All our energy.
All the time.

MARITIME ELECTRIC
A FORTIS COMPANY

August 8, 2018

Island Regulatory & Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Commissioners:

Please find enclosed 6 copies of Maritime Electric's 2019 Capital Budget.

If you require further information, please do not hesitate to contact me at 902-629-3696.

Yours truly,

MARITIME ELECTRIC

Jason Roberts
Vice President, Finance
and Chief Financial Officer

JCR45
Encl. as noted

180 Kent Street • PO Box 1328 • Charlottetown, PE C1A 7N2
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C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY

AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2019 Annual Capital Budget and for certain approvals incidental to such an order.

APPLICATION AND EVIDENCE

OF

MARITIME ELECTRIC COMPANY, LIMITED

August 8, 2018

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1.0 APPLICATION

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2019 Annual Capital Budget and for certain approvals incidental to such an order.

Introduction

1. Maritime Electric Company, Limited ("Maritime Electric" or the "Company") is a Corporation incorporated under the laws of Canada with its head or registered office at Charlottetown and carries on a business as a public utility subject to the Electric Power Act ("EPA" or the "Act") engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

Application

2. Maritime Electric hereby applies for an order of the Island Regulatory and Appeals Commission ("IRAC" or the "Commission") approving the Annual Capital Budget ("the Budget") for the year 2019 as outlined in the attached evidence.

3. The proposals contained in this Application represent a just and reasonable balance of the interests of Maritime Electric and those of its customers and will, if approved, allow the Company to perform necessary capital additions and improvements at a cost that is, in all circumstances, reasonable.

Procedure

4. Filed hereto is the Affidavit of John D. Gaudet, Jason C. Roberts, Angus S. Orford and Byron A. Chubbs which contains the evidence in which Maritime Electric relies in this Application.

Dated at Charlottetown, Province of Prince Edward Island, this 8th day of August, 2018.

D. Spencer Campbell, Q. C.

STEWART MCKELVEY
65 Grafton Street, PO Box 2140
Charlottetown PE C1A 8B9
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Solicitors for Maritime Electric Company, Limited

2.0 AFFIDAVIT

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2019 Annual Capital Budget and for certain approvals incidental to such an order.

AFFIDAVIT

We, John David Gaudet of Charlottetown, Jason Christopher Roberts of Suffolk, Angus Sumner Orford of Charlottetown and Byron Ambrose Chubbs of Stratford, in Queens County, Province of Prince Edward Island, MAKE OATH AND SAY AS FOLLOWS:

1. We are the President and Chief Executive Officer, Vice-President, Finance and Chief Financial Officer, Vice-President, Corporate Planning and Energy Supply and Vice-President, Customer Service of Maritime Electric respectively and, as such, have personal knowledge of the matters deposed to herein, except where noted, in which case we rely upon the information of others and in which case we verily believe such information to be true.

2. Maritime Electric is a public utility subject to the provisions of the Electric Power Act engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

3. We prepared or supervised the preparation of the evidence and to the best of our knowledge and belief the evidence is true in substance and in fact. A copy of the evidence is attached to this, our Affidavit, and is collectively known as Exhibit "A", contained in Sections 3 through 9 inclusive and Appendices A through P inclusive.

4. Section 10 contains a proposed Order of the Commission based on the Company's Application.

SWORN TO SEVERALLY at
Charlottetown, Province of Prince Edward Island,
the 8th day of August, 2018.
Before me:

John D. Gaudet

Jason C. Roberts

Angus S. Orford

Byron A. Chubbs

A Commissioner for taking Affidavits
in the Supreme Court of Prince Edward Island.

3.0 INTRODUCTION

3.1 Corporate Profile

Maritime Electric owns and operates a fully integrated system providing for the purchase, generation, transmission, distribution and sale of electricity throughout Prince Edward Island. The Company's head office is located in Charlottetown with generating facilities in Charlottetown and Borden-Carleton. The Company has contractual entitlement to capacity and energy from NB Power's Point Lepreau Nuclear Generating Station ("Point Lepreau") and an agreement for the purchase of capacity and system energy from NB Power delivered via four submarine cables owned by the Province of Prince Edward Island. The Company purchases 92.5 MW of wind powered energy through contracts with PEI Energy Corporation.

3.2 Overview of Evidence

Under Section 17 (1) of the Electric Power Act, Maritime Electric is required to submit to the Island Regulatory and Appeals Commission, for its approval, an annual Capital Budget of proposed improvements or additions to the property of the public utility. This is the evidence in support of the Company's proposed 2019 Annual Capital Budget. In preparing this evidence, Maritime Electric used the Capital Expenditure Justification Criterial filed on April 10, 2018. Accordingly, for each proposed Capital Budget investment, the evidence will indicate whether the project is considered mandatory, recurring, justifiable or work support services.

Appendix A outlines the level of the Company's actual and proposed capital expenditures over the 2010-2019 periods.

Table 1 below outlines the proposed capital expenditures for 2019 specifically.

Table 1

Proposed 2019 Capital Expenditures

4.0	**Generation**		
	4.1	Charlottetown Plant Buildings and Services Projects	$ 171,000
	4.2	Charlottetown Plant Boiler Projects	8,000
	4.3	Charlottetown Plant Turbine-Generator Projects	1,424,000
	4.4	Borden Plant Projects	143,000
			1,746,000
5.0	**Distribution**		
	5.1	Replacements due to Storms, Collisions, Fire and Road Alterations	1,418,000
	5.2	Distribution Transformers	4,168,000
	5.3	Services and Street Lighting	4,375,000
	5.4	Line Extensions	2,928,000
	5.5	Line Rebuilds	4,245,000
	5.6	System Meters	655,000
	5.7	Distribution Equipment	2,033,000
	5.8	Transportation Equipment	1,642,000
			21,464,000
6.0	**Transmission**		
	6.1	Substation Projects	5,002,000
	6.2	Transmission Projects	2,325,000
			7,327,000
7.0	**Corporate**		
	7.1	Corporate Services	573,000
	7.2	Information Technology	1,211,000
			1,784,000
Sub-total			32,321,000
8.0	**Capitalized General Expense**		527,000
9.0	**Interest During Construction**		429,000
Less:	Customer Contributions		(400,000)
TOTAL			**$32,877,000**

Figure 1 shows the proposed 2019 capital expenditures by origin.

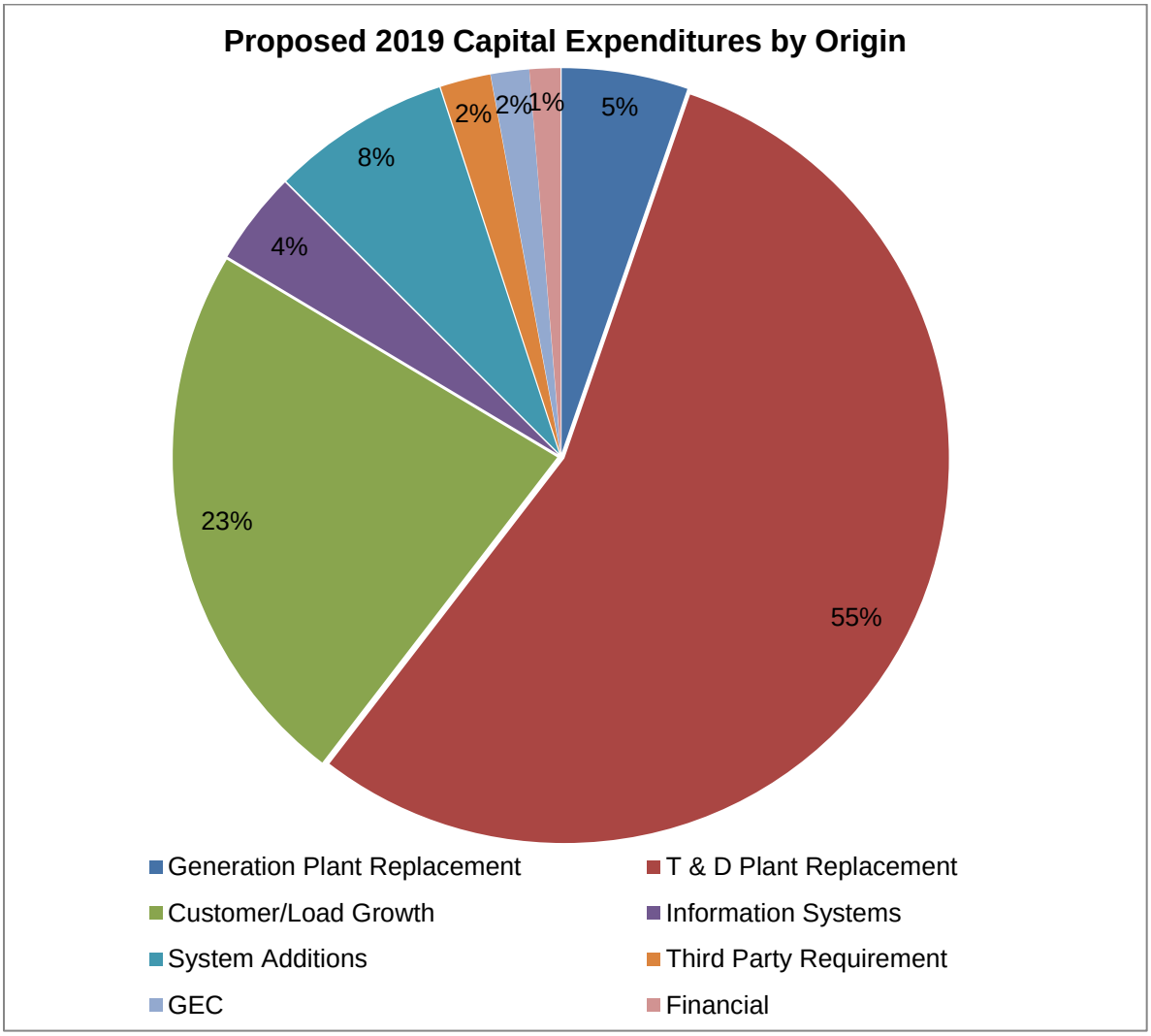


Figure 1: Proposed 2019 Capital Expenditures by Origin

Figure 2 shows the proposed 2019 capital expenditures by classification.

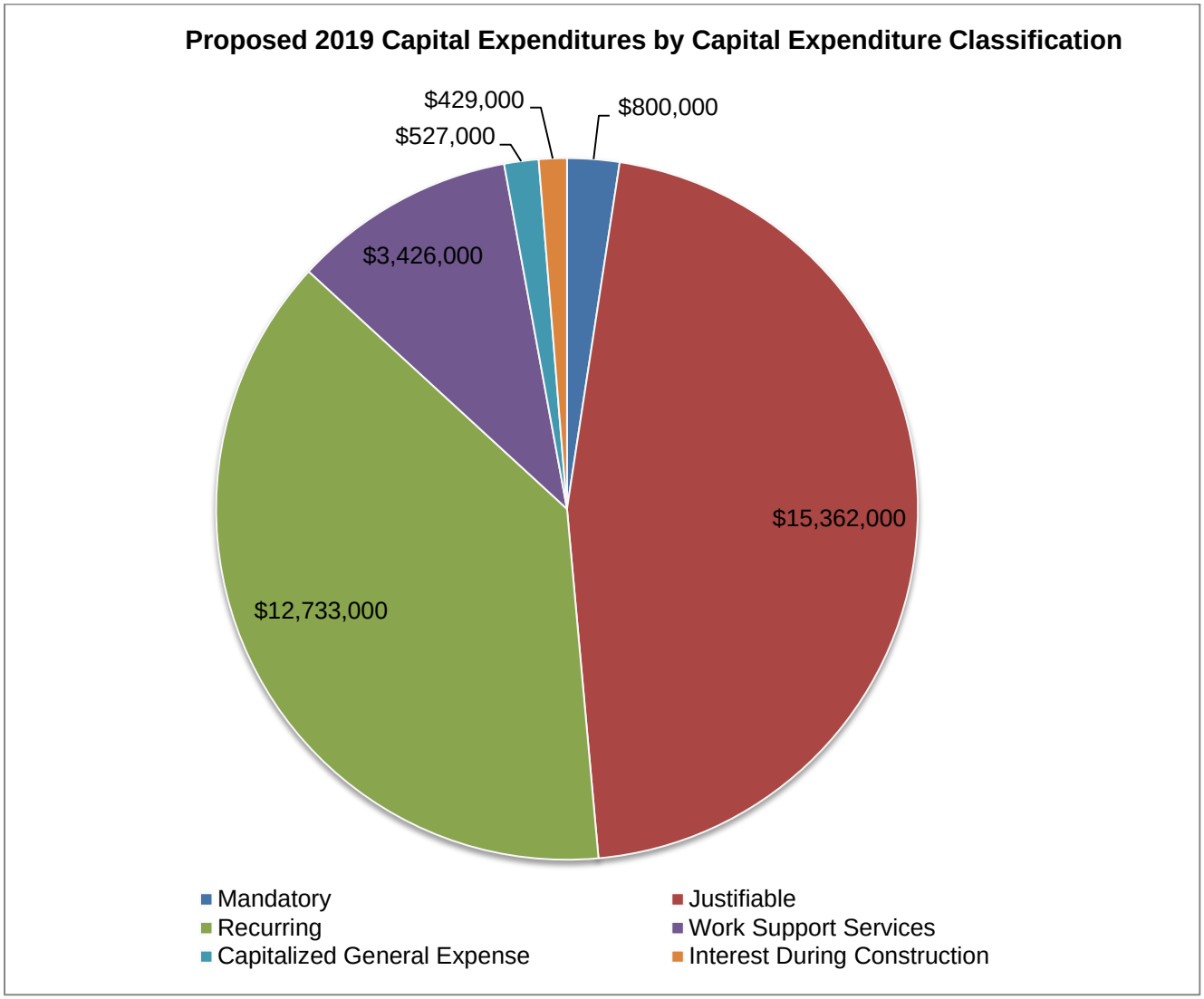


Figure 2: Proposed 2019 Capital Expenditures by Capital Expenditure Classification

4.0 GENERATION

Maritime Electric's three on-Island generating stations are primarily backup supply sources. Those stations are:

Charlottetown Thermal Generating Station		
("CTGS" or "Charlottetown Plant")	4 Generators	55 MW
Borden Generating Station ("CT1 and CT2")	2 Generators	40 MW
Charlottetown Combustion Turbine No. 3 ("CT3")	1 Generator	50 MW

Although the primary role of Maritime Electric's generation is backup for the submarine cables, benefits are also realized through reduced purchased energy costs. The current annual value of the avoided capacity and operating reserve purchases supplied by these three facilities is approximately $7.0 million, based on the current Energy Purchase Agreement with NB Power which expires February 28, 2019. The annual value of this benefit will decrease as the CTGS capacity, recognized under the Energy Purchase Agreement with NB Power, is reduced from January 1, 2019 to January 1, 2022. In addition, this generation provides on-Island supply in times of curtailment from off-Island energy suppliers and also supplies energy during transmission line outages or curtailments on the mainland or on PEI.

The CTGS is approaching the end of its useful life and there are numerous risks and costs associated with prolonging the operation of the oldest CTGS units. Management has prepared a plan to decommission the CTGS in a staged approach starting with the older and smaller units. This Decommissioning Plan, which was filed with IRAC on June 28, 2018, calls for the two largest units (Unit 9 and Unit 10) to be placed into warm, long-term layup starting on March 1, 2019 and would be available to generate as required until December 31, 2021. Thermal Units 7 and 8 will cease to provide capacity value or generating capability effective January 1, 2019 and 2020, respectively.

The Generation Capital Budget is comprised of projects required to keep the generating facilities in a state of readiness to operate as well as meet reliability and safety requirements. These requirements and considerations are set out in the Company's Energy Purchase Agreement with NB Power, safety regulations, provincial boiler inspection branch recommendations, contingency planning and insurance requirements.

4.1 Charlottetown Plant Buildings and Services Projects ***$ 171,000***

This category includes expenditures required for buildings and support systems for the Charlottetown Plant facilities. Support systems include but are not limited to:

- Energy Control Centre ("ECC") provides 24 hour operation of the Maritime Electric electrical system including energy purchases, load and wind forecasting, generation dispatch and line crew dispatch;
- River Pumphouse provides cooling water for the thermal generation units at the Charlottetown Plant;
- Fuel tanks provide storage of fuel for a minimum of 7 days generation at full load;
- Lighting within the Charlottetown generation facilities; and
- Other equipment such as sump pumps and fuel pipe lines.

a. Energy Control Centre SCADA Simulator (Justifiable) $ 121,000

Maritime Electric's Supervisory Control and Data Acquisition ("SCADA") System is a software application program that monitors and controls the electricity system by gathering data in real time from remote locations such as combustion turbine plants and substations. It is used by the Energy Control Centre ("ECC") Operators to remotely monitor and control the Company's electricity system and by Engineering staff to analyze system events.

The SCADA system includes hardware and software components. The hardware gathers and feeds data into computers that have the SCADA software installed. The computer processes this data and quickly presents it to the ECC Operators. The SCADA system warns the ECC Operators when conditions become hazardous through visual changes of state on computer displays and by sounding alarms. The SCADA system also records and logs all events into an application referred to as a Historian for both the instantaneous presentation to the ECC Operators and for post event analysis by Engineering staff.

With significant expansion and improvements to Maritime Electric's transmission system over the past number of years, the system has become increasingly complex. There have been significant changes and upgrades to equipment, much of which can be operated remotely from the ECC and, therefore it is

important that ECC Operators are well trained to respond effectively to system events. The SCADA Simulator is necessary for the ECC Operators to continuously test and monitor their skills to ensure they can respond appropriately to such events. The SCADA Simulator will be a valuable tool for testing and training ECC Operators to the required level of expertise by simulating contingency scenarios using real-time data to improve their troubleshooting and emergency response skills.

The proposed budget includes the purchase of the required computer hardware and external expertise to set up the simulation exercises and provide the necessary training to the ECC Operators. The estimate to complete all work associated with the SCADA Simulator Project is $121,000. Table 2 provides a breakdown of the total project cost.

Table 2
Project Cost

Description	
SCADA Simulator, License and Hardware	$ 47,000
Consultant	38,000
IT/Engineering	36,000
TOTAL	**$ 121,000**

Appendix B includes a budgetary quote for the SCADA simulator.

b. **Refurbish Energy Control Centre Roof (Justifiable) $ 25,000**

The ECC office building roof has a modified bitumen roof system. A 2016 thermal scan of the roof indicated that it is in fair condition; however, a poor quality drip edge detail is causing water to pond at the perimeter of the roof which is deteriorating the polyurethane coating. This project will cover the costs to improve the drip edge detail, repair the polyurethane coating, and make repairs to deteriorated mastic at pitch pockets and roof penetrations. The estimate to complete the roof repairs is based on costs for similar repairs completed in the past.

c. **Charlottetown Plant Miscellaneous Buildings and Services** **(Recurring)$25,000**

A provision has been made for a number of smaller projects that may be required throughout the year to extend the operating life of the buildings at the site or replace safety or other critical operating equipment as the Charlottetown Plant is transitioned to a long-term layup mode.

4.2 Charlottetown Plant Boiler Projects ***$ 8,000***

These expenditures relate to the boilers and boiler systems associated with the Company's thermal generating units. Boilers typically include numerous sub-systems required for operation such as: fuel oil system, combustion air system, burner safety management system, auxiliary steam system, feedwater system, sootblower system, boiler chemicals system, instrument air system, boiler furnace, boiler steam tubing, smoke stacks, emission monitoring system, boiler control and emission control equipment.

a. Miscellaneous Boiler Projects (Recurring) **$ 8,000**

A provisional amount is included in the budget for miscellaneous boiler related improvements required as the CTGS is transitioned to long-term layup, and for the purchase of replacement tools for the Charlottetown Plant's Machine Shop and Electrical & Instrumentation Shop. This budget amount has been substantially reduced from prior years in recognition of the planned decommissioning of the CTGS.

4.3 Charlottetown Plant Turbine-Generator Projects *$ 1,424,000*

This section covers expenditures associated with the 50 MW Combustion Turbine (CT3) and the steam turbines and generators at the CTGS. The steam turbines and generators include many subsystems such as: main steam system, auxiliary steam system, bleed steam system, lube oil system, relay oil system, cooling and auxiliary cooling water systems, air extraction system, condensate system, generator excitation system and vibration monitoring system.

a. Combustion Turbine 3 Turbo-Generator Overhaul (Justifiable) $ 1,235,000

Combustion Turbine 3 (CT3) was installed in 2005 and has been in service for 13 years. General Electric, the Original Equipment Manufacturer, has periodically issued Service Bulletins and Product Bulletins to Maritime Electric. These bulletins inform owners of potential issues that include safety, reliability, maintenance and performance benefits related to their combustion turbine-generator. In 2019, the Company plans to perform the first major overhaul of CT3 since its installation and incorporate many of the Service Bulletins and Product Bulletins to ensure the turbine's long term safety, reliability and performance. Accepted industry best practice suggests performing major overhauls on turbines every 10 years. Given the low operating hours on the turbine, this overhaul is scheduled 14 years after the turbine first went into service.

Appendix C describes the justification for the CT3 overhaul and inspection. It includes an internally prepared report outlining the planned work with supporting appendices containing the General Electric proposals.

b. Combustion Turbine Improvements and Spare Parts (Recurring)$ 189,000

It is Management's intent to place the generating units at the CTGS into long-term layup starting on March 1, 2019 starting with Unit 7. It has become standard practice for the plant's steam turbines to be inspected in preparation for being laid up each year. These inspections identify equipment replacements and upgrades as well as insulation replacements that must be completed before the next startup. This provisional amount is contingent on pre-layup inspection results from Unit 9 and Unit 10 which are planned to remain in service until January 1, 2022.

4.4 Borden Plant Projects *$ 143,000*

This category provides for expenditures related to the facilities at the Borden Plant which are stand-by and peaking units that also supply ancillary services needed for reliability purposes. The Borden Plant houses two diesel fueled combustion turbines ("CT1" and "CT2") which are rated at a combined output of 40 MW. This facility also includes: three diesel fuel storage tanks, a fuel tanker truck offloading facility, a maintenance building, two control rooms, lube oil storage building, two storage buildings for spare lengths of submarine cable, a 69 kV substation with two step-up transformers, and the adjacent 138 kV Borden Riser Station for submarine cables 3 and 4.

a. Miscellaneous Combustion Turbine Improvements (Recurring)$ 117,000

A provisional amount has been included in the budget to source spare parts and to implement turbine improvement work identified through regular inspections during the year.

b. Miscellaneous Buildings and Services Improvements (Recurring)$ 26,000

A provisional amount, based on previous experience, is included in the budget each year for needed refurbishment work including sandblasting, metal patching and replacement, and painting.

5.0 DISTRIBUTION

Maritime Electric's proposed 2019 capital expenditures on distribution was developed using the Company's Integrated System Plan and will focus on the replacement of aged infrastructure to maintain system reliability, improve energy efficiency and ensure continued compliance with all safety and environmental requirements. In addition, distribution assets will be installed to service new customers, modify existing service connections and address system load growth impacts. The Company's asset database, field inspection results and reliability data continues to be used to identify facilities and equipment for priority replacement.

5.1 Replacements Due to Storms, Collisions, Fire and Road Alterations *$ 1,418,000*

The proposed provisional amount for distribution asset replacements required due to storms, fire, motor vehicle accidents and road alterations was determined based on historical expenditures over the past five years as shown in Table 3 below. The proposed provisional amount is lower than the five year average because expenditures for significantly size road alterations and severe storms in 2015 and 2016 have been excluded.

Table 3
Replacements Due to Storms, Collisions, Fire and Road Alterations

	2014	2015	2016	2017	2018F
Expenditure	$1,415,152	$1,907,865*	$1,997,881**	$1,276,552	$1,432,000

* Includes expenditures due to severe ice storm on December 4, 2015 resulting in replacement of 111 broken poles, 14 damaged transformers and 5 kilometres of conductor.

** Includes expenditures due to successive severe snow, ice and wind storms between November 27, 2016 and December 1, 2016 resulting in replacement of 165 broken poles, 15 damaged transformers and 5 kilometres of conductor.

a. Replacements due to Storms, Fire and Collisions (Recurring) $ 891,000

The scope and severity of damage caused by storms and other adverse events can be highly variable from year to year. For this reason, the budgeted amount is a provisional cost estimation for labour and material that will be required in 2019 to replace distribution equipment (predominantly poles and wire) damaged as a result of events that are beyond the control of the Company.

b. **Replacements due to Road Alterations (Recurring)** **$ 527,000**

Each year, the Company relocates or replaces distribution assets to accommodate provincial and municipal government infrastructure projects such as sidewalk installations, sewer and water line extensions, road widening, road construction and bridge replacements. At the time that the 2019 Capital Budget was developed, government plans for infrastructure work in 2019 were not yet confirmed and therefore a provisional amount has been proposed based on historical spending.

5.2 Distribution Transformers *$ 4,168,000*

The purchase and installation of new distribution transformers and other related equipment is an annual recurring capital budget expenditure that is necessary to serve new customers, accommodate changes for existing customers and replace deteriorated or damaged units.

a. Polemount and Padmount Transformer Equipment (Recurring)$ 3,368,000

For polemount transformers, the historical annual requirement is approximately 39,200 kVA including units replaced under the Company's Spill Prevention Program. The requirement is expected to remain approximately the same for 2019 pending the results of a new in-situ testing program described in more detail below.

For padmount transformers, the historical annual requirement has been approximately 13,000 kVA including three units associated with the Transclosure Removal Program. This Program involves the removal and replacement of thirteen transclosures with an equivalent padmount transformer to align with current standards over a period of four years (2017 to 2020). Three transclosures will be replaced in 2019 and the final three will be replaced in 2020 to complete the Program.

b. Pre-1982 Polemount Transformers Life Extension (Mandatory)$ 800,000

Federal regulations state that all equipment transformers containing PCB with a concentration of more than 50 mg/kg must be removed from service by December 31, 2025. Maritime Electric estimates there will be approximately 2,500 pre-1982 pole top transformers remaining in the system in 2019 with the potential of having a PCB concentration of greater than 50 mg/kg.

