AUTOMATED METER READING (AMR) ELECTRIC METERS INFORMATION SHEET

TYPES OF ELECTRIC METERS

Electro-Mechanical Meter

- Gear-driven consumption register
- Speed of disk varies with energy use
- Essentially a small electric motor driving a mechanical counter.
- Accuracy of +/- 2%
- No longer produced

AMR Residential Meter

- No moving parts, solid state technology
- Accuracy of +/-.5%
- Uses Radio Frequency to transmit
- Transmits consumption register reading every 30 seconds
- One radio, no communication into premises
- Duration of transmission - 150 mSec
- Transmit duty cycle is .5%

AMR Commercial Meter

- Same as residential AMR meter PLUS
- Capable of metering electrical demand for billing purposes

Smart Meter

- No moving parts, solid state technology
- Accuracy of +/-.5%
- Transmits time of use information and peak use at intervals as required by the Utility Company
- Uses Radio Frequency to transmit
- Allows for time of use billing
- Provides two way communication
- Meter can interface with smart appliances and thermostats on premises (with optional communication functionality enabled)
- Duration of transmission: 32 - 150 mSec
- Total daily transmit time depends on Utility Company data requirements
- The City of Penticton has no plans to deploy Smart Meters.

CITY AMR METER SPECS

- Signal Frequency 902 - 928 Mhz
- Transmission Rate Every 30 seconds
- Transmission Duration 150 mSec
- Transmitter Power 146 mW
- 2-Way Communication No
- Information Transmitted Kwh register reading
- Meter Cost <$60 each
- RF Signal Strength at 20 cm 0.029 mW/cm2

BACKGROUND:

- The City of Penticton has been deploying AMR (Automated Meter Reading) meters since 2003. These meters permit remote reading of the consumption registers with either a walk-by or drive-by reading system, greatly increasing meter reading efficiency and accuracy.
- Walk-by system deployed in 2005 and upgraded to a drive-by system in 2010.
- The meter population is currently 85% converted to AMR meters (14,500 meters) with 98% deployment planned for the end of 2012.
- AMR installation cost $1,450,000 to date
- Potential to reduce meter reading time by 80% once full AMR conversion is achieved
- The AMR meters transmit a very brief signal which contains only the current meter register reading.

METER EQUIPMENT APPROVALS:

CSA Approval – Meters used for revenue purposes are exempt from CSA certification. Revenue meters owned and managed by electric utilities are regulated by various branches of Industry Canada and the BC Electrical Safety Regulations (per CSA C17-M84).

Measurement Canada - All revenue metering equipment used in Canada, including electric meters, must be approved by Industry Canada (Measurement Canada branch). The meters currently in use within the City of Penticton electric utility have received the following Approvals:

- Itron Centron (single phase): Approval # AE-0920
- Itron Centron (polyphase): Approval # AE-1466
- Itron Sentinel (polyphase): Approval # AE-1132

Spectrum IC - The radio transmitters contained in these meters must be approved for use within Canada by the Spectrum branch of Industry Canada. Utility staff have received written confirmation from Spectrum IC that all AMR radio devices deployed in Penticton are approved and certified for use in Canada. Spectrum IC has confirmed that the RF energy levels produced by these devices fall well below Health Canada's Safety Code 6 limits for the protection of the general public (see Attachment A).

Health Canada Safety Code 6 - Maximum Permissible Exposure (MPE) level to RF energy is 0.6 mW/cm^2 for signals in the 900 MHz range.

Note: Safety Code 6 MPE level also incorporates a safety factor of 50:1. In other words, the MPE of 0.6 mW/cm^2 would have to be exceeded by a multiple of 50 before any negative biological effects would be observed

PRIVACY CONCERNS:

The only information transmitted by the AMR meter is the kwh reading currently indicated on the digital display. This is the same information that would be collected by a meter reading performing a manual meter reading at the meter. No interval data is recorded or transmitted by the meter.

The remote reading capability of the AMR meters removes the need for meter readers to enter private property to collect meter readings.

