

March 17, 2013

Mr. Ryan Haley

Manager, Croton Wind

Re: Occupancy of OEM Building

There are no occupancy requirements for the Town of Croton, NH. I did visit the building numerous times during construction and was given a tour of the building approximately 10 days ago and found it to be very acceptable, maintained and easy to locate anything in the building. Egress locations were adequate and a supervised alarm system in place.

If there are any further concerns or questions please feel free to contact me at your earliest convenience.

Respectfully,

Roger L Thompson  
Fire Chief

## Epstein, Mark

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**From:** Epstein, Mark  
**Sent:** Wednesday, May 29, 2013 2:58 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; Labonte, Matthew; Michael J. Iacopino  
**Subject:** RE: Groton Wind Farm

Ron,

My apologies for any confusion with my email. I will look into it and get back to you as soon as possible.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

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**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Wednesday, May 29, 2013 12:55 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; Labonte, Matthew; Michael J. Iacopino  
**Subject:** FW: Groton Wind Farm  
**Importance:** High

Mr. Epstein,

I have tried sending this email to you twice and it kept coming back as undeliverable. I was given this email address to try. I look forward to hearing from you. As of today, I still have not received anything from Karl.

Regards,

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**From:** Anstey, Ronald  
**Sent:** Tuesday, May 28, 2013 5:49 PM  
**To:** 'mark.epstein@iberdrolausa.com'  
**Cc:** Degnan, J. William; Labonte, Matthew  
**Subject:** FW: Groton Wind Farm  
**Importance:** High

Good afternoon,

I sent this email to you on 5/17/13 and have not had any response. I am checking to make sure that you received it

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**From:** Anstey, Ronald  
**Sent:** Friday, May 17, 2013 2:56 PM  
**To:** 'mark.epstein@iberdrolausa.com'  
**Cc:** Degnan, J. William; 'Michael J. Iacopino'; Labonte, Matthew  
**Subject:** Groton Wind Farm  
**Importance:** High

Good afternoon Mr. Epstein,

I was a pleasure meeting you last month in Groton. When we spoke you indicated that you were the person to notify if we were not getting the information that is required for your project. On 4/25/13, the day after our meeting, Karl DeLooff emailed me and indicated that he was going to provide plans to us as soon as he could get them printed. To date no plans have been submitted to this office for review. To print plans for structures the have already been built should take a matter of hours, not weeks. We have been waiting for plans for over two years and it appears, even after our meeting, nothing has changed. Consequently we must establish the following dead lines.

Iberdrola will provide a complete set of plans for all structures on the Groton site to the State Fire Marshal's Office no later than May 31, 2013. The plans must be complete and shall include, but not be limited to, structural, mechanical, and electrical details. In addition, fire suppression plans for the turbines (nacelles) must also be included. If the plans are not received by this office by May 31, 2013 we will issue a stop work order for every structure on the site. Given the fact the there were never any plans submitted for review, there were never any compliance inspections conducted and certificates of occupancy have not been issued, the site is still deemed to be under construction.

I will be out of the office for training next week. However, I will be checking my emails. I will have my cell phone as well, my number is 603-703-2498. I look forward to hearing from you.

Regards,

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

## Epstein, Mark

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**From:** Epstein, Mark  
**Sent:** Thursday, May 30, 2013 9:17 AM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; Labonte, Matthew; Delooff, Karl (kdelooff@iberdrolaren.com); SGeiger@orr-reno.com  
**Subject:** RE: Groton Wind Farm  
**Attachments:** Groton Fire Chief OM Letter-03-17-13.pdf

Ron,

My apologies again for the confusion on the email – apparently, I hadn't cleaned my old cards out of my bag when I pulled out the one that I gave to you. (I will spare you a list of the other things I found when I started rummaging around in there.)

As to your question below, it is my understanding that, because the local fire chief assumed jurisdiction over the project (as shown in the attached letter), that is where the determination of occupancy is made, which is the reason the plans hadn't been provided earlier. Having said that, to accommodate your request, we will have a full set of plans sent to you by the end of next week.

