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NEEDS ASSESSMENT REPORT

Region: South Georgian Bay/Muskoka

Revision: Final
Date: March 3, 2015

Prepared by: South Georgian Bay/Muskoka Region Study Team

South Georgian Bay/Muskoka Region Study Team	
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Disclaimer

This Needs Assessment Report was prepared for the purpose of identifying potential needs in the South Georgian Bay/Muskoka Region and to assess whether those needs require further coordinated regional planning. The potential needs that have been identified through this Needs Assessment Report may be studied further through subsequent regional planning processes and may be reevaluated based on the findings of further analysis. The load forecast and results reported in this Needs Assessment Report are based on the information and assumptions provided by study team participants.

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NEEDS ASSESSMENT EXECUTIVE SUMMARY

REGION	South Georgian Bay/Muskoka Region		
LEAD	Hydro One Networks Inc.		
START DATE	January 2, 2015	**END DATE**	March 3, 2015

1. INTRODUCTION

The purpose of this Needs Assessment report is to undertake an assessment of the South Georgian Bay/Muskoka Region ("the Region") and determine if there are regional needs that require coordinated regional planning. Where regional coordination is not required, and a "localized" wires solution is necessary, such needs will be addressed between relevant Local Distribution Companies (LDCs) and Hydro One Networks Inc. (HONI) and other parties as required.

For needs that require further regional planning and coordination, the Independent Electricity System Operator (IESO) will initiate the Scoping Assessment (SA) process to determine whether an IESO-led Integrated Regional Resource Planning (IRRP) process, or the transmitter-led Regional Infrastructure Plan (RIP) process (wires solution), or whether both are required.

2. REGIONAL ISSUE/TRIGGER

The Needs Assessment for the South Georgian Bay/Muskoka Region was triggered in response to the Ontario Energy Board's (OEB) Regional Infrastructure Planning process approved in August 2013. To prioritize and manage the regional planning process, Ontario's 21 regions were assigned to one of three groups. The Needs Assessment for Group 1 Regions is complete and has been initiated for Group 2 Regions. The South Georgian Bay/Muskoka Region belongs to Group 2 and the Needs Assessment for this Region was triggered on January 2, 2015 and was completed on March 3, 2015.

3. SCOPE OF NEEDS ASSESSMENT

The scope of the Needs Assessment study was limited to the next 10 years as per the recommendations of the Planning Process Working Group (PPWG) Report to the Board. As such, relevant data and information was collected up to the year 2023.

Needs emerging over the next 10 years and requiring coordinated regional planning may be further assessed as part of the IESO-led SA process, which will determine the appropriate regional planning approach: IRRP, RIP, and/or local planning.

This Needs Assessment included a study of transmission system and connection facilities capability, which covers station and line loading, thermal and voltage analysis as well as a review of system reliability, operational issues such as load restoration, and assets approaching end-of-useful-life.

4. INPUTS/DATA

Study team participants, including representatives from LDCs, the IESO and HONI transmission provided information for the Region. The information included historical load, load forecast, Conservation and Demand Management (CDM) and Distributed Generation (DG) information, load restoration data, and performance information including major equipment approaching end-of-useful-life. See Section 4 of the report for further details.

5. ASSESSMENT METHODOLOGY

The assessment's primary objective was to identify the electrical infrastructure needs in the Region over the study period (2014 to 2023). The assessment reviewed available information and load forecasts, and included single contingency analysis to confirm needs, if and when required. See Section 5 of the report for further details.

6. RESULTS

Transmission Capacity Needs

A. 115/230kV Transmission Lines and Auto-Transformers

- With the 230/115kV auto-transformer T1 or T2 at Essa TS out-of-service, the companion transformer is expected to exceed its summer 10-Day Limited Time Rating (LTR) during the study period based on gross summer demand forecast. T1 is expected to exceed its summer 10-Day LTR in the near-term and T2 in the medium-term. The net summer demand forecast is not expected to significantly defer the need due to the high growth rate at Barrie TS.
- With one element out of service, the 115 kV circuit E3B is expected to exceed its summer Long-Term Emergency (LTE) rating in the near-term based on gross summer demand forecast. The net summer demand forecast is not expected to significantly defer the need due to the high growth rate at Barrie TS.

