

To test SAR or not to test SAR? That is the question !

The answer ?

Hydro prefers not to do the SAR test (DAS test, is French).

Ah.....!

Why is Hydro so reluctant to go through a SAR test which is part of Code 6 ?

There are a couple of reasons :

A SAR test would make the SM (Smart/Sick Meter) look terrible in comparison to a cell phone. It would have to be conducted with both antennas in operation and at full and continuous power. It would compel Hydro to warn customers to stay away from the meter by a certain distance. The AQLPA presented already at the Regie a document pertaining to Manufacturer directives on this matter (exhibit : R-3770-2011-C-SÉ-AQLPA-0030-PREUVE-AUTRE-2012_03_19; yet, it has been conveniently forgotten. The directives call for a minimum of 20 cm and they forbid the collocation with other antennas within the same distance (this is a serious recommendation that comes from the FCC – the USA Federal Communication Commission). A lot of Hydro's installation (practically most in LaSalle) do not meet this requirements.

More than that, having to go through a SAR test would open up a can of worms for installations that have many meters put together. If there is a distance to be kept for a single SM, what is the distance to be kept from a group of meters bunched together? On this type of test as well, if the letter of the law is followed, all meters must be assumed to be working at maximum power and duty cycle(continuously) throughout the 6 minutes interval specified in Code 6. This is a very inconvenient test to go through for the proponents of the SM deployment. So, it is more convenient for HYDRO (or whoever is driving Hydro) to skip the test. **And,they did just that: skip the test.**

On a lighter note, Hydro is compelled by the law to permit costumers to get close to the meter for reading the consumption display; and, Hydro could be required to somehow compensate for the extra space taken by the meter on the clients home. So, skipping the test is the best approach for the pro-Landis-Gyr group within Hydro. Their solution to this hurtle ? SKIP THE TEST !

So, what can save Hydro from going through this test which is part of Code 6?

By using the exemption clauses specified in RSS-102 (Radio Frequency Exposure Compliance of Radiocommunication Apparatus) from Industry Canada.

(<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01904.html>)

RSS-102 exemption clauses are shown below;

2.5.1 Exemption from Routine Evaluation Limits – SAR Evaluation

SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- from 3 kHz up to 1 GHz inclusively, and with output power (i.e. the higher of the conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 200 mW for general public use and 1000 mW for controlled use;
- above 1 GHz and up to 2.2 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 100 mW for general public use and 500 mW for controlled use;
- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 20 mW for general public use and 100 mW for controlled use;
- above 3 GHz and up to 6 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 10 mW for general public use and 50 mW for controlled use.

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the output power of the device was derived.

2.5.2 Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 1.5 GHz and the maximum e.i.r.p. of the device is equal to or less than 2.5 W;
- at or above 1.5 GHz and the maximum e.i.r.p. of the device is equal to or less than 5 W.

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

in short : if the Antenna EIRP is less than 200mW, the unit can be exempted from going through the SAR test.

Is their combined antenna EIRP less than 200mW ?

Here is an excerpt from the EPRI report that says that reports on the tests that have been done by the FCC on the FOCUS AXR-SD (page 2.2... top of the page)

Table 2-2

Summary of operational parameters for the NIC507 and NIC514 radios taken from FCC test reports

| Radio | 902-928 MHz band | | 2,400-2,450 MHz band | |
|--------|------------------|--------------------|----------------------|--------------------|
| | Power (dBm) | Antenna gain (dBi) | Power (dBm) | Antenna gain (dBi) |
| NIC507 | +29.5 | 2.4 | +20.05 | 1.5 |
| NIC514 | +29.86 | 4 | +21.7 | 1 |

The above parameters indicate that the maximum effective isotropic radiated power (EIRP) for the 900 MHz band is between +31.9 dBm (1,549 mW) and +33.9 dBm (2,455 mW) and for the 2.4 GHz band is between +21.5 dBm (141.3 mW) and +22.7 dBm

(186.2 mW). The indicated antenna gains are the maximum values; antenna gains in directions other than the main beam would be less, resulting in a lower transmitted power density.

So, according to the FCC, the EIRP is well over the 200mW limit. In fact, it ranges from a minimum of 1549 mW to 2455 mW with the for the main antenna alone, and from 1690 mW (NIC 507) to 2641 mW for the (NIC514) unit.

Hydro should have taken the meter through the SAR test or advise people to stay away from the meter. That is inconvenient to Hydro, isn't it ?

So, watch the twist to the logical way of proceeding.

