EB-2016-0160

Hydro One Networks Inc. Transmission

Application for electricity transmission revenue requirement and related changes to the Uniform Transmission Rates beginning January 1, 2017 and January 1, 2018

BOMA's COMPENDIUM

December 8, 2016

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Consumers Council of Canada (CCC) INTERROGATORY #025

Reference:

C2/T2/S1/pp. 1-2

Interrogatory:

Please recast the Schedule – Comparison of OM&A Expense by Major Category to include forecasts amounts.

Response:

Please refer to the following table.

Witness: Glenn Scott

Filed: 2016-08-31
EB-2016-0160
Exhibit I
Tab 13
Schedule 25
Page 2 of 4

Transmission OM&A ($millions)	Actual 2012	Approved 2012	Actual 2013	Approved 2013	Actual 2014	Approved 2014	Actual 2015	Approved 2015	Bridge 2016	Approved 2016
Sustaining OM&A										
Transmission Stations										
Land Assessment and Remediation	1.9	1.1	3.1	2.4	3.1	3.3	3.6	3.1	3.0	2.9
Environment Management	11.3	15.4	11.9	13.2	10.7	15.3	9.8	14.9	10.4	16.0
Power Equipment	55.7	66.6	60.2	61.2	61.4	63.2	64.5	60.7	54.3	59.7
Ancillary System Maintenance	10.1	16.5	10.1	11.6	10.0	12.0	9.2	10.0	10.8	10.0
Protection, Control, Monitoring, Metering and Telecommunications	44.9	45.8	49.4	50.9	52.1	52.2	63.9	51.7	61.2	53.7
Site Infrastructure Maintenance	22.7	25.8	25.2	28.8	24.5	30.6	24.0	28.5	25.1	29.3
Total Transmission Stations OM&A	**146.5**	**171.2**	**159.9**	**168.0**	**161.9**	**176.7**	**175.0**	**169.0**	**164.8**	**171.6**
Transmission Lines										
Rights of Way	27.1	28.0	31.1	29.1	35.5	29.5	32.6	32.8	35.8	33.2
Overhead Lines	17.9	22.7	15.7	21.2	17.6	22.9	15.9	20.3	18.0	20.7
Underground Cables	3.6	3.9	3.6	4.8	4.0	4.9	4.1	4.8	5.0	4.9
Total Transmission Lines OM&A	**48.6**	**54.6**	**50.4**	**55.1**	**57.1**	**57.4**	**52.6**	**57.8**	**58.8**	**58.8**
Engineering & Environmental Support	9.5	11.7	10.7	12.6	9.6	12.5	6.0	11.9	4.0	10.8
Total Sustaining OM&A	**204.7**	**237.5**	**221.0**	**235.7**	**228.6**	**246.5**	**233.6**	**238.7**	**227.5**	**241.1**

Witness: Glenn Scott

Transmission OM&A ($millions)	Actual 2012	Approved 2012	Actual 2013	Approved 2013	Actual 2014	Approved 2014	Actual 2015	Approved 2015	Bridge 2016	Approved 2016
Technical	2.5	14.8	3.1	6.3	3.3	7.7	2.8	5.6	3.0	6.0
Research Development and Demonstration	-	-	-	-	-	-	-	-	2.1	-
Customer Power Quality	-	-	-	-	-	-	-	-	0.2	-
Technology Studies	3.5	-	3.2	3.6	2.8	3.6	3.0	3.7	-	3.8
Smart Grid	2.4	4.0	2.2	3.3	1.4	3.3	0.3	3.6	-	3.6
Total Development OM&A	**8.4**	**18.8**	**8.6**	**13.2**	**7.5**	**14.7**	**6.1**	**12.9**	**5.3**	**13.4**
Operations OM&A										
Operations Contracts	21.4	25.6	21.3	24.4	20.9	25.1	22.4	22.9	22.9	23.1
Environmental, Health and Safety	1.3	3.4	1.5	2.4	1.1	2.3	1.1	2.4	1.6	2.6
Operators	32.1	33.3	33.9	31.0	34.6	30.6	35.5	33.1	35.5	33.4
Total Operations OM&A	**54.8**	**62.4**	**56.7**	**57.7**	**56.6**	**58.0**	**59.0**	**58.5**	**60.0**	**59.1**
Customer Service OM&A	**4.4**	**6.7**	**5.3**	**4.9**	**5.4**	**4.7**	**5.1**	**5.5**	**4.1**	**5.5**
OM&A Common Corporate Costs and Other Costs										
Asset Management	32.3	39.1	31.8	35.2	32.6	34.1	31.0	37.2	36.6	35.7
Common Corporate Functions & Services	80.5	83.9	87.7	85.0	93.1	85.6	95.7	96.9	98.9	96.4
Information Technology (including Cornerstone)	60.7	48.7	61.1	61.2	55.2	60.3	55.1	63.5	61.4	63.5
Cost of Sales	11.4	8.5	13.9	10.7	11.1	10.6	8.8	6.7	5.0	6.8
Other	(104.2)	(150.7)	(118.6)	(129.8)	(154.8)	-131.6	(116.8)	(134.0)	(129.6)	(131.1)
Total OM&A Common Corporate Costs and Other Costs	**80.7**	**29.4**	**75.8**	**62.3**	**37.2**	**59.0**	**73.9**	**70.2**	**72.3**	**71.3**

Witness: Glenn Scott

Transmission OM&A ($millions)	Actual 2012	Approved 2012	Actual 2013	Approved 2013	Actual 2014	Approved 2014	Actual 2015	Approved 2015	Bridge 2016	Approved 2016
Property Taxes & Rights Payments	**62.1**	**72.2**	**21.2**	**66.0**	**64.1**	**66.8**	**63.9**	**66.3**	**62.9**	**67.0**
Less settlement/decision reduction								(20.0)		(20.0)
Exclusion of B2M								(0.9)		(0.7)
Total Transmission OM&A	**415.1**	**427.2**	**388.4**	**440.0**	**399.5**	**449.8**	**441.6**	**431.2**	**432.1**	**436.8**

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6. PERFORMANCE AND REPORTING

Hydro One's new executive leadership and Board of Directors are committed to building a stronger performance management culture and are focused on achieving excellence in execution in all aspects of the company's work. The ability to measure and track performance is essential to this vision.

Two critical elements of the journey towards stronger performance culture are: (i) the development of a scorecard; and (ii) the selection of key performance indicators that measure the drivers of the company's performance and track productivity improvements.

Exhibit B2, Tab 1, Schedule 1 discusses the cost efficiencies, productivity improvements and key performance indicators ("KPIs") that Hydro One is implementing to ensure that its business objectives are aligned with the principles of the RRFE.

In Exhibit B2, Tab 1, Schedule 1, Hydro One has provided a performance scorecard that will track its performance in areas directly tied to its own business objectives, which are aligned with those of the RRFE. The metrics contained in the scorecard will provide the Board and stakeholders visibility into how the company performs in a variety of areas, including cost control. The proposed scorecard is replicated in Table 8.

Table 8: Proposed Transmission Scorecard

RRFE Principle	Category	Metric	*Definition*
Customer Focus	**Service Quality**	Satisfaction with Outage Planning Procedures	*% satisfied in OGCC survey*
		Customer Delivery Point Performance Standards Outliers (as % of total delivery points)	*% of total delivery points designated as outliers*
	Customer Satisfaction	Overall % satisfied in corporate survey	*Transmission customers (Industrial, Generators, LDC) only*
Operational Effectiveness	**Safety**	# of recordable incidents per 200,000 hours	*Average # of incidents per 200K hours*
	System Reliability	Average. # of sustained interruptions per delivery point	*T-SAIFI-S*
		Average # of momentary interruptions per delivery point	*T-SAIFI-M*
		Average minutes that power to a delivery point is interrupted	*T-SAIDI*
		System unavailability (%)	*% of system not available for use*
		Unsupplied energy (minutes)	*Unsupplied MW-minutes/Peak MW*
	Asset Management	In-service additions as % of OEB-approved plan	*$ ISA as percentage of Planned $ Amounts*
		Capital expenditures as % of Budget	*$ Capital expenditures as % of Budgeted $ Capital expenditures*
	Cost Control	Total OM&A and Capital expenditures/Gross fixed asset value	*OM&A and Capital expenditures/ Gross fixed assets*
		Sustainment capital /Gross fixed asset value	*Sustainment Capital expenditures/ Gross fixed assets*
		OM&A/Gross fixed asset value	*OM&A/ Gross fixed assets*
Policy Response	**Renewables**	% of new connection impact assessments completed on time	*Total assessments completed within expected time/Total connections requested*

Financial Performance	**Regulatory Compliance**	NERC & NPCC Standards Compliance – High impact issues	*# of high impact compliance violations as defined by NERC/NPCC*
		NERC & NPCC Standards Compliance – Medium/low impact issues	*# of medium/low impact compliance violations as defined by NERC/NPCC*
	Regional Infrastructure	Regional Infrastructure Planning progress - % Deliverables met	*Total deliverables met/Total deliverables expected*
	Leverage	Debt to Equity Ratio	*Debt (including Short &Long Term)/ Equity*
	Liquidity	Current Ratio (Current Assets/Current Liabilities)	*Current Assets/Current Liabilities*
	Profitability	Return on Equity (deemed)	*Included in rates*
		Return on Equity (achieved)	*Actual return on equity*

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Exhibit B1, Tab 1, Schedule 3 provides Hydro One's performance data relating to three of its business objectives: safety, customer satisfaction and reliability.

7. OPERATIONS, MAINTENANCE AND ADMINISTRATION (OM&A) EXPENSE

A summary of forecast operations, maintenance and administration ("OM&A") expenses for the test years are provided at Exhibit C1, Tab 2, Schedule 1. Forecast OM&A expenses are expected to demonstrate a declining trend in the 2016 bridge year and in the 2017 and 2018 test years, despite upwards pressure from inflation of approximately 2% per year, a growing asset base, and increasing compliance costs arising from new regulatory standards, such as the North American Electric Reliability Corporation's ("NERC") Critical Infrastructure Protection ("CIP") Cyber Security reliability standards. Table 9 provides a summary of forecast OM&A expenditures.