On the issue of the fire suppression systems, we are gathering the technical details. As you can imagine, the interplay of the various systems that allow the electrical systems to be shut down in fractions of a second involve the interplay of several of our equipment manufacturers, and it is my understanding that we do not have on hand the materials you requested in the appropriate form. We have asked that those materials be provided to us as soon as possible, though it may be a few weeks before we have everything. I have asked Karl to provide you with deliveries of whatever we can provide in late June, along with further details on how we are working to ensure the delivery of any materials that are outstanding.

In order to ensure that there is no further communication concern, my cell phone is (610)772-1363. Though I generally respond best to email, if, for some reason I don't respond, that number will always get my attention.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
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Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

**GROTON WIND PROJECT**  
**PROJECT NUMBER: 11.02613**  
**ISSUED FOR RECORD – REVISION 2 (5-31-13)**

**RELAYS 11F1 and 11F2 – SEL751 (CAT# 751501A1ACA5X850630)**

**Relaying Scheme**

Feeder 1 is comprised of 12 2.0 MVA Gamesa wind turbine generators (WTG), generating a maximum output of 24 MW.

Feeder 2 is comprised of 12 2.0 MVA Gamesa wind turbine generators (WTG), generating a maximum output of 24 MW.

This relay will provide protection of this feeder using directional overcurrent (OC), under voltage, over voltage, under frequency, and over frequency. This relay will also be used for circuit breaker control for CB 52F#. A mirrored bit communication medium will be used to communicate information to other relays in the collector substation.

**Assumptions**

- Primary Relaying will be directional phase and residual ground definite time OC. Breaker will also trip on over or under voltage, and over or under frequency.
- Reclosing will not be used.
- Synch check will not be used. The 34.5kV bus must be energized to allow closing of CB 52F#. It is assumed that the feeder is dead if CB 52F# is open.
- The OC will be directional and must be set high enough to avoid tripping on inrush current of all wind turbine generator step-up transformers (GSUs) on the feeder.
- This relay will coordinate tripping of CB 52F# with the GSU transformer protection.
- Breaker Fail will be performed by this relay and trip will be transmitted by a mirrored bit signal.
- Relay will monitor the trip coil of CB 52F#.

**System Data**

Nominal System Voltage: 34.5kV (19.9kV L-N)  
Line Length: 100 is used  
Line Ratings:  
F1and F2: Peak: 24 MW, 402 A  
Line inrush current to energize all transformers: 802 A (estimate 2 times FLC of feeder)

CT Ratio: 1200:5 → 240:1

PT Ratio: 300:1

Secondary Ohms = Primary Ohms \* (CTR/PTR)

Line Impedance:

Primary Relay Ohms (Longest Feeder):

Positive Sequence: 4.102 @ 59.9 Degrees (Ohms)  
Zero Sequence: 9.100 @ 58.7 Degrees (Ohms)  
Line Length: 100 is used

Secondary Relay Ohms:

Positive Sequence: 3.28 @ 60 Degrees (Ohms)  
Zero Sequence: 7.28 @ 59 Degrees (Ohms)  
Line Length: 100 is used



Description	Feeder 1		Feeder 2	
	Max.	Min	Max.	Min
Wind Turbine Generators on Feeder	12		12	
Full load current (Amps) (Unity Voltage and PF)	402		402	
Max. phase current out of feeder for a fault on the 34.5kV bus (Amps)	2880		2888	
	Max.	Min	Max.	Min
Low side of GSU (690V) max/min phase fault current (Amps) *	90	88	90	88
Low side of GSU (690V) max/min negative sequence fault current (Amps) *	52	51	52	51
Low side of GSU (690V) min 3 phase fault current (Amps) *	NA	177	NA	177
Low side of GSU (690V) max/min phase fault current (Amps seen by G&W Switch)	142	142	142	142
34.5kV portion of FDR min. 3 phase fault current (Amps)*	NA	2379	NA	2249
34.5kV portion of FDR min. L-L phase fault current (Amps)*	NA	2036	NA	1948
34.5kV portion of FDR min. phase fault current (Amps) *	NA	1096	NA	1080
34.5kV portion of FDR min. ground fault current (Amps) *	NA	1496	NA	1472
34.5kV portion of FDR min. negative sequence fault current (Amps) *	NA	299	NA	295
* Current as seen by the feeder relay.				

