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London Hydro

Schedule 1 - Advanced Metering Infrastructure (AMI): Supplier Self-Certification Declaration for the Supply, Delivery and Integration of an MDUS-Compliant Operational Data Store (ODS)

Issue Date: February 1, 2010

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1.0 INTRODUCTION

1.1 Background

1.1.1 The Provincial Government Policy Landscape

1.1.1.1 The Provincial Smartmetering Initiative

To create a conservation culture in Ontario and make the Province a North American leader in energy efficiency, the Government undertook action to facilitate a number of key initiatives, including:

- The introduction of flexible, time-of-use pricing for electricity;
- A targeted reduction in Ontario's energy consumption by five percent by 2007;
- A commitment to install a smart electricity meter in 800,000 homes and small businesses by 2007 and throughout Ontario by 2010; and
- The passage of legislation to enable implementation of its smart metering initiative and conservation targets.

Figure 1-1 below depicts the Ministry of Energy & Infrastructure's conceptual view of revenue metering data (and other information) from the consumer's Smart-meter through various interconnected computer systems (i.e. the LDC's AMI, the LDC's CIS, the provincial MDM/R, systems operated by energy retailers, etc.) through to the consumer's monthly bill.

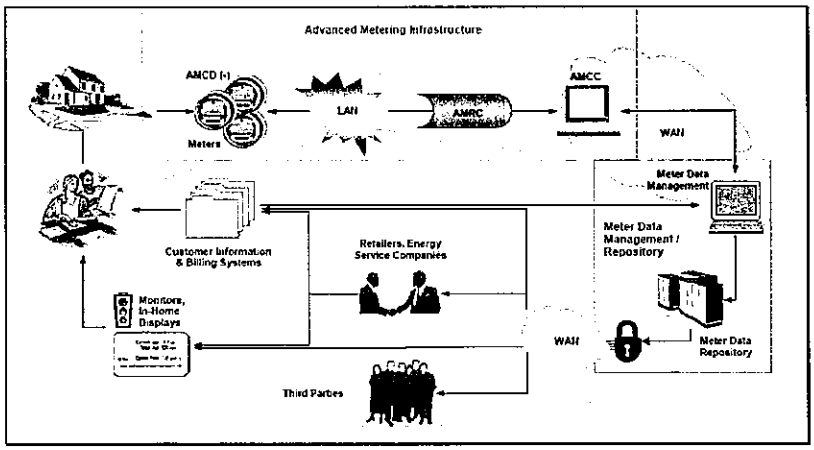

Figure 1-1, Conceptual View of Information Flow for TOU Electricity Pricing

Ontario Regulation 393, *Smart Metering Entity*, formally designated the provincial Independent Electricity System Operator (IESO) as the SME and assigned this agency exclusive jurisdiction over a number of Smart meter activities including validation, estimating and editing services and preparing billing quantity data for billing purposes.

Under the auspices of the June 2008 amendment to Ontario Regulation 427/06, *Smart Meters: Discretionary Metering and Procurement Principles*, London Hydro procured a Sensus FlexNet™ advanced metering infrastructure, a radio-based system that has a system architecture as illustrated in Figure 1-2 below.

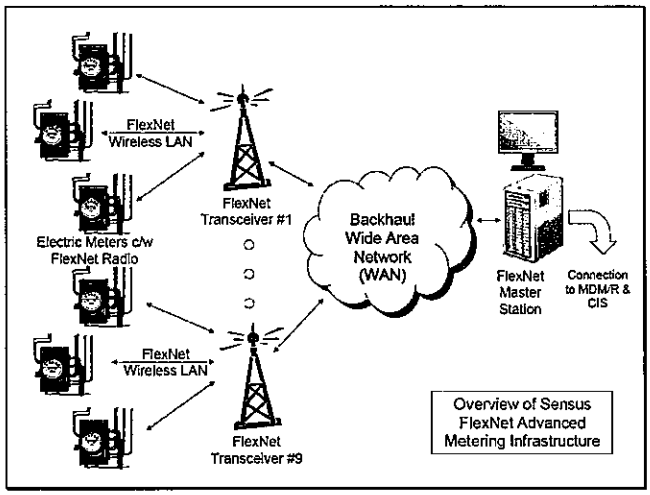

Figure 1-2, Architecture of Sensus FlexNet AMI System

London Hydro started deployment of this AMI system in the Spring of 2009 and expects to be substantially complete (i.e. some 143,000 meters installed) by the end of 2010.

1.1.1.2 The Provincial Green Energy Initiative

Ontario Bill 150, *The Green Energy and Green Economy Act (GEA)*, and related amendments to other legislation, received Royal Assent on May 14, 2009. This Act is intended to provide the government with the necessary tools to ensure Ontario's place as North America's renewable energy leader, and to create a culture of conservation, assisting homeowners, government, schools and industry in embracing lower energy use.

Specifically this would be achieved by:

- Creating a Feed-in Tariff (FIT) that guarantees specific rates for energy generated from renewable sources.
- Establishing the right to connect to the electricity grid for renewable energy projects that meet technical, economic and other regulatory requirements.
- Establishing a one stop streamlined approvals process, providing service guarantees for renewable energy projects that meet regulatory requirements.
- Implementing a 21st century "*smart*" power grid to support the development of new renewable energy projects, and prepare Ontario for new technologies like electric cars.

1.1.2 Creating a Foundation for Computer Systems Integration

Sharing information across the enterprise has been the ultimate goal of data management theorists and practitioners for more than twenty-five years. Certainly one of the key success factors for Smart-Grid will be development of an architecture that is resilient to technology obsolescence, applies standards for applications interfaces and infrastructure technology as well as supports interoperability (between CIS, OMS, WFM, GIS, AMI, SCADA and other purpose-designed computer systems necessary for the efficient operation of an LDC)..

1.1.3 London Hydro's Investment in SAP

In the Spring of 2007, London Hydro embarked on a project to either redesign its existing CIS system (to accommodate the provincial Smartmetering initiative) or to procure a new CIS solution based on commercial off-the-shelf software products.

As an end result to this endeavour, London Hydro elected to invest in an SAP product, and specifically their Industry Solutions – Utilities (IS-U) suite.

Two other LDC's, namely "Cambridge & North Dumfries Hydro Inc" and "Greater Sudbury Hydro Inc" entered into a contractual arrangement with London Hydro to share a common SAP IS-U system. This partnership was to be known as the CODAC group.

1.1.4 Overview of Recommended System Architecture

In the summer of 2009, London Hydro engaged subject matter experts from SAP to clearly define for London Hydro's anticipated population of metering end points, the prevailing Market Rules, and London Hydro's assumptions (e.g. the number of customers that will elect retailer contracts, the number of customers that will elect "*hourly spot*" pricing, and the number of default customers that will have RPP TOU pricing, etc.) whether the SAP IS-U system is adequate for systems integration (and master file synchronization) or whether a separate so-called "*middleware*" product will be necessary.

The requisite types of transactions in the emerging electricity marketplace are illustrated in Figure 1-3 through to Figure 1-8 below.