Table 9: Summary of Transmission OM&A Budget ($ Millions)

Description	Historic				Bridge	Test	
	2012	2013	2014	2015	2016	2017	2018
Sustaining	204.7	221.0	228.6	233.6	227.5	241.2	238.5
Development	8.5	8.6	7.5	6.1	5.3	4.8	5.0
Operations	54.8	56.7	56.6	59.0	60.0	61.3	62.1
Customer Care	4.4	5.3	5.4	5.1	4.1	4.0	3.9
Common Corporate and Other OM&A	80.7	75.8	37.2	73.9	72.3	49.9	47.5
Taxes Other Than Income Taxes	62.1	21.2	64.1	63.9	62.9	63.6	64.3
Pension Adjustment*	-	-	-	-	-	-11.0	-8.0
B2M LP Adjustment*	-	-	-	-	-	-0.8	-2.1
Total	**415.2**	**388.4**	**399.5**	**441.6**	**432.1**	**413.1**	**411.2**

*See Exhibit C1, Tab 2, Schedule 1 for further details.

Total OM&A expenditures for test year 2017 are forecast to be $413.1 million, which is a decrease of $19 million or 4.4% from the 2016 bridge year. Total OM&A expenditures for test year 2018 are forecast to further decrease by $1.9 million or 0.4% versus 2017.

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CAPITAL WORK EXECUTION STRATEGY

1. INTRODUCTION

Every year, Hydro One aims to complete its annual work program - a series of multi-year projects and programs for which expenditures will be occurred in that calendar year. Hydro One's annual work program is subject to the relevant year's OEB-approved amounts for both net capital expenditures and in-service additions. Hydro One's Transmission Capital Work Execution Strategy has been able to demonstrate that it can accomplish a very large work program, while maintaining the needed flexibility to accommodate any required adjustments in that capital work plan due to project challenges (e.g. outage constraint, external approvals, material delivery, site conditions), customer needs, changing priorities and emergent investments. A focus on the company's business objectives including safety, quality, efficiency, and meeting customer commitments strongly influences Hydro One's work planning and execution activities.

Hydro One successfully completed its largest-ever capital work program in 2015 and is on track to complete a similar-sized work program in 2016 as a result of recently implemented improvement initiatives. Fully executing the work program is essential in continuing to meet the transmission performance expectation of customers. The new bundling approach to work has optimized planned outages, addressing a key concern for transmission customers according to Hydro One surveys. Safety performance is steadily improving, resulting in the lowest level of recordable incidents in over ten years. Additional metrics to track the performance of the capital work program can be found in the proposed transmission scorecard and the Cost Efficiencies, Productivity and Key Performance Indicators exhibit, Exhibit B2, Tab 1, Schedule 1.

Witness: Brad Bowness

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2. ABILITY TO EXECUTE

Hydro One has worked to ensure that the timing of its capital investments and in-service additions matches the timelines proposed in the EB-2014-0140 proceeding, while being flexible enough to respond to changing priorities and emerging needs.

Building on the current momentum, additional initiatives will be implemented during the 2016-2018 period to ensure that the increased capital work program is accomplished in a cost-effective and reliable manner, with reduced variability at the investment level, and in-line with regulatory expectations. The initiatives identified in this document are the culmination of an end-to-end review of the capital work processes, and impact the two main areas of the capital work program lifecycle: project definition and project execution. For the OEB approved and actual total amounts of in service additions for historical years (2014 and 2015), as well as forecast additions in bridge year (2016) and test years (2017 and 2018), please see table 1 in Exhibit D1, Tab 1, Schedule 2.

3. COST DRIVERS OF THE CAPITAL WORK PROGRAM

The cost of the Capital Work Program is comprised of: i) material; ii) construction labour, fleet and equipment; iii) contracts; iv) engineering and project management; v) commissioning and vi) interest and overhead. Hydro One is continually looking for cost efficiencies and productivity improvements to offset the increasing costs of these six drivers.

3.1 Materials

Materials represent approximately 30% of total capital work program costs. Hydro One manages its procurement and supply base by using strategic sourcing in the acquisition of

goods and services. Strategic sourcing is a disciplined business process for purchasing goods and services on a company-wide basis using cross-functional teams to manage the supply base. The methodology's five-step process includes spending analysis, market analysis and development of a sourcing strategy, negotiation, award, and contract/services management. Efficient and effective sourcing of materials also includes Demand Planning in collaboration with Operations. For Supply Chain initiatives and value realization, see exhibits; Exhibit C1, Tab 5, Schedule 1 and Exhibit B2, Tab 1, Schedule 1 respectively.

3.2 Construction Labour, Fleet and Equipment

Construction labour, fleet and equipment costs represent approximately 20% of total capital work program costs. The field construction groups lead a diverse workforce of construction building trades to safely and cost effectively sustain and develop the transmission system. With a service territory that covers the province and over 200 in-flight projects to oversee, there are many challenges to successfully deliver top quality products. All construction labour (casual trades) is unionized in the province and therefore the same unionized labour rates apply whether the work is managed internally or externally. Hydro One engages staff through the hiring hall to meet work demands across the province, and the workforce works for ten hours, four days a week to save on travel costs associated with the expansive service territory and also reduce 'windshield' (travel) and down time.

3.3 Contracts

Contracted Services represent approximately 15% of total capital work program costs. The Contracted Services category includes contracts for a wide variety of external services that help deliver the transmission capital work program including: third party

EPC (Engineer, Procure & Construct) agreements for select projects, specialty construction skills that are not retained within Hydro One (i.e. tunnelling, high voltage cable installation, etc.), and specialty equipment rentals with operators (e.g. cranes, day lighting / vacuum trucks, etc.). Services are competitively procured on either a project-by-project basis (e.g. for EPC projects), or using a master service agreement structure for others. Ongoing continuous improvement in this area is focused on refining the contract management processes and utilization of commercial levers to optimize spend.

3.4 Engineering and Project Management

Engineering and Project Management represents approximately 15% of total capital work program costs. The Engineering function provides key inputs into project definition and produces the standards, designs, and equipment specifications to support procurement and construction activities for Sustaining and Development investments. Deliverables are produced using a mix of internal and external resources, with an increasing volume of external work. Key efficiency and productivity focus areas have been process and organizational enhancements to improve on-time delivery, establishment of quality assurance systems, and restructuring of third party contracts to improve cost effectiveness and overall value.

The Project Management function provides end to end coordination and governance to ensure that projects are delivered according to project plan, including scope, cost, and schedule. This cost category is comprised of internal Hydro One resources generally covering project management, estimating, construction and quality assurance. Throughout early 2016, Hydro One has been working with a strategic partner to support the continuous improvement of project management tools and processes.

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3.5 Commissioning

Commissioning represents approximately 5% of the total capital work program costs. Commissioning is the process of assuring that all systems and components are designed, installed, tested, operated, and maintained according to the operational requirements. The commissioning team validates the functionality through formal site acceptance testing.

3.6 Interest and Overhead

Interest and Overhead represent approximately 15% of total capital work program costs. Hydro One's interest capitalization rate is based on the embedded cost of debt that is used to finance its capital expenditures. This is consistent with Hydro One's adoption of United States Generally Accepted Accounting Principles ("US GAAP") per the Board's decision in EB-2011-0268 and US GAAP requirements for the determination of interest capitalized. The rates used in calculating capitalized interest for the bridge and test years represent the effective rate of Hydro One Transmission's forecasted average debt portfolio during the year.

Hydro One capitalizes costs that are directly attributable to capital projects as well as overheads expended to support capital projects. The overhead capitalization rate is a calculated percentage representing the amount of overhead costs that are required to support capital projects in a given year. At year-end, capitalized overheads are trued-up to reflect actual results.

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4. CAPITAL PROJECT PROCESS OVERVIEW

The Capital Project process is comprised of two key stages, Project Definition and Project Execution, with a governance structure overseeing the entire process.

4.1 Project Definition

Objectives of the Project Definition phase are to identify project needs, develop project scope as discussed in Investment Planning Process (see Exhibit B1, Tab 2, Schedule 1); as well as produce a conceptual and detailed design, estimate the costs of the project, and produce a preliminary project plan. It involves the asset management, engineering and estimating functions of Hydro One. This stage includes input from many key stakeholders including customers, Hydro One's real estate, project management, construction services, operating, and station maintenance workgroups, and external agencies.

4.2 Project Execution

Project Execution encompasses several workgroups within the Engineering and Construction Services organization working in concert with other lines of business and ancillary teams to deliver the transmission capital work program. The four stages of Project Execution are described in sections 4.2.1 to 4.2.4. Overall project oversight, coordination, and control are provided by the Project Delivery and Work Program Management groups by a team of experienced project managers and support staff to ensure that projects are executed within the defined scope, budget, and planned timelines.

4.2.1 Detailed Engineering and Procurement

Once an investment is approved in accordance with the Executive Authority Registry, it proceeds to the detailed production engineering phase. The output of this stage involves the development of detailed design packages, environmental approvals, and major equipment procurement. Upon substantial completion of production engineering and the procurement of major materials and services, the expectation is that most of the potential variability is removed from the project, and as such there is a reasonable expectation that key elements such as cost to compete, planned accomplishments, schedule completion dates and other major execution milestones will be met, barring extraordinary circumstances.

4.2.2 Construction

The goal during the construction phase is to build the required technical standards and detailed engineering specification in a manner that is safe, cost effective, high quality and in compliance with regulatory and environmental requirements. Detailed job planning and daily tailboards are emphasized as key communication elements at every stage of the process, from site preparation and civil / electrical work to major equipment installation and site remediation activities.

4.2.3 Commissioning

Following a formal hand-off at the end of the construction stage, formal testing and commissioning commences, to provide quality assurance and assess readiness for transfer of control to Ontario Grid Control Centre. This critical step is performed by the Stations and Operating division, which has overall accountability for operating the power system and for the safe and efficient execution of all assigned work related to the operation and maintenance of the transmission and distribution systems.

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4.2.4 Project Closure Process

Starting in 2015, capital projects with a budget of $5 million or greater are subject to a combined Project Close Out and Lessons Learned site meeting to ensure that the project objectives have been met. The project closure process engages key participants throughout the capital work program life cycle to ensure knowledge transfer for future projects and to establish a culture of continuous improvement.

