Engineering Instruction EI-22

Guidelines for Supplying Interval-Style Revenue Metering Systems

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Overview

The Distribution System Code and London Hydro's policy dictate that retail customers with loads above a defined threshold have interval-style revenue metering systems installed. Retail customers with loads below this threshold may also request the installation of an interval-style revenue metering system. This Engineering Instruction sets forth the procedure, division of responsibilities, and recoverable costs associated with the installation of interval-style revenue metering systems.

REVISION INDEX

Changes from the previous edition of this Engineering Instruction are listed below. Relocation of paragraphs or editorial changes is not shown.

Revision Number	Issue Date	Section	Description of Change
R0	April, 2003		Initial Release
R1	July, 2004	1.1	500 kW changed to 200 kW
		6.8	$12 changed to $27
R2	September, 2005	1.1	Added paragraph 5.1.4 from the Distribution System Code
		4.4	Added new Section 4.4, Alternate Means of Communication Requirements
		4.5	Revised old Section 4.5 (now 4.6), Telephone Line Sharing
		4.9	Prices updated to reflect reduced equipment costs
		6.1	Prices in Table 8-1 updated to reflect reduced interval meter costs
		6.2	Prices in Table 8-2 adjusted to reflect current burden rate for labour
		6.6	Prices in Table 8-3 adjusted to reflect revised burden rate for labour
		6.8	Revised Section 6.8, Manual Data Collection
R3	September, 2006	4.4	Price adjusted
		4.6	Price adjusted
		6.8	Price adjusted
R4	January, 2013	2.2	Contact Information, removed stale workflow.
		3.0	Clarified 120V receptacle responsibility.
		6.1, 6.2	Prices adjusted to reflect revised burden rate for labour.
		6.6	Require meter access authentication, pricing
		6.8	Clarified weekly site visits
		8.1	Clarified MVWEB access
		Appendix A	Removed

Revision Number	Issue Date	Section	Description of Change
R5	May, 2014	1.4	Included Smart meters within definitions
		2.2	Removed Meter Modification Flowchart
		4.0-5.0	Added Communications options and TCP/IP
R6	September, 2014	1.1	Updated DSC 5.1.3 update requiring MIST metering on GS>50 installations
		2.1	Added Figure for meter type determination
		4.2	Added requirement for static IP address
		9.1	Updated Interval Data Center Web Link
R7	April, 2016	All	Removed "Customer-Requested" from document title and all incidents
			Removed all references to MV-90
			General update to reflect service offerings, communication options and GS > 50kW
R8	July 2017	7.0-7.6, 8.4, 8.9	Updated to clarify interface options
		8.6, 10.1-10.4	Updated contact information

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1.0 INTRODUCTION

1.1 Background

Licensed electricity distributors, such as London Hydro, are required to comply with the Ontario Energy Board's *Distribution System Code* as a condition of their electricity distribution license.

Certain clauses within the Code apply to interval metering for retail customers and are repeated below for convenience of reference:

5.1.3 For the purposes of measuring energy delivered to the customer, a distributor shall:

a) install a MIST meter on any new installation that is forecast by the distributor to have a monthly average peak demand during a calendar year of over 50 kW; and

b) have until August 21, 2020 to install a MIST meter on any existing installation that has a monthly average peak demand during a calendar year of over 50 kW.

5.1.4 A distributor may set a threshold level for installation of MIST meters other than that required by section 5.1.3 as long as the threshold is delineated by customer class in the distributor's Conditions of Service and sets a threshold lower than that required by section 5.1.3.

5.1.5 A distributor shall provide an interval meter within a reasonable period of time to any customer who submits to it a written request for such meter installation, either directly or through an authorized party, in accordance with the Retail Settlement Code, subject to the following conditions:

- *The customer that requests the interval metering shall compensate a distributor for all incremental costs associated with that meter, including the capital cost of the interval meter, installation costs associated with the interval meter, ongoing maintenance (including allowance for meter failure), verification and re-verification of the meter, installation and ongoing provision of communication line or communication link with the customer's meter, and cost of metering made redundant by the customer requesting interval metering.*
- *The distributor shall determine whether the meter will be a MIST or MOST meter, subject to the requirements of this Code.*
- *A communication system utilized for MIST meters shall be in accordance with the distributor's requirements.*
- *A communication line shall be required in the case of inside or restricted access meters.*

London Hydro's threshold limit for the installation of interval meters is consistent with the OEB's *Distribution System Code*, i.e. MIST-type interval meters shall be installed on all services having a monthly average peak demand during the calendar year of over or equal to 50 kW.

1.2 Purpose

This Engineering Instruction sets forth the procedure, division of responsibilities, and recoverable costs associated with the installation of interval-style revenue metering systems.

