

McCarthy Tétrault LLP
PO Box 48, Suite 5300
Toronto-Dominion Bank Tower
Toronto ON M5K 1E6
Canada
Tel: 416-362-1812
Fax: 416-868-0673

Gordon M. Nettleton
Partner
Email: gnettleton@mccarthy.ca

**mccarthy
tétrault**

December 6, 2016

VIA RESS AND COURIER

Kirsten Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, 27th Floor
Toronto, Ontario M4P 1E4

Dear Ms. Walli:

**RE: EB-2016-0160 Hydro One Networks Inc. (“Hydro One”) Transmission Rates
Application – Responses to Undertakings J5.2 and J3.1**

Hydro One’s responses to Undertakings J5.2 and J3.1 are enclosed.

Yours truly,

McCarthy Tétrault LLP

Per:



For: Gordon M. Nettleton

GMN

UNDERTAKING – J5.2

1
2
3
4
5
6
7
8
9
10

Undertaking

TO PROVIDE THE REFERRED-TO IESO DOCUMENT IN THE FORM IT WAS PROVIDED

Response

Please see the attached email.

1

From: Hanna Smith
Sent: November 09, 2016 12:42 PM
To: 'Bing.Young@HydroOne.com'
Cc: Adrian Pye
Subject: IESO Info on Transmission Loss-related Costs

Hi Bing,

Below is wording from the IESO on system-wide transmission loss-related costs. Please note that we didn't elaborate on "static system limitations" in the last paragraph given that Hydro One is better equipped to clarify/elaborate.

Please let me know if you have questions or concerns. We do ask that we have the opportunity to review information attributed to the IESO in Hydro One's final submission to the OEB that's due on the 11th.

Thank you,
Hanna

Hanna Smith | Senior Regulatory Analyst | Planning, Legal, Indigenous Relations and Regulatory Affairs
Independent Electricity System Operator | T: 416.969.6213 | C: 905.467.4379
E: hanna.smith@ieso.ca | W: www.ieso.ca

Costs associated with system-wide transmission line losses and real-time intertie congestion are settled in Ontario's wholesale electricity market together through an hourly charge, the Net Energy Market Settlement Uplift (charge code 150). The charge covers differences between the amount paid to suppliers for the commodity and the amount paid by buyers in a given hour. It is recovered from non-market participant consumers as part of the wholesale market service rate, which is set by the OEB.

The total amount paid by market participants through charge code 150 in 2015 for costs related only to transmission line losses was approximately \$66.3 million. From January 1 to September 30, 2016, the total amount paid was approximately \$36.1 million.

These figures are relatively close to what would be derived by using Environmental Defence's (ED) strategy of multiplying the province's generation output by an estimated system-wide transmission system loss factor and by the average weighted HOEP for each of 2015 and 2016 to-date. However, the IESO estimates the loss factor to be 2.2% as stated in its 2016 fee application rather than the 2.5% applied by ED in its September 29, 2016 motion.

It should be noted that higher transmission line loss-related costs don't necessarily mean higher costs for consumers. For example, the overall cost of supply from one generator may be lower than from another generator even if dispatching the supply would lead to higher line losses. Moreover, unanticipated events such as generator or transmission outages – not simply static system limitations – may lead to higher costs.

2

Witness: Bing Young

UNDERTAKING – J3.1

Undertaking

WITH REFERENCE TO EXHIBIT 3.1, PAGE 20, TO ADVISE WHICH OF THE SCORECARD METRICS WERE RECOMMENDED

Response

The table below includes metrics that appear on the proposed Hydro One Transmission Scorecard and were also included in the suite of metrics from Navigant. Navigant did not give specific recommendations regarding the proposed scorecard. Please see the attachment for the complete suite of metrics provided by Navigant to Hydro One.