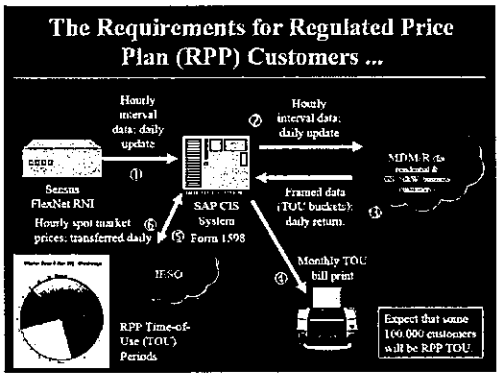

Figure 1-3, Processing Requirements for Regulated Price Plan Customers

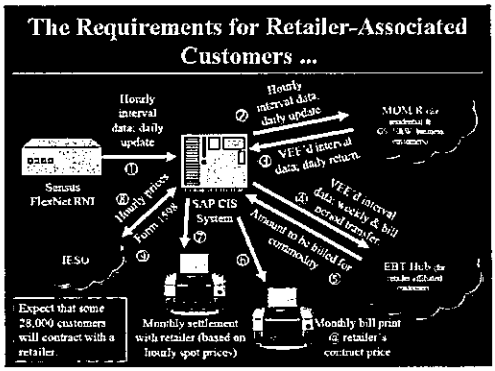

Figure 1-4, Processing Requirements for Retailer-Associated Customers

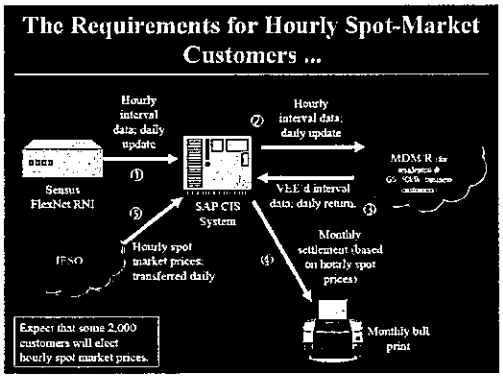

Figure 1-5, Processing Requirements for Hourly Spot-Market Customers

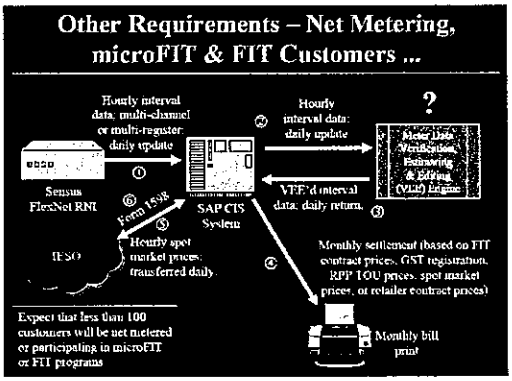

Figure 1-6, Processing Requirements for Net Metering, MicroFIT & FIT Customers

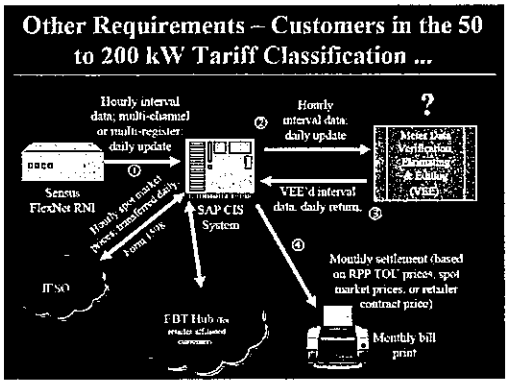

Figure 1-7, Processing Requirements for General Service > 50 kW Customers

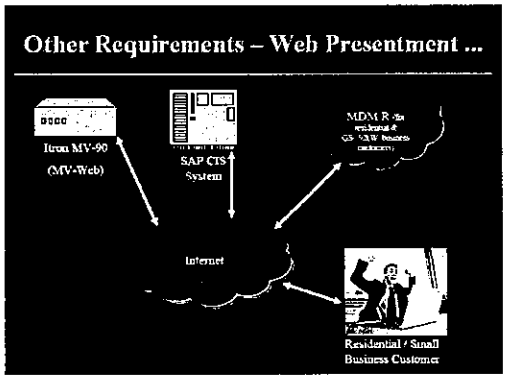

Figure 1-8, Options for Web Presentment of Customer Consumption Profiles

For a variety of reasons, SAP's subject matter expert recommended that London Hydro adopt the so-called MDUS architecture on a go-forward basis. Basically a third-party system, that is integrated with the SAP IS/U system using what SAP refers to as the MDUS methodology, be procured to augment the SAP system. Such an architecture was suggested to be the most cost effective (over the product life-cycle)

and having the least implementation risk due to its alignment with both SAP's and the SAP AMI Lighthouse Council's vision.

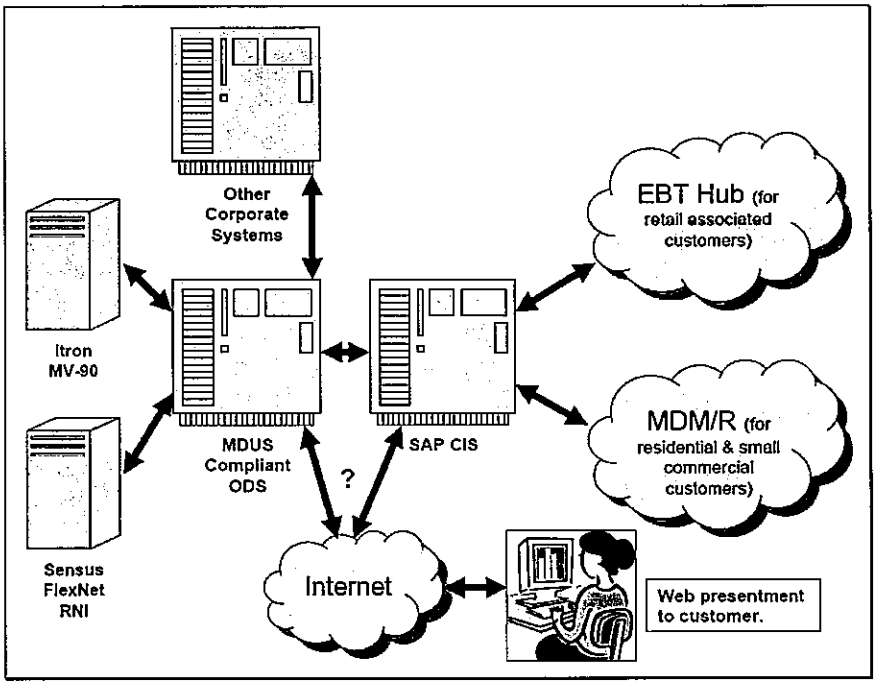

Figure 1-9, Conceptual System Architecture

The Ontario Ministry of Energy & Infrastructure has a publicly-stated objective of billing 1,000,000 residential and small commercial customers on time-of-use electricity rates by June 2010. To this end, London Hydro has received a verbal request for the Ministry to participate in this endeavour.

1.1.5 London Hydro's Corporate Computing Platform

1.1.5.1 Computer Hardware and Operating System

London Hydro has migrated to the following hardware and operating system products for corporate computing:

- Hewlett-Packard's BladeSystem equipped with model BL25-p server blades (dual 64-bit AMD processors with 16 GB of RAM);
- ESX Server, Version 2 (using both Windows 2000 and 2003 images) virtual machine software; and
- Red Hat Enterprise Linux, Version 4 (including updates 1 – 3).

Preference will be given to MDUS/ODS products designs that can operate on this platform.

1.1.5.2 Data Base Management System

London Hydro holds an enterprise license for the Oracle DBMS that encompasses a sufficient number of concurrent client access licences to encompass the ODS system. As such, supplier cost proposals need not include licensing or other fees associated with the Oracle DBMS.

1.2 Scope

This supplier self-certification declaration document is primarily a set of forms that provide the MDUS-compliant ODS supplier to explicitly define the capabilities, features, and status of their ODS product in comparison to London Hydro's requirements and preferences.

1.3 Purpose and Objective

London Hydro's overall objective is to procure a commercial off-the-shelf software (COTS) system that:

- Interfaces with London Hydro's Sensus FlexNet™ AMI system;
- Interoperates with London Hydro's SAP IS/U system via the MDUS
- Manages significant volumes of time-series data (i.e. interval data from revenue meters)
- Performs VEE functionality;
- Involves as little custom software development work as possible; and
- Acts as foundation for future Smart-Grid applications.

Given the short timeframe for this project in conjunction with the few MDUS-compliant software systems in the marketplace, this procurement methodology is an accelerated variant of a formal Request for Proposal (RFP) while preserving its important elements with respect to fairness.

1.4 Overview of MDUS/ODS System Selection Process

1.4.1 Request for Information

By way of e-mails dated September 21st and September 24th, 2009 candidate MDUS/ODS suppliers were apprised of London Hydro's interest in procuring an MDUS-compliant ODS product.

