Safety of Itron's Smart Meters

Itron has rigorous quality assurance processes to ensure the safety, accuracy and reliability of our meters. We comply with safety standards established by a number of utility industry standard bodies including the American National Standards Institute (ANSI), Institute of Electrical and Electronics Engineers (IEEE) and the International Electrotechnical Commission and National Electrical Manufacturers Associations.

ANSI is the official representative of the International Organization for Standardization (ISO) and sets electrical safety and operating standards for the United States. These standards have also been adopted by several utilities in Canada as Canada's electrical system is interconnected with the United States' electrical system. These safety and operating standards address topics such as humidity, rain, voltage surge and others to ensure meters operate properly when functioning within certified operational parameters.

Itron's CENTRON OpenWay HW 3.1 Polyphase ANSI Meters and CENTRON OpenWay Hardware 3.1 Single Phase Meters, which are installed at BC Hydro, are in compliance with ANSI C12.1-2008, *Code for Electricity Metering*, and ANSI C12.20-2010, *American National Standard for Electricity Meters 0.2 and 0.5 Accuracy Classes*. ANSI Standards C12.1 and C12.20 can be requested online at http://webstore.ansi.org..

Meter compliance engineering testing is performed by certified personnel. All compliance testing results are reviewed by a Professional Engineer. The following list indicates Itron's compliance with ANSI testing procedures:

Test	C12.20	Status
No Load	Section 5.5.4.1, Test No. 1	Passed
Starting Load	Section 5.5.4.2, Test No. 2	Passed
Load Performance	Section 5.5.4.3, Test No. 3	Passed
Effect of Variation of Power Factor	Section 5.5.4.4, Test No. 4	Passed
Effect of Variation of Voltage	Section 5.5.4.5, Test No. 5	Passed
Effect of Variation of Frequency	Section 5.5.4.6, Test No. 6	Passed
Equality of Current Circuits	Section 5.5.4.7, Test No. 7	Passed
Internal Meter Losses	Section 5.5.4.8, Test No. 8	Passed
Temperature Rise	Section 5.5.4.9, Test No. 9	Passed
Effect of Register Friction	Section 5.5.4.10 Test No. 10	Test specified for electromechanical meters; smart meters are solid state

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Effect of Internal Heating	Section 5.5.4.11, Test No. 11	Passed
Effect of Tilt	Section 5.5.4.12 Test No. 12	Test specified for electromechanical meters; smart meters are solid state
Stability of Performance	Section 5.5.4.13, Test No. 13	Passed
Effect of Polyphase Loading	Section 5.5.4.14, Test No. 14	Passed
Insulation	Section 5.5.5.2, Test No. 15	Passed
Voltage Interruption	Section 5.5.5.3, Test No. 16	Passed
Effect of High Voltage Line Surges	Section 5.5.5.4, Test No. 17	Passed
Effect of External Magnetic Field	Section 5.5.5.5, Test No. 18	Passed
Effect of Variation of Ambient Temperature	Section 5.5.5.6, Test No. 19	Passed
Effect of Temporary Overloads	Section 5.5.5.7, Test No. 20	Passed
Effect of Current Surge in Ground Conductor	Section 5.5.5.8, Test No. 21	Passed
Effect of Superimposed Signals	Section 5.5.5.9 Test No. 22	This test is no longer a part of ANSI standards
Effect of Voltage Variation - Secondary Time Base	Section 5.5.5.10, Test No. 23	Passed
Effect of Variation of Ambient Temperature-Secondary Time Base	Section 5.5.5.11 Test No. 24	Combined with Test No. 30
Electrical Fast Transient Test	Section 5.5.5.12, Test No. 25	Passed
Oscillatory Waveform SWC	Added to 2008 version of C12.1	Passed
Effect of Radio Frequency Interference	Section 5.5.5.13, Test No. 26	Passed
Radio Frequency Conducted and Radiated Emissions	Section 5.5.5.14, Test No. 27	Passed
Effect of Electrostatic Discharge	Section 5.5.5.15, Test No. 28	Passed
Effect of Storage Temperature	Section 5.5.5.16 Test No. 29	Per sub clause 4.7.3.15 of ANSI C12.1-2008, this test has been omitted as the storage temperature and the operating temperature are the same.
Effect of Operating Temperature	Section 5.5.5.17, Test No. 30	Passed
Effect of Relative Humidity	Section 5.5.5.18, Test No. 31	Passed
Mechanical Shock (IEC)	Section 5.5.5.19, Test No. 32	Passed
Transportation Drop (ISTA)	Section 5.5.5.20, Test No. 33	Passed

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Mechanical Vibration (IEC)	Section 5.5.5.21, Test No. 34	Passed
Transportation Vibration (ISTA)	Section 5.5.5.22, Test No. 35	Passed
Weather Simulation	Section 5.5.5.23, Test No. 36	Passed
Salt Spray	Section 5.5.5.24, Test No. 37	Passed
Raintightness	Section 5.5.5.25, Test No. 38	Passed

In-Process Quality Testing

Itron's ISO-9000 quality systems systemically perform in-process tests during the manufacturing process to verify manufacturing conformance and accuracy checks. The system is calibrated at least once year to ensure accuracy. After manufacturing, our products are subject to additional reliability tests as well as further accuracy tests.

Reliability Testing

Conformance testing validates that each meter meets regulatory requirements. In addition, extensive reliability testing is completed at very early stage in the product lifecycle to prove field reliability, product lifetime performance and safety, including:

- Temperature Cycling: Temperature is varied from -40°C to +85°C at a rate of 5 cycles per day.
- High Temperature High Humidity: Stress conditions are 80°C and 80% Relative Humidity (RH).
- High Temperature: Stress condition is 90°C, held constant.
- Meter Farm / "Outdoor Life": Performed on powered meters in full, direct sunlight and with exposure to the elements.

All of these testing measures are put in place to ensure that Itron's meters are safe, reliable and accurate.

I, Carlos Brando, as a designated representative for Itron, do certify the referenced meters are in compliance with the above mentioned ANSI Standards.

Carlos Brando
R&D Manager - Product Services

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