour	OMTE OMTW EWTW	OMTE - O MW OMTW - O MW EWTW - O MW
4/5/04 9:15 AM	5/6/04 4:15 PM	M2D_DRYDEN	CWW	2 Hour	OMTE OMTW EWTW	April 5-April 19 & May 2-May 6: OMTE - O MW OMTW - O MW EWTW - O MW April 19-May 2 with K24F also out of service (o/s): Covered by outage below.
4/19/04 5:00 AM	5/2/04 6:00 PM	K24F	CWW	8 Hour	OMTE OMTW EWTE EWTW MPFN MPFS	With M2D also o/s: OMTE - 100 MW OMTW - 250 MW EWTE - 75 MW EWTW - 50 MW MPFN - 50 MW MPFS - 100 MW
5/10/04 5:00 AM	5/23/04 6:00 PM	K23D	CWW	8 Hour	OMTE OMTW EWTE MPFN	May 10-May 21 with T1M also o/s: Covered by outage below. May 21-May 23: OMTE - 50 MW OMTW - 250 MW EWTE - 75 MW MPFN - 25 MW
5/10/04 2:00 PM	5/21/04 4:00 PM	T1M_TERRACEBAY	CWW	4 Hour	OMTE OMTW EWTE EWTW MPFN MPFS	With K23D also o/s: OMTE - 50 MW OMTW - 250 MW EWTE - 75 MW EWTW - 0 MW MPFN - 25 MW MPFS - 0 MW

Table C6 Northwest Zone (continued)

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
5/26/04 7:00 AM	6/18/04 5:00 PM	A3M	DWW	4 Hour	OMTE OMTW EWTE EWTW	May 26-May 31 & June 13-June 18: OMTE - O MW OMTW - O MW EWTE - 50 MW EWTW - O MW May 31-June 13 with A21L also o/s: Covered by outage below.
5/31/04 7:00 AM	6/13/04 6:00 PM	A21L	CWW	8 Hour	OMTE OMTW EWTE EWTW	With A3M also o/s: OMTE - 70 MW OMTW - 0 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
8/30/04 8:00 AM	10/1/04 5:00 PM	K24F	DWW	7 Hour	OMTE OMTW EWTE MPFN	Aug. 30-Sept. 13 & Sept. 26-Oct. 1: OMTE - 50 MW OMTW - 250 MW EWTE - 75 MW MPFN - 25 MW Sept. 13-Sept. 16 with D26A also o/s: Covered by outage below.
9/13/04 5:00 AM	9/26/04 6:00 PM	D26A	CWW	8 Hour	OMTE OMTW EWTE EWTW MPFN MPFS	With K24F also o/s: OMTE - 225 MW OMTW - 250 MW EWTE - 75 MW EWTW - 100 MW MPFN - 50 MW MPFS - 100 MW
10/4/04 5:00 AM	10/18/04 6:00 PM	F25A	CWW	8 Hour	OMTE OMTW EWTE EWTW MPFN MPFS	With M2D also o/s: OMTE - 100 MW OMTW - 250 MW EWTE - 75 MW EWTW - 50 MW MPFN - 50 MW MPFS - 100 MW
10/4/04 9:15 AM	12/16/04 4:15 PM	M2D_DRYDEN	CWW	2 Hour	OMTE OMTW EWTW	Oct. 4-Oct. 18 with F25A also o/s: Covered by outage above. Oct. 18-Dec. 16: OMTE - O MW OMTW - O MW EWTW - O MW
12/13/04 12:01 AM	12/19/04 11:59 PM	Thunder Bay C1	CWW	0 Non-Recallable		
5/15/05 12:01 AM	7/24/05 11:59 PM	Thunder Bay C1	CWW	0 Non-Recallable		

Table C7 Ottawa Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
4/5/04 5:00 AM	4/16/04 6:00 PM	Hawthorne TS.R2	CWW	72 Hour		
5/3/04 6:00 AM	5/21/04 4:00 PM	A4K_HAWTHORNE	CNW	4 Hour		
11/15/04 6:00 AM	11/26/04 4:00 PM	B5D_STISIDORE	CNW	4 Hour	FIO Ontario-Quebec South Interconnection	FIO - 0 MW Ontario-Quebec South Interconnection - 400 MW

Table C8 Southwest Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
10/27/03 11:43 AM	12/31/04 6:00 PM	Gage TS.T2	CWW	0 Non-Recallable		
3/29/04 8:00 AM	4/15/04 3:30 PM	Mohawk TS.SC3	CWW	2 Hour		
4/5/04 7:30 AM	4/22/04 4:00 PM	Goderich TS.SC2	CWW	0 Non-Recallable		
4/19/04 7:00 AM	5/6/04 6:00 PM	Stayner TS.SC2, Stayner TS.SC2B	CWW	12 Day	Depending on the load levels, load rejection (L/R) arming at Stayner may be required.	
6/21/04 5:00 AM	7/15/04 4:00 PM	Kenilworth TS.T1, Kenilworth TS.J_BUS, Kenilworth TS.T1-A, Kenilworth TS.27-K2G	CWW	12 Hour		