The twist

I look through the data bank of Industry Canada and I find a module (the only one that suggest it is related to the FOCUS AXR-SD), here it is :



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Radio, Spectrum and Telecommunications > Certification and Engineering Bureau > Wireless Program > Radio Equipment List (REL)

Certification and Engineering Bureau

Radio Equipment List (REL)

Model: L+G Focus AX w/ Zigbee Utilinet Endpoint

Company Number:
Company Name:
Certification Number: 5294A-ER1R2S4
Approval Date: 2007-08-03
Type of Radio Equipment: Spread Spectrum/Digital Device (2400-2483.5 MHz) Spread Spectrum/Digital Device (902-928 MHz)
Certified By: TIMCO Engineering Inc.

| Model: L+G Focus AX w/ Zigbee Utilinet Endpoint | | | | | | | | |
|---|------|------------|----------|----------------------|------------|------------|----------------|----------|
| Spec. | Iss. | From Freq. | To Freq. | Emission Designation | Min. Power | Max. Power | Field Strength | Dis. (m) |
| RSS210 | 7.0 | 902.1 M | 927.9 M | 28K5Q1D | 62 mW | 62 mW | | |
| RSS210 | 7.0 | 2.405 G | 2.48 G | 1M57G1D | 2.2 mW | 2.2 mW | | |

Note: The above model table is generated based on information received from Certification Bodies, Manufacturers or Suppliers at time of certification.

So, what do we see ?

The test accepted by Industry Canada have been conducted by TIMCO engineering (a US PRIVATE company based in Florida, they also have an office in HK); they say that the transmitter power is just 62mW (see above) for the antenna power. Even if I add an antenna gain of 4db which is the maximum specified in the EPRI report, I arrive at 125 mW; So, that's below the 200mw limit. This allows Hydro to forgo the test. So..... Here we are, the twisting has been accomplished. Hydro is happy and someone in Ottawa is happy too.

Should I believe the FCC , Industry Canada, or is it that I do not see things right ?

But there is more about this in my next e-mail, I have recorded my public meeting with Hydro in LaSalle. In this meeting I have had the good fortune to speak to Mr Francois Bouchard, who prepared the documents for Hydro at the Regie. I will send you the recording.

Mr Bouchard first tells me that Hydro did not do the test because the EIRP of the antenna is only 600 mW. So, here we are : we have yet another different figure : 600 mW for the EIRP of the same module.

Mr. Bouchard first claimed that Hydro can be exempted because modules that have antenna EIRP less than 2500mW do not need to be tested; he is wrong on this matter. I tell him that the 600mW does not entitle him to skip the test, because the limit is 200mW and not 2500mW. He gets a little nervous; then, he tells me that Hydro does not have to go through the test because the limit is 600mW multiplied by a utilization factor of 1/1000. So, their EIRP is only : 0.06 mW and this entitles Hydro to skip the test. OK, I ask him to give me his calculations. He first tells me that these are private; then, he tells me that these are on the site of the Regie. I looked and looked and I did not find them. You can draw your conclusion.

My reading of the story: they do not want to go through the test, and someone in Ottawa who directs Industry Canada is happy with the Smart meter deployment, and does not mind closing an eye on a small technicality. This is my reading at the moment....., but I keep an open mind, and I will follow up.

[Andrew Young, an American congressman once said :” Nothing is illegal if one hundred well-placed business men decide to do it “](#)

But, wait..... I have another question.

If Hydro can skip the SAR test, why did it not also claim that it can skip the RF exposure evaluation for the far field ?

This is the one where the famous 6,000,000 μ W limit applies.

After all, according the RSS-102 exemption clauses, if their EIRP allows them to skip the SAR test, they are also automatically entitled to skip the RF test (the one about the 6,000,000 μ W limit).

Has Industry Canada tested for the far field RF limits of the FOCUS AXR-SD modules ?

Most likely it has not done so.

Summary: most likely (99.9999% sure on my part), the modules were approved without any of these tests being conducted.

Summary: no SAR test and no RF test on the part of Industry Canada, that's the approval mark from the Federal side.

Why did Hydro go through the process of showing compliance with Code 6 at the Regie?

Why did PG&E do the same giving that they are also using the non-licensed band for the same meter?

One answer : A Public Relation exercise that suits them, and no more than that.

Why did Hydro opted not to have SAR measurement presented to the Regie ?

One answer : these would look terrible from a public relation point of view. And, the results and would make the installation problematic. So, they skipped the SAR test.

Any equipment that operates in the unlicensed band has already received a stamp of approval with respect to Code 6 before it is sold; theoretically, the compliance requirements have already been set by Industry Canada.

Has Industry Canada put any restriction on the use of the antenna modules used in the FOCUS ?

Answer : None, from what I can conclude.

So, they test what suits them, blow their trumpets to the entire world about passing the test and crown themselves with the glory of good behavior, and then they quietly skip the test that does not suit them. Honesty in the day but not in the night, is 50 % honesty.

I expect from a state-owned corporation better behavior than that of a private company and I expect a government to be a watchdog of people's interest, not a sleepy dog that only cares about chewing on a little bone while thieves pass by the entrance of the democratic palace that is supposed to defend. I would really like to know why some well placed people In Ottawa like to see smart meters being installed all over Canada. I would like to know who they are, and why they are so supportive with their silence. I think they are stealing funds from the already depleting public bank with this deployment and undermining our health. I am not at all happy about the situation.

Peter.