4.3 Governance

A robust cross-functional governance structure is in place and consists of internal Engineering and Construction Services resources as well as parties within the Finance, Asset Management and Executive functions. Investments are monitored and scrutinized at multiple levels to ensure that material changes to scope, cost or schedule are identified, properly approved, and mined for lessons-learned to prevent re-occurrence. A combination of standard reporting requirements, key performance indicators, change management approval processes, and monthly review of the capital work program both at the project and portfolio level provides assurance that projects are being well managed.

5. PRODUCTIVITY AND EFFICIENCY IMPROVEMENTS, PROJECT DEFINITION

A number of continuous improvement initiatives have been undertaken to increase effectiveness and efficiency of the capital work program delivery, and are outlined in the following sections.

5.1 Integrated Planning

Hydro One changed its approach to planning, monitoring and executing its sustainment capital work program beginning in 2014. At a high level, the integrated investment planning approach involves bundling work at an individual station or line segment level rather than the asset level. It has been implemented across the transmission sustainment capital portfolio, which has streamlined the end-to-end project lifecycle. The station-centric and line-centric approach has reduced the number of mobilization and demobilization activities, and optimized outages, maintenance requirements, and engineering and project management processes. For further details of sustainment capital portfolio refer to Exhibit B1, Tab 3, Schedule 2.

5.2 Enterprise Engagement during Investment Plan Development

Hydro One has made significant efforts to increase the participation of the executing lines of business in the planning process to ensure the investment plan is realistic and achievable in its entirety. The level of detail provided in planning has improved to include actual and future customer commitments, external approval requirements, and more detail on the assets being replaced. Executing lines of business are provided with more time to review the projects with the Planning organization to clarify assumptions. They are also able to identify interim milestones for project definition stages that will set the organization up for success as well as provide the ability to monitor these milestones and identify challenges earlier in the process. All of this information has assisted the executing lines of business in planning their work execution strategy and expanding their planning horizon.

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5.3 Stronger Stage Gate Process

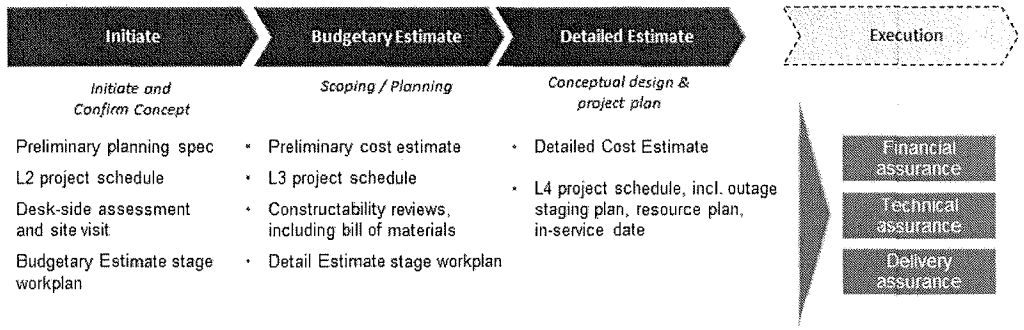

Figure 1: Stage Gate Process

Hydro One has taken steps to increase the level of accuracy of its estimates prior to project approval. The majority of capital investments follow a two-stage estimating process which is intended to give an increasing assurance of scope, schedule and cost, resulting in an increasingly accurate project plan and cost prior to approval.

In order to achieve a greater degree of accuracy in its estimates, Hydro One has focused on improvements to upfront project definition process and deliverables to minimize the implementation risks and increase estimating accuracy. This approach generally advances several project activities earlier in the investment lifecycle to support a more defined project plan and estimate. Such activities include additional engineering to minimize technical assumptions made during the estimating phase, greater consideration to procurement needs for major equipment, and additional consideration to project staging & outage requirements. New process steps ensure that internal stakeholders are engaged upfront to provide timely input to enable successful outcomes (i.e., input and design reviews for constructability, operability, maintainability, consideration to safety improvements, and minimizing environmental impacts).

Hydro One has placed a renewed emphasis on deliverable completeness and quality across all estimating stage gates, and has implemented a multi-disciplinary estimate review committee at the director level to scrutinize assumptions, share knowledge, and reach alignment on the estimate and risks. These changes are intended to increase confidence in the project plan including scope, schedule and cost to increase technical and financial certainty and reduce variability within individual projects and the broader Transmission Capital portfolio.

5.4 Estimating

Hydro One has been working to improve the estimating process and methodologies with significant changes implemented in 2015. The company has adopted the practice of setting an annual escalation rate of 2.3% for 2017 and 2.5% for 2018 and a maximum contingency rate of 10% of a project's estimate, respectively. These thresholds are in line with the industry norms, and are an improvement from prior practices where contingency could be as much as 20%. Hydro One has accomplished this by modifying the estimating process to complete a greater portion of conceptual engineering upfront, thereby minimizing the uncertainty inherent in the estimating process.

In consultation with an industry leading project management partner, Hydro One has approved an initiative to further improve the estimating processes and methodologies, which includes a new estimating tool that will be operational in late 2016. This initiative will increase the quality of estimates at each stage in the investment life cycle through new internal trending and analysis capabilities. Hydro One is also investigating a new process to monetize project risk so that the contingency can be more accurately defined and released as the project progresses and risks either materialize or are mitigated.

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5.5 Engineering

A key dependency of successfully delivering the transmission capital work program in its entirety is the timely completion of quality engineering work as a predecessor to procurement and construction activities. Hydro One has made a number of process and organizational improvements resulting in increased engineering output and these improvements have contributed to the continued trend to successfully accomplish an increasing transmission capital work program. Substantial work has been done to standardize engineering processes and design packages, resulting in improved on-time delivery rates and overall cost effectiveness. Improved organizational alignment of different engineering functions has enabled more integrated solutions across project definition and project execution phases.

With the increasing Transmission capital work program, there continues to be an increasing need to utilize external engineering partners. The portion of the engineering portfolio completed externally has continued to grow over recent years, from roughly 14% in 2012 to roughly 25% in 2015. In addition to increased capacity through additional engineering resources, the external utilization has a cost efficiency element as fully burdened external labour rates are lower than fully burdened internal labour rates

Although there are cost savings associated with external engineering partners, Hydro One Engineering is essential in the development of the engineering standards, equipment designs and material designs that ensure safety, efficiency, quality and consistency to meet regulatory and compliance requirements (e.g. NERC, IESO, NPCC, CSA, etc.). Engineering's extensive knowledge of the Hydro One transmission system allows the group to diagnose system problems accurately and efficiently and provide support to other lines of business to quickly remedy emergency/break fix issues. Hydro One

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Engineering prepares the technical specifications that feed external Engineering, and acts as Owner's Engineer to ensure quality and compliance.

External engineering partners are participating in a robust quality management system to ensure that the resultant third party work meets the needs of Hydro One.

Through a combination of internal and external engineering resources, Hydro One is working to complete both an increasing volume of engineering work as well as advancing engineering deliverables earlier in the project lifecycle to create an intentional backlog of construction-ready projects. As a result of this improved overall readiness, there will be increased technical, financial, and strategic assurances.

5.6 Advanced Readiness

Hydro One has concentrated its effort on implementing continuous improvement initiatives in the front-end of the investment lifecycle, when there is a greater opportunity to influence a successful project outcome. The objective is to have a larger portion of the capital portfolio in a more mature state to minimize variability in project scope, cost, and schedule. Process improvement during the initial stages of an investment (e.g. engineering and estimating) enables improved readiness in the later stages (e.g. procurement and construction) where the majority of the capital expenditure occurs. The result is increased technical and financial assurance for individual projects and the entire capital program portfolio.

As discussed previously, projects follow a two-stage estimating process. The first stage is to develop the scope with the assistance of the Engineering team, and produce a high-level cost estimate, as well as technical details related to the scope of work. After this milestone is achieved, the scope is frozen and, the second stage of the estimating process

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commences. Prior to inclusion in a regulatory application, and to inform the OEB of planned net capital expenditures and in-service addition targets, all projects should have cleared the first stage gate. As shown in the graphs below, the company is moving towards, but has not yet fully reach this desired state.

As a result of the improved readiness of the capital work program, there is increased confidence in the overall capital expenditures and in-service additions. As of May 1, 2016, 89% of the 2017 and 67% of the 2018 test work program's gross capital expenditures have passed the Budgetary Estimate stage gate (see Figure 2). This is a significant improvement over past years and provides an increased level of technical and financial assurance that informs the transmission capital expenditures and in Hydro One's ability to accomplish the overall work program.

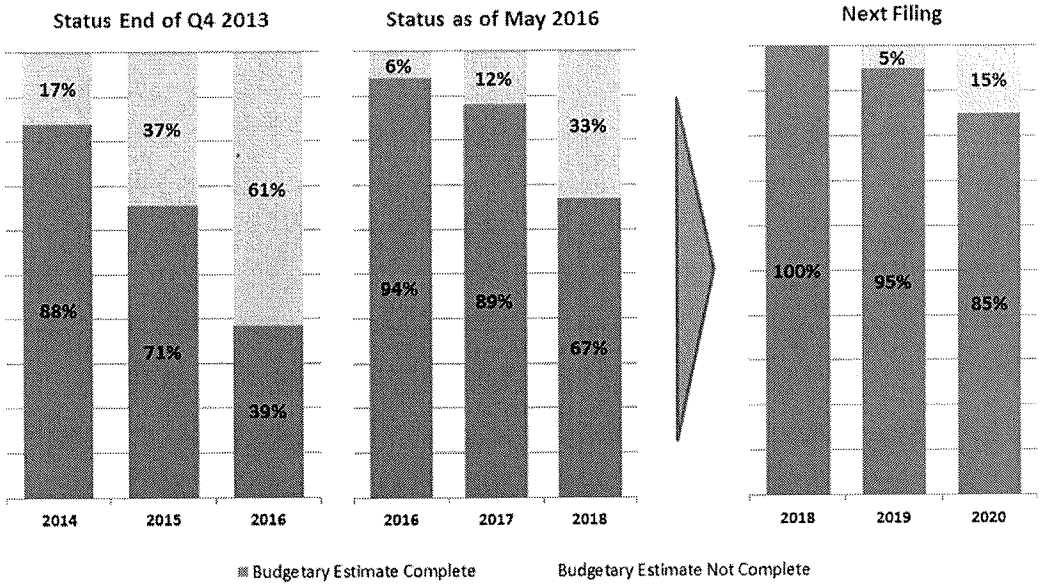

Figure 2: Current and Future State of Work Readiness

6. PRODUCTIVITY AND EFFICIENCY IMPROVEMENTS, PROJECT EXECUTION

A number of continuous improvement initiatives have been undertaken in this area and are outlined in the following sections.

