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**Joanne Richardson**
Director – Major Projects and Partnerships
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BY COURIER

February 5, 2018

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
Suite 2700, 2300 Yonge Street
P.O. Box 2319
Toronto, ON M4P 1E4

Dear Ms. Walli:

**EB-2018-0098 – Hydro One Networks Inc.'s Section 92 - Kapuskasing Area Reinforcement Project – Application and Evidence**

Please find attached two copies of Hydro One Networks Inc.'s ("Hydro One") Application and Evidence in support of an Application pursuant to Section 92 of the Ontario Energy Board Act for an Order or Orders granting leave to upgrade existing transmission line facilities in the Kapuskasing area.

An electronic copy of this has been filed through the Ontario Energy Board's Regulatory Electronic Submission System (RESS).

Sincerely,

ORIGINAL SIGNED BY JOANNE RICHARDSON

Joanne Richardson

# Exhibit List

| Exh | Tab | Schedule | Attachment | Contents |
|---|---|---|---|---|
| A | | | | |
| | 1 | 1 | | Exhibit List |
| B | | | | |
| | 1 | 1 | | Application |
| | 2 | 1 | | Project Overview |
| | 2 | 1 | 1 | General Area Map |
| | 3 | 1 | | Evidence In Support of Need |
| | 3 | 1 | 1 | IESO Evidence in Support of Need |
| | 4 | 1 | | Classification and Categorization |
| | 5 | 1 | | Cost Benefit Analysis and Options |
| | 6 | 1 | | Benefits |
| | 7 | 1 | | Apportioning Project Costs and Risks |
| | 8 | 1 | | Network Reinforcement |
| | 9 | 1 | | Transmission Rate Impact |
| | 10 | 1 | | Deferral Account |
| | 11 | 1 | | Project Schedule |

| Exh | Tab | Schedule | Attachment | Contents |
|---|---|---|---|---|
| C | | | | |
| | 1 | 1 | | Physical Design |
| | 2 | 1 | | Maps |
| D | | | | |
| | 1 | 1 | | Operational Details |
| E | | | | |
| | 1 | 1 | | Land Matters |
| | 1 | 1 | 1 | Temporary Access and Temporary Access Road |
| | 1 | 1 | 2 | Temporary Construction Licence |
| | 1 | 1 | 3 | Damage Claim |
| F | | | | |
| | 1 | 1 | | System Impact Assessment |
| | 1 | 1 | 1 | Notification of IESO Approval |
| | 1 | 1 | 2 | IESO System Impact Assessment |
| G | | | | |
| | 1 | 1 | | Customer Impact Assessment |
| | 1 | 1 | 1 | Hydro One Customer Impact Assessment |

# ONTARIO ENERGY BOARD

**IN THE MATTER OF** the *Ontario Energy Board Act, 1998*;

**AND IN THE MATTER OF** an Application by Hydro One Networks Inc. for an Order or Orders granting leave to upgrade existing transmission line facilities ("**Kapuskasing Area Reinforcement Project**" or "**KAR Project**") in the municipalities of Kapuskasing, Moonbeam, Fauquier-Strickland, and Smooth Rock Falls.

## APPLICATION

1. The Applicant is Hydro One Networks Inc. ("**Hydro One**"), a subsidiary of Hydro One Inc. The Applicant is an Ontario corporation with its head office in the City of Toronto. Hydro One carries on the business, among other things, of owning and operating transmission facilities within Ontario.
2. Hydro One hereby applies to the Ontario Energy Board (the "**Board**") pursuant to s. 92 of the *Ontario Energy Board Act, 1998* (the "**Act**") for an Order or Orders granting leave to upgrade 32 kilometres of transmission line facilities in the Kapuskasing area and associated station facilities. These facilities are required to ensure that the area continues to receive a safe and reliable supply of electricity. Documentation from the IESO outlining the need for upgrading the facilities has been provided as **Exhibit B, Tab 3, Schedule 1, Attachment 1**.
3. The proposed KAR Project will upgrade the 32km of 115 kV circuit ("**H9K**") between Spruce Falls Junction ("**JCT**") to Carmichael Falls JCT, and the corresponding station facilities at Kapuskasing Transmission Station ("**TS**"). An overview map of this area is provided in **Exhibit B, Tab 2, Schedule 1, Attachment 1** as well as **Exhibit C, Tab 2, Schedule 1** and a schematic diagram of the Project can be found at **Exhibit B, Tab 2, Schedule 1, Figure 1**.

The proposed in-service date for the KAR Project is the end of October 2019, assuming a construction commencement date of October 2018. A project schedule is provided at **Exhibit B, Tab 11, Schedule 1**.

4. The Project will continue to utilize the existing corridor. As a result, the transmission facilities upgrade will not require any new permanent property rights. Temporary construction rights for access or staging areas may be required for the duration of the construction period of the KAR Project. Further information on land related matter is found at **Exhibit E, Tab 1, Schedule 1**.

5. The Independent Electricity System Operator has outlined the need for the 32km of the Project between Spruce Falls Junction ("**JCT**") to Carmichael Falls JCT. This document is provided as **Exhibit B, Tab 3, Schedule 1, Attachment 1**. Accordingly, this Project has been identified as a non-discretionary development project in **Exhibit B, Tab 4, Schedule 1**.

6. The IESO has also provided an expedited and final System Impact Assessment ("**SIA**"). The SIA concludes that the Project is expected to have no material adverse impact on the reliability of the integrated power system and recommends that a *Notification of Conditional Approval for Connection* be issued. The IESO's Notification of Conditional Approval is provided as **Exhibit F, Tab 1, Schedule 1, Attachment 1** and the SIA is provided as **Exhibit F, Tab 1, Schedule 1, Attachment 2** of Hydro One's prefiled evidence.

7. Hydro One has completed a final Customer Impact Assessment ("**CIA**") in accordance with Hydro One's connection procedures. The results confirm that there will be no impacts on area customers as a result of the KAR Project. A copy of the CIA is provided as **Exhibit G, Tab 1, Schedule 1**.

8. The total cost of the transmission line facilities for which Hydro One is seeking approval is approximately $15.1 million. The details pertaining to these costs are provided at **Exhibit B, Tab 7, Schedule 1, Table 1**.

9. Coincident with the transmission line upgrade, work will also be carried out at Kapuskasing TS to install a 10 Mvar capacitor bank and reactor. The

transmission-related cost of the station work is estimated to be approximately $6 million. The need for these station facilities is further discussed in **Exhibit B, Tab 3, Schedule 1, Attachment 1.**

10. Project economics, as filed in **Exhibit B, Tab 9, Schedule 1**, show that the KAR Project will result in no impact ($0.00/kw/month) in the network connection pool rate and no impact (0.00%) on the overall average Ontario consumer's electricity bill.

11. The Application is supported by written evidence which includes details of the Applicant's proposal for the transmission line and station work. The written evidence is prefiled and may be amended from time to time prior to the Board's final decision on this Application.

12. Given the information provided in the prefiled evidence, Hydro One submits that the Project is in the public interest. The Project meets the need of the transmission system and improves quality of service and reliability with minimal impact on price.

13. Hydro One is requesting a written hearing for this proceeding. Hydro One requests that a decision on this Application is provided by August 30, 2018 to meet the needs of the system operator.

14. Hydro One requests that a copy of all documents filed with the Board be served on the Applicant and the Applicant's counsel, as follows:

a) The Applicant:

Eryn MacKinnon
Sr. Regulatory Coordinator
Hydro One Networks Inc.

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| | |
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b) The Applicant's counsel:

Michael Engelberg
Assistant General Counsel
Hydro One Networks Inc.

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M5G 2P5

| | |
|---|---|
| Telephone: | (416) 345-6305 |
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| Electronic access: | mengelberg@HydroOne.com |

# Project Overview Documents

The Hydro One H9K circuit is a 115kV network transmission line in northeast Ontario providing electrical connection between regions of Kapuskasing and Hunta. The Independent Electricity System Operator ("**IESO**") has identified that increased power transfer limits across H9K will be required to supply Kapuskasing area loads during times of high hydroelectric generation and as a result of the inability to rely on local generation facilities as a firm generation source. This increased power demand causes sections of the H9K circuit to become overloaded. Consequently, the circuit needs to be upgraded as well as associated station facilities.

Hydro One's proposed Kapuskasing Area Reinforcement Project ("**KAR Project**" or "**Project**") will upgrade the thermal ratings of 32km of the H9K Circuit. Specifically, this application is seeking OEB approval to allow for Hydro One transmission facilities to be upgraded or constructed. Namely, the reconductoring of 32km of line from Spruce Falls Junction ("**JCT**") to Carmichael Falls JCT and the installation of new reactive control facilities (10 MVar capacitor and 10 MVar reactor) at Kapuskasing Transmission Station ("**TS**").

Figure 1 below schematically depicts the 32km section which will be upgraded as well as the location of the connecting transmission stations. A map showing the geographic location of the proposed facilities is provided as **Exhibit B, Tab 2, Schedule 1, Attachment 1**.

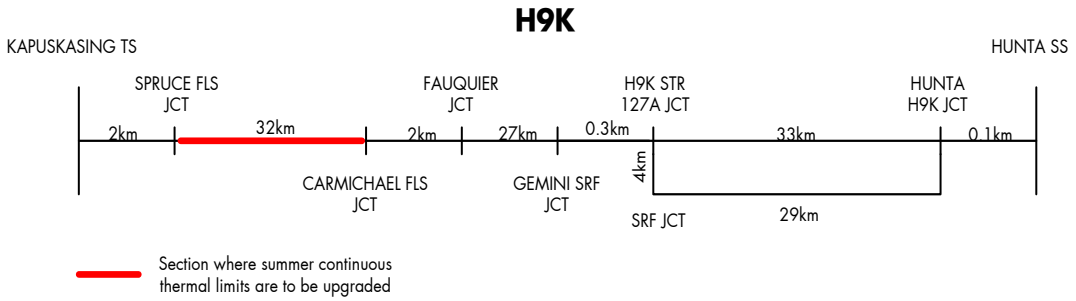



**Figure 1: H9K Circuit Upgrade diagram**

All of the proposed facilities are subject to section 92 approval.

Filed: 2018-02-05
EB-2018-0098
Exhibit B-02-01
Attachment 1
Page 1 of 1

SINAI RD
BRUNETVILLE RD
GOVERNMENT RD W
GOVERNMENT RD E
SPRUCE FALLS JCT
GOUGH RD
HANLAN RD
STEVENS RD
CLEAR LAKE RD S
OUELLETTE RD
HIGHWAY 11
OUELLETTE RD
DES PERES RD
WALKER RD
RÉMI LAKE RD
HIGHWAY 581
ST JOSEPH RD
NURSERY RD
D'AMOURS RD
GOVERNMENT RD
STE MARIE RD
CHAIN OF LAKES RD
BEAUVAIS RD
ST JEAN RD
ST AMOUR RD
CONCESSION RD 6 & 7
GRZELA RD
HIGHWAY 11
CARMICHAEL FALLS JCT

*Kapuskasing*
*Cochrane, Unorganized, North Part*
*Moonbeam*
*Fauquier-Strickland*

hydro one

Produced By: Inergi LP, GIS Services
Date: Jun 28, 2016/Revised Feb 1, 2018
Map10-49_CircuitH9K_GM_v3

inergi



Junction
Transmission Line
Section of Circuit H9K 115 kV to be Upgraded
Highway
Road
Railway
Municipal Boundary
Waterbody

**Circuit H9K: General Area Map**

1:80,000

0 1 2 4 km

# Evidence In Support of Need

On September 1, 2015, the IESO published the NUG ("Non-Utility Generator") Framework assessment report ("NUG Report")[1] to the Minister of Energy. This report identified that following the contract expiry of local area generation, reliability standards may not be met without further system reinforcement.