Until recently, the only method of determining if a transformer contained PCBs was to remove it from service to collect an oil sample for analysis. In recent years, new improved work methods and equipment have made it possible to sample pole top transformers in-situ by using a special insulated tool that creates a small hole in the transformer case thereby enabling samples to be collected with a syringe. The hole is then plugged and the sample is collected for PCB

analysis. Photographs of pole top transformers in-situ testing are show in Appendix D. The in-situ testing will specifically identify the pre-1982 pole top transformers that need to be removed from the system due to PCB contamination. It is anticipated that approximately 5 per cent of the remaining 2,500 pre-1983 pole top transformers may have a PCB concentration of more than 50 mg/kg and will need to be replaced. The budget includes the replacement of these transformers. The alternative to in-situ testing is to replace 2,500 transformers at an average cost of $2,226 for a total of $5,565,000.

5.3 Services and Street Lighting *$ 4,375,000*

The proposed budget allocation allows for the construction of service lines to connect new customers, the refurbishment of aged service lines, the installation of new street lights and replacement of existing street lights with new energy efficient LED fixtures. The service line expenditures are expected to be partially offset by customer contributions for construction charges as set by the General Rules and Regulations.

The proposed provisional budget is based upon historical spending over the past five years as shown in Table 4 and reflects an upward trend in services each year.

Table 4
Services and Street Lighting

	2014	2015	2016	2017	2018F
Expenditures	$3,787,503	$4,078,108	$4,289,762	$4,882,276	$4,384,000

a. New Overhead and Underground Services (Recurring) $ 3,595,000

The number of overhead and underground new services fluctuate from year to year; therefore, the budgeted amount for labour and material to install or replace overhead and underground services is a provisional estimate based on historical customer requests.

b. Street and Area Lighting (Justifiable) $ 780,000

The Company continues to replace existing high-pressure sodium (HPS) and mercury vapour (MV) light fixtures with energy efficient light emitting diode (LED) fixtures under the Commission approved Conversion Program which began in 2015. The budget amount allows for the replacement of approximately 750 LED street lights through the Conversion Program. The budget amount also includes the installation of approximately 150 LED street and yard lights based upon the historical level of customer requests and light replacements due to fixtures reaching the end of their useful life.

5.4 Line Extensions *$ 2,928,000*

Line extension projects can be customer driven but can also provide a way to cost effectively redistribute system loads by reconfiguring circuits or establishing new circuits for overall improvements in system reliability and operability. The proposed budget allocation for line extensions was established based on historical expenditures for customer driven work and specific projects described in Appendix E. Customer driven line extensions are expected to be partially offset by customer contributions.

a. Customer Driven Line Extensions (Recurring) $ 1,623,000

Line extensions to accommodate customer requests can involve both upgrades to existing infrastructure and new construction of single phase and three phase distribution lines to serve all types of customers and customer driven supply requirements. The proposed budget reflects historical spending for customer driven line extensions over the past four years as shown in Table 5 below. At the time that the 2019 Capital Budget was developed, the Company was unaware of any significantly sized line extensions in 2019 and therefore the provisional amount has been budgeted based on 2014 and 2015 expenditures.

Table 5
Customer Driven Line Extensions

	2014	2015	2016	2017
Expenditure	$1,691,125	$1,687,655	$2,857,984*	$2,133,350*

* There were significantly sized line extensions in 2016 and 2017 in Milligan's Wharf, Heatherdale Road and Newton Road.

b. Reliability Driven Line Extensions (Justifiable) $ 1,305,000

Line extensions to improve system reliability include the following projects:

i. West Royalty Substation 3rd Circuit
ii. Bonshaw Circuit (West River Bridge)

Project details and justification of these projects are shown in Appendix E.

5.5 Line Rebuilds — *$ 4,245,000*

The projects and programs proposed in the line rebuilds budget category enable the Company to address the timely replacement of aged infrastructure, improve reliability and voltage levels, reduce electrical losses and improve safety for workers by upgrading the system to meet current construction standards. The Company's asset database, field inspection results and reliability data serve as the primary tools for prioritizing single and three phase rebuilds, pole and component replacements and other reliability improvement activities. Telecommunication companies also periodically request joint use pole replacements or line upgrades to accommodate additional communication infrastructure. Such types of capital expenditures are often partially offset by a contribution from these third parties.

a. Single Phase and Three Phase Rebuilds (Justifiable) — $ 2,115,000

The budget provides for the rebuilding of single phase and three phase distribution lines including joint use lines. Projects are prioritized for rebuild based on the condition of poles and wire, length of spans, historical reliability issues associated with the line and historical and projected load growth in this area.

The planned rebuilds will improve both reliability and voltage stability, allow for future load growth and, in many cases, lead to a reduction in losses. The rebuilds will also improve safety for Company employees by implementing modern construction standards with safer line clearances and updated equipment. The majority of the rebuilds planned for 2019 are in areas that contain eastern cedar poles that are more than 40 years old and have damaged or deteriorated conductor.

The following single phase and three phase line rebuilds are planned for 2019:

i. Union Road Single Phase Rebuild (4.2 kilometres)
ii. Union Road Three Phase Rebuild (1.4 kilometres)
iii. Iona Road Single Phase Rebuild (7.8 kilometres)
iv. Howlan Road Single Phase Rebuild (4.8 kilometres)
v. Northport Three Phase Rebuild (1.8 kilometres)
vi. North Carleton Road Three Phase Rebuild (2.0 kilometres)

vii. Crapaud TCH Three Phase Rebuild (0.8 kilometres)

Additional project details and justifications are provided in Appendix F.

b. <u>Distribution Line Refurbishment</u> (Justifiable) $ 680,000

The Company owns and operates in excess of 5,200 kilometres of distribution lines in both rural and urban environments. In 2017, the Company initiated a Distribution Inspection Program as a proactive way to improve reliability by identifying components of the distribution system that are unsafe or at risk of failure. The Program was designed to ensure that all overhead primary distribution lines are subject to a detailed ground inspection every six years.

The timely refurbishment of distribution lines plays a critical role in extending and/or maintaining their lifespan, enhancing employee and public safety, and improving system reliability by reducing the probability of component failure. Photographs of deficiencies identified through the Program are shown in Appendix G.

The proposed provisional budget will allow for the inspection of feeders identified in Table 6 and for the prioritization of replacement of deteriorated assets such as poles, crossarms, conductor and hardware. The locations of the feeders are provided in Figure 3.

Table 6
Distribution Feeder Inspections Planned

Feeders	Kilometres	Number of Customers
Rennies Road	170	617
Malpeque	148	1,313
Eldon-Belfast	209	1,411
Crapaud	100	1,159
O'Leary	243	2,461
TOTAL	**870**	**6,961**

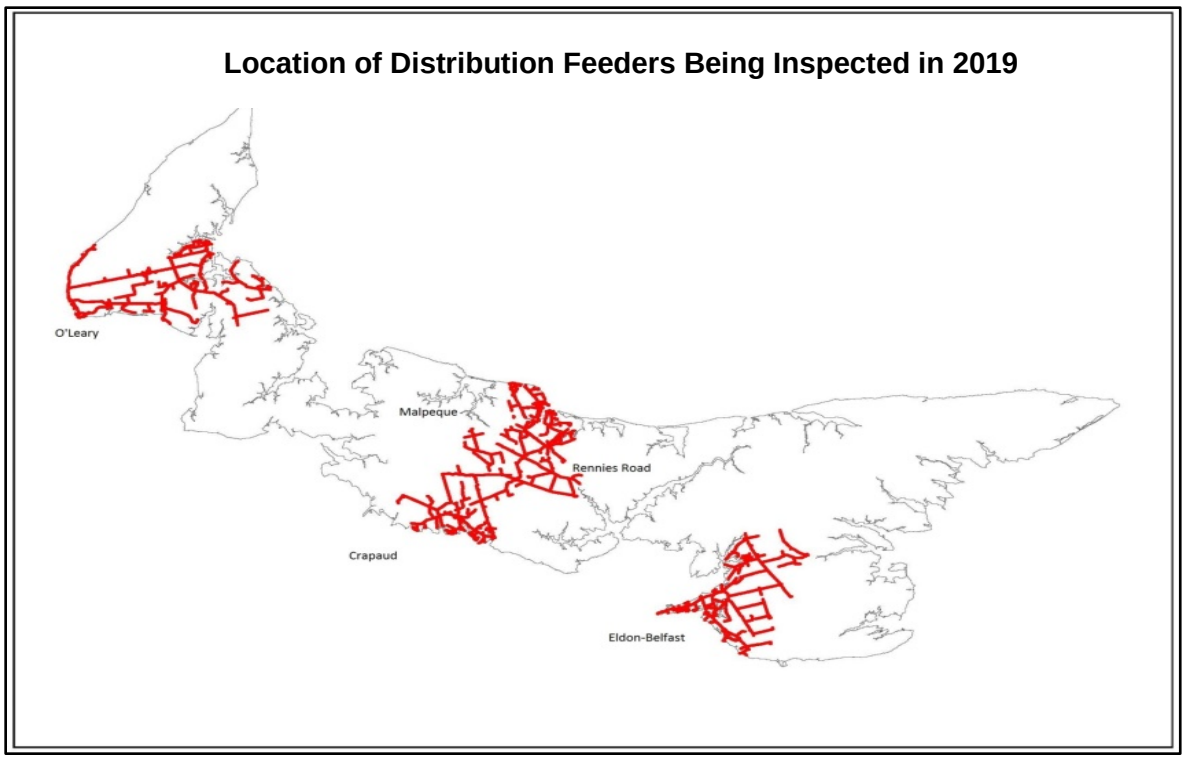


Figure 3: Location of Distribution Feeders Being Inspected in 2019

c. **<u>Accelerated Distribution Component Replacement</u> (Justifiable)$ 1,450,000**

The proposed budget for Accelerated Distribution Component Replacement, formerly limited to the replacement of porcelain cutouts, will be expanded in scope to encompass the accelerated replacement of eastern cedar poles. Justification for the Accelerated Distribution Component Replacement programs is provided below.

i. ***Porcelain Cutout Replacement Program $ 300,000***

The Porcelain Cutout Replacement Program began 10 years ago in 2008. Before the program was implemented, the frequent failure of porcelain cutouts was negatively impacting system reliability and was a concern for employee safety. Over the past several years, there has not been a safety incident reported as a result of a cutout failure. To date, there has been a significant reduction in outages attributed to cutout failures as a result of the program as shown in Figure 4.

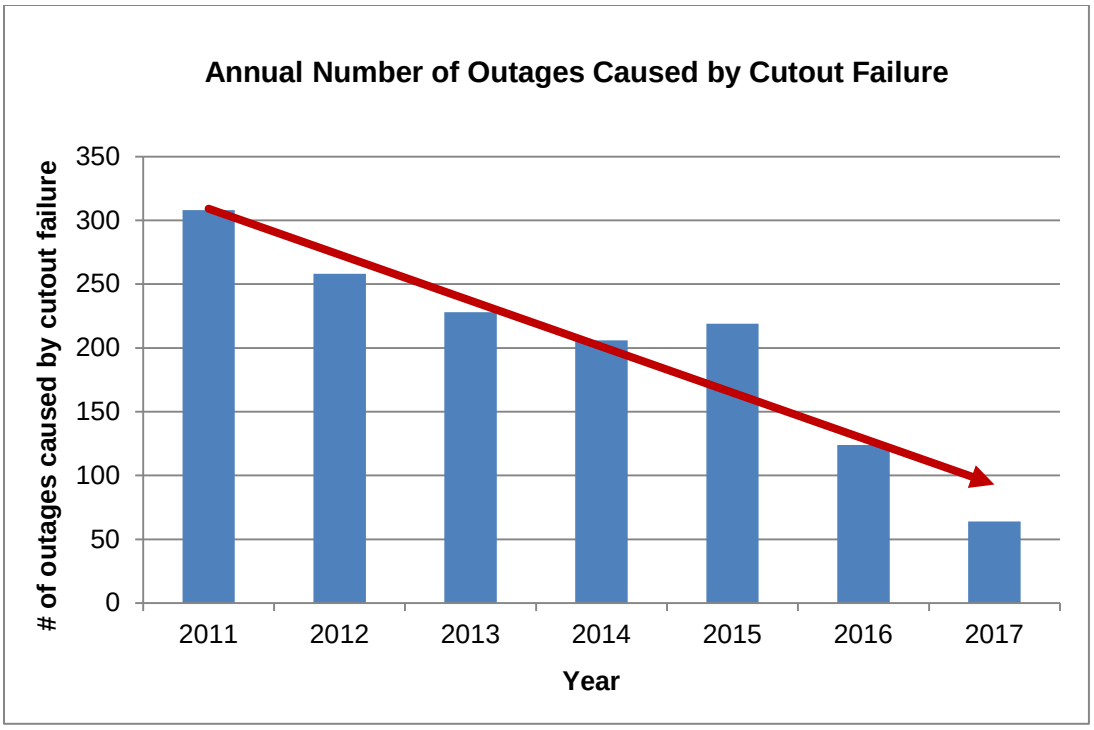


Figure 4: Annual Number of Outages Caused by Cutout Failure

The reduction in the number of outages and safety incidents caused by cutout failures points to the effectiveness of these types of replacement programs. In 2019, Porcelain Cutout Replacement Program will be scaled back from historical levels of approximately 2,500 porcelain cutout replacements per year to 500 replacements in 2019.

The Program is justified based on the need to maintain safe working conditions for the employees and the public and the need to maintain reliable electrical service.

ii. Eastern Cedar Pole Replacement Program $ 1,150,000

The vast majority of eastern cedar poles in the Company's distribution system are approximately 40 years of age. These poles are currently being replaced through a combination of rebuild projects and storms at a combined rate of approximately 900 per year. At this current rate of replacement, it will take close to 20 years to replace the approximately 17,000 eastern cedar poles that remain in the system.

In the Spring of 2018, the Company engaged EDM International Inc. (“EDM”) to conduct an independent assessment of the eastern cedar poles that comprise approximately 14 per cent of the total poles in the distribution system. The data resulting from the field inspection and testing component (see Appendix H) indicates that the strength of more than half of the eastern cedar poles tested has deteriorated to 60 per cent (or less) of required capacity. The Canadian Standards Association requires 60 per cent of remaining strength for poles to remain in service without rehabilitation. As such, these poles pose significant safety concerns that warrant an accelerated replacement approach.

The proposed Eastern Cedar Pole Replacement Program will increase the replacement rate to approximately 1,500 poles per year (an incremental addition of 600 poles) and reduce the timeframe for substantial removal to approximately 10 to 12 years.

The Program is justifiable based on the need to replace aged end-of-life poles as well as the need to maintain safe, reliable electrical service.

5.6 System Meters — *$ 655,000*

This amount provides for the purchase and installation of revenue metering and associated equipment. Table 7 shows historical spending over the past five years. The proposed provisional budget reflects a similar budget to 2018 with the addition of Bridge meters required for load research.

Table 7
System Meters

	2014	2015	2016	2017	2018F
Expenditures	$654,454*	$415,481*	$466,266	$441,884	$591,000

* Included the conversion of the combination meters to digital RI combination meters.

a. Watt-hour Meters (Recurring) — $ 263,000

The 2019 budget for RF remote interrogation watt-hour meters includes a provision for new service installations during the year, an allowance for the replacement of damaged or failed units and new replacement RF watt-hour meters to permit annual sample testing of approximately 724 meters to ensure compliance with Industry Canada/Measurement Canada Standards.

The forecast below for new meters for 2019 is based upon the anticipated rate of customer growth, historical equipment damage and failure rates as well as the requirement to conduct annual compliance testing.

Single phase – customer growth, replacements and annual testing	868
Network and three phase meters	438
Total	1,306

b. Combination Meters (Recurring) — $ 144,000

The budget amount for 2019 provides for the purchase and installation of new combination meters that measure both demand and energy consumption. The proposed budget amount for new meters is required to meet forecast customer growth levels and to replace combination meters due to damage, failure or customer service size upgrades.

In addition, the budget amount provides for the performance of in-situ meter installation tests (potential transformers and current transformers) to confirm accuracy. Measurement Canada recommends the testing of meter installations on an 8 year cycle.

Customer Growth	54
Replacements due to upgrades, damage and failure	40
Total	94

c. Miscellaneous Metering Equipment (Recurring) $ 34,000

This provides for the purchase of metering equipment such as potential transformers, current transformers, cabinets, security bands, sealing rings, locks, meter covers, load limiters, cable connectors, meter adapters, test blocks, phase indicators, neutral isolators, communication cables and media converters for interval meters, DC breakers and disconnect sleeves.

d. Outdoor Metering Tanks (Recurring) $ 114,000

Metering tanks are used in both the Company's substations and in specific customer applications where customers are metered at either transmission or primary voltage levels. The budget amount provides for the purchase of four metering tanks and is based on historical expenditures.

e. Bridge Meters for Load Research (Justifiable) $ 100,000

Maritime Electric operates under a cost of service regulatory model whereby the utility's rates are intended to recover the cost of providing electricity service to customers. To enable an assessment of the fairness of the rates charged to each of the customer classes, the Company periodically does a cost allocation study. The results of the cost allocation study provides a benchmark to guide rate design. The basic approach followed in a cost allocation study is to break down the costs into demand costs, energy costs and customer costs and allocate the appropriate share of these costs to each customer class. For energy costs and customer costs this is relatively straightforward because the number of kilowatt-hours used by each customer class and the number of customers in each customer class are known quantities. However, allocating the demand costs are

not straightforward because the maximum load for some of the customer classes is not known exactly and cannot currently be measured directly. This is the case for the Residential and General Service customer classes which together represent approximately 85 per cent of Maritime Electric's load. The allocation of demand costs to these customer classes relies on estimates of their peak loads. These estimates are based in part on load research done in the early 1990s. That research involved collecting hourly load data for a representative sample of Residential and General Service customers that was then used to improve the estimates of coincident and non-coincident peak loads for those customer classes in subsequent cost allocation studies.

To provide more up-to-date input for the next cost allocation study, the Company is proposing to collect hourly load data for a sample of Residential and General Service customers in preparation for the next cost allocation study. The budget amount is for the purchase and installation of 400 Bridge meters on a random selection of Residential and General Service customers. Bridge meters are designed to capture customer usage information which will be used to determine the demand costs for Residential and General Service customers.

5.7 Distribution Equipment — *$ 2,033,000*

a. System Equipment (Recurring) — $ 1,809,000

This provides for the replacement of aged equipment used to provide voltage support, communications and for protection and control of the Company's assets as shown in Table 8. The ongoing investment in system equipment is essential to provide ongoing reliable service to customers. Unplanned failures due to aged equipment can be expensive and reduce reliability of service to customers. Some of these assets will only require replacement parts to extend the life of the asset while others will require a complete replacement.

Table 8

Proposed System Equipment Replacement for 2019

System Equipment Description	Material	Labour	Total
i. Voltage Regulators, Reclosers, Controllers, Circuit Breakers and Power Transformer Upgrades	**$ 453,000**	**$ 233,000**	**$ 686,000**
Electronic Reclosers (Quantity of 4)	$ 110,000	$	$
Recloser Controllers to Replace Obsolete Controllers (Quantity of 2)	$ 12,000	$	$
Voltage Regulator Controls Replacement (Quantity of 5)	$ 20,000	$	$
Voltage Regulators (Quantity of 6)	$ 150,000	$	$
Capacitor Bank Controllers (Quantity of 3)	$ 10,000	$	$
Capacitor Banks and Parts (Quantity of 2)	$ 20,000	$	$
Voltage Regulator and Recloser Parts – Upgrades	$ 10,000	$	$
Power Transformer Parts	$ 6,000	$	$
Transformer Oil	$ 30,000	$	$
Transformer Oil Reconditioning	$ 10,000	$	$
69 kV and 138 kV Breaker Contacts – Upgrades	$ 25,000	$	$
Annual Dissolved Gas Analysis	$ 25,000	$	$
Tap Changer Contacts - Auto transformer Upgrades	$ 25,000	$	$
ii. Teleprotection and Relay Replacement	**$ 120,000**	**$ 62,000**	**$ 182,000**
Teleprotection and Relay Replacement Equipment	$ 120,000	$	$
iii. Communication Equipment Replacements	**$ 448,000**	**$ 231,000**	**$ 679,000**
Aging Battery Bank Replacement (Quantity of 1)	$ 20,000	$	$
Replacement of LEDR Radios (2 sites per year)	$ 20,000	$	$
Communication Equipment Replacements	$ 75,000	$	$
SCADA RTU Retro – Fit Parts	$ 10,000	$	$
Fault Indicators	$ 20,000	$	$
Vehicle Antenna (Radio and RF Meters)	$ 3,000	$	$
Backbone Communication System Upgrade	$ 300,000	$	$
iv. Distribution	**$ 135,000**	**$ 69,000**	**$ 204,000**
Recloser By-Pass Switch	$ 20,000	$	$
13.8 kV City Circuits Switches	$ 100,000	$	$
Voltage Regulator By-Pass Switch	$ 15,000	$	$
v. Test Equipment	**$ 58,000**	**$**	**$ 58,000**
Doble Power Factor Test Equipment	$ 30,000	$	$
Meter Shop Equipment	$ 28,000	$	$
TOTAL	**$ 1,214,000**	**$ 595,000**	**$ 1,809,000**

Table 9 i. **Voltage Regulators, Reclosers, Circuit Breakers and Power Transformer Upgrades**

The Company has 27 substations and over 5,200 kilometres of overhead distribution lines with equipment such as reclosers, voltage regulators, capacitor banks, power transformers and circuit breakers. The need to replace equipment is determined on the basis of equipment condition, age, test results and operational history of the equipment. An adequate amount of spare equipment is budgeted based on past experience, engineering judgement and historical expenditure. Equipment procurement is obtained through a competitive tendering process to ensure the best possible pricing is achieved.

As Figure 5 indicates, the average age of the reclosers in the system is approximately 16 years. However, there are still some reclosers in the system that are over 40 years old and approaching the end of their useful life. Examples of the reclosers in need of replacement are included in Appendix I.

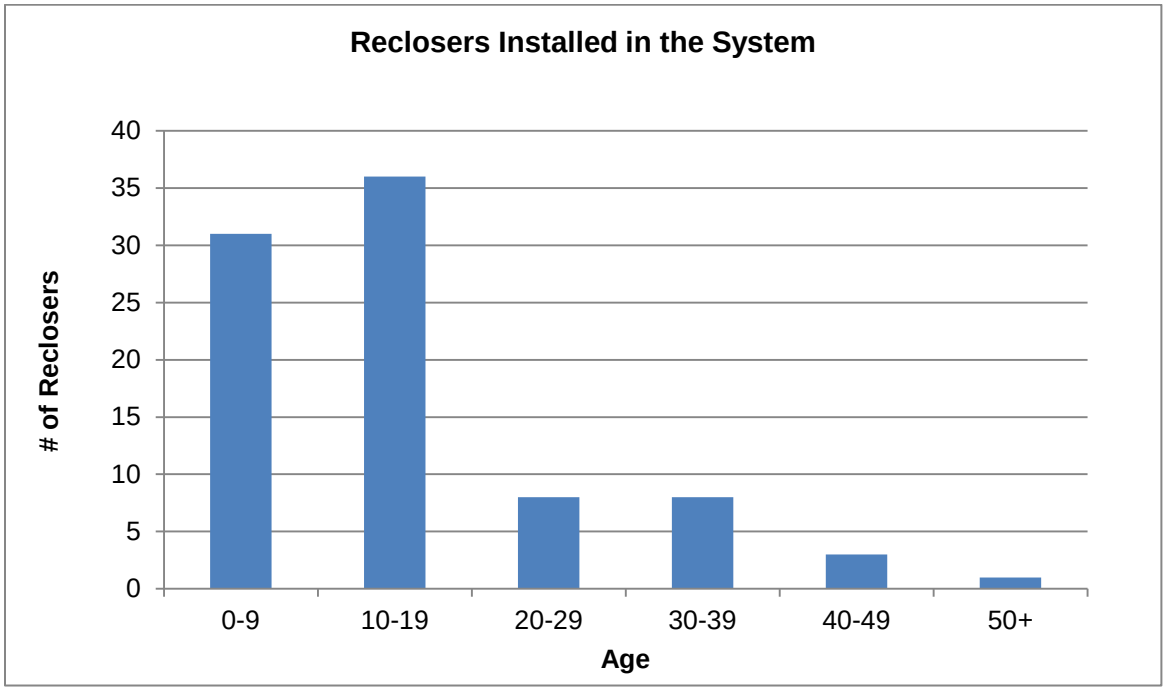


Figure 5 – Reclosers Installed in the System

As Figure 6 indicates, approximately 14 per cent of the voltage regulators installed in the system are over 40 years old and approaching the end of their useful life. An example of a voltage regulator in need of replacement is included in Appendix J.

