



Hydro One Networks Inc.
483 Bay Street
Toronto, Ontario
M5G 2P5

LOCAL PLANNING REPORT

B5D/D5A LOAD RESTORATION

Sub-Region: Outer Ottawa

Region: Greater Ottawa

Revision: Final

Date: September 22, 2015



Disclaimer

This Local Planning Report was prepared for the purpose of developing wires-only options and recommending a preferred solution(s) to address the local needs identified in the [Needs Assessment \(NA\) report](#) for the Outer Ottawa Sub-region, Greater Ottawa Region that do not require further coordinated regional planning. The preferred solution(s) that have been identified through this Local Planning Report may be reevaluated based on the findings of further analysis. The load forecast and results reported in this Local Planning Report are based on the information and assumptions provided by study team participants.

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LOCAL PLANNING EXECUTIVE SUMMARY

REGION	Outer Ottawa Sub-Region/Greater Ottawa Region (“Region”)		
LEAD	Hydro One Networks Inc. (“Hydro One”)		
START DATE	25 August 2014	END DATE	22 September 2015
1. INTRODUCTION			
<p>The purpose of this Local Planning (LP) report is to consider wires-only options and recommend a preferred solution that will address the local needs identified in the Needs Assessment (NA) report for the Outer Ottawa Sub-Region/Greater Ottawa Region. The development of the LP report is in accordance with the regional planning process as set out in the Planning Process Working Group (PPWG) Report to the Ontario Energy Board’s (OEB) and mandated by the Transmission System Code (TSC) and Distribution System Code (DSC).</p> <p>The remaining portion of the Greater Ottawa Region has been the subject of an IESO led IRRP which was completed in April, 2015 and is available for review at the IESO website (IESO - Ottawa Area IRRP).</p>			
2. LOCAL NEEDS REVIEWED IN THIS REPORT			
<p>The LP need addressed in this report is the load restoration following the loss of both Beauharnois TS to St Isidore TS (B5D) and Hawthorne TS to St Isidore (D5A) circuits.</p>			
3. NEED ANALYSIS			
<p>The NA report for the Outer Ottawa Sub-Region, identified that the combined loss of 230kV circuits D5A and B5D can result in a total loss of 174MW of load. Existing criteria governing load interruptions require that interruptions above 150MW have to be restored within 4 hours and all smaller load interruptions must be restored within 8 hours. Hydro One has reviewed the load restoration capability for the area. A detailed account of this review is provided in Section 4.</p>			
4. CONCLUSIONS			
<p>Hydro One reviewed the restoration issue identified in the NA report and concluded that the existing infrastructure and its current restoration policies and procedures for the area are adequate to meet the restoration criteria. The rationale for reaching this conclusion is provided in Section 5.</p>			
5. RECOMMENDATIONS			
<p>No capital investment nor changes in Hydro One policies and/or procedures are required to address the B5D/D5A Load Restoration issue identified in the NA report.</p>			

TABLE OF CONTENTS

Local Planning Executive Summary.....	ii
Table of Contents	iii
List of Figures and Tables	iv
1 Introduction	5
2 Regional Description and Connection Configuration.....	5
3 Local Need.....	8
4 Local Need Analysis.....	8
5 Conclusions	9
6 Recommendations	9
7 References	9
8 Acronyms	10
9 Load Forecast.....	11

LIST OF FIGURES AND TABLES

Figure 1: Greater Ottawa Region and Approximate Sub-Region Boundaries..... 6
Figure 2: Single Line Diagram of load pocket identified supplying 174MW 7
Figure 3: B5D/D5A Circuit Supply 7

Table 1: Study Team Participants for Outer Ottawa Sub-Region/Greater Ottawa Region 5
Table 2: Forecast Peak Load Supplied from Circuits B5D/D5A for 8
Table 3. Winter peak forecast used for NA study..... 11

1 INTRODUCTION

The Needs Assessment (NA) for the Outer Ottawa Sub-Region/Greater Ottawa Region (“Region”) was triggered in response to the Ontario Energy Board’s (OEB) Regional Infrastructure Planning process approved in August 2013. The NA for the Outer Ottawa sub-region was prepared jointly by the study team, including LDCs, Independent Electric System Operator (IESO), Ontario Power Authority (merged with IESO as of January 2015 and herein referred to as IESO), and Hydro One. The [NA report](#) can be found on Hydro One’s Regional Planning website. The study team identified needs that are emerging in the Region over the next ten years (2014 to 2023) and recommended that they should be further assessed through the transmitter-led Local Planning (LP) process.

As part of the NA report for the Outer Ottawa Sub-Region, it has been identified that the combined loss of 230kV circuits D5A and B5D can result in loss of 174MW of load. As per ORTAC, load curtailment above 150MW has to be restored within 4 hours and all lower curtailments must be restored within 8 hours.