1.3 Revenue Meter Ownership and Maintenance

London Hydro will own, furnish, install, calibrate, test, and maintain all revenue meters and associated equipment (e.g. instrument current and voltage transformers) used for retail billing and settlement purposes within its franchise service territory.

London Hydro will continue to read revenue meters in its service territory. Metered data used for retail billing and settlement purposes will be supplied to the customer's energy service provider (in cases where London Hydro is not the default energy services provider).

1.4 Definitions

The following definitions are not intended to embrace all legitimate meanings of the terms.

Interval meter means a revenue meter that measures and records electricity use on an hourly or sub-hourly basis throughout the billing period. "Smart meters" are not considered Interval meters.

Non-interval meter means a revenue meter that measures and records electricity usage cumulatively over the meter reading period.

MIST meters means interval meters from which data are obtained and validated within a designated settlement timeframe; MIST is an acronym for "Metering Inside the Settlement Timeframe".

MOST meters means interval meters from which data are only available outside of the designated settlement timeframe; MOST is an acronym for "Metering Outside the Settlement Timeframe".

1.5 Document Revisions and Distribution

This Engineering Instruction is distributed within London Hydro as controlled distributions document (i.e. all registered holders of Engineering Instruction manuals automatically receive updates as they are generated).

London Hydro customers and their agents will receive the current release of this Engineering Instruction in response to a formal application request (see Section 2.0 below), but no updates thereafter.

If there is an extended time period between an initial inquiry and carrying out of the work, the customer (or their agent) shall be responsible for ensuring that they have the most updated version of this Engineering Instruction before proceeding.

2.0 APPLICATION REQUEST

2.1 New Services

For new services that wouldn't otherwise automatically qualify for an interval-style revenue meter (i.e. the projected load is below the threshold identified in Section 1.1), the provision of a interval-style revenue meter will be coordinated by the Engineering Department as part of the usual service order process. As London Hydro's Electric Metering Technician would normally be going to the customer's site anyway, the installation cost for an interval meter as outlined in Section 8.2 is waived. However the customer will be responsible for other costs as outlined in Sections 8.1, 8.3, 8.5 and 8.6 herein. To meet the requirements of MIST metering for smaller GS>50kW services the following diagram illustrates the type of metering based on service size and installation type:

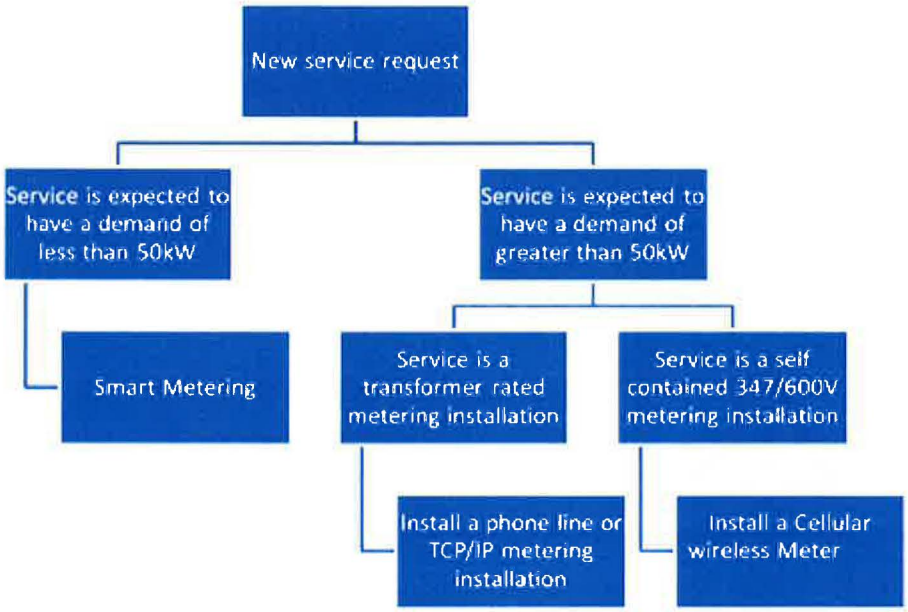

Figure 2-1, Meter Type Determination

2.2 Modifications to Existing Services

This section provides an overview of the internal work process involved in converting non-interval revenue metering systems to interval revenue metering systems at the customer's request. For most installations, the service equipment such as the meter enclosure or cabinets will be capable of accepting the interval-style revenue meter and the only upgrade required will be the installation of an interval style meter, communication method & 120 volt dedicated receptacle and breaker, complete with a breaker lock.

London Hydro's Electric Meter Department (☎ 519-661-5800 Ext. 5574) will provide the exclusive liaison function between the customer and other London Hydro departments or work groups.

2.3 Termination of Service

The customer shall also be required to reimburse London Hydro for removal costs at the time of termination of service. Removal costs for are the costs of removing the interval meter and restoring the metering facility to a non-interval recording configuration. London Hydro will invoice the customer for such removal and restoration costs at the time of removal and restoration based on actual time (including travel

time to and from the site) and material costs for the work. The customer shall be required to agree to pay such costs as a condition to returning to non-interval metered service.

