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October 7, 2013

Yukon Utilities Board
Box 31728
Whitehorse, Yukon Y1A 6L3

Attention: Mr. Bruce McLennan, Chair

Re: Yukon Electrical Company Limited – 2013 - 2015 General Rates Application
YUB Direction Regarding Hyperlinked Documents

Dear Mr. McLennan:

Our client, the Utilities Consumers' Group ("UCG") is in receipt of the Yukon Utilities Board's directions regarding the use of hyperlinks within documents on October 4, 2013.

In its July 18, 2013 submission of information requests, UCG included a hyperlink to an evaluation of the AMR meter project proposed by Newfoundland and Labrador Hydro for its Bear Cove and Plum Point service areas as part of question 125(i).

As directed by the Board, UCG now provides a copy of that referenced document in PDF format.

If there are any questions concerning the contents of this submission, I would ask that they be directed to me by email at mjanigan@piac.ca or by phone at (613) 562-4002 ext 26.

Yours truly,

Michael Janigan
Counsel for UCG

cc (by email): Yukon Electrical Company Limited
Registered Intervenors

A REPORT TO
THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

Electrical
Mechanical
Civil
Protection & Control
Transmission & Distribution
Telecontrol
System Planning

Install Automated Meter Reading 2013-2014

Various Service Areas

July 2012

newfoundland labrador hydro
a nalcor energy company

SUMMARY

This proposal is for the installation of an Automated Meter Reading (AMR) system in various service areas to automatically collect and transfer revenue metering from each customer location. It is part of an ongoing program to install AMR systems for all services. Identical AMR system have already been successfully installed and used for other Hydro service areas. AMR system installations are prioritized based on meter reader retirements and/or in order to maintain current meter reader work loads. As such, the service areas in which AMR will be installed will vary depending on these conditions. This capital budget proposal is based on installing AMR in the service areas of Plum Point and Bear Cove.

TABLE OF CONTENTS

1 INTRODUCTION

Hydro provides electrical service to 31 geographic service areas that are connected to the Island Interconnected System and to 21 isolated service areas served by diesel generation. In 2003-2004 Hydro initiated a pilot program for automated customer meter reading in St. Brendan's. This pilot program proved successful and Hydro has extended the program to other service areas.

To date, Hydro has implemented AMR in 12 service areas as part of an ongoing program.

An AMR system provides the capability to report a customer's power usage without requiring a meter reader to visit the meter location to record the reading. Each customer's meter contains a transmitter that reports the meter reading. The meter readings are transmitted from each meter to a collector located at a local substation over the distribution power lines using power line carrier communications. These readings are then forwarded to a server in St. John's.

2 PROJECT DESCRIPTION

This project is required to implement Automatic Meter Reading (AMR) in various Hydro customer service areas. This capital budget proposal is based on the service areas of Bear Cove and Plum Point. This project is a continuation in the deployment of AMR approved in Hydro's 2007, 2008, 2009, 2011 and 2012 Capital Budget Applications.

In Bear Cove and Plum Point, the AMR functionality is being implemented for all customers in those service areas. The work includes:

(i) Replacement of existing customer meters with AMR equipped meters;

(ii) Installation of data collectors in the substations;

(iii) Communications to the AMR server located in St. John's; and

(iv) Configuring computer systems in St. John's to handle the additional AMR meter readings and billing for each customer.

3 JUSTIFICATION

This project is justified on the results of a cost-benefit analysis which shows that the new AMR system has economic benefit over the existing system through a reduction in controllable costs.

The new system also provides improvements in customer service through the following:

- Meter reading errors will be reduced or eliminated;
- Estimated readings will be reduced or eliminated;
- More detailed energy usage information will be available to help customers track consumption patterns; and
- More flexible billing options will be available to customers such as consolidated bills and customer selected billing dates.

In addition to the above, implementation of AMR will enhance safety by reducing employee risk exposure and will provide a benefit to the environment as a result of less vehicle usage.