The North-East of Sudbury Regional Planning process commenced on September 24, 2015, and based on the fact that there were existing challenges in operating the bulk transmission system in the area, the IESO and Hydro One agreed that a bulk system study should be run in parallel with the formalized Regional Planning Process. This enabled the bulk system study to be expedited to ensure timely solutions would be in place given the potential lead time for transmission-based solutions. The scope of the bulk system study for the Kapuskasing area investigated the adequacy and operability of the system supplying the Kapuskasing area, as it currently exists, and following the contract expiry of local area generators.

The Kapuskasing Area Reinforcement Project serves to execute the needs identified by the IESO. The major facilities required to address the IESO's bulk system needs include:

- Increasing the thermal limit of H9K circuit (32km Carmichael Falls JCT x Spruce Falls JCT)
- Installation of 10MVar reactive support and 10MVar capacitive support at Kapuskasing TS.

The IESO further elaborates on the need for this investment in **Exhibit B, Tab 3, Schedule 1, Attachment1**.

[1] http://www.ieso.ca/-/media/files/ieso/document-library/reports/nug-framework-assessment-report.pdf?la=en

Hydro One will also be installing new reactive control facilities (10MVar Capacitor, 10MVar Reactor) at Kapuskasing TS. This investment is currently in budgetary estimating phase with an expected in-service date to align with the H9K circuit upgrade. Preliminary costs for the station facilities have been estimated at approximately $6M. The need for these station facilities is further discussed in **Exhibit B, Tab 3, Schedule 1, Attachment 1**.

# Independent Electricity System Operator

# H9K Upgrade Evidence

January 30, 2018

# Table of Contents

## 1.0 Executive Summary

The IESO conducted bulk system studies in 2016 and identified reliability needs in the Kapuskasing Area ("Area"). These needs were driven by the expiry of local generation facility contracts and are expected to emerge in the summer of 2020. Once the generation contracts have expired, these facilities can no longer be relied on to meet local needs. Supply of load in the Area will then become dependent on external resources, resulting in increased flows on surrounding circuits. Under these increased flow conditions, following an event on the local system, flows are expected to exceed the existing capability of a 32 km section of circuit H9K, and voltage criteria are expected to be violated at the load stations supplied by H9K.

The IESO recommends increasing the capacity of circuit H9K between Carmichael Falls Junction ("JCT") and Spruce Falls JCT (a distance of 32 km) to a minimum of 310 A and installing a 10 Mvar capacitor bank at Kapuskasing Transformer Station ("TS"). This will enable sufficient load supply to the Area as required by applicable reliability standards. Based on technical and economic analysis performed by the IESO, this is the least-cost option for providing required reliability. This solution is required to be in-service no later than June 2020.

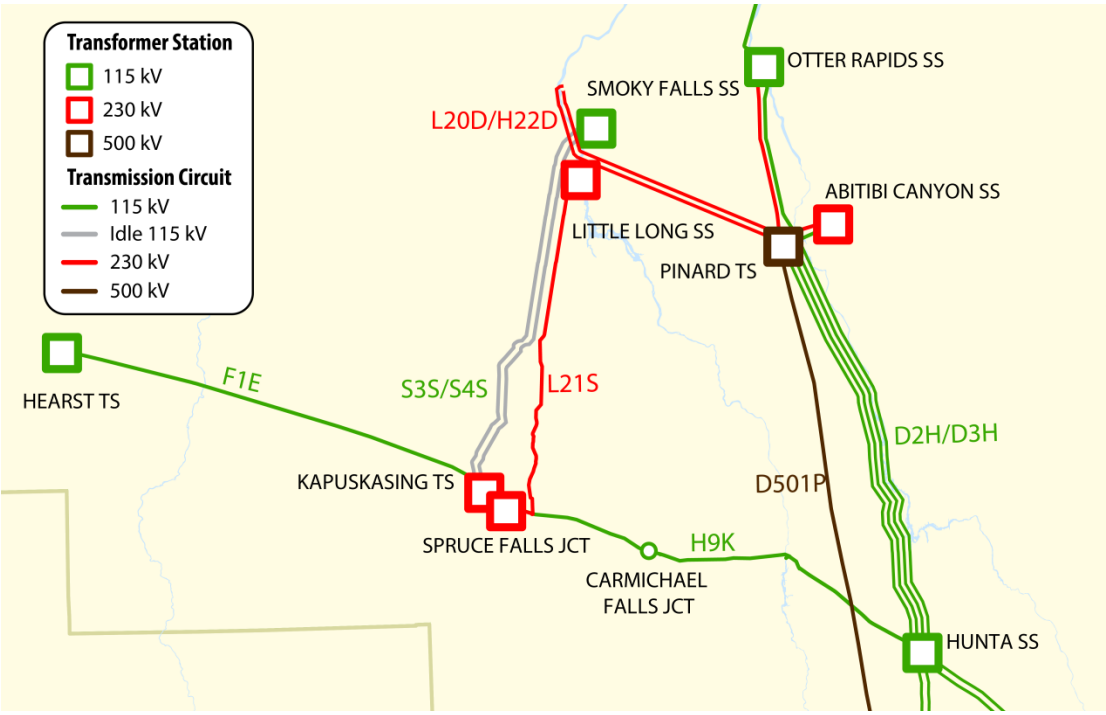
The Net Present Value ("NPV") of this project is estimated between $8.4 to $10.5 million (in 2017 dollars), including the upgrade of a 32 km section of circuit H9K and the capacitor bank.

## 2.0 Kapuskasing Area

The Kapuskasing Area System[1] is illustrated in Figure 2-1 below. The Area's main system supply points are at Pinard TS and Hunta Switching Station ("SS").

[1] Only Hydro One-owned transmission facilities are illustrated on the map.

**Figure 2-1: Kapuskasing Area System**




Peak electricity demand in the Kapuskasing Area System is approximately 175 MW, of which approximately 65 MW is firm and non-dispatchable load. The industrial sector is the primary contributor to peak electricity demand in the Area, making up over 75% of the Area's peak demand.

Generation facilities in the Area include hydroelectric generation along the Mattagami River and gas and biomass generation facilities located within the communities of Kapuskasing and Hearst.

## 3.0 Description of Need

This project is required to address capacity and voltage performance needs that emerge due to the expiry of local generation facilities' contracts. Once the contracts expire, these generation facilities can no longer be relied on to meet local needs. The project need date is June 2020.

*Regional and Bulk System Planning Study*

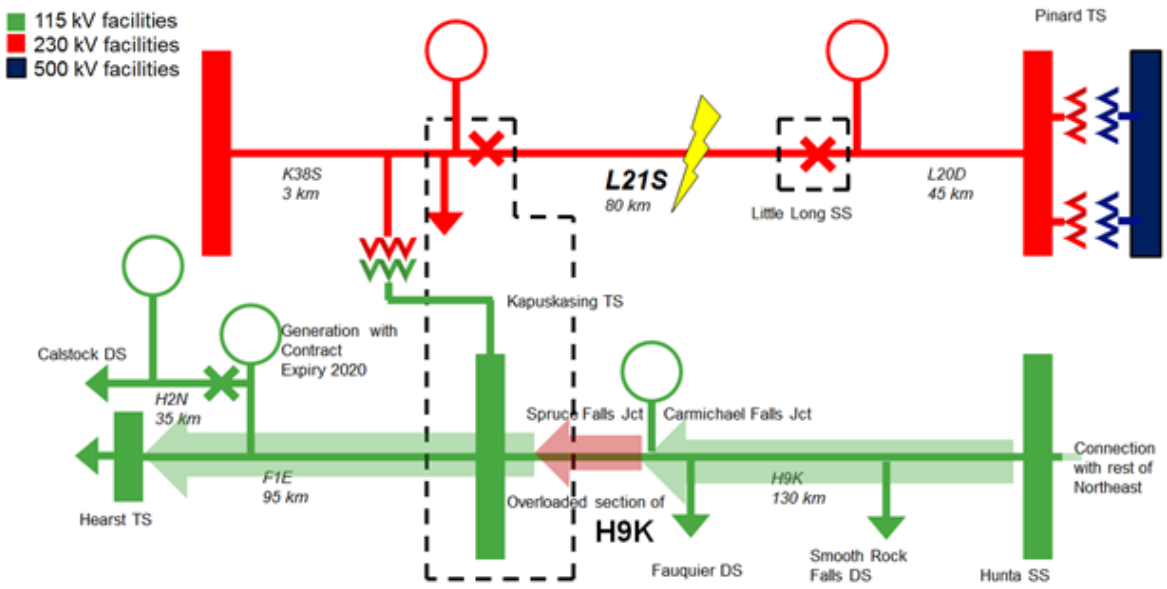
As part of the North/East of Sudbury regional planning process, the IESO and Hydro One Networks Inc. ("Hydro One") identified challenges with operating the bulk transmission

system in the Area. Through discussions with the regional planning Working Group[2] during the Needs Assessment, it was agreed that a bulk system study should be conducted in parallel with the formalized regional planning process to address these bulk transmission system challenges.

The IESO, with support from Hydro One, initiated bulk system studies for the Area. One of the purposes of these studies was to assess the reliability of the system supplying the Area after the generation contracts have expired and these facilities can no longer be relied on to meet local needs. Supplying load in the Area will then become dependent on external resources, resulting in increased flows on surrounding circuits. The IESO determined through these studies that reliance on external supply resources would not meet reliability standards. More specifically, studies have shown that following the loss of circuit L21S, the flows on circuit H9K would exceed the existing capability of a 32 km section of the circuit and thereby violate the Ontario Resource and Transmission Adequacy Criteria ("ORTAC") Section 4.7. At the same time, voltages in the Area are expected to fall below minimum requirements and exceed the voltage change limits prescribed by ORTAC Section 4.3.

Figure 3-1 below illustrates this event.

**Figure 3-1: H9K Circuit Overload between Carmichael Falls Jct and Spruce Falls Jct**




[2] The regional planning Working Group includes: Greater Sudbury Hydro Inc., Hearst Power Distribution Company Ltd., North Bay Hydro Distribution Ltd., Northern Ontario Wires Inc., Hydro One Networks Inc. (Transmission and Distribution), and the IESO.

## 4.0 The Recommended Project

To address the identified capacity and voltage performance needs in the Area, the IESO recommends increasing the capacity of circuit H9K between Carmichael Falls JCT and Spruce Falls JCT (a distance of 32 km) to a minimum of 310 A and connecting a capacitor bank at the Kapuskasing TS 115 kV bus. These facilities will satisfy the applicable reliability requirements of ORTAC.