1.4.2 Formal Supplier Interviews

Candidate MDUS-compliant ODS suppliers were invited to demonstrate their product to London Hydro staff on two occassions, specifically:

- The first product demonstrations occurred in early October 2009 and the main focus of this demonstration event was to gain an appreciation of the system features that provide integration to the SAP system and provide that functionality required or desired to fulfill the provincial Smartmeter requirements;
- The second product demonstration occurred in mid-November 2009 and the main focus of this demonstration event was to between understand the functionality outside the Smartmeter initiative but that would provide a building block for future Smart Grid applications.

1.4.3 Evaluation of Supplier Proposals

As a follow-up to the product demonstrations candidate ODS suppliers were requested to provide copies of their presentation, system user guides, and other materials that would provide the London Hydro project team with reasonably complete understanding of the capabilities and features of each supplier's ODS system.

1.4.4 Minimum Functional Capability

After reviewing the formal proposals (including this self-certification schedule) provided by candidate suppliers, London Hydro's evaluation team may conclude that the goal is unlikely to be achieved (for reasons outside the MDUS/ODS supplier's or London Hydro's control) or the cost premium wouldn't be warranted. In either case, this procurement will be suspended and the Ministry of Energy & Infrastructure advised of London Hydro's inability to play a part in the initial TOU roll-out.

1.4.5 Supplier Self-Certification

This supplier self-certification declaration, when completed by the supplier, will be akin to the "*table of conformance*" submission that is often submitted as one element in the "*form of tender*" to a more formal Request for Proposal or Invitation to Tender.

1.4.6 Basis of Award

All proposals received from vendors will be reviewed and evaluated by a committee of qualified personnel. This committee will recommend for selection the proposal that most closely meets the requirements of this RFP.

Note: The bid evaluation committee will have representation from Electric Metering, Meter Data Management, Information Services, and Purchasing.

1.4.6.1 Review Criteria

The award, if any, will be made to the best bidder(s). In evaluating whether a vendor is the best bidder, the review committee may utilize some or all of the following criteria in addition to any mentioned throughout this RFP:

- Information submitted in the proposal.

- Information obtained from the listed references.
- Technical merit.
- Experience, qualifications, and references of the firm.
- Proposal's responsiveness to the scope of work and minimum requirements.
- Proposed timeline.
- Demonstrated experience in the design, implementation and operation of Advanced Metering Infrastructure (AMI) networks.
- Competitive price.
- The quality of the product and services offered.
- The capacity of the vendor to perform the contract or provide the service promptly, within the time specified, and without delay or interference.
- The sufficiency of the vendor's financial resources.
- The character, integrity, reputation, judgment, training, experience and efficiency of the vendor.
- Vendor's use of open standards.

Bidders are advised that London Hydro's ability to evaluate proposals is dependent in part on the Bidder's ability and willingness to submit proposals which are well ordered, detailed, comprehensive, and readable. Clarity of language and adequate, accessible documentation is essential.

1.4.6.2 Basis of Award

The following criteria will be of major importance in making the selection.

Table 1-1, Proposal Evaluation Weightings

Evaluation Category	Evaluation Points Available
Technical and functional features of system offering	50 points
System Cost, including future costs	30 points
Other factors (experience, qualifications, references, etc.)	20 points

London Hydro reserves the right to award in whole or in part, whatever is deemed to be in its best interest.

1.4.7 Development of Contract

The contract documents and their order shall be as listed below. If there are any inconsistencies between any provisions of the contract documents, the terms of the upper most listed document will govern which effectively amends the documents listed below it.

- The Purchase Order issued by London Hydro. The Purchase Order shall only set forth terms related to (i) product ordered; (ii) quantities of product; (iii) delivery date; and (iv) shipment information, i.e. the "*fine print*" that may be on the reverse side of the Purchase Order is not part of the contract.
- Other schedules as may be required to document other contractual understandings (e.g. project milestones and payment schedules, etc).
- The bidder's completed *Schedule 1 – Advanced Metering Infrastructure (AMI): Supplier Self-Certification Declaration for the Supply, Delivery and Integration of an MDUS-Compliant Operational Data Store (ODS).*
- The bidder's cost proposal (that will be re-formatted as a schedule).
- The bidder's presentation material provided at their respective product demonstrations, and follow-up literature, documentation, etc. that was provides for evaluation.
- The bidder's standard Terms & Conditions and Software License.

There are no other agreements between the parties hereto either oral or written, and neither this Agreement nor any Contract Documents shall be modified or amended without the written consent of the authorized representatives of the parties hereto.

This Agreement will not be deemed modified by the acknowledgment or acceptance of Contractor's invoices, bills of lading or other documents or by virtue of any general terms and conditions set forth in any purchase orders used to place Product orders under this Agreement.

If any provision is held to be void, unlawful or unenforceable, that provision shall be severed from the Contract Documents and replaced automatically by a provision containing terms as nearly like the void, unlawful or unenforceable as provision; and the Contract Documents shall otherwise continue in full force and effect.

1.4.8 Other Guiding Principles

It is not intended that this declaration restrict bidder's ideas, inventions, advances in the state of the art, or technological improvement, and therefore all bids will be given careful consideration. It must be noted, however, that London Hydro requires sufficient explanations and descriptions to be able to make good value judgment.

1.5 Terminology

The definitions of terms contained in this RFP are not intended to embrace all legitimate meanings of the terms. They are applicable only to the subject treated in this RFP.

Advanced Metering Infrastructure systems are the primary means for utilities to interact with their revenue meters at customer sites. However, in addition to basic meter reading, AMI systems provide two-way communications that can be used by

many functions and, as authorized, by third parties to exchange information with customer devices and systems.

Smart-Grid means refers to a modernization of the electricity delivery system so it monitors, protects and automatically optimizes the operation of its interconnected elements – from the central and distributed generator through the high-voltage transmission network and the distribution system, to industrial users and building automation systems, to energy storage installations and to end-use consumers and their thermostats, electric vehicles, appliances and other household devices. The Smart Grid vision will be characterized by a two-way flow of electricity and information to create an automated, widely distributed energy delivery network. It incorporates into the grid the benefits of distributed computing and communications to deliver real-time information and enable the near-instantaneous balance of supply and demand at the device level.

1.6 Abbreviations, Acronyms and Symbols

1.6.1 Acronyms

AMI means Advanced Metering Infrastructure

EDM means Energy Data Management and refers to a module within the SAP ISU product.

LDC means Local Distribution Company, the franchise distributor of electricity in a given municipality.

MDUS means Meter Data Unification & Synchronization. This is a term coined by the *SAP AMI Lighthouse Council*, a collaboration effort involving SAP AG and several major utility companies with the goal to develop a solution to integrate market-leading advanced metering infrastructure (AMI) with back-end *SAP for Utilities* enterprise technology.

TOU means Time-of-Use

VEE means validate, estimate and edit (when used in regard to AMI interval metering data)

2.0 INSTRUCTIONS TO CANDIDATE SYSTEMS SUPPLIERS

2.1 Return Date for Completed Self-Certification Declaration.

Candidate suppliers of MDUS-compliant ODS systems are requested to complete this self-certification declaration and return the completed document to London Hydro on or before Wednesday, March 10, 2010 at 3:00 pm EST.

The completed self-certification declaration shall be delivered in a sealed envelop to the following location:

Mr. Tom Beacock
Purchasing Coordinator
London Hydro Inc.
P.O. Box 2700
111 Horton Street
London, Ontario
N6A 4H6

Telephone:(519) 661-5800 Ext 4775

Two (2) copies of the completed declaration document shall be provided.

2.2 Contents of Self-Certification Declaration

A completed self-certification declaration will be deemed to consist of the following elements:

- All tables within Section 3.0, *Technical and Functional Requirements*, completed with the appropriate codes and references;
- The information requested within Section 5.0, *Other System Selection Criteria.* This material may simply be appended as Attachments A through E.

The latter information will be included as Attachments in the contract document.

