From: Amirault, Tom (GE Renewable Energy) <tom.amirault@ge.com>
Sent: Thursday, April 18, 2019 6:11 AM
To: Delaney, Mark <MDelaney@invenergyllc.com>
Cc: Seal, Andrew (GE Renewable Energy) <Andrew.Seal@ge.com>
Subject: [EXTERNAL] RE: GE Safety Manual Question

Mark,

GE confirms the below description as the method employed by GE to sense and assess ice build-up on the blades and to control the machine appropriately, and that GE's recommended setback guidance of *1.1*Tip Height* is intended to cover residual risks of blade icing.

Regards,

Tom Amirault
Wind Technical Leader
GE Renewables
(518) 389-8197

From: Delaney, Mark <MDelaney@invenergyllc.com>
Sent: Wednesday, April 17, 2019 9:56 PM
To: Amirault, Tom (GE Renewable Energy) <tom.amirault@ge.com>
Cc: Seal, Andrew (GE Renewable Energy) <Andrew.Seal@ge.com>
Subject: EXT: GE Safety Manual Question

Dear Tom,

In the GE Technical Documentation Wind Turbine Generator System 1&2 MW Platform Safety Manual, GE recommends use of an ice detector to detect ice buildup on blades. Deuel Harvest Wind Energy LLC intends to use the following as an ice detector system on the GE 2.3-116 and GE 2.82-127 turbines proposed for the Deuel Harvest North Wind Farm: Sensors on the nacelle and instrumentation will measure air temperature, wind speed, and power output. That information, in addition to monitoring for deviations in each turbine's power curve, will then be used by an algorithm in the software system to assess whether there is ice buildup on the blades. When it senses ice build-up the algorithm automatically shuts down the turbine.

Can you confirm that this is the current GE recommended ice detection system for the two turbine models? Also, will you please confirm that with the use of this ice detection system, the GE recommended setback from roads, residences, and buildings to address ice throw is 1.1 times tip height?

Regards,

Mark Delaney | Director, Renewable Project Engineering
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