Based on technical and economic analysis performed by the IESO, as summarized below, this recommendation is the least-cost option for providing the required levels of reliability. This solution is required to be placed in-service no later than June 2020, when the local generation facilities' contracts will have expired and the need emerges.

The capital cost of the project is estimated at $17.06 million (in 2017 dollars), which is comprised of $15.06 million for the upgrade of a 32 km section of circuit H9K and $2 million for the capacitor bank. While this solution must be in-service by June 2020, the 32 km section of H9K is expected to reach end-of-life between 2029 and 2034. For this reason, the IESO used the cost of *advancing* the replacement in its cost comparison of alternatives. Also, while the need for the project is June 2020, Hydro One proposes an in-service date of October 2019 and, as such, the economic analysis assumes these costs are incurred in 2019.

The estimated cost of advancing the H9K upgrade to a 2019 in-service date and installing a capacitor bank at Kapuskasing TS has a NPV in 2017 of approximately $8.4 to $10.5 million. This includes an NPV of the advancement of upgrades to H9K ranging from $5.4 (assuming a 10-year advancement) to $7.4 million (assuming a 15-year advancement) and an NPV of the capacitor bank of $3.04 million. The NPV is calculated based on the assumed 70-year life of the transmission upgrade using a real social discount rate of 4%. The NPV includes operating costs and the annual revenue required to cover the project's capital cost. The capacitor bank is assumed to be replaced at the end of its assumed 45-year life. The advancement costs associated with this project are summarized in Table 4-1 below.

**Table 4- 1: Summary of Cost of H9K Upgrade Advancement[3]**

| Advancement of Upgrade to 32 km of H9K | In-Service Date | Capital Cost (2017 dollars) | NPV[4] (in 2017) | Advancement Cost (NPV in 2017) |
|---|---|---|---|---|
| 10-Year Advancement | 2019 | $15.06 million | $16.16 million | $5.36 million |
| | 2029 | | $10.79 million | |
| 15-Year Advancement | 2019 | $15.06 million | $16.16 million | $7.43 million |
| | 2034 | | $8.72 million | |

The bulk system studies carried out by IESO also found a high voltage issue for the existing system in the Kapuskasing Area during energization and outage conditions. As a result, the IESO also recommended that Hydro One install a 10 Mvar reactor bank at Kapuskasing TS. The need for these facilities is not triggered by the expiry of the local generation contracts and is required regardless of the option selected for meeting the capacity and low voltage needs that are the subject of this evidence. For this reason, these facilities are not included in the cost analysis.

## 5.0 Alternatives

The options considered in meeting the supply capacity and voltage performance needs in the Area included:

1. Proposed solution (Option 1) — Advance by approximately 10 to 15 years the replacement of the 32 km section of circuit H9K between Carmichael Falls JCT and Spruce Falls JCT to increase the rating to at least 310 A and install a 10 Mvar capacitor bank. The estimated cost of advancing this replacement for an October 2019 in-service date and installing a capacitor bank has an NPV in 2017 dollars of approximately $8.4 to $10.5 million.

[3] Note that numbers may not add-up precisely due to rounding.

[4] The NPV analysis was based on the following assumptions, which included operating costs and the annual revenue required to cover the project's capital cost (i.e. return of capital, return on equity, interest paid, and taxes paid based on earnings after interest and the declining balance capital cost allowance).

2. Option 2 — Do not advance work on the H9K replacement, and instead install a new 10 MW generator in the Area for 10 to 15 years. Given the characteristics required – quick start, short lead time – a reciprocating engine is the most cost-effective generating resource for satisfying the need. At the end the contract term for this generator, and aligning with the end-of-life upgrade of H9K, install a capacitor bank to address voltage needs. This option has an estimated NPV in 2017 dollars of approximately $43 to $47 million.

3. Option 3 — Do not advance work on the H9K replacement, and instead execute a new supply contract at an existing generation facility for at least 10 MW of supply until circuit H9K reaches end-of-life. Due to the size and configuration of existing facilities, the capacity of the lowest-cost option is likely to be approximately 30 MW. At the end the contract term for this generator, and aligning with the end-of-life upgrade of H9K, install a capacitor bank to address voltage needs. This option has an estimated NPV in 2017 dollars of more than $38 million.

Based on the above, Option 1 was determined to be the least-cost option for meeting the capacity and voltage performance needs in the Area.

Additionally, Option 1 is preferable to a new generation facility because any new generation facility would only be required to meet the need for the 10- to 15-year interim period between contract expiry of local generation facilities and the end-of-life replacement of the 32 km section of circuit H9K. This period is shorter than a typical contract period for a similar new facility.

## 6.0 Conclusion

The IESO recommends increasing the capacity of circuit H9K between Carmichael Falls JCT and Spruce Falls JCT (a distance of 32 km) to a minimum of 310 A and installing a new 10 Mvar capacitor bank to provide for sufficient load supply and voltage performance to the Area. The cost of this solution is approximately $8.4 to $10.5 million. Based on technical and economic analysis performed by the IESO, this is the least-cost option for providing the required levels of reliability. The solution is required to be in-service no later than June 2020.

# Project Classification and Categorization

*Project Classification*

Per the Board's filing guidelines, rate regulated projects are classified into three groups based on their purpose.

- Development projects are those which
  - (i) provide an adequate supply capacity and/or maintain an acceptable or prescribed level of customer or system reliability for load growth or for meeting increased stresses on the system; or
  - (ii) enhance system efficiency such as minimizing congestion on the transmission system and reducing system losses.
- Connection projects are those which provide connection of a load or generation customer or group of customers to the transmission system.
- Sustainment projects are those which maintain the performance of the transmission network at its current standard or replace end-of-life facilities on a "like for like" basis.

Based on the above criteria, the Project is a development project to help increase supply capacity to the Kapuskasing area.

*Project Categorization*

The Board's filing guidelines require that projects be categorized to distinguish between a project that is a "must-do", which is beyond the control of the applicant ("non-discretionary"), from a project that is at the discretion of the applicant ("discretionary"). Non-discretionary projects may be triggered or determined by such things as:

a) mandatory requirement to satisfy obligations specified by regulatory organizations including NPCC/NERC or by the Independent Electricity System Operator (IESO);
b) a need to connect new load (of a distributor or large user) or new generation connection;
c) a need to address equipment loading or voltage/short circuit stresses when their rated capacities are exceeded;
d) projects identified in a provincial government approved plan;
e) projects that are required to achieve provincial government objectives that are prescribed in governmental directives or regulations; and
f) a need to comply with direction from the Ontario Energy Board in the event it is determined that the transmission system's reliability is at risk.

Based upon the above criteria, the Project is considered non-discretionary. The Project is being undertaken at the request of the IESO and it will increase power transfer capability into the Kapuskasing area and it will support the transmission system during periods of high output from generation sources.

**Categorization and Classification**

| | | **Project Need** | |
|---|---|---|---|
| | | Non-discretionary | Discretionary |
| **Project Class** | Development | **X** | |

# Cost Benefit Analysis and Options

**TRANSMISSION ALTERNATIVES**

Hydro One was requested in a letter from the IESO to upgrade the thermal rating of 32km of the H9K circuit (Carmichael x Spruce Falls). To achieve this rating increase, the following options were considered;

**Alternative 1** – Replace the existing 32km conductor (Carmichael Falls JCT x Spruce Falls JCT)

**Alternative 2** – Perform one or a combination of the following; Increase operating temperature, replace existing wood poles with higher structures, increase conductor tension on existing wood poles.

The three design alternatives identified in Alternative 2 are cost effective only if the conductor is in fair condition, and has considerable service life remaining. The existing conductor is of 1950 vintage and it is predicted to have approximately 10-15 years of service left before reconductoring is required. This reconductoring due to age/end of life will be required in the near future regardless of any interim design solutions to help increase the thermal ratings. Consequently, to achieve cost synergies and to avoid double customer and community construction impacts over a short time period, Alternative 2 was not explored further.

Alternative 1 provides a long term cost-effective solution that avoids redundant expenditures. In order to minimize capital project expenditures to address both, the aging conductor and satisfy IESOs thermal increase requirement, Hydro One recommends Alternative 1.

# Quantitative Benefits of the Project

The H9K Project encompasses the following quantitative benefit:

*Increase Thermal Rating of 32km of H9K*

This investment will increase the thermal limits of a 32km line section (Spruce Falls Junction ("JCT") x Carmichael Falls JCT) to a minimum summer continuous rating of 370A.

# Qualitative Benefits of the Project

The H9K Project encompasses the following qualitative benefit that cannot be specifically quantified at this point in time:

*Avoiding Future Refurbishment Activities*

Increasing the thermal limits of the H9K sections will require the replacement and/or refurbishment of the supporting wood pole structures, insulators and hardware. Field surveys and engineering assessments have determined that some of these assets are showing signs of deterioration and ageing. It is reasonable to expect that they will be replaced at some point in the future[1] even though their replacement is not currently in any existing Hydro One business plans.

[1] Current estimates are 10-15 years.

# Apportioning Project Costs & Risks

The estimated capital cost of the KAR Project, including overheads and capitalized interest, is shown below:

**Table 1: Project Cost**

| | **Estimated Cost ($000's)** |
|---|---|
| Materials | 3,000 |
| Labour | 5,765 |
| Equipment Rental & Contractor Costs | 3,400 |
| Sundry | 400 |
| Contingencies | 700 |
| Overhead [1] | 1,500 |
| Allowance for Funds Used During Construction [2] | 300 |
| **Total Line Work** | **$15,065** |
| 10 MVar reactive support | 4,000 |
| 10 MVar capacitive support | 2,000 |
| **Total Station Work** | **$6,000** |
| **TOTAL PROJECT WORK** | **$21,065** |

The cost of the work provided above allows for the schedule of approval, design and construction activities provided in **Exhibit B, Tab 11, Schedule 1**.

[1] Overhead costs allocated to the project are for corporate services costs. These costs are charged to capital projects through a standard overhead capitalization rate. As such they are considered "Indirect Overheads". Hydro One does not allocate any project activity to "Direct Overheads" but rather charges all other costs directly to the project.

[2] Capitalized interest (or AFUDC) is calculated using the Board's approved interest rate methodology (EB-2006-0117) to the projects' forecast monthly cash flow and carrying forward closing balance from the preceding month.

## 1.0 RISKS AND CONTINGENCIES

As with most projects, there are risks associated with estimating costs. Hydro One's cost estimate includes an allowance for contingencies in recognition of these risks.

The top 3 project risks are outlined below. These risks are the major contributors to the total contingency suggested for this project.

- **Resource shortage** – there is a risk of resource shortages due to multiple projects that are set to be in execution at the same time in the general area of the KAR Project. This may lead to schedule delays and additional costs.
- **Outage constraints –** there is a risk that securing an outage will not be supported by customers in the area and this may result in schedule delays and additional costs.
- **Aggressive timelines** - there is a risk of not meeting the in-service date due to the aggressive timelines set on the Project (14 months following the leave to construct approval).

Cost contingencies that have not been included, due to the unlikelihood or uncertainty of occurrence, include:

- Labour disputes;
- Safety or environmental incidents;
- Significant changes in costs of materials since the estimate preparation;
- Any other unforeseen and potentially significant event/occurrence.

