

## The Value of Technology

Hydro-Québec Pilots New Approval Process Using the Itron CENTRON® Meter

### background

#### The Background

With the introduction of new technologies, Hydro-Québec needed to develop new standards for approving meters to include meter functionalities and meter accuracy. We found that with the increase in complexity of metering equipment, the accuracy rate decreased. We also had seen problems, for example with pulse outputs and radio frequency fields.

#### The Process

In 1997, an approval process for the meter was put into place based on Hydro-Québec's needs. We also included national and international standards, such as IEC, ANSI, and CSA. The level of severity was selected jointly with the CRIQ, IREQ, PTT, INNOVEM and meter manufacturers as a function of our environment.

Objectives of the process were the following:

- > Determine if equipment is subject to failure because of design.
- > Evaluate equipment based on installation environment, electrical requirements, climatic conditions and mechanical endurance.
- > Develop technical expertise based on approved metering equipment:
  - Documentation, technical specifications, diagrams, procurement specifications, quality requirements
  - Procedures, guidelines, engineering of metering stations
  - Repair and maintenance instructions.

This new approval process is applied to new products, minor modifications, or an equivalent product. For an electronic meter, the following tests are performed:

- > Visual test (inspection)
- > Accuracy test
- > Functionality test
- > Mechanical robustness test
- > Electromagnetic compatibility
- > Climatic test



The CENTRON Meters were installed on house exteriors with no protection from winds, rain, snow, and sand dust.

For Metrological parameters, the process includes verification of the following parameters:

- > Energy
- > Power demand
- > Recorder
- > Impulse transmission, etc.

We use the CRIQ (Centre de Recherche Industrielle du Québec) for the majority of the testing. CRIQ is a private laboratory located in Montreal. We have worked with them since the beginning of the approval process at Hydro-Québec, and they know us well. In fact, we are beginning to share our process with neighboring utilities and with the Canadian Electric Association.

#### Benefits

**Proven CENTRON  
meter reliability in  
extreme climatic  
conditions.**

**Validated CENTRON  
meter's resistance to  
water infiltration,  
dust, and snow over  
a long period of time.**

**Validated Hydro-  
Quebec's new  
approval process.**

# application

## Application

Since 1997, we have applied this process to nine meters (three electromechanical and six electronic) and one electronic probe. No product was approved on the first round of tests. After making minor modifications, six products passed and three failed. Some of the problems we encountered were things such as mechanical weakness, metrological instability, non-conformance to federal regulations, non-conformance to manufacturer specifications, non-conformance to Hydro-Québec specifications, and design flaws.

## CENTRON Pilot Project

We started testing the CENTRON meter in July 2002 and completed it in May 2003.

With this project, our objectives were to evaluate product robustness and reliability in a real measurement environment and extreme climatic conditions and to subject the meters to very low temperatures and bad weather over a long period of time. We also wanted to validate resistance to bad weather, water infiltration, dust and snow over a long period of time.

We used 300 C1S, 2-200A with cyclometer CENTRON meters. These meters were installed in July 2002. We removed 11 meters from the village of Salluit in May 2003.

## Site Selection

We selected the NUNAVIK Territory, consisting of 14 villages located in the arctic region along the Ungava Bay and Hudson Strait. These villages are about 930 to 1550 (1500 to 2500 km) miles north of Montréal with no terrestrial roads between Nunavik and Québec. We sent the meters by boat, taking three to four months to arrive.

In the winter, temperatures can get as low as -40°F and lasts for about eight months a year. The ground is permanently frozen with violent winds up to 100 mph (160 km/h).

## Installation Types

These meters were installed on the exterior of houses with no protection from winds, rain, snow, and sand dust.

# results

## Results

We had tested the meters before we put them in the extreme climate, and we tested them at the end of the year. We removed 11 meters from the Salluit Village. The other 300 meters are still in the field.

Overall, we were pleased with the results:

- > No material breaking
- > No discoloration or change of color on the case or the stickers
- > All functionality testing was successful
- > Accuracy test successful
- > No failure was found among the 300 meter installation in the 11 villages.

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