6.1 Enhanced Delivery and Contract Models

The term "'delivery model" refers to the staffing model by which a project is executed and completed – e.g. entirely by internal staff, or in partnership with a third-party. Existing delivery models are being evaluated to determine how to achieve optimal business outcomes, including Hydro One's ability to accomplish work; the acceleration of projects into the execution phase; and flexibility in how work is implemented. Hydro One is also evaluating contract models used with third-party construction partners to determine if evolutions may result in increased cost efficiencies for rate payers (i.e. a mix of target price and fixed-price contract models.)

Hydro One believes that it has a highly flexible construction workforce that can meet the demands of a variety of work programs. Although the direct hire casual building trades workforce is scalable, there is a practical limit to its size defined by the volume of work that can be safely and efficiently planned and managed by internal staff. The work contracted out is completed using a combination of internal resources, engineering subcontracts, construction contracts or arrangements contracted on a fixed-price basis. Hydro One will continue supplementing internal resources with an external work force to execute the work program.

While maintaining and improving the current outsourcing strategy for greenfield station investments, the company will look to increase its outsourcing capacity to align with the

growing work program. While development and station sustainment work have been successfully achieved using existing delivery models, the majority of the transmission capital work program increases in the test years are for overhead lines component refurbishment and replacement projects. Hydro One will believes it can effectively and efficiently outsource this work in order to achieve the growing work program. In the fall of 2016 Hydro One will be tendering a request for proposal (RFP) to identify construction partners who are experts in line refurbishment to create a list of vendors of record to expedite the RFP process to outsource projects. This will allow Hydro One to determine best practices and align standard approaches.

External resources are not only used by the construction team, but by groups such as engineering as well. By leveraging an external complement for engineering work, Engineering can create a pipeline of construction-ready projects to ensure that the work program is full achieved, and in a timely fashion. This partnership with a few key firms has allowed Hydro One to increase its opportunity for strategic feedback and align on processes and standards and establish a robust quality assurance process for engineering deliverables.

6.2 Quality Assurance/Quality Control Approach

Hydro One is introducing an improved end-to-end quality assurance & quality control program to ensure that work that delivered using external and internal delivery models is of a sufficient quality standard to ensure reliable, compliant and cost effective design, construction and commissioning activities. The program improvements will occur in two stages starting with work that is delivered externally and then for work that is delivered internally. The first phase will enhance the already established quality assurance practices to monitor the quality of construction. Subsequent efforts will include a review

of current technology will also take place to identify opportunities for increased efficiency, accuracy and speed to capture and document the information.

6.3 Field Execution Efficiency

The benefits of introducing upstream efficiencies in the Project Definition Phase as well as the evolution of the company's delivery model strategy will result in tangible downstream improvements as field workforce productivity will benefit from improved project planning, engineered drawing timeliness, material delivery certainty and outage and staging plan optimisation. Although efficiency initiatives relating to downstream work practices are being considered, the current focus is on upstream processes, as these are foundational to support any significant changes in the field.

6.4 Project Closure Process and Lessons Learned

A formalized project closure process has been established with all key stakeholders, from the Project Definition and Execution, to ensure there is a feedback loop to enable continuous improvement. The closure process includes:

- Site inspection to confirm that the project has met all sponsor, customer and stakeholder requirements;
- Comparison of the project's estimated versus actual cost and a discussion of the differences;
- Verification that all deliverables have been met and accepted;
- Discussion of the significant changes in the project plan and the resulting impacts;
- Review of the contractor performance to the standard of the agreement (if applicable);
- Recommendations arising from the lessons learned during the project;

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- Documentation of the issues and reasoning for deviations and the associated corrective actions taken; and
- Documentation of all lessons learned using the Hydro One knowledge management system, assignment of actions, and follow through on completion and communication to all relevant parties.

7. PRODUCTIVITY AND EFFICIENCY IMPROVEMENTS, GOVERNANCE

A number of continuous improvement initiatives have been undertaken in this area and are outlined in the following sections.

7.1 Organization Re-Alignment

Several organizational re-alignments have occurred to improve lateral integration throughout the capital project process, providing increased visibility for the management team to identify potential efficiencies. For example, Engineering resources have been consolidated into a single division to contribute to the overall efficiency of the stage gate process, allowing the Company to build engineering teams comprised of all disciplines that take an investment from the conceptual stage through to the completion of production engineering.

Another change involves the reallocation of Project Management resources to provide optimal support for projects. Project Managers and Project Schedulers, for example, have been re-assigned to projects based on geographical zones rather than project magnitude and complexity. Aligning investments and staff geographically to form multi-disciplinary teams accountable for the success of a project promotes a better

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understanding of the complexities associated with geographic challenges such as construction resource deployment and outage planning.

7.2 Portfolio Management

7.2.1 Capital Budget

As recommended in the Transmission Total Cost Benchmarking Study, Hydro One is working to formalise a rolling two-year capital budget and project portfolio with a reporting framework that includes parameters, authorizations and associated key performance indicators to promote continuous improvement. This will provide the flexibility needed to reschedule projects within a two-year rolling window and will ensure Hydro One is set up to achieve planned annual investments and meet future commitments.

7.2.2 Project Controls

An improvement initiative is underway to enhance the tool suite and processes for the Project Controls office to improve risk management, estimating, scheduling, project change management and reporting capabilities. The benefit will be improved accuracy in project forecasts and will further facilitate earned value reporting. The project controls initiative will include implementation of improved processes to strengthen rules and governance, the streamlining of the work breakdown structure, improving database maintenance, and encourage greater alignment with outage planning. It will also include a review of the organizational structure and effectiveness to ensure it is providing the level of support to project management.

Hydro One has selected a work program management partner to support the transition to these new improved tools and processes, assist in building the future state skill set, and help to manage any additional work program volume.

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7.2.3 Improved In-Service additions Forecasting

A better connection has been established between capital expenditures and in-service additions across the project delivery organizations, allowing Hydro One project managers to forecast in-service additions more accurately. The Company is now also forecasting multi-year in-service additions, and has increased the practice of reporting partial in-servicing to optimize portfolio management resulting in minimized interest costs for assets under construction. Alignment of Project Delivery Managers with Area Construction Managers to perform monthly portfolio reviews of forecasted in-service additions has brought more rigor and control to the forecasting approach. On a quarterly basis the forecasting window expands to a multi-year window of gross cost and in-service additions.

7.2.4 Contingency

Hydro One is developing the tools necessary to analyze and manage contingency dollars at a portfolio level. Senior management discretion will determine the size of the contingency pool available to line managers and the establishment of a management reserve to enable strategic decision making. A more rigorous analysis of investment risks in the planning and scoping stages will ensure that an appropriate level of risk dollars is assigned for each capital project during the project definition phase. A consistent model will be established to forecast the use of contingency funds tied to specific risk of occurrence and a new change management system that requires higher level of approval and justification for the draw-down of contingency dollars. The release of a contingency fund at a project level will enable the availability of funding to develop other projects and aid in using the Capital investment budget to the fullest extent in a cost effective manner.

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8. SAFETY INITIATIVES

The Operations team continually launches safety-related improvement initiatives. Continuous improvement in this area reflects the value the corporate culture places on safety. As shown in Figure 3, these initiatives have resulted in a steady decrease to the recordable injury frequency per construction hours worked at the same time that the overall work program has grown substantially. Also of positive note is that the general severity of incidents has consistently decreased over recent years, with reductions in the most severe incidents classified as high maximum reasonable potential for harm (high MRPH).

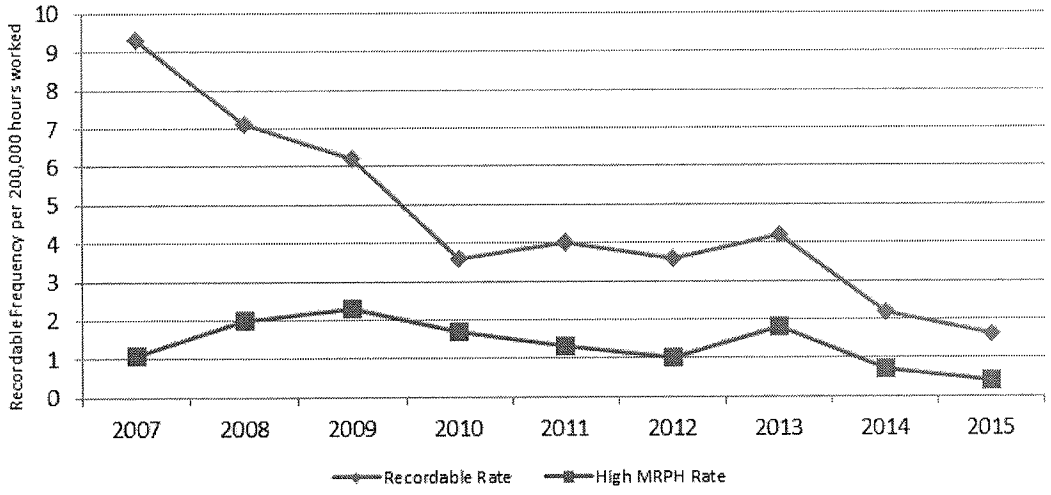

Figure 3: Recordable Injury Frequency per 200,000 Construction hours worked

In 2014 the company increased the complement of field business clerks to alleviate the amount of administrative work placed on the supervisors in the field. This initiative allows supervisors to provide greater oversight to their employees to ensure work is being conducted in a safe manner. A time study conducted in the summer of 2015 demonstrated that field supervisors are now spending 70% of their time on field

supervision, up from 50%. This has been a significant factor in the improved safety record.

In 2015, the number of safety roll-outs to the field crews was increased from one to two. The safety roll-outs allow senior management to reinforce the company's commitment to safety and ensure that corporate targets and goals are communicated consistently. A fall session was added to allow staff to refocus on safety, bond with their peers, share experiences and learn from each other.