B. 115/230kV Transmission Stations

- Barrie TS is a summer peaking station and currently exceeds its normal supply capacity based on both gross and net summer demand forecast.
- Muskoka TS is a winter peaking station and will exceed its normal supply capacity in near-term based on both gross and net winter demand forecast.
- Parry Sound TS is a winter peaking station and currently exceeds its normal supply capacity based on both gross and net winter demand forecast.
- Midhurst TS T1/T2 DESN may exceed its normal supply capacity in the medium-term based on gross and net summer demand forecast if potential new commercial operations in the city of Barrie materialize.

System Reliability, Operation and Restoration Needs

Based on the gross and net coincident demand forecast, the loss of one element will not result in load interruption greater than the limit of 150MW. The loss of two elements will not result in load interruption greater than the limit of 600MW.

For the loss of two elements, based on gross and net region-coincident demand forecast the load interrupted by configuration may exceed 150MW and 250MW. The loss of 230kV circuits M6E+M7E may require some load to be restored within 4 hours and 30 minutes; the loss of 230kV circuits M80B+M81B may require some load to be restored within 4 hours; and the loss of 230kV circuits E8V+E9V may require some load to be restored within 4 hours during the study period. 230kV circuit M6E+M7E may not meet the 30 minutes restoration criteria. Further assessment is required.

Due to the increase generation within the Bruce Area, 115kV circuit S2S and Stayner T1 auto-transformer may be overloaded under pre-contingency conditions during high flow eastward from the Bruce Area. One possible solution would be to operate S2S open loop. This issue was identified by IESO as part of this assessment. Further assessment is required.

With Essa TS 500/230kV auto-transformer T3 or T4 out of service, the loss of the remaining 500/230kV Essa TS auto-transformer, may result in excessive post-contingency voltage declines under high loads conditions within the Essa area. This issue was identified by IESO as part of this assessment. Further assessment is required.

Aging Infrastructure / Replacement Plan

- Replacement of 115-44kV transformers (T1 and T2) at Barrie TS is scheduled for 2018.
- Replacement of 230-44kV transformers (T1 and T2) and possible rebuild of low voltage switchyard at Minden TS is scheduled for 2019.
- Replacement of dual windings 230-44/27.6kV transformers (T1 and T2) and associated low voltage equipment at Orangeville TS is scheduled for 2017.
- Ground clearance on several sections of the 230kV circuits M6E and M7E are planned to be increased in 2015. This may increase the current thermal rating of the lines.

7. RECOMMENDATIONS

Based on the findings of this Needs Assessment, the study team's recommendations are as follows.

Study team recommends that a Scoping Assessment should be undertaken to address the near-term transmission and system reliability, operation and restoration needs as listed in Section 6, taking into consideration where appropriate the aging infrastructure/replacement plans identified.

These near-term needs require coordinated regional planning and development of a regional and/or sub-regional plan as soon as possible. The Scoping Assessment will determine whether the IESO-led IRRP process and/or the transmitter-led RIP process (for wires solutions) should be further undertaken for one or more of these needs. The assessment may also recommend that local planning of wires only option between the transmitter and affected LDCs may be undertaken to address certain needs.

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1 INTRODUCTION

This Needs Assessment report provides a summary of needs that are emerging in the South Georgian Bay/Muskoka Region ("the Region") over the ten-year period from 2014 to 2023. The development of the Needs Assessment report is in accordance with the regional planning process as set out in the Ontario Energy Board's (OEB) Transmission System Code (TSC) and Distribution System Code (DSC) requirements, and the Planning Process Working Group (PPWG) Report to the Board.

The purpose of this Needs Assessment report is to undertake an assessment of the South Georgian Bay/Muskoka Region to identify any near-term and/or emerging needs in the area and determine if these needs require a "localized" wires only solution(s) in the near-term and/or a coordinated regional planning assessment. Where a local wires only solution is necessary to address the needs, Hydro One Networks Inc. (HONI), as transmitter, with Local Distribution Companies (LDCs) or other connecting customer(s), will further undertake planning assessments to develop options and recommend a solution(s). For needs that require further regional planning and coordination, the Independent Electricity System Operator (IESO) will initiate the Scoping Assessment (SA) process to determine whether an IESO-led Integrated Regional Resource Planning (IRRP) process, or the transmitter-led Regional Infrastructure Plan (RIP) process (wires solution), or both are required. The SA may also recommend that local planning between the transmitter and affected LDCs be undertaken to address certain needs.