2.3 Requests for Clarification

Should clarification to any of London Hydro's requirements be necessary, the candidate system supplier is requested to direct the question to:

Mr. Mark Rosehart
Director of Utility Support Services & Energy Management
London Hydro Inc.
P.O. Box 2700
111 Horton Street
London, Ontario
N6A 4H6

E-mail: roseharm@londonhydro.com

It is preferred that questions, if any, be phrased to solicit a simple YES or NO answer.

2.4 Availability of Self-Certification Declaration in Electronic Format

As a convenience to candidate ODS suppliers, an electronic copy of this self-certification document can be provided in Microsoft® Office Word 2003 format.

3.0 TECHNICAL AND FUNCTIONAL REQUIREMENTS

The following tabulation identifies a number of technical and functional requirements of the MDUS/ODS. London Hydro understands that some features are available now in production releases of the supplier's offering, some are available in beta releases of the product, and other either aren't available or are contemplated for some future product release.

For each stated requirements, the supplier shall denote one of the following responses in Column 3:

- B Included in the Base application
- O Functionality would require purchase of an optional module (identify module and any associated costs)
- F Included in a future release of the application (please provide timeline)
- X Functionality requires an enhancement
- N Requirement cannot be met with the proposed solution.

The Functional checklist has been divided into the sections listed above for clarity and context - these do not necessarily reflect any evaluation process. The checklist may have items which are beyond the scope of your current product/s. Our near term plans may not necessarily include such extensive functionality and may be used more for informational purposes. The inability to specify that your product has certain functionality does not imply failure.

Please add any explanation or details in the Reference column. If a substantial amount of space is required for clarification, we prefer that separate documentation be provided with an appropriate reference in the Reference column

3.1 Core Functionality

3.1.1 Smart Meters – Mass Market

Single-phase, network, and polyphase revenue meters that measure "*energy consumption*" only (as opposed to "*energy*" and "*demand*") and that are used for residential and small commercial customers (i.e. those with the tariff classification "*residential*" or "*general service less than 50 kW*") are often referred to as "*mass market*" applications. The basic ODS requirements for this market segment are given in Table 3-1 below.

Table 3-1, Core Functionality for Mass Market Smartmeters

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-1.1	System is able to support a minimum of 250,000 electric services						
3-1.2	System can support storage and management of asset, site and customer master data						
3-1.3	System can store interval smart meter data in 30 minute or 60 minute quantities						
3-1.4	Must be able to store both interval and time of use data for a meter, for the life of the meter, including minimum 2 years online						
3-1.5	System supports definition of Time-of-Use periods, holiday calendar and seasonal variation, allowing for a minimum of the following period types: > On-Peak > Mid-Peak > Off-Peak > Critical Peaks						
3-1.6	System supports multiple Time-of-Use definitions that						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	can be applied on a per-class basis						
3-1.7	System can calculate (and store) Time-of-Use billing quantities from measured and validated interval data using defined periods						
3-1.8	System supports versioning of all meter data, including both internal changes and re-import of external data sources						
3-1.9	System provides an overview of all versions of a data set and allows user to visualize differences (e.g. comparison graph, etc)						
3-1.10	System supports standard VEE rules with customizable parameters, including high/low, zero consumption, etc.						
3-1.11	System supports automatic estimation of data based on available historical meter data						
3-1.12	System meets the Ontario MDM/R VEE standards as defined in document IESO_STD_0078						
3-1.13	Provides simple user interface for CSRs to view customer data for the purpose of customer inquiries						
3-1.14	System supports rate definition and can calculate intermediate or final billing amounts for provision of bill-ready data to CIS						
3-1.15	System supports storing of meter alarm and event data						
3-1.16	System supports triggering of actions internally or externally based on input of events from meters/AMI						
3-1.17	The system has data warehousing and analysis						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	capabilities, including following facilities: > Comparison of customer usage with other customers > Assignment of customer groups for combined analysis > Query tool for end-user defined custom reporting						

3.1.2 Commercial and Industrial Meters

Single-phase, network, and polyphase revenue meters that measure both "energy consumption" (with two channels; the first for active energy in watt-hours, and the second for reactive energy in VAr-hours) and "demand" (generally in two of the three quantities: watts, volt-amperes reactive, or volt-amperes) are used for commercial, industrial and institutional customers (i.e. those with the tariff classification "*general service greater than 50 kW*" or "*large user*"). The basic ODS requirements for this market segment are given in Table 3-2 below.

Table 3-2, Core Functionality for C&I (Combination Energy & Demand) Meters

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-2.1	System is able to support at least 2500 interval commercial and industrial services						
3-2.2	All standard electrical units of measure are available						
3-2.3	System supports creation of custom units of measure						
3-2.4	The system is capable of handling multiple channels for a meter (2, 4, 10 channels etc.) with various units of measure						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-2.5	System can store interval smart meter data in various interval sizes, including 5, 15, 30 or 60 minute quantities						
3-2.6	System is able to perform aggregations and totalizations of channels (additive and subtractive in combination)						
3-2.7	System supports storage and maintenance of loss factors at both service and meter levels to support complex loss scenarios						
3-2.8	System supports ability to view meter data both with and without loss factors applied						
3-2.9	The system includes defined validation processes > Parity Error > Load Factor Limit > Power Factor Limit > Interval % change > Alarms / Phase errors > Power outage > Short / Long interval > Clock Error > Reset Occurred > CRC/ROM/RAM checksum > Watchdog Timeout > Time Reset Occurred > Test Mode > Load Control						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> Spike control						
3-2.10	The system is capable of performing demand calculations using standard algorithms, i.e. Rolling 60, Fixed 15						
3-2.11	System supports user-defined custom calculation processes for intermediate and final bill determinant calculation						
3-2.12	System supports rate definition and can calculate intermediate or final billing amounts for provision of bill-ready data to CIS						
3-2.13	System provides an intuitive user interface for manually editing meter data						
3-2.14	System is capable of estimating interval data based on different scenarios						
3-2.15	System supports remote interrogation of interval meters via common communication methods, e.g. modem/phone line, tcp/ip						
3-2.16	System is able to perform automated remote interrogation based on a user-defined schedule						
3-2.17	System is able to make unscheduled (on-demand) remote interrogation of interval meters						
3-2.18	The system is capable of customer interaction for Commercial and Industrial customer						

3.2 Interfaces and Integration

3.2.1 Sensus FlexNet™ RNI Data Retrieval / Interrogation

London Hydro has invested in the Sensus FlexNet AMI system. The minimum data interchange requirements for this interface (between the Sensus FlexNet RNI master station computers and the ODS) are given in Table 3-3 below.

Table 3-3, Data Interchange with Sensus FlexNet AMI Master Station

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-3.1	System provides a file based interface with Sensus RNI/AMCC system to retrieve hourly interval data for at least 250,000 electric meters						
3-3.2	System provides an API (webs service, etc.) based interface with Sensus RNI/AMCC system to retrieve hourly interval data for at least 250,000 electric meters						
3-3.3	System supports synchronization of master data with a Sensus RNI/AMCC system, including the following entities an corresponding attributes: > assets > premises > customer information						
3-3.4	System supports automatic synchronization of meter changes (e.g. replacement/exchange) with the Sensus RNI						
3-3.5	System supports a file based interface for import of meter alarm and other event data from the Sensus RNI						
3-3.6	System supports an API based interface for import of meter alarm and other event data from the Sensus RNI						
3-3.7	System is capable of performing on-demand read						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	requests via the Sensus RNI system						
3-3.8	System is capable of sending all Sensus-supported remote commands either in batch or real-time, with appropriate logs						
3-3.9	Supports reconciliation of data with Sensus RNI to ensure data is completely synchronized						

3.2.2 CIS / SAP

The supplier's current MDUS certification level and roadmap to certification to future SAP Enhancement Pack releases is stated in Table 3-4 below.

