Energy Management Department

To: Vinay Sharma

Date: February 24, 2009
From: Gary Rains

Re: Advanced Metering Infrastructure Project
Selection of a Wireless Backhaul Communications System

Background

You will recall the architecture of the Sensus FlexNet® Advanced Metering Infrastructure to be generally as depicted in Figure 1 below:

Whereas KTI/Sensus, our selected AMI vendor, is supplying the revenue meters, FlexNet 900 MHz transceivers (associated with the wireless LAN communications system), and FlexNet master station, the onus is on the LDC (London Hydro in this case) to secure a wide area network (WAN) communications system to interconnect the FlexNet transceivers distributed throughout the service territory to the master station in London Hydro's head office building.

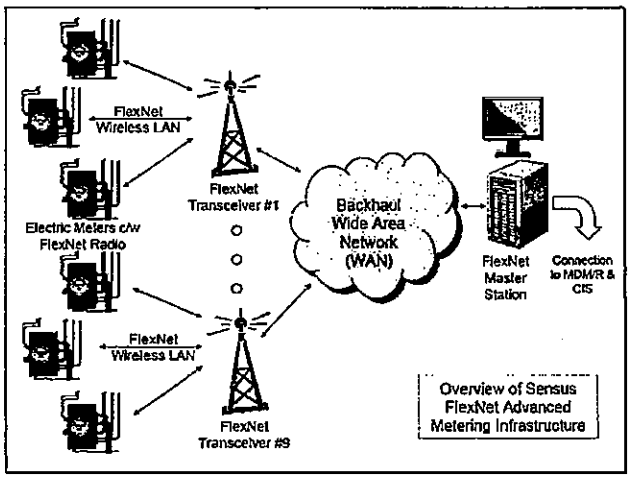

Figure 1, Overview of Sensus AMI

You will recall that Joe Lee, P.Eng. (Manager of Metering Technologies) previously carried out an analysis of the various WAN technologies (leased line, fibreoptic, wireless, etc.) and ownership options (i.e. public carrier versus private). The final report advocated a private wireless WAN as being the preferred alternative (provided of course that the procurement price doesn't exceed the price assumptions in the report as the basis for comparison).

Highlights of the RFP Process

An RFP (reference: #T2008-N-28 entitled: *Wireless Backhaul Network to Interconnect Advanced Metering Infrastructure*) was subsequently prepared by Joe Lee and issued to the marketplace on December 19th, 2008. Twenty-six (26) known technology providers were directly invited to respond to the RFP (via directly mailing), and notices were placed in both London Free Press and The National Post on December 19th.

An optional bidders conference was held on London Hydro premises on January 20th, 2009 at which some thirty (30) persons were in attendance (not including London Hydro staff).

On the closing date of January 30th, 2009, proposals were received from the seven (7) companies identified following (in no particular order): Spectrum Communications, WireIE Holdings, Trispec Communications, World Innovative Networks, KLA Laboratories, Bell Canada, and Capella Telecommunications.

Evaluation of the Proposals

The methodology used for evaluating proposals was a "*best buy*" approach whereas each proposal was assigned a technical score out of 50 technical points, a commercial score out of 30 cost points (whereas the proposal with the lowest predicted system life-cycle cost was assigned the full 30 points, and all other bids scaled from there), and a "miscellaneous other factors" score out of 20, based on the companies vision, quality system, stability and success in the marketplace, and customer satisfaction (based on interviews with previous customers).

Note: Some proposals were rejected at the technology evaluation phase as being "non-constructible" in that (as but one example) the proposal was contingent upon London Hydro erecting towers significantly greater in height than the 50 foot threshold meaning a protracted process of municipal input and public hearing before the project can be submitted for federal approval.

Two (2) evaluation teams were assembled, one to examine the technical merit of the proposals, the other to assess the "most probable life-cycle ownership cost" for each proposal. The members of each panel are listed below:

Table 1, Representation on RFP Evaluation Panels

Technical Evaluation Panel	Financial Evaluation Panel
• Joe Lee, P.Eng.	• Tom Beacock
• Michael Martin (IBM Consulting)	• Mark Steeves, P.Eng.
• Bill Milroy, P.Eng.	• Mike Chase
• Joe Michienzi	

Note: Gary Rains also reviewed the technical proposals but his assessment was limited only to the "constructability" of alternative offerings. This limited review is documented in a February 7th memorandum.