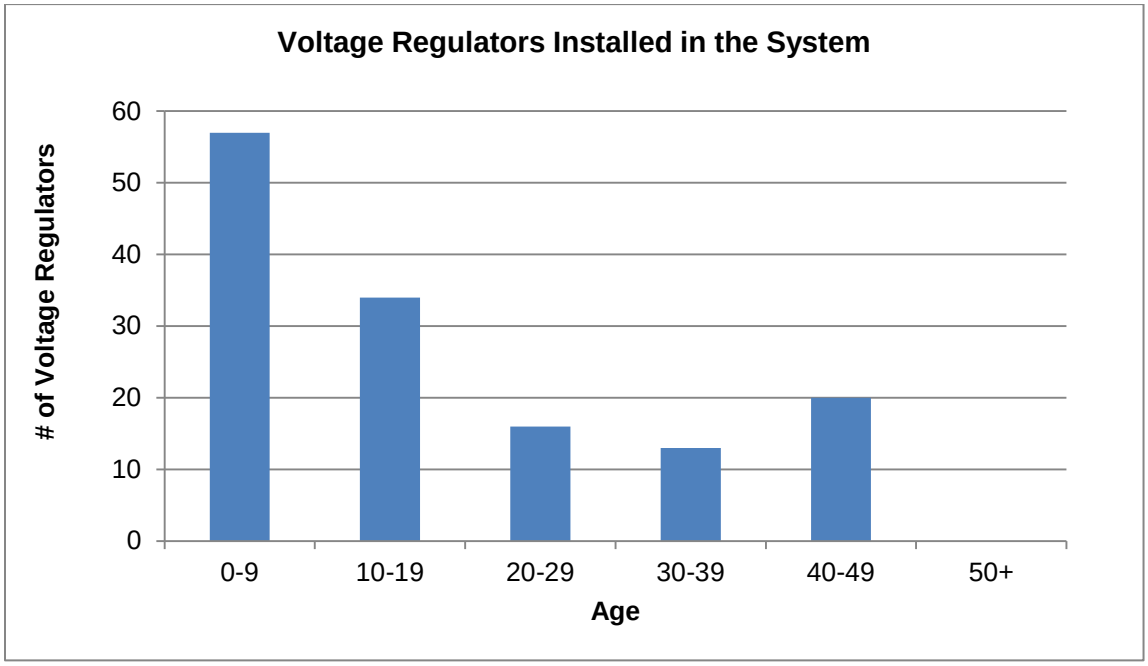


Figure 6 – Voltage Regulators Installed in the System

As Figure 7 indicates, approximately 31 per cent of the capacitors installed in the system are over 40 years old and approaching the end of their useful life. An example of a capacitor bank and oil switch in need of replacement is included in Appendix K.

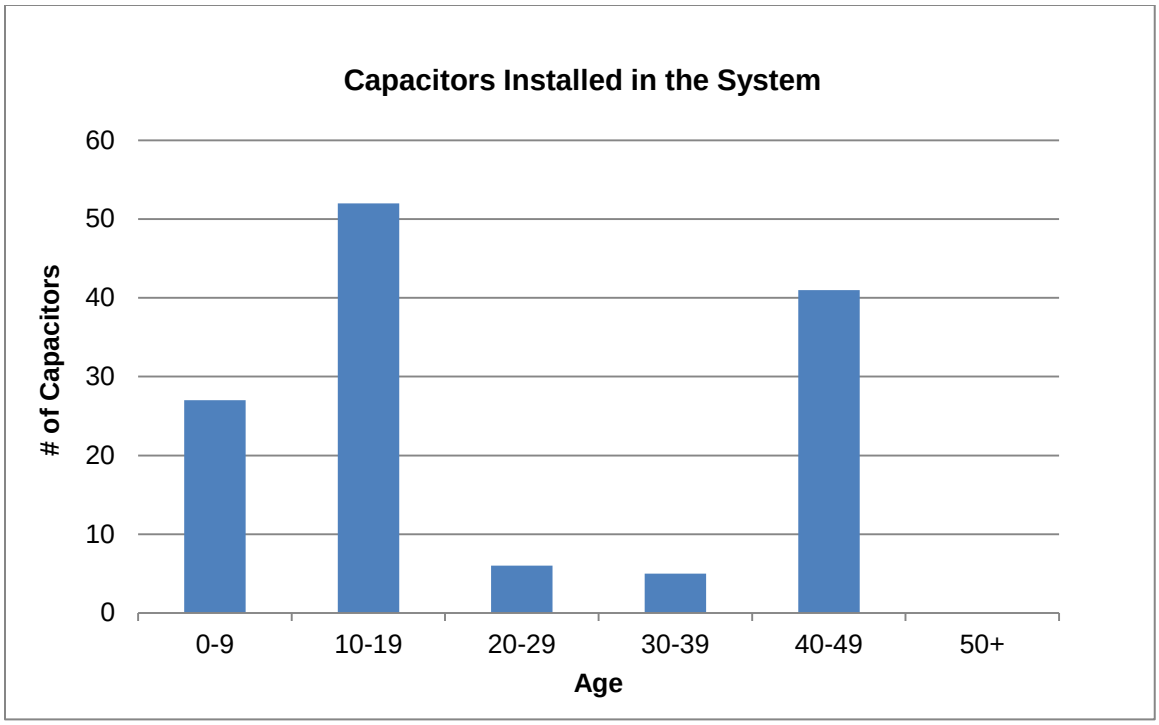


Figure 7 – Capacitors Installed in the System

Table 9 ii. **Teleprotection and Relay Replacement Equipment**

Teleprotection devices are typically used for the Cable Overload Schemes and to control transmission capacitor banks for the Cable Under Voltage and Over Voltage Protection Schemes. Teleprotection equipment will be installed in Charlottetown, Lorne Valley and Church Road to replace the existing GARD equipment originally installed in 2006 because the existing equipment cannot be used to control transmission capacitor banks or cable over load schemes.

New generation, microprocessor-based relays offer a host of advantages compared to electromechanical relays because of their capabilities and programming versatility. One microprocessor-based relay replaces several electromechanical relays resulting in cost and efficiency advantages. Electromechanical relay replacements are planned for Y-111, X-5 and X-6 in West Royalty Substation and 138 kV Bus/Transfer Bus in the Bedeque Station.

Table 9 iii. **Communication Equipment Replacements**

The Company has 43 communication sites comprised of a 7 GHz microwave and fibre backbone system and spur system comprised of major equipment including microwave radios, towers, fibre transmission system, IP based multiplexer equipment, spur radio system, SCADA system and battery backup system. The need to replace equipment is determined on the basis of equipment condition and reliability. An adequate amount of spare equipment is budgeted based on past experience, engineering judgement and historical expenditures. Equipment procurement is obtained through a competitive tendering process to ensure the best possible pricing is achieved. In 2019, the plan is to replace Local Area network ("LAN") switches and routers at the spur substations/repeater site at Alberton and Mount Pleasant. These switches were installed in 2008 and do not have any additional ports available for new connections to interface with wind farm communication upgrades.

Backbone Communication System Upgrade

Equipment that Maritime Electric uses for routing the SCADA and teleprotection traffic on the 7 GHz Island wide communication backbone system was installed in 2008. Routers and LAN switches no longer have redundancy with the addition of new substations and growth of the communication system over time. The backbone system needs to be redundant to minimize SCADA and teleprotection outages.

In 2019, the plan is to replace LAN switches and routers at ECC, West Royalty Substation and Rollo Bay and Summerville repeater sites. The addition of two new routers for Church Road is also required in 2019. A total of eight routers (two per site for redundancy) and associated LAN switches are required.

The budget to complete all the work associated with the backbone communication system upgrade is provided in Table 9.

Table 9 Backbone Communication System Upgrades Project Cost	
Description	
Material (routers and LAN switches)	$ 250,000
Consultant	$ 50,000
Internal labor	$ 20,000
Project Management	$ 30,000
TOTAL	**$ 350,000**

Table 9 iv. **Distribution**

This provision is for the replacement of six 13.8 kV switches in the City of Charlottetown based on findings of an ongoing switch inspection program. The budget also includes a provision for bypass switches used for bypassing recloser and voltage regulators when performing maintenance.

Table 9 v. **Test Equipment**

This budget amount provides for the purchase of power quality test equipment, voltmetres and meter test equipment as required.

b. **Line Equipment (Justifiable)** **$ 224,000**

This budget amount provides for the replacement of line test equipment such as hotline sticks, phasing sticks, potential indicators, ground mats, hard and rubber cover-up and fall arrest equipment, survey equipment and material handling equipment such as presses and dies, running blocks and chain hoists. The proposed budget reflects historical spending over the past five years as shown in Table 10 and is adjusted by $45,000 to include the purchase of an insulated mechanical device that can be attached to the end of an aerial boom to perform energized work safely and efficiently minimizing disruption of service to customers.

Table 10 Line Equipment Expenditure History					
	2014	**2015**	**2016**	**2017**	**2018F**
Expenditures	$155,729	$186,603	$169,448	$160,469	$200,000

5.8 Transportation Equipment (Work Support Services) *$ 1,642,000*

The Company's transportation fleet consists of large line vehicles with aerial and/or digger attachments, cars, small trucks, vans, pole and wire trailers and other related equipment. Large line vehicle replacements are planned based on the age and condition of the unit. The life span of these units average from 10 to 12 years with the aerial units lasting longer than the digger units. Small vehicle replacements depend on age, mileage and type of service; however, the life span typically averages from 5 to 10 years. Table 11 outlines the proposed expenditure for 2019. The transportation equipment justification report is included in Appendix L.

Table 11
Proposed Transportation Equipment - 2019

	Description	Location	Age (Yrs)	Mileage (km)	2017 Maintenance Cost	Replacement Cost
1.	Hiab Boom Truck	Stores	9	125,000	$ 7,000	$ 142,000
2.	Aerial Bucket Truck	Central Line Dept.	16	250,000	$ 30,500	$ 475,000
3.	Aerial Bucket Truck	Eastern Line Dept.	13	368,000	$ 17,600	$ 443,000
4.	1/2 Ton Truck	Engineering	12	110,000	$ 3,600	$ 37,000
5.	Honda CRV	Central Meter Reader	9	230,000	$ 3,200	$ 37,000
6.	Toyota Rav4	Properties	14	335,000	$ 1,000	$ 37,000
7.	GMC Van	Meter Dept.	12	265,000	$ 3,100	$ 63,000
8.	Tacoma 4x4	Survey Dept.	11	350,000	$ 3,800	$ 37,000
9.	Tacoma 4x4	Technical Services	11	330,000	$ 3,000	$ 37,000
10.	Ford F-150 4x4	Eastern Line Dept.	12	265,000	$ 3,800	$ 42,000
11.	Honda Element	Survey Dept.	11	340,000	$ 3,600	$ 42,000
12.	Ford F-150 4x4	Mechanical Maintenance	13	200,000	$ 2,300	$ 42,000
13.	1-Pole Trailer	Line Dept.	-	-	-	$ 30,000
14.	Wire Tensioning Trailer	Line Dept.	-	-	-	$ 103,000
15.	Allowance for unforeseen capital expenditures					$ 75,000
TOTAL						**$ 1,642,000**

6.0 TRANSMISSION

The Transmission category reflects the Company's proposed activities for the expansion and replacement of the 69 kV and 138 kV transmission system using the Company's Integrated System Plan as a guideline. This includes transmission lines, substations, power transformers and protection devices such as circuit breakers.

6.1 Substation Projects *$ 5,002,000*

a. Lorne Valley 69 kV Switching Station Expansion (Justifiable) $ 2,820,000

The Lorne Valley Switching Station, located at #4494 48 Road, is a key switching station serving eastern PEI. Currently, there are three 69 kV transmission lines and two 69 kV breakers at this location. Transmission line T-10 radially supplies three distribution substations with approximately 6,800 customers in the Scotchfort, Montague and Wood Island areas. Transmission line T-2 is a looped line connected to the Charlottetown Plant Substation and supplies one distribution substation with approximately 6,400 customers in the Stratford area. Transmission line T-8 is another looped line which is connected to the Church Road Substation and supplies three distribution substations with approximately 6,000 customers in the Georgetown, Dingwells Mills and Souris areas. This transmission line also interconnects 60 MW of wind generation in eastern PEI.

The PEI-NB interconnection in Borden, combined with increasing central and eastern PEI load, has required the addition of 10 MVAr of transmission-connected capacitors at Lorne Valley to improve voltage. This requires an expansion to the substation footprint to meet current construction standards and ensure electrical clearances are maintained.

The Lorne Valley Switching Station was originally built with old construction standards. Safety clearances have improved since that time and it is difficult to complete maintenance and repairs at the substation in a safe manner without customer outages. As shown in Appendix M Photo 1, the Switching Station was originally built with wood poles and cross arms. The 69 kV Oil Circuit Breakers for T-8 (Breaker #852) and T-10 (Breaker #854) were installed 32 years ago and

have a significant number of operations. There is currently no breaker in Lorne Valley for T-2 transmission line, and as a result, any faults on this transmission line will result in an outage to approximately 19,000 customers in eastern PEI. With the completion of Y-104 transmission line in 2017, a looped supply has been formed by Y-104, T-8 and T-2 and adding a breaker on T-2 at Lorne Valley will reduce the number of customers affected by a fault on this line to approximately 6,400. In addition, protection coordination with the wind generation facilities in eastern PEI will also be enhanced.

Appendix M Figure 1 shows the existing single line diagram for Lorne Valley. The new design will incorporate a breaker for T-2 transmission line at the Lorne Valley Switching Station which will improve reliability for customers in eastern PEI. The new breaker will allow faults on T-2 between Charlottetown and Lorne Valley to be cleared without an outage to the eastern PEI load.

In 2019, the Company is proposing to rebuild the Lorne Valley Switching Station on the existing property adjacent to the existing station, as shown in Appendix M Photo 2. The new reconfigured switching station will be constructed using steel structures and will have a high reliability protection arrangement by utilizing a ring bus design with four breakers for transmission lines T-2, T-8, T-10 and the 10 MVAr capacitors. Appendix M Figure 2 shows the single line diagram for the proposed expansion. The substation design will also incorporate a future 138 kV connection into Lorne Valley which will be required when the island load grows to 350 MW which is forecast to occur in 2030. As shown in Appendix M Figure 3, the new design will allow for this expansion.

The project is justified based on the need to maintain safe, reliable electrical service, improve voltage support and improve reliability in Eastern PEI. A cost breakdown (including materials and labour) is shown below in Table 12.

Table 12 Lorne Valley Substation Construction Costs	
Description (includes material and labour)	**Cost**
Civil Works	$ 217,000
Foundations	287,000
Ground Grid and Fencing	203,000
Equipment	1,443,000
Steel/Bus Works	670,000
TOTAL (includes material and labour)	**$ 2,820,000**

b. **15/20 MVA Airport Power Transformer Replacement (Justifiable)$ 1,100,000**

There are approximately 11,000 customers connected to the 25 kV distribution system in central PEI. This 25 kV distribution system is supplied by two substations, the Airport Substation and the West Royalty Substation. The Airport Substation has a 7.5/10 MVA transformer and supplies approximately 2,400 customers including the Charlottetown Airport and customers along the Brackley Point Road and Winsloe Road areas. The West Royalty Substation has two 15/20 MVA power transformers and supplies approximately 8,600 customers in the West Royalty Business Park, Biocommons Industrial Park, Cornwall, Bonshaw and Argyle Shore areas.

The 25 kV distribution system described above has seen significant customer growth in recent years, with electrical demand increasing approximately 12 per cent from 2016 to 2018. In addition, several large commercial loads are being added at the Biocommons Industrial Park and Airport Industrial Park and a new hotel on the Trans-Canada Highway in Charlottetown starting in 2019. As a result, the West Royalty and Airport 25 kV load is expected to exceed the combined transformer capacity of 50 MVA between 2020 and 2021 as shown in Figure 8 below and additional transformer capacity is required in order to continue to provide reliable service to customers in this area.

Options for adding transformer capacity to this system include expanding the existing West Royalty Substation and adding a third power transformer, expanding the Airport Substation and adding a second power transformer,

constructing a new substation in the area and transferring customer load to this new substation or upgrading the size of the existing transformers at the West Royalty and Airport Substations. Because the existing 7.5/10 MVA transformer at the Airport substation is currently 46 years old, continues to show signs of deterioration and has been repaired on several occasions, it is recommended that the existing transformer at the Airport Substation be replaced with a 15/20 MVA transformer. This will increase the overall capacity of the 25 kV distribution system supplied by the Airport and West Royalty Substations to 60 MVA. See Appendix N for a photo of the existing 7.5/10 MVA power transformer.

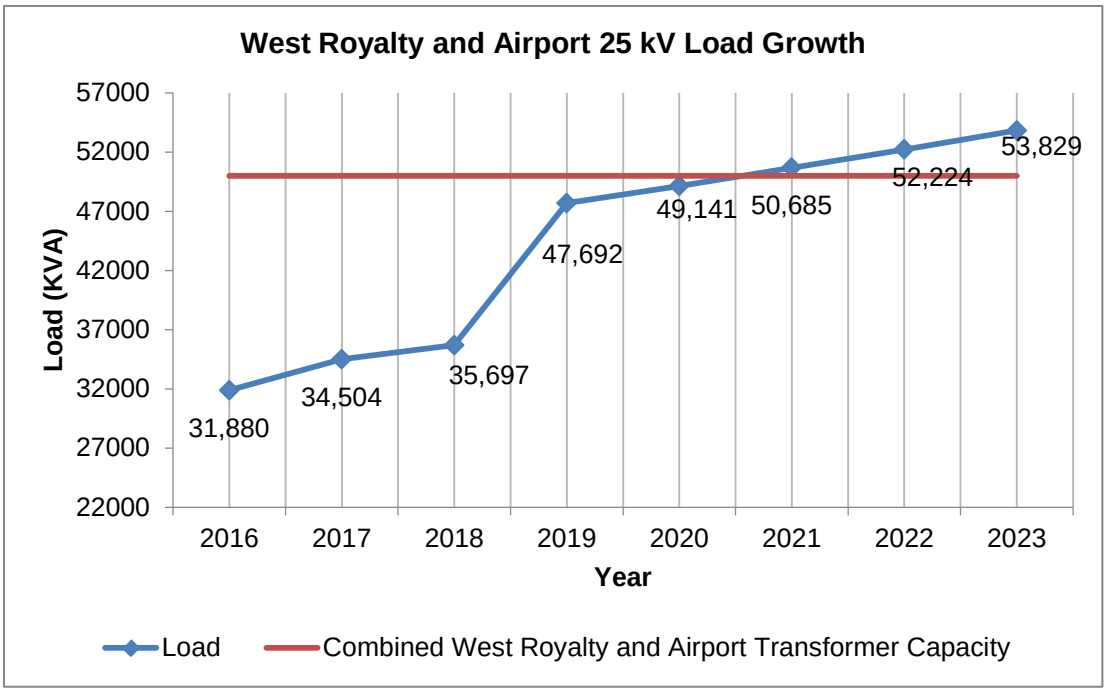


Figure 8 – West Royalty and Airport 25 kV Load Growth

The project is justified based on the need to address the capacity issue of the 25kV distribution system in central PEI and to replace the aged and deteriorated transformer currently in service at the Airport Substation.

c. <u>Substation Engineering and Environmental Assessment</u> (Justifiable)

$ 263,000

The Company is proposing to build a new substation in the New Haven area and a 138 kV/69 kV transmission interconnection in O'Leary ("O'Leary

Interconnection Project") in the near term. The New Haven Substation project has multiple benefits including improved reliability for customers, a reduction in system losses, and additional transformer capacity. The New Haven Substation is required to off-load the West Royalty and Airport Substations as the load continues to grow in these areas. If load growth exceeds the projected forecast, the New Haven Substation may be required earlier than anticipated. The O'Leary Interconnection Project will interconnect two existing transmission lines, Y-115 and T-21, at a new substation in the O'Leary area. This will improve the voltage and reliability in western PEI with the establishment of a transmission loop.

Detailed engineering studies will be completed to determine the best location for the substations taking into account the transmission source, proximity to the customer load, and loss savings. A preliminary estimate for the New Haven Substation and O'Leary Interconnection Project are $3.5 million and $7.8 million, respectively. In future Capital Budget Applications, the Company will provide detailed evidence of these projects after the engineering assessments are completed, including the total amounts and estimated timelines. Because of the long lead time required to complete the engineering and environmental assessment and public consultation for projects similar in nature and because of the uncertainty of the load growth, the Company is proposing to complete the engineering assessment, Environmental Impact Assessment ("EIA"), public consultation and land purchase for both projects several years in advance.

d. <u>Substation Modernization Program</u> (Justifiable) $ 685,000

The items identified for the Substation Modernization Program in 2019 are shown in Table 13.

Table 13
Substation Modernization Program for 2019

Proposed Work	Material	Labor	Total
i. Ground Grid Modernization	$ 80,000	$ 50,000	$ 130,000
ii. Substation Security – Camera Installation	$ 50,000	$ 20,000	$ 70,000
iii. Fence Upgrades	$ 25,000	$ 10,000	$ 35,000
iv. Substation and Distribution Automation	$ 270,000	$ 70,000	$ 340,000
v. Mobile Transformer Accommodation	$ 80,000	$ 30,000	$ 110,000
TOTAL	**$ 505,000**	**$ 180,000**	**$ 685,000**

i. In the first half of 2018, copper theft occurred in the following substations: Lorne Valley, Church Road, Souris, West St. Peters, Scotchfort, Dingwells Mills and West Royalty. In order to deter copper theft, the Company is proposing to replace all exposed copper grounding leads in the substations with theft-deterrent Erico cable. Erico cable consists of outer galvanized steel strands that functions as copper conductor, but appears to be non-copper conductor and are difficult to cut with hand tools. The Company is proposing to replace copper grounds in Bedeque and West Royalty Substations in 2019.

ii. As an additional measure to improve substation security and deter copper theft, the Company will start to implement security cameras at its substations. The Company is proposing to install security cameras in Borden, Bedeque, Sherbrooke and West Royalty Substations.

iii. The Company is proposing to complete substation fence upgrades in order to improve the safety and security of the substations.

iv. In 2019, the Company is proposing to implement automation equipment on distribution feeders. This will improve reliability by reducing outage restoration times. The Company is also proposing to install automation equipment at the Charlottetown Substation and upgrade the existing automation equipment in Sherbrooke.

v. The Company has two mobile transformers, both 7.5/10 MVA transformers, purchased in 1979 and 2016. The older 7.5/10 MVA mobile transformer has a high voltage rating of 69 kV while the new mobile transformer is larger because of the dual 138/69 kV high voltage rating. The mobile bays in the substations that were built before the new mobile transformer was purchased require expansion to be able to accommodate the new mobile transformer. The Company is proposing to upgrade the mobile bay at the West St. Peters Substation in 2019.

These projects are justified based on the need to maintain safe, reliable electrical service and ensure workplace safety by improving security at the substations and automating equipment to improve reliability and outage response times.

e. **138 kV Breaker Replacement Program (Justifiable) $ 134,000**

There are a total of nine breakers in the Bedeque Switching Station. Five of these breakers are over 40 years old. This is a provision to replace the 138 kV Transfer breaker in the Bedeque Switching Station installed in 1976. The breaker replacement is based on test results, age and severity of the impact on the system in the event of failure. The Company continuously monitors the condition of breakers to assess the need for life extension or replacement.

The project is justified based on the need to replace aged equipment at the end of its useful life.

6.2 Transmission Projects *$ 2,325,000*

a. 69 kV and 138 kV Switch Program (Justifiable) $ 515,000

This is a provision to upgrade and extend the life of certain 69 kV and 138 kV line switches. The switch upgrades will be prioritized based on results from switch inspections and operational and reliability requirements.

There are three switches that were identified that will require remote control and load interrupters. These include switches at O'Leary, Victoria Cross and Dingwells Mills.

By implementing load interrupters and remote control of these switches, outage restoration times will be reduced.

b. Transmission Line Refurbishment (Justifiable) $ 865,000

The 69 kV and 138 kV transmission lines are the backbone of Maritime Electric's electricity delivery system. The proposed budget amount provides for the life extension activities of the transmission system, which will also support system reliability. The following projects are planned for 2019:

- Completion of ground inspection and Emergency and Priority 1 deficiencies on the following 69 kV (T-Line) and 138 kV (Y-Line) transmission lines:
  - T-1 from West Royalty to Sherbrooke (which includes the Hunter River, Bagnall Road, Rattenbury and Kensington Substations);
  - T-10 from Lorne Valley to Dover (which includes the Victoria Cross Substation);
  - T-11 from Sherbrooke Substation to the City of Summerside;
  - Y-101 and Y-103 from Bedeque to Richmond Cove;
  - Y-104 from West Royalty to Church Road; and
  - Y-108 and Y-112 from Church Road to the Hermanville and Eastern Kings Wind Farms.
- Aerial inspection of all transmission lines.

The project is justified based on the need to maintain safe and reliable electrical service from the transmission system.

c. <u>T-3 Rebuild</u> (Justifiable) $ 945,000

The existing T-3 transmission line connects the Borden-Carleton and Albany Substations and is located along the Trans-Canada Highway. The line will be rebuilt from near the Industrial Drive intersection to 23258 Trans-Canada Highway (near MacDougall Steel Erectors). Project details and justifications are shown in Appendix O.

7.0 CORPORATE

7.1 Corporate Services *$ 573,000*

The Corporate Services category provides for facilities including the Main Office at 180 Kent Street, the District Service Centres in West Royalty, Roseneath, Rosebank, Sherbrooke and other general facilities throughout the Province.

a. Recurring Annual Capital Requirements (Work Support Services)$ 271,000

This budget item provides for the ongoing capital additions and refurbishments at various facilities including:

- Window and Door Replacements
- Garage Doors
- Roofing and Siding
- Paving for Facility Entrances and Parking Lots
- Office Furniture and Equipment
- Unforeseen Capital Expenditures

b. 180 Kent Street Office Building Elevator – Phase 1 (Work Support Services) $ 226,000

The elevators at 180 Kent Street office building are an Otis General Relay dual shaft passenger system installed in August 1975. Otis has advised that the units are well past their expected service life as indicated in the letter provided (Appendix P). They are no longer considered as safe as modern equivalents and do not meet the current B44 Code requirements or Barrier Free Guidelines. This budget request is for the replacement of one elevator at the end 2019 with the replacement of the second elevator to be requested in the 2020 Capital Budget Application. The proposed budget calls for the purchase of the Gen2 system, which will ensure the units meet today's safety and mobility standards, and uses regenerative technology which puts energy back into the operation, resulting in an average 75 per cent efficiency improvement over the current system.