### Determining fault current

The low side of the GSU minimum fault currents are found by using the weakest infeed from the source (N-1) and all other feeders open and placing a fault on the farthest WTG away from the sub. The low side maximum fault currents are found by using the strongest infeed from the source including the projected future source strength and closing all feeder breakers and placing a fault on the nearest WTG to the sub. The 34.5kV minimum fault currents are found by using the weakest infeed from the source (N-1) and all other feeders open and placing a fault on the farthest part of the 34.5kV system away from the sub for that particular feeder. However no N-1 data has been provided and the normal source impedance provided was used for all calculations.

### Faults on 34.5kV portion of the feeder

Any fault that occurs on the 34.5kV part of a feeder will trip the feeder breaker with a 15 cycle delay for either a phase or ground definite time current pickup. One phase OC element (67P1) will be set to pick up for faults anywhere on the 34.5kV portion of the feeder but will be blocked during the inrush of the GSU transformers at the WTGs and will be turned off in a LOP condition. The second phase OC element (67P2) will still be below inrush current but will be blocked for less time, this element will be made non-directional in a LOP condition. This element will provide protection for faults during the inrush of the GSU transformers or during a LOP condition. The third phase OC element (67P3) will need to be above the maximum inrush current of the GSU transformers (314 amps) and above the maximum expected fault current out of any of the feeders (2880 amps). This element is used to trip in the event of miss-operating directional elements and will not pickup for some faults further from the substation. All of the phase settings must be higher than the maximum phase fault current on the low side of the GSU (142 amps) but lower than the minimum phase fault current on the 34.5kV system (1096 amps). The ground setting must be lower than the minimum ground fault current on the 34.5kV system (1496 amps). Ground current will not be seen for faults on the low side of the GSU. All of these elements are directional and are set to coordinate with the Merlin Gerin CB that is at the base of each WTG for any faults that happen down line from the Merlin Gerin CB.

### Faults on the low side of the GSU

Any fault on the low side of the GSU will first be cleared by the Merlin Gerin CB. The substation feeder relaying cannot provide backup protection for faults in this location due to the low fault current levels on this site.

### General

PHROT = ABC                      Phase rotation is ABC  
FNOM = 60                        Nominal Frequency is 60 Hz  
DATE\_F = MDY  
FAULT = SV16T\*67P1T + SV15T\*67P2T + SV20 + 67P3T + 67G1T + SV22T

### Event Messenger

EMP = N                        Event messenger points are not enabled

### Settings Group Selection

TGR = 2

SS1 = 1                      Settings group 1 is the only group that is used  
SS2 = 0  
SS3 = 0

### **Synchronized Phasor Measurement**

EMPU = N                      Synchrophasors are not used

### **Time and Date Management**

IRIGC = NONE  
UTC\_OFF = 0  
DST\_BEGM = OFF

### **Breaker Failure**

52ABF = N                      52A interlock is not used.  
50BFP = 0.1                      Current detector pickup in secondary amps (24 amps primary).  
BFD = 0.17                      Breaker failure delay.  
ATD = OFF                      Auxiliary timer delay is turned off.  
BFI = /TRIP                      Breaker failure will be initiated on the rising edge of the TRIP relay word bit. Bit  
BFT will set the BF latch bit.

### **Arc-Flash Protection**

50PAFP = OFF

### **Station DC Battery Monitor**

DCLOP = OFF  
DCHIP = OFF

### **Breaker Monitor**

EBMON = Y                      Breaker monitor is enabled.  
BKMON = OUT401+\52A\*!OUT401  
COSP1 = 10000                      Close/Open operations set point.  
KASP1 = 1.2                      Primary kA interrupted.  
COSP2 = 150                      Close/Open operations set point.  
KASP2 = 8.0                      Primary kA interrupted.  
COSP3 = 12                      Close/Open operations set point.  
KASP3 = 20.0                      Primary kA interrupted.

