Advanced Metering Infrastructure (AMI) – Phase 1 Smartmeter Deployment: *Guidelines for the Evaluation of Sample Revenue Meters and Regional Collectors*

February 9, 2008

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1.0 INTRODUCTION

1.1 Purpose and Objective

The governing RFP (entitled: *Request for Proposal for Advanced Metering Infrastructure (AMI) – Phase I Smartmeter Deployment*) includes a number of technical requirements that may be difficult for members of the Bid Evaluation Technical Panel to gauge compliance based on text descriptions and glossy brochures that the bidder may have included in their proposal.

By letter dated January 10th, 2008, bidders were formally requested to provide samples of their field devices as listed below:

- A sample unsealed revenue meter, for evaluation in accordance with the criteria stipulated in Section 6.3.3.1, *Revenue Metering Maintainability*, of the RFP; and
- A sample regional collector, for evaluation in accordance with the criteria set forth in Section 6.3.3.2, *Regional Collector Maintainability*, of the RFP.

Note: For bidders with PLC/BPL offerings, samples of other field-installed devices (e.g. couplers, bypass elements, etc.) should also be included for evaluation of maintainability (using criteria consistent with the revenue meter and regional collector elements).

In the meantime, the Bid Evaluation Technical Panel was instructed to mark their individual scorecards with the text "R/C" (for requires clarification) or "E/D" (for evaluation deferred)

1.2 Exhibition of Samples

A number of logistical matters precluded circulating the sample devices amongst consortium LDC's in conjunction with their respective proposal. Instead, arrangements have been made for all sample meters, regional collectors, and other field devices to be assembled at London Hydro's facilities for viewing and evaluation by the members of the Bid Evaluation Technical Panel (and representatives from other consortium LDC's that have an interest).

The said samples will be evaluated in accordance with the described methodology on the afternoon of Monday, February 11th, 2008 (weather permitting).

1.3 Exceptions

Some bidder's AMI designs (e.g. Sensus) don't use the concept of a regional collector. Instead they use a common RF transmitter station. As it isn't practical to ship such an apparatus for examination, arrangements will be made to evaluate such offerings at an LDC's site where pilot testing is ongoing.

2.0 SCOPE OF EVALUATION

The sample device evaluation will be confined to the following aspects of the governing RFP:

- Section 6.2.2, Purchasing Description for Energy Meters (Level 1) –

  The final paragraph reads:

  > *Revenue meters shall be equipped with a green LED (or similar signalling device) to indicate establishment of a communications link between the meter's AMCD and an upstream regional collector.*

  In some proposals it has been difficult to ascertain whether in fact there is such feature, and whether or not the feature is obscured by an opaque meter cover.

- Section 6.2.7.1, General –

  The requirement pertains to regional collectors and reads:

  > *Regional collectors shall be rugged and designed for long-life operation in extreme environments. It is essential that the regional collector not be unsightly, i.e. the colour and shape of the device shall blend with the installation environment as opposed to drawing attention to the unit.*
  >
  > *Note: It is strongly suggested that, in their proposals, bidders make clear that they are cognizant of the key design philosophy differences between consumer-grade electronics and industrial- or military-grade products, and provide evidence via photographs or brochures of the design measures incorporated into their regional collector to provide reliable long term operation (i.e. long mean-time-between-failures).*

  Evaluators shall examine sample regional collectors with respect to their ruggedness, appearance, and human factors design considerations (with respect to regional collector installation), and assign each design a score against a "3 point scale", where a score of 3 would be indicative of a design considered excellent in every regard, and a score of 0 would be considered lacking in every regard.

- Section 6.3.3.1, Revenue Meter Maintainability –

  The requirement in its entirety reads:

  > *In general, revenue meters are disposable items, meanings it is generally more cost-effective to replace malfunctioning units than to repair them. London Hydro's interest is in selecting a revenue meter (complete with AMCD unit) with design and assembly features that is seen as robust and therefore likely to result in the lowest maintenance costs.*
  >
  > *Upon request, bidders shall provide an (unsealed) electric meter complete with AMCD for examination. Desirable features and attributes include:*
  >
  > - *Surface-mounted circuitry*
  > - *Clean Printed Circuit Board (PCB) layout*
  > - *Elimination of batteries by utilizing rechargeable capacitors*

- *Circuit-stability features to ensure performance over a range of temperatures and humidity conditions as are experienced in Ontario*
- *Design aspects including technology, ergonomics, usability, human factors, and material technology*

Undesirable features and attributes include:

- *Jumpers, bypasses or cut traces on printed circuit boards;*
- *Reroutes and kluges on the PCB*
- *Use of obsolete parts and components*
- *Batteries or items that require site visits for replacement and maintenance*
- *Poor shielding and isolation*
- *Poor grounding and RF interference for the communications components*
- *Unstable oscillators and displays that may be affected by temperature or humidity*
- *Prototypes and untested components*
- *Weak or unstable connections*
- *Clumsy, hard to reach or illogical controls*
- *Poor weather-proofing*

Evaluators shall examine the internal components for the sample revenue meters, and assign each design a score against a "5 point scale", where a score of 5 would be indicative of a design that complied with the first five bullets in every regard.