## 2.0 COSTS OF COMPARABLE PROJECTS

The OEB Filing Requirements for Electricity Transmission and Distribution Applications, Chapter 4, requires the Applicant to provide information about a cost comparable project constructed by the Applicant. For lines cost comparisons, Table 2 compares the line refurbishment cost of D2L Dymond x Upper Notch Junction completed in August 2017 to H9K with a forecast to complete in October 2019.

The comparable lines project, D2L Dymond x Upper Notch Junction was a line refurbishment project from Dymond TS to Upper Notch Jct Structure 261. The D2L Line Refurbishment included wood pole replacement, shieldwire replacement, like for like conductor replacement as well as line hardwares, dampers, u-bolts and insulators. The project went in-service in August of 2017. The main driver of the variance in comparable costs between the two projects is the number of wood pole replacements. H9K will replace 324 wood poles while D2L replaced 60 H-frame wood poles. Additionally, the H9K Project involves extra cost for multiple river crossings, access and terrain challenges such as swampy-like conditions.

**Table 2: Costs of Comparable Line Projects**

| **Project** | **D2L Dymond x Upper Notch Junction Line refurbishment** | **H9K - Spruce Falls Jct x H9K STR 127A Junction Line refurbishment** |
|---|---|---|
| Technical | 115kV H-Frame Wood Pole Single Circuit 477kcmil conductors 7#10 alumoweld shieldwire | 115kV Wood Pole Single Circuit 411kcmil conductors 7#8 alumoweld shieldwire |
| Length (circuit km) | 42 | 32 |
| Project Surroundings | Rural | Rural |
| Environmental Issues | None | None |
| In-Service Date | August 2017 | October 2019 |
| Total Project Cost | $16,000k | $15,065k |
| Less: Non-Comparable Costs (extra no. of wood poles) | | $1,240k |
| Less: Non-Comparable Costs (multiple river crossings, access, etc.) | | $960k |
| Add: Escalation Adjustment (2%/year) | $646k | |
| Total Comparable Project Costs | $16,646k | $12,865k |
| Total Cost/Circuit km | $396k | $429k |

# Connection Projects Requiring Network Reinforcement

This is not a connection project and network facilities being upgraded as a result of this Project are limited to those discussed in the details of the work being undertaken in **Exhibit C, Tab 1, Schedule 1.**

# Transmission Rate Impact Assessment

## 1.0 ECONOMIC FEASIBILITY

Hydro One's proposed Kapuskasing Area Reinforcement Project ("**KAR Project**" or "**Project**") will upgrade the thermal ratings of 32km of the H9K Circuit to accommodate increased system flows on the H9K Transmission line and will install 10MVar reactive support and 10MVar capacitive support at Kapuskasing TS connected to the 115kV bus. The facilities will provide network voltage support during contingencies in the area and replace the reactive control area following the contract expiry of local area generation. The costs for the upgraded circuits and replacement of the reactive control will be included in the Network Connection pool for cost classification purposes and not allocated to any individual customer. See **Exhibit B, Tab 1, Schedule 1**, for information on the proposed work. No customer contribution is required for this project.

There are no incremental operating and maintenance costs as a result of the proposed project. The project will also have no impact on provincial peak load resulting in zero incremental network revenue over the 25-year evaluation period.

A 25-year discounted cash flow analysis of the network pool work was conducted. The results show that based on the estimated initial cost of $21.1[1] million, plus the assumed impact on the future capital cost allowance and Hydro One corporate income tax, this capacity enhancement project will have a negative net present value of $18.3 million. This amount will be fully recovered via the network rates.

[1] Initial costs of $21.1 million include $19.4 million of up front capital costs plus $1.7 million cost of removals

## 2.0 COST RESPONSIBILITY

*Network Pool*

The Hydro One H9K circuit is a 115kV network transmission line in northeast Ontario providing electrical connection between regions of Kapuskasing and Hunta. The Independent Electricity System Operator ("**IESO**") has identified that increased power transfer limits across H9K will be required to supply Kapuskasing area loads during times of high hydroelectric generation and due to the inability to rely on local generation facilities as a firm generation source. The facilities will provide network voltage support during contingencies in the area. This increased power demand causes sections of the H9K circuit to become overloaded. As part of the project, Hydro One will also install 10MVar reactive support and 10MVar capacitive support at Kapuskasing TS to be connected to the 115kV bus. The purpose of these facilities is to replace the reactive control area following the contract expiry of local area generation. This is a system project and not tied to any load increase or customer load application, and is intended to accommodate increased system flows on the line and reduce congestion on the transmission system during periods of high output from hydroelectric generation. As such, the proposed line upgrades are included in the network pool and no customer capital contribution is required, consistent with the provisions of Section 6.3.5 of the Transmission System Code.

## 3.0 RATE IMPACT ASSESSMENT

The analysis of the Network Connection pool rate impacts has been carried out on the basis of Hydro One's transmission revenue requirement for the year 2018, and the most recently approved Ontario Transmission Rate Schedules. The Network Connection pool revenue requirements would be affected by the line upgrade based on the project cost allocation.

*Network Pool*

Based on the project's initial cost of $21.1 million and the associated network pool incremental cash flows, there will be a slight change in the network pool revenue requirement once the project's impacts are reflected in the transmission rate base at the projected in-service date, July 2019. Over a 25-year time horizon, this slight change in the network pool revenue requirement is not material enough to incrementally impact the Provincial Network rate, which was assessed at the approved $3.59/kW/month. The maximum revenue shortfall related to the proposed network facilities will be $1.53 million in the year 2026. The detailed analysis illustrating the calculation of the incremental network revenue shortfall and rate impact is provided in Table 1 below.

Impact on Typical Residential Customer

Based on the load forecast, initial capital costs and ongoing maintenance costs, adding the costs of the upgrade of the required facilities to the network pool will cause no change in a typical residential customer's rates under the Regulated Price Plan (RPP).

# Table 1: Revenue Requirement and Network Pool Rate Impact, page 1

**Revenue Requirement and Network Pool Rate Impact** **(Before Capital Contribution)**

| ***H9K*** | | Project YE 30-Jul 2020 | 30-Jul 2021 | 30-Jul 2022 | 30-Jul 2023 | 30-Jul 2024 | 30-Jul 2025 | 30-Jul 2026 | 30-Jul 2027 | 30-Jul 2028 | 30-Jul 2029 | 30-Jul 2030 | 30-Jul 2031 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Calculation of Incremental Revenue Requirement ($000)*** | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| In-service date | 30-Jul-19 | | | | | | | | | | | | |
| Capital Cost | 19,365 | | | | | | | | | | | | |
| Less: Capital Contribution Required | - | | | | | | | | | | | | |
| Net Project Capital Cost | 19,365 | | | | | | | | | | | | |
| Average Rate Base | | 9,489 | 18,784 | 18,397 | 18,009 | 17,622 | 17,235 | 16,848 | 16,460 | 16,073 | 15,686 | 15,298 | 14,911 |
| Incremental OM&A Costs | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grants in Lieu of Municipal tax | | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| Depreciation | | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 |
| Interest and Return on Rate Base | | 599 | 1,186 | 1,161 | 1,137 | 1,112 | 1,088 | 1,063 | 1,039 | 1,015 | 990 | 966 | 941 |
| Income Tax Provision | | (16) | (153) | (115) | (80) | (49) | (21) | 5 | 28 | 49 | 68 | 85 | 100 |
| **REVENUE REQUIREMENT PRE-TAX** | | **1,043** | **1,493** | **1,507** | **1,517** | **1,524** | **1,528** | **1,529** | **1,528** | **1,524** | **1,519** | **1,511** | **1,502** |
| Incremental Revenue | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SUFFICIENCY/(DEFICIENCY)** | | **(1,043)** | **(1,493)** | **(1,507)** | **(1,517)** | **(1,524)** | **(1,528)** | **(1,529)** | **(1,528)** | **(1,524)** | **(1,519)** | **(1,511)** | **(1,502)** |
| | Base Year | | | | | | | | | | | | |
| Network Pool Revenue Requirement including sufficiency/(deficiency) | 893,562 | 894,605 | 895,055 | 895,069 | 895,079 | 895,086 | 895,090 | 895,091 | 895,090 | 895,086 | 895,081 | 895,073 | 895,064 |
| Network MW | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 |
| Network Pool Rate ($/kw/month) | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 |
| Increase/(Decrease) in Network Pool Rate ($/kw/month), relative to base year | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RATE IMPACT relative to base year** | | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** |

**Assumptions**

| | | |
|---|---|---|
| Incremental OM&A | | Years 1 to 5 0.95% of Initial Capital each year; Years 6 to 15 1.90% of Initial Captial each year; Years 16 to 25 2.38% of Initial Capital each year. |
| Grants in Lieu of Municipal tax | 0.38% | Transmission system average |
| Depreciation | 2.00% | Reflects 50 year average service life for towers, conductors and station equipment, excluding land |
| Interest and Return on Rate Base | 6.31% | Includes OEB-approved ROE of 9%, 2.29% on ST debt, and 4.68% on LT debt. 40/4/56 equity/ST debt/ LT debt split |
| Income Tax Provision | 26.50% | 2018 federal and provincial corporate income tax rate |
| Capital Cost Allowance | 8.00% | 100% Class 47 assets |

# Table 1: Revenue Requirement and Network Pool Rate Impact, page 2

**Revenue Requirement and Network Pool Rate Impact** **(Before Capital Contribution)**

| ***H9K*** | | 30-Jul 2032 | 30-Jul 2033 | 30-Jul 2034 | 30-Jul 2035 | 30-Jul 2036 | 30-Jul 2037 | 30-Jul 2038 | 30-Jul 2039 | 30-Jul 2040 | 30-Jul 2041 | 30-Jul 2042 | 30-Jul 2043 | 30-Jul 2044 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Calculation of Incremental Revenue Requirement ($000)*** | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| In-service date | 30-Jul-19 | | | | | | | | | | | | | |
| Capital Cost | 19,365 | | | | | | | | | | | | | |
| Less: Capital Contribution Required | - | | | | | | | | | | | | | |
| Net Project Capital Cost | 19,365 | | | | | | | | | | | | | |
| Average Rate Base | | 14,524 | 14,136 | 13,749 | 13,362 | 12,975 | 12,587 | 12,200 | 11,813 | 11,425 | 11,038 | 10,651 | 10,263 | 9,876 |
| Incremental OM&A Costs | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grants in Lieu of Municipal tax | | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| Depreciation | | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 | 387 |
| Interest and Return on Rate Base | | 917 | 892 | 868 | 843 | 819 | 795 | 770 | 746 | 721 | 697 | 672 | 648 | 623 |
| Income Tax Provision | | 114 | 126 | 137 | 146 | 155 | 162 | 168 | 173 | 178 | 182 | 185 | 187 | 189 |
| **REVENUE REQUIREMENT PRE-TAX** | | **1,491** | **1,479** | **1,465** | **1,450** | **1,434** | **1,417** | **1,399** | **1,380** | **1,360** | **1,339** | **1,318** | **1,296** | **1,273** |
| Incremental Revenue | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SUFFICIENCY/(DEFICIENCY)** | | **(1,491)** | **(1,479)** | **(1,465)** | **(1,450)** | **(1,434)** | **(1,417)** | **(1,399)** | **(1,380)** | **(1,360)** | **(1,339)** | **(1,318)** | **(1,296)** | **(1,273)** |
| | Base Year | | | | | | | | | | | | | |
| Network Pool Revenue Requirement including sufficiency/(deficiency) | 893,562 | 895,053 | 895,041 | 895,027 | 895,012 | 894,996 | 894,979 | 894,961 | 894,942 | 894,922 | 894,901 | 894,880 | 894,858 | 894,835 |
| Network MW | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 | 249,132 |
| Network Pool Rate ($/kw/month) | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 | 3.59 |
| Increase/(Decrease) in Network Pool Rate ($/kw/month), relative to base year | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RATE IMPACT relative to base year** | | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** |