This report was prepared by the Region study team (Table 1) and led by the transmitter, Hydro One Networks Inc. (“HONI”). This report captures the results of the assessment based on information provided by LDCs and HONI.

Table 1: Study Team Participants for Outer Ottawa Sub-Region/Greater Ottawa Region

No.	Company
1.	Hydro One Networks Inc. (Lead Transmitter)
2.	Hydro One Networks Inc. (Distribution)
3.	Hydro Hawkesbury Inc.

2 REGIONAL DESCRIPTION AND CONNECTION CONFIGURATION

This Sub-Region comprises the eastern and western portions of the Greater Ottawa Region.

The eastern portion of the Sub-Region is bordered by the city of Clarence-Rockland, municipality of Casselman and eastward to Champlain Township (see Figure 1). Along the Ottawa River there are several LDC owned distribution stations supplied by the 115kV circuit 79M1. This area also includes two Hydro One owned transformer stations, Longueil TS and St Isidore TS, and an industrial customer supplied by 230kV circuits D5A and B5D.

The distribution system in this Sub-Region operates at both 27.6 kV and 44 kV.

A single line diagram of the eastern portion of the Outer Ottawa Sub-Region is shown in Figure 2.

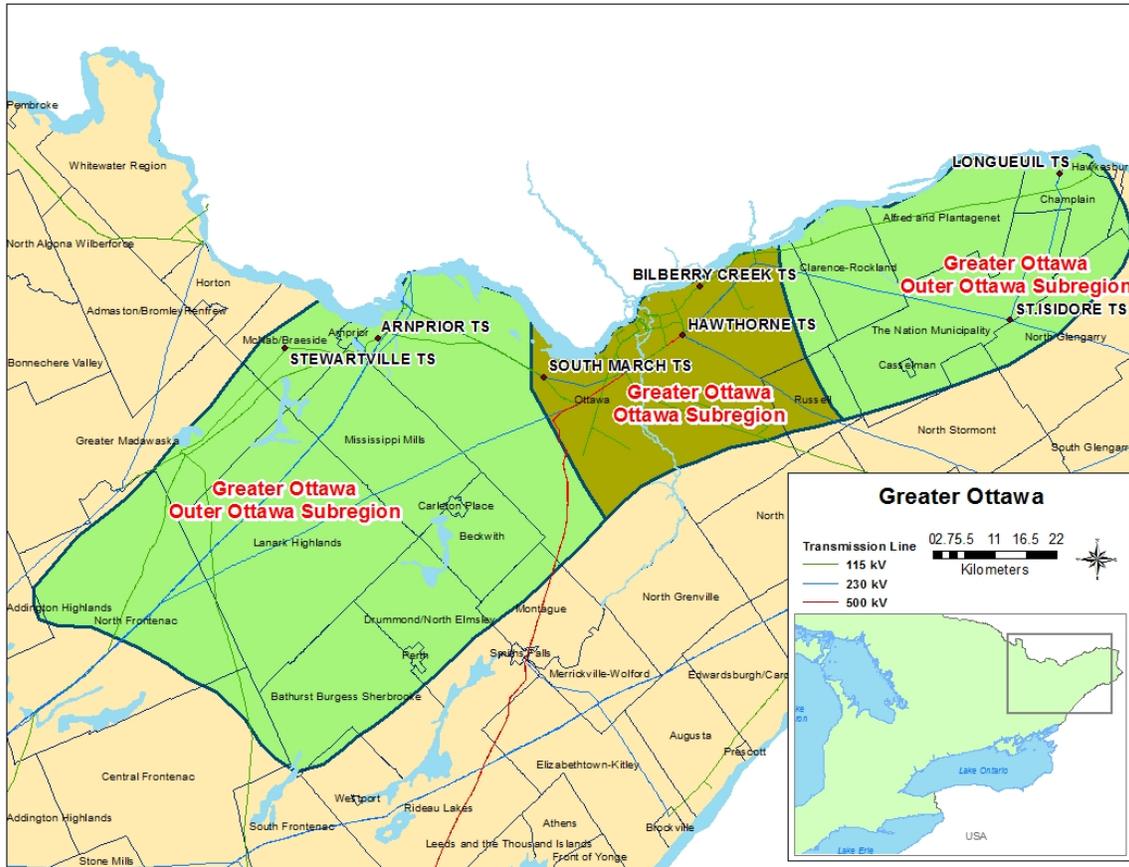


Figure 1: Greater Ottawa Region and Approximate Sub-Region Boundaries

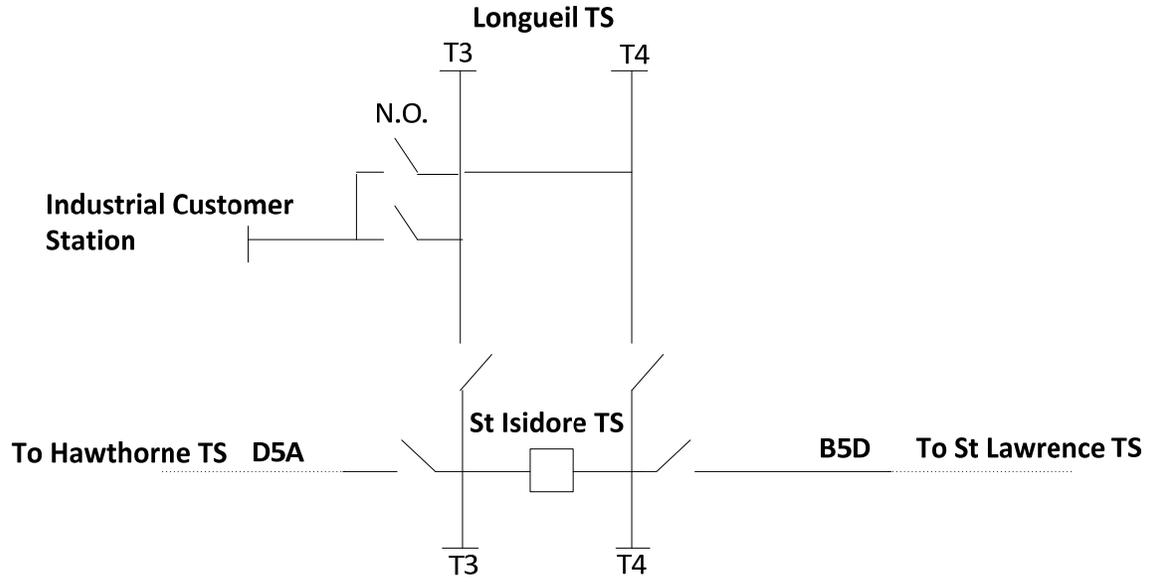


Figure 2: Single Line Diagram of load pocket identified supplying 174MW

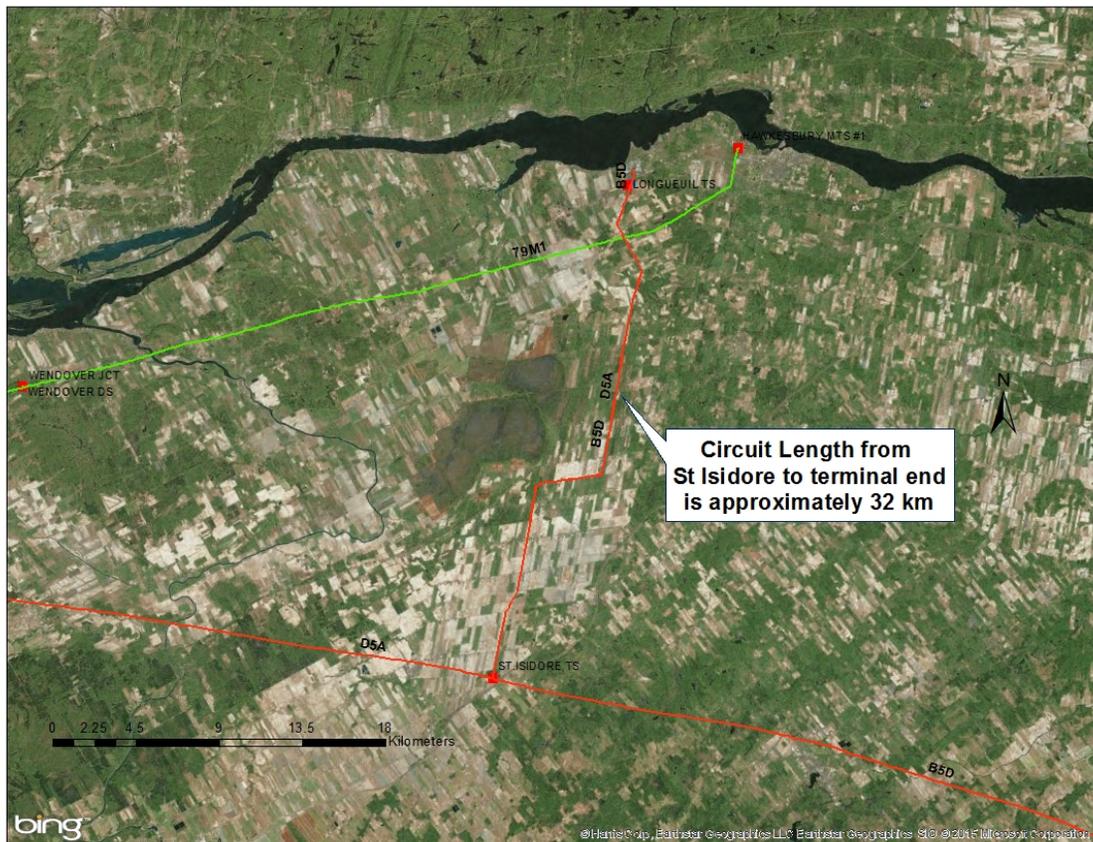


Figure 3: B5D/D5A Circuit Supply

3 LOCAL NEED

The NA report identified that circuits D5A and B5D are supplying a load pocket whose peak demand is 174MW. As per ORTAC, any load above 150MW must be restored within 4 hours, and all load be restored within 8 hours.