RADIO FREQUENCY EXPOSURE CONCERNS:

The amount of Radio Frequency (RF) energy produced by the City's AMR meters is extremely low and falls well below the applicable health standards. RF energy values are as follows:

- @ 20 cm - 0.029 mW/cm2 — 20 times less than Safety Code 6 MPE
- @ 200 cm - 0.00029 mW/cm2 — 2,069 times less than Safety Code 6 MPE
- @ 305 cm - 0.00012 mW/cm2 — 5,000 times less than Safety Code 6 MPE

The RF signal strength is greatest at the meter and diminishes very quickly as distance from the meter increases:

RF SIGNAL STRENGTH COMPARISON IN mW/cm^2:

- FM radio or TV broadcast station signal — 0.000005
- Itron AMR device at 10 feet — 0.0001
- Cyber cafe (Wi-Fi) — 0.010 - .020
- Laptop computer — 0.010 - .020
- Cell phone held up to head — 0.030 - 10
- Walkie-Talkie at head — 0.5 – 42
- **Safety Code 6 MPE Limit** — **0.6**

INTERESTING EXCERPTS:

Health Canada Safety Code 6

"The purpose of this code is to establish safety limits for human exposure to radiofrequency (RF) electromagnetic energy in the frequency range from 3 kHz to 300 GHz."

"This code has been adopted as the scientific basis for the equipment certification specifications outlined in Industry Canada's regulatory compliance documents (1–3), that govern the use of wireless devices in Canada"

"The safety limits in this code are based on an ongoing review of published scientific studies on the health impacts of radiofrequency electromagnetic energy"

"The exposure limits specified in Safety Code 6 have been established based upon a thorough evaluation of the scientific literature related to the thermal and possible non-thermal effects of RF energy on biological systems"

"Health Canada scientists consider all peer-reviewed scientific studies, on an ongoing basis, and employ a weight-of-evidence approach when evaluating the possible health risks of RF energy"

"…the basic restrictions in Safety Code 6 are similar to those adopted by most other nations, since all recognized standard-setting bodies use the same scientific data"

“At present, there is no scientific basis for the premise of chronic and/or cumulative health risks from RF energy at levels below the limits outlined in Safety Code 6”

“A safety margin of 50 has been incorporated for exposures in uncontrolled environments to protect the general public”

Vancouver Coastal Health Authority Report - Dec 20, 2011

On Dec 20, 2011, the Vancouver Coastal Health Authority provided the results of their investigation into the possible health hazards of Smart Meters to the City of Richmond Mayor and Council. The entire document can be accessed at the flowing link:

http://www.health.gov.bc.ca/pho/pdf/vch-response-to-richmond-city-council-re-investigation-into-smart-meters.pdf

The final paragraph of the document states:

“In conclusion, the public may be opposed to the BC Hydro Smart Meter Program for a number of reasons. That these Smart Meters are health hazards should not be one of them. These devices are active only for an extremely short amount of time each day. They add so little to the existing background radio-frequency fields that it is very difficult to separate them apart from our everyday environment. We recognize that some may disagree with our assessment. We respectfully differ. We are confident however that our assessment is in agreement with the overall scientific understanding regarding radio frequency electromagnetic fields.”

The authors of the report are as follows:

- Dr. James Lu, Medical Health Officer – Richmond (Vancouver Coastal Health)
- Dr. Patricia Daly, Chief Medical Health Officer (Vancouver Coastal Health)
- P.R.W. Kendall, Provincial Health Officer (OBC, MBBS, MHSc, FRCPC)

The BC Ministry of Health website provides numerous links to reputable agencies which have investigated Smart Meter concerns:

http://www.health.gov.bc.ca/pho/issues.html

ATTACHMENT A

Industry Canada Industrie Canada
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Date: January 25, 2012

City of Penticton
Electrical Utility Department
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Industry Canada confirms the Automatic Meter Reading radio devices the City of Penticton proposes to deploy meet radio equipment standards and are certified for use in Canada.

The devices identified are certified under Industry Canada's Radio Standards and Specifications 210 (RSS 210), *Licence Exempt Radio Devices*, and are certified to transmit at low power levels (i.e., under 1 watt) as per Annex 8 of the Standard.

The Itron Centron C1SR and CN1SR are certified for 0.980 Watts.

The Itron Centron CP1SDR3 is certified for 0.137 Watts

The Schlumberger Sentinel SS1S2T, SS3A2T, SS2S2T, and the ITRON Sentinel SS4A2T are certified, but the power is not indicated in the certification. Although the power is not listed they are certified as low power devices, under 1 Watt.

In our experience, these low power devices fall well below Health Canada's Safety Code 6 limits for the protection of the general public.

Information on specific radio devices certified for use in Canada can be found online at http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng

Information on the standards and specifications for radio devices can be online found at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf06129.html

I have attached RSS 210 issue 8 for your information.

Sincerely,

Morris Bodnar
Director, Interior B.C. & Yukon District

Canada