## Table 2: DCF Assumptions

### Hydro One Networks -- Transmission Connection Economic Evaluation Model
### 2018 Parameters and Assumptions

**Transmission rates** are based on current OEB-approved uniform provincial transmission rates.

| | | Monthly Rate ($ per kW) | |
|---|---|---|---|
| Network | | **3.59** | |

| | | | |
|---|---|---|---|
| **Grants in lieu of Municipal tax** (% of up-front capital expenditure, a proxy for property value): | | **0.38%** | Based on Transmission system average |
| **Income taxes:** | | | |
| Basic Federal Tax Rate - % of taxable income: | 2018 | **15.00%** | Current rate |
| Ontario corporation income tax - % of taxable income: | 2018 | **11.50%** | Current rate |
| **Capital Cost Allowance Rate:** Class 47 costs | 2018 | **8%** | Current rate |
| **After-tax Discount rate:** | | **5.59%** | Based on OEB-approved ROE of 9% on common equity and 2.29% on short-term debt, 4.68% forecast cost of long-term debt and 40/60 equity/debt split, and current enacted income tax rate of 26.5% |

**Other Assumptions:**

| | | | |
|---|---|---|---|
| **Estimated Incremental OM&A:** | Project specific ($ k): | | |
| | Network Station | **1.0%** | of up-front capital expenditure each year for years 1 - 5 |
| | | **1.9%** | of up-front capital expenditure each year for years 6 - 15 |
| | | **2.4%** | of up-front capital expenditure each year for years 16 - 25 |

# Deferral Account Requests

There are no new deferral account requests being made as part of this Application.

# Project Schedule

| TASK | START | FINISH |
|---|---|---|
| Submit Section 92 | | February 2018 |
| Projected Section 92 Approval | | August 30, 2018 |
| **LINES** | | |
| Detailed Engineering | March 2018 | October 2018 |
| Procurement | July 2018 | October 2018 |
| Receive Material | September 2018 | January 2018 |
| Construction | October 2018 | October 2019 |
| **IN SERVICE** | | **29 October 2019** |

# Descriptions of the Physical Design

## 1.0 LINE FACILITIES

*Details of Proposed Line Facilities*

Hydro One is proposing to increase the transmission capacity of the 115 kilovolt ("**kV**") circuit H9K between Spruce Falls Junction ("**JCT**") to Carmichael Falls JCT near Kapuskasing. The line sections involved are all wood pole lines. Currently, it is strung with 4/0 Aluminum Conductor Steel Reinforced (6/1) and has a continuous ampacity limit of 290A for Spruce Falls JCT x Carmichael Falls JCT. However, due to the need for increased power transfer capability identified by the IESO, it is necessary to increase the ampacity of these two sections of circuit H9K. A map indicating the geographic location and route of the Project is provided as **Exhibit B, Tab 2, Schedule 1, Attachment 1**. A schematic diagram of the proposed facilities is included in **Exhibit B, Tab 2, Schedule 1**.

Hydro One is seeking OEB Leave-to-Construct approval for the following upgrade work on existing transmission facilities:

- To upgrade 32km of transmission circuit H9K between Spruce Falls JCT to Carmichael Falls JCT with 411.4kcmil Aluminum Conductor Steel Reinforced (Trapezoidal) Compact Conductor, which will meet the summer continuous rating requirements of 370A for Spruce Falls JCT x Carmichael Falls JCT;
- To replace existing 5/16" Galvanized Steel shieldwire with 7#8 Alumoweld shieldwire;
- To replace old porcelain and polymeric insulators and associated hardware;
- To adjust line protections due to the change in conductor type;
- To replace wood pole structures that are in poor condition, or to replace wood pole structures that currently violate clearance requirements. The total number of structures to be replaced is approximately 275. The replacement structures

will be mostly like-for-like. The majority of the structures (233 of them) are single-pole suspension structures with steel harp arms. This type of structure is shown in **Figure 1** below.

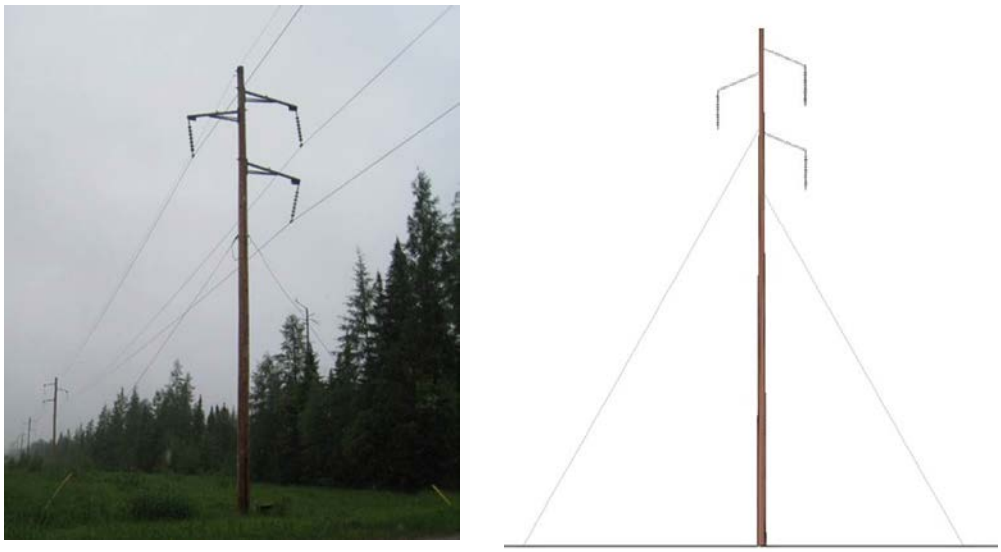


**Figure 1**: Picture of a single-pole suspension structure along the H9K circuit with steel harp arms adjacent to a virtual rendition of the same structure.

- 30 structures would be H-frame suspension type. In some locations, Hydro One plans to change suspension structures with dead-end type in order to reduce the risk of cascading failure of the line. A virtual rendering of the dead-end type structure is provided in **Figure 2** on the following page.

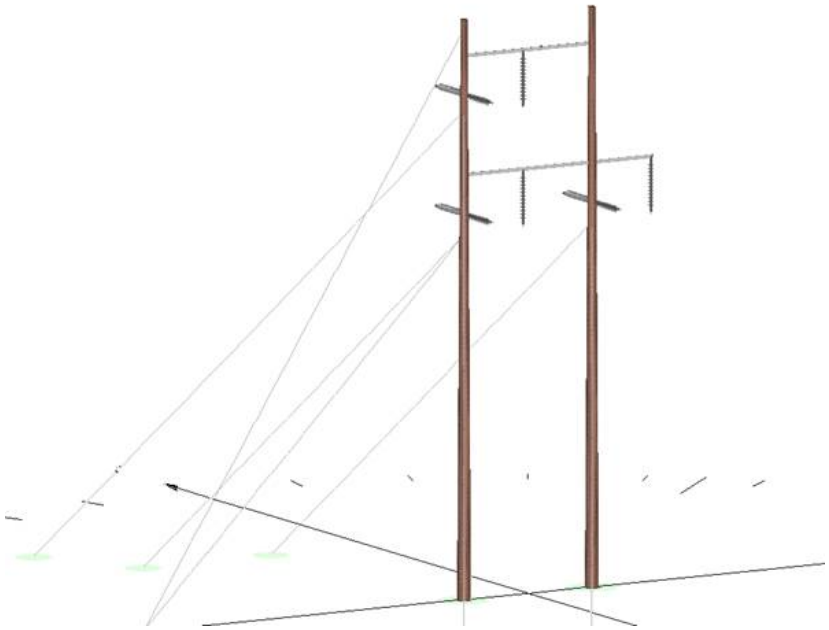
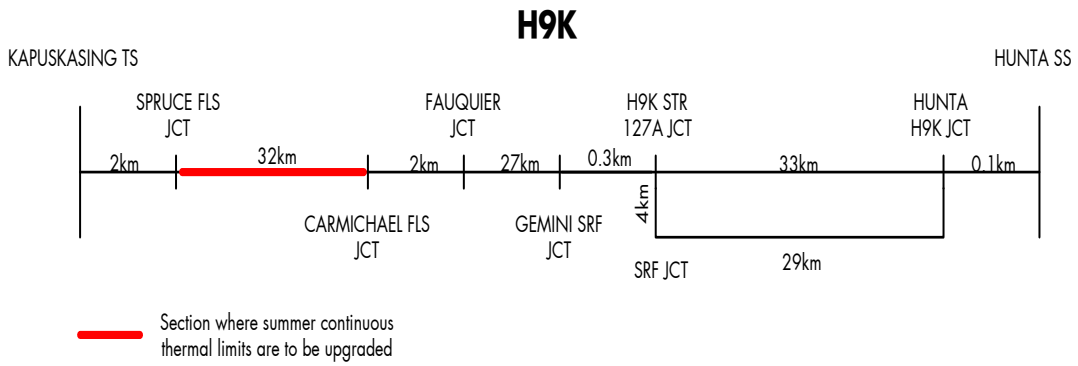


**Figure 2:** Two-Pole Dead End Structure.

As documented, the 115kV H9K in the above sections is strung on wood poles. The existing conductor is 4/0 ACSR. The proposed 411.4kcmil ACSR/TW conductor is heavier and larger in diameter than 4/0 ACSR therefore some structures will need to be replaced to maintain adequate clearance. Additionally, some of the existing pole structures are in bad condition and need to be replaced. For most of the replacement structures, replacements will be undertaken on a like for like configuration replacement approach.

# Maps

A map indicating the geographic location of the H9K circuit is provided in **Exhibit B, Tab 2, Schedule 1, Attachment 1**. Additionally, a schematic of the section of the line that is planned to be upgraded, as part of this Project, is provided again below:




This Project is proposed to reinforce a section of the existing H9K transmission line between Carmichael Falls Junction ("**JCT**") and Spruce Falls JCT (32km).

# Operational Details

The KAR Project includes the replacement of two sections of the existing 115 kilovolt ("**kV**") H9K transmission circuit (total of 32km) with new conductors of higher thermal capability. No portion of the circuits will be relocated or reconfigured, and as a result, there will be no change to the operation of the circuits. The terminal stations connecting H9K will remain as Kapuskasing Transmission Station ("**TS**") and Hunta TS.