Hydro requests that it be granted the right to change the location of the deployment of AMR to a different area, if circumstances change. See Appendix 1 for a list of the 5-year AMR plan.

3.1 Existing System

The current meter reading system used in the Bear Cove and Plum Pointy service areas is the Radix System. This system involves the following process for reading meters:

- Meter Route information is transferred from the Customer Information/Billing System to the Radix System and then loaded into a handheld device in the local area;
- A Meter Reader visits each customer's meter and manually enters the meter reading into the handheld device;

- After the meter readings have been taken, the handheld device is connected to a local computer and the readings are transferred to the Radix System; and
- The meter readings are transferred from the Radix System to the Customer Information/Billing System at head office in St. John's.

The AMR system being deployed is Landis + Gyr's[1] TS1 System. The TS1 System is a one-way power line carrier based communications system where data is transferred from a customer's meter to a data collector located in a terminal station using the existing distribution lines to carry the meter data signals. Communications to a customer's meter is not supported with this system.

Under previously approved capital projects for 2007, 2008, 2009, 2011 and 2012 AMR has been implemented in the customer services areas of Bay d'Espoir, Change Islands, Conne River, Cow Head, Daniel's Harbour, Fogo, Gaultois, Hawke's Bay (excluding Port au Choix), Parsons Pond, St. Anthony with ongoing projects in Labrador City - Wabush and Rocky Harbour and Glenburnie, as well as a pilot project conducted in St. Brendan's in 2003-2004.

3.2 Operating Experience

The AMR system will replace:

(i) Manual handheld devices used to collect meter readings at each customer's site;

(ii) Supporting infrastructure (computers and modems) used to retrieve the data; and

(iii) A requirement for personnel to travel to each customer location to read meters. Previous AMR projects have been completed by Hydro in a number of other the service areas. The AMR system being implemented has proven to be reliable and accurate.

[1] Landis + Gyr is a supplier of electricity metering including advanced or "smart metering systems".

3.2.1 Industry Experience

The TS1 System is Landis + Gyr's power-line carrier product line which was introduced in 1995. There are currently over 400 utility customers using TS1 Systems and over four million endpoints deployed.

3.2.2 Vendor Recommendations

Landis + Gyr's estimated life expectancy for the data collectors used in the AMR system, which are located in terminal stations to capture meter readings, is 15 years. This time period is used for completing the cost-benefit analysis (see Section 4.3).

For the Radix system, Radix's expectations are that the handheld models average about 18 months or 500 charges on a set of batteries before requiring return to the factory for replacement. The devices are supported for a period of seven to nine years.

3.2.3 Maintenance or Support Arrangements

Hydro has a maintenance agreement in place with Radix Micro Devices for the Radix System. The annual cost of the agreement for 2012 is $11,184 and this covers software support, maintenance and repair services on equipment.

Hydro has a maintenance agreement in place with Landis + Gyr for the AMR System. The annual cost of the support agreement for 2012 is $12,078. The maintenance agreement includes software and hardware support, software updates from Landis + Gyr and full replacement of any defective endpoint integrated into the meters to provide AMR functionality.

3.2.4 Maintenance History

The five-year maintenance history for the entire Radix System is shown in the Table 1.

Table 1: Maintenance History

Year	Preventive Maintenance ($000)	Corrective Maintenance ($000)	Total Maintenance ($000)
2011	0.0	0.0	0.0
2010	0.0	0.0	0.0
2009	0.0	6.7	6.7
2008	12.5	4.8	17.3
2007	12.5	7.4	19.9
2006	0.0	0.3	0.3

There is no maintenance history for the AMR System as the first service areas only became operational in 2008 and no maintenance costs have been incurred.

3.2.5 Historical Information

This is a recurring project started in 2007. A list of projects is provided in Table 2.