The overall evaluation of each proponent's technology offering is tabulated below:

Table 2, Overall RFP Evaluation Scores

Proponent	Evaluation Scores			
	Technical	Cost	Other Factors	Total
(Col 1)	(Col 2)	(Col 3)	(Col 4)	(Col 5)
Spectrum				
WirelE				
Trispec				
World Innovation				
KLA Laboratories				
Bell Canada				
Capella Telecomm.		30		

Although all proponents were evaluated technically and their respective technical scores recorded in Column 2 of Table 2, many were considered "*non-constructible*" in that they required communications towers of up to 90 feet, significantly in excess of the planned 50 foot tower heights and hence subjecting the communications tower to the extended and uncertain federal approvals process set forth in Industry Canada publication CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*; Issue 4. This process is akin to an environmental assessment requiring consent by the municipality and then public hearings before the application can be submitted to the federal government.

Several proponents required additional transceivers to be constructed atop such core area buildings as One London Place, 363 Colborne Street, City Centre and other locations.

Following the initial technical evaluation, and with a clear understanding of each proponent's technology offering, it was the considered opinion of both Joe Lee and Michael Martin (our subject matter expert from IBM Consulting) that the only viable technology offerings for the stated parameters of London Hydro's application are the Motorola Canopy® system as offered by Spectrum Communications and the BelAir Networks system as offered by Capella Telecommunications.

These two (2) proponents (Spectrum and Capella) were invited to provide a presentation of their technology offering to the Technical Evaluation Panel on February 23rd, 2009 with specific instructions as follows:

(i) Rather than install supplementary equipment atop buildings in the core area of the city, give consideration to mounting such supplementary transceivers on the CFPL tower if such a measure would increase the overall success by eliminating obstructions in the so-called Fresnel zone between antennas. As part of the UniFi-London project, informal approval had been received to install antennas at three different heights.

(ii) In the presentation, include information that highlights previous projects using the same technology as is being proposed to London Hydro.

Unfortunately Spectrum Communications had no previous installations of the Motorola Canopy solution and weren't able to demonstrate a workable solution unless London Hydro considered 70 foot communications towers at the municipal substation locations. Another question raised during the presentation was whether there was indeed an unobstructed path between Spectrum's preferred rooftop location at 363 Colborne Street and London Hydro's tower at 111 Horton Street. Subsequent to the meeting it was determined that this path is indeed obstructed, thereby further complicating the Spectrum layout.

The Capella presentation, by contrast, was inspiring. Several examples of deployments using the same BelAir Networks technology were described. Furthermore this proponent was able to show most convincingly how it could use the CFPL tower (instead of a supplementary rooftop antenna at One London Place and another on the Fire Department tower north of Dearness Home as included in the submitted proposal) to provide a backhaul system that provides significantly more bandwidth than called for in the RFP.

Note: Although not part of the technical evaluation, there are many features of the Capella / BelAir proposal that make it better foundation for a future UniFi-London endeavour as well as a more likely building block for a Smart Grid.

Down to only one technical solution deemed viable, the Financial Evaluation Panel noted that the Capella/Belair proposal was well within the budget allocation for this phase of the Smartmeter project. In fact, the Financial Evaluation Panel expressed initial concern that this proponent may have omitted significant cost items from their proposal.

Next Step – Developing a Statement of Work

Given that there is only one (1) viable technical solution (that happens to be a good one) and is well within projected budget level, it is hereby recommended that London Hydro enter into Statement of Work negotiations with Capella Telecommunications / Belair Networks

At this time, the Statement of Work discussion items are as listed following:

(i) Preparation and submission of complete RF propagation study (based on the CFPL tower, appropriate mounting heights on the municipal substation communication towers, and clutter data);

(ii) Submission of "functional drawings" for all three project phases;

(iii) DC supply to the BelAir transceiver for the CFPL tower;

(iv) migration from unlicensed 5.8 GHz to licensed 4.9 GHz (first responders) spectrum;

(v) Detailed review of deliverables on Bill of Materials (e.g. coaxial cables seem to be a few meters too short, it isn't certain that the coaxial cable jackets are impervious to UV breakdown, etc.);

(vi) Agreement on a service level agreement on the in-service performance of the WAN system;

(vii) Consideration of system reinforcements – the proposed system fulfils the basic requirements, but perhaps an additional transceiver that is strategically placed would yield a significant improvement in system robustness;

(viii) Clarification of London Hydro responsibilities (procuring Blade computers, arranging tenancy on CFPL tower, etc.) and Contractor responsibilities;

(ix) System installation timetable / schedule; and

(x) Provisions for transferring SCADA RTU to WAN in six bungalow-style municipal substations.

With your endorsement of the selection process and findings to date, I will have our Purchasing Department formally contact Capella Telecommunications / BelAir Networks to commence the Statement of Work phase.

At the end of this phase you will be presented with a Requisition to Purchase (that will explicitly show the final contract price) and a Statement of Work document that explicitly addresses the aforementioned items.

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