### **Data Reset and Access Control**

RSTTRGT = RB07  
RSTENRGY = 0  
RSTMXMN = 0

RSTDDEM = 0  
RSTPKDEM = 0

### Access Control

DSABLSET = 0

### Time and synchronization Source

TIME\_SRC = IRIG1      Port 3 is used as the source for the IRIG signal

### Main

RID = 11F#\_R0  
TID = GROTON  
CTR = 240  
CTRN = 240  
PTR = 300  
DELTA\_Y = WYE  
SINGLEV = N  
VNOM = 115      Nominal line-to-line voltage

### Line Parameter

Z1MAG = 3.28  
Z1ANG = 60  
Z0MAG = 7.28  
Z0ANG = 59  
LL = 100  
EFLOC = Y

### Instantaneous/Definite-Time Overcurrent Settings

50P1P = 2.3      Pickup – Is set below the inrush of the GSU transformers so it will be blocked for 2 seconds after the breaker closes. It will detect all faults on the 34.5kV portion of the feeder. Since this element is set lower than the maximum fault current out of the feeder for a 34.5kV bus fault it will be directional. Element is set at 100A above the 0.1s trip pickup of the Merlin Gerin switches and is set at about 27% of the minimum expected fault current on the 34.5kV system.

$$\text{Setting} = \text{Merlin Gerin} + 100 = 432 + 100 = 532 \text{ A Primary} = \frac{532}{240} = 2.22 \text{ A Secondary}$$

50P1D = 0.25s      15 cycle delay for definite time OC element 1 – Delay allows for coordination with the 34.5kV circuit breaker at the WTG bases.

50P1TC = DIRPF\*!LOP      Phase definite time overcurrent element 1 will be directional looking in the forward direction (into the feeder) under normal

conditions and will be disabled in the event of a Loss of Potential (LOP) or load encroachment (ZLIN).

50P2P = 4.5 Pickup (directional OC set to 1039 Amps primary) – Is set to pick up for all faults on the 34.5kV system. This element will be set with a 15 cycle delay to coordinate with the breaker on the high side of the GSU transformer at the WTGs. The purpose of this element is to provide protection for faults when the 50P1 element is disabled due to a loss of potential condition. This element will also provide faster tripping for faults when the 50P1 element is being blocked during inrush. Since this element is set below the inrush current of the GSU transformers it will be blocked for 30 cycles after the breaker closes. This element will be directional since it is set below the maximum fault current out of the feeder. In a LOP situation, this element will be made non-directional to increase sensitivity of fault protection. Element is set at about 100A above the maximum full load current of the feeder with the most generation (calculated at 0.9 pu voltage and 0.95 power factor). Setting is also set at about 56% of the minimum expected phase fault current.

$$Setting = MaxFLC + 100 = \frac{836}{0.9 * 0.95} + 100 = 1077A \text{ Primary} = \frac{1077}{240} = 4.49A \text{ Secondary}$$

Also, since it can be non-directional

$$Setting > Max FLC = \frac{836}{0.95 * 0.9} = 977 \rightarrow 1077 > 977$$

This is the lowest this setting can be set as it must be left non-directional if a LOP condition asserts.

50P2D = 0.25s 15 cycle delay for definite time OC element 2 – Delay allows time for inrush current to clear before operating. The 50P1 element will trip before this element in all cases except during inrush.

50P2TC = DIRPF + LOP Phase definite time overcurrent element 2 will be directional looking in the forward direction (into the feeder) under normal conditions and will be non-directional in the event of a LOP.

50P3P = 12.5 Pickup (non-directional OC set to 3000 Amps primary) – Is set above the inrush of the GSU transformers and the maximum expected fault current out of the feeder so it will be non-directional. It will not detect all faults on the 34.5kV portion of the feeder. Element is set at 100A above the max fault current out of any feeder.

$$Setting = Max IFout + 100 = 2888 + 100 = 2980 A \text{ Primary} = \frac{2980}{240} = 12.5A \text{ Secondary}$$

50P3D = 0.25s 15 cycle delay for definite time OC element 3.

