Airborne de-icing solution for wind turbines.

Agenda

Background

Method/Technology

Film clip

When is it beneficial to use this spectacular method?

Questions.

Further questions, in our booth

Background

September 2012: First contact between Alpine Helicopter and H Gedda Consulting

June 2013: First prototype assambled

August 2013: Contact established with Skellefteå Kraft

October 2013: Initial test att Uljabuouda wind farm

February 2014: Initial de-icing test at site Uljabuouda

April 2014 – present: Continued development and testing

De-icing of wind turbine blades by means of an helicopter opens new opportunities.

New research and field tests has made it possible to cost effective remove ice from blade and aviation light.

Environmentally friendly method.

The method is environmentally friendly and cost effective compared to downtime.

Results from Canada has shown:

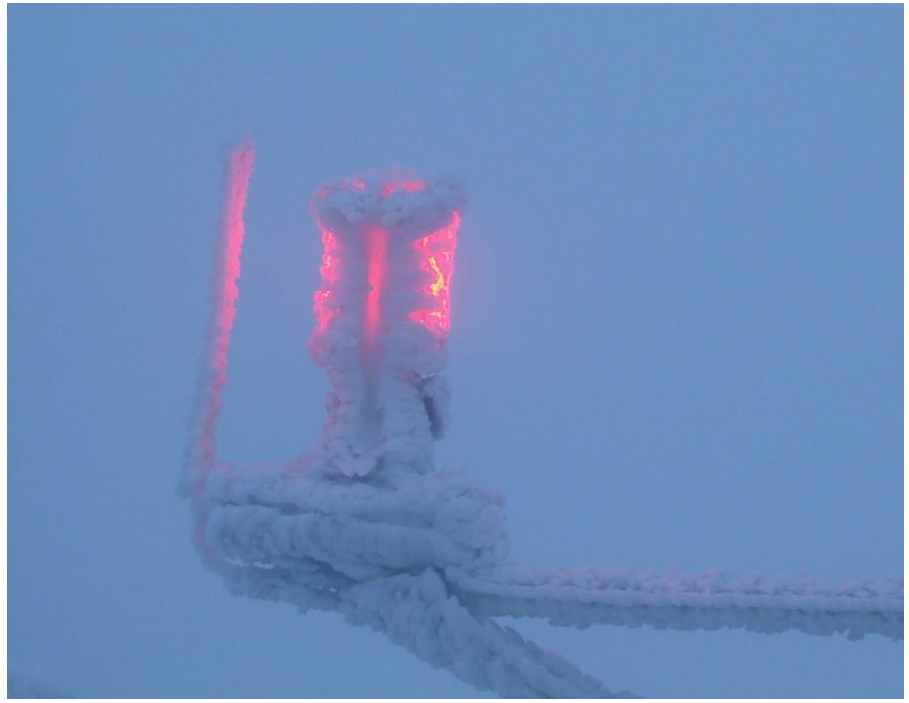
It is possible to remove ice from wind turbine blade.

However, it takes too long due to the fact that the equipment works more like a high pressure washer, similar to a snow making machine

De icing (Vestas V90) with hot water and a helicopter in Canada

Alpine Helicopter AB

With this adopted technology and further developed airborne de-icing technology for turbine blade and aviation light, we've been able to reach a successful method.



Simple solution!!!

A truck equiped with a water tank and oil burner heats the water.

The water is then filled into a water tank.

Tank capacity 855 l

Refills in 20 sec

Simple solution!!!

The Helicopter lifts the water tank, flies to a position close to the blade.

The water is then sprayed onto the blades and removes the ice in same way as when de-icing an aircraft.

Water jet is controlled with a joystick

Set up for field establishment:

- 44 m³ water tank capacity.
- Oil fuel depot and oil burner (260 kW) for water heating
- Heating capcity from 7°C to 65°C in 7h.
- Helicopter fuel depot

Benefits

No need for access to plowed roads

Ability to de-ice up to 3 WTG:s a day (1,5-2h/turbine)

Cost of de-icing/turbine equals approximately two days of downtime/turbine

De-icing of aviation light 6 min/turbine.

Only hot water is used, no chemicals

Airborne de-icing solution for wind turbines

The method should only be used when the turbines are standing still due to icing and when good wind conditions are expected within the next few days without the risk of new ice formation!

Airborne de-icing solution for wind turbines

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Skellefteå Kraft

Energimyndigheten

Thank you for your attention

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