Table 3-4, MDUS Certification Level and Roadmap

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-4.1	System is able to interface to SAP CIS via MDUS/Lighthouse Council standard interface						
3-4.2	System supports all interface functions defined with SAP ECC 6.0 Enhancement Pack 4						
3-4.3	System is fully tested with SAP Enhancement Pack 4 integration						
3-4.4	System is certified by SAP for use with SAP Enhancement Pack 4						
3-4.5	System development roadmap includes functionality to support all interfaces with SAP Enhancement Pack						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	5 (within 6 months of EP5 availability)						
3-4.6	Vendor is committed to certification of system for use with SAP Enhancement Pack 5 when available						
3-4.7	System can synchronize and store Universal SDP from SAP						
3-4.8	System can fully synchronize master data with SAP IS-U, whereby the SAP IS-U system is considered the ""system of record"", including the following entities: > assets (meters, instrument transformers) > premises > customer information						

3.2.3 MDM/R Interfaces (IESO_SPEC_9027)

In the event that London Hydro elects to utilize the ODS as the synchronizing interface engine to the provincial MDM/R, the inherent features within the ODS that comply with the published MDM/R requirements are given in Table 3-5 below.

Table 3-5, MDM/R Interface Features Inherent in ODS Product

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-5.1	System can store the MDM/R assigned Universal SDP identifier in association with an electric service						
3-5.2	System provides Universal SDP ID Assignment Request (outbound) and Response (inbound) interfaces per MDM/R specs						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-5.3	System provides outbound Periodic Audit Synchronization interface (complete file set) per MDM/R specs						
3-5.4	System provides outbound Incremental Audit Synchronization interface (complete file set) per MDM/R specs						
3-5.5	System can create interface file as per MDM/R Billing Quantity Request per MDM/R specs (outbound)						
3-5.6	System can import interface file for Billing Quantity Response per MDM/R specs (inbound) & store billable hourly/ToU values						
3-5.7	System supports retrieval of usage data via the MDM/R Web Services Request/Reply interface						
3-5.8	System can import interface file for Aggregated Settlement Data interface (inbound) per MDM/R Specs						
3-5.9	System can import interface file for Aggregated Settlement Data Contributors interface (inbound) per MDM/R Specs						
3-5.10	System supports creation of CMEP MDM/R Meter Read Interface file using the Sensus2 format						
3-5.11	System supports creation of CMEP MDM/R Meter Read Interface file using any of the existing MDM/R supported variants						

3.2.4 MDM/R Reports (SME_SPEC_0001)

In the event that London Hydro elects to utilize the ODS as the synchronizing interface engine to the provincial MDM/R, the additional features inherent within the ODS that comply with the published MDM/R requirements are given in Table 3-6 below.

Table 3-6, Additional MDM/R Interface Features Inherent in ODS Product

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-6.1	System can import MDM/R data collection and VEE reports to facilitate business processes and exception management						
3-6.2	System can trigger workflow processes based on exceptions provided in the reports						
3-6.3	System utilizes interface logs and tracking to filter out exceptions that would not require user interaction						

3.2.5 Geographic Information System (GIS)

London Hydro currently has an Intergraph GIS (G/Technology) system. In time there is a system planning need to export meter voltage and consumption information (from a given snapshot in time, e.g. for the hourly interval ending at 4:00 pm on a given date) to the GIS system for spatial presentation. For example, a visual depiction of all service points where the supply voltage was below the CSA limits would be useful for determining a course of course of corrective action (e.g. change the tap on a single distribution transformer, adjust the tap on a substation power transformer, add VAr compensation, re-conductor segment of circuit, etc.). The GIS interface functions that are inherent in the proposed ODS are as stipulated in Table 3-7 below.

Table 3-7, Inherent GIS Data Exchange Functionality

Requirement	Statement of Requirement	Bidder's Response	Reference to Solution in

		B	O	F	X	N	
3-7.1	Ability to interface with GIS systems for recording and maintenance of spatial data relating to CIS-managed assets, e.g. service point locations						
3-7.2	System provides meter usage data interface to GIS systems						
3-7.3	System supports all GIS interfaces with the Intergraph G/Technology system						
3-7.4	System supports utilization of GIS connectivity data to allow consumption and demand analysis based on grid connectivity						

3.2.6 Outage Management System (OMS)

London Hydro has had an interest in implementing an Outage Management System (OMS) for some time, carried out a proof-of-concept project with M3i a number of years ago, but has not yet procured an OMS. The approach of late has been to see what features are inherent with AMI, and then procure an OMS to fill in the gaps in functionality. The mechanisms inherent within the supplier's ODS offering to support an Outage Management System are stipulated in Table 3-8 below.

Table 3-8, Inherent Functionality to Support a Third-Party OMS

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-8.1	System has the ability to interface with common outage management systems for review of outages > List supported OMS systems						
3-8.2	System can pass meter events through to OMS for outage reporting and analysis						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-8.3	System can filter meter events to avoid OMS notification of brief outages due to switching, etc.						
3-8.4	System can utilize OMS outage information as part of the meter data VEE process to validate periods of zero consumption						

3.2.7 Work Force Management (WFM)

London Hydro has an active interest in procuring a Work Force Management (WFM) system to support the "meter exchange process" once there are only Smartmeters and interval-style meters within its service territory. The features inherent in the supplier's ODS offering to support a Work Force Management system are stipulated in Table 3-9 below.

Table 3-9, Inherent Functionality to Support a Third-Party WFM System

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-9.1	System has the ability to interface with common work force management systems > List supported WFM systems						
3-9.2	System can automatically create tickets in the WFM system for meter events such as tamper detect, etc.						
3-9.3	System can utilize WFM planned work items to suppress meter events from triggering action, e.g. 'tamper detect' when a meter exchange service order is occurring						

3.3 Reporting

3.3.1 Reporting Technology

The inherent reporting features of the proposed ODS product are as stipulated in Table 3-10 below.

Table 3-10, Inherent Reporting Features of ODS

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-10.1	The system provides a report exporting tool						
3-10.2	Be able to provide a query type tool for custom reports						
3-10.3	Able to provide an MDM missing data report by range						
3-10.4	The system can support automation of standard or custom Utility reports						
3-10.5	Reports can be printed or viewed on an on-line screen						
3-10.6	Support third party query tools e.g. sql on database or Crystal Reports						

3.3.2 Audit Reporting

The inherent audit reporting features of the proposed ODS product are as stipulated in Table 3-11 below.

Table 3-11, Inherent Audit Reporting Features of ODS

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-11.1	Able to view a report for all transactions for a certain time period						
3-11.2	Able to report transactions by username or name of operator						
3-11.3	The system supports Archiving or storing of all transactions for a certain amount of time						
3-11.4	Able to view a report for all customer web transactions						
3-11.5	Able to view all system type transactions						
3-11.6	Able to view all system data processing transactions						
3-11.7	The system supports reporting for all sync transactions						
3-11.8	The system supports aggregation auditing to ensure correct contributors are being used						
3-11.9	The system supports rate calculation auditing						
3-11.10	Able to view customers on specific rate calculations						

3.3.3 Data Reporting

The inherent system and metering data reporting features of the proposed ODS product are as stipulated in Table 3-12 below.

Table 3-12, Built-In System and Metering Data Reports

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-12.1	The ability to report meter and data events for a time range						
3-12.2	Capable of reporting meter or system alarms. E.g. theft of power						
3-12.3	The system supports total and interval consumption reports						
3-12.4	Able to view TOU pricing for a specific time range						
3-12.5	Support a report to show customer information > Name / Business name > Address > Phone number > Other contact information > Rate Classification > Meter information > Historical meter data						
3-12.6	Able to view TOU information > Consumption / Total > Seasonal information > Price structure						
3-12.7	The system can support C&I interval data and pricing reports > 7-7 demand > Consumption total for a specified time period > Peak Demand > Aggregated totals (if applicable)						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> HOEP pricing > Total Loss Factors > Uplift charges if any						
3-12.8	Support kVA analysis reporting. If no kVA present, can the system calculate?						
3-12.9	Provide a TOU or interval report > Output interval in 5,15, or 60 minute > Rolling or clock demand > Be able to support any or all channels > By season						
3-12.10	Be able to view Validation, Editing, Estimation data reports > By file > By Time > By Group of meters or customers						

3.3.4 Work Force Management Reports (Queue)

The inherent work force management reporting features of the proposed ODS product are as stipulated in Table 3-13 below.