Table 2: Historical Information

Year	Capital Budget ($000)	Actual ($000)	Units	Cost Per unit ($000)	Comments	Number of Permanent Full-time and Part-time Meter Reader Positions
2012-2013	578.4	-	1800	-	In progress	15 (December 2011)
2011-2012	292.2	-	1000	-	In progress	15 (December 2011)
2009-2010	490.5	378.8	1861	0.20	Completed	15 (December 2010) 16 (December 2009)
2008	606.0	598.0	1775	0.34	Completed	17 (December 2008)
2007	1,275.8	1,290.5	4129	0.31	Completed	19 (December 2007)

3.2.6 Anticipated Useful Life

The handheld units for the Radix system have an anticipated service life of five years. Handheld units are not used with the AMR System. Endpoints do not change the useful life of the system.

3.3 Development of Alternatives

Two alternatives were considered:

Alternative 1: Maintain the existing Radix system; and

Alternative 2: Deploy Landis + Gyr's TS1 AMR System.

3.4 Evaluation of Alternatives

Alternative 1 is labour intensive and meter reading costs will continue to increase over time.

Alternative 2 has been selected by Hydro for the following reasons:

- The cost-benefit analysis shows that this alternative results in lower meter reading costs and a savings to Hydro as detailed in the Economic Analysis, Section 3.5.2 of this report
- Incorrect and estimated meter readings are reduced or eliminated
- There is a future opportunity for Hydro's customers to have available more detailed energy usage statistics

3.4.1 Energy Efficiency Benefits

There are no direct energy efficiency benefits that can be attributed to implementation of AMR. However, the capability to provide more detailed energy usage statistics enables customers to track consumption patterns. This helps promote energy efficiency.

3.4.2 Economic Analysis

For the Bear Cove and Plum Point service areas, the cumulative net present worth analysis of AMR and the current system has a positive net present value starting in 2022 (10 years) and total savings of $ 147,710 by 2027. This savings result primarily from the reduction in labour costs in not requiring meter readers to visit each customer's site to read their meter.

The cumulative net present value comparison results between the two alternatives is shown in Table 3.

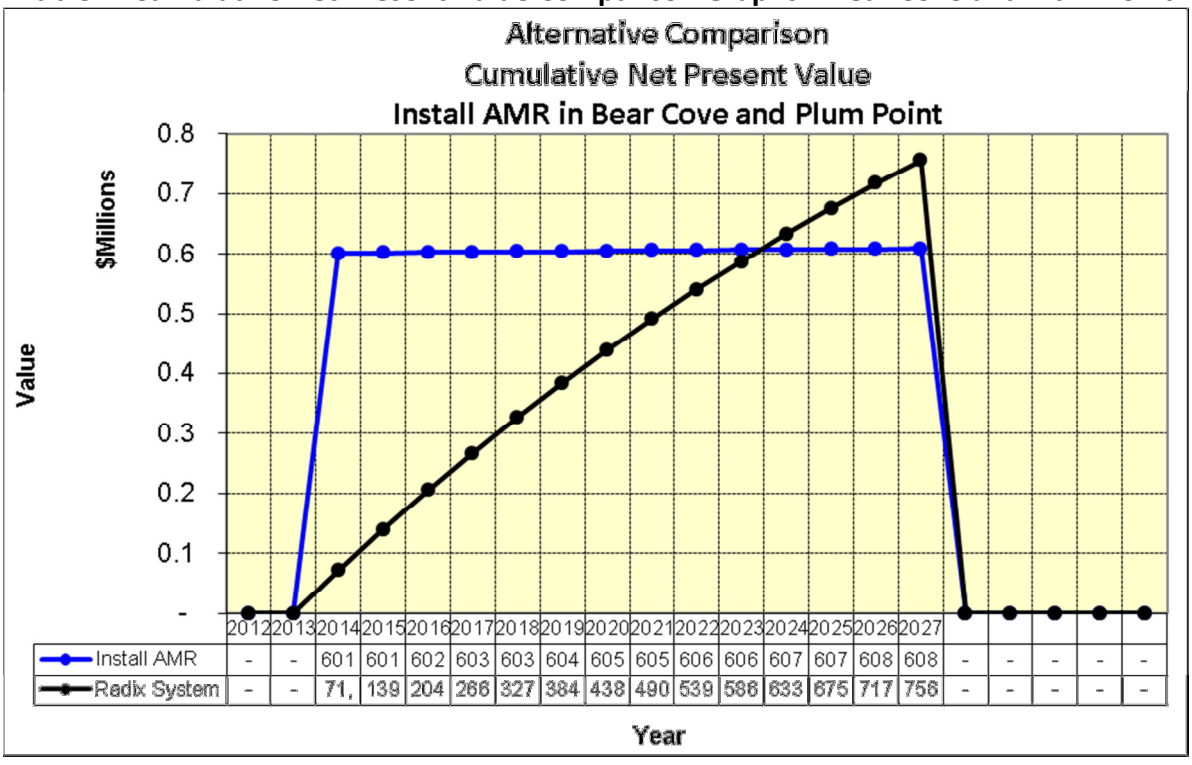
Table 3: Cumulative Net Present Value Comparison – Bear Cove and Plum Point