This report was prepared by the South Georgian Bay/Muskoka Region Needs Assessment study team (Table 1) and led by the transmitter, HONI. The report captures the results of the assessment based on information provided by LDCs, the OPA and the Independent Electricity System Operator (IESO).

Table 1: Study Team Participants for South Georgian Bay/Muskoka Region

No.	Company
1.	Hydro One Networks Inc. (Lead Transmitter)
2.	Independent Electricity System Operator
3.	Hydro One Networks Inc. (Distribution)
4.	PowerStream Inc.
5.	Innisfil Hydro Distribution Systems Ltd.
6.	Orangeville Hydro Ltd.
7.	Veridian Connections Inc.

2 REGIONAL ISSUE/TRIGGER

The Needs Assessment for the South Georgian Bay/Muskoka Region was triggered in response to the OEB's RIP process approved in August 2013. To prioritize and manage the regional planning process, Ontario's 21 regions were assigned to one of three groups. The Needs Assessment for Group 1 Regions is complete and has been initiated for Group 2 Regions. The South Georgian Bay/Muskoka Region belongs to Group 2. The Needs Assessment for this Region was triggered on January 2, 2015 and was completed on March 3, 2015.

3 SCOPE OF NEEDS ASSESSMENT

This Needs Assessment covers the South Georgian Bay/Muskoka Region over an assessment period of 2014 to 2023. The scope of the Needs Assessment includes a review of transmission system connection facility capability which covers transformer station capacity, thermal capacity, and voltage performance. System reliability, operational issues such as load restoration, and asset replacement plans were also briefly reviewed as part of this Needs Assessment.

3.1 South Georgian Bay/Muskoka Region Description and Connection Configuration

The South Georgian Bay/Muskoka Region is the area roughly bordered by West Nipissing to the northwest, Algonquin Provincial Park to the northeast, Peterborough County and Hastings County to the southeast, Lake Scugog, York and Peel Regions to the south, Wellington County to the southwest and Grey Highlands to the west. The boundaries of the Region are shown in Figure 1 below.

Electrical supply to the Region is provided through two (2) 500/230kV auto-transformers at Essa TS, the 230kV transmission lines connecting Minden TS to Des Joachims TS, the 230kV circuits E8V and E9V coming from Orangeville TS, and the single 115kV circuit S2S connecting to Owen Sound TS. There are sixteen (16) HONI step-down transformer stations in the Region, most of which are supplied by circuits radiating out from Essa TS, and the majority of the distribution system is at 44kV, except for Orangeville TS which has 27.6kV and 44kV feeders.