Table 3-13, Built-In Work Force Management Reports

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-13.1	Report on order activities and sort > user defined > system defined						
3-13.2	The system supports statistics for time performance e.g. how much time before activity is closed						
3-13.3	Be able to report on status of activity > open / close / pending > date opened or closed > who assigned > who owns the task						
3-13.4	The system is capable of printing all Work Force Management Reports						
3-13.5	Be able to report on status of activity > open / close / pending > date opened or closed > who assigned > who owns the task						
3-13.6	System is able to monitor and report (email or other means) when a task has been assigned						

3.4 Web Presentment / Customer Interaction

3.4.1 Data Presented

The provincial Smartmeter initiative anticipates the availability of an Internet interface for customers (with Smartmeters) to view their energy consumption profiles. The desired features of a web presentment feature that is integral to the ODS are outlined in Table 3-14 below.

Table 3-14, Web Presentment Features of ODS

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-14.1	The system will display the interval data in 5, 15 and 60 minutes intervals > user defined date and time range > user define interval length > user define meter number > User defined UOM						
3-14.2	The system will calculate missing user defined Units of Measure (UOM) example: kVA calculated from kW and kVAr						
3-14.3	The system is capable of displaying framed TOU data > user defined date and time range > user define interval length > user define meter number						
3-14.4	The ability to compare consumption month to month for at least 13 months						
3-14.5	The system will be able to send alerts when consumption levels are reached						
3-14.6	The system can be configured to specify the version of						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	data to present (raw or VEE)						
3-14.7	Customer can be presented with a single version of their consumption data						
3-14.8	Capable of selecting the option to display loss adjusted data or unadjusted data						
3-14.9	The system is able to display Demand Peaks over a select time and date range > user defined date and time range > user define interval length						
3-14.10	The system will display On/Mid/Off peak colours scheme to match colours used in SM/TOU communication brochures (On = red / Mid = yellow / Off = green)						
3-14.11	The system will display Total daily kWh consumption and $ value of consumption						
3-14.12	The system will display Daily TOU kWh / $ consumption data including total daily on/mid/off peak kWh/$ consumption						
3-14.13	The system will display the minimum of: Up to a configurable number of days (meant to cover a seasonal billing cycle); or the number of days has lived at the current residence as indicated by their account relationship to a specific location (Service Delivery Point) up to a maximum of 2 years.						
3-14.14	The system is able to show Power Factor > user defined date and time range > user define customer						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-14.15	The system can overlay weather data for comparison > user defined date and time range > user define interval length > user define meter						
3-14.16	The system will be able to group the data by customer > Can a customer see multiple meters at one time > Can the customer aggregate the meter data						
3-14.17	The system will allow for Retailers to access their customer's data						
3-14.18	The customer will be able to print/download the data in a printable form > Excel > PDF						
3-14.19	The Retailer will be able to print/download the data in a printable form > Excel > PDF						
3-14.20	The system will be able to calculate the customers Carbon Credits						
3-14.21	The system can compare similar households to one another						

3.4.2 Graph Interval Data

The inherent capabilities of the proposed ODS to present interval metering data in a graphic format are as stipulated in Table 3-15 below.

Table 3-15, Graphic Presentation of Interval Metering Data

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-15.1	The system can display a graph of the interval data in 5, 15 and 60 minutes intervals > user defined date and time range > user define interval length > user define meter number > User defined UOM						
3-15.2	Can calculate user defined Units of Measure (UOM) example: kVA calculated from kW and kVAr						
3-15.3	The system will display a graph of framed TOU data > user defined date and time range > user define interval length > user define meter number						
3-15.4	The system is able to select the option to display a graph containing loss adjusted data or unadjusted data						
3-15.5	The system will display a graph containing Demand Peaks over a select time and date range > user defined date and time range > user define interval length						
3-15.6	The system is able to show a graph containing Power Factor						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> user defined date and time range > user define customer						
3-15.7	The system will overlay weather data for comparison in a graph > user defined date and time range > user define interval length > user define meter						
3-15.8	The system will graph data based by customer > The customer will be able to see multiple meters at one time > The customer will be able to graph aggregate meter data						
3-15.9	The system will graph in different forms > Pie Chart > Bar Graph > Line Graph						

3.4.3 Data Analysis

The inherent capabilities of the proposed ODS to analyze interval metering data are as stipulated in Table 3-16 below.

Table 3-16, Metering Data Analysis Functionality

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-16.1	The system will perform the analysis for % total						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	kWh/$ consumption for each TOU period in the selected range (see "range of data" on previous slide)						
3-16.2	The system will display a table or chart showing a given day's consumption total by TOU period compared with the same day of week for a selected number of weeks in the past falling within the time period for which the customer's account is associated with that location.						
3-16.3	The system is capable of displaying a table or chart showing a given month's consumption total by TOU period compared with the previous months' totals for a selected number of months in the past falling within the time period for which the customer's account is associated with that location.						
3-16.4	The system is able to display a table or chart showing a given period's consumption total by TOU period compared with a previous period's totals for a selected number of periods in the past, falling within the time period for which the customer's account is associated with that location.						
3-16.5	The system is able to display a table or chart showing a given week's or month's consumption total by TOU period compared with the same week or month in previous years for a selected number of years falling within the time period for which the customer's account is associated with that location. .						
3-16.6	The system is capable of displaying a table or chart comparing total $ consumption during a given period under TOU rates vs. retailer rate (to be entered by user / not including provincial benefit).						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-16.7	The system has an appliance Rate Calculator						

3.4.4 Data Export

The inherent capabilities of the proposed ODS to export interval metering data are as stipulated in Table 3-17 below.

Table 3-17, Data Export Functionality Inherent with Web Presentment Feature

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-17.1	The system will allow selected data to be exported to .csv file which can be imported into a variety of applications by the consumer. (The selected data can be either selected through the 'display of consumption data' function or the 'analysis' function.)						

3.4.5 Browser Compatibility

The inherent capabilities of the proposed ODS to interact with end-user home computer products are as stipulated in Table 3-18 below.

Table 3-18, Compatibility of Web Presentment Feature with User Browsers

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-18.1	The web presentment website is HTML 4.0 compliant						
3-18.2	The following Browsers are compatible > Internet Explorer 6 through 8 > Firefox 2.x and 3.x > Safari 3.x and 4.x > Google Chrome 3.x > Opera 9.x and 10.x						
3-18.3	Website relies on HTML only, and does not require browser plug-ins such as Java, Flash or Silverlight.						

3.4.6 Client System Compatibility

The client platforms supported by the proposed ODS are as stipulated in Table 3-19 below.

Table 3-19, Supported Client Platforms

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-19.1	The Client Platform will be supported > Windows > Mac > Linux						

3.4.7 Mobile Device Support

The mobile devices supported by the proposed ODS are as stipulated in Table 3-20 below.

Table 3-20, Supported Mobile Devices

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-20.1	The website is compatible with the following mobile platforms > iPhone > Blackberry > Windows Mobile > Android						

3.4.8 Technical Requirements (Security)

The security mechanisms supported by the proposed ODS are as stipulated in Table 3-21 below.

Table 3-21, System Security Requirements

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-21.1	Supports SSL 128 bit or 256 bit encryption						
3-21.2	Utilizes standard Apache based process including openssl and httpd.conf modification to request and install certificates						
3-21.3	Utilizes standard Windows IIS tools to request and						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	install certificates						

3.4.9 SAP UCES Portal Integration

The user authentication mechanisms supported by the proposed ODS are as stipulated in Table 3-22 below.

Table 3-22, System User Authentication Requirements

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-22.1	Can authenticate against UCES credentials						
3-22.2	Can present a unified customer portal that integrates UCES content						
3-22.3	Content can be integrated into UCES portal						
3-22.4	System supports one login to view ODS content and UCES content (customer only signs in once and is not presented with another login when accessing the other content)						

3.4.10 User Management (for Customer Logins)

The user management mechanisms supported by the proposed ODS are as stipulated in Table 3-23 below.

