

## **Design Flaws of ITRON smart meter, Shortfalls in Testing by BC Hydro**

Regardless of the BCH claim that they are an organization that is "Self-Regulating", they have not been able to furnish documentary evidence via a FOI request proving that adequate smart meter testing has been completed, and the sign-off by a B.C Professional Engineer as is required in the B.C. Safety Act for Utilities using non-certified devices.

BCH are using the disconnect switch as a means to disconnect and to isolate the power feed to customers. The switch and its implementation should therefore be certified as a **"service entrance disconnecting means."**

When the power has been apparently turned "OFF" using the smart meter disconnect switch there is a risk of electrocution due to:

1. The worker (electrician, homeowner, firefighter etc) downstream of the meter assumes that the switch is "OPEN", and that there is no way that the power can be switched on inadvertently, AND
2. The software-controlled disconnect switch has inadequate electrical safety features such as distances between the contacts, as is required by CSA/UL Standards.
3. There is no VISIBLE indication of the switch and its power contacts in order to verify that it is "open".

The requirements for properly sizing a disconnect switch are dependent on the type of application.

***Most of the following data was requested from ITRON, on 15 April 2014. There was no response.***

The smart meter embedded power disconnect switch needs to meet the various safety certification requirements for a disconnect switch.

For the switch as part of the meter, it will require evidence that the switch meets the criteria : "Suitable as service entrance disconnecting means", in accordance with UL 98. The ***primary distinguishing feature of switches meeting service entrance requirements is that they have larger clearances (separation of live parts)*** than other industrial control equipment.

Disconnect switches also need to meet several other technical requirements, the following is a summary only for example:

It must be rated for a continuous load current (for example 200 ampere) appropriate for its application,

The ability to safely and repeatedly interrupt load current and still remain serviceable, this includes the interruption of load current which may be highly inductive, such as heaters and motors,

The ability to safely and repeatedly energize load current and still remain serviceable, this load current may include highly inductive current, such as heaters and motors,

It must disconnect all live lines of the supply,

It must have a short-time short-circuit current rating appropriate for its application, and in accordance with the UL/CSA Standards, for example 100,000 Amperes,

The ability to safely withstand the magnetic forces during a short-circuit current fault and still remain safe,

The ability to safely carry out a specific quantity of switching operations, known as electrical operations, for some switches defined as up to 10,000 operations. The switch will also have a mechanical life rating for example 50,000 operations,

The switch enclosure must be rated in accordance with the UL/CSA Standards.

The dimensions of the switch enclosure must meet the Standards requirements.

Each item listed above has specific performance data in the Standards that the switch must meet.

Again it is considered very unsafe and dangerous to work on electrical equipment downstream of the software-controlled disconnect switch. This issue was brought to CSA attention in 2014.

IBEW, CSA, BCUC, BC safety Authority and Municipalities should be again notified.

Typical Standards for disconnect switches:

UL 98, UL 508 Enclosed Disconnect Switches—16 to 1200A

CAN/CSA-C22.2 NO. 4-04 (R2009) - Enclosed and Dead-Front Switches (Tri-National standard, with ANCE NMX-J-162-2004 and UL 98).

C22.2 NO. 55-M1986 (R2012) - Special Use Switches

The following data is shown on ITRON Web Site:

*Meets ANSI C12.20 specifications Switch Ratings are 200 amps  
(Form 1S included)*

*Rated for 30,000 mechanical cycles under no load*

*Rated for 5000 mechanical cycles under full load*

*Meter remains energized and records “zero consumption”*

*Monitors load side voltage*

*Load Limiting capability*

*Manual arming button on meter cover*

*Capability to reconnect by utility or customer interaction.*

Replacement of smart meters and switches from Aug 2014.:

<http://www.theledger.com/article/20140826/NEWS/140829388/1002/sports?Title=Overheating-Concerns-Lakeland-Electric-to-Replace-10-657-Residential-Smart-Meters-&tc=ar>