50P3TC = 1 Torque control.

50P4P = 2.5 Pickup (non-directional OC set to 603 Amps primary)  
(Non-directional inst. OC set to pick up on any 34.5kV fault in the substation, used only for ER)

$$Setting = FLCmax * 1.5 = 402 * 1.5 = 603A \text{ Primary} = \frac{603}{240} = 2.5A \text{ Secondary}$$

50P4D = 0

50P4TC = 1 Torque control.

50G1P = 0.63 Directional OC pickup, set to 150 Amps primary – Set to pick up for any ground fault on the 34.5kV portion of the feeder, the substation does not supply ground current to a fault on the low side of a GSU transformer and so it will not pick up for

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faults there. Pickup has been set well above the G&W ground current pickup but still well below the minimum expected ground current of 1496A.

$$\text{Setting} = I_{\min, \text{gnd}} * 0.1 = 1496 * 0.1 \approx 150 \text{ A Primary} = \frac{150}{240} = 0.63 \text{ A Secondary}$$

50G1D = 0.25

15 cycle delay for residual ground definite time OC element 1.  
Delay allows for coordination with the 34.5kV circuit breaker at the WTG bases.

50G1TC = DIRGF + LOP

Residual ground definite time overcurrent element 1 will be directional looking in the forward direction (into the feeder) under normal conditions and will be non-directional in the event of a LOP.

### **Directional Elements**

EDIR = AUTO

Directional control is used.

EFWDLOP = N

Loss of potential is not enabled.

DIR1 = N

All directional control will be done via the torque control equations. DIR equations shall not be used.

DIR2 = N

DIR3 = N

DIR4 = N

ORDER = QV

### **Load-Encroachment Elements**

ELOAD = Y

Load-Encroachment elements are enabled.

ZLF = 128.0 ohms

PLAF = 30.0 deg

NLAF = -30.0 deg

ZLR = 0.10 ohms

PLAR = 120.0 deg

NLAR = 180 deg

### **HIF**

EHIF = N

High Impedence Fault detection is disabled.

### **RTD (Resistance Temperature Device)**

E49RTD = NONE

### **Voltage Element Settings**

Note: Voltage settings are set to comply with the most current draft of the NERC standard PRC-024-01 document.

27P1P = 59.76

Phase undervoltage pickup element 1 is set to 90% of nominal

27P1D = 5  
27P2P = 49.8           Phase undervoltage pickup element 2 is set to 75% of nominal  
27P2D = 3.0  
59P1P = 73.04           Phase overvoltage pickup element 1 is set to 110% of nominal  
59P1D = 5  
59P2P = 79.68           Phase overvoltage pickup element 2 is set to 120% of nominal  
59P2D = 3.5

### **Synchronism Check**

E25 = N

### **Power Factor**

55LGTP = OFF  
55LDTP = OFF  
55LGAP = OFF  
55LDAP = OFF

### **Frequency Element Settings**

Note: Frequency settings are set to comply with the most current draft of the NERC standard PRC-024-01 document.

81D1TP = 59.4           Under-frequency element 1 pickup  
81D1TD = 0           Element 1 time delay will be extended with a timer (1800s total)  
81D2TP = 57.8           Under-frequency element 2 pickup  
81D2TD = 2           Element 2 time delay in seconds  
81D3TP = 60.6           Over-frequency element 3 pickup  
81D3TD = 0           Element 3 time delay will be extended with a timer (600s total)  
81D4TP = 62.2           Over-frequency element 4 pickup  
81D4TD = 2           Element 4 time delay in seconds  
81D5TP = OFF  
81D6TP = OFF

### **Demand Metering Settings**

EDEM =THM  
DMTC = 5  
PHDEMP = OFF  
GNDEMP = OFF  
3I2DEMP = OFF

### **Power Elements**

EPWR = N           Power elements are not used.