3.0 RESPONSIBILITIES FOR SERVICE ENTRANCE EQUIPMENT MODIFICATIONS

For all new three-phase low-voltage services (e.g. 120/208Y and 347/600Y V) and medium-voltage services (e.g. 8/13.8Y kV and 16/27.6Y kV), London Hydro's standard arrangement for the revenue metering system is what is termed a three-element scheme. Most revenue metering systems installed prior to the advent of microprocessor-based revenue meters were arranged in what is termed a 2½-element scheme.

For all Interval meter installations the customer must supply a dedicated 120 volt receptacle to the meter cabinet housing the electrical meter, the receptacle should be clearly marked and a breaker tie installed to prevent nuisance outages to the metering cabinet.

Measurement Canada's Bulletin E-24-E (Rev 1), *Policy on Approval and Use of 2½ Element Metering*, calls for the phasing out of 2½-element schemes on an *opportunity* basis. London Hydro's approach is consistent with Measurement Canada's long-term expectations.

Conversion from *2½ Element* to *3 Element* generally requires installation of an additional instrument voltage transformer, test link panel and interconnecting control wiring. The customer will not be responsible for London Hydro's labour and equipment costs to carry out this conversion work. To comply with the prevailing worker safety legislation, such conversion projects will generally require a planned service interruption to the customer's premises.

NOTE:

There are a few remaining three-phase three-wire 600 V services remaining within London Hydro's service territory. London Hydro is unable to provide interval meters for these customers unless the customer undertakes a larger project to upgrade their service entrance equipment (and incoming supply cables if underground) to a three-phase four-wire 347/600Y V arrangement.

For low-voltage transformer-rated services, London Hydro will provide an additional instrument voltage transformer at no cost for installation in the service entrance switchgear or metering cabinet. High-voltage revenue metering installations generally already have interval-style revenue metering systems installed. The scope of conversion work to be carried out in conjunction with requests for interval-style meters on these installations will be determined on a case-by-case basis by the Electric Metering Supervisor and Director of Network Planning based on the nature, age and condition of the existing high-voltage instrument transformers or metering unit.

3.1 Role of Electrical Safety Authority (ESA)

The provincial Electrical Safety Authority is generally not involved in the conversion of a revenue metering system from non-interval to an interval type. However, if the customer's service entrance equipment (e.g. meter base, revenue metering compartment, remote metering cabinet, interconnecting conduit, etc.) is observed to be severely corroded, damaged, or otherwise in a state of disrepair, London Hydro is obliged to refer the matter to the provincial Electrical Safety Authority for re-inspection (pursuant to Rule 2-016, *Re-Inspection,* and Rule 2-018, *Defects*, of the Electrical Safety Code).

If the service entrance equipment has to be upgraded, the customer will need to obtain a qualified electrical contractor to perform this work in accordance with the provincial Electrical Safety Code and London Hydro's supplementary requirements.

3.2 Communication Options

The following are communication options available for selection and paring with each issued interval-style revenue meter, but due to site specific conditions and/or type of meter not all may apply:

a) TCP/IP wired via customer Internet Service Provider (ISP)

b) Dedicated Telephone Line

c) London Hydro provided Cellular

The customer is responsible for all costs associated with installing, operating and maintaining the communication to the electricity meter for options a) or b) above.

TCP/IP wired option will be available for new services and on an opportunity basis during scheduled meter change outs. If customer requests a communication change prior to a scheduled meter change out additional Time and Material fees shall apply.

In all cases where the customer selected communication option is not installed by the advised period, or meter installation, the assumed communication option will be a London Hydro provided Cellular solution. London Hydro will own the cellular carrier subscription but the cost of this service will be billed to the customer on a monthly recurring basis on their electrical bill, reference section 8.4. If the communication option is requested to be changed at a later date the customer is subject to Time and material Fees.

3.3 Revenue Meter Data Retrieval Frequency

Although the revenue meter can generally store several weeks of consumption data, London Hydro will retrieve the interval data from each revenue meter each day to minimize data loss in case of equipment failure.

4.0 Connection to the TCP/IP Wired via Customer ISP Network

4.1 General Responsibilities

The customer shall provide a working Ethernet connection to each interval-style revenue meter for communication. The customer is responsible for all costs associated with installing, operating, and maintaining this Ethernet service and corresponding Internet Service Provider (ISP) subscription.

London Hydro recommends DHCP IP address assignment when interfacing with a customer network, but static addressing is also available upon request. Figure 4-1 below depicts the typical meter data communication traffic.

To allow network traffic London Hydro's devices use IPSec VPN Tunnelling to ensure secure data exchange and require ports UDP 500 and 4500 open to connect.