The project is justified based on the need to replace aged elevators at the end of their service life and are difficult to maintain due to the lack of replacement parts

as well as the safety concern that the elevators do not meet the current B44 Code requirements.

c. **Forklift at West Royalty Service Centre (Work Support Services) $ 76,000**

The West Royalty Service Centre includes the warehouse for line material inventory, storage and handling of construction materials, transformer storage and general tools and construction equipment. The existing forklift, manufactured in 1985 has reached the end of its serviceable operating life and will require replacement. The budget amount is for the replacement of the existing forklift.

7.2 Information Technology *$ 1,211,000*

a. Hardware Acquisitions (Work Support Services) $ 289,000

Table 14 Hardware Acquisitions (Work Support Services)	
Description	**Cost**
Servers and Communication Equipment	$ 113,000
Upgrade of Computers in Line Trucks	35,000
Personal Computers and Printers	141,000
TOTAL	**$ 289,000**

The budget amount includes the purchase and implementation of additional and life-cycle replacement or upgrade of computer hardware, servers and communication equipment (switches, routers, etc.) in the data centre as outlined in Table 14. This equipment is critical to ensuring the efficient operation of the Company's business network and provision of service to customers. The replacement or upgrade of servers and communications equipment is determined based on the existing performance of the equipment, the ability to expand the equipment for future growth, the criticality of the equipment based on the business or customer impact should the equipment fail, and the cost of replacing or upgrading as compared to operating the existing equipment. Industry practice is to replace servers and communication equipment every five years.

The budget amount includes the purchase and implementation of additional and life cycle replacement of personal computers (desktops, laptops and tablets) and printers as outlined in Table 14. The Company has approximately 240 of these devices which are replaced every 5 – 7 years. The 2019 budget amount also includes the replacement of the computers in the line trucks which were last replaced in 2013.

Hardware acquisitions are justified based on the need to replace and upgrade information technology ("IT") hardware to maintain a reliable IT network which is critical to the overall service the Company provides to customers.

b. Purchased Software and Upgrades (Work Support Services) $ 380,000

Table 15 Purchased Software and Upgrades (Work Support Services)	
Description	**Cost**
Microsoft Suite	$ 85,000
Great Plains Financials	35,000
ESRI Mapping System	50,000
Software Development Tools	40,000
Miscellaneous Software Upgrades	60,000
New Purchases	61,000
Cyber Security Software	49,000
TOTAL	**$ 380,000**

Maritime Electric relies on a wide variety of software to deliver service to customers. The vendors who supply and support this software charge for the ongoing development of new features, the creation of security patches and the support of system customizations. These enhancements improve the functionality and security of the software.

Microsoft supplies end user business software such as word processing, spreadsheets and email. They also supply key data centre software including the corporate database management system and the financial management suite. Microsoft also supplies most core operating systems both on servers and personal computers. The budget amount in Table 15 provides for the access and support for the latest versions of each software product.

ESRI is the company's provider of enterprise Geographic Information System ("GIS") solutions. ESRI maps are embedded in most Maritime Electric applications including the Customer Information System, Vegetation Management System and the outage restoration map on the Corporate Website. The budget amount in Table 15 provides for the continued support by the vendor, contributing to the effective operation of the GIS.

Cybersecurity software is sourced from several vendors and provides essential services to Maritime Electric in order to maintain a safe network. These solutions

include the management of mobile devices, second factor authentication and intrusion detection.

The Company also uses a wide variety of smaller applications that also require annual upgrade fees. These include software development tools, engineering design software and billing support applications.

Purchased software and upgrades are justified based on the need for the continued support of the software products being utilized to ensure there is no negative impact to the security and operation of the IT network which is critical to the overall service the Company provides to customers.

c. Network Access Control (Work Support Services) $ 80,000

The budget amount provides for the purchase and implementation of a network access control (NAC) solution to prevent unauthorized or insecure devices from accessing the computer network. This system will allow only Maritime Electric devices to be acknowledged on the network. Absence of a NAC application was identified in a 2017 network security assessment performed by an external security specialist, as a moderate level risk. A NAC solution had been considered in prior years however at the time it had been cost prohibitive. A wireless network project in 2016 has put the Company in a position to take advantage of new technology which enables NAC (via wireless vendor) at a cost effective price.

This project is justified based on the need to improve the Company's NAC capabilities and infrastructure thereby improving the security of the system network.

d. Customer Self Service (Work Support Services) $ 187,000

The approved 2018 Capital Budget included Phase 1 of the Customer Self Service Project which included several enhancements to self-service options provided to customers. Phase Two of the Customer Self-Service Project, proposed in 2019, will include enhancements such as unified phone, email, text and social media communications, online chat and enhanced outage information. Phase Two also builds on the recent enhancements to the suite of digital self-

serve products provided to customers, and delivers improved ways that customers can communicate with the Company through the platform of their choice.

The project will include customer enhancements for new services integration work, improved outage information and privacy upgrades. Notifications will be developed to communicate power outage and new service information with customers so they can be kept informed regarding outages or service orders. Additionally, progress tracking for new service orders will be provided so that customers have the ability to check the status of their active service order requests. The goal is for the Company to effectively communicate directly with customers through the platform of their choosing as these new system enhancements are implemented.

The Company will execute the findings from its Website Security Audit in 2018 to ensure the corporate website and associated digital products and services are secure and protect the privacy of our customers.

The project is justified primarily on Customer Service improvements by providing convenience to customers, while reducing Customer Service Representative assisted service requests.

e. **Security Enhancements SCADA Network (Work Support Services)$ 120,000**

The Operations (or "SCADA") Network provides remote monitoring and control of the Company's electrical grid. In 2017, the IT Department was tasked with evaluating and overseeing cybersecurity on the SCADA network.

As a first step, IT contracted a vendor that specialized in SCADA security to perform an independent review of the network and provide its findings and recommendations. In summary, the review recommended that improvements were needed in the areas of segmentation and basic design (as it applies to cybersecurity). The report concluded that, once the recommendations were implemented, tools could be added to the network that would provide better

visibility, monitoring and alerting. A subsequent Fortis Group led cybersecurity assessment identified similar recommendations.

The proposed 2019 budget amount will be used to address the assessment recommendations. Improving and maintaining the security of the network will be an ongoing effort.

The project is justified based on the need to improve the security of the SCADA system and minimize the vulnerability to cyber attacks.

f. **Contractor Line Truck Technology (Work Support Services) $ 80,000**

Maritime Electric has a fleet of 24 line trucks that are equipped with computers and GPS tracking devices. This allows dispatchers to distribute work and to know the location of line crews. This technology improves efficiency and safety especially in outage situations. The Company also uses the services of up to 14 contractor line trucks for standard line work as well as outage restoration. This budget amount will be used to add similar technology to these vehicles. It is anticipated that similar gains in efficiency and safety will be achieved.

g. **Internal Audit Compliance Software (Work Support Services) $ 75,000**

The budget amount provides for the purchase and implementation of a software solution called Workiva that will be used for oversight and management of the Sarbanes Oxley ("SOX") compliance program. Workiva will automate program oversight using dashboarding capabilities that will automatically capture SOX program data. Workiva is a financial reporting tool that allows for management of quarterly certification requirements, Internal Controls over Financial Reporting ("ICFR") documentation, deficiency logs and testing programs. Currently, the execution of the ICFR program is done using Microsoft Office. Workiva will provide more automated capabilities thereby improving efficiency.

8.0 CAPITALIZED GENERAL EXPENSE *$ 527,000*

This amount includes a portion of administrative costs (predominately labour) that are properly recognized as part of the Company's overall capital expenditure program. These recurring expenditures represent an allocation of administrative costs, not specific to any one capital project, but rather as part of the overall development, implementation and management of the Company's capital budget program. The costs are labour and transportation related and derived from departments that support the overall capital program of the Company, primarily the Finance and Purchasing departments and Stores operations.

The proposed budget reflects historical spending over the past five years as shown in Table 16.

Table 16
Capitalized General Expenses

	2014	2015	2016	2017	2018F
Finance and Purchasing	$292,983	$362,482	$366,639	$438,405	$459,600
Stores	$ 95,747	$ 95,951	$111,075	$ 64,045	$ 67,400
Total Expenditure	**$388,730**	**$458,433**	**$477,714**	**$502,450**	**$527,000**

9.0 INTEREST DURING CONSTRUCTION *$ 429,000*

This represents an allowance for the cost of funds used during the construction of certain assets. It is reflected in the accounts as an offset to financing costs and is based on the Company's cost of borrowing. This amount is allocated to fixed assets and recovered through amortization over the life of the assets.

The proposed budget reflects historical spending over the past five years as shown in Table 17.

Table 17
Interest During Construction

	2014	2015	2016	2017	2018F
Expenditure	$368,486	$376,452	$405,915	$449,760	$400,000

10.0 PROPOSED ORDER

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2019 Annual Capital Budget and for certain approvals incidental to such an order.

UPON receiving an Application by Maritime Electric Company, Limited (the "Company") for approval of the Company's capital budget for year 2019;

AND UPON considering the Application and Evidence filed in support thereof;

NOW THEREFORE, for the reasons given in the annexed Reasons for Order and pursuant to the Electric Power Act;

IT IS ORDERED THAT

The 2019 Capital Budget Application of the Company, filed herein on _____, 2018 and summarized below is approved:

2019 Capital Budget Summary	
Generation	$ 1,746,000
Distribution	21,394,000
Transmission	7,327,000
Corporate	1,854,000
General Expense Capitalized	527,000
Interest During Construction	429,000
Total	$ 33,277,000
Less: Contributions	(400,000)
Total (Net)	$ 32,877,000

DATED at Charlottetown, Prince Edward Island, this ___ day of _____, 2018.

BY THE COMMISSION:

_____

Chair

_____

Commissioner

_____

Commissioner

_____

Commissioner

APPENDIX A

Summary of Capital Expenditures
(2010 – 2019)

Maritime Electric Company, Limited

Summary of Capital Expenditures (2010-2019)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2018	2019
	Actual	**Actual**	**Actual**	**Actual**	**Actual**	**Actual**	**Actual**	**Actual**	**Budget**	**Forecast**	**Budget**
Generation											
Charlottetown Plant and CT3	1,200,419	1,195,221	844,766	669,275	592,872	451,154	500,777	983,658	1,561,000	1,461,000	1,603,000
Borden Plant	75,334	600,300	59,333	881,322	1,468,960	234,642	740,335	81,062	210,000	195,000	143,000
	1,275,753	1,795,521	904,099	1,550,597	2,061,832	685,796	1,241,112	1,064,720	1,771,000	1,656,000	1,746,000
Distribution and Transmission											
Distribution	16,225,133	18,334,780	17,371,849	15,707,728	16,974,255	16,132,068	18,246,306	19,834,463	20,113,000	20,460,000	21,464,000
Transmission	2,195,688	2,476,363	3,305,468	4,106,795	6,462,871	8,092,839	8,283,251	10,832,373	6,240,000	6,240,000	7,327,000
	18,420,821	20,811,143	20,677,317	19,814,523	23,437,126	24,224,907	26,529,557	30,666,836	26,353,000	26,700,000	28,791,000
Corporate	750,794	979,447	997,025	757,930	979,141	897,585	1,039,510	841,786	2,164,000	2,229,000	1,784,000
Sub-total	20,447,368	23,586,111	22,578,441	22,123,050	26,478,099	25,808,288	28,810,179	32,573,342	30,288,000	30,585,000	32,321,000
Capitalized General Expense	2,179,629	371,689	263,704	350,331	388,730	458,433	477,714	502,450	527,000	527,000	527,000
Interest During Construction	317,828	333,182	295,027	298,913	368,486	376,452	405,915	449,760	400,000	400,000	429,000
	22,944,825	24,290,982	23,137,172	22,772,294	27,235,315	26,643,173	29,693,808	33,525,552	31,215,000	31,512,000	33,277,000
Less: Customer Contributions	(524,811)	(1,106,139)	(760,444)	(643,920)	(525,236)	(382,693)	(1,262,517)	(746,454)	(400,000)	(600,000)	(400,000)
Net Capital Expenditures	**22,420,014**	**23,184,843**	**22,376,728**	**22,128,374**	**26,710,079**	**26,260,480**	**28,431,291**	**32,779,098**	**30,815,000**	**30,912,000**	**32,877,000**

Note: Actual amounts above, where applicable, include amounts expended for approved carryovers from the previous year.

APPENDIX B

Budgetary Quote from Survalent for an Operator Training Simulator (OTS)

Survalent.

Quotation:

Maritime Electric Company

ME - OTS

Quotation No. A18_2_32086 [Rev1]

February 12, 2018

Survalent Technology Corporation
7965 Heritage Road
Brampton, Ontario • L6Y 5X5 Canada
T +1-905-826-5000 • F +1-905-826-7144
survalent.com

Item	Qty	Description	Price (CAD)
		Survalent ONE SCADA Licenses	
001	1	**OTS License** The Operator Training Simulator (OTS) consists of a second independent copy of the ADMS system operating with simulation programs instead of scan tasks. The OTS system provides facilities that allow the instructor to maintain many different copies of the database to select any of these to use for a training session and to execute multiple simultaneously running event scripts.	$31,335
		Total Survalent ONE SCADA Licenses	**$31,335**

Shipping Terms: EXW Ontario, Canada

Shipment approximately 1 To 2 weeks from receipt of purchase order. Please send purchase order to stcorder@survalent.com

This quotation is valid for 60 days and is based on Survalent Standard Terms and Conditions of Sale.

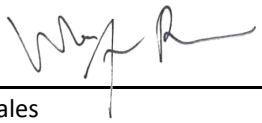
Note 1: Prices do not include applicable state, provincial, or federal taxes.

Note 2: Survalent ONE software licenses are non-refundable and cannot be exchanged.

Note 3: Software license prices do not include installation and commissioning services. If you have not purchased system engineering services, and would like support to install, configure, test, and commission your new Survalent ONE software, please request a quote at sales@survalent.com

Note 4: Please ensure the end user client name is identified on the purchase order; purchase orders may be rejected if this information is missing.

This quotation is not valid unless signed by an authorized representative of Survalent Technology Corporation.

Prepared By: 

Weijun Ren, Inside Sales

Approved By: 

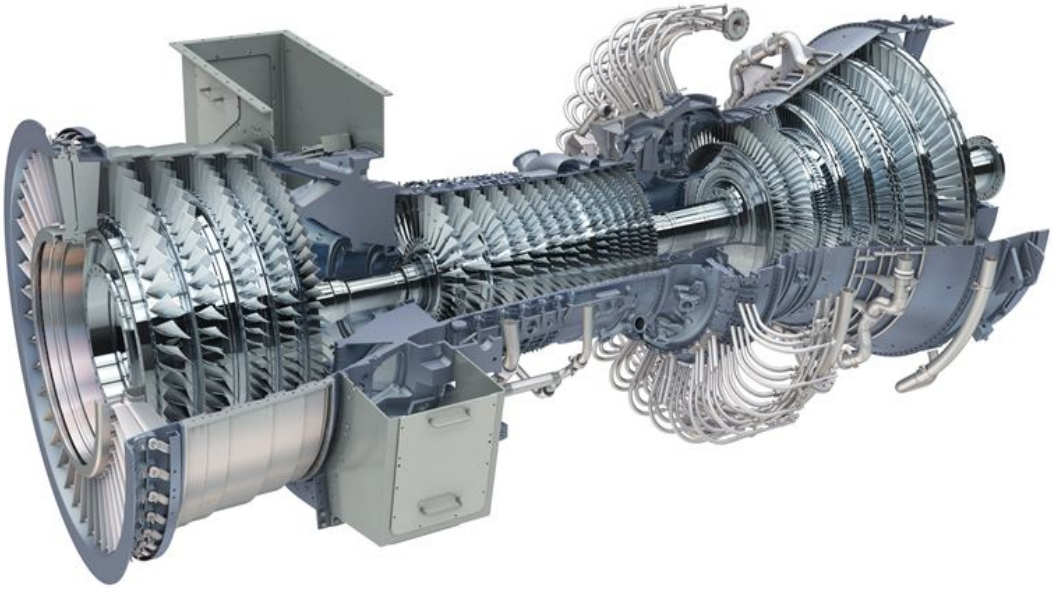
Joe De Filippis, Manager Project Delivery & Inside Sales

APPENDIX C

Combustion Turbine Inspection and Overhaul - 2019

Combustion Turbine Inspection and Overhaul

2019



Prepared By:

Joe Steele, C.E.T.

Maritime Electric Company, Limited

April 2018

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Appendices

Appendix 1 - General Electric Equipment and Services Proposal
Appendix 2 - General Electric Optional Service Bulletins
Appendix 3 - General Electric Combustion Turbine Engine Equipment Maintenance Schedule

1.0 General

Maritime Electric is a fully integrated utility that is the owner/operator of generating assets located at Charlottetown and Borden-Carlton, PEI. One of the generating assets is a General Electric LM6000PC NextGen combustion turbine generator (CT3) that is a dual fuel, black start, 10-minute start, simple cycle unit capable of generating up to 50 Megawatts (MW) of electrical power. General Electric is the Original Equipment Manufacturer (OEM) for this combustion turbine package.

The unit was installed in 2005 and has provided Maritime Electric with the ability to defer the operation of the Charlottetown Thermal Generating Station (CTGS) and maintain the electrical system during the period of time leading up to the installation of the two newly installed interconnecting cables (commercially operational in 2017). The generating unit has also allowed Maritime Electric the flexibility to offset the purchasing of off-island capacity and energy. This generating unit, along with the additional two combustion turbines (located at the Borden Generating Station), allow Maritime Electric the flexibility to operate the generating units that will assist with potential interruptions in power delivery from other sources (i.e. NB Power, Maritime Electric transmission issues, wind generation).

The deployment of CT3 has changed over the years. In 2005, the unit was installed and the electrical load on PEI was within the limits of the two 100 MW interconnected cables. The unit was only operated for testing purposes. In 2006, CT3 was operated throughout the year mostly to complete system issues and to prevent the overload of the two 100 MW interconnected cables. The unit has been operated as a peaking/standby unit since its installation. It has been serving as a peaking unit during high load and low wind conditions and standby during energy shortages (i.e. wind generators being off schedule).

2.0 Previous Upgrades

The following is a list of substantial upgrades completed from the Time Since New (TSN).

- 2007 Weather Enclosure for Fuel Forwarding Pump Pad
- 2015 Exhaust Stack Damper
- 2017 RO/EDI Water Treatment Plant RO Membrane Filter Replacement
- 2017 Redundant High Pressure NOx Water Injection Pump
- 2017 Bird Exclusion Netting
- 2018 Turbine Controls Upgrade

3.0 Service/Product Bulletins

Service/Product Bulletins are issued by General Electric to inform users of potential issues that include safety, reliability, maintenance and performance benefits of installed combustion turbine generator packages. The Service Bulletins are focused on the engine and engine-related hardware and the Product Bulletins are focused on the package hardware and users are to validate the appropriate package configuration.

4.0 OEM Recommended Equipment Maintenance Schedule

General Electric has an Equipment Maintenance Schedule for the combustion turbine engine (SP-M002) which is shown in Appendix 3 of this Report. This recommended Maintenance Schedule lists a number of items in Table 2.1 that are recommended to be disassembled and inspected based on chronological time, or number of operating hours on the engine, whichever comes first. A number of these items require a Level 3 depot visit which entails off-site internal maintenance including all Level 2 capabilities plus a complete teardown and rebuilding of the engine and replacement of major subassemblies with spare subassemblies. Items like the Combustor are recommended for a teardown and potentially a depot visit every 6 months or 4,000 hours. The Engine Inlet and Compressor Assembly also require a depot visit every 4,000 hours. Combustion Turbine 3 only has 1,582 operating hours on it (less than half of the 4,000 hours); however, General Electric typically expects that an operator will reach the 4,000 hour mark in 6 months and not in 13 years. It is generally accepted industry best practice to perform a major overhaul on turbines every 10 years. Therefore, even though CT3 has not reached the 4,000 operating hour mark Maritime Electric believes it is prudent to send the engine for its depot visit and to incorporate OEM recommended Service/Product Bulletins at the same time.

5.0 Engineering Assessment

5.1 Scope of the Work

The work shall include having the combustion turbine locked-out and tagged-out to allow Maritime Electric personnel under the supervision of a General Electric field engineer to dismantle the combustion turbine (engine) and remove it from the enclosure. The engine will be packaged in an OEM-supplied shipping container and the engine will be transported to a General Electric Level 3/4 Service Depot (Depot). Once the engine has arrived at the depot it shall be inspected and photographed to document its arrival condition. The engine shall then be disassembled into modules to enable the appropriate Service Bulletins to be performed.

The Service Bulletins that are intended to be completed on the engine at the depot are: SB220, SB230, SB237, SB239, SB244, SB249, SB250, SB254, SB256, SB258, SB266, SB310, SB313, SB315 and SB317. During the inspection phase of the work a number of optional Service Bulletins (SB225, SB261, SB286, SB307, SB323 and SB325) are to be evaluated, based on engine condition and shall be implemented if required.

Upon the completion of the Service Bulletins the engine is to be test operated and packaged to be returned to site then reinstalled with Maritime Electric personnel under the supervision of a General Electric field engineer. After the engine has been installed into the package the unit is to be operated with the assistance of a General Electric controls field engineer. The controls field engineer is to calibrate the variable geometry of the dynamic systems that are contained on the engine and are critical to ensure its safe and efficient operation.

5.2 Listing of Service Bulletins to be Completed

Bulletin Number	Title
LM6000-IND-220	Introduction of Inlet Gearbox Assembly PN 9185M71G31
LM6000-IND-230	T48 Thermocouple Probe Reinforcement Sleeve Inspection
LM6000-IND-237	VBV Door Clevis Bolt Length Increase
LM6000-IND-239	Improved LPT Coupling Nut
LM6000-IND-244	Turbine Rear Frame Strut End Adapter Gasket Replacement
LM6000-IND-249	Introduction of Self-Locking VBV Linkage Clevis Lock Nuts
LM6000-IND-250	Introduction of VBV Actuator without Lockwire
LM6000-IND-254	No. 3 Bearing Stationary Oil Seal Replacement
LM6000-IND-256	No. 1 Bearing Stationary Air-Oil Seal Replacement
LM6000-IND-258	Air Collector Aft Flange Bolt Replacement
LM6000-IND-266	High Pressure Turbine Integral Pressure Tube-Coupling Nut Inspection and Replacement
LM6000-IND-310	High Pressure Compressor Rotor Stages 3 Through 5 Blades Dovetail Coating Refurbishment
LM6000-IND-313	Improved Radial Drive Shaft Housing and Hose Clamps
LM6000-IND-315	Stage 11 Compressor Stator Vanes Part Number Identification and Replacement
LM6000-IND-317	LPT Cooling Air Orifice Plates Inspection and Replacement

6.0 Project Cost Estimate

The estimate to complete all work associated with the CT3 Turbine Inspection and Overhaul Project is $1,235,000. Table 1 provides a breakdown of the total project cost.

Table 1
Project Cost

Description	
Material	$ 1,023,000
Internal Labour	$ 40,000
Project Management	$ 172,000
TOTAL	**$ 1,235,000**

Appendix 1

General Electric Equipment and Services Proposal

GE Package Power, Inc.

Equipment and Services Proposal

for

ESN 191-552 Service Bulletin Implementation

for

MARITIME ELECTRIC COMPANY

Proposal Number: 1269662

Dated: March 16, 2018

GE Power

Rob Grahn
GE Power Services
Services Sales Manager

2300 Meadowvale Blvd
Mississauga, ON, L5N 5P9
CA

Phone: 1-647-382-0749
E-Mail: robj.grahn@ge.com

March 16, 2018

Maritime Electric Company Limited
180 Kent Street,
Charlottetown, PE
C1A 7N2

Subject: Service Bulletin Implementation ESN 191-552

Reference: Proposal Number 1269662

Dear Joe,

GE Packaged Power Inc. (hereinafter referred to as "Seller") is pleased to provide MARITIME ELECTRIC (hereinafter referred to as "MARITIME ELECTRIC" or "Buyer") with this proposal for the implementation of service bulletins ESN 191-552.

This proposal includes pre-requested repair with service bulletin implementation at the GE Service Center in Houston, TX. In addition, this proposal also includes the quote for optional service bulletin in Attachment 2 if Buyer elects to implement.

GE Packaged Power provides industry leading repair capabilities through our extensive network of authorized repair sources and state-of-the-art repair development expertise and technologies. We are dedicated to providing cost effective and timely repair solutions

I look forward to reviewing the benefits of this opportunity with you. If you have any questions about this proposal, please feel free to contact me.

Regards,

Senior Sales Manager
T: 905-858-5736
M: 647-382-0749
F: 905-248-3129
robj.grahn@ge.com

Workscope

Within this proposal GE is offering at a Firm Fixed price for the requested service bulletin implementation in the Houston SC and time and material for engine removal and installation.

The proposed high level workscope:

- GE to deliver an engine container for use of transportation of customers engine to and from Buyer's facility
- GE to provide tooling to facilitate removal and fuel system support (Jungle Gym)
- (1) GE technical representative for a period of 3 days on site to work with customer supplied craft labor to remove the engine from customer package
- Package and secure gas turbine in a GE shipping container.
- Prepare package for short term storage as well as materials removed.
- Transport gas turbine to GE Houston Service Center for SB implementation.
- Service Bulletin to be implemented are SB 220, 230, 237, 239, 244, 249, 250, 254, 256, 258, 266**, 310, 313, 315, 317.
    - **SB266 Implementation only includes labor for inspection of High Pressure Turbine Integral Pressure Tube/Coupling Nut. In the event, inspection fails the replacement with new Tube is priced at $96K
    - Optional test is provided if requested or in the event further disassembly has occurred GE recommends performing an engine test.
- Transport the engine back to Buyers Facility
- (1) GE technical representative for a period of 5 days on site to work with customer supplied craft labor to install the engine into customer package and align per the latest GEK alignment revision.
- (1) Controls technician to support start up.

The above Houston Service Center option is provided on a fixed priced basis per the scope detailed in Attachment 1 and an optional service bulletin implementation for review Attachment 2. Any additional materials or labor required due to inspection findings will be additional at the rates below under Workscope Fees.

