Overview of IEA Wind Task 19 results from 2013-2015

WinterWind 2016, 9-10.2.2016, Åre ,Sweden

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Outline

- What is IEA Task 19?

- Main achievements of working period 2013-2015

- Quick view to 2016-2018 activities

- Conclusions & next steps

What is IEA Wind R,D&D Task 19?

- Task 19 – Wind Energy in Cold Climates – expert group
- Working group for
  - Acquaring information on the cold climate wind energy topic
  - Writing recommendations
  - Disseminating information
  - International research collaboration
- Task worked since 2002
- Next term 2016-18 beginning
  - Newest members: Norway & UK

Main achievements 2013-2015

1)

T19IceLossMethod

T19IceLossMethod free software

- **Why need?**
  1. Compare different icing site severities with each other
  2. To validate the IEA Ice Classification
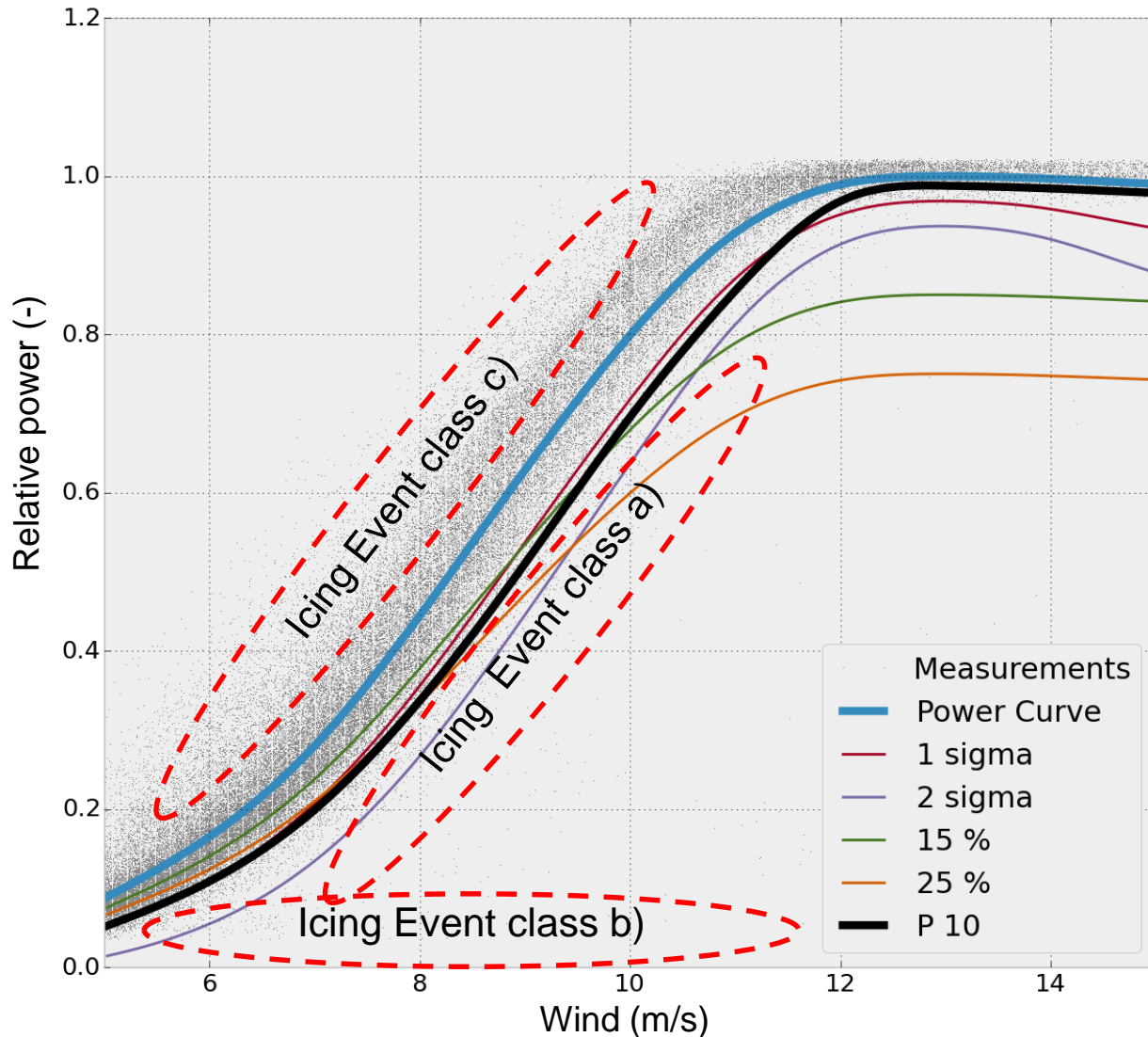 3. Evaluate effectiveness of various blade heating systems versus non-heated systems