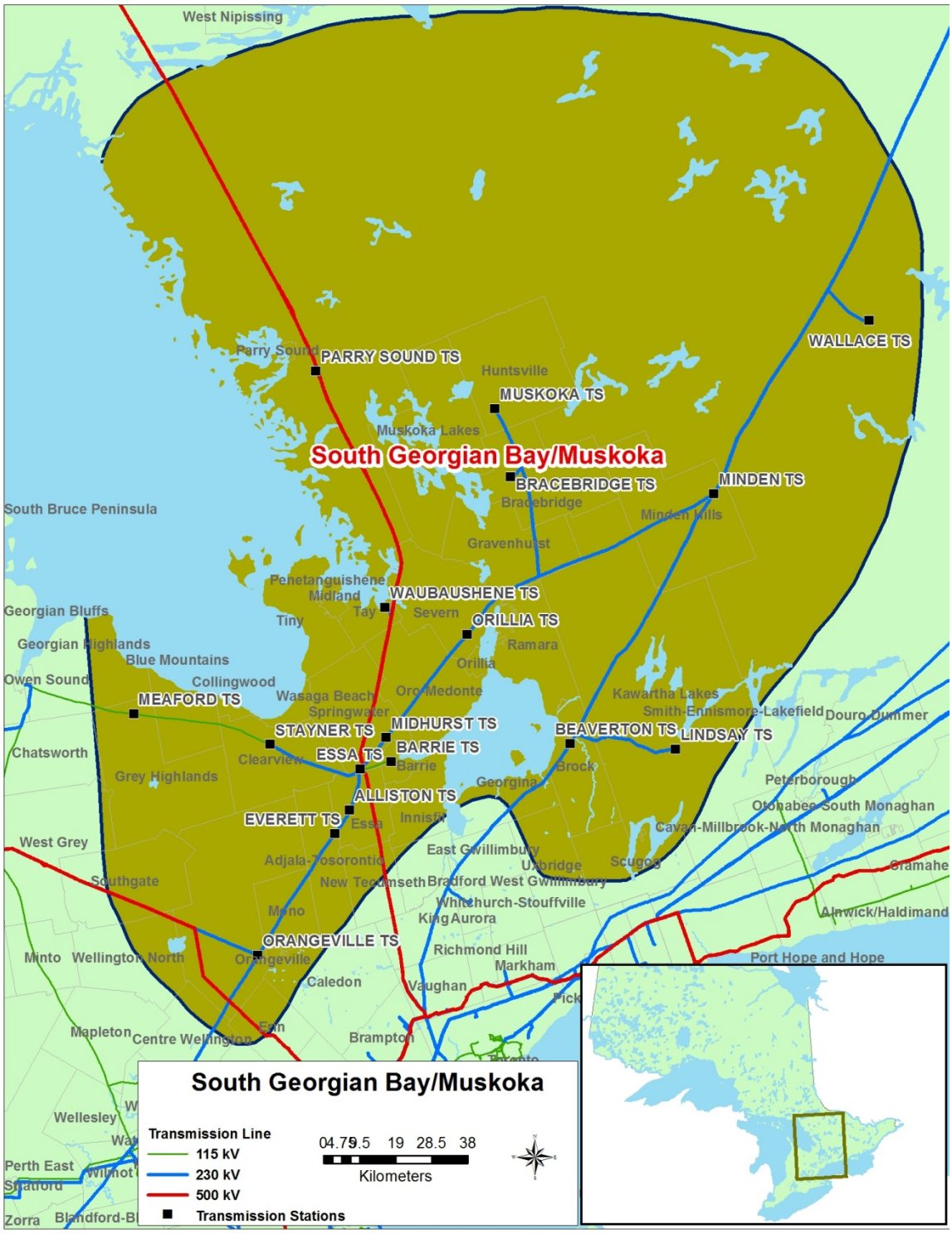

Figure 1: South Georgian Bay/Muskoka Region Map

The following circuits are not included in the South Georgian Bay/Muskoka Region:

- The 230kV circuits, B4V and B5V, and all stations which they supply. These circuits and stations are included in the Greater Bruce/Huron Region.

- The 230kV circuits, D6V and D7V, and all stations which they supply. These circuits and stations are included in the Kitchener/Waterloo/Cambridge/Guelph Region.

The existing facilities in the Region are summarized below and depicted in the single line diagram shown in Figure 2. The 500kV system is part of the bulk power system and is not studied as part of this Needs Assessment:

- Essa TS is the major transmission station that connects the 500kV network to the 230kV system via two 500/230kV auto-transformers. Essa TS also supplies the 115kV system towards Barrie TS via two 230/115kV auto-transformers.

- Eleven step-down transformer stations supply load to the north and east areas of the Region (north and east of Essa TS): Barrie TS, Beaverton TS, Bracebridge TS, Lindsay TS, Midhurst TS, Minden TS, Muskoka TS, Orillia TS, Parry Sound TS, Wallace TS, and Waubashene TS.

- Five step-down transformer stations supply load to the south and west areas of the Region (south and west of Essa TS): Alliston TS, Everett TS, Meaford TS, Orangeville TS, and Stayner TS.

- Eight 230kV circuits (E8V, E9V, E20S, E21S, E26, E27, M6E, and M7E) radiating outward from Essa TS provide local supply to the Region. These circuits are essential to the Region and will be included in the study to ensure long-term reliability. Four 230kV circuits (D1M, D2M, D3M, and D4M) entering the region from the east are also a major supply path for the Region and will be analyzed in this study.