Hydro One has made improvements to the job planning function with the overall goal of improving engagement at the working level. Frequent tailboard sessions at the start of the day and after breaks serve to refocus field staff on critical hazards and reinforce safe and effective work practices. The use of open-ended questions is encouraged to generate good discussion and to ensure that everyone is heard. Crews participate in warm-up/stretch session during the course of the day as needed to reduce the occurrence of musculoskeletal injuries. The Company is well on its way to achieving its goal of zero workplace injuries, and safety initiatives will continue to be added to ensure this target is reached.

9. SUMMARY

Hydro One's Transmission Capital Work Execution Strategy has been able to demonstrate that it can accomplish a very large work program, while maintaining the needed flexibility to accommodate any required adjustments in that capital work plan due to changing priorities, project challenges and emergent investments. The improvement initiatives discussed in this exhibit have been carefully selected to ensure that the company can accommodate an increasing work program in a cost-effective, safe and reliable manner. The transmission capital work execution strategy will result in greater

effectiveness throughout the stage-gate process and increased accuracy in forecasting work and timelines. A continued focus on the business objectives of the transmission system plan including safety, quality, efficiency, and meeting customer commitments will ensure Hydro One's success in accomplishing its capital work program.

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Building Owners and Managers Association (BOMA) INTERROGATORY #010

Reference:

Exhibit A, Tab 5, Schedule 2, Page 12

Interrogatory:

Please provide a copy of the annual risk assessment document.

Response:

Attached please see the 2015 annual risk assessment document.

Witness: Michael Vels

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Asset Deployment

Risk Assessment Workshop

Hydro One Networks

November 3, 2015

Risk Management Group

Hydro One Networks Inc.

WORKSHOP DETAILS

Project Asset Deployment

Invitees:

Kathleen McCorriston
Alex Jackson
Ryan Lee
Jason MacDermott
Joe Ly
Andy Stenning
Mike Boland
Fred Vanderbeek
Tom Meta
Michael Fraser
Travis Iwamoto
James Mardegan
Brad Bowness
Andrew Spencer
Alex Turpin
Chris Cooper
Tom Irvine
Randy Church
Rob Berardi
Kyle Higgins
Bruno Jesus
Jeff Schaller

Facilitators:

Frank D'Andrea

Maja Shkolnik

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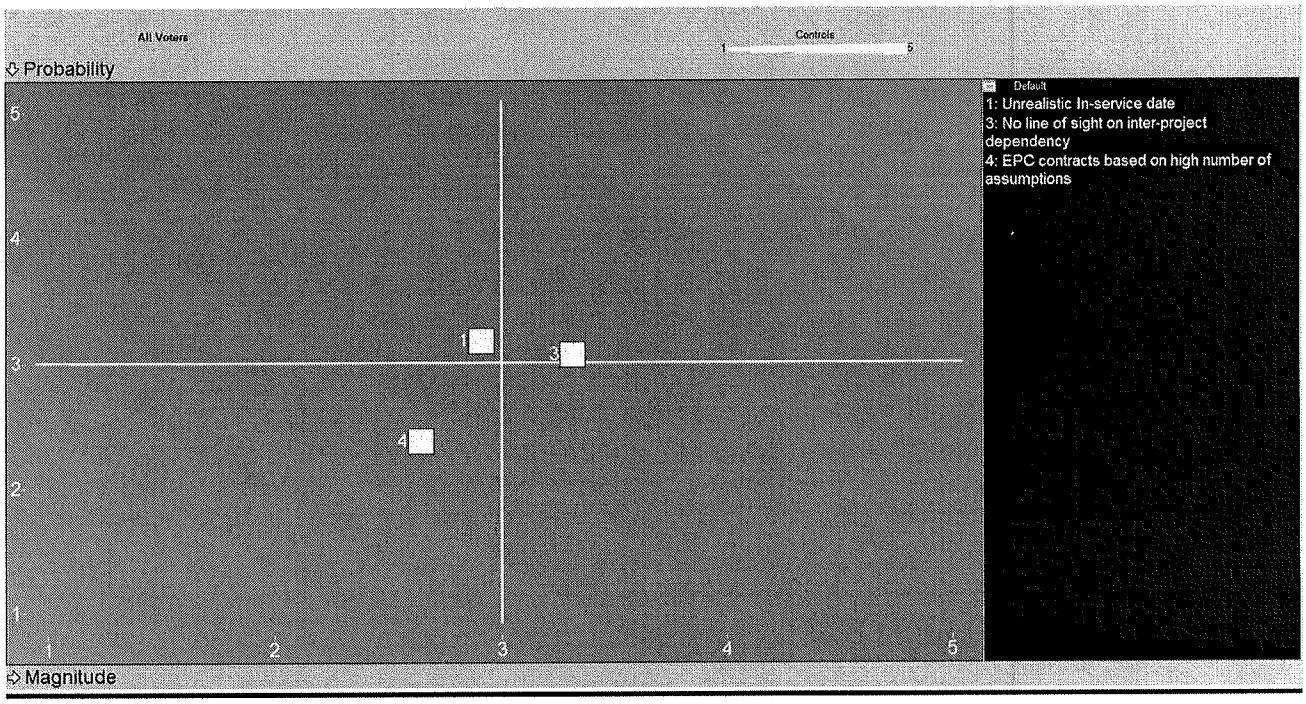
All Voters
Controls
1
5
Probability
5
4
3
2
1
1
2
3
4
5
Magnitude
Default
1: Unrealistic In-service date
3: No line of sight on inter-project dependency
4: EPC contracts based on high number of assumptions

Unrealistic In-service date

Description: *Committed in-service date not aligned with the execution schedule; project gets in service late; Cost/productivity risk (outage planning); capital and deployment of the assets - in-service not clearly identified and other pushed ahead - other lobs works gets kicked out to accommodate the in-service date*

Scenarios
• Customer jobs – lack of delivery to customer in timely manner • Projects require many parties to work in sequence to deliver. in case of delay, we don't not make adjustments to I/S date • When delay is identified, we don't assess/change I/S date(we focus on trying to get to it) • We don't have the tough conversations to change the date • I/S date set without enough information (prematurely) • I/S date set based on the outage plan – can't change it as it may cause cascading effect with planned outages • Significantly back end loaded with end of year I/S dates (need to hit Dec 31st OEB target),

Magnitude & Probability
• (4) SV – credibility w regulator (loss of), • (3) percentage of work program completed • (2) historically – I/S date impact has not been severe (not ideal) • (2) productivity • We get the work program completed at the expense of productivity (sacrificing 5%) • (2) the plan is aggressive at start (not realistic)

- The plan contains work that cannot be completed cost efficiently (1B vs. 750M)
- (3) we've made a step change – worst credible -70%-84% I/S capital completed
- (3) productivity issues (efficiency)
- Prioritization - sacrifice efficiency in order to complete jobs (we focus on people completing work, not work planning how to get work done)
- We're not early enough in planning (3 years ideal) to set realistic I/S dates, schedules not created with enough slack time
- (3) safety, jamming too much work can lead to increase in injuries (a lot of emphasis on delivering the I/S date)
- We're focused on top projects in execution, smaller project get lost
- Individual projects have realistic I/S dates – not integrated/coordinated into work program well

If it's happening today – it's very likely it will happen in the next 5 years (productivity)

4 – likely chance of impacting productivity

3 – 1 in 10 chance

	Magnitude	Controls	Probability	Risk Score	Tolerable Risk?
Risk Rating	2.9	2.6	3.2	3.05	No

Controls	
In Place:	**Gaps/Needs:**
• Work released earlier • Plans / actions to address the process (AD) • Regular project (options) reviews • Customer contracts (with more comfort level) • Individual projects have realistic I/S dates (in isolation) – not achievable when integrated into work program • Asset Deployment process initiative	- no flexibility to move I/S date target - number of initiatives on the way to address the existing issues (WIP) – not completed yet (in progress) – expectations need to be set - results will be seen in 3 years - controls we have in plans are not used - limited controls around Quality / efficiencies when focused on getting the work done - upfront conversations needed (realistic plans) - initial date based on high level information (ends up being committed date) – no opportunity to go back and change it ("culturally we believe the date is unchangeable") - urgent projects take priority over long term plans - the plans in place have to be completed / put in place

Initiatives		
Description	**Responsible**	**Due**
• Preliminary Engineering and Estimating Process Initiative	Michael Fraser/ James Mardegan /Kathleen McCorriston	Ongoing (year end 2015
• Construction Services Integrated Scheduling tool	Kathleen McCorriston	June 2016

Poor Outage Planning – discussed together with "No line of sight on inter-project dependency"

Description: *Cannot meet outage plans/in-service; what was planned is not executed; Risk of not achieving the investment plan; need to be 3 years out in planning - and anchor outage planning needs*

Scenarios
• X

Magnitude & Probability					
•					
	Magnitude	Controls	Probability	Risk Score	Tolerable Risk?
Risk Rating					

Controls	
In Place:	**Gaps/Needs:** -

Initiatives		
Description	**Responsible**	**Due**
• X		

No line of sight on inter-project dependency / Poor Outage Planning

Description: *Project managers focused on single projects; project managers don't have line of sight on other projects going on; Development and sustainment projects not identifying project needs/overlaps*

Scenarios
• ex. Hawthorne – conflict between sustainment and development – pushing I/S date out • missing data (and lack of transparency) in the accomplishment file – inability to see if work is done • project collisions, delays, missing I/S dates due to lack of visibility • downstream impact • resource pool / switching / jurisdictional (union) issues • preventative maintenance work on something that will be replaced in near future (5 years) • outage requirements not visible (when multiple projects require outages at the same location) • commitments being made on a high level • project collision visible at work release stage / too late in the process to change I/S date • planning process in place on project level (in isolation), not program level • moving to more sustainment work (with more variables / many unknowns) • poor information that the outage (staging) plan is based on • outage planners have no visibility to downstream impact a cancel outage may have • staging plans required (from EN) in order to define the outage plans • domino effect due to lack of buffer in the outage plan (cancelled outage early on impacts the rest of the plan) • the market place has determined the outage plans with anything that leaves Ontario need to be planned 18 months in advance