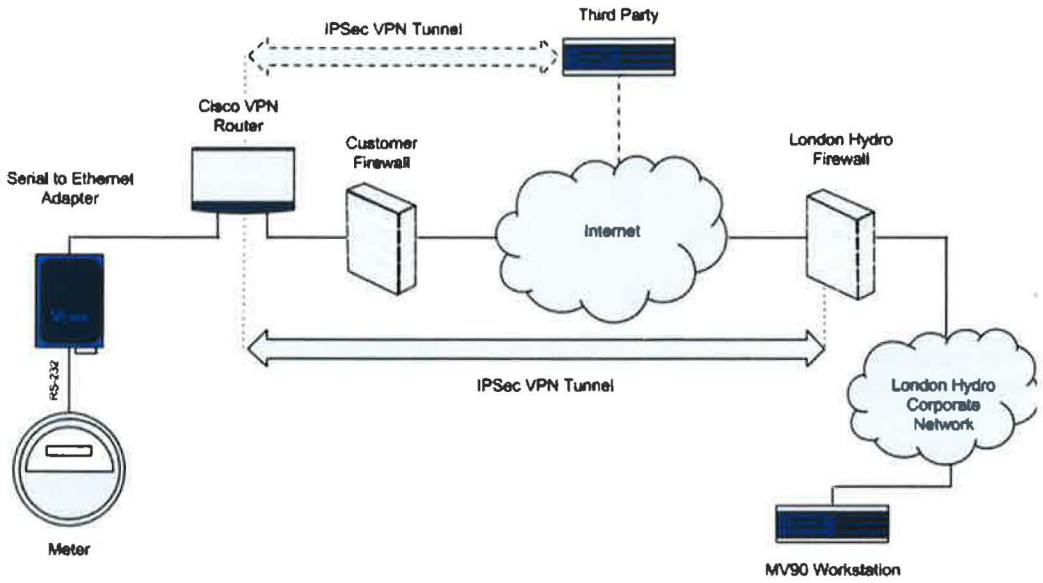

Figure 4-1, Internet Metering

4.2 Overview

To enable TCP/IP communication, the customer's meter is connected to a London Hydro specified VPN (Virtual Private Network) Router. The router is configured by London Hydro to establish an IPSec VPN tunnel to London Hydro's firewall, encrypting all meter communication. If required, London Hydro can configure third party access to the meter at an additional cost.

4.3 Point of Demarcation

The electric meter is owned by London Hydro. The necessary networking equipment is issued and owned, operated and maintained by London Hydro. They are locked in a meter cabinet and cannot be accessed by the customer. The router is configured by London Hydro and the device is locked so that the customer cannot change the router software configuration. Third party access can be configured at the time of installation, or later by London Hydro staff.

For interface arrangement details see section 5.6.

4.4 TCP/IP wired Ethernet acceptance testing

For Ethernet connections the communication must be thoroughly tested by the installer to verify the following:

- Link is active
- Outbound communications are enabled
- Inbound communications can be received
- The DHCP/static IP address provided is correct

When the customer notifies London Hydro that the installation of an operational Ethernet connection has been completed, London Hydro will schedule the meter installation upgrade, unless an interval meter

already exists. At the time of the meter upgrade, London Hydro's Metering Technician will verify that the Ethernet connection is operational. If the connection is tested to be operational the meter shall be installed and connected via the CAT5 cable, and proceed to confirm communications with London Hydro's central metering data collection system.

If the Ethernet service is not operational, the meter installation and/or upgraded shall not proceed, and the customer will be required to correct the defect. When the customer notifies London Hydro of the defect correction, London Hydro will revisit the site and upgrade the meter installation. However, the customer will be subject to the prevailing additional site visit charge – see Table 8-3 on page 24 herein.

5.0 CONNECTION TO THE PUBLIC SWITCHED DEDICATED TELEPHONE NETWORK

5.1 General Responsibilities

The customer is responsible to provide a dedicated analogue telephone line used to communicate with each interval-style revenue meter. The customer is responsible for all costs associated with installing, operating, and maintaining this telephone service. The customer must inform London Hydro of new and/or changed phone number assigned to the electric meter.

London Hydro staff will make the final physical connection to the meter and/or cabinet demarcation.

The telephone company will bill monthly service subscription fee directly to the customer, as the subscription will be in the customer's name, not London Hydro.

London Hydro's central metering data collection system does not support Voice over Internet Protocol (VoIP) telephone systems. Therefore, VOIP service is not permitted and/or satisfy the communication requirement.

5.2 Wire-Line Telecommunications Circuit

London Hydro's central metering data collection system communicates with the interval-style revenue meters via a telephone-based communications system that is configured as per IEEE Standard 1390, *Utility Telemetry Service Architecture for Switched Telephone Network*, for outbound telemetry (i.e. calls initiated by London Hydro) using direct dial access.

