

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



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Ph.D Student Manufacturing Systems Engineering 1999-2004

MW-Innovation 2005-2010, development and evaluation of de-icing technology.

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Agenda

Icing on wind turbine blade

Background

Need of alternative de-icing

Equipment

Method



Icing on wind turbine blade

- Significantly reduce the aerodynamic properties.
- Mechanical failures due to increased load or unsymmetrical distribution of the ice.
- Damages on bearings and gear boxes.
- Safety risks



Background

- If you don't have a de-icing system or a system which not working properly.
- If the weather forecast predicts good wind conditions the upcoming days and your wind turbines are standing due to icing.
- Then You can't do anything else except wait with unwanted production losses.
- Until now there has been no alternative to remove ice from wind turbines without a working de-icing system

De-icing with hot water

Results from Canada shows that it is possible to remove ice from wind turbine blade (Vestas V90) with hot water.



Alpine Helicopter AB

Alpine Helicopter AB has adopted this technology and developed the first generation of airborne de-icing technology for turbine blade.



Truck equipped for fast field establishment.



Truck

Equipped with:

- 17 m³ water tank capacity, made of stainless steel
- Oil fuel depot and oil burner (260kW) for water heating
- Heating capacity from 7°C to 65°C in 6,5h for 17 m³ water.
- Helicopter fuel depot

Ready for field establishment



De-icing tank

long range of the water
jet (40 m)



Helicopter test of de-icing equipment at Uljabuouda



Tank capacity 900 l

Refilling of the tank takes 45 sec

Water jet is controlled with a joystick

Helicopter and de-icing equipment



water filling is in progress

Thank you for your attention



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