Magnitude & Probability

- (5) safety – putting people in dangerous situations (only through training and luck that we are getting by to date), can't achieve the work plan we have put in front of the OEB (loss of credibility)
- (4) productivity, we're at 6-10% today and there is an upside – opportunity to get better
- (4) Media – provincial media attention
- (2) to date we have managed the impact
- Long lead plans required for anything leaving the province will need to be scheduled 18 months ahead
- We're able to complete the program at cost (peril) to productivity

Unlikely - Worst credible scenarios do happen, however not often (ex, Allanburg, Hawthorne)

Highly visible projects we're good at, the smaller ones we're not that good at

Likely – 2/3 of or projects are either under or over budget

	Magnitude	Controls	Probability	Risk Score	Tolerable Risk?
Risk Rating	3.3	2.7	3.1	3.2	no

Controls	
In Place:	**Gaps/Needs:**
• group in place with visibility to entire work program • work accomplishment file • station centric model (single location) • TSOG process • Very strong network of knowledgeable people (superhuman effort)	- Not enough information when planning decisions are made prior to work release - Lack of information upfront (and scheduling tool) - Outage planning on the system is not widely understood - upfront / contingency planning not done upfront - no buffer throughout each stage of the outage plan - lack of interdependencies visibility - development / sustainment lack of integration - regional planning group (team) looking at planning needs based on geographic location

Initiatives		
Description	**Responsible**	**Due**
• In the accomplishment plan - functional location list visibility • Accomplishment plan review (accuracy)	Randy	tbd
• Construction Services Integrated Scheduling tool	Kathleen McCorriston	June 2016
• scheduling tool for stations	Mike Boland	tbd
• Enterprise wide visibility tool, more upfront visibility (sustainment and development), line of sight to ex. resource requirements outages	Tbd	

Outsourcing (EPC) contracts based on high number of assumptions

Description: *Poor upfront scope - or changes to scope - increasing the costs of EPC contracts; EPC ability to procure to our spec - quality concern - do they have the QA to ensure they can deliver upon requirements, note ... add #5 comment*

Scenarios
• at the moment we're exploring only one (lump sum) model, financial risk • safety – different work procedures between HONI and constructor (both recognized by the ministry of labour), equivalent, but different practices • burn on resources due to lack understanding on standards, practices – work needs to be done by our staff due to misunderstanding (rework) • HONI resources required for rework due to work not being completed to our (undocumented expectations) • lack of engineering review during the contract execution • lack of time due to pressure of I/Servicing causes us to have to complete the rework rather than the contractor • undocumented practices internally – not passed down to the contractors, work does not get completed to our expectations – resulting in rework / more maintenance • contractors lack the understanding of HONI practices – can't complete the work without extensive hand holding resulting in HONI fix ups • projects delivered / completed with increased maintenance needs • contractor subcontracts work to companies not on HONI's preferred list (ex. EN companies we would not use) • scoping / information changing in-plan requiring quick deadlines to EPC • lack of upfront information to make decisions regarding work execution (EPC / in-house)

Magnitude & Probability

- Reliability impact when contractors use equipment with lesser life expectancy
- (1) we spend a lot of time managing EPC – making it difficult for them to fail
- (4) large impact on EN resources (especially when the project comes back and in-plan work gets pushed off),
- (3) productivity impacts
- (2) negligible financial impact, impact to productivity (lost opportunities)

  3 - program will get bigger, expectations higher

  2 – committed controls will fill in the gap, resulting in more efficient process

	Magnitude	Controls	Probability	Risk Score	Tolerable Risk?
Risk Rating	2.6	2.6	2.4	2.5	yes

Controls

In Place:	Gaps/Needs:
• Looking at different outsourcing models • Enforcement • Scoping • Benchmarking initiative • RFP – firm to help out with the EPC process • RFP – outsourcing partner • Dedicated group focused on EPC • Fully competitive tendering process • Delivering projects within project timelines • Site inspections	- We use the excuse that we're not good at it in order not to do it - Gap between management / worker level – resulting in resistance and barriers to EPC - Lack of process documentation (on helping out the contractors) - Immature in our ability to manage (EPC) contract - Information not available in time to plan properly - Need better contract/procurement package

Initiatives		
Description	**Responsible**	**Due**
• Committed initiatives listed under controls above		

Inefficient or unclear resource planning – discussed with "Outsourcing (EPC) contracts based on high number of assumptions"

Description: *Poor upfront planning results in not identifying required resources in a timely manner; Indecisive in work execution strategy: supply chain ability to get contractor in time for work; due to changing strategies - EPC or HONI (Ex. Aylmer and Overbrook)*

Scenarios
• X

Magnitude & Probability					
• X					
	Magnitude	Controls	Probability	Risk Score	Tolerable Risk?
Risk Rating					

Controls	
In Place:	**Gaps/Needs:** -

Initiatives		
Description	**Responsible**	**Due**
• X		

LOB Misalignment – not discussed

Description: *Lack of alignment in LOBs meeting workflow stages of the project (Ex. supply invoices, labour); Ex. customer commitment to financial close out within 180 day but there's a lack of commitment on supplier invoices; Ex. before project release and after project execution - (Eng. and project mgmt.) - misalignment in team understanding of requirements - risk of not meeting in-service.*

Scenarios
• X

Magnitude & Probability					
• X					
	Magnitude	Controls	Probability	Risk Score	Tolerable Risk?
Risk Rating					

Controls	
In Place:	**Gaps/Needs:** --

Initiatives		
Description	**Responsible**	**Due**
• X		

Summary of Initiatives

Risk	**Initiative**	**Responsible**	**Due**
Unrealistic In-service date	Preliminary Engineering and Estimating Process Initiative	J. Mardegan /K. McCorriston	On going
	Construction Services Integrated Scheduling tool	K. McCorriston	June 2016
No line of sight on inter-project dependency / Poor Outage Planning	In the accomplishment plan - functional location list visibility Accomplishment plan review (accuracy)	Randy Church	Tbd
	Construction Services Integrated Scheduling tool	K. McCorriston	June 2016
	Scheduling tool for stations	Mike Boland	tbd
	Enterprise wide visibility tool, more upfront visibility (sustainment and development), line of sight to ex. resource requirements outages	Tbd	
Outsourcing (EPC) contracts based on high number of assumptions	Looking at different outsourcing models Benchmarking initiative		

Risk Universe

Asset Deployment
Risk Universe

Risk Registry

Risk Registry - Asset Deployment.xlsx

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Building Owners and Managers Association (BOMA) INTERROGATORY #011

Reference:

Exhibit A, Tab 5, Schedule 2, Page 13

Interrogatory:

Please provide a copy of the Inergi Outsourcing Agreement.

Response:

Please find attached a confidential copy of the requested agreement. Hydro One has redacted all terms and conditions specifically relating to Customer Service Operations, as these services are not provided to Hydro One's transmission business and are therefore beyond the scope of Hydro One's current application. Also redacted is information that is sensitive from a security viewpoint (e.g. server names, addresses, etc.). If this information were to be disclosed to the public, there is significant risk that individuals or organizations could use the information to the detriment of Hydro One and Inergi.

Witness: Gary Schneider

UNDERTAKING – TCJ1.17

Undertaking

To clarify whether or not the amounts shown at Exhibit B, Tab T-1 – B2, T1, S1 are amounts that are just examples, or if they're amounts in aggregate; to provide a list of additional examples of productivity initiatives.

Response

The amounts provided in response to Exhibit I, Tab 13, Schedule 9 were only a few examples of procurement related savings.

Currently embedded in the investment plan are the following savings.

In $M		2017	2018
Procurement			
	OM&A	2.1	2.8
	Capital	11.2	21.4
Information Solutions Division (ISD)			
	OM&A	3.4	4.5
Stations			
	OM&A	2.9	3.5
Total			
	OM&A	8.4	10.8
	Capital	11.2	21.4

The forecasted savings are in the areas of procurement, information technology and stations. The procurement and information technology savings are explained below. For a breakdown of the stations savings, refer to Exhibit I, Tab 1, Schedule 116.

Procurement Savings

Following the initial public offering (IPO), Hydro One identified opportunities for cost savings and productivity improvements.

As described in Exhibit C1, Tab 5, Schedule 1, Hydro One's Supply Chain division is refining its current approaches and introducing new approaches to increase both savings potential and productivity efficiencies for Hydro One.

Witness: Michael Vels

Specifically, there are seven planned enhancements to sourcing approaches.

1. Bundling/Volume Discounts – Renew view of sourcing categorization, grouping materials/services supplied by like-suppliers to maximize savings and volume discount opportunities, and addressing multiple sub-categories at once. Bundle multiple contracts with a single supplier, and negotiate volume discounts across multiple categories and contracts.

2. Feedback Rounds – Maximize competitive pressure through multiple feedback rounds on rates, with an opportunity for vendors to improve their proposals.

3. 'Lean' RFPs – Emphasize leaner, "bidder-friendly" scope and value in RFP formats with fewer onerous requirements and redundancies.

4. Standardization of Spend and Specifications – Standardize requirements to allow direct, like-for-like comparisons across bidders. Move towards industry-standard specifications where reasonable, rather than Hydro One specifications, to reduce unnecessary costs.

5. Streamlined Evaluation – Compress timelines and streamline evaluation process to meet business needs and accelerate the realization of negotiated savings.

6. Cost Transparency – Increase knowledge of bidders' prices and composition to improve Hydro One's ability to challenge and negotiate less competitive pricing.

7. Transition Pricing – Where contracts are being renegotiated with incumbent vendors, implement new negotiated rates before the renegotiated contract execution.

The table below lists spending categories and their associated potential savings (expressed as percentages) over the test years. The savings assumptions for procurement are against the 2015 spend.