The local loop circuit (including the customer's premise wiring between the demarcation point and the revenue meter) shall be a conventional two-wire analogue voice service line with direct dial (using dual tone multi-frequency or Touch-Tone® dialing) access.

Note: The telephone company may refer to the required telephone circuit as a "Plain Old Telephone Service" (POTS) circuit.

5.3 Alternate Means of Communication Requirements

The customer shall be responsible for ensuring that London Hydro has satisfactory and reliable reads with 100% accessibility to interrogate (read) the meter remotely. If the customer uses a line sharing device or alternate means of communication (i.e. any means other than a dedicated telephone line) and it fails to meet London Hydro's requirements, then the customer shall provide a dedicated telephone line to the meter on London Hydro's request. London Hydro's decision will be final and mandatory for the customer. The customer shall pay either the OEB approved special meter reading charge or the actual time and material charge applicable for site visits until such time as the problem with the communication circuit has been resolved to London Hydro's satisfaction.

5.4 Telephone Line Sharing

Upon written approval from the London Hydro Meter Database Management Supervisor, a customer may share a telephone circuit (among various office equipment used on an intermittent basis such as facsimile machines, credit card authorization terminals, point-of-sale terminals, etc.), by supplying and installing a call processor as illustrated in Figure 5-1 below. In situations where London Hydro is unable to get 100% satisfactory meter reads from the shared telephone circuit (as outlined in London Hydro's requirements previously stated in Section 5.3) then the customer shall provide a dedicated telephone line or Ethernet connection to the meter on London Hydro's request. London Hydro's decision will be final and mandatory for the customer. The customer shall pay either the OEB approved special meter reading charge or the actual time and material charge applicable for site visits until such time as the problem with the communication circuit has been resolved to London Hydro's satisfaction.

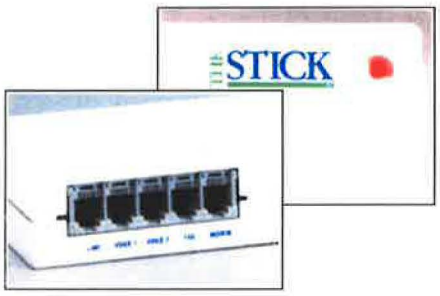

Figure 5-1, Typical Automatic Call Processor

Note: Most call processors require a 120 Vac supply from a nearby receptacle.

Where call processors are used, the following features (offered by the telephone company) shall be blocked:

- Call waiting; and
- Call forwarding.

5.5 Isolation Equipment for High-Voltage Metering

Telecommunications equipment located within customer-owned high-voltage electric power substations shall be electrically isolated to protect wired communications lines from high voltages and current. The customer will be responsible for retaining a consultant to:

- Carry out a GPR study in accordance with IEEE Standard 367, *Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage from a Power Fault*;
- Selection isolation equipment that fulfils the requirements of IEEE Standard 487, *Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Electric Power Stations*, for a *Type 1* service and *Class B* service performance objective.
- Submitting the isolation system design to Bell Canada's *Access Network – Provisioning Support* department for approval.

The customer shall further be responsible for the procurement, installation, testing, and ongoing maintenance of the protective equipment.

5.6 Interface Arrangement for Metering Cabinets and Remote Metering Cabinets

It is essential that the communication line be permanently installed to ensure its continued availability for meter interrogation. Since London Hydro does not allow premise-wiring contractors to make modifications to energized metering cabinets and remote metering cabinets, the Owner shall arrange for the

communications lines (phone or Ethernet) wired to premise metering cabinet, and confirmed operational prior London Hydro coordinating a meter installation.

The requisite preparation work is outlined below:

NOTE: A RJ45 bulkhead jack will be installed by London Hydro on the side of the metering cabinet illustrated in Figure 5-2, denoting the demarcation.

- A standard eight-conductor Category 5e cable, or better, shall be installed in ½ inch diameter EMT, which complies with CSA Standard C22.2 No. 83-M1985 (R1999), *Electrical Metallic Tubing*, to the metering cabinet demarcation.
- Twelve to eighteen inches of Category 5e, or better, shall be coiled and terminated with a male RJ-11 for analogue phone, or, male RJ-45 for Ethernet connection, but not plugged into the meter cabinet demarcation Jack.
- A tag bearing the network switch and port number for Ethernet connections, or, phone number for the telephone circuit, shall be attached to the wire.

Figure 5-2, RJ-45 Bulkhead Jack

London Hydro's Electric Metering Technician will complete the installation of the communication line into the revenue meter and/or metering cabinet demarcation Jack.

5.7 Telephone Circuit Acceptance Testing

Prior to interval meter installation by London Hydro, the dial-type telephone line shall be thoroughly tested by the premise-wiring contractor to verify the following:

- Dial tone is available
- Outbound calls can be made
- Inbound calls can be received
- The assigned phone number is correct
- The outside line access digit (where applicable) is correct

Plugging in a standard telephone set into the jack and making both inbound and outbound calls can easily accomplish this testing.