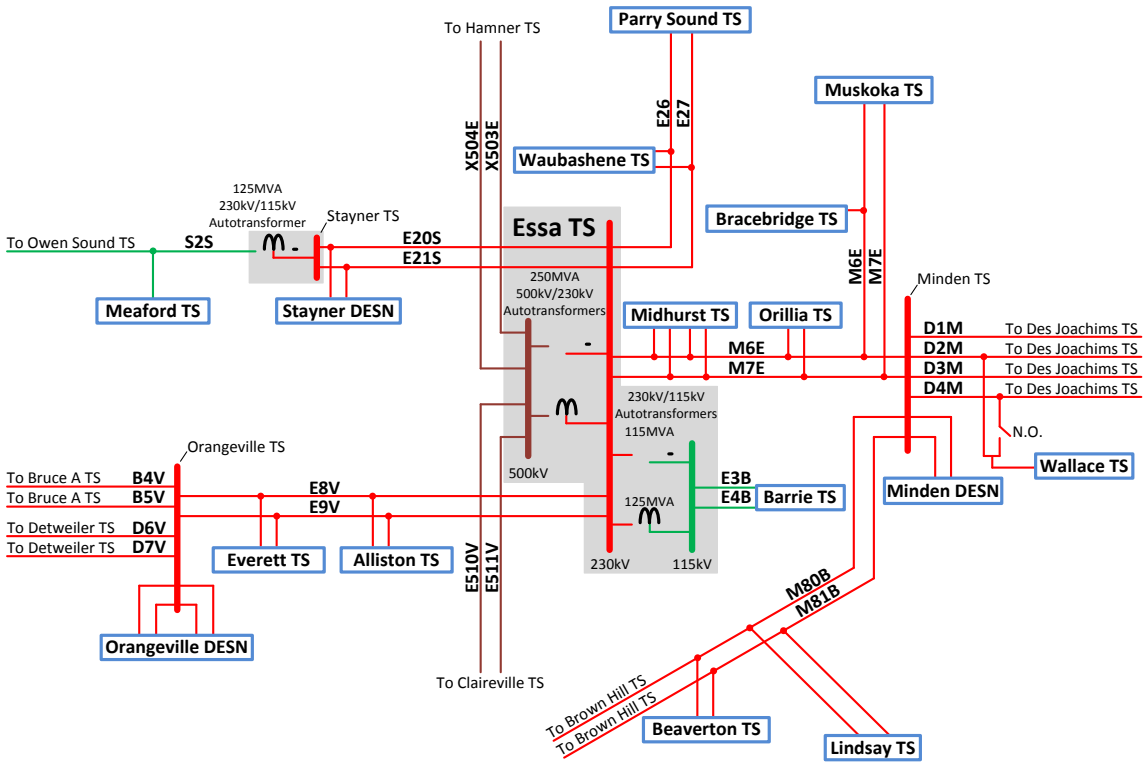

Figure 2: Single Line Diagram – South Georgian Bay/Muskoka Region

Table 2 below provides a list of LDCs in the South Georgian Bay/Muskoka Region.

Table 2: List of LDCs in the South Georgian Bay/Muskoka Region

Local Distribution Companies (LDCs)
Hydro One Networks Inc. (Distribution)
Powerstream Inc.
COLLUS PowerStream Corp.
InnPower Corp.
Lakeland Power Distribution Ltd.
Midland Power Utility Corp.
Orangeville Hydro Ltd.
Orillia Power Distribution Corp.
Parry Sound Power Corp.
Newmarket-Tay Power Distribution Ltd.
Veridian Connections Inc.
Wasaga Distribution Inc.

4 INPUTS AND DATA

In order to conduct this Needs Assessment, study team participants provided the following information and data to HONI:

- IESO provided:
  i. Historical 2013 regional coincident peak load and station non-coincident peak load
  ii. List of existing reliability and operational issues
  iii. Conservation and Demand Management (CDM) and Distributed Generation (DG) data
- LDCs provided historical (2011-2013) net load and gross load forecast (2014-2023)
- HONI (Transmission) provided transformer, station, and circuit ratings
- Any relevant planning information, including planned transmission and distribution investments provided by the transmitter and LDCs, etc.

4.1 Load Forecast

As per the data provided by the study team, the load in the South Georgian Bay/Muskoka Region is expected to grow at an average gross rate of approximately 2% annually from 2014-2018 and 1.8% annually from 2019-2023.

Most of the load growth is attributed to the southern portion of the region, with the highest approximate annual growth rate occurring at the following stations: Barrie TS (4.1% from 2014-2018 and 5.9% from 2019-2023); Alliston TS (4.7% from 2014-2018 and 3.3% from 2019-2023); Midhurst TS (3.5% from 2014-2018 and 2.9% from 2019-2023) and Everett TS (3.2% from 2014-2018 and 2.9% from 2019-2023).

5 ASSESSMENT METHODOLOGY

The following methodology and assumptions are made in this Needs Assessment report:

1. The Region is winter peaking, however five out of sixteen stations in the Region are summer peaking (Alliston TS, Barrie TS, Everett TS, Midhurst TS and Orangeville TS T1/T2 DESN). Therefore, this assessment is based on both winter and summer peak loads, as appropriate.