The Gas Turbine will be inducted into the Seller's Service Center for the primary workscope disassembly. Inspection findings will be made known and workscope discussed with the Buyer. Any findings which drive a workscope increase will be priced per the rates below.

Buyer's acceptance of the initial repair estimate shortly after module disassembly findings are known, will allow for the modules to be disassembled and components requiring repairs to be dispatched to the component repair vendors. Once all the repairs have been accomplished and final component scrap rates are known, the final repair estimate will be generated.

Pricing Table

Item	Description	Qty	Price
1.	**Firm Fixed Price Service Bulletin Implementation** • Service Bulletin implemented per the attached work scope • Freight for GE Engine container to and from Buyers facility • Freight for customers engine to and from Buyers facility **Note:** In the event HPT coupling nut fails inspection SB-266 is required, there will be an additional $96K charge to the fixed priced project	1	USD $331,360
2.	**Field Service – Engine Removal** • Includes Tooling rental (Job Box & Fuel System Support) • Engine Removal • Includes Mobilization and Tooling rental & Freight	1	CAD $28,021
3.	**Field Service – Engine Installation** • Includes engine Installation • Includes Demobilization and Return of Tooling • Includes Tooling rental (Job Box, Laser Alignment Tooling) **Note:** This does not include any consumables to complete the installation of engine into package.	1	CAD $50,743

Optional Adder

4.	Optional - Engine Test (Includes Fuel)	1	USD $48,640

(Example: TRF for seal replacement and bearing was removed and reinstalled or bearing replacement GE recommends performing an engine test)

Delivery and Transfer of Title

Seller will transport the engine from Buyer's site to the GE Houston Service Center and delivery of engine back to Buyer's site per delivery terms Carriage Paid To" (CPT) Incoterms 2010 to Buyer's site. Transfer of title for materials and overhaul services provided under this proposal shall pass to the Buyer upon being made available for delivery at Seller Facility.

Buyer warrants to Seller and its successors and permitted assignees that the title to the Parts are free and clear of all liens and encumbrances on the date of transfer and Buyer will defend such title forever against all claims and demands.

Buyer further warrants to Seller that Buyer is the beneficial owner of the removed Parts and that Buyer has full right, power, and authority to execute this Bill of Sale.

Buyer will be responsible for any tax or import duties for the Seller's rotable(s) or materials. Buyer is also responsible for any tax or export duties to return Buyer's rotable(s) to designated service center of the Seller.

Terms of Payment

Seller will invoice Buyer after the completion of each installment for the percentage amount due. Payment terms from invoice date are shown in the table below.

Item	Installment Description	Percentage of Item Price Due
1	Upon PO Acceptance	25% of Item 1 – Net 30
2	Upon Removal of GT at Buyers facility	100% Upon Completion of Item 2 - Net 30
1	Final Workscope Acceptance by Buyer	60% of Item 1 Price – Net 30 and Prior to Shipment
1	Final Delivery	15% Upon Delivery to Buyers Facility – Net 30
3	Upon GT Installation	100% Upon Completion of Item 3 – Net 30
4	Optional Test	If selected will be added to Item 1 schedule above

All invoices to be paid via wire transfer to the instructions contained on each invoice.
**** Optional Service bulletin work would follow schedule Item 1 (Attachment 2)**

Field Services

For Field Services work scope in Item 2 and 3 is provided at Time and Material Estimate, pro rata actual payment shall become due as work is completed upon receipt of Seller's invoice, paid in full within thirty (30) days from date of invoice.

Workscope Fees

The pricing for the workscope set forth in this Proposal is Firm Fixed Priced. Any additional mutually agreed workscope will be at the rates and fees as follows.

Work Scope Item	Amount
Service Center Labor	$117/Hr
Genuine GE LM Unique Parts	Current GE List Less 12%
Genuine GE CF6 Parts	Current GE List
Outside Services	Vendor Invoice Plus 10%
Customer Furnished OEM Hardware	15% of GE List, 10K Cap Per Line

If required, a revised workscope and pricing will be presented upon completion of the tear down and proper inspections.

Field Services

Field Services for the engine includes removal and installations from package for ESN 191-552 above in Item 2 and 3 at Time and Material Estimate. Field Services includes one (1) field service representatives working (1) 12 hour single shift per day for three days for removal and one (1) field services representative working (1) 12 hour single shift per day for five days and one (1) specialty representative working at site (1) 12 hour single shift for one day to support start up.

It is also assumed that Buyer has completed Lock-Out Tag Out ("LOTO") will be performed by site personnel prior to unit being worked if required. A Field Service report will be provided at completion of work scope, which will include a description of all worked performed. The proposed Field Services Time and Material estimate does not include any additional troubleshooting beyond the Scope of the Work described in this proposal and/or standby time related to the Buyer's schedule. It also does not include any cranes or lifting devices that are the Buyer's responsibility.

Terms and Conditions of Sale

This Proposal is based on the terms stated in the Service Agreement Between Maritime Electric and GE Packaged Power Inc. the Agreement Number 821243 Dated December 13, 2013

With respect to (i) non-OEM material or OEM Material that has been repaired with a process or by a service provider, that is not authorized by the OEM for those specific parts ("Alternate Material"), (ii) OEM material that has been previously operated in conjunction with Alternate Material, or (iii) any material, whether OEM, or Alternate Material or OEM material that has been previously operated in conjunction with Alternate Material, that is provided by the Buyer to install as part of the Parts or Services supplied herein ("Buyer Supplied Material"), the Parties hereby acknowledge and agree that Seller shall not be obligated to install, reinstall or reuse any of the types of material mentioned in (i), (ii) or (iii) above as part of any Services or Parts supplied herein. If Seller does agree, however, to incorporate any of the types of material mentioned in (i), (ii) or (iii) above as part of any Services or Parts supplied herein, those material will not be covered by any warranty conditions, either express or implied. Buyer further acknowledges and agrees that Seller shall be released from any and all liability associated with the types of material mentioned in (i), (ii) or (iii) above and Buyer shall indemnify, defend and hold the Seller harmless from and against any and all liability arising out of claims made by a third party related to the types of material mentioned in (i), (ii) or (iii) above. Notwithstanding the foregoing, to the extent that Seller, in its sole discretion, is able to re-repair OEM Material that has previously been repaired with a process or by a service provider that is not authorized by the OEM for those specific parts, then Seller's normal warranty shall apply to only those parts that have been re-repaired and reused.

"Outside Services" means those parts, materials, labor and services, including craft labor, which are manufactured by and/or performed by subcontractors or other third parties, including Seller Affiliates, outside of Sellers Service Center Repair Facility.

All components replaced as a result of or part of the FFP module overhaul process in the depot will be dispositioned as GE Owned scrap materials. Materials declared scrap as a part of T&M repair scope will be the Buyer's to disposition.

Parts supplied hereunder are manufactured in accordance with GE Packaged Power's standard specifications for industrial gas turbines. These parts are not intended for use and are not certified for use in on-wing aircraft modules or any other application.

This quotation is based solely on the GE terms and conditions referenced herein, and also on the presumptions that (a) no U.S. Government (U.S.G.) funds are being utilized to pay for the goods/services being quoted, (b) there are no U.S.G. terms, conditions or other requirements contained in any resultant sales transaction, and (c) any parts being furnished are not to be used for flight module applications; if any of these presumptions are incorrect, this quotation may be withdrawn by Seller prior to receipt of Buyer's acceptance.

Purchase Order Issuance

If this proposal meets your requirements, please issue the purchase order to the following GE entity and address. Please reference the **Proposal Number 1269662 and Service Agreement Between Maritime Electric and GE Packaged Power Inc. the Agreement Number 821243 Dated December 13, 2013 "** in the body of the purchase order.

GE Packaged Power, Inc.
16415 Jacintoport Blvd
Houston, TX 77015
Attn: Rob Grahn
email robj.grahn@ge.com

General Electric Canada
2300 Meadowvale Blvd,
Mississauga, Ontario, Canada
L5N 5P9
e-mail to: robj.grahn@ge.com

Acceptable financial arrangements for payment of services rendered under a Purchase Order must be established prior to acceptance of the Purchase Order by Seller.

Validity

This proposal is valid for thirty (30) days from the date of this proposal, subject to prior sale of the offered equipment.

Attachments

Attachment 1: Service Center Workscope
Attachment 2: Optional Service Bulletin Scope

Submittal and Acceptance

This proposal submitted by:

Name: Rob Grahn

Title: Sales Manager

For: GE Packaged Power, Inc

Date: March 18, 2018

Upon acceptance, this Proposal shall constitute the entire agreement between the parties and any understanding, promise, representation; warranty or conditions not incorporated herein shall not be binding on either party:

This Proposal is accepted by:

Name: _____

Title: _____

For: _____

Date: _____

Appendix 2

General Electric Optional Service Bulletins

Attachment 2: Optional Service Bulletin

Bulletin Number	Title	Compliance Date	Labor	Material	Vendor	Total	Notes
LM6000-IND-225	Introduction of New Spline Adapter PN 9228M83P07	-	$ 6,500	$ 3,200	$ 2,570	**$ 12,270**	Highly recommended to perform with SB 220
LM6000-IND-244	Turbine Rear Frame Strut End Adapter Gasket Replacement	-	$ 100	$ 230		**$ 330**	
LM6000-IND-261	High Pressure Turbine Cooling Air Tube and 11th Stage Check Valve Replacement	-	$ 6,500	$ 65,630		**$ 72,130**	
LM6000-IND-286	Improved LPT Shaft XNSD Speed Sensor Spring Retainer	-	$ 400	$ 3,273		**$ 3,673**	
LM6000-IND-307	CRF Oil Manifold Hardware Improvement (PA, PA Uprate, PC, and PG)	-	$ 33,900	$ 90,807	$ 30,157	**$ 154,864**	
LM6000-IND-323	Turbine Rear Frame D- and E-Sump Preformed Packing Material Change for Improved Durability	-	$ 33,500	$ 18,095	$ 7,715	**$ 59,310**	Includes check blance of LPT and LPC modules
LM6000-IND-325	Introduction of VSV Harness Support Brackets for Improved Electrical Cable Support	-	$ 200	$ 3,552		**$ 3,752**	

Appendix 3

General Electric Combustion Turbine Engine Equipment Maintenance Schedule

Maintenance

Gas Turbine Engine

EQUIPMENT MAINTENANCE SCHEDULE

Refer to *Table 2.2, Turbine Engine On-Condition Maintenance Inspection/Check Schedule,* for the recommended inspection intervals for the equipment used on GTG set. Refer to General Electric *LM6000 Series On-Site Operation and Maintenance Manual, GEK 105059*, in Section 4 of this manual for detailed maintenance procedures.

On- and Off-Site Maintenance

Level 1 on-site external maintenance and module replacement includes protective and corrective tasks such as adjusting or replacing externally accessible components and engine replacement. Level 2 on-site internal maintenance requires partial disassembly of the engine and replacement of the compressor blade/vane, hot section component, HPT blade, and gearbox. Level 3 off-site internal maintenance includes all Level 2 capabilities plus a complete teardown and rebuilding of the engine and replacement of major subassemblies with spare subassemblies. Level 4 off-site overhaul includes Level 3 capabilities plus complete disassembly of the major subassemblies of the gas turbine and rebuilding subassemblies with replacement parts. A permanent shop and a test cell are required for a Level 4 overhaul facility.

Table 2.1, Turbine Engine On-Condition Maintenance Inspection/Check Schedule

Component	Inspection Check Required	Inspection Frequency	Maint. Level	Remarks
1	Engine Oil Level	Weekly	I	Check oil level and check system for oil leaks.
2	General Condition of Engine	Weekly	I	Inspect external engine components for security of installation.
3	Engine Mounts	500 Hours	I	Check for security, cracks, and isolation deterioration.
4	Electrical Harness Leads & Cables	500 Hours	I	Check for security; check ignition leads and thermo-couple harness for burning or chafing.

Table 2.1, Turbine Engine On-Condition Maintenance Inspection/Check Schedule (Cont)

Component	Inspection Check Required	Inspection Frequency	Maint. Level	Remarks
5	Control Linkage	500 Hours	I	Check for freedom of movement, rod end wear, and security.
6	Magnetic Plugs	500 Hours	I, II, III	Continuity check for particle accumulation.
7	Engine Plumbing	500 Hours	I	Check fuel and oil plumbing line to and on engine for security, chafing, and leaks.
8	Lubricating Oil	1 Month or 700 Hours	I, II	Have oil sample analyzed.
9	Fuel Filter	2000 Hours	I	Check for cleanliness and damage.
10	Thermocouple Calibration	4000 Hours	I	Check thermocouple calibration.
11	Thermocouples & Wiring	6 Months or 4000 Hours	I, II	Inspect first at 500 hours, then 1000 hours, then each 4000 hours thereafter.
12	Mechanical Linkages	4000 Hours	I	Check for wear.
13	Engine Inlet & Compressor Assy	4000 Hours	I, II, III	Maintenance level dependent on inspection findings.
14	Engine Oil Filter	6 Months or 4000 Hours	I	Remove, inspect, replace filter.
15	Igniters & Liner Supports	6 Months or 4000 Hours	I	Inspect at 4000 hours, then every 12 months or 8000 hours.
16	Turbine First Stage	6 Months or 4000 Hours	I, II	Inspect first at 500 hours, then 4000 hours or 6 months.
17	Combustor	6 Months or 4000 Hours	I, II, III	Maintenance level dependent on inspection findings.

Table 2.1, Turbine Engine On-Condition Maintenance Inspection/Check Schedule (Cont)

Component	Inspection Check Required	Inspection Frequency	Maint. Level	Remarks
18	Fuel Nozzles	6 Months or 4000 Hours	I	Inspect first at 500 hours, then 4000 hours for carbon accumulation and/or wear.
19	Rpm & Temperature Control	6 Months or 4000 Hours	I, II	Check for accuracy; calibrate if necessary.
20	Compressor Cleaning	As Required by Engine Performance	I	Water wash. (Refer to procedures in Section 5.)
21	Engine-to-Generator Alignment	As Vibration Monitors Warrant	I	Check for accuracy; adjust if necessary.
22	Variable Bypass Valve (VBV) Drain Check Valve	6 Months or 4000 Hours	I	Manually operate check valve.
23	VBV Oil Filter	6 Months or 4000 Hours	I	Check for high ΔP. Replace when ΔP approaches 20 psid.
24	Inlet Volute Drain Valve	After Every Shutdown	I	Manually cycle valve.

INFORMATION

Refer to the Description Supplement in this section, *SP-D002, Gas Turbine Engine*, for a detailed description of the gas turbine engine. Refer to the Operation Supplement in this section, *SP-OI002, Gas Turbine Engine*, for operating procedures for the gas turbine engine.

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APPENDIX D

Images of Polemount Transformer In-Situ Testing

APPENDIX E

Reliability Driven Line Extensions

Title: **West Royalty Substation 3rd Circuit**
Location: **West Royalty**
Line Type: **Distribution – Three Phase**
Distance: **2.0 kilometres**
Amount: **Approximately $265,000**

Project Description:

This project includes the installation of a new 25 kV feeder at the West Royalty Substation. The new feeder will provide power to the West Royalty Business Park and the BioCommons Research Park, which is expected to experience a major load increase in 2019 with the expansion of local businesses. The line will be a 25 kV three phase line that follows Maritime Electric's access corridor from the West Royalty substation to the Charlottetown Arterial Highway before connecting to line WR18030 at approximately 50 Fourth Street (see Figure 1). The existing WR18030 line contains 10 spans of 2/0 ACSR (Quail) conductor, rated for 270 amps, which will be replaced with 477 ASC (Cosmos), rated for 646 amps. The new line will be constructed with poles that are high enough to accommodate a double circuit if another feeder is added at the West Royalty substation in the future.

Project Justification

The primary justification for the project is that the customer load at the West Royalty Business Park and the BioCommons Research Park is growing and Maritime Electric must plan accordingly to meet the needs of existing and future customers in the area. With the expansion of one customer, the BioCommons Research Park is expected to experience a load increase of more than 5 MW, which currently risks overloading the Milton circuit. In addition, the new 25 kV feeder will increase reliability of the Bonshaw feeder as existing infrastructure will allow for alternative options to feed customers. The conductor of line WR18030 is being upgraded to accommodate the increase in load.

Construction

Permits from the Department of Transportation, Infrastructure and Energy and the Department of Communities, Land and Environment will be required for this project. Tree trimming will not be required to complete the project as the access way from the West Royalty substation to the

Charlottetown Arterial Highway is well maintained. Flaggers and substantial signage will be necessary for the project as both traffic volume and speed are high on the Arterial Highway.

West Royalty Industrial Park New Circuit

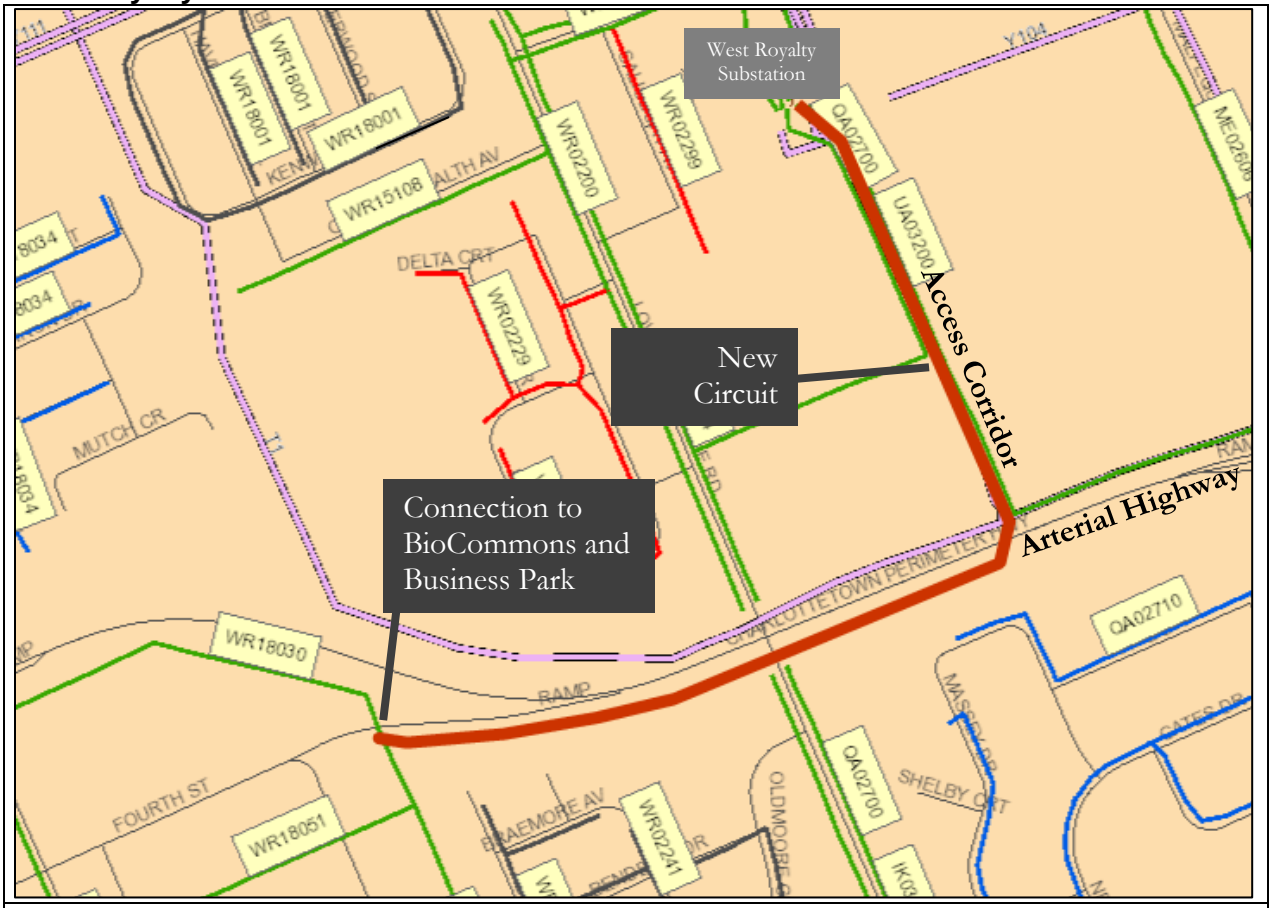


Figure 1: West Royalty, PE – New Industrial Park Circuit

Title: **Bonshaw Circuit (West River Bridge) Line Extension**
Location: **Meadowbank**
Line Type: **Distribution – Three Phase**
Distance: **4.0 kilometres**
Amount: **Approximately $1,040,000**

Project Description:

This project includes line conversions from single phase to three phase for lines WR01595 and WR02565 and a three phase underground line extension between them that crosses the West River Bridge. The objective of the project is to decrease the load of line WR02540 that crosses the Dunedin Bridge and provide alternative options to feed customers when there is a power outage in the area.

Line Conversions

Line WR01595 (0.9 kilometres) will be converted from single phase to three phase along the Upper Meadowbank Road from Stephens Lane to 105 Upper Meadowbank Road. Line WR02565 (1.4 kilometres) will also be converted from single phase to three phase along Route 19 from the Westville Road to 1013 Route 19.

Line Extension

The line extension (1.7 kilometres) will close the gap between lines WR01595 and WR02565 across the West River Bridge from 105 Upper Meadowbank Road to 1013 Route 19 (see Figure 2).

Project Justification

Currently, the areas of St. Catherine's, New Argyle, Canoe Cove, Rice Point, Nine Mile Creek, Cumberland, Fairview and Rocky Point are fed from a three-phase feeder that crosses the Dunedin Bridge and feeds 1,630 customers. The feeder, which has experienced several outages in recent years, is heavily loaded and there are currently no means of dividing the customer load or provide alternate feeds. The line extension is intended to improve reliability in the area. Closing the gap across the West River Bridge will reduce the load on the existing feeder that crosses the Dunedin Bridge and create a loop that will provide increased reliability to customers in the area. The loop will provide the southeastern end of the feeder with a redundant three phase feed, which will ensure that outages located in the southeastern end of the feeder

do not interrupt power in the populated Cornwall area. The existing #4 ACSR (Swan) conductor, rated for 140 amps, for lines WR01595 and line WR02565 will be replaced with 4/0 ACSR (Penguin) conductor, rated for 340 amps, to upgrade the line to current standards.

There is the potential for an alternative route option (see Figure 3) through directionally drilling under a narrow section of the West River nearby. The advantage of this approach is that the length of the new construction is reduced from 1.7 kilometres to 0.5 kilometres. Further investigation of this option will be performed to identify the preferred route.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for this project and depending upon which option is selected to cross the river, environmental approvals may also be required. There is minimal tree trimming required and one set of flaggers will be necessary for the project along with substantial signage as both traffic volume and speed are high on the road.

Future Development Benefits

Once the project is completed, there is potential in the future to feed customers in the area from a different substation which would provide further improvements to customer's reliability in the area.