### **Trip and Close Logic**

TDURD = 0.5s                      Minimum trip duration  
 CFD = 0.5s                        Close failure delay  
 TR = (SV15T\*67P1T) + (SV16T\*67P2T) + 67P3T + 67G1T + SV14T + SV20 + REMTRIP  
    Trip if inst./def. time OC element 1 operates (67P1T), OR if  
    inst./def. time OC element 2 operates (67P2T), OR if  
    inst./def. time OC element 3 operates (67P3T), OR if  
    inst./def. time residual ground OC element 1 operates  
    (67G1T), OR if voltage or frequency trip (SV14T), OR  
    (SV20) Trip No-Delay Maintenance setting OR REMTRIP  
    Trip  
 REMTRIP = OC\*RMB4A + RMB1A                      Sets remote trip bit if SCADA sends open command AND  
    43SUP is on, OR if TT is received (RMB1A).

ULTRIP = !(52A + ORED50T)  
 52A = IN404  
 CL = /IN301 + RMB4A\*CC + SV18T  
 ULCL = 52A

**Reclosing Control**

E79 = N                              Reclosing is not used.

**SELogic Enables**

ELAT = 22  
 ESV = 23  
 ESC = N  
 EMV = N

**Latch Bits**

SET04 = (PB04_PUL + /RB03)*!LT04*LT06	Enables maintenance settings.
RST04 = (PB04_PUL + /RB04)*LT04*LT06	Disables maintenance settings.
SET06 = (/SV06T + /RB05)*!LT06	Disables LOCK.
RST06 = (/SV06T + /RB06)*LT06	Enables LOCK.
SET09 = BFT	52F# Breaker Fail
RST09 = TRGTR	Target reset button on front of SEL must be pushed to reset the trip coil fail.
SET10 = SV10T	Trip Coil 1Fail
RST10 = TRGTR	Target reset button on front of SEL must be pushed to reset the trip coil fail.
SET11 = SV11T	Trip Coil 2Fail
RST11 = TRGTR	Target reset button on front of SEL must be pushed to reset the trip coil fail.
SET18 = CF + RMB7A + !SV14T*/TRIP + !TRIP*\52A + SV17T*TRIP + LT04	Block Auto-restoration if Close Failure (relay word bit), 86 Block is on, Trip operated AND it was not because of OV/UV or OF/UF, Trip did not operate AND the breaker



RST18 = /RMB2A + /52A + /RB01 + \LT04

opened, the breaker was tripped less than 15 minutes after closing, OR maintenance settings are active. For a more detailed description of the auto-restoration logic see description at the end of the philosophy.

Unblock Auto-restoration if 43A/R switch is reset, OR if the breaker is closed, OR if SCADA sets remote bit 1, OR if maintenance settings are turned off.

SET22 = SV22T

RST22 = TRGTR

### SELogic Control Equation Variables

SV06 = PB06

Timer used to set and reset LOCK function.

