



LineScout and its robotic arm

LineScout

A Robot for Inspecting Live Transmission Lines

Ensuring the reliability, performance and long-term operability of the transmission grid, with over 30,000 km of lines, is of top priority for Hydro-Québec. Inspecting lines is thus important in order to check their condition and detect such latent problems as a missing nut, broken insulator or damaged strand. To achieve this, crews now rely on a leading-edge technology, LineScout.

Designed to clear obstacles (insulator strings, vibration dampers, aircraft warning markers, corona rings, etc.), this acrobatic robot is able to function in places that line workers have difficulty reaching. It can run along the ground wire, individual conductors or bundled conductors. Through its camera, line crews can thus conduct detailed and highly precise inspections of live transmission lines, safely and without compromising grid operation. LineScout is the tool of choice for obtaining the high-quality information that is crucial for grid reliability.



LineScout on a four-conductor bundle



Robotic arm and tool

High value applications

The three-axis robotic arm has been designed to reach the four conductors of a typical Hydro-Québec transmission line bundle. One end of the arm is equipped with a pointable camera and the other can hold a variety of tools for tasks such as:

- > High quality visual inspection
- > Infrared inspection
- > Checking the condition of splices by measuring their electrical resistance
- > Tightening and loosening bolted assemblies
- > Temporary repair of broken conductor strands

Specifications

Robot LineScout	Values
Weight:	112 kg
Length:	1.37 m
Height:	0.85 m
Traction:	500 N
Linear speed:	1.0 m/s
Battery life:	5.0 hours
Remote control range:	4.0 km
Electromagnetic immunity:	735 kV – 1,000 A
Line components / environment	
Conductor diameter:	12-60 mm
Splice sleeve diameter:	25-85 mm
Maximum length of obstacles:	76 cm
Maximum conductor temperature:	95°C
Maximum horizontal angle at tower:	12 deg.
Maximum gradient:	30 deg.
Ambient temperature range:	-10°C to +35°C

For information:

Research

Serge Montambault, Eng., PhD – Project Manager
 Institut de recherche d'Hydro-Québec
 1740, boul. Lionel-Boulet
 Varennes (Québec) J3X 1S1
 Canada
 Telephone: 450 652-1319
 E-mail: montambault.serge@ireq.ca

Patent

US 7,552,684

October 2010

2010G080-02A



LineScout crossing an insulator string