Bonshaw Circuit Line Extension (West River Bridge)

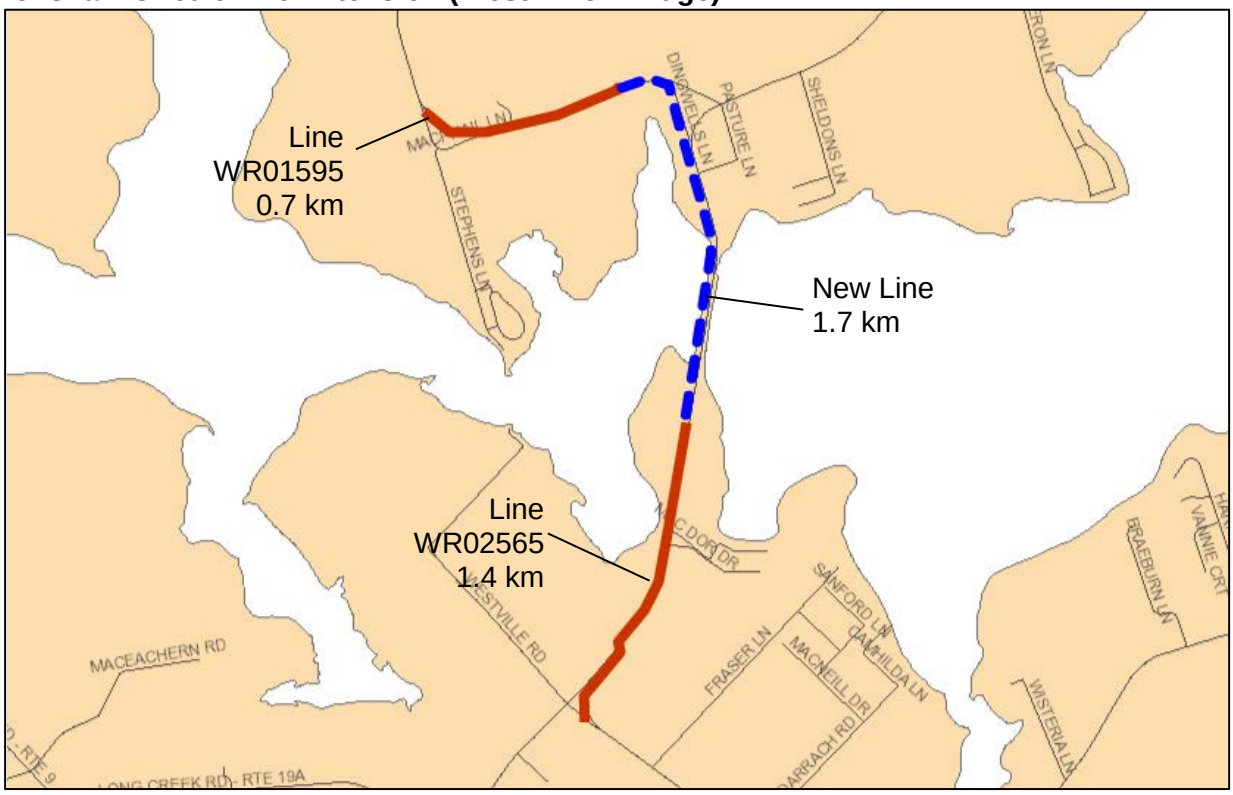


Figure 2: West River Bridge, PE – Line Conversions and Extension to Cross the West River Bridge

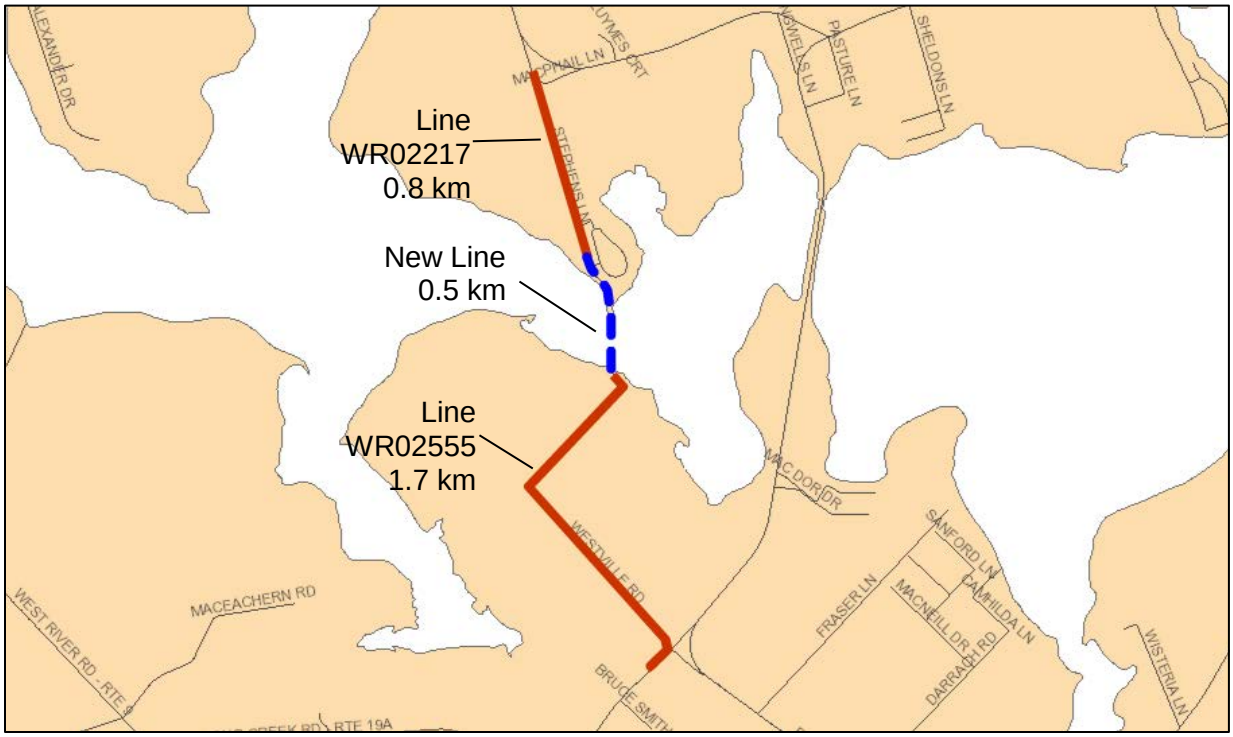


Figure 3: West River Bridge, PE – Alternate Line Conversions and Extension Option to Cross River

APPENDIX F

Single Phase and Three Phase Rebuild Project Description and Justification

Title: **Union Road Single Phase Rebuild**

Location: **Brackley**

Line Type: **Distribution – Single Phase**

Distance: **4.2 kilometres**

Amount: **Approximately $249,300**

Project Description:

The project is a 4.2 kilometre single phase line rebuild and voltage conversion that will replace line AP52207 along the Union Road from the Hardy Mill Road to the Kilkenny Road (see Figure 1). Line AP52207 is operated at 7,200 V and is connected to the Airport Substation. There are 47 customers on this section of line.

Project Justification

The primary justification for the project is that AP52207 is aged and deteriorated. There are approximately 58 poles along the route, many of which are in poor condition. 31 of the poles (53%) are aged eastern cedar. In addition, the line contains inadequate neutral spacing, long spans and numerous porcelain insulators that present safety concerns and put the line at risk of failure. There are 15 splice repairs in this section of line that were installed through previous conductor repairs as a result of failures. The existing #4 ACSR (Swan) conductor, rated for 140 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to upgrade the line to current standards.

Voltage Conversion

The project is also justified on the basis that the voltage is limited to 7,200 V and is being fed from a step down transformer that is currently operating at 110 per cent capacity during the winter and 80 per cent capacity in the summer. For this reason, the stepdown transformer will be removed and the line converted to 14,400 V.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be rebuilt on the same side of the road by leaning the existing line out of the way and building the new line with the existing line still energized. Some

tree trimming will be required prior to construction. One set of flaggers will be necessary for the project as traffic volume is low but speed limit is high.

Future Development Benefits

The completion of this project will also support future reliability improvements in the area. This could be accomplished by eliminating the gaps along the Kilkenny Road and Union Road to provide opportunities for alternate feeds (see Figure 2).

Union Road Single Phase Rebuild

Old eastern cedar pole with inadequate neutral spacing

Old bell insulator

Inadequate neutral spacing and poor primary connection to insulator

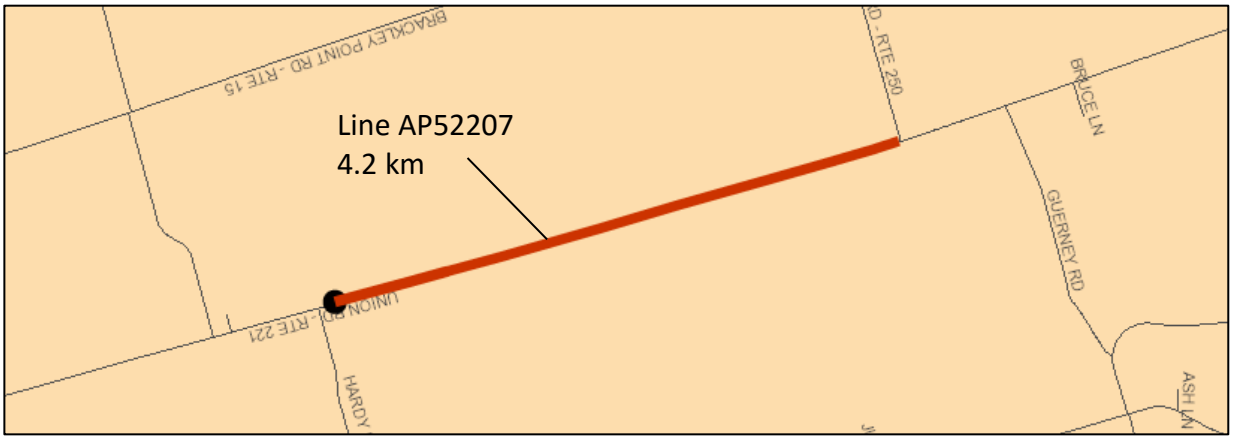


Figure 1: Union Rd, PE - 1-Phase Rebuild and Voltage Conversion

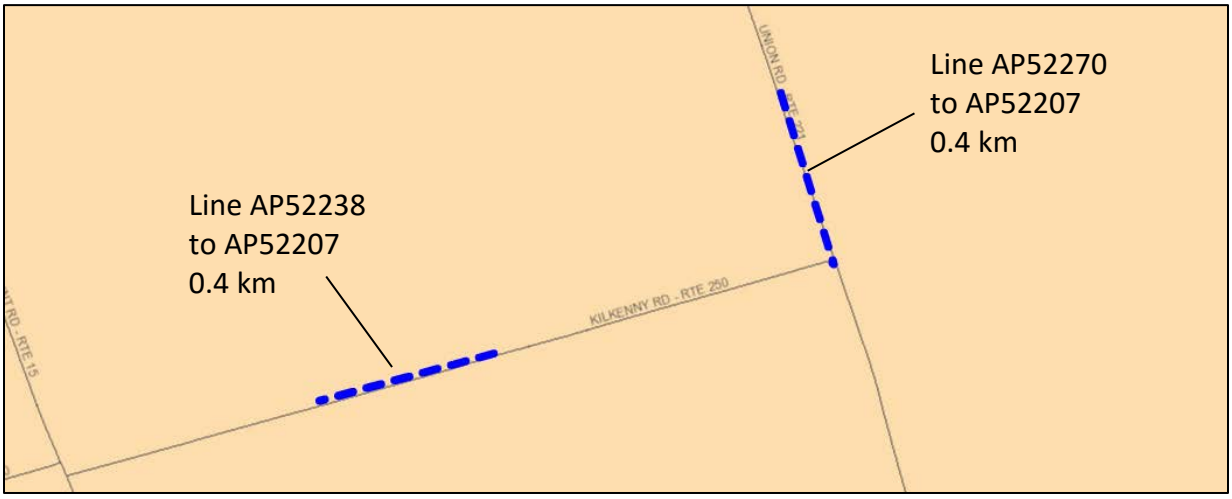


Figure 2: Kilkenny Rd & Union Rd, PE – Areas with potential for future line expansion

Title: **Union Road Three Phase Rebuild**

Location: **Brackley**

Line Type: **Distribution – Three Phase**

Distance: **1.4 kilometres**

Amount: **Approximately $138,000**

Project Description:

The project is a three phase line rebuild to replace a 1.4 kilometre section of line AP52205 from 792 Union Road to 610 Union Road (see Figure 3). Line AP52205 is the main feed for the City of Charlottetown water well pumping station at 588 Union Road. The line is operated at 25 kV and is connected to the Airport Substation. There are 17 customers fed from this section of line.

Project Justification

The primary justification for the project is that AP52205 is aged and deteriorated. There are approximately 21 poles along the route with 13 (60%) of them being aged eastern cedar. In addition, the line contains inadequate neutral spacing, numerous porcelain insulators, long spans and non-standard flat braces supporting deteriorated cross arms that present safety concerns and put the line at increased risk of failure. The existing #2 ACSR (Sparrow) conductor, rated for 180 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to upgrade the conductor to current standards.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be rebuilt on the same side of the road by leaning the existing line out of the way and building the new line with the existing line still energized. There is minimal tree trimming required. One set of flaggers will be necessary for the project as traffic volume is low but speed limit is high.

Union Road Three Phase Rebuild

Old eastern cedar pole

Inadequate neutral spacing and deteriorated cross-arm

Inadequate neutral spacing and porcelain insulators

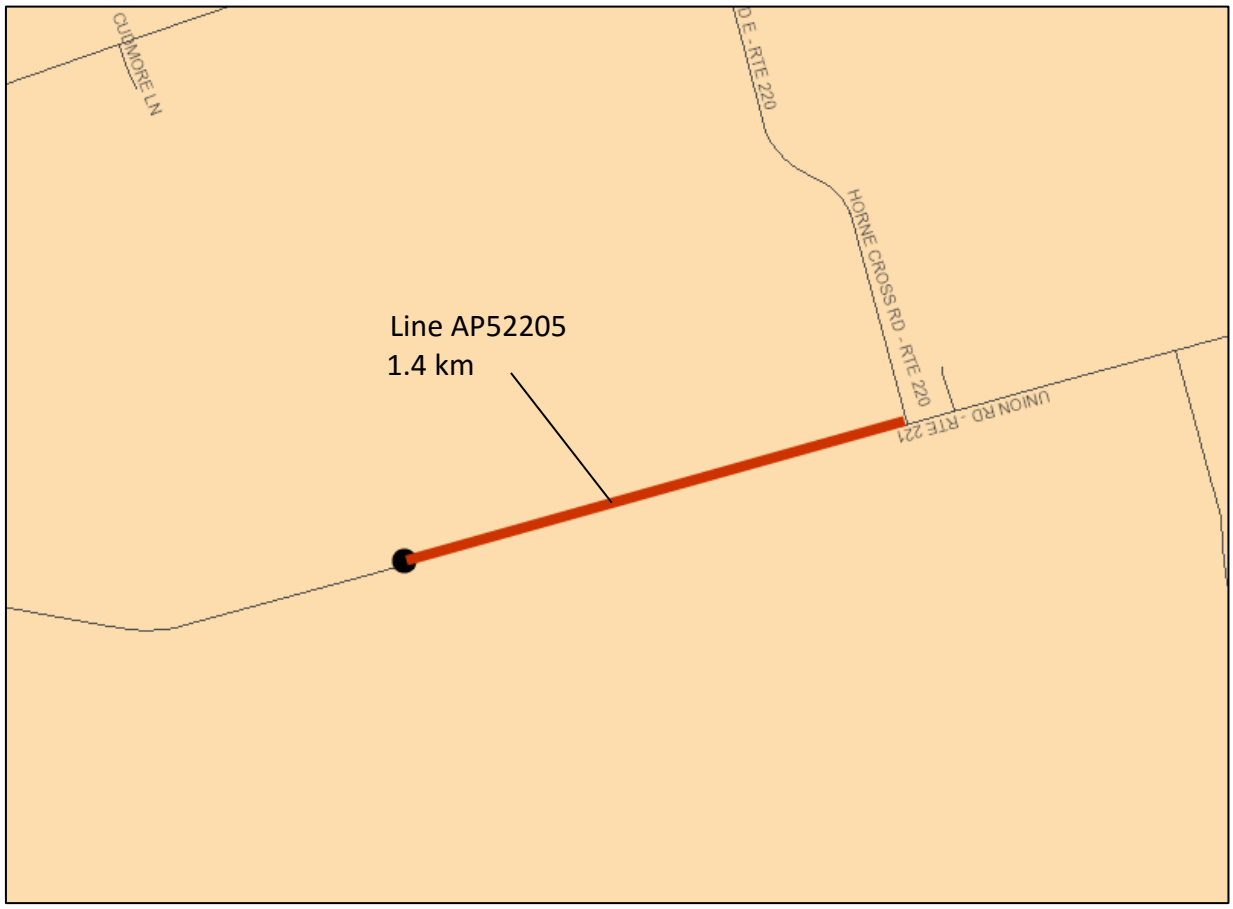


Figure 3: Union Rd, PE - 3-Phase Rebuild

Title: **Iona Road Single Phase Rebuild**

Location: **Iona**

Line Type: **Distribution – Single Phase**

Distance: **7.8 kilometres**

Amount: **Approximately $555,500**

Project Description:

The project is a 7.8 kilometre single phase line rebuild to replace line VC01490 along the Iona Road from the Murray Harbour Road to 2638 Iona Road (see Figure 4). Line VC01490 is operated at 7,200 V and is connected to the Victoria Cross Substation. There are 64 customers fed from this section of line.

Project Justification

The primary justification for the project is that VC01490 is aged and deteriorated. There are approximately 103 poles along the route, many of which are in poor condition. 25 (24%) of the poles are aged eastern cedar. In addition, the line contains inadequate neutral spacing, numerous porcelain insulators, and inconsistent span lengths that present safety concerns and put the line at increased risk of failure. The existing #2 ACSR (Sparrow) conductor, rated for 180 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to upgrade the conductor to current standards.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be built on the same side of the road by leaning the existing line out of the way and building the new line with the existing line still energized. Tree trimming will be required for approximately 57 spans (56% of total). One set of flaggers will be necessary for the project as traffic volume is low but speed limit is high.

Iona Road Single Phase Rebuild

Old eastern cedar pole with inadequate neutral spacing

Inadequate neutral spacing and old bell insulators

Inadequate neutral spacing

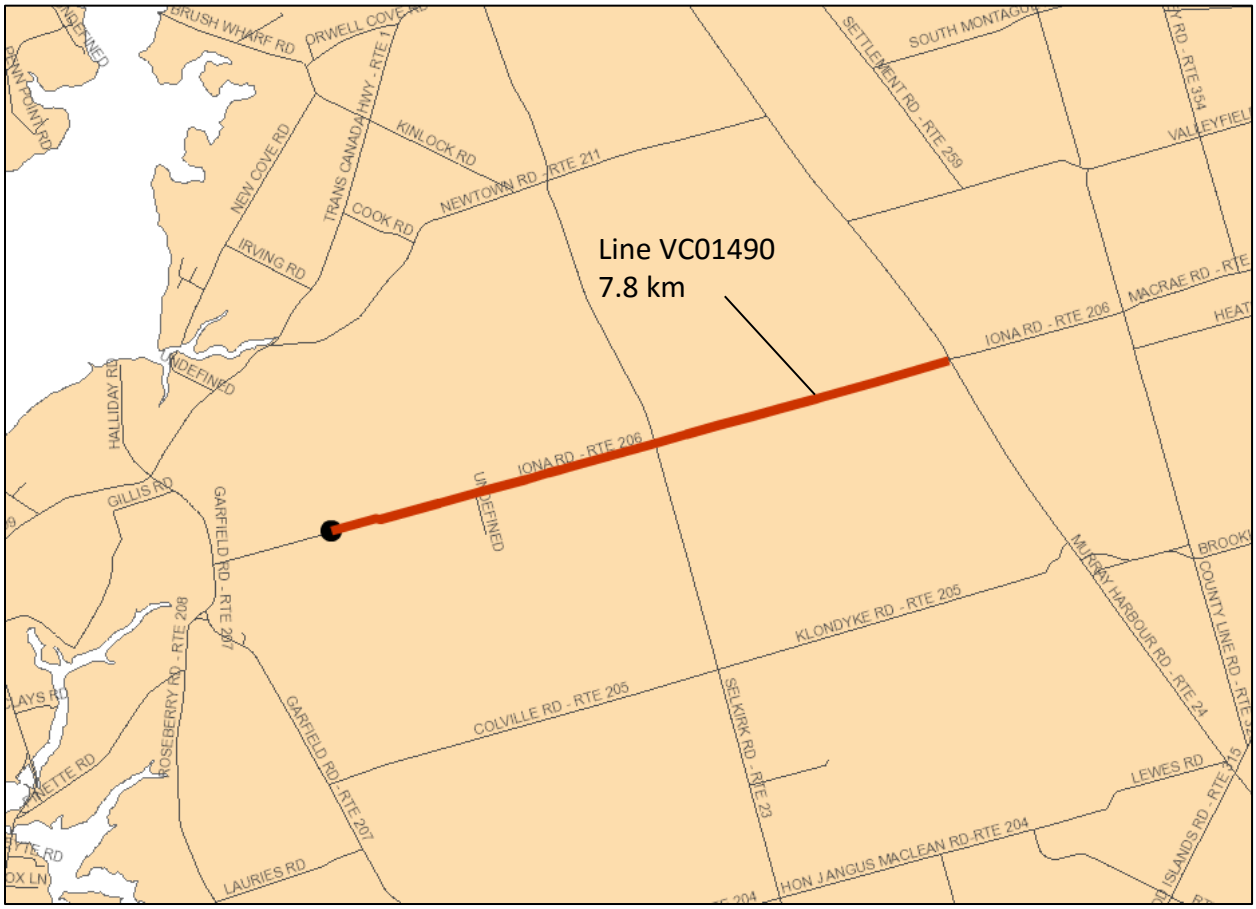


Figure 4: Iona Road, PE - 1-Phase Rebuild

Title: **Howlan Road Single Phase Rebuild**

Location: **Howlan**

Line Type: **Distribution – Single Phase**

Distance: **4.8 kilometres**

Amount: **Approximately $512,700**

Project Description:

The project is a 4.8 kilometre single phase line rebuild to replace line OL09001 along the Howlan Road from Gaspe Road to the Locke Road (see Figure 5). Line OL09001 is operated at 7,200 V and is connected to the O'Leary Substation. There are 80 customers fed from this section of line.

Project Justification

The primary justification for the project is that OL09001 is aged and deteriorated. There are approximately 75 poles along the route, many of which are in poor condition. 15 (13%) of the poles are old eastern cedar. In addition, the line contains inadequate neutral spacing, numerous porcelain insulators and very long spans that present safety concerns and put the line at increased risk of failure. There are over 75 splice repairs in this section of line that were installed through previous conductor repairs as a result of failures. The existing #4 ACSR (Swan) conductor, rated for 140 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to upgrade the line to current standards.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be built on the same side of the road by leaning the existing line out of the way and building the new line with the existing line still energized. Extensive tree trimming will be required along the line. One set of flaggers will be necessary for the project as traffic volume is low but speed limit is high.

Howlan Road Single Phase Rebuild

Old eastern cedar pole and inadequate neutral spacing

Pole repair following fire caused by a porcelain insulator

Old eastern cedar pole with inadequate neutral spacing

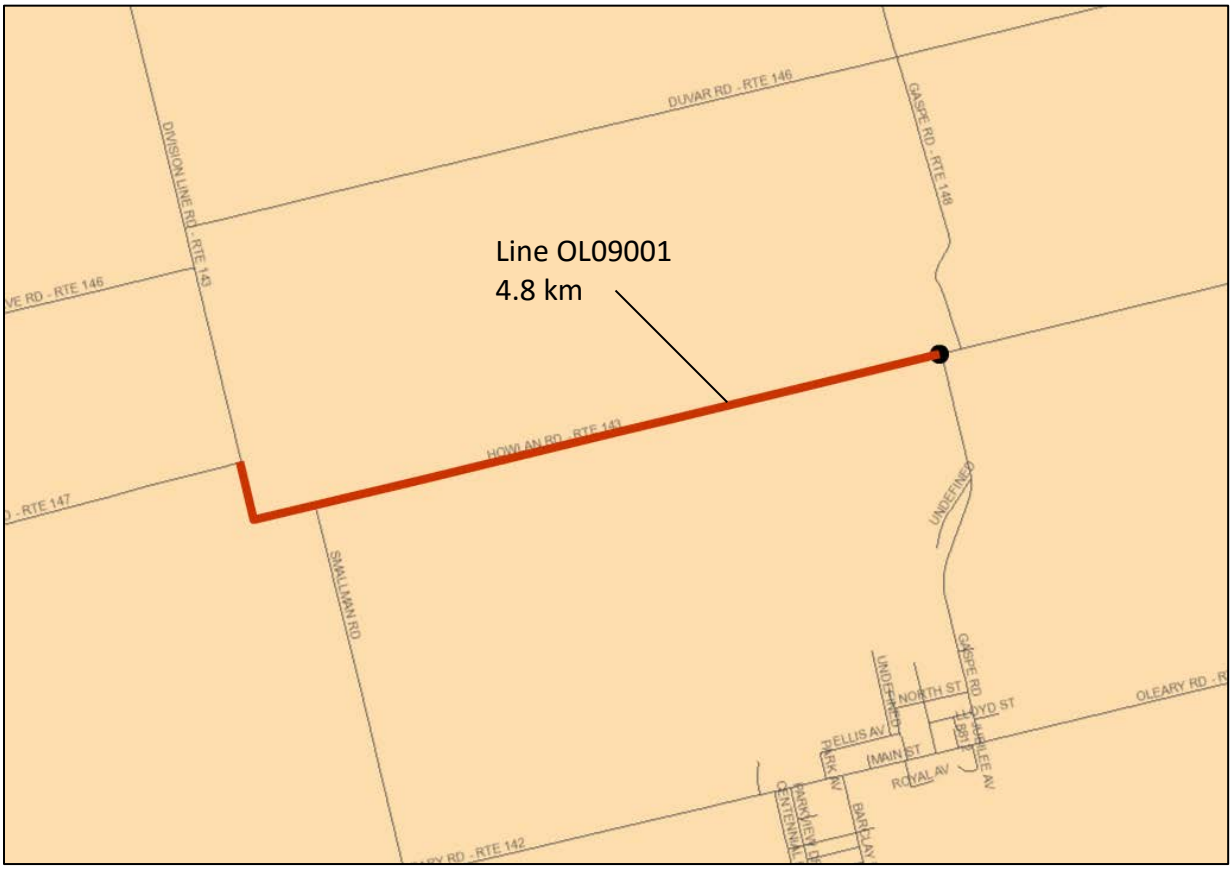


Figure 5: Howlan Road, PE - 1-Phase Rebuild

Title: **Northport Three Phase Rebuild**

Location: **Alberton**

Line Type: **Distribution – Three Phase**

Distance: **1.8 kilometres**

Amount: **Approximately $254,500**

Project Description:

The project is a 1.8 kilometre three-phase line rebuild to replace line AL00231 along Main Street in Alberton, PEI from 446 Main Street to 255 Main Street (see Figure 6). Line AL00231 is operated at 12,500 V and is connected to the Alberton Substation. There are 266 customers fed from this section of line.

Project Justification

The primary justification for the project is that AL00231 is aged and deteriorated. There are approximately 41 poles along the route, many of which are in poor condition. 8 (20%) of the poles are old eastern cedar. In addition, the line contains inadequate neutral spacing and many porcelain insulators that present safety concerns and put the line at increased risk of failure. The existing #4 ACSR (Swan) conductor, rated for 140 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to upgrade the line to current standards.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be built on the same side of the road by leaning the existing line out of the way and building the new line with the existing line still energized. Tree trimming will be required for approximately 18 spans. One set of flaggers will be necessary for the project as speed limit is low but traffic volume is high.