- **The Goal**:
  1. Develop and validated a robust method to assess icing losses from standard SCADA data
  2. The method should 1) focus on robustness and 2) minimize the uncertainties from false icing event alarms
  3. Maximize easiness of calculating production losses for any SCADA dataset with a free software

T19IceLossMethod free software

- **The Approach**: Different Icing Event classes

Download free T19IceLossMethod here!

2)
Available Technologies
- report

Available Technologies - report

Objective

- summarize available state-of-the-art cold climate wind energy solutions
- "compare & pick" your CC solution need

Target audience

- project engineer
- researcher/consultant working for developer

Gives

- Easy summary tables as core "beef"
- Entire CC value chain included

Next edition update in progress

- Lauch in 2016

October 2012 Edition

IEA Wind Task 19

State-of-the-Art of Wind Energy in Cold Climates

Download free previous 2012 edition
http://www.ieawind.org/task_19.html

Example: Ice detection summary table

Mast/nacelle detection				
Detector manufacturer	**Technical description**	**Applications**	**Sold items**	**References**
HoloOptics T40 series		Meteorological icing: x		Paper: [12], [13]
		Instrumental icing:		
		Icing rate: x		Perf.: [14], [15]
		Icing severity:		
		Used for turbine control *:		Other: [16]
Combitech IceMonitor (ISO Cylinder)		Meteorological icing: x		Paper: [12], [13], [17], [18], [19]
		Instrumental icing: x		
		Icing rate: x		Perf.: [14],[15]
		Icing severity: x		
		Used for turbine control *:		Other: [20]

Example: CC turbines summary table

| | 1sLTC proto | LTC [MW | Ice Dect | IOM | IceProtection System | | | N of refs | | |
					Method	1st proto	instal [MW]	Jour	Perf	Oth
OEM B	1996	50	TH	x	BB/IC	1999	20	_	3	3
OEM C	2002	700	NI	X	ET/PS	2012	50	_	2	3
OEM D	2008	500	PC	_	HA	2014	300	_	_	3
OEM E	2006	400	NI	_	ET	2008	600	_	1	_
OEM F	2001	500	PC & BF	X	HA	2014	180	_	_	4