SV06PU = 3

SV06DO = 0

SV08 = REMTRIP

Remote trip Logic

SV08PU = 0

SV08DO = 0.5

SV10 = !IN401\*52A

Trip Coil #1 Fail

SV10PU = 2

SV10DO = 0

SV10 = !IN402\*52A

Trip Coil #2 Fail

SV10PU = 2

SV10DO = 0

SV12 = 81D3T

Timer extends delay of OF element 3

SV12PU = 600

SV12DO = 0

SV13 = 81D1T

Timer extends delay of UF element 1

SV13PU = 1800

SV13DO = 0

SV14 = (27P1T + 27P2T)\*SV15T + 59P1T + 59P2T + SV13T + 81D2T + SV12T + 81D4T

OV/UV, OF/UF to TRIP

SV14PU = 0

SV14DO = 0

SV15 = 52A

Block 67P1 element during inrush of GSU XFMRs

SV15PU = 0.5

SV15DO = 0

SV16 = 52A

Blocks 67P1 element during inrush of GSU XFMRs

SV16PU = 0.5

SV16DO = 0

SV17 = /52A

Rising edge of 52A, used in auto restoration

SV17PU = 0

SV17DO = 900

SV18 = RMB2A\*!LT18\*!TRIP\*!52A\*!27P1\*RMB3A\*ROKA\*RMB5A

Auto-restoration Close if all of the following: 43A/R switch is on, Auto-restoration is not blocked, Trip is not activated, breaker is not already closed, 34.5kV bus is hot, and Source is ready (line is hot and 52T# is closed), Channel A communications are ok, and all communications with the RTAC are OK. For a more detailed

---

description of the auto-restoration logic see description at the end of the philosophy.

SV18PU = 20  
SV18DO = 0.01  
SV19 = /TRIP  
SV19PU = 0  
SV19DO = 60  
SV20 = SV15T\*LT04\*(67P1P + 67G1P)  
SV20PU = 0  
SV20DO = 0

Timer to enable close after fault  
1min delay to close after fault  
TRIP no delay for maintenance settings.

### **SELogic Counters**

Not used.

### **Math Variables**

Not used.

### **Input Assignments**

Input 301 – 52CS Close Initiate  
Input 302 – Mirrored Bit Cutout  
Input 303 – Spare  
Input 304 – Spare  
Input 401 – Trip Coil 1 Monitor  
Input 402 – Trip Coil 2 Monitor  
Input 403 – SPARE  
Input 404 – 52A Breaker Status

### **Output Assignments**

OUT101FS = Y  
OUT101 = HALARM + SALARM  
Out 101 – F1 Alarm to 2440 IN101  
Out 101 – F2 Alarm to 2440 IN102

OUT102FS = N  
OUT102 = 0  
Out 102 – Spare

OUT103FS = Y  
OUT103 = 0  
Out 103 – Spare

OUT301FS = N  
OUT301 = CLOSE  
Out 301 – Close Circuit Breaker 52F#

OUT302FS = N  
OUT302 = !27P2\*!SV19T  
Out 302 – CB Close Enable if all of the following:  
34.5kV bus is hot, BF/TT is not being received, 86  
Block is not being received, AND breaker has been  
tripped for at least 60s.

OUT303FS = N  
OUT303 = 0  
Out 303 – Spare

OUT304FS = N	
OUT304 = 0	Out 304 – Spare
OUT401FS = N	
OUT401 = TRIP	Out 401 – Trip Circuit Breaker 52F#
OUT402FS = N	
OUT402 = LT09	Trip 86BF1
OUT403FS = N	
OUT403 = 0	Out 403 – Spare
OUT404FS = N	
OUT404 = TRIP*SV08T	Trip 52F# TC2

### **MIRRORED BITS**

TMB1A = LT09*IN302	Sends Breaker Fail to RTAC.
TMB2A =	
TMB3A =	
TMB4A =	
TMB5A =	
TMB6A =	
TMB7A =	
TMB8A = 52A	Sends breaker status to RTAC.
RMB1A	Relay received BF/TT.
RMB2A	Relay receives AR (auto restoration) enabled.
RMB3A	Relay receives Source ready.
RMB4A	Relay receives 43SUP to allow SCADA operation of the breaker
RMB5A	Relay receives Comms OK.
RMB6A	
RMB7A	Relay receives 86 Block.
RMB8A	

### **General**

EDP = 23  
ELB = N  
FP\_TO = 15  
FP\_CONT = 5  
FP\_AUTO = ROTATING  
RSTLED = Y  
LEDENAC = G  
LEDTRPC = R

### **Target LED**

T01LEDL = Y	
T01LEDC = R	
T01_LED = SV20	Instantaneous trip.
T02LEDL = Y	
T02LEDC = R	