Northport Three Phase Rebuild

Old eastern cedar pole

Old eastern cedar pole

Old bell insulators

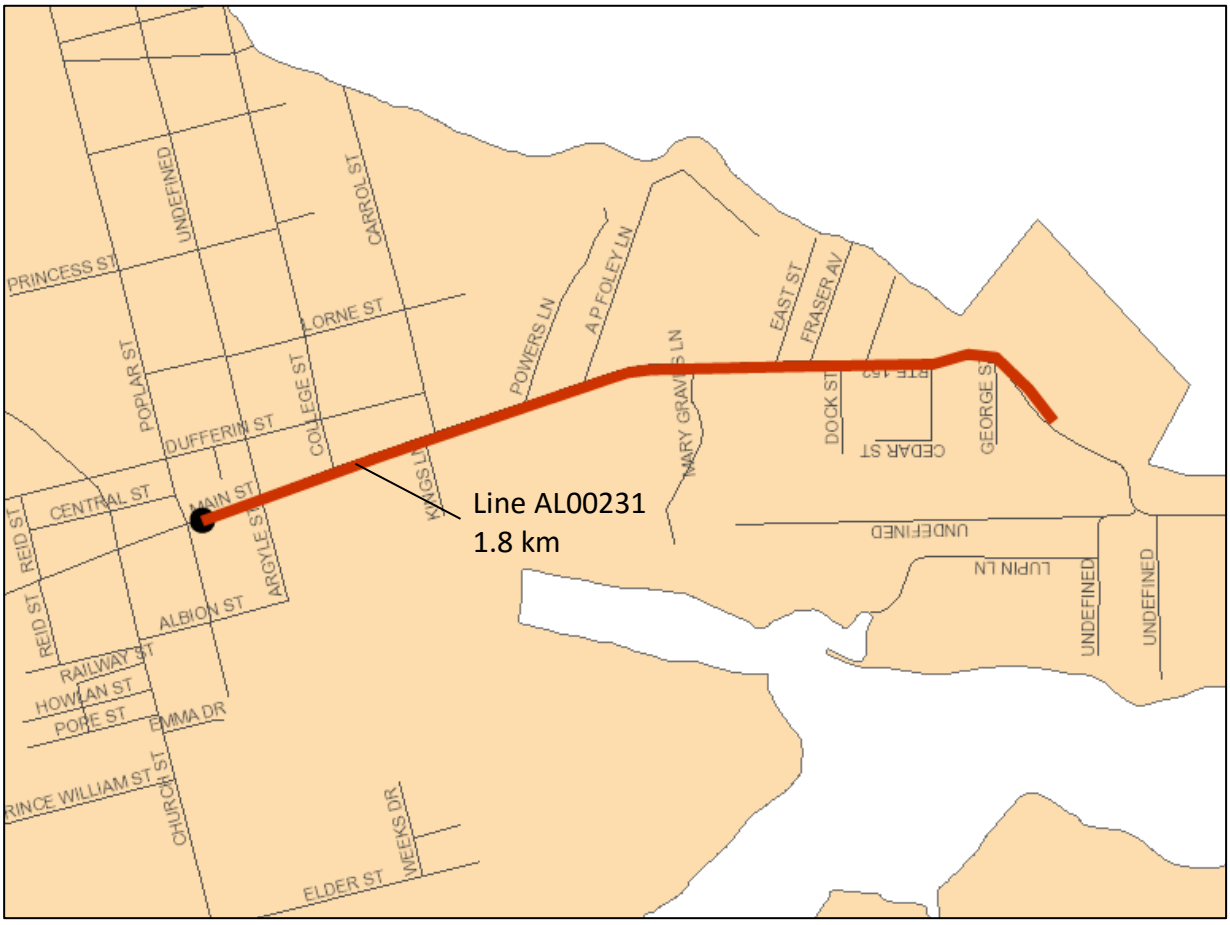


Figure 6: Northport, PE - 3-Phase Rebuild

Title: **North Carleton Road Three Phase Rebuild**

Location: **Carleton**

Line Type: **Distribution – Three Phase**

Distance: **2.0 kilometres**

Amount: **Approximately $263,500**

Project Description:

The project is an upgrade of lines AB00368 and AB00318 from single phase to three phase and a partial three phase rebuild of line AB00367 along the North Carleton Road. The start of the project is at the Trans Canada Highway intersection and it ends at the MacWilliams Road intersection (see Figure 7). The North Carleton Road is currently fed from AB00397 along Dickie Road. Upon completion of the project, the North Carleton Road will be fed from the new proposed line and line AB00397 will be converted from three phase to single phase at a future date. The new line will be operated at 12,500 V and will be connected to the Albany Substation. There are 200 customers fed from this section of line.

Project Justification

The primary justification for the project is that AB00397 and AB00367 are aged and deteriorated. There are approximately 46 poles along the route, many of which are in poor condition. 14 (30%) of the poles are aged eastern cedar. In addition, the lines contain inadequate neutral spacing, numerous porcelain insulators, porcelain cutouts and discontinued flat braces supporting cross arms that put the line at risk of failure. The existing #2 ACSR (Sparrow) conductor, rated for 180 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to meet current standards.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be rebuilt on the same side of the road by leaning the existing lines out of the way and building the new line with the existing lines still energized. Minimal tree trimming will be required and one set of flaggers will be necessary for the project as traffic volume is low but speed limit is high.

North Carleton Road Three Phase Rebuild

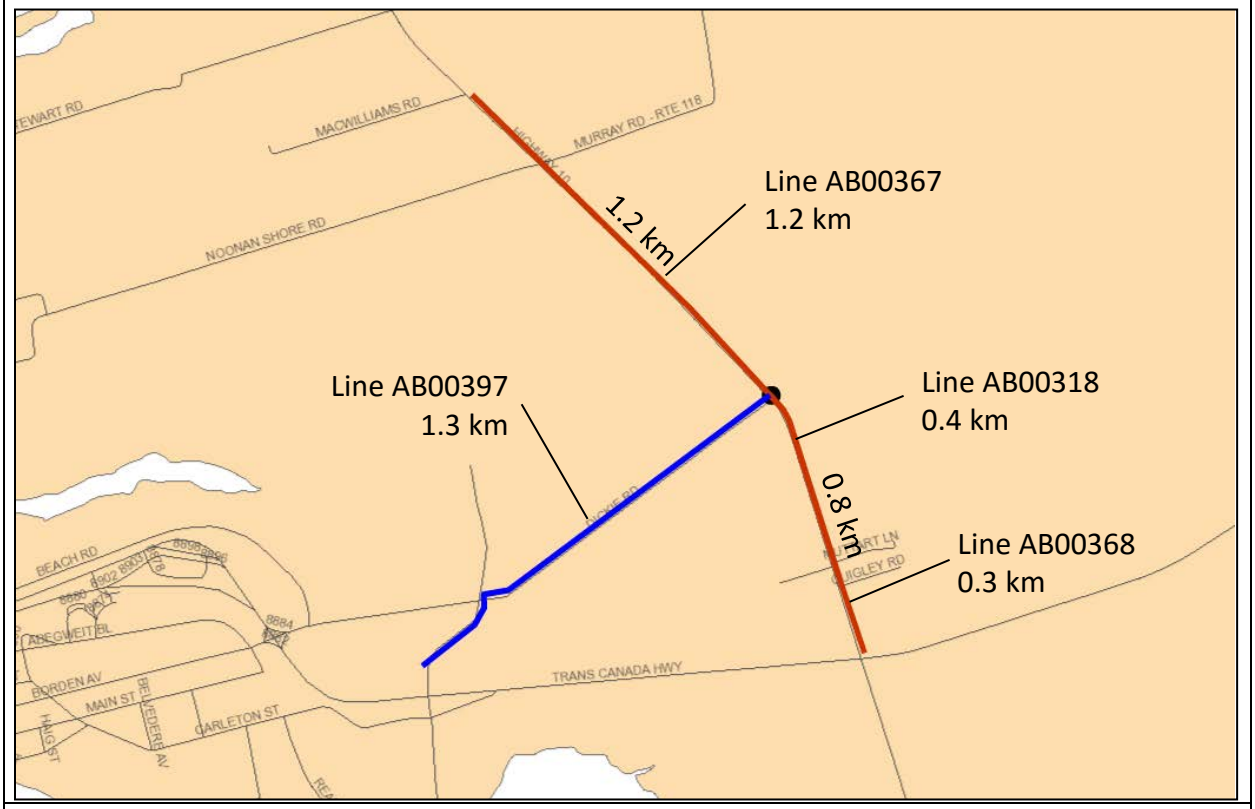


Figure 7: Carleton, PE - 3-Phase Rebuild

Title: **Crapaud Three Phase Rebuild**
Location: **Crapaud**
Line Type: **Distribution – Three Phase**
Distance: **0.8 kilometres**
Amount: **Approximately $141,500**

Project Description:

The project is a 0.8 kilometre three phase line rebuild to replace line AB03313 along the Trans-Canada Highway from 20499 TCH to approximately the Englewood School towards Victoria (see Figure 8). Line AB03313 is operated at 12,500 V and is connected to the Albany substation. There are 211 customers fed from this section of line with some being commercial businesses in Victoria.

Project Justification

The primary justification for the project is that AB03313 is aged and deteriorated. There are approximately 20 poles along the route, many of which are deteriorated along the base of the pole. 11 (55%) of the poles are aged eastern cedar. In addition, the line contains inadequate neutral spacing, numerous porcelain insulators, aged open secondary conductor and non-standard flat brace cross arms that present safety concerns and put the line at risk of failure. The existing #2 ACSR (Sparrow) conductor, rated for 180 amps, will be replaced with 2/0 ACSR (Quail) conductor, rated for 270 amps, to upgrade the line to current standards.

Construction

A permit from the Department of Transportation, Infrastructure and Energy will be required for the project. It is intended that the line will be built on the same side of the road by leaning the existing line out of the way and building the new line with the existing line still energized. There is minimal tree trimming required. One set of flaggers will be necessary for the project and substantial signage will be required as both traffic volume and speed limits are high.

Future Development Benefits

The completion of this project will also support future reliability improvements in the area. This could be accomplished by including opportunities for alternate feeds along the route towards Victoria.

Crapaud Three Phase Rebuild

Deteriorated old eastern cedar pole base

Inadequate neutral spacing and old bell insulators

Inadequate neutral spacing and open secondary

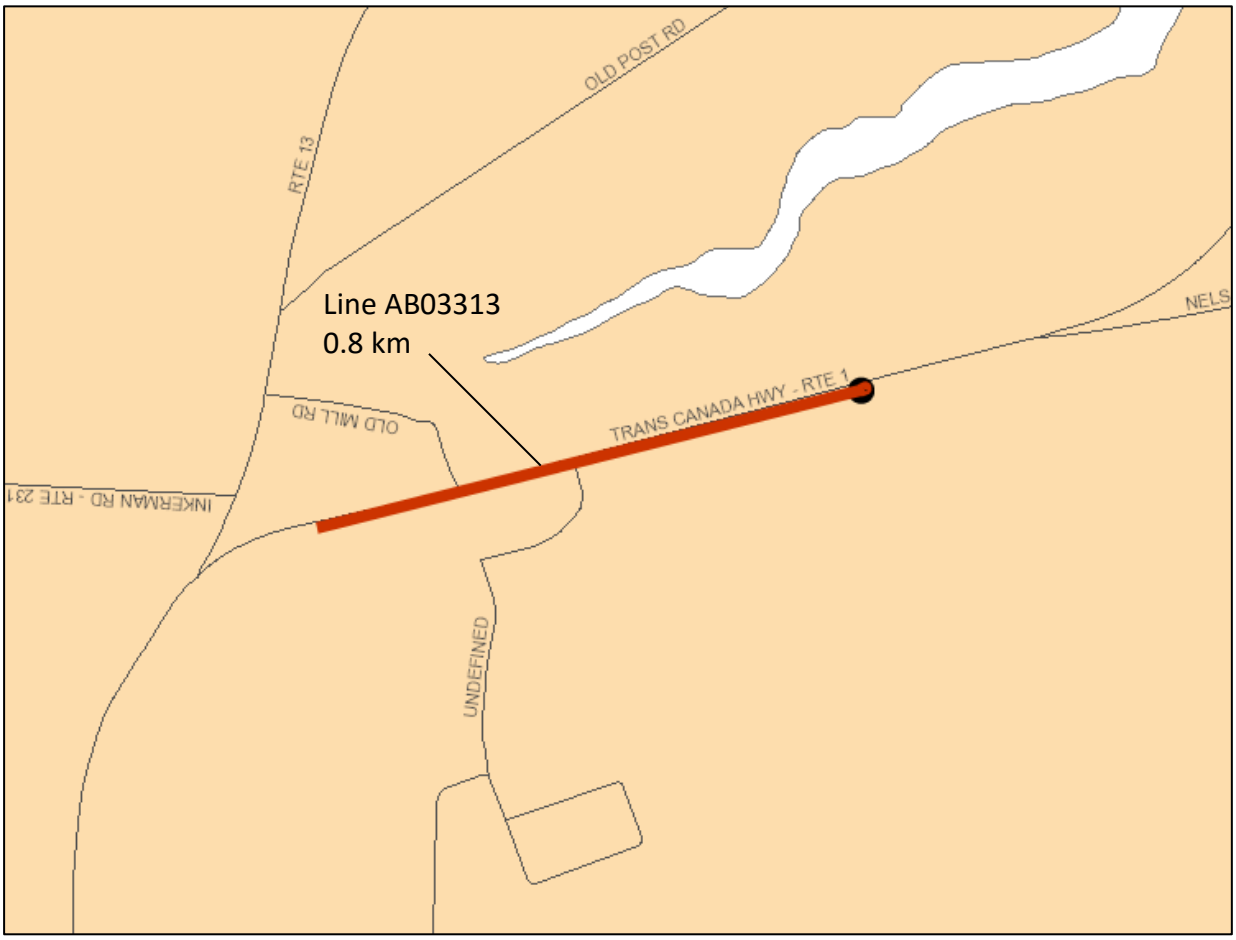
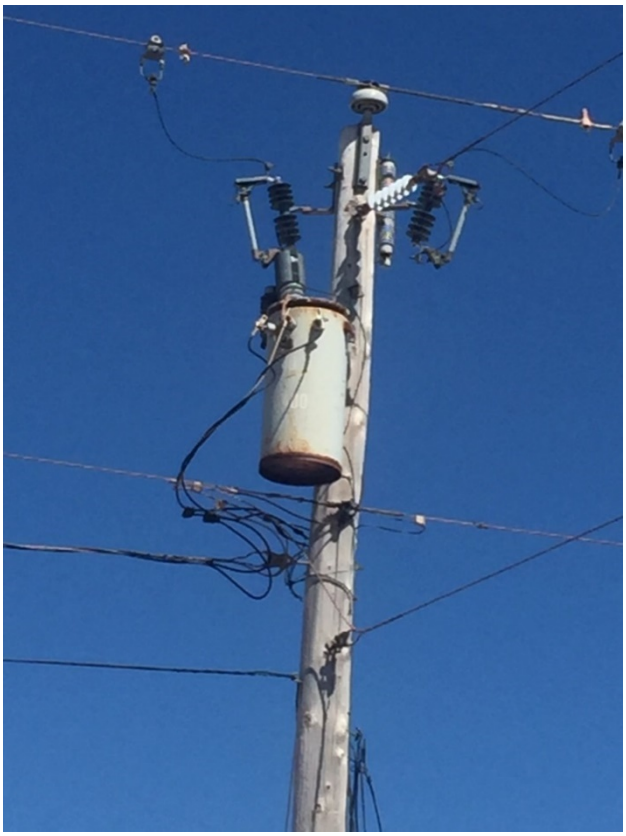


Figure 8: Crapaud, PE - 3-Phase Rebuild

APPENDIX G

Distribution Inspection Deficiencies



Rusted Transformer and Deteriorated Conductor

Rotten pole

Rusted Transformer

Bottom of transformer

APPENDIX H

Eastern Cedar Pole Field Inspection and Testing Results

EDM Field Inspection and Testing Results

Struct ID	Brand Year	Original Treatment	Class	Height ft.	Pole Species *EC-cedar JP-Jack Pine RP-Red Pine WH-Western Hemlock*	Inspection Type *P-Partial Excavation SB-Sound Bore V-Visual*	Pole Setting S-soil A-asphalt	Ground line circumference (inches)	Net D-Calc RSM (%)
10387	1965	Cedar	4	35	EC	P	S	40.5	6.82
12382	1985	Penta	4	40	JP	SB	A	37	76.63
13192	1993	Penta	4	35	JP	SB	A	38	100
13427	1967	Cedar	4	35	EC	P	S	36	10.81
13585	1965	Cedar	4	35	EC	P	S	40	61.41
18394	1983	Penta	3	40	RP	P	S	40.5	100
18576	1988	CCA	4	40	JP	SB	A	38	100
18591	1985	Penta	4	40	JP	SB	A	37	64.53
18703	1977	Penta	4	40	JP	SB	A	41	83.18
18857	1975	Penta	4	40	JP	SB	A	38	70.04
20373	1975	Cedar	4	35	EC	P	S	37	53.55
26043	1975	Cedar	4	45	EC	P	S	50	65.8
26049	1975	Cedar	4	45	EC	P	S	39	39.55
28101	1988	Penta	4	40	JP	SB	A	37	93.06
28864	1968	Creosote	4	35	JP	P	S	39	100
28891	1968	Penta	4	40	JP	SB	A	40	74.32
28991	1966	Cedar	4	35	EC	SB	A	40	13.07
29751	1975	Creosote	4	35	JP	P	S	34.5	100
29761	1975	Penta	4	35	JP	P	S	34	54.22
30323		Penta	4	35	EC	V	A	30	86.05
30469	1983	Penta	3	40	RP	P	S	40	100
30491	1968	Cedar	4	35	JP	SB	A	34.5	73.36
30544	1965	Cedar	4	35	EC	P	S	43	30.47
45755	1967	Cedar	4	35	EC	P	S	38	61.7
45756	1967	Cedar	4	35	EC	P	S	34.5	25.48
56800		Penta	4	35	WH	P	S	39	74.14
56801	1965	Cedar	4	35	EC	P	S	30	38.21
56851	1965	Creosote	4	45	JP	P	S	41.5	100
56889	1966	Creosote	4	50	JP	P	S	38	100
64067	1975	Cedar	4	35	EC	P	S	30.25	16.01
64069	1975	Cedar	4	35	EC	P	S	36.5	15.12
64072	1975	Cedar	4	35	EC	P	S	44	67.65
68315	1967	Cedar	4	35	EC	P	S	45	90.62
68337	1975	Cedar	4	40	EC	P	S	42	97.91
80583	1975	Cedar	4	40	EC	P	S	48	81.62
80747	1975	Cedar	4	40	EC	P	S	42	79.2
80749	1975	Cedar	4	40	EC	P	S	48.5	72.34

EDM Field Inspection and Testing Results

Struct ID	Brand Year	Original Treatment	Class	Height ft.	Pole Species *EC-cedar JP-Jack Pine RP-Red Pine WH-Western Hemlock*	Inspection Type *P-Partial Excavation SB-Sound Bore V-Visual*	Pole Setting S-soil A-asphalt	Ground line circumference (inches)	Net D-Calc RSM (%)
80762	1975	Cedar	4	30	EC	P	S	43.5	62.57
80771	1975	Cedar	4	35	EC	P	S	46.5	36.34
80774	1987	Creosote	4		JP				
87517	1965	Cedar	4	35	EC	P	S	43.75	100
87518	1965	Cedar	4	35	EC	P	S	48.5	100
110169	1975	Cedar	4	35	EC	SB	S	50	45.75
110170	1975	Cedar	4	35	EC	P	S	43.5	100
110171	1975	Cedar	4	35	EC	P	S	44	69.52
122023	1965	Cedar	4	35	EC	P	S	48	15.05
122025	1965	Cedar	4	35	EC	P	S	39	82.6
122028	1965	Cedar	5	35	EC	P	S	32	57.07
123738	1975	Cedar	4	35	EC	P	S	38.5	31.45
123739	1975	Cedar	4	35	EC	P	S	41	15.98
124022	1974	Cedar	4	40	EC	SB	S	44	26.58
124025	1975	Cedar	4	35	EC	P	S	47	51.1
124864	1975	Cedar	4	35	EC	P	S	49	22.19
124865	1975	Cedar	4	40	EC	P	S	45	49.41
124866	1975	Cedar	4	40	EC	P	S	48	9.26
146833	1975	Cedar	4	35	EC	P	S	36	40.36
146836	1975	Cedar	4	35	EC	P	S	32.5	33.58
146839	1975	Cedar	4	35	EC	P	S	36	10.59

EDM Field Inspection and Testing Results

EDM Field Inspection and Testing Results

APPENDIX I

Images of Reclosers in need of Replacement

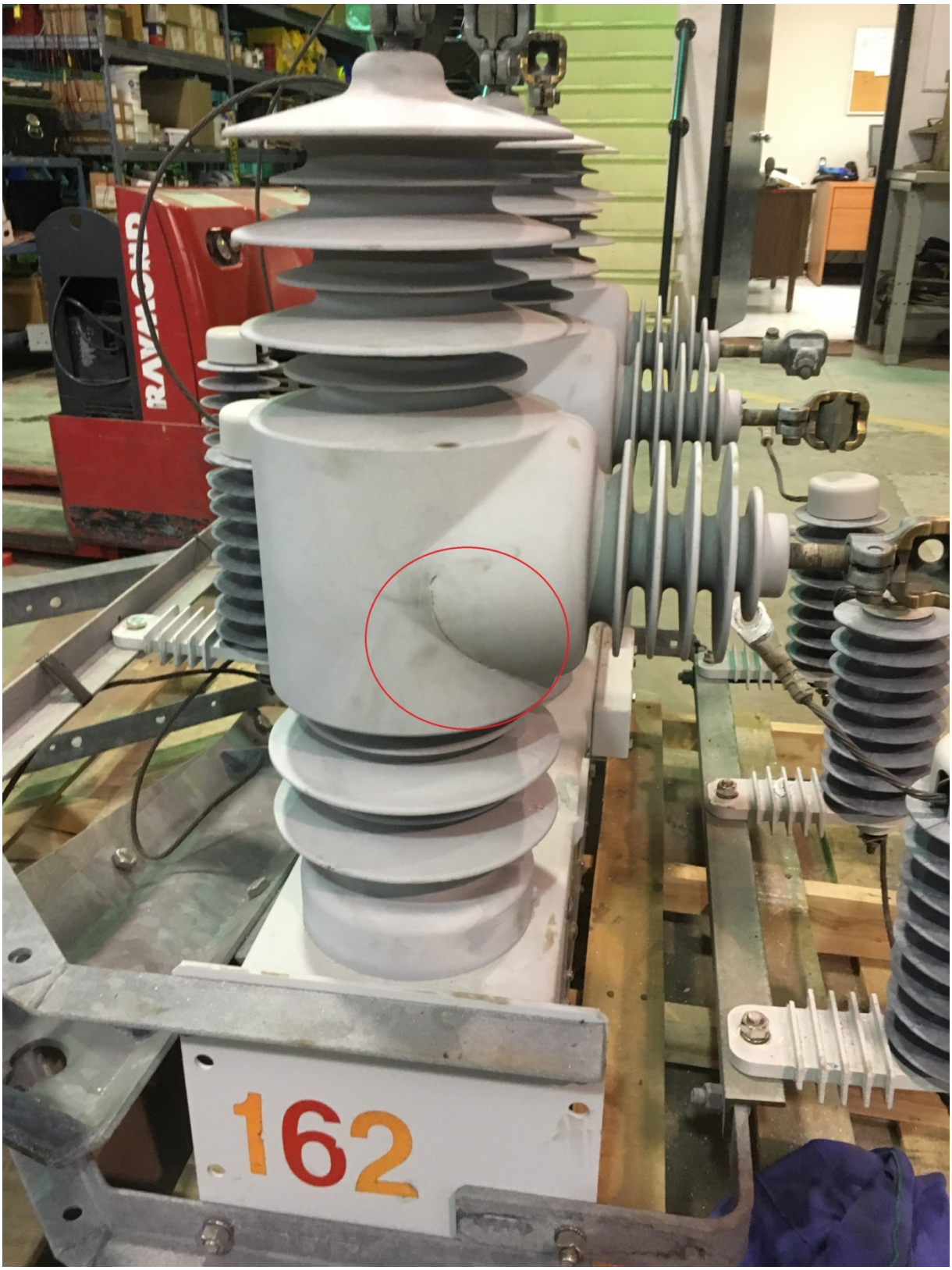


Photo 1: Photo of Cracked Recloser

Photo 2: Photo of Rusty Recloser

APPENDIX J

Voltage Regulator in need of Replacement

Photo 1: Photo of Rusty Voltage Regulator

APPENDIX K

Capacitor Bank and Oil Switch in need of Replacement

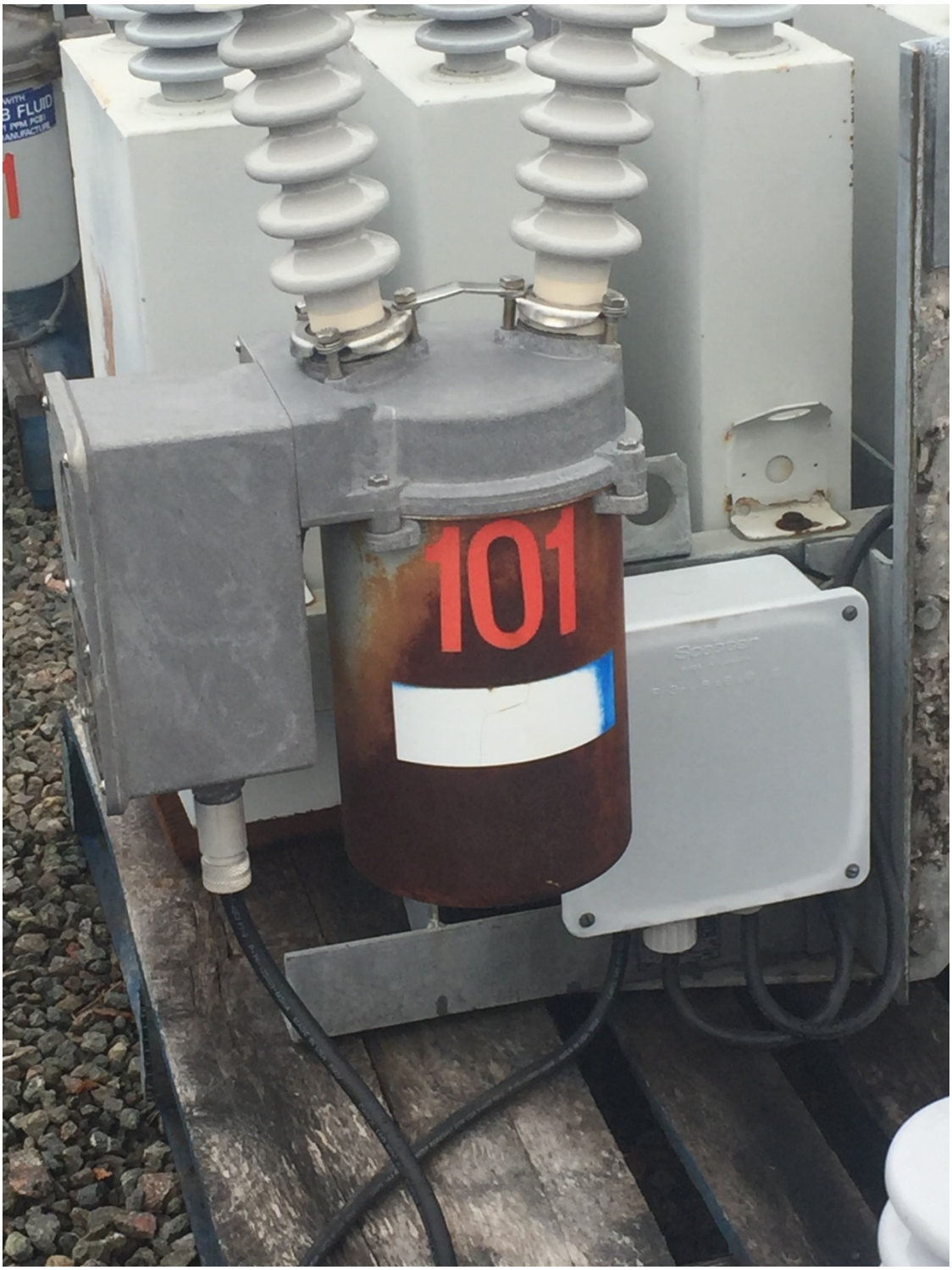


Photo 1: Photo of a rusty oil switch for a capacitor bank

APPENDIX L

Transportation Justification - 2019

Maritime Electric

Transportation Justification

2019

Prepared by

Adam MacKenzie (Project Engineer)

Maritime Electric Company, Limited

Table of Contents

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3.0 Vehicle Replacement Criteria 1

4.0 Details of Vehicles >$250,000 Slated for Replacement in 2019 2

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Appendix 1 – Photographs of Aerial Bucket Trucks for Replacement in 2019

1.0 Introduction

This Transportation budget involves the necessary replacement of heavy fleet, medium fleet, trailers and passenger vehicles. Detailed evaluation of the units to be replaced indicates they have reached the end of their useful service lives.