Table 3-23, System User Management Requirements

Requirement	Statement of Requirement	Bidder's Response	Reference to Solution in

		B	O	F	X	N	
3-23.1	The system has functionality to allow customers to create their own login with uniquely identifiable information compliant with PIPEDA						
3-23.2	The system has functionality for CSR's to create customer logins						
3-23.3	The system has functionality for CSR's to reset a customer's password						
3-23.4	The system has functionality for customers to reset their own password						
3-23.5	The system supports an email address for customer login usernames						
3-23.6	The system supports a configurable password policy for customer logins > Minimum length > Minimum alphanumeric, numeric, special characters > Restrict allowable passwords to avoid common or dictionary words > Change after specified duration > Lock after specified failed attempts						
3-23.7	Can use LDAP for user management, authentication and authorization						
3-23.8	Can use Active Directory for user management, authentication and authorization						
3-23.9	London Hydro will be able to obtain statistical user information on the website > Total number of Customer log ons for a given time period						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> Failed Attempts > Total users setup						

3.4.11 Website Branding

For the web presentment feature inherent in the proposed ODS, the options for London Hydro to augment the presented information is stipulated in Table 3-24 below.

Table 3-24, Flexible Branding of Web Presentment Feature

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-24.1	London Hydro will be able to customize space on the web application for our own branding and advertising > Customer Energy Tips > Customer weekly or monthly message						

3.5 Additional Functionality

3.5.1 EBT Usage Transactions

Interactions with energy retailers via the so-called EBT Hub are presently handled via the SAP system. In the event that London Hydro wished to off-load this functionality to the proposed ODS, the features inherent in the proposed ODS to support a compliant EBT Hub interface are stipulated in Table 3-25 below.

Table 3-25, Inherent Features to Support Data Exchanges with Retailers

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-25.1	The system can generate xml files as an output						
3-25.2	The system can generate xml files using a XSD template						
3-25.3	The system is capable of generating interval usage xml files to send to the Retailers > Billable usage > Weekly usage > Uplifted data						
3-25.4	The system can generate Cancel and NEW interval usage xml files to send to the Retailers after and adjustment of the data has happened > Billable usage > Weekly usage > Uplifted data						
3-25.5	The system can store and manage interval usage xml files that were sent to the Retailers > Billable usage > Weekly usage > Uplifted data"						
3-25.6	Can the system generate Historical interval usage xml files to send to the Retailers > This is up to 24 billing periods of billable usage > Uplifted data						
3-25.7	The system can generate TOU usage xml files to send to the Retailers						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> Billable usage > Weekly usage > Uplifted data						
3-25.8	The system will generate Cancel and NEW TOU usage xml files to send to the Retailers after and adjustment of the data has happened > Billable usage > Weekly usage > Uplifted data						
3-25.9	The system can store and manage TOU usage xml files that were sent to the Retailers > Billable usage > Weekly usage > Uplifted data						
3-25.10	The system is capable of generating Historical TOU usage xml files to send to the Retailers > this is up to 24 billing periods of billable usage > Uplifted data						

3.5.2 Smart Grid

The inherent functionality in the offered ODS to support future Smart Grid applications is as stipulated in Table 3-26 below.

Table 3-26, Inherent Functionality to Support Future Smart Grid Initiatives

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-26.1	The system is able to support consumer participation programs (Consumer Enablement) > Smart Home > Smart Appliances > Intelligent Equipment						
3-26.2	The ability to support ""Self Healing"" (Advanced Distribution Operations) (Advanced Transmission Operations) > Using real-time information from embedded sensors and automated controls to anticipate, detect, and respond to system problems, a smart grid can automatically avoid or mitigate power outages, power quality problems, and service disruptions"						
3-26.3	The system can support Load adjustment > A smart grid may warn all individual load, or another larger customer, to reduce the load temporarily						
3-26.4	The system is able to support Demand response programs > Allows loads to interact in an automated fashion in real time, coordinating demand to flatten spikes						
3-26.5	The system supports power quality measurement and reporting > Measurement device (Phasor measurement units) to allow monitor power quality and in some cases respond automatically to them.						
3-26.6	Able to interact with Smart Meters to assist with Load						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	controlling						
3-26.7	The system will send pricing signals to consumers and or loads > SMS messages > Email Alerts > Auto Dialers > Other signals						
3-26.8	The system is able to support Smart phone applications > Messages and alerts > Smart Appliances control > Intelligent Equipment control						
3-26.9	The system will interact with Smart Maps > Google Earth > Google Maps						

3.5.3 Wholesale Settlements

Whereas wholesale settlements are presently carried out in the SAP system (and specifically within the Energy Data Management module), London Hydro would be interested in offloading the SAP system by transferring the wholesale settlements processing to the ODS provided that the ODS inherently had this functionality. The inherent functionality in the offered ODS to support wholesale settlements is as stipulated in Table 3-27 below.

Table 3-27, Inherent Capability of ODS to Support Wholesale Settlements

Requirement	Statement of Requirement	Bidder's Response	Reference to Solution in

		B	O	F	X	N	
3-27.1	The system is able to store unadjusted and adjusted data for the same Delivery Point in 5, 15, and/or 60 minute intervals						
3-27.2	The system can aggregate delivery points into a single "totalized" point and store the data in 5, 15, and/or 60 minute intervals						
3-27.3	The system will create custom formula's to calculate the Total Retail interval data AQEW						
3-27.4	The system will store all channels for Embedded Generators						
3-27.5	The system will aggregate all channels for Embedded Generators into a single totalized point in 5, 15, and/or 60 minute intervals						
3-27.6	The system is capable of interfacing with the IESO MOS (MV Web) system to download the interval data						
3-27.7	The system is capable of loading and storing the Preliminary Statements from the IESO > HOEP for pricing						
3-27.8	The system is capable of loading and storing the Final Statements from the IESO.						
3-27.9	The system will calculate and store the values for the creation of Net System Load Shape (NSLS) > Total London Hydro Wholesale AQEW > Total Retail Interval AQEW > Total Streetlight AQEW > Total Generation AQEW						
3-27.10	The system will store the interval data for Street lights						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> Can the data be stored for calculation purposes > Can the system create and invoice from the data						

3.6 Additional Utilities

3.6.1 Natural Gas

There are no requirements for the automated reading and billing of natural gas. However, should an LDC with a gas distribution license join the CODAC group in future, then the functionality inherent in the proposed ODS is as stipulated in Table 3-28 below.

Table 3-28, Future Support for Natural Gas Distribution Utilities

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-28.1	The system must be able to store Gas data						
3-28.2	The system supports cubic metres, and cubic feet						
3-28.3	The system supports hourly interval gas reads						
3-28.4	The system supports periodic gas reads						
3-28.5	The system supports on demand gas reads (examples: move ins, move outs)						
3-28.6	Able to support deduct and aggregated/totalized gas meter setups						
3-28.7	System supports standard calculations for pressure/volume adjustments						

3.6.2 Domestic Water

London Hydro presently reads domestic water meters and bills customers on behalf of the City of London and will be connecting a few FlexNet water meter interface devices to the Sensus FlexNet AMI for remote meter reading. Should this proof-of-concept be expanded in future, then the functionality inherent in the proposed ODS is as stipulated in Table 3-29 below.

Table 3-29, Future Support for Domestic Water Distribution Utilities

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-29.1	The system must be able to store water data						
3-29.2	The system supports cubic metres, and cubic feet						
3-29.3	The system supports hourly interval water reads						
3-29.4	The system supports periodic water reads						
3-29.5	The system supports on demand water reads (examples: move ins, move outs)						
3-29.6	Able to support deduct and aggregated/totalized water meter setups						

3.7 System Architecture and Infrastructure

3.7.1 Hardware

The inherent capability of the offered ODS to run on London Hydro's preferred corporate computing platform is as stipulated in Table 3-30 below.

Table 3-30, Compatibility with London Hydro's Corporate Computing Platform

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-30.1	Our standard server platform is based on an HP c7000 Blade System chassis as a minimum specification.						
3-30.2	Our standard based server configuration utilizes AMD Opteron processors in the C-Class HP blade server line.						
3-30.3	Our standard base server configuration is based on AMD processors in various core combination (2, 4, 6 core).						
3-30.4	Our standard data storage environment is based on HP EVA 8100 Storage Area Network.						