- Section 6.3.3.2, Regional Collector Maintainability –

The requirement in its entirety reads:

> *Regional collectors, communications transmitters (if a private wireless WAN is offered) and signal injectors (if a PLC system is offered) shall conform to Chapter 2.0, Design for Maintainability, of US Department of Energy Handbook 1140-2001, Human Factors / Ergonomics Handbook for the Design for Ease of Maintenance.*[17]
>
> *Note: Bidders may be requested to provide samples of such devices for disassembly and assessment by the bid evaluation panel.*
>
> *Note: Bidders may also be requested to provide regional collector documentation (manuals, schematics, diagrams, etc.) for readability and thoroughness.*

Evaluators shall examine the internal components for the sample regional collectors, and assign each design a score against a "28 point scale" using the methodology described below.

> "The referenced maintainability handbook contains 14 chapters. Two (2) technical points are available for compliance with each chapter for a total of 28 technical points, i.e.
>
> (i) Section 2.1, Unitization, modularization and standardization, - 2 points available

(ii) Section 2.2, Unit layout, mounting and configuring, - 2 technical points available

(iii) Section 2.3, Labelling, marking and coding, - 2 technical points available

(iv) Section 2.4, Equipment accessibility, - 2 technical points available

(v) Section 2.5, Controls, displays and protective devices, 2 technical points available

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(xiv) Section 2.14, Maintenance Safety, - 2 technical points available

Two printed copies of Chapter 2 of the referenced DOE Handbook will be available in the exhibit area for convenience of reference.

- Section 6.7.3, Meter Design for End-of-Life Disassembly and Materials Recycling –

  The requirement in its entirety reads:

  In anticipation of future regulations and directives mandating the recycling of electronic waste (or e-waste), preference will be given to revenue meters designed for simple end-of-life disassembly and material recycling. Such measures include, but are not limited to, the following:

  - *The resins used in the transparent cover and meter base components shall be embossed with the appropriate recycling symbol (pursuant to the Society of the Plastics Industry's resin identification coding system) to make resin reprocessing possible.*
  - *The number of parts and materials used in a meter shall be minimized, making it simpler to sort and recycle.*
  - *Parts that snap together are favoured over screws or other fasteners. If screws must be used, the same type of screws, all oriented in the same direction (so they can be removed in rapid succession, using one tool), is preferred.*
  - *Gluing product parts together should be avoided (because adhesives contaminate the recycled materials and make sorting next to impossible).*

  Evaluators shall examine the sample revenue meters, and assign each design a score against a "4 point scale", where a score of 4 would be indicative of a design that complied with the four bullets in every regard.

3.0 EVALUATOR'S SCORECARD

Given the current stage of technical evaluations, member of the Bid Evaluation Technical Panel shall retain one (1) copy of their scorecard to assist them in evaluating future proposals. The original scorecard shall be handed in to London Hydro's Smartmeter Coordinator, who will transcribe the evaluation information to evaluation scorecards that have already been submitted.

The scorecard that will be used for the evaluation of meter, regional collectors and other sample devices is attached.

Scorecard for the Evaluation of Sample Revenue Meters and Regional Collectors

Name of LDC: _____ Name of Technical Panel Member: _____

Section in RFP	Points Available	Ampy Metering	Cellnet – Hunt	CURRENT Group	Elster	HD Supply Utilities – EKA Systems	HD Supply Utilities – Trilliant	Hexagram	Itron	KG Canada – Main Net	KTI Sensus	Kinects	Olameter – Elster	Olameter – Kinects	Siemens		Silver Spring Networks	Tantalus	
6.2.2	✓												-- Same as Elster --	-- Same as Kinects --					
6.2.7.1	3																		
6.3.3.1	5																		
6.3.3.2	28																		
6.7.3	4																		

Upon completion of scoring, each member of the Bid Evaluation Technical Panel (or their designate) shall provide this scorecard to London Hydro's Smartmetering Coordinator, who will maintain the original on file and provide the panel member with a photocopy to assist with the evaluation and scoring of future proposals.