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Procurement Productivity – Category Overview

Category	Potential Savings (%)	Potential Approach/Levers
Electrical Hardware	5 – 15	• Conduct broad RFP with multiple feedback rounds • Consolidate spend across common suppliers thus increasing volume discount potential
EPC Services	10 – 15	• Establish competitive rate cards for project work through RFP with rate decomposition and quartile feedback
Engineering Services	10 – 15	• Establish competitive rate cards through RFP with cost transparency • Review distribution of work strategy to maximize use of best rates
Fleet	5 – 7	• Conduct broad RFP with multiple feedback rounds • Renegotiate Fleet Management contract
Staff Aug	5 – 15	• Conduct RFP with consolidated roles and conduct multiple feedback rounds on cost transparency
Professional Services	10 – 20	• Renegotiate rate cards and greater cost transparency
Equipment Rentals	5 – 10	• Conduct RFP to lock-in rates and consolidate spend for rentals with preferred suppliers(s) with provincial capacity • Bundling other services as part of the same RFP process
IT Software	5 – 15	• Renegotiate IT software contract (s)
Transformers	5 – 10	• Conduct broad RFP with multiple feedback rounds leveraging an expanded supplier base
Construction Services	2 – 5	• Conduct RFP to establish competitive rate cards preferred suppliers(s) through multiple feedback rounds
General Hardware	10 – 15	• Conduct broad RFP with multiple feedback rounds • Consolidate suppliers thus increasing volume discount potential
Construction Materials	5 – 10	• Conduct broad RFP with multiple feedback rounds • Consolidate suppliers thus increasing volume discount potential

Telecom	0 – 5	• Conduct broad RFP with telecoms and networks carrier services spend to leverage scale • Consolidate bulk of spend with fewer preferred suppliers
IT Hardware	5 – 15	• Conduct broad RFP with telecoms and networks carrier services spend to leverage scale
Enviro. Services	5 – 10	• Conduct RFP to lock-in prices with preferred suppliers through multiple feedback rounds • Bundling other services as part of the same RFP process
Engineered Hardware	5 – 10	• Re-establish prices with insulator suppliers and conduct broad RFP to rebase prices for top repeat items • Negotiate volume discount agreements to maximize savings
Travel & Ent.	10 – 20	• Rationalize and lock-in preferred supplier rates for hotels and accommodations and negotiate volume discounts
Office Supplies	5 – 15	• Conduct broad RFP with multiple feedback rounds • Evaluate market alternatives and renegotiate printing supplies

The majority of the savings are embedded in OM&A forecasts for Real Estate and Facilities, IT, Power Equipment, and NERC Cyber Security Compliance. In aggregate, the savings for 2017 and 2018 are $1.5 million and $1.9 million.

Embedded capital savings are reflected in the areas of transmission High Voltage Yard Investments, Overhead Lines, IT, Fleet and Load Customer Connections. They total $9.4 million in 2017 and $16.5 million in 2018.

Information Technology Savings

The following list of initiatives is driving the majority of the OM&A savings in IT.

1. Backup and Storage Optimization

Based on an assessment of industry best practices as well as project and application support requirements, Hydro One has determined opportunities to change its practices regarding frequency of full backups on non-production environments with resultant savings of disc space and staff time.

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Procedures have been changed regarding the backup and archiving policies related to full backups and daily incremental backups of its SAP production environment, with some routines changed to weekly rather than daily. For no material change in risk profile, this change resulted in a SAP storage savings of over 75%. Specifically, Hydro One's monthly storage requirement has decreased by fifty percent.

2. Project Environment Optimization

Hydro One has consolidated IT environments where there were redundancies and, in some cases, decommissioned them outright. This has resulted in a reduction in its monthly invoices from its service provider.

3. Infrastructure and Database Decommissioning

After an assessment of all IT infrastructure components and databases, Hydro One began decommissioning servers and databases that had very little or no utilization. To date, 138 servers and 38 databases have been decommissioned, and Hydro One plans to decommission an additional 76 servers and seven databases by January 1, 2017. An ongoing monthly review of all servers and database has been implemented to ensure unused infrastructure is decommissioned in a timely manner. This has reduced Hydro One's monthly server and database fees.

4. Software Contract Renegotiation

A review of all 3rd party contracts was performed to determine opportunities for renegotiation based on overall cost and current contract renewal timelines. Hydro One renegotiated its contract with a significant provider with savings to take effect in 2017. Hydro One is continuing its analysis of other 3rd party contracts and opportunities for renegotiation.

5. 3rd Party Contractor Rate Reduction

Hydro One has engaged its primary vendor in negotiations to reduce its rates by 20 to 30% effective as of 2017.

6. Mobility Contract Reduction

Hydro One has negotiated a significant per user rate reduction with its mobility providers Bell and Rogers for a period of five years.

7. Implementation of Cloud Infrastructure

Hydro One plans on implementing secure cloud platform technology for certain applications. This will result in a reduction in infrastructure resource effort, ongoing management and support and reduced costs.

Witness: Michael Vels

UNDERTAKING – TCJ1.18

Undertaking

To explain how the 14.9% and the $80 million are calculated.

Response

These figures were each derived by taking the net present value of the aggregate estimated net savings ($120 million) achieved over the ten year contract term, relative to the estimated cost if Hydro One were to perform or manage the work. The savings are net of the costs of retained staff, contingency and stranded overhead.

The $80 million is the net present value of the estimated net savings. The 14.9% is the associated percentage savings.

Witness: Gary Schneider

RATE BASE

1. INTRODUCTION

This Exhibit provides the forecast of Hydro One Transmission's rate base for the 2017 and 2018 test years and provides a detailed description of each of the rate base components. The composition of Hydro One Transmission's assets is described in Exhibit B1, Tab 1, Schedule 2.

The rate base underlying the test year revenue requirement includes a forecast of net utility plant, calculated on a mid-year average basis, plus a working capital allowance. Net utility plant is gross plant in-service minus accumulated depreciation. Working capital includes an allowance for cash working capital and materials and supplies inventory.

2. UTILITY RATE BASE

Hydro One Transmission's utility rate base for the transmission system for the test years is filed in Exhibit D2, Tab 1, Schedule 1. The calculation of average balances to derive net utility plant for the historical, bridge and test years is filed in Exhibit D2, Tab 2, Schedule 1 and Exhibit D2, Tab 2, Schedule 2.

Hydro One Transmission's forecast rate base for the 2017 test year is $10,554.4 million and for the 2018 test year is $11,225.5 million. Table 1 provides a summary of the calculation.

Table 1: Transmission Rate Base ($ Millions)[1]

Description	2017	2018
Gross Plant	16,641.1	17,616.4
Less: Accumulated Depreciation	(6,113.4)	(6,418.7)
Net plant in service	**10,527.8**	**11,197.7**
Working Capital	26.6	27.8
Total Rate Base	**10,554.4**	**11,225.5**

2.1 Derivation of Net Utility Plant

The mid-year gross plant balance reflects the in-service additions resulting from the capital expenditure program forecast for the test years. These programs are described in detail in the Company's written evidence at Exhibits B1, Tab 3, Schedule 1 through 8. The justifications for individual capital projects in excess of $3 million are filed in Exhibit B1, Tab 3, Schedule 11.

The 2017 Net Plant in-service of $10,527.8 million is $510.3 million or 5.1% higher than 2016 Board-approved Net Plant of $10,017.5 million approved in EB-2014-0140. The 2018 Net Plant in-service of $11,197.7 million is $669.9 million or 6.4% higher than 2017 Test Year. These increases reflect the Company's infrastructure investments to address asset replacement and refurbishment needs of the Transmission system; these investments are described in detail in Exhibit B of this application.

[1] Gross plant and accumulated depreciation values are calculated using a mid-year approach. Capital contributions have been netted out. Contributed capital refers to amounts contributed by third parties to specific capital projects, such as, for example, Joint Use Assets.

A continuity schedule for gross fixed assets for the test, bridge and historical years is shown in Exhibit D2, Tab 2, Schedule 1. In-service additions in that exhibit reflect the placing in-service of some of Hydro One Transmission's capital programs, shown in Exhibit D1, Tab 1, Schedule 2.

A continuity schedule for accumulated depreciation for the test, bridge and historical years is shown in Exhibit D2, Tab 2, Schedule 2. The accumulated depreciation balance for the test years incorporates the accepted Foster Associates' Inc. methodology. The depreciation expense is further discussed in Exhibit C1, Tab 7, Schedule 1.

2.2 Cash Working Capital

In 2015, Hydro One Transmission retained Navigant Consulting Inc. to undertake a lead-lag study. The provision for working capital in 2017 and 2018 incorporates the results of this new study.

The cash working capital requirement for the transmission system is based on the following factors:

- the forecast of revenues,
- the forecast of OM&A, taxes and other cash expenditures and the net lead lag days determined.

Applying the lead lag study methodology results in a net cash working capital requirement of $14.7 million for the 2017 test year and $15.6 million for the 2018 test year. The calculation of cash working capital is discussed in further detail in Exhibit D1, Tab 1, Schedule 4.

2.3 Materials and Supplies Inventory

The other component of working capital is materials and supplies inventory. The average annual materials and supplies inventory balances are $12.0 million for 2017 and $12.2 million for 2018. Materials and supplies inventory is discussed in further detail in Exhibit D1, Tab 2, Schedule 1.

3. COMPARISON OF RATE BASE TO BOARD APPROVED

Table 3 compares 2015 costs to the 2015 Rate Base approved by the Board in their Decision on Hydro One Transmission's previous application in EB-2014-0140.

Table 3: 2015 Board Approved versus 2015 Rate Base ($M)

Rate Base Component	2015 Actual	2015 Board Approved	Variance
Gross Plant	15,102.1	15,117.7	(15.5)
Accumulated Depreciation	(5,508.0)	(5,490.9)	17.1
Net Utility Plant	**9,594.1**	**9,626.8**	**(32.6)**
Cash Working Capital[1]	10.7	10.7	0.0
Materials & Supplies Inventory	12.2	13.7	(1.5)
Total Rate Base	**9,617.1**	**9,651.2**	**(34.1)**

Notes: [1]Hydro One Transmission does not calculate actual cash working capital, thus the 2015 approved amount was used for illustrative purposes.

Total rate base was $34.1 million below the Board approved amount; a variance of 0.4%.

Table 4 compares 2016 forecast costs to the 2016 Rate Base approved by the Board in their Decision on Hydro One Transmission's previous application EB-2014-0140.

Table 4: 2016 Board Approved versus 2016 Bridge Year Rate Base ($M)

Rate Base Component	2016 Bridge Year (Forecast)	2016 Board Approved	Variance
Gross Plant	15,794.8	15,805.2	(10.4)
Accumulated Depreciation	(5,802.8)	(5,787.7)	15.1
Net Utility Plant	**9,992.0**	**10,017.5**	**(25.5)**
Cash Working Capital[1]	8.5	8.5	0.0
Materials & Supplies Inventory	11.7	14.0	(2.3)
Total Rate Base	**10,012.2**	**10,040.0**	**(27.8)**

[1] Hydro One Transmission does not calculate actual cash working capital, thus the 2016 approved amount was used for illustrative purposes.