3.7.2 Application Servers

The inherent capability of the offered ODS to run on London Hydro's preferred operating systems is as stipulated in Table 3-31 below.

Table 3-31, Compatibility with London Hydro's Corporate Operating Systems

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-31.1	Our standard operating system for applications is based on Red Hat Enterprise Linux R5 (64-bit).						
3-31.2	Our standard alternate operating system for applications is based on Microsoft Windows 2003 Server (32-bit) at a minimum.						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-31.3	Application must be scalable to support processing of 1 million meter device.						

3.7.3 Database Servers

The inherent capability of the offered ODS to interoperate with London Hydro's preferred database management system is as stipulated in Table 3-32 below.

Table 3-32, Compatibility with London Hydro's Database Management System

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-32.1	Our standard database platform is Oracle 10.0.2 at a minimum.						
3-32.2	Our standard database platform, Oracle 10.0.2, is based on Red Hat Enterprise Linux R5 at a minimum.						

3.7.4 Web Server / Browser

In instances where the user interface to the ODS is via a web browser, the inherent compatibility of the ODS with London Hydro's requirements is as stipulated in Table 3-33 below.

Table 3-33, Inherent Compatibility with London Hydro's Web Servers & Browsers

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-33.1	Our standard web browser is Internet Explorer version 6 at a minimum.						
3-33.2	Our standard web server is based on either Apache Tomcat on Red Hat Enterprise Linux R5 or IIS on Windows 2003 Server						

3.7.5 Database Accessibility

The inherent capability of the offered ODS to interoperate with London Hydro's preferred database management system is as stipulated in Table 3-34 below.

Table 3-34, Database Accessibility Design Preferences

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-34.1	Can the database be separated from the application server to enhance security features						
3-34.2	Does the system provide an end user web interface(s)						
3-34.3	Does the system provide a front end client interface(s)						
3-34.4	Database must be scalable to support processing of 1 million meter devices.						

3.7.6 London Hydro Infrastructure

The inherent capability of the offered ODS to interoperate with London Hydro's infrastructure services is as stipulated in Table 3-35 below.

Table 3-35, System Integrity Requirements

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-35.1	Does your solution support integration with Microsoft Active Directory (LDAP) security services						
3-35.2	Does your solution support single sign-on integration with LDAP (AD services)						
3-35.3	Our standard backup solution is based on EMC Networker ver. 7.3 SP4 for both application and database servers at a minimum.						

3.7.7 SAP and Modules

The inherent capability of the offered ODS to interoperate with the current releases of London Hydro's SAP IS-U product is as stipulated in Table 3-36 below.

Table 3-36, Inherent Compatibility with Existing SAP Product Releases

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-36.1	System must support full integration with SAP						
3-36.2	System must support, at minimum, SAP module ECC ver. 6, release 700 level 0013						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-36.3	System must support, at minimum, SAP module CRM ver. 5.2, release 700, level 0013						
3-36.4	System must support, at minimum, SAP module PI and BI: Netweaver 2004s, release 700, level 0013						
3-36.5	System must support, at minimum, SAP module Solution Manager 7.0, release 700, level 0016						

3.7.8 Security

The inherent user password protection capability of the offered ODS is as stipulated in Table 3-37 below.

Table 3-37, User Password Protection and Administration

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
3-37.1	The system has auditing and user security management Describe the system's security capabilities > Are configuration changes auditable > Are data changes auditable > User grouping for roles and privileges						
3-37.2	Can use LDAP or Active Directory for user management, authentication and authorization						
3-37.3	If the system supports internal user management, a configurable password policy is available, including: > Minimum length						

Requirement Number	Statement of Requirement	Bidder's Response					Reference to Solution in Bidder's Documentation
		B	O	F	X	N	
	> Minimum alphanumeric, numeric, special characters > Restrict allowable passwords to avoid common or dictionary words > Change after specified duration > Lock after specified failed attempts						
3-37.4	The system is capable of creating user names and passwords						
3-37.5	Able to delete user accounts when necessary						
3-37.6	The system asks for a username and password at start-up						
3-37.7	A complete user audit trail is saved						
3-37.8	Roles and privileges are customizable for a single user or group						
3-37.9	Default administration password can be changed						
3-38.10	User account logs out after a predefined amount of inactivity						

3.7.9 System Architecture

The inherent capability of the offered ODS to support multiple LDC's (similar to the design feature of the SAP system whereby multiple LDC's are supported simultaneously) is as stipulated in Table 3-38 below.

Table 3-38, Support for Partitioned Operation and Third-Party Add-Ons

Requirement	Statement of Requirement	Bidder's Response	Reference to Solution in

		B	O	F	X	N	
3-38.1	The system is capable of isolating multiple LDCs data in one system > Detail additional licensing costs (if any) > List any additional infrastructure that is required > Is it PIPEDA compliant						
3-38.2	The system is designed to be modular to allow add-ons to be built, either by the vendor, or by a third party > Provide details of the modular design > List the enhancements or add-ons available						

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4.0 COST PROPOSAL

Candidate ODS suppliers have previously been requested to provide system licensing costs and cost estimates for defined system integration work. No additional cost information is requested at this time.

However, during the contract development phase with the successful ODS supplier, the individual costs elements will be verified with the supplier to ensure that London Hydro's anticipated ODS ownership cost projections are valid.

If so, the individual cost elements will be included below (in a modified document) for convenience of reference.

5.0 OTHER SYSTEM SELECTION CRITERIA

5.1 Supplier's Project Team

Please provide an organization chart showing the reporting structure for the project team (within the team itself, within the larger organization, and within the umbrella quality management system), the qualifications and experience of the individual team members, and the roles and responsibilities of each member of the project team. Also include a written description of the tools, techniques and methodology that will be used for successfully managing this project.

5.2 Description of Supplier's Risk Mitigation Strategy

Please provide a Gantt chart (or similar presentation tool) illustrating the milestones and activities for an MDUS-compliant ODS deployment, using experience from similar projects (listed in Section 5.3, *Supplier References*) to guide estimation of duration of each activity.

Please provide a written risk analysis (no more than 3 pages) that identifies potential risks which, in your experience, occur on projects of this type. Identify steps which can be taken to avoid or mitigate those problems; and steps to be taken should the problem occur. Incorporate activities in project plan (Gantt chart) to reduce the occurrence, severity and impact of events or situations which can compromise the attainment of any project objective. Your discussion should deal, at least in part, with the degree of increased risk associated with levels of software development and customization imposed by the requirements, the degrees of increased risk through levels of use of non-commercially available software, the degree of reduced risk associated with the used of tools, techniques, and configurations similar to other existing, installed software, hardware, and network configurations.

Please also include a discussion of your assumptions regarding the release date of SAP's Enhancement Pack 5, the impact on this ODS integration project if this release date is significantly delayed, and your expectations with respect to London Hydro's migration to EP5 (i.e. should it be done during the project, delayed until the end of the project, etc.).

5.3 Supplier References

Please provide at three (3) references where an MDUS-compliant ODS similar to the proposed system was provided by the bidder's firm:

Reference Utility #1: _____

Contact Name: _____ Telephone: _____

Address: _____

City, Province / State, Postal Code: _____

Date of Installation: _____

Type of Equipment Provided: _____

Reference Utility #1: _____

Contact Name: _____ Telephone: _____

Address: _____

City, Province / State, Postal Code: _____

Date of Installation: _____

Type of Equipment Provided: _____

_____

Reference Utility #1: _____

Contact Name: _____ Telephone: _____

Address: _____

City, Province / State, Postal Code: _____

Date of Installation: _____

Type of Equipment Provided: _____

5.4 Letter(s) Attesting to MDUS Certification

Please include a letter from SAP or the SAP AMI Lighthouse Council verifying that the proposed ODS is MDUS-compliant.

Attachments

A. Project Organization Chart
B. Resumes for Key Project Personnel
C. Project Gantt Chart
D. Supplier's Risk Mitigation Strategy
E. Letter(s) Attesting to MDUS Certification

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