PC = Power Curve ice detection
NI = Nacelle based ice detection
TH = Temperature and humidity
BF = Blade frequency ice detection (or just rotor blade)
HA = Hot air ice protection system
ET = Electro thermal ice protection system
BB = Black blades
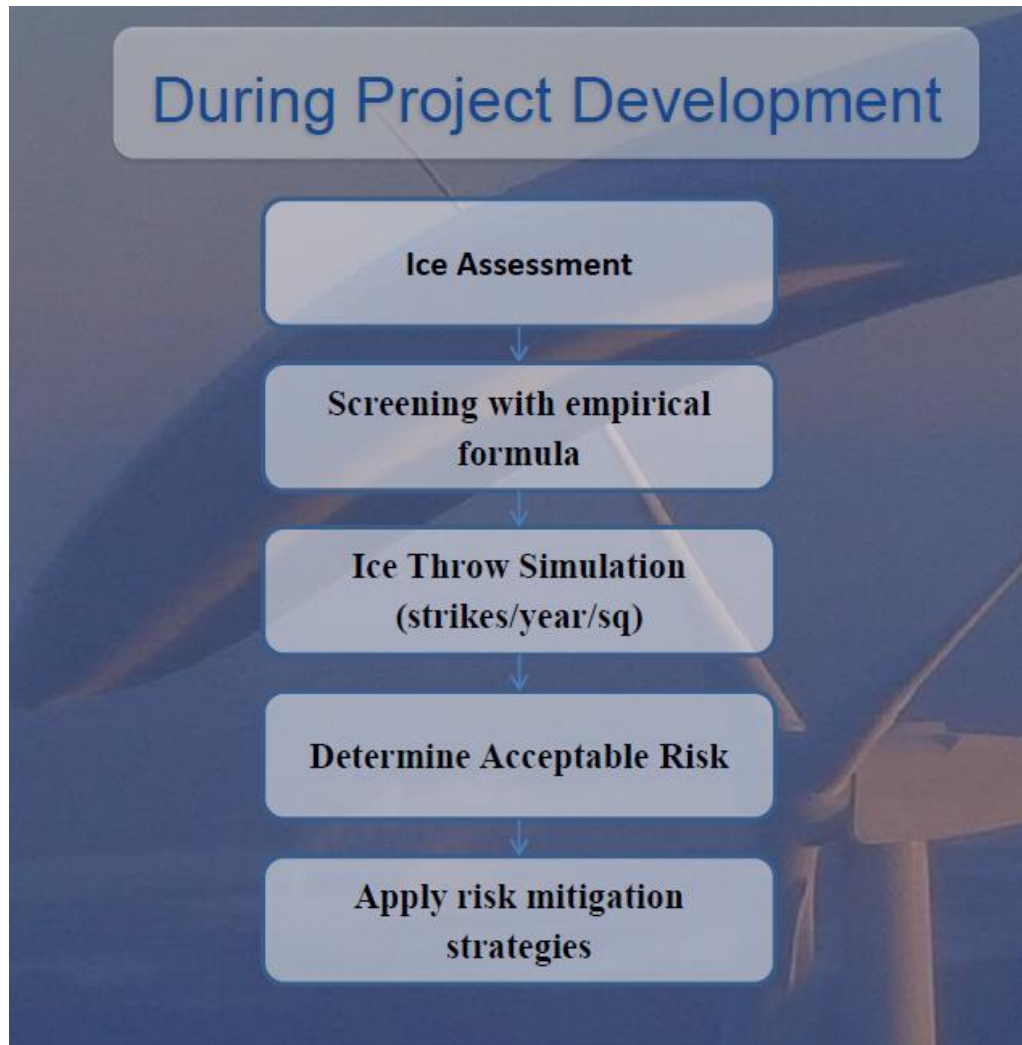IC = Ice phobic coating
PS = Preventive shutdown

3)
Recommended practices- report

IEA Ice Classification

Validation of Ice Classification in René Cattin's presentation later…

Ice throw guidelines

During Project Development

Ice Assessment

↓

Screening with empirical formula

↓

Ice Throw Simulation (strikes/year/sq)

↓

Determine Acceptable Risk

↓

Apply risk mitigation strategies

What is Task 19 doing in 2016-2018?

IEA Task 19 topics for 2016-2018

Deliverables

Topic	Content	2016	2017	2018
Deployment	Market study update for 2016-2020	■		
Standardization	International standard IEC 61400-15 "Site energy yield assessment" CC aspects			■
	T19IceLossMethod valid. & development			■
	Laboratory and full scale testing			■
	Ice protection system performance evaluation guidelines		■	
Ice meas. & mapping	Ice mapping			■
	Ice sensor classification			■
Safety	International ice throw guidelines			■

Conclusions

- Main achievements of working period 2013-2015
  1. T19IceLossMethod free software
  2. Available Technologies – report (ed 2016)
  3. Recommended Practices – report (ed 2016)

- Task 19 will heavily focus on standardization in 2016-2018!

- Want to join Task 19?
Please contact Ville!!

http://ieawind.org/task_19.html

Thank you!
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Only for
Cold Climate
experts