When the customer notifies London Hydro that the installation of an operational telephone line has been completed, London Hydro will schedule the meter installation upgrade unless an interval meter has already

been installed. At the time of the meter upgrade, London Hydro's Metering Technician will verify that the telephone line is operational. If the telephone line is operational, the Metering Technician will install the meter, connect the telephone line, and establish communications with London Hydro's central metering data collection system.

If the telephone line is not operational, the meter installation will not be upgraded, and the customer will be required to correct the defect. When the customer notifies London Hydro of the defect correction, London Hydro will revisit the site and upgrade the meter installation. However, the customer will be subject to the prevailing *additional site visit charge* — see Table 8-3 on page 24 herein.

6.0 CONNECTION TO THE LONDON HYDRO PROVIDED CELLULAR NETWORK

6.1 General Responsibilities

London Hydro will provide, and own, the cellular communication hardware and/or service but the customer will be responsible to pay the monthly recurring service fee associated. See section 8.4 for recurring monthly fee added to customer electrical service bill.

Depending on site specific conditions cellular service may not be possible if no signal is available in the meter location. In this case the customer must make other arrangements for meter communication, either option (a) TCP/IP via Customer ISP or (b) Dedicated analogue Telephone line.

London Hydro cellular service is via Bell Mobility networks. As a general rule, if a cellular phone with Bell service plan has a strong signal in close proximity to the electrical meter demarcation, then a cellular solution has a high probability of working.

6.2 Overview

Electric meter data is exchanged with London Hydro's central metering data collection system using TCP/IP communication protocol, similar to Ethernet service described above in Section 4.0, the differentiating factor is the network link is provided by a public carrier's cellular network via private APN for enhanced security and reliability. There are no customer required network configurations and/or requisite site work for a cellular communication option.

6.3 Point of Demarcation

The electric meter is owned by London Hydro. The necessary networking equipment is issued and owned, operated and maintained by London Hydro. The equipment is locked in a meter cabinet and cannot be accessed by the customer. The router is configured by London Hydro and the device is locked so that the customer cannot change the router software configuration. Third party access can be configured at the time of installation, or later by London Hydro staff.

For Interface arrangement details see section 5.6.

6.4 Interface Arrangement for Self-Contained Revenue Meters

For new service, or in case where the existing revenue metering system consists of a self-contained single-phase, network or poly-phase revenue meter, the meter shall be installed, or upgraded, with a self-contained meter that has a cellular module under the meter cover. Therefore only a meter base is required, which is the customers responsibility but no metering cabinet required.

NOTE:

There are a few remaining three-phase three-wire 600 V services within London Hydro's service territory. London Hydro is unable to provide interval meters for these customers unless the customer undertakes a larger project to upgrade their service entrance equipment (and incoming supply cables if underground) to a three-phase four-wire 347/600Y V arrangement.

7.0 AVAILABILITY OF OTHER INTERFACES TO THE REVENUE METER

This section pertains to customers interested in a real-time interface between the revenue meter to building load management systems or other types of data collection systems.

Please contact London Hydro's Meter Data Management (MDM) representative by email: mdm@londonhydro.com for additional details and/or inquiries.

7.1 KYZ Output Pulses – Discontinued Offering

Due to advances in the state-of-the-art, London Hydro no longer purchases revenue meters with pulse outputs. Consequently (effective October 2001), London Hydro no longer supplies KYZ output pulses to customer-owned energy management systems.

Note: Customers to which London Hydro previously supplied KYZ output pulses (in accordance with Engineering Instruction EI-8, *Standard Arrangements for Providing Revenue Metering Pulse Signals to Customer-Owned Energy Management Systems*) will be grandfathered until expiry of the government seal on the metering installation.

7.2 Serial Data Communication Interface – Discontinued Offering

Certain high-end interval-style revenue meters that London Hydro procures can be equipped with an interface for data interchange with a customer's energy management system. The interface is specified to meet the signalling and protocol requirements of:

- ANSI/TIA/EIA Standard 232-F-1997, *Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange;* and
- Modbus (10-bit ASCII variant) as defined on Schneider Automation's web site (www.modicon.com/techpubs/toc7.html).

7.3 Local Area Network Data Communication Interface – Discontinued Offering

Certain high-end interval-style revenue meters that London Hydro procures can be equipped with an interface for data interchange with a customer's local area network.

7.4 Periodic Modem (Telephone) Access for Measured Load Information

Customers or third parties with own software solutions, interested to remotely interrogate the revenue meter can obtain parameters that will allow the meter to be remotely interrogated. It is imperative that the customer or third parties not interfere with London Hydro's remote meter read interrogation schedule.