Total rate base was $27.8 million below the Board approved amount, a variance of 0.3%.

IN-SERVICE ADDITIONS

1. INTRODUCTION

In-service additions represent increases to rate base as a result of capital work being declared in-service and ready for use by Hydro One Transmission customers. The in-service additions vary from capital expenditures due to the multi-year nature of capital projects with defined in-service dates.

Table 1 provides an overview of Hydro One Transmission's in-service additions over the 2014 to 2016 period and the test years.

Table 1: In-Service Capital Additions 2014 – 2018 ($ Millions)

	2014	2014	2015	2015	2016	2016	Test Years	
	ISA Actuals	OEB Approved	ISA Actuals	OEB Approved	Bridge Projected	OEB Approved	2017	2018
Sustaining	655.8	588.4	569.7	572.2	604.5	480.9	771.1	747.7
Development	177.9	177.3	27.9	134.7	209.5	119.4	64.6	374.9
Operations	12.1	14.7	29.4	50.4	15.1	10.0	8.0	10.3
Common & Other	68.7	82.9	72.2	64.1	82.6	63.1	87.8	76.8
Total	**914.5**	**863.3**[1]	**699.1**	**821.3**	**911.7**	**673.3**	**931.4**	**1,209.7**

Hydro One is expecting to achieve the OEB- approved cumulative 2014 to 2016 in-service additions of $2,357.9 million. In addition Hydro One responded to emergent non-

[1] The total amount represents the revised in-service capital additions in 2014, presented in the Settlement Agreement which was subsequently accepted by the OEB in EB-2014-0140.

discretionary needs of $162 million, representing 7% incremental additions above the approved plan.

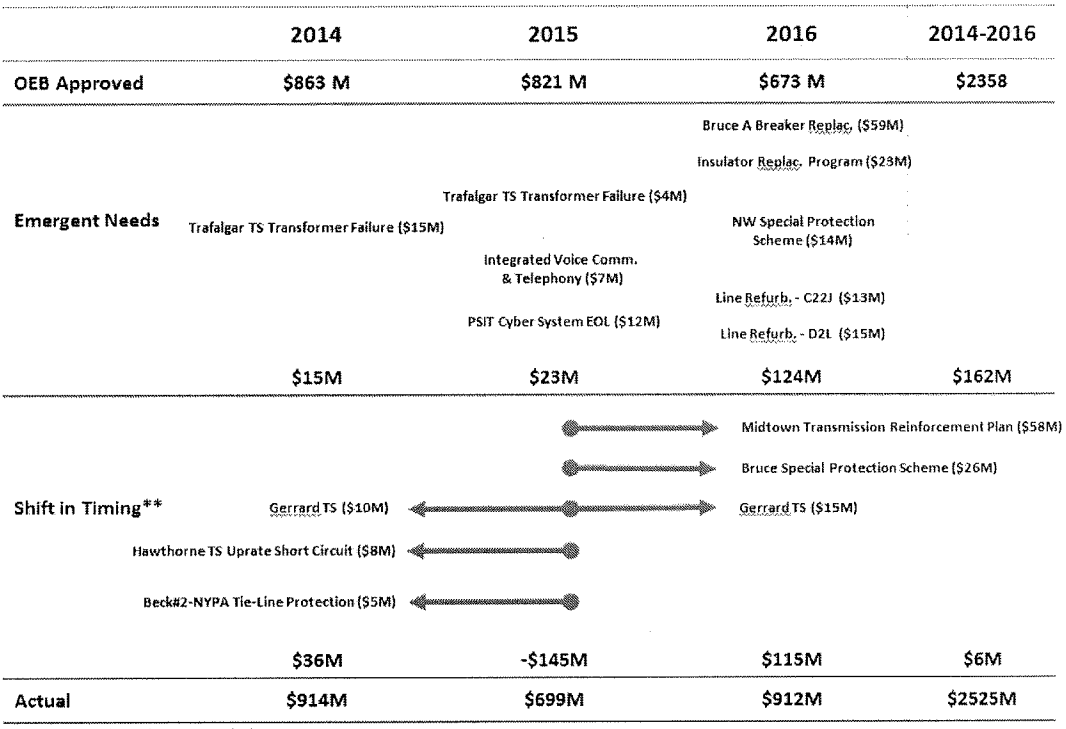
Hydro One is committing to achieving the projected level of in-service capital additions over the test years by using a mix of internal and external resources. Hydro One's capital work execution strategy is described in detail in Exhibit B1, Tab 4, Schedule 1, which outlines how Hydro One intends to accomplish the forecast level of in-service capital additions.

2. TREND ANALYSIS 2014-2016

As described in Exhibit B1, Tab 2, Schedule, 7, the development of an investment plan must be done in a manner that is dynamic and flexible to respond to changing and unforeseen circumstances. In response to some unforeseen events and based on execution constraints, Hydro One made tactical adjustments to its investment and execution plan in the 2014-2016 period. Typically, these adjustments are reflected as delays, prudent cost/scope increases, or a valid redirection of projects to address new risks related to development, compliance or anticipated expenditures associated with equipment failures.

Figure 1 compares Hydro One's forecast in-service additions for the period 2014 to 2016 to its OEB-approved in-service additions plan and summarizes the timing of emergent needs and projects with significant shifts in in-service timing.

Figure 1: 2014-2016 Actual/Forecast In-service Additions vs. OEB-approved Plan*



* Numbers have been rounded
** Only represents significant shifts in project timing

2.1 Emergent Needs

Table 2 describes the non-discretionary investments that Hydro One Transmission made and in-serviced during the 2014-2016 period in response to changes in circumstance and new information.

Table 2: Non-discretionary In-service Additions, 2014-2016

Project	Amount ($M)	Prudency Rationale
Bruce A – Air Blast Circuit Breaker Replacement	59	Advanced replacement of synchronizing breakers and all air blast circuit breakers that were negatively impacting Bruce Power's ability to connect to the transmission grid.
Insulator Replacements	23	Additional investment based on emerging information on insulator failure risk impacting safety and system reliability.
Trafalgar TS - Replace T15	19	Emergency replacement of T15 (750MVA 500kV) auto transformer failure. This was a demand capital replacement that was carried out to restore security of supply and system reliability.
Northwest Special Protection Scheme	14	Requested by the IESO in December 2014 to address northwest reliability issues.
PSIT Cyber System End-of-Life	12	Meeting NERC cyber security regulatory requirements.
Line Refurbishment: C22J/C24Z/C21J /C23Z - Chatham SS X Lauzon TS & Keith TS	13	Restore integrity of deficient structures supporting these circuits, which supply electricity to Chatham, Windsor and the surrounding area and the interconnection with Michigan.
Line Refurbishment - D2L	15	Laboratory testing of conductor samples revealed the lines were at end of life. Field inspections found structures required refurbishment to restore design integrity.
OGCC Integrated Voice Communication & Telephony (IVCT)	7	Updating the IVCT environment which was comprised of multiple customized applications supplied by different vendors, to maintain vendor support of a critical control centre communications system.
TOTAL	**162**	

2.2 Timing Changes

Table 3 lists projects which had in-service dates adjusted to capitalize on favourable outage and work conditions, respond to customer needs, external constraints, and project delivery issues.

Table 3: Timing Changes of In-service Additions, 2014-2016

Project	Shift in In Service year	Prudency Rationale
Midtown Transmission Reinforcement Plan	2015 to 2016	Delay of project to 2016 due to construction challenges with the tunnel portion of the work. See link below for the Project Status Update letter Hydro One sent to the OEB in September 2015. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/495637/view/
Bruce Special Protection Scheme	2015 to 2016	Delay of project due to vendor equipment failing type testing during the detailed engineering phase
Gerrard TS	2015 to 2014/16	Acceleration of replacement of T1/T2 to 2014 and the delay of replacement of T3/T4 to 2016 to ensure reliability of supply to Toronto Hydro during the 2015 Pan American games.
Hawthorne TS Uprate Short Circuit	2015 to 2014	Acceleration of the breaker replacements to meet the needs of customers and to connect additional generation.
Beck #2 NYPA Tie-line Protection	2015 to 2014	Acceleration of work to address the end of life protection equipment that affects the reliability of the tie line between Hydro One and New York Power Authority.

3. IN-SERVICE ADDITIONS IN 2017 AND 2018

In-service capital additions will increase slightly in 2017 as compared to the 2016 projected amount and increase more significantly in 2018 as compared to 2016.

Sustainment in-service capital additions will increase in 2017 as compared to the 2016 projected amount primarily due to increased investment in transmission overhead lines for insulator replacements, steel structure coating, and wood pole replacements.

Development in-service additions will increase in 2018 as compared to 2017 project amount primarily due to the Clarington TS project which was requested by the IESO *(formerly the OPA)* and presented in Proceeding EB-2012-0031, and the Supply to Essex

County Transmission Reinforcement project which was approved in Proceeding EB-2013-0421.

Operations in-service capital additions will decrease in 2017 and 2018 as compared to the 2014 to 2016 amount primarily due to the completion of major upgrades and enhancements of Operations tools over 2015 and 2016.

The associated capital expenditures in 2017 and 2018 are described at the program and major project level in Exhibit B1, Tab 3 and Tab 1. All projects with spending greater than $3 million in one of the test years are described in more detail in Exhibit B1, Tab 3, Schedule 11. The following is a list of in-service capital additions over the test years of greater than $50 million:

- Clarington TS: Build new 500/230 kV Station (D01) ($263.8 million in 2018)*;
- Insulator Replacements (S79) ($122.0 million over 2017 and 2018);
- Steel Structure Coating (S76) ($98.4 million over 2017 and 2018);
- Tx Wood Pole Replacements (S75) ($82.8 million over 2017 and 2018);
- Air Blast Circuit Breaker Replacement - Richview TS (S07) ($60.7 million in 2018)*; and
- Supply to Essex County Transmission Reinforcement (D14) ($50.5 million in 2018).

*Note some of these projects have been placed partially in-service prior to the test years.