2.0 Vehicles to be Replaced in 2019

Table 1 summarizes the units to be replaced in 2019.

Table 1
2019 Proposed Vehicle Replacements

Category	No. of Units
Heavy Fleet Vehicles	2
Medium Fleet Vehicles	1
Passenger Vehicles	9
Trailers	2
Total	14

In 2019, there are 2 heavy fleet vehicles that meet the age, mileage and condition parameters that indicate replacement is necessary. Also in 2019, the Company has identified 1 medium fleet vehicle, 9 passenger vehicles and 1 trailer for replacement. The Company's replacement criteria for vehicles are as indicated in Table 2.

3.0 Vehicle Replacement Criteria

Table 2
Maritime Electric Replacement Criteria for Vehicles

Tracked Heavy Vehicles	15 years
Heavy/Medium Flat Bed Trucks	10 years or 250,000 km
Heavy Vehicles	10 years or 250,000 km
Service Trucks (CSUP – run double shift) Medium Vehicles	5 years or 250,000 km
Passenger Vehicles	7 years or 200,000 km

The age of the vehicle is the guiding factor but vehicles reaching the threshold are also evaluated on a number of additional criteria such as annual maintenance costs, Power Take Off ("PTO") hours (if applicable) and vehicle condition (rust, electrical issues, etc.) to determine whether they have reached the end of their useful service lives. Based on such evaluations, it has been forecast that each unit proposed for replacement will reach the end of its useful service life and require replacement in 2019.

4.0 Details of Vehicles >$250,000 Slated for Replacement in 2019

Item	Aerial Bucket for Central District	Aerial Bucket for Eastern District
Vehicle #	03-12-65	06-12-76
Chassis Make/Model	Freightliner/FL-80	Freightliner/M2-106
Boom Make/Model	Posi-Plus/400-46A	Posi-Plus/400-46-R
Description	The chassis was replaced in 2003 boom was originally built in 1997. Unit is a 46 ft. aerial bucket truck	The truck and chassis were purchased new in 2006. Unit is a 46 ft. aerial bucket truck
Mileage	250,000 km	368,000 km
PTO Hours	8,500 hours	PTO dial does not work
Approximate Maintenance Costs Over Past 3 Years	$78,000	$128,000
Summary	Boom is 21 years old and has more than twice as many hours on it than any other truck in the fleet except for the spare digger. Chassis/body has been well looked after but is starting to show signs of its age.	Outriggers, deck, underside of chassis and chassis frame are all showing serious corrosion issues. Maritime Electric is concerned that this truck may not pass the year's inspection due to these issues.

Appendix 1

Photographs of Aerial Trucks for Replacement in 2019

Truck #03-12-65 – Sideview

Truck #03-12-65 – Fuel Tank Below Driver Door

Truck #03-12-65 – Rust perforation in deck

Truck #03-12-65 – Rust on body trim

Truck #06-12-76 – Overall view of truck

Truck #06-12-76 – Heavy rust on frame

Truck #06-12-76 – Heavy rust on underside of chassis

Truck #06-12-76 – Heavy rust on underside of chassis

Truck #06-12-76 – Heavy rust on air tank

APPENDIX M

Lorne Valley Switching Station Single Line Diagram

Photo 1: Existing Lorne Valley Substation

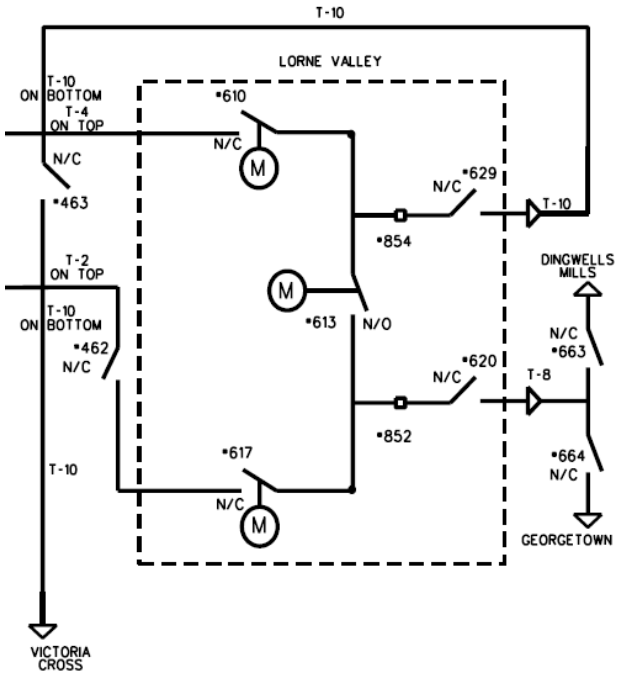


Figure 1: Single Line Diagram for Lorne Valley

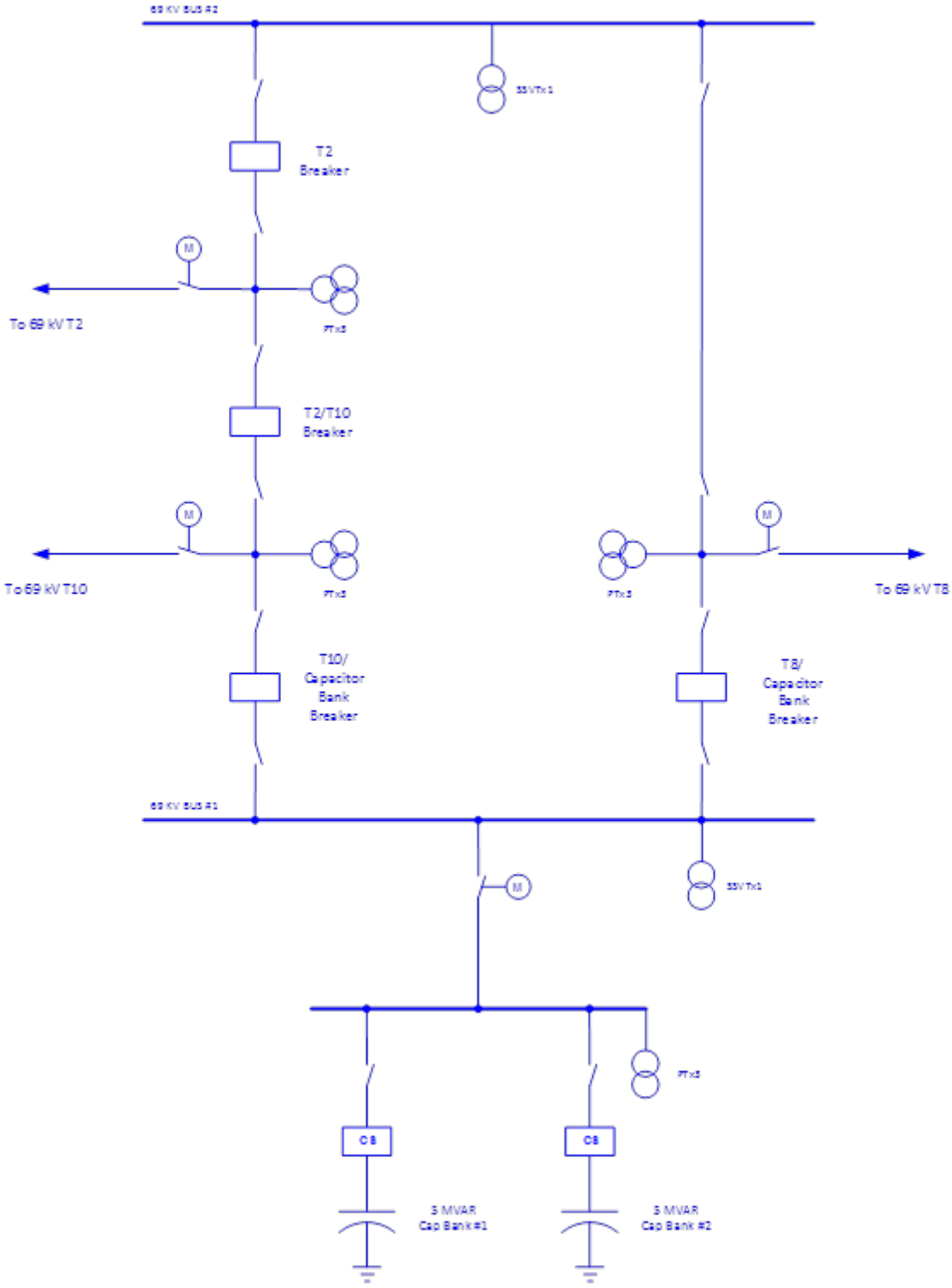


Figure 2: 69 kV Lorne Valley Conceptual Single Line Diagram
4 Breakers Ring Bus

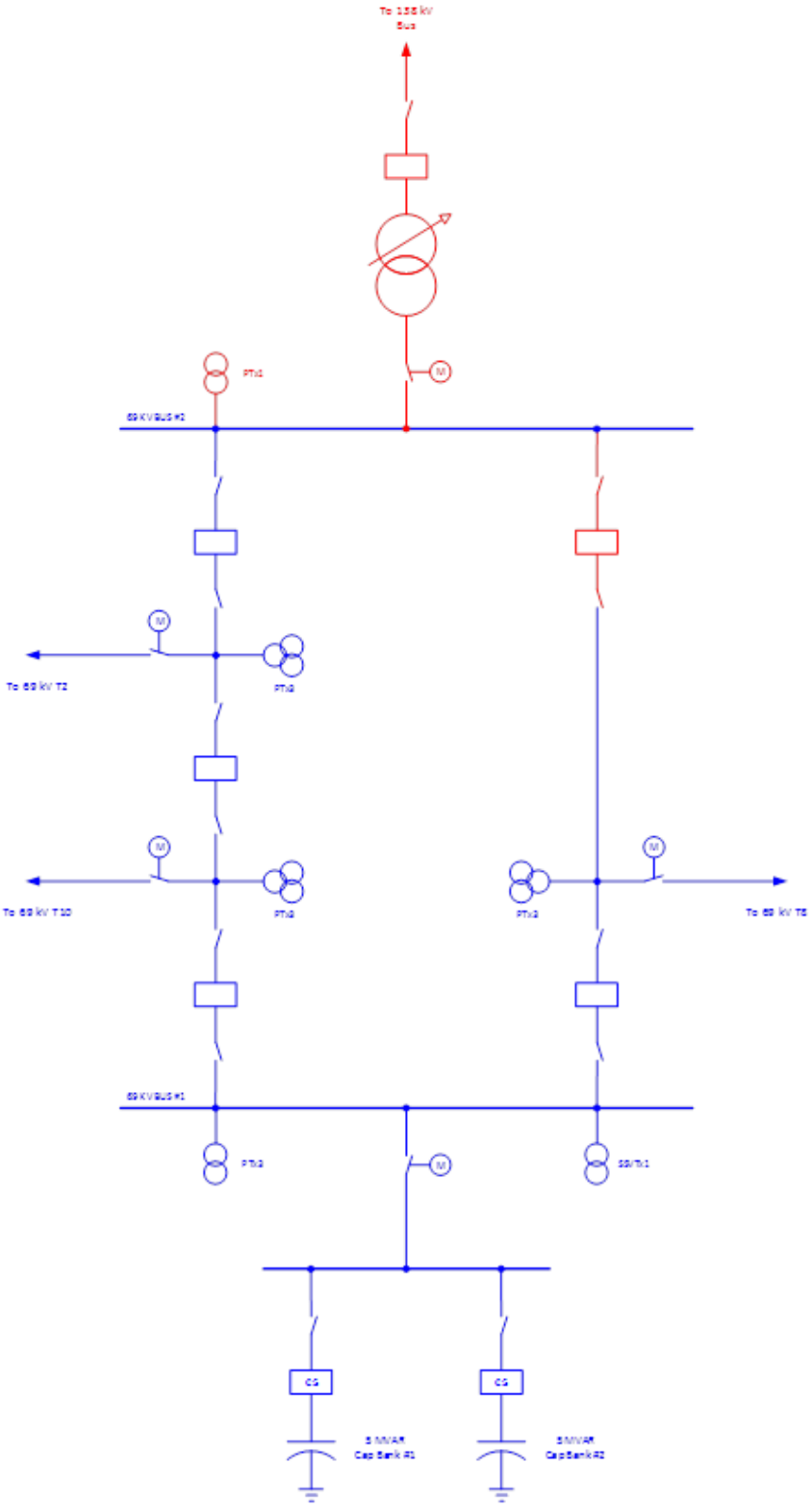


Figure 3: 69 kV Lorne Valley Conceptual SLD: 138 kV in LV with Auto

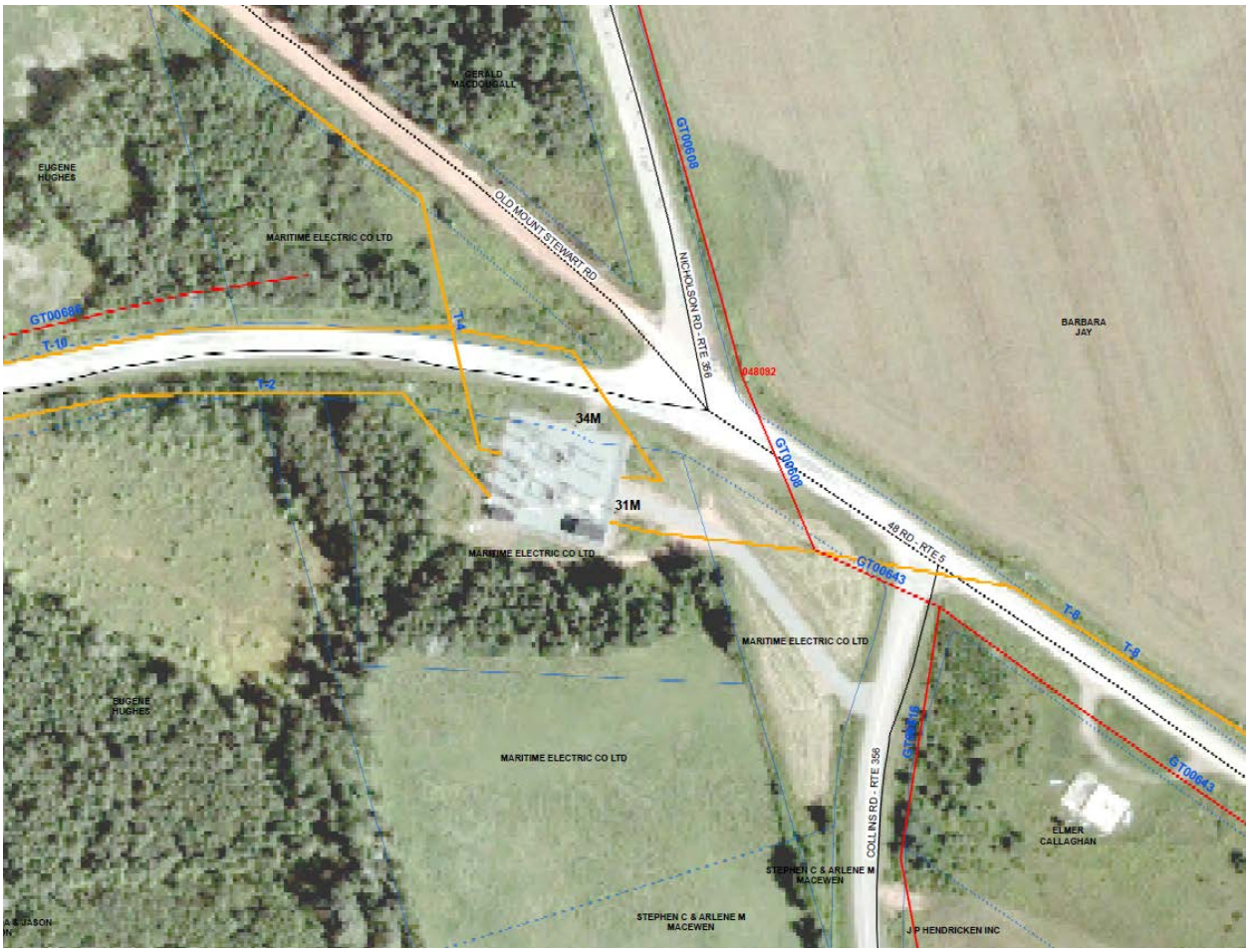


Photo 2: Lorne Valley Switching Station Land located at #4494, 48 Road

APPENDIX N

Existing 7.5/10 MVA Transformer at Airport Substation

Photo 1: Existing 7.5/10 MVA Airport Transformer

APPENDIX O

T-3 Transmission Rebuild Justification

Title: **T-3 Transmission Line Rebuild (Borden to Albany Substation)**

Location: **Borden-Carleton to Albany**

Line Type: **Transmission – 69 kV**

Distance: **2.9 kilometres**

Amount: **Approximately $945,000**

Project Description:

The project is a 2.9 kilometre transmission line rebuild to replace a section of T-3 between Borden-Carleton and Albany Substation. The section of line to be replaced is located along the Trans-Canada Highway from civic address 23792 to civic address 23258 (see Figure 1).

Project Justification

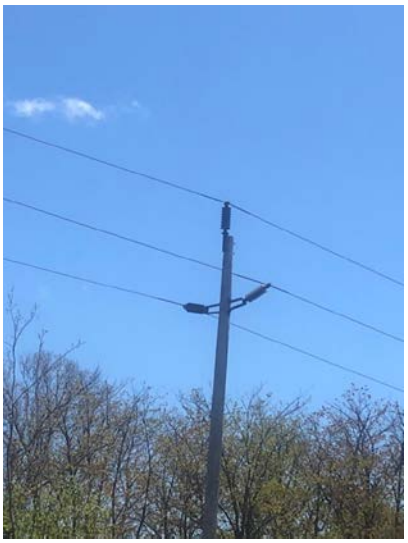
The primary justification for the project is that T-3 is aged and deteriorated. Since 2013, there have been five outages on this section of line resulting in 38,987 customer outage hours. There are approximately 75 poles along the route, many of which are in poor condition and dating back to as early as 1973. In addition, the line contains numerous porcelain insulators, wood cross arms (no longer used for transmission lines) and discontinued stand-off brackets that present reliability and safety concerns and put the line at risk of failure. Many of the existing poles also carry and support line T-9, a discontinued transmission line. The conductor installed for the new line will be 720 Flint insulated to 138 kV for future upgrading and will be designed for construction to the current standards using PLS-CADD software.

Construction

Permits from the Department of Transportation will be required for this project. The existing T-3 line, which feeds the Albany Substation, will be retired and removed prior to the construction of the new T-3 line. The Albany Substation will be temporarily fed from Y-109 during construction to improve safety for workers and eliminate the need for outages. It is intended that the new line will be constructed on the same side of the road as the existing line. T-3 will be reenergized to feed the Albany Substation after the construction of the line is completed. Tree trimming should not be required given that the new line will be rebuilt along the same route as the existing line. Flaggers and substantial signage will be required as both traffic volume and speed limits are high on the Trans-Canada Highway.

T-3 Transmission Line Rebuild (Borden to Albany Substation)

Old bell insulators and wooden cross arms



Discontinued stand-off brackets with porcelain insulators

Aged structure carrying lines T-3 and T-9

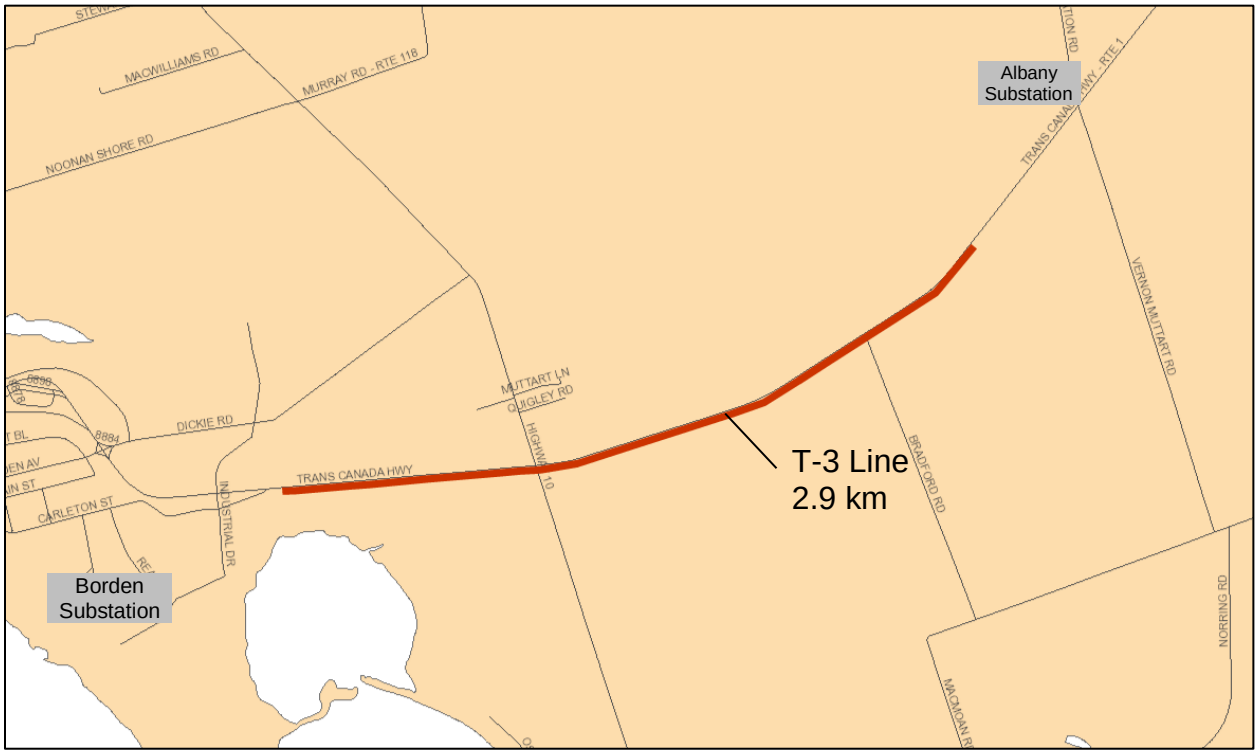


Figure 1: Borden-Carleton, PE – T-3 Rebuild

APPENDIX P

Otis Recommendation Letter

Otis Canada, Inc.

120 Ashburn Lake Road
Unit 8
Saint John, NB
E2J 5E2

Otis
A United Technologies Company

August 3, 2018

Reference: **Maritime Electric Building**

To Whom It May Concern:

The following is a brief description of the elevator equipment at Maritime Electric:

- Manufacturer: Otis Elevator
- Type: Geared Passenger Elevators
- Capacity: 2000 lbs
- Speed: 150 feet per minute
- Date of Installation: 1975
- The equipment does not meet current B44 Code requirements or Canadian Barrier Free Guidelines

General: At 43 years of age, the elevator control system has exceeded its designed equipment life expectancy. Though the maintenance program in effect over the years has very likely contributed to prolonging the life of the elevator, it has become increasingly difficult to maintain the high level of availability and reliability you have come to expect. Based on the degraded reliability, Otis highly recommends modernizing the equipment at Maritime Electric.

If you have any questions please call me directly at 506-647-9764.

Sincerely,
Otis Canada Inc.

Jane E. Rouse

Jane Rouse
Account Manager
Cell: 1 (506) 647-9764
Email: jane.rouse@otis.com