2. Forecast winter/summer loads are provided by the Region's LDCs. There are no customer loads within this region.

3. The LDC's load forecast is translated into load growth rates and is applied onto the 2013 winter/summer peak load as a reference point.

4. The 2013 winter/summer peak loads are adjusted for extreme weather conditions according to HONI's methodology.

5. Accounting for (2), (3), (4) above, the gross load forecast and a net load forecast were developed. The gross demand forecast is used to develop a worst case scenario to identify needs. Where there are issues, the net load forecast, which accounts for CDM and DG, is analyzed to determine if needs can be deferred.

   A gross and net non-coincident peak load forecast was produced for both winter and summer and were used to perform the analysis for Section 6.1.2 of this report.

   A coincident region peak load forecast was used to perform the analysis for sections 6.1.1 of this report. A gross and net-region coincident peak load forecast was developed for winter conditions. As for summer conditions, only a gross coincident forecast was developed for conservatism but also due to the high load growth relative to CDM and DG in the summer peaking portion of the region. The gross summer coincident peak load forecast was developed based on projected percentages of the winter historical loading.

6. Review impact of any on-going and/or planned development projects in the Region during the study period.

7. Review and assess impact of any critical/major elements planned/identified to be replaced at the end-of-their-useful-life such as auto-transformers, cables, and stations.

8. Station capacity adequacy is assessed by comparing the non-coincident peak load with the station's normal planning supply capacity, assuming a 90% lagging power factor for stations having no low-voltage capacitor banks or the historical low voltage power factor, whichever is more conservative. For stations having low-voltage capacitor banks, a 95% lagging power factor was assumed or the historical low-voltage power factor, whichever is more conservative. Normal planning supply capacity for transformer stations in this Region is determined by the summer/winter 10-Day Limited Time Rating (LTR).

9. To identify emerging needs in the Region and determine whether or not further coordinated regional planning should be undertaken, the study was performed observing all elements in service and only one element out of service.

10. Transmission adequacy assessment considers, but is not limited to, the following criteria:
    - Region-coincident peak load forecast is used.
    - With all elements in service, the system is to be capable of supplying forecast demand with equipment loading within continuous ratings and voltages within normal range.
    - With one element out of service, the system is to be capable of supplying forecast demand with circuit loading within their Long-Term Emergency (LTE) ratings and transformers within their summer/winter 10-Day LTR.
    - All voltages must be within pre and post contingency ranges as per Ontario Resource and Transmission Assessment Criteria (ORTAC).
    - With one element out of service, no more than 150MW of load is lost by configuration. With two elements out of service, no more than 600MW of load is lost by configuration.
    - With two elements out of service, the system is capable of meeting the load restoration time limits as per ORTAC.

6 RESULTS

This section summarizes the results of the Needs Assessment in the South Georgian Bay/Muskoka Region.

6.1 Transmission Capacity Needs

6.1.1 115/230kV Transmission Lines and Auto-Transformers

The 115/230kV transmission line and auto-transformer needs identified during the study period include, but may not be limited to the following:

- With the 230/115kV auto-transformer T1 or T2 at Essa TS out of service, the companion auto-transformer at Essa TS is expected to exceed its summer 10-Day LTR in the near-term based on gross summer demand forecast. T1 is expected to exceed its summer 10-Day LTR in the near-term (approximately 104% and 142% of summer 10-Day LTR by 2018 and 2023 respectively) and T2 in the medium-term (approximately 106% and 113% of summer 10-Day LTR by 2022 and 2023 respectively). The net summer demand forecast is not expected to significantly defer the need due to the high growth rate at Barrie TS.
- With one element out of service, the 115kV circuit E3B is expected to exceed its summer LTE rating in the near-term based on gross summer demand forecast (approximately 106% and 137% of summer LTE rating by 2019 and 2023

respectively). The net summer demand forecast is not expected to significantly defer the need due to the high growth rate at Barrie TS.

- With one element out of service, the voltage after tap-changer action at the Muskoka TS 230kV bus drops slightly below minimum continuous voltage limit in the medium-term based on gross winter demand forecast. With net winter demand forecast, the voltage remains within acceptable limits. This will be monitored and reassessed in the next regional planning cycle.
- With one element out of service, the voltage declines immediately following a contingency at Muskoka TS 44kV exceeds the limit of 10% after 2020 based on gross winter demand forecast. With the net winter demand forecast, the voltage remains within acceptable limits. This will be monitored and reassessed in the next regional planning cycle.