There are 4 existing customers connected to the H9K circuit and will remain connected to the same electrical location after the upgrade work is completed. These customers include:

- Gemini Power Corp – Smooth Rock Falls Generating Station ("**GS**")
- Brookfield Power – Carmichael Falls GS
- Hydro One Distribution – Fauquier Distribution Station ("**DS**")
- Hydro One Distribution – Smooth Rock Falls DS

# Land Matters

As referenced in the Application, the KAR Project will involve line work on the existing 115 kilovolt ("**kV**") circuit on a line section between Spruce Falls Junction ("**JCT**") and Carmichael Falls JCT. The existing right of way width is 100 feet and provides sufficient width for the proposed reinforcement work.

The existing transmission corridor crosses an estimated 104 parcels of land, which consists of:

- Hydro One fee simple ownership;
- Easement corridor over privately-owned and municipally-owned properties;
- Lands under the jurisdiction of the Ministry of Natural Resources and Forestry, which Hydro One holds a Master Land Use Permit for its transmission and distribution facilities;
- Crossings over highways under the jurisdiction of the Ministry of Transportation; and,
- Crossings over railways.

The proposed transmission facility work is not expected to have any impact on the rights of any adjacent properties.

*Required Land Easements*

The existing corridor within the line section from Spruce Falls JCT to Carmichael Falls JCT is predominantly located on privately-owned properties, which Hydro One has existing easement rights. The proposed reinforcement work will be accommodated by the existing corridor. Railway and waterway crossing permits may be updated as necessary to accommodate construction and stringing activities. Any additional temporary off-

corridor requirements (including but not limited to construction staging areas, access, flagging and permitting) will be communicated with affected property owners.

*Early Access to Land*

The line reinforcement work falls under the existing land rights held by Hydro One and it is not expected to require additional corridor rights. Early access will not be required to complete the reinforcement work.

*Land Acquisition Process*

Hydro One will be utilizing its existing land rights for the Project. Should any updates of crossing permits be required, Hydro One will work with the authority under the transmission lines to appropriately update the existing crossing permits. It is anticipated that the reinforcement work will be accommodated by the existing corridor. Further temporary off-corridor access or construction requirements will be negotiated with the necessary affected land owner.

Copies of Off-Corridor Temporary Access and Temporary Access Road, Construction License Agreement for construction staging, and a Damage Claim Agreement and Release Form (which will be used as the basis for compensation related to construction impacts, such as crop or property damage) are included at the end of this schedule as **Attachments 1 through 3**.

**Temporary Access and Temporary Access Road**

**THIS AGREEMENT** made in duplicate the _____day of _____20XX

Between:

***INSERT NAME OF OWNER***

(hereinafter referred to as the "Grantor")

OF THE FIRST PART

--- and ---

**HYDRO ONE NETWORKS INC.**

(hereinafter referred to "HONI")

OF THE SECOND PART

WHEREAS the Grantor is the owner in fee simple and in possession of certain lands legally described as, ***INSERT LEGAL DESCRIPTION*** (the "Lands").

**WHEREAS HONI** in connection with its **[Insert Project Name]** Project (the "Project") desires the right to enter onto the Lands in order to construct temporary access roads on, over and upon the Lands in order to access the construction site associated with the "Project.

**WHEREAS** the Grantor is agreeable in allowing HONI to enter onto the Lands for the purpose of constructing temporary access roads on, over and upon the Lands, subject to the terms and conditions contained herein.

**NOW THEREFORE THIS AGREEMENT WITNESSETH** that in consideration of the sum of ***INSERT CONSIDERATION*** to be paid by HONI to the Grantor, and the mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

**1.** The Grantor hereby grants, conveys and transfers to HONI in, over, along and upon that part of the Lands highlighted in yellow as shown in Schedule "A" attached hereto (the "Access Lands"), the rights privileges, and easements as follows:

(a) for the servants, agents, contractors and workmen of HONI at all times with all necessary vehicles and equipment to pass and repass over the Access Lands for the purpose of access to the construction site associated with the Project, subject to payment of compensation for damages to any crops caused thereby;

(b) to construct, use and maintain upon the Access Lands, a temporary road to the construction site associated with the Project, together with such gates, bridges and drainage works as may be necessary for HONI's purposes (collectively, the "Works"), all of which Works shall be removed by HONI upon completion of the construction associated with the Project.; and

(c) to cut and remove all trees, brush and other obstructions made necessary by the exercise of the rights granted hereunder

**2.** The term of this Agreement and the permission granted herein shall be XXXX from the date written above (the "Term"). HONI may, in its sole discretion, and upon 60 days notice to the Grantor, extend the Term for an additional length of time, which shall be negotiated between the parties.

**3.** Upon the expiry of the Term or any extension thereof, HONI shall repair any physical damage to the Access Lands and/or Lands resulting from HONI's use of the Access Lands and the permission granted herein; and, shall restore the Access Lands to its original condition so far as possible and practicable.

**4.** All agents, representatives, officers, directors, employees and contractors and property of HONI located at any time on the Access Lands shall be at the sole risk of HONI and the Grantor shall not be liable for any loss or damage or injury (including loss of life) to them or it however occurring except and to the extent to which such loss, damage or injury is caused by the negligence or willful misconduct of the Grantor.

**5.** HONI agrees that it shall indemnify and save harmless the Grantor from and against all claims, demands, costs, damages, expenses and liabilities (collectively the "Costs") whatsoever arising out of HONI's presence on the Access Lands or of its activities on or

in connection with the Access Lands arising out of the permission granted herein except to the extent any of such Costs arise out of or are contributed to by the negligence or willful misconduct by the Grantor.

**6.** Notices to be given to either party shall be in writing, personally delivered or sent by registered mail (except during a postal disruption or threatened postal disruption), telegram, electronic facsimile or other similar means of prepaid recorded communication to the applicable address set forth below (or to such other address as such party may from time to time designate in such manner):

TO HONI:

Hydro One Networks Inc.
Real Estate Services
5th Floor
483 Bay Street South Tower
Toronto, Ontario M5G 2P5

Attention:
Fax:

TO GRANTOR:

**7.** Notices personally delivered shall be deemed to have been validly and effectively given on the day of such delivery. Any notice sent by registered mail shall be deemed to have been validly and effectively given on the fifth (5th) business day following the date on which it was sent. Any notice sent by telegram, electronic facsimile or other similar means of prepaid recorded communication shall be deemed to have been validly and effectively given on the Business Day next following the day on which it was sent. "Business Day" shall mean any day which is not a Saturday or Sunday or a statutory holiday in the Province of Ontario. This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable herein. The parties hereto submit themselves to the exclusive jurisdiction of the Courts of the Province of Ontario.

**8.** Any amendments, modifications or supplements to this Agreement or any part thereof shall not be valid or binding unless set out in writing and executed by the parties with the same degree of formality as the execution of this Agreement.

**9.** The burden and benefit of this Agreement shall run with the Lands and everything herein contained shall operate to the benefit of, and be binding upon, the respective heirs; successors, permitted assigns and other legal representatives, as the case may be, or each of the Parties hereto.

**IN WITNESS WHEREOF** the parties hereto have caused this Agreement to be executed by their duly authorized representatives as of the day and year first above written.

SIGNED, SEALED & DELIVERED
In the presence of:

**OWNER:**

_____
Witness

_____

_____
Witness

_____

HYDRO ONE
HST #

**HYDRO ONE NETWORKS INC.**

By: _____
Name:
Title:

I have authority to bind the Corporation

**SCHEDULE “A”**

**PROPERTY SKETCH**

# TEMPORARY CONSTRUCTION LICENCE

THIS AGREEMENT made in duplicate X day of X 20XX the

BETWEEN:

**HYDRO ONE NETWORKS INC.** (hereinafter called the "HONI") OF THE FIRST PART

and

**XXXXX** (hereinafter called the "Owner") OF THE SECOND PART

**WHEREAS:**

**(a)** The Owner is the registered owner of lands legally described as ***INSERT LEGAL DESCRIPTION*** (the "Lands").

**(b)** HONI will be constructing new electrical transmission facilities in the area highlighted in yellow on a portion of the Lands more particularly shown on Schedule "A" attached hereto (the "Project") and requires a portion of the Lands as a temporary construction area.

**(c)** The Owner is agreeable in allowing HONI to enter onto the Lands and using a portion of the Lands for the purposes of a temporary construction area, which area is more particularly shown in red on Schedule "A" attached hereto in order to facilitate construction work on HONI's adjacent transmission corridor.

**NOW THEREFORE THIS AGREEMENT WITNESSES THAT IN CONSIDERATION** of the sum of Five Dollars ($5.00) now paid by each party to the other and the respective covenants and agreements of the parties hereinafter contained (the receipt and sufficiency of which are hereby acknowledged by the parties hereto), the parties hereto agree as follows:

1. The Owner hereby grants to HONI the right to enter upon a portion of the Lands highlighted in red, being XX acres, for the purpose of a temporary construction area (the "Licenced Area").

2. HONI will pay the Owner the amount of ***INSERT CONSIDERATION*** for the rights granted herein (the "Licence Fee").

3. HONI agrees that it shall take all reasonable care in its construction practices. HONI agrees that it shall erect such barriers and take such other appropriate safety precautions (i.e. gating system), as may be reasonably required to effectively prevent death or injuries to persons or the Owner's property during the Term of this Agreement.

4. All agents, representatives, officers, directors, employees and contractors and property of HONI located at any time on the Licenced Area shall be at the sole risk of HONI and the Owner shall not be liable for any loss or damage or injury (including loss of life) to them or it however occurring except and to the extent to which such loss, damage or injury is caused by the negligence or willful misconduct of the Owner.

5. HONI agrees that it shall indemnify and save harmless the Owner from and against all claims, demands, costs, damages, expenses and liabilities (collectively the "Costs") whatsoever arising out of HONI's presence on the Lands or of its activities on or in connection with the Licenced Area arising out of the permission granted herein except to the extent any of such Costs arise out of the negligence or willful misconduct of the Owner.

6. This Agreement and the permission granted herein shall be for a XXXXX term commencing from XXXXX until XXXXX (the "Term").

7. This Agreement and the permission granted herein may be renewed by HONI on a month to month basis up to an additional one year term, upon the same terms and conditions contained herein, including the Licence Fee, which amount shall be pro-rated to a monthly amount if applicable, save and except any further right to renewal. In the event HONI desires to renew this Licence, it shall provide notice in writing to the Owner of its desire to renew the Licence, at least thirty (30) days prior to the end of the Term, or any renewal thereof.

8. Upon the expiry of this Licence, HONI shall remove all equipment and debris from the Licenced Area and shall restore the Licenced Areas to as close as is practicable to its original condition immediately prior to HONI's occupancy at HONI's sole cost and expense.

