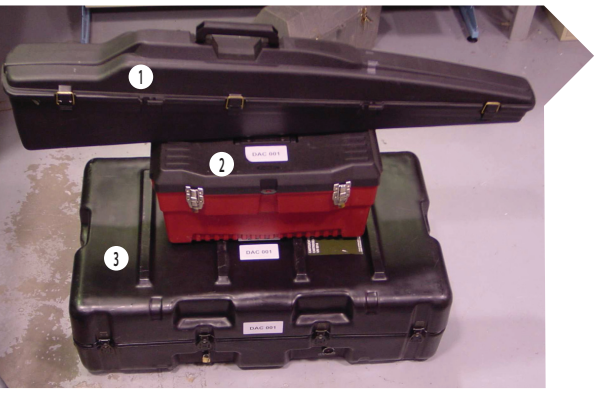


Valise - DAC
1 - Mechanical line thrower
2 - Tools
3 - DAC and cartridges

DAC

De-Icer Actuated by Cartridge

The 1998 ice storm in Québec highlighted the lack of effective tools for de-icing conductors and ground wires. To correct this, an R&D program was launched and a search for solutions began. The inventiveness of two Quebecers, combined with the efforts of researchers at the Institut de recherche d'Hydro-Québec (IREQ), yielded a new de-icing technique using an explosive cartridge.

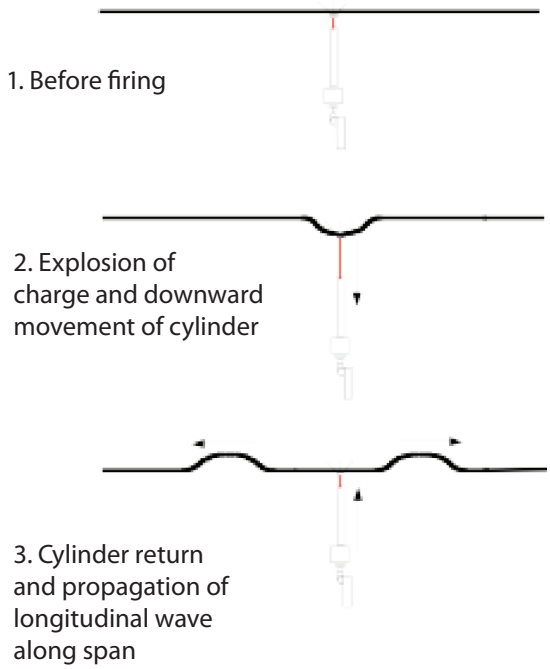
Portable and remote-controlled

The de-icer actuated by cartridge (DAC) can be used for emergency work on Hydro-Québec transmission lines. The DAC is a portable device operated by remote control. It consists of a cylinder-and-piston system that can be suspended from a conductor or ground wire and fired by means of an electronic trigger. Installation from the ground is facilitated by the use of a line thrower. When the cartridge explodes, it generates a mechanical impulse that propagates along the span, breaking the ice instantaneously. This technology helps ensure grid reliability at lower cost than conventional de-icing methods.

The DAC has proven its efficacy by successfully de-icing ground wires in the Saguenay and Matapédia regions. Since 2011, five DAC kits have been in use at strategic locations on the Hydro-Québec transmission system. Portable and easy to use, the DAC could prove invaluable in regions severely affected by freezing rain, not only in Québec but in other parts of the world as well.

Main advantages

- Explosive charges of various strengths
- Special ropes and a line-throwing system for installation from the ground



A three-step procedure

The first step is to raise the DAC using the line thrower while standing on the ground. Once in contact with the conductor or ground wire to be de-iced, the device is held in place with ropes and fired from a distance by means of a remote control (1). Before firing, the internal rod is completely retracted. Explosion of the cartridge causes rapid deployment of a piston connected to the rod (2). When the charge is set off, the sudden increase in pressure inside the cylinder pushes the entire lower part of the DAC downward, while the upper part stays in contact with the conductor or ground wire. The resulting shock wave propagates rapidly along the span, breaking the ice (3).

The DAC comes with a tool kit to facilitate dismantling and cleaning. Depending on the height of the conductor or ground wire, a mechanical or pneumatic line thrower may be used. The use of special induction-resistant, dielectric roping is required. The device contains six charges, which may be set off in succession at one-minute intervals. The internal battery allows an average of 50 to 100 shots (depending on ambient temperature), after which it must be recharged.

DAC components
1 - Gun and battery
2 - Cable stopper
3 - Cylinder and piston
4 - Charger
5 - Box of 7-mm cartridges (200)
6 - Remote control

For nformation

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