6.1.2 115/230kV Transformer Stations

The connection capacity needs identified during the study period include, but may not be limited to the following:

Barrie TS T1/T2 DESN (115-44kV):

- Barrie TS is a summer peaking station and currently exceeds its normal supply capacity based on both gross and net summer demand forecast (approximately 103% and 150% of summer 10-Day LTR in 2014 and 2023 respectively).

Everett TS T1/T2 DESN (230-44kV):

- Everett TS is a summer peaking station and will exceed its normal supply capacity at the end of the study period based on the gross summer demand forecast. With the net summer demand forecast, the station remains below its normal supply capacity. This will be monitored and reassessed in the next regional planning cycle.

Minden TS T1/T2 DESN (230-44kV):

- Minden TS is a winter peaking station and will exceed its normal supply capacity in the near-term based on the gross winter demand forecast. With the net winter demand forecast, the station remains below its normal supply capacity until the end of the study period. This will be monitored and reassessed in the next regional planning cycle.

Muskoka TS T1/T2 DESN (230-44kV):

- Muskoka TS is a winter peaking station and will exceed its normal supply capacity in near-term based on both gross and net winter demand forecast (approximately 100% and 103% of winter 10-Day LTR in 2016 and 2023 respectively). The station capacity is currently limited by the low voltage current transformers (CTs). If this

limitation is non-existent, the power transformer winter LTR would remain above the gross winter demand forecast for the study period.

Parry Sound TS T1/T2 DESN (230-44kV)

- Parry Sound TS is a winter peaking station and currently exceeds its normal supply capacity based on both gross and net winter demand forecast (approximately 117% and 119% of winter 10-Day LTR in 2014 and 2023 respectively). Using a historically more reasonable winter power factor of 0.95, the station still exceeds its normal supply capacity (approximately 111% and 113% of winter 10-Day LTR in 2014 and 2023 respectively).

Waubaushene TS T5/T6 DESN (230-44kV)

- Waubaushene TS is a winter peaking station and will exceed its normal supply capacity at the end of the study period based on the gross winter demand forecast. With the net winter demand forecast, the station remains below its normal supply capacity. This will be monitored and reassessed in the next regional planning cycle.

Several load customers are planning new commercial operations in the City of Barrie during the study period. The forecast used for capacity assessment is the 'median' load growth projection for the City of Barrie, which reflects the historical load growth. Using the 'high growth scenario', where new commercial operations may materialize and achieve their projected loading by 2018, the following additional capacity needs emerge:

Midhurst TS

- Both T1/T2 and T3/T4 DESN stations at Midhurst TS are summer peaking and remain within their normal supply capacity based on gross 'median' summer demand forecast.
- T1/T2 DESN may exceed its normal supply capacity in the medium-term based on both net and gross 'high growth scenario' summer demand forecast (approximately 102% and 104% of summer 10-Day LTR in 2021 and 2023 respectively).
- T3/T4 DESN may exceed its normal supply capacity in the medium-term based on gross 'high growth scenario' summer demand forecast. With the net forecast, the station remains within its normal supply capacity until the end of the study period. This will be monitored and reassessed in the next regional planning cycle.

6.2 System Reliability, Operation and Restoration Review

Based on the gross and net coincident demand forecast, the maximum load interrupted by configuration due to the loss of one element is below the load loss limit of 150MW. The maximum load interrupted by configuration due to the loss of two elements is below the load loss limit of 600MW.

For the loss of two elements, the load interrupted by configuration may exceed 150MW and 250MW based on gross and net coincident demand forecast. The loss of 230kV circuits M6E+M7E may require some load to be restored within 4 hours and 30 minutes; the loss of 230kV circuits M80B+M81B may require some load to be restored within 4 hours; the loss of 230kV circuits E8V +E9V may require some load to be restored within 4 hours during the study period. 230kV circuit M6E+M7E may not meet the 30 minutes restoration criteria. Further assessment is required.

Due to the increase generation within the Bruce Area, 115kV circuit S2S and Stayner T1 auto-transformer may be overloaded under pre-contingency conditions during high flow eastward from the Bruce Area. One possible solution would be to operate S2S open loop. This issue was identified by IESO as part of this assessment. Further assessment is required.