Performance Categories	Metric On the Proposed Hydro One Transmission Scorecard	Metric on the Suite of Metrics provided by Navigant
Safety	Recordable Incident Rate	Recordable Incidents
System Reliability	T-SAIFI-S	T-SAIFI
	T-SAIDI	T-SAIDI
	System Unavailability	Availability of Critical Assets
Asset Management	CapEx as % of Budget	% of capital budget spent during each year
Cost Control	Total OM&A and Capital per Gross Fixed Asset Value (%)	CapEx plus OpEx per Asset
	Sustainment Capital per Gross Fixed Asset Value (%)	Sustaining CapEx per Asset
	OM&A per Gross Fixed Asset	OpEx per Asset
Connection of Renewable Generation	% on time completion of renewables connection impact assessments	Cycle time to respond to interconnect requests

Transmission Performance Metrics

Costs

High-Level Costs -- 1-year values and multi-year trends

	Lines & Subs	Lines Only	Subs Only
Capex Plus Opex per asset	X	X	X
Total Capex per Asset	X	X	X
Growth Capex per Asset	X	X	X
Sustaining Capex per Asset	X	X	X
Opex per asset	X	X	X
Opex per circuit km		X	
Veg mgt per asset		X	
Veg mgt per km		X	
Opex less veg mgt per asset		X	
Opex less veg mgt per km		X	
Opex per MVA			X

Unit Costs

Cost per pole replacement	X
Cost per tower replacement	X

Capital Program Management

Portfolio Measures

- % of capital budget spent during each year
- Average actual as a % of estimate for all completed projects
- % of projects "walked-in" during the year
- % of projects completed on time
- % of projects completed on or under budget
- % of projects completed within x% of budget (see table below)

	5%	10%	20%
Conceptual budget			
Preliminary Budget			
Budget @ release to construction			

Individual Project Measures

- Earned Value (cost and schedule performance indices)
- Actual as % of estimate
- Actual as % of schedule

Capital Replacement Programs

- % complete - planned pole replacements

Transmission Performance Metrics

- % complete -- planned cable replacements
- % complete -- planned transformer replacements
- % complete -- planned breaker replacements

Interconnections

- # of new interconnections
- Cycle time to respond to interconnect requests
 - Request to Engineering, Engineering to Construction

Maintenance Activities

- \$ per asset maintained
- % of assets maintained
- % corrective v. preventive MWOs (# and \$)
- % facilities inspected
- # of unscheduled maintenance events
- Cost of unscheduled maintenance events
- OT hours on unscheduled maintenance events
- Maintenance schedule compliance (actual v planned)
- Maintenance event rework (# and \$)
- Average direct cost per maintenance event (per asset type)
- Maintenance hours scheduled
- # maintenance w/o scheduled

Engineering Activities

- Design process milestones (days)
- Design cost (% of total project cost)
- # capital work orders created
- # maintenance work orders created
- # backlog work orders created
- # backlog construction hours
- % work orders closed in X days
- # design errors/project
- On-time completion % for Engineering work

Reliability - 1-year values and multi-year trends

Totals and breakouts by cause

Contributions to End-use Customer Outages

	Lines Only	Subs Only
Contributions to SAIDI	X	X
Contributions to SAIFI	X	X

Delivery-Point Reliability Performance

Transmission Performance Metrics

T-SAIDI

T-SAIFI

TADS Metrics

Totals and breakouts by cause

SOF >200kV

X

MOF >200kV

X

TOF >200kV

X

SOF <200kV

X

MOF <200kV

X

TOF <00kV

X

SOF from Failed AC Sub Eq,
plus Failed Prot Sys Eq

X

MOF from Failed AC Sub Eq,
plus Failed Prot Sys Eq

X

TOF from Failed AC Sub Eq, plus
Failed Prot Sys Eq

X

Transformer Failures per 1000 Xformers

X

Outages by cause codes

X

Worst-performing Circuits

X

Availability of critical assets

X

X

Cumulative availability of critical assets

X

X

Asset Management

Replacement Rates

% of lines replaced - km

X

% of cable replaced - km

X

% of Transformers replaced

X

% of Breakers replaced

X

% of structures replaced (poles,
towers, etc.)

X

Demographics to Track

Age of equipment - by type of equipment

Wood Structures

Steel Structures

Tower Foundations

OH Conductor

UG Conductor

Power Transformers

Transmission Performance Metrics

Switch Gear
Circuit Breakers
Relays
Communications

Staffing Metrics (not exactly performance metrics, but indicators of management approach)

\$ managed per project manager
Projects managed per project manager
Support staff per project manager
Field crew personnel per km of line
% OT for each major work classification
Substation crews per transformer, breaker, etc.

Safety

Total and for specific work groups

Recordable incidents
Lost-Time incidents
Severity Rate
Vehicle Incident Rate
Preventable Vehicle Incident Rate