This LP study was initiated to evaluate further the situation and determine Hydro One’s capability to restore the load.

4 LOCAL NEED ANALYSIS

The area is winter peaking and the forecast Winter 2015/16 and Winter 2023/24 peak loads (no DG or CDM included) for stations supplied from circuits D5A and B5D are given in Table 2. The load forecast was provided by the customers supplied from these stations. The loads are assumed to be coincidental as both Longueil TS and St Isidore TS have their winter peak at approximately the same time. Table 3 shows the load forecast used for the NA report.

Table 2: Forecast Peak Load Supplied from Circuits B5D/D5A for Winter 2015/16 and Winter 2023/24. No DG or CDM included.

Station	2015/16 Peak Load (MW)	2023/24 Peak Load (MW)
Customer Station	63.5	63.5
Longueil TS	54.1	56.5
St. Isidore TS	51.1	53.5
Total	168.7	173.5

Circuit D5A is from Hawthorne TS to St Isidore TS and B5D is from St Isidore TS to Beaharnois TS. The circuits meet at St Isidore TS and share towers to supply Longueil TS and Ivaco CTS. Four scenarios are considered for this local need analysis:

1. The loss of a single circuit

The loss of a single circuit may result in load loss at the Customer station. However, switching is available to restore the load from the other circuit. Figure 2 shows the switches available for isolation.

2. The loss of B5D/D5A tap to Longueil TS

The loss of both circuits on the tap supplying Longueil TS and Ivaco TS can result in up to 120MW of load loss. As per criteria, this load must be restored within 8 hours. Hydro One can restore supply within that timeframe for any non-catastrophic contingency.

3. One circuit out pre-contingency or loss of the remaining circuit.

With either circuit out of service pre-contingency, the loss of the remaining circuit will result in a load loss of up to 174MW. Hydro One can normally restore supply by returning to service the circuit which was out pre-contingency with a 4 hours recall time.

4. Loss of either circuit followed by Breaker Fail at St. Isidore TS

This scenario would result in loss of up to 174MW of load as breaker fail would take out the other circuit. However, the faulted breaker can be isolated and all load restored within 30 minutes.

A review of the historic outage data for these circuits over the past 10 years have indicated that, not only is the occurrence of coincidental sustained outages rare; in all the occurrences the restoration of at least one of the circuits was performed well under four hours.

5 CONCLUSIONS

Considering that:

1. Load curtailments below 150MW in the area can be restored within 8 hours
2. Historically, the coincidental occurrence of forced sustained outages of B5D and D5A are rare and in all cases one of the circuits was restored in less than 4 hours
3. The potential violation of the criteria is between 18 and 24MW above the 150MW limit.
4. Although no specific infrastructure options to address this need were evaluated, it can be safely stated that the cost of any such options would be significant

it was concluded that:

1. No capital investment will be made to address the load restoration capability of B5D/D5A
2. No changes in the Hydro One policies and/or procedures are required
3. This need may be reviewed at the next planning cycle of the Greater Ottawa Region

6 RECOMMENDATIONS

No actions are recommended at this time to address the B5D/D5A restoration issue identified in the NA report.

7 REFERENCES

- i) [Planning Process Working Group \(PPWG\) Report to the Board: The Process for Regional Infrastructure Planning in Ontario – May 17, 2013](#)
- ii) [IESO Ontario Resource and Transmission Assessment Criteria \(ORTAC\) – Issue 5.0](#)
- iii) [Needs Assessment Report Outer Ottawa Subregion/Greater Ottawa Region](#)

8 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
MW	Megawatt
MVA	Mega Volt-Ampere
NA	Needs Assessment
NERC	North American Electric Reliability Corporation
NGS	Nuclear Generating Station
NPCC	Northeast Power Coordinating Council Inc.
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

9 LOAD FORECAST

Table 3. Winter peak forecast used for NA study. No DG or CDM included.

Station	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
St. Isidore TS	51.1	51.4	51.6	51.9	52.2	52.5	52.8	53.1	53.5
Longueuil TS	54.1	54.4	54.6	54.9	55.3	55.6	55.9	56.2	56.5