Table C9 Toronto Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
2/23/04 8:00 AM	4/30/04 3:00 PM	Claireville TS.W3L570	CWW	5 Day		
3/1/04 5:00 AM	4/16/04 6:00 PM	H3L_GERRARD, H1L_GERRARD	CWW	4 Hour	Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits could occur.	
3/29/04 7:00 AM	4/9/04 3:00 PM	Fairbank TS.T1	DWW	1 Hour		
4/5/04 5:00 AM	4/30/04 6:00 PM	Leaside TS.SC11	CWW	3 Week		
4/5/04 5:00 AM	4/7/04 6:00 PM	Cherrywood TS.T14, Cherrywood TS.T15, Cherrywood TS.W2_BUS	CWW	0 Non-Recallable	The loss of the paired Cherrywod T16 and T17 transformers would result in the separation of the Cherrywood 500 kV and 230 kV systems. Depending on load levels and the number of Pickering units in-service, the following problems may arise: (a) Thermal overloads of the Claireville 500/230 kV transformers. (b) 230 kV voltage declines at Cherrywood. (c) Maintaining minimum 230 kV voltages at Cherrywood and Leaside. (d) Shut down of Pickering G4 if Pickering 230 kV voltage drops below 226 kV.	
4/7/04 6:00 PM	4/21/04 5:00 AM	Cherrywood TS.T14	CWW	0 Non-Recallable	Depending on load levels and the number of Pickering units in-service, thermal overloading of the remaining Cherrywood T15 transformer could occur upon the loss of Cherrywood T16 and T17.	
4/21/04 5:00 AM	4/23/04 6:00 PM	Cherrywood TS.T14, Cherrywood TS.J_BUS	CWW	0 Non-Recallable	Depending on load levels and the number of Pickering units in-service, thermal overloading of the remaining Cherrywood T15 transformer could occur upon the loss of Cherrywood T16 and T17.	

Table C9 Toronto Zone (continued)

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
4/9/04 5:00 AM	5/14/04 6:00 PM	Leaside TS.SC11	CWW	4 Hour		
4/19/04 5:00 AM	5/28/04 6:00 PM	H7L_LEASIDE, H11L_LEASIDE	CWW	4 Hour	Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits could occur.	
4/26/04 5:00 AM	4/27/04 6:00 PM	Cherrywood TS.T16, Cherrywood TS.T17, Cherrywood TS.W3_BUS	CWW	0 Non-Recallable	Depending on load levels and the number of Pickering units in-service, thermal overloading of the remaining Cherrywood transformer could occur upon the loss of Cherrywood T14 or T15.	
4/27/04 6:00 PM	5/12/04 5:00 AM	Cherrywood TS.T17	CWW	0 Non-Recallable		
5/12/04 5:00 AM	5/14/04 6:00 PM	Cherrywood TS.T17, Cherrywood TS.A_BUS	CWW	0 Non-Recallable		
4/28/04 5:00 AM	6/4/04 6:00 PM	Wiltshire TS.T6, Wiltshire TS.R6	CWW	12 Hour		
10/4/04 5:00 AM	11/26/04 6:00 PM	Manby West TS.T4, Manby West TS.T4Y	CWW	3 Week		
10/4/04 5:00 AM	12/10/04 6:00 PM	C5E_ESPLANADE, C7E_ESPLANADE	CWW	4 Hour	Depending on load levels, thermal overloading of other Hearn x Leaside 115 kV circuits could occur.	
11/7/04 6:00 PM	11/20/04 6:00 PM	Manby East TS.T7, Manby East TS.E_BUS, Manby East TS.T7-W7, Manby East TS.W7-P19	CWW	9 Hour	On loss of the Manby East 'D' bus supply to Fairbank, Runnymede and Wiltshire transformer stations will be interrupted. Pre-contingency some load may be transferred to Leaside supply leaving less load vulnerable to a supply interruption.	
11/15/04 5:00 AM	11/20/04 6:00 PM	Manby East TS.T7, Manby East TS.E_BUS, Manby East TS.T7-W7, Manby East TS.W7-P19	CWW	9 Hour	As above.	
12/25/04 7:30 AM	1/4/05 6:00 PM	Wilson TS.T4	CWW	36 Hour		

Table C10 West Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
3/29/04 7:30 AM	4/23/04 4:00 PM	Clarke TS.T4	CWW	8 Hour		
6/7/04 7:30 AM	6/24/04 4:00 PM	Sarnia Scott TS.HL22	CWW	0 Non-Recallable		
6/28/04 7:30 AM	7/15/04 4:00 PM	Sarnia Scott TS.HL27	CWW	0 Non-Recallable		

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