7.5 Customer Engagement Portal Data Download and Retrieval Interfaces

London Hydro customers have the ability to delegate access to their account information to third parties through automated and on-demand process featured in MyLondonHydro, Interval Data Centre and Property Management Portal applications. London Hydro applications offer time range data downloads in CSV and HTML file formats.

Please contact greenbutton@londonhydro.com for any inquiries related to this service

7.6 MyLondonHydro Greenbutton Data Platform Interfaces

London Hydro Green Button Platform offers download and connect my data functionality. Green Button Download my Data feature provides on-demand data download in XML file format for predefined or selected time periods (today, yesterday, current week, current month, last three months, last six months, last on year or selected period). Green Button Connect my Data functionality offers API

(application program interface) for third party data authorization and access. To leverage Connect my Data functionality, third party has to comply with Green Button Standard and has to be registered as third party app within London Hydro Green Button Data platform.

Please contact greenbutton@londonhydro.com for any inquiries related to this service

8.0 RECOVERABLE COST ELEMENTS

8.1 Incremental Cost of Interval Meter

The customer will be responsible for reimbursing London Hydro for the incremental cost between a non-interval and an interval electronic meter. The difference between the two styles is essentially that the interval meter has both mass-memory (for recording electrical consumption data for each time interval) and a built-in communication tunnel / RS232 (for communicating to a common metering data collection system).

Based on procurements throughout 2015, the incremental cost (GST excluded) for the various styles of revenue meters are tabulated below.

Table 8-1, Incremental Costs for Interval-Style Meters

Meter Style	Incremental Cost of Interval Meter
Self-Contained:	
• Single-Phase	$800.^{00}$
• Network	$800.^{00}$
• Polyphase	$800.^{00}$
Transformer Rated:	$800.^{00}$

The incremental cost may be significantly greater in instances where a specific revenue meter is required to provide a specific external interface to a building load management system (refer to Section 7.0 herein) or to provide additional reporting (refer to Section 10.0 herein).

8.2 Installation Cost of Interval Meter

The installation cost for an interval-style revenue meter will depend upon the overall scope of work and the timing of the work. If no modifications to the service entrance equipment or instrument transformers and control wiring are required, the interval meter can generally be installed and connected to the telecommunications system in a 1½-hour timeframe (included travel to and from the site).

Table 8-2, Hourly Rates for Interval Meter Installation Work (2015)

Cost Element	During Normal Working Hours	Outside of Normal Working Hours
Labour (2 technicians)	$173.^{90}$ / hr	$212.^{40}$ / hr
Transportation	$13.^{91}$ / hr	$13.^{91}$ / hr

Pursuant to the federal *Electricity and Gas Inspection Act*, London Hydro will re-verify the accuracy of the installed population of revenue meters on a cycle ranging from 6 to 12 years, depending upon the type of revenue meter. In cases where the requested work is planned and carried out within 90 calendar days preceding the date when the meter is scheduled for re-verification, the labour and transportation costs to install an interval meter will be waived.

8.3 Installation and Recurring Cost of a Telecommunications Circuit

The customer is responsible for all costs associated with revising the premise wiring to provide a communications connection circuit to the revenue meter.

The customer is also responsible for the ongoing monthly tariff charges, if any, from the telephone or communications company for providing and maintaining the communications.

8.4 Recurring Cost of a London Hydro Provided Cellular Service

London Hydro's central metering data collection system is capable to communicate with the interval-style revenue meters via a cellular-based communications. This is a "plug and play" option with no additional work required by the customer for installation. The approved Ontario Energy Board rate is $30.00 per month, and would be added to the customer's bill for the ongoing cost and maintenance of the cellular connection. This fee may be adjusted from time to time in accordance with Ontario Energy Board rules and regulations.

It should be noted that this option may not be available for all installations as it is dependent on reliable cellular coverage. Meters located inside buildings and inside steel meter cabinets may not perform well with this solution.

London Hydro reserves the right to approve or deny a communication method based on its anticipated reliability.

8.5 Administrative Fee to Validate Central Meter Data Collection System Parameters

The cost of conducting a so-called end-to-end test between the revenue meter and central meter data collection system to validate the metering parameters is included in the installation cost of the revenue meter (as outlined in Section 8.2 above).

8.6 Recurring Monthly Service Charge

Customers with interval-style revenue metering systems will have a cost component of $5.^{50}$ per month embedded within the monthly service charge for information processing. This fee covers what the Ontario Energy Board refers to as the VEE function (i.e. validating, estimating, and editing of revenue metering data).

Note: A complete description of the VEE procedures can be obtained from London Hydro's Meter Database Management Services (MDMS) Department by email: mdm@londonhydro.com.

Customers with interval-style revenue meters that have enrolled with a retailer will also have their interval meter data sent to the appropriate retailer via the Ontario Retail Settlement Electronic Business Transaction System in accordance with the Ontario Energy Board's *Retail Settlement Code*.