9. Any notice to be given to the Owner shall be in writing and shall be delivered by pre-paid registered post or by facsimile, at the address noted below:

   in the case of the Owner, to:

   Attention:
   Fax No.:

   in the case of the HONI, to:

   Attention:
   Fax No.:

   Such notice shall be deemed to have been given, in, writing or delivered, on the date of delivery, and, where given by registered post, on the third business day following the posting thereof, and if sent by facsimile, the date of delivery shall be deemed to be the date of transmission if transmission occurs prior to 4:00 p.m. (Toronto time) on a business day and on the business day next following the date of transmission in any other case. It is understood that in the event of a threatened or actual postal disruption in the postal service in the postal area through which such notice must be sent, notice must be given in writing by

delivery or by facsimile, in which case notice shall be deemed to have been given as set out above. "Business day" shall mean any day which is not a Saturday or Sunday or a statutory holiday in the Province of Ontario.

10. This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable herein. The parties hereto submit themselves to the exclusive jurisdiction of the Courts of the Province of Ontario.

11. The burden and benefit of this Agreement shall run with the Lands and everything herein contained shall operate to the benefit of, and be binding upon, the respective heirs; successors, permitted assigns and other legal representatives, as the case may be, or each of the Parties hereto.

12. Any amendments, modification or supplement to this Agreement or any part thereof shall not be valid or binding unless set out in writing and executed by the parties with same degree of formality as the execution of this Agreement.

**IN WITNESS WHEREOF** the parties hereto have executed this Agreement by the hands of their duly authorized signing officers in that regard.

Per: _____

Name:

Title:

I have authority to bind the Corporation

**HYDRO ONE NETWORKS INC.**

Per: _____

Name:

Title:

I have authority to bind the Corporation

SCHEDULE “A”

Damage Claim

**THIS MEMORANDUM OF AGREEMENT** dated the day of 20XX

Between:

herein called the "Claimant"

-and-

**Hydro One Networks Inc.**

herein called "HONI"

## Witnesseth:

The Claimant agrees to accept .....($ ) in full payment and satisfaction of all claims or demands for damages of whatsoever kind, nature or extent which may have been done to date by HONI during the construction, completion, operation or maintenance of the works of HONI constructed on Lot(s) ..... , Concession(s) ..... or according to Registered Plan No. ..... in the ..... of ..... of which property the Claimant is the ..... and which damages may be approximately summarized and itemized as:

**WITNESS**

Name:

Address:

HYDRO ONE
HST#

**CLAIMANT**

Name:

Address:

**HYDRO ONE NETWORKS INC.**

Per:

Name:

Title:

**I have authority to bind the Corporation**

## RELEASE AND WAIVER

## FULL AND FINAL RELEASE

IN CONSIDERATION of the payment or of the promise of payment to the undersigned of the aggregate sum of [INSERT SETTLEMENT AMOUNT] ($), the receipt and sufficiency of which is hereby acknowledged, I/We, the undersigned, on behalf of myself/ourselves, my/our heirs, executors, administrators, successors and assigns (hereinafter the "Releasors"), hereby release and forever discharge HYDRO ONE NETWORKS INC., its officers, directors, employees, servants and agents and its parent, affiliates, subsidiaries, successors and assigns (hereinafter the "Releasees") from any and all actions, causes of action, claims and demands of every kind including damages, costs, interest and loss or injury of every nature and kind, howsoever arising, which the Releasors now have, may have had or may hereafter have arising from or in any way related to [INSERT DESCRIPTION OF THE DAMAGE CAUSED] on lands owned by [INSERT PROPERTY OWNER NAME] and specifically including all damages, loss and injury not now known or anticipated but which may arise or develop in the future, including all of the effects and consequences thereof.

AND FOR THE SAID CONSIDERATION, the Releasors further agree not to make any claim or take any proceedings against any other person or corporation who might claim contribution or indemnity under the provisions of the *Negligence Act* and the amendments thereto from the persons or corporations discharged by this release.

AND FOR THE SAID CONSIDERATION, the Releasors further agree not to disclose, publish or communicate by any means, directly or indirectly, the terms, conditions and details of this settlement to or with any persons other than immediate family and legal counsel.

AND THE RELEASORS hereby confirm and acknowledge that the Releasors have sought or declined to seek independent legal advice before signing this Release, that the terms of this Release are fully understood, and that the said amounts and benefits are being accepted voluntarily, and not under duress, and in full and final compromise, adjustment and settlement of all claims against the Releasees.

IT IS UNDERSTOOD AND AGREED that the said payment or promise of payment is deemed to be no admission whatsoever of liability on the part of the Releasees.

AND IT IS UNDERSTOOD AND AGREED that this Release may be executed in separate counterparts (and may be transmitted by facsimile) each of which shall be deemed to be an original and that such counterparts shall together constitute one and the same instrument, notwithstanding the date of actual execution.

IN WITNESS WHEREOF, the Releasors have hereunto set their respective hands this ..... day of ....., 20XX.

SIGNED, SEALED & DELIVERED
In the presence of:

_____
Witness

_____
Name

SIGNED, SEALED & DELIVERED
In the presence of:

_____
Witness

_____
Name

# System Impact Assessment

Please refer to **Attachment 1** for the Notification of Conditional Approval of Connection Proposal and **Attachment 2** for the Final System Impact Assessment prepared by the Independent Electricity System Operator (SIA reference # CAA 2016-EX866).

Hydro One confirms that it will implement the requirements noted by the IESO in the SIA regarding the 32km line stretch from Spruce Falls to Carmichael Falls. Consistent with the IESO Evidence in Support of Need (provided in **Exhibit B, Tab 3, Schedule 1, Attachment 1**), there is no longer an identifiable need to complete the 0.3km stretch of line from Gemini Falls to H9K Structure and Hydro One will not be carrying out this work. There is no anticipated system impact.

ieso
Connecting Today.
Powering Tomorrow.

Independent Electricity System Operator
Station A, Box 4474
Toronto, ON M5W 4E5
t 905.403.6900
www.ieso.ca

April 6, 2017

Ibrahim El Nahas
Manager – System Planning
Hydro One Networks Inc.
483 Bay Street
Toronto, Ontario
M5G 1P5

Dear Mr. El Nahas:

***115 kV Circuit H9K (the "project")***
***Notification of Conditional Approval of Connection Proposal***
***CAA ID Number: 2016-EX866***

Thank you for the information regarding the project. The IESO has concluded that the proposed changes will not result in a material adverse impact on the reliability of the integrated power system. The IESO is therefore pleased to grant **conditional** approval as detailed in the attached expedited System Impact Assessment report. Please note that any material changes to your proposal, or changes to the information available to or system assumptions made by the IESO at the time the assessment for the project was carried out may require a re-assessment by the IESO and may nullify your conditional approval.

The likelihood of your assessment being re-assessed due to changes in the system assumptions made by the IESO will be reduced once your project attains the "committed" status as per Section 3.3 of Market Manual 2.10: Connection Assessment and Approval. Therefore, if your project is not "committed" at this point, you are reminded of your obligation to provide updates and notifications in order for the IESO to give your project this classification. Meanwhile, in the event you are required to make a project related decision and are concerned about the validity of the Notification of Conditional Approval of this project and the connection requirements presented in the System Impact Assessment, please contact us at connection.assessments@ieso.ca.

Please note that this conditional approval does not in any way constitute an endorsement of the proposed connection for the purposes of obtaining a contract with the IESO for the procurement of supply, generation, demand response, demand management or ancillary services.

You may now initiate the IESO's **Market Registration** process. To do so, please contact Market Registration at market.registration@ieso.ca as soon as possible/at least eight months prior to your expected energization date. The SIA report, attached hereto, details the requirements that your company must fulfill during this process, including demonstrating that the equipment *as installed* will not be materially different from the equipment *as approved* by the IESO.

Your conditional right to connect is balanced by an obligation to demonstrate installed equipment meets performance requirements. During the **Market Registration** process, you shall be required to demonstrate this obligation has been fulfilled in accordance with Market Manual 2: Market Administration Part 2.20: Performance Validation.

When your company has successfully completed the IESO's **Market Registration** process, the IESO will provide you with a **final approval**, thereby confirming that the equipment is fully authorized to connect to the IESO-controlled grid.

If you have any questions or require further information, please contact me via connection.assessments@ieso.ca.

Yours truly,

Mauro Facca
Acting Sr. Manager – Engineering Studies
*Telephone:* *(905) 855-6424*
*Fax:* *(905) 855-6319*
*E-mail:* *mauro.facca@ieso.ca*
*cc:* *IESO Records*

# IESO Expedited System Impact Assessment

# 115 kV Circuit H9K – Conductor Upgrade

# 2016-EX866

# Final Report

## Summary

### Project Description

In response to an IESO directive, Hydro One Networks Inc. (the "connection applicant") proposes to upgrade the following sections on the 115 kV circuit H9K by the replacing the existing conductors with new conductors (the "project"):

(1) The 0.3 km section between Gemini Smooth Rock Junction to H9K STR 127 A Junction; and

(2) The 32 km section between Spruce Falls Power & Paper Co. Junction to Carmichael Falls Junction

The re-conductored sections will result in an increase in thermal capability of these sections. A diagram of showing H9K and the sections to be re-conductored are shown in **Figure 1.**

The proposed in-service date of the project is in Q2, 2019.

### Conditional Approval for Connection

This assessment concluded that the project is expected to have no material adverse impact on the reliability of the integrated power system. Therefore, the IESO recommends that a *Notification of Conditional Approval for Connection* be issued for the project, subject to implementation of the requirements outlined in this report.

### Specific Requirements

1. The connection applicant is required to provide the new summer and winter long term emergency and short term emergency for ratings for the re-conductored sections during the IESO Market Registration process as they were not provided in the application for this assessment.
2. As per the IESO directive, the connection applicant must ensure that the continuous rating of the Spruce Falls Power & Paper Co. Junction to Carmichael Falls Junction must be at least 310 A.

### General Requirements

The connection applicant shall satisfy all applicable requirements specified in the Market Rules and the Transmission System Code (TSC). As H9K is classified as a Bulk Electric System (BES) element, the connection applicant must also satisfy all applicable requirements in the North American Electric Reliability Corporation (NERC) reliability standards.

The following requirements summarize some of the general requirements that are applicable to project.

1. The connection applicant must notify the IESO at connection.assessments@ieso.ca as soon as it becomes aware of any changes to the project scope or project data used in this assessment. The IESO will determine whether these changes require a re-assessment.

2. The connection applicant must initiate and complete the IESO Market Registration process for the project in a timely manner to the IESO-controlled grid and prior to the commencement of any project related outages, in order to obtain IESO final approval.

   The connection applicant is required to provide "as-built" equipment data for the project during the IESO Market Registration process. If the submitted data differs materially from the data used in this assessment, then further analysis of the project will need to be done by the IESO.

3. As per Market Manual 2.10, the connection application will be required to provide a status report of its proposed project with respect to its progress upon request of the IESO. The project status report form can be found on the IESO Web site at http://www.ieso.ca/imoweb/pubs/caa/caa_f1399_StatusReport.doc . Failure to comply with project status requirements listed in Market Manual 2.10 will result in the project being withdrawn.