Install Automated Meter Reading – Bear Cove and Plum Point		
Alternative Comparison ***Cumulative Net Present Value*** ***To The Year*** **2027**		
Alternatives	**Cumulative Net Present Value (CPW)**	**CPW Difference between Alternative and the Least Cost Alternative**
AMR	608,594	0
Radix System	756,304	147,710

For the deployment of AMR in the Bear Cove and Plum Point service area, the savings are derived from no longer requiring a meter reader for the area.

The cumulative net present value comparison between the two alternatives is shown in graphic form in Table 4.

Table 4: Cumulative Net Present Value Comparison Graphs – Bear Cove and Plum Point



4 CONCLUSION

Implementation of Landis + Gyr's TS1 AMR System is the chosen alternative as determined from a cost benefit analysis.

4.1 Budget Estimate

The proposed project budget estimate is shown in Table 5.

Table 5: Project Budget Estimate

Project Cost:*($ x1,000)*	**2013**	**2014**	**Beyond**	**Total**
Material Supply	251.0	50.6	0.0	301.6
Labour	79.0	45.2	0.0	124.2
Consultant	30.0	12.0	0.0	42.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	9.4	2.6	0.0	12.0
Interest and Escalation	28.5	52.4	0.0	80.9
Contingency	0.0	96.0	0.0	96.0
TOTAL	**397.9**	**258.8**	**0.0**	**656.7**

4.2 Project Schedule

The anticipated project schedule is shown in Table 6.

Table 6: Project Schedule

Activity	Description	Start Date	End Date
Planning	Approval of Design Transmittal	January 2013	March 2013
Design	Meters Tendered	March 2013	April 2013
Procurement	AMR Equipment Ordered	April 2013	April 2013
	Terminal Station Equipment Ordered	April 2013	April 2013
Construction	Install Endpoints into Meters at Manufacturer	May 2013	May 2013
	Terminal Station Equipment Received	June 2013	June 2013
	Meters Received	June 2013	June 2013
Commission	Terminal Station Equipment Installation	June 2013	September 2013
	Meter Installation	September 2013	April 2014
	In-service	May 2014	June 2014
Closeout	Project Completion and Closeout	July 2014	August 2014

Appendix A

Five-Year Plan

Five-Year AMR Plan

Year	Region	Number of Meters
2013-2014	Plum Point/Bear Cove	1975
2014-2015	English Harbour West/Barachoix	1980
2015-2016	Happy Valley and partial Goose Bay	2350
2016-2017	Goose Bay/Sheshatshiu/North West River	2030
2017-2018	Labrador West	2780