8.7 Administrative Fee to Modify Remote Access Passwords

To prevent unauthorized access to data and programmable functions, revenue meters are programmed with several levels of remote access passwords. Upon request, customers will be provided with a password that will allow them (or their agents) read-only access to meter information (billing and load profile data, status information, and program information). Proof of eligibility to access the meter by customers or third party will be required at the discretion of London Hydro. Appropriate letters of authorization may be required upon request.

At the time of original installation, only the customer will be issued a formal letter documenting their assigned remote access password. The onus will be on the customer to disseminate their assigned password to their agents or energy service providers (if any).

London Hydro will entertain customer-initiated requests to change the remote access password. The customer is responsible for the costs of dispatching a Metering Technician to the site to make the configuration change to the revenue meter. The flat rate charge (less GST) for such service calls is tabulated below:

Table 8-3, Flat Rate Additional Site Visit Charge (2014)

Cost Element	During Normal Working Hours	Outside of Normal Working Hours
Labour (1½ hour, including traveling time)	$144.[66]	Service not offered
Transportation	$16.[80]	"

Note: Requests to change the remote access password might be expected following a change in the customer's energy service provider.

8.8 Recovery of Stranded Investment Costs

Although rare, London Hydro has a small population of *unique* revenue metering systems installed that haven't yet reached their normal asset lifetime and, if removed from active service, couldn't be deployed in other locations. For these situations, customers requesting a change to an interval meter will be expected to reimburse London Hydro for the residual value of the existing revenue metering equipment. The residual value assessments will be unique to each installation, but in all cases will be based on an expected 30-year service lifetime for the asset.

8.9 Manual Data Collection

If London Hydro is unable to retrieve the metered data using the remote communication method, then London Hydro will visit the meter location and collect the data using a manual data retrieval system. At a minimum, such visits are required weekly to meet validation and editing standards and to ensure the meter is functioning satisfactorily and does not require replacement.

If the inability to retrieve metered data is due to a failure of the remote communication method, London Hydro will notify the customer of such failure, and the customer will be responsible for repairs. If necessary, London Hydro will collect metered data manually for up to one week after notifying the customer of the communication failure. Thereafter, if the remote communication method is still not operational, London Hydro will continue to collect the data manually at the OEB approved special meter reading charge ($30.00 per visit), or the actual time and material charge applicable for the site visits required by a meter reader, or meter technician, until such time as the problem with the communication circuit has been resolved.

In all cases where the customer selected communication option is not installed or repaired within 10 weeks, the assumed communication option will be a London Hydro provided Cellular solution. London Hydro will own the cellular carrier subscription but the cost of this service will be billed to the customer on a monthly recurring basis on their electrical bill, reference section 8.4. If the communication option is requested to be changed at a later date the customer is subject to Time and material Fees.

9.0 Project Scheduling

London Hydro strives to provide electric service with minimum delay or inconvenience. The timing of a meter replacement can be affected by each of the following conditions:

- Metering equipment availability;
- New business volume;
- Number of pending requests for interval metering systems;
- Volume of meter re-verification work for compliance with Measurement Canada statutes;
- Weather constraints; and
- Installation site constraints.

Assuming all required materials are in stock, the job will be scheduled on receipt of payment from the customer. The projected start date averages three weeks after receipt, but this is dependent on the factors listed above.

Request for information relating to the job start date, progress, completion, etc. may be obtained directly from London Hydro's Electric Metering Lead Technician (☎ 519-661-5800 Ext. 5574).

10.0 OTHER SERVICE OFFERINGS

10.1 Load Profile Reports

London Hydro offers all interval metered customer's access to their interval meter data via an on-line web presentment tool through MyLondonHydro Account portal.

This Interval Data Center has several predefined reports that can be run for selected time periods in addition to the ability to export the data so that it can be incorporated into custom spreadsheets and reports. This service is currently being provided to London Hydro customers free of charge. To sign up for access complete the sign up form at https://www.londonhydro.com/ and allow two business days for completion.

Customers can also receive load profile reports directly from London Hydro for a fee.

Please contact London Hydro's Meter Data Management (MDM) by email: mdm@londonhydro.com, for a list of load profile offerings, or to obtain samples of available reports.

10.2 Power Quality Monitoring

Certain models of interval-style revenue meters that London Hydro has available can be configured to capture and record power quality events (e.g. out-of-limit detection, harmonic distortion measurement, sag/swell detection, etc.).

Please contact London Hydro's Meter Data Management (MDM) representative by email: mdm@londonhydro.com, for additional details and/or inquiries..

10.3 Metering Validation and Sealing

London Hydro offers meter validation test-bench capabilities and meter metrology sealing capabilities.

Please contact London Hydro's Meter Data Management (MDM) representative by email: mdm@londonhydro.com, for additional details and/or inquiries.

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