   The connection applicant will be required to also provide updates and notifications in order for the IESO to determine if the project as "committed" as per Market Manual 2.10. A committed project is a project that has demonstrated to the IESO a high probability of being placed into service.
   A project will be deemed by the IESO to be committed/not-committed if all/any of the following conditions are met/not met:

   - the connection applicant provides notification to the IESO specifying a defined and future-dated in-service date for the project, and;
   - the connection applicant provides notification to the IESO indicating that project is actively being completed (ie. not declared to be "on hold"), and;

   In the event the connection applicant is also the transmitter, this notification will be deemed as provided when the transmitter identifies the project in its Plans for New or Modified Facilities Information Submittal Form for 18-Month Outlook (IESO_FORM_1484), or Plans for Retired, New or Modified Facilities Information Submittal Form (IESO_FORM_1494) provided to the IESO as part of its submission for the IESO 18-Month Outlook and other reliability assessments.

# 1 Project Description & Data Verification

In response to an IESO directive, Hydro One Networks Inc. (the "connection applicant") proposes to upgrade the following sections on the 115 kV circuit H9K by the replacing the existing conductors with new conductors (the "project"):

(1) The 0.3 km section between Gemini Smooth Rock Junction to H9K STR 127 A Junction; and

(2) The 32 km section between Spruce Falls Power & Paper Co. Junction to Carmichael Falls Junction

The re-conductored sections will result in an increase in thermal capability of these sections. A diagram of showing H9K and the sections to be re-conductored are shown in **Figure 2.**

The proposed in-service date of the project is in Q2, 2019.

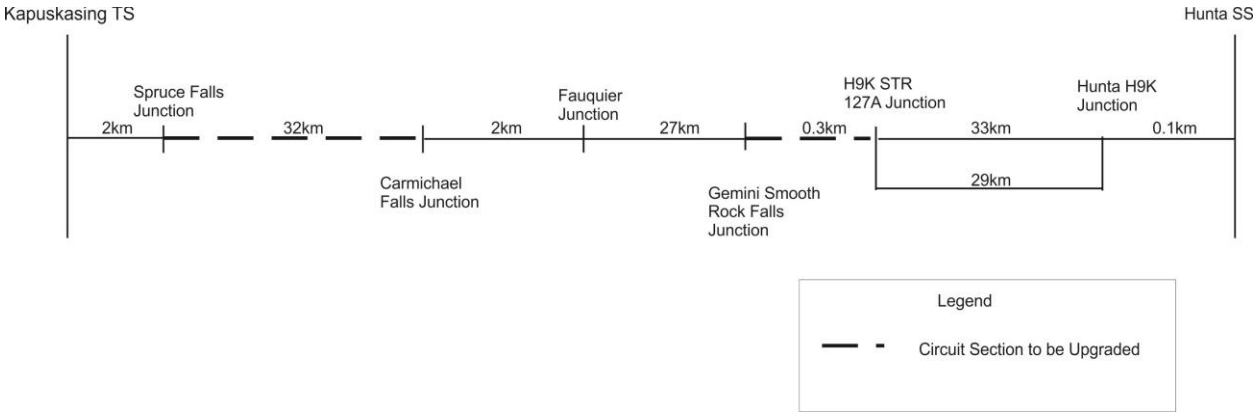



**Figure 1: Sections to be upgraded on H9K**

## 1.1 Circuit Section Specifications

The existing and new specifications of the affected circuit sections are shown in **Table 1**.

**Table 1 – Specifications of Upgrade H9K Circuit Sections**

| Specifications | Existing | New |
|---|---|---|
| H9K circuit section – Gemini Smooth Rock Junction to H9K STR 127 A Junction | | |
| Summer Continuous Rating | 370 A | at least 410 A |
| Summer Long Term Emergency (LTE) Rating | 470 A | Not provided |
| Summer Short Term Emergency (STE) Rating | 530 A | |
| Winter Continuous Rating | 430 A | |
| Winter Long Term Emergency (LTE) Rating | 510 A | |
| Winter Short Term Emergency (STE) Rating | 570 A | |
| R (Resistance in per unit[1]) | 0.000807 pu | 0.000409 pu |
| X (Reactance in per unit[1]) | 0.001179 pu | 0.001025 pu |
| B (Branch Charging Susceptance in per unit[1] ) | 0.000148 pu | 0.000145 pu |
| Conductor Type | 211.6 ACSR 6/1 | 336.4 ACSR 26/7 |
| H9K circuit section – Spruce Falls Power & Paper Co. Junction to Carmichael Falls Junction | | |
| Summer Continuous Rating | 290 A | at least 370 A |
| Summer Long Term Emergency (LTE) Rating | 290 A | Not provided |
| Summer Short Term Emergency (STE) Rating | 290 A | |
| Winter Continuous Rating | 370 A | |
| Winter Long Term Emergency (LTE) Rating | 370 A | |
| Winter Short Term Emergency (STE) Rating | 370 A | |
| R (Resistance in per unit[1]) | 0.084797 pu | 0.043668 pu |
| X (Reactance in per unit[1]) | 0.124285 pu | 0.109355 pu |
| B (Branch Charging Susceptance in per unit[1] ) | 0.015623 pu | 0.015483 pu |
| Conductor Type | Combination of 211.6 ACSR 6/1 and 336.4 ACSR 26/7 | 336.4 ACSR 26/7 |

Note: (1) Sbase= 100 MVA, Vbase=118.05 kV

# 2 Assessment

**(i) H9K circuit section – Gemini Smooth Rock Junction to H9K STR 127 A Junction**

The information provided by the connection applicant indicates that this re-conductored section will result in an increased continuous rating of 410 A. This is an improvement from the existing continuous rating of 370 A. Although summer long term emergency (LTE), summer short term emergency (STE), winter continuous, winter LTE and winter STE ratings were not provided, based on the increase in summer continuous rating, it can be assumed that these ratings will also be higher than the existing ones.

A comparison of the new impedances against the existing impedances of this section indicates that there is no material change in the values.

**(ii) H9K circuit section – Spruce Falls Power & Paper Co. Junction to Carmichael Falls Junction**

The information provided by the connection applicant indicates that this re-conductored section will result in an increased continuous rating of 370 A, which will meet the IESO directive minimum requirement of 310 A. This is an improvement from the existing continuous rating of 290 A. Although summer LTE, summer STE, winter continuous, winter LTE and winter STE ratings were not provided,

based on the increased in summer continuous rating, it can be assumed that these ratings will also be higher than the existing ones.

A comparison of the new impedances against the existing impedances of this section indicates that there is no material change in the values.

# 3 Conclusion

The project is expected to have no material adverse impact on the reliability of the integrated power system provided that all requirements in this report are met.

**--End of Document--**

# Customer Impact Assessment

Please refer to **Attachment 1** for the Final Customer Impact Assessment ("**CIA**") prepared by Hydro One. The attached CIA includes reference to upgrading 0.3km of H9K circuit between Gemini SRF JCT x H9K127A JCT in addition to the 32km section which is the subject of this application.

After further review, Hydro One will only be pursuing the 32 km line section as the 0.3km work is no longer required. There is no resulting customer impact with this change.

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

# CUSTOMER IMPACT ASSESSMENT

# Kapuskasing Area Reinforcement – H9K Upgrade

Revision: **0**
Date: **October 16, 2017**

Issued by: **Transmission Planning Department**
**System Development Division**
**Hydro One Networks Inc.**

Prepared by:

Kirpal Bahra
Network Management Engineer
Transmission System Development
Hydro One Networks Inc.

Approved by:

Ibrahim El Nahas
Transmission Plans Manager - North
Transmission System Development
Hydro One Networks Inc.

## Disclaimer

This Customer Impact Assessment was prepared based on customer information available about the connection of the proposed project. It is intended to highlight significant impacts, if any, to affected transmission customers early in the project development process and thus allow an opportunity for these parties to bring forward any concerns that they may have including those needed for the review of the connection and for any possible application for leave to construct. Subsequent changes to the required modifications or the implementation plan may affect the impacts of the proposed connection identified in this Customer Impact Assessment. The results of this Customer Impact Assessment and the estimate of the outage requirements are also subject to change to accommodate the requirements of the IESO and other regulatory or municipal authority requirements.

Hydro One Networks shall not be liable to any third party which uses the results of the Customer Impact Assessment under any circumstances whatsoever, for any indirect or consequential damages, loss of profit or revenues, business interruption losses, loss of contract or loss of goodwill, special damages, punitive or exemplary damages, whether any of the said liability, loss or damages, arises in contract, tort or otherwise.

## 1.0 Project Description

The Hydro One 115kV H9K circuit is a transmission line in northeast Ontario providing electrical connection between the areas of Kapuskasing and Hunta. The IESO has identified that increased power transfer limits across H9K will be required to supply Kapuskasing area loads during times of high hydroelectric generation and the inability to rely on local area generation for reactive voltage control. To fulfill the increased power transfer requirement, Hydro One will be thermally upgrading two sections of the H9K circuit as seen in figure 1 below.
A System Impact Assessment (SIA) has been completed and results can be found with the IESO referencing SIA # 2016-EX866

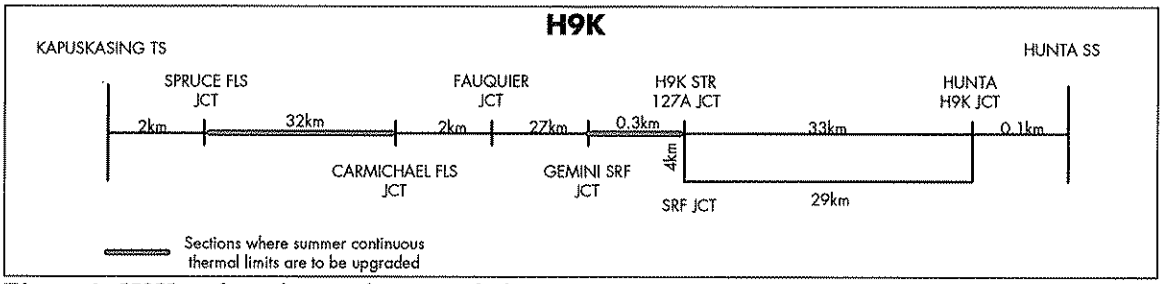


Figure 1- H9K and sections to be upgraded

## 2.0 Voltage & Short Circuit

Upgrading the two sections of conductor (Spruce Fls JCT x Carmichael Fls JCT) and (Gemini SRF JCT x H9K STR 127A JCT) does not impact voltage limits seen by area customers.

Upgrading the two sections of conductor (Spruce Fls JCT x Carmichael Fls JCT) and (Gemini SRF JCT x H9K STR 127A JCT) does not impact short circuit values seen by area customers

## 2.0 Reliability Impact

The conductor upgrade on the H9K sections listed above will not have impact on area customer supply reliability.

## 3.0 Outage Requirements

Hydro One will utilize the existing MSO (Mid-Span Openers) along the line to help isolate sections of the circuit during construction. This will allow area customers to be supplied radially from either Kapuskasing TS or Hunta TS during the construction schedule. As needed, Hydro One will coordinate all work and notify area customers during the execution of the project to ensure minimal power supply interruption. The proposed line construction will begin October 2018 with an expected In-Service of October 2019

## 4.0 Conclusions and Recommendations

The H9K upgrade on the sections (Spruce Fls JCT x Carmichael Fls JCT) and (Gemini SRF JCT x H9K STR 127A JCT) will not have any impact to area customers.