With an Essa TS 500/230kV auto-transformer T3 or T4 out of service, the loss of the remaining 500/230kV Essa TS auto-transformer, may result in excessive post-contingency voltage declines under high load conditions within the Essa area. This issue was identified by IESO as part of this assessment. Further assessment is required.

6.3 Aging Infrastructure and Replacement Plan of Major Equipment

HONI reviewed the sustainment initiatives that are currently planned for the replacement of any auto-transformers, power transformers and high-voltage cables.

During the study period:

- Replacement of 115-44kV transformers (T1 and T2) at Barrie TS is scheduled for 2018.
- Replacement of 230-44kV transformers (T1 and T2) and possible rebuild of low voltage switchyard at Minden TS is scheduled for 2019.
- Replacement of dual windings 230-44/27.6kV transformers (T1 and T2) and associated low voltage equipment at Orangeville TS is scheduled for 2017.
- Ground clearance on several sections of the 230kV circuits M6E and M7E are planned to be increased in 2015. This may increase the current thermal rating of the lines.

7 RECOMMENDATIONS

Based on the findings of the Needs Assessment, the study team's recommendations are as follows.

Study team recommends that a Scoping Assessment should be undertaken to address the following needs:

- Barrie TS 115kV transmission and transformation capacity – this includes the 230/115kV auto-transformer needs at Essa TS, the 115kV circuit E3B supplying Barrie TS (first three points of section 6.1.1) and the transformation capacity need at Barrie TS (first point of section 6.1.2). Coordination is also required with the existing sustainment initiative at Barrie TS.
- Muskoka TS T1/T2 DESN transformation capacity (fourth point of section 6.1.2).
- Parry Sound TS transformation capacity (fifth point of section 6.1.2).
- Midhurst TS T1/T2 DESN potential transformation capacity need based on 'high growth scenario'.
- System reliability, operation and restoration needs (section 6.2).

These near-term needs require coordinated regional planning and development of a regional and/or sub-regional plan as soon as possible. The Scoping Assessment (SA) will determine whether the IESO-led IRRP process and/or the transmitter-led RIP process (for wires solutions) should be further undertaken for one or more of these needs. The assessment may also recommend that local planning of wires only option between the transmitter and affected LDCs may be undertaken to address certain needs.

8 NEXT STEPS

IESO will initiate a SA process for the region as soon as possible for the needs identified in the region.

9 REFERENCES

i) Planning Process Working Group (PPWG) Report to the Board: The Process for Regional Infrastructure Planning in Ontario – May 17, 2013
ii) IESO 18-Month Outlook: March 2014 – August 2015
iii) IESO Ontario Resource and Transmission Assessment Criteria (ORTAC) – Issue 5.0
iv) IESO System Impact Assessment Report for Dufferin Wind Farm (CAA ID: 2010-396)
v) South Simcoe Area Study: Adequacy of Transmission Facilities and Transmission Plan 2010-2024
vi) Minden, Essa and Parry Sound Area Supply Study (2010)

10 ACRONYMS

BES	Bulk Electric System
BPS	Bulk Power System
CDM	Conservation and Demand Management
CIA	Customer Impact Assessment
CGS	Customer Generating Station
CTS	Customer Transformer Station
DESN	Dual Element Spot Network
DG	Distributed Generation
DSC	Distribution System Code
GS	Generating Station
GTA	Greater Toronto Area
IESO	Independent Electricity System Operator
IRRP	Integrated Regional Resource Planning
kV	Kilovolt
LDC	Local Distribution Company
LTE	Long-Term Emergency
LTR	Limited Time Rating
LV	Low-voltage
MTS	Municipal Transformer Station
MW	Megawatt
MVA	Mega Volt-Ampere
NERC	North American Electric Reliability Corporation
NGS	Nuclear Generating Station
NPCC	Northeast Power Coordinating Council Inc.
NA	Needs Assessment
OEB	Ontario Energy Board
OPA	Ontario Power Authority
ORTAC	Ontario Resource and Transmission Assessment Criteria
PF	Power Factor
PPWG	Planning Process Working Group
RIP	Regional Infrastructure Planning
SIA	System Impact Assessment
SS	Switching Station
TS	Transformer Station
TSC	Transmission System Code
ULTC	Under Load Tap Changer