T02_LED = 67P1T + 67P2T + 67P3T	Phase overcurrent trip.
T03LEDL = Y	
T03LEDC = R	
T03_LED = 67G1T	Ground overcurrent trip.
T04LEDL = Y	
T04LEDC = R	
T04_LED = 0	
T05LEDL = Y	
T05LEDC = R	
T05_LED = SV12T + SV13T + 81D2T + 81D4T	Frequency trip.
T06LEDL = Y	
T06LEDC = R	
T06_LED = LT09	Breaker Fail.
PB1ALEDC = RO	
PB1A_LED = !LT18*RMB2A	Auto restoration ON.
PB1BLEDC = RO	
PB1B_LED = LT18*RMB2A	Auto restoration blocked.
PB2ALEDC = AO	
PB2A_LED = 0	
PB2BLEDC = AO	
PB2B_LED = 0	
PB3ALEDC = AO	
PB3A_LED = 0	
PB3BLEDC = AO	
PB3B_LED = 0	
PB4ALEDC = RO	
PB4A_LED = LT04	Maintenance settings enabled.
PB4BLEDC = RO	
PB4B_LED = !LT04	Maintenance settings disabled.
PB5ALEDC = AO	
PB5A_LED = 0	
PB5BLEDC = AO	
PB5B_LED = 0	
PB6ALEDC = RO	
PB6A_LED = !LT06 + SV06*!SV06T	LOCK disabled.
PB6BLEDC = RO	
PB6B_LED = LT06 + SV06*!SV06T	LOCK enabled.
PB7ALEDC = RO	
PB7A_LED = !OUT302	Block close.
PB7BLEDC = RO	
PB7B_LED = 52A	Breaker closed.
PB8ALEDC = AO	
PB8A_LED = 0	
PB8BLEDC = GO	
PB8B_LED = !52A	Breaker open.

**Display Points**

DP01 = PB1A\_LED, "RESTORE ENABLE"  
DP02 = PB1B\_LED, "RESTORE BLOCK"  
DP03 = RMB2A, "RESTORE DISABLED"  
DP07 = RMB4A, "REMOTE ENABLED"  
DP08 = LT09, "BF RESET"  
DP09 = LT09, "BREAKER FAIL"  
DP10 = LT10, "TRIP COIL 1 FAIL"  
DP11 = LT11, "TRIP COIL 2 FAIL"  
DP12 = LT10, "TAR RESET TO CLR"  
DP13 = LT11, "TAR RESET TO CLR"

### **Event Report**

ER = /67P1P + /67P2P + /67P3T + /67G1P + /52A + /SV22T  
LER = 64  
PRE = 6

### **SER Trigger List (up to 24 per SER)**

SER1 = 67P1P, 67P1T, 50P2P, 67P2T, 50P3P, 67P3T, 50G1P, 67G1T, LT04, LT06, LT09, LT10, LT11, LT18  
SER2 = IN101, IN102, IN301, IN302, IN303, IN304, IN401, IN402, IN403, IN404, OUT101, OUT102, OUT103,  
OUT301, OUT302, OUT303, OUT304, OUT401, OUT402, OUT403, OUT404  
SER3 = SV06T, SV10T, SV11T, SV12T, SV13T, SV14T, SV15T, SV16T, SV17T, SV18T, SV19T, SV20T, SV21T,  
SV22T, SV23T, SV24T  
SER4 = 52A, REMTRIP, OC, CC, RB01, RB02, RB03, RB04, RB05, RB06, RB07, RB08, RB09, RB10, RB11, RB12,  
LINKA  
HIFLER = 10  
LDLIST = IAV, VAVE, S, P, Q, PF, FREQ  
LDAR = 5

### **Auto Restoration (AR)**

Auto restoration is blocked (LT18 is set) if any of the following occurs:

1. CF (Relay word bit, asserts if relay tries to close the breaker and fails.)
2. RMB7A (86Block) is received.
3. Rising Edge of TRIP AND NOT SV14T (Trip from other than OV, UV, OF, or UF. If 1 of these 4 trips the CB, auto restoration is not blocked)
4. NOT TRIP AND falling edge of the 52A. (This means the CB was opened tripped by something other than the relay and auto restoration is blocked)
5. TRIP AND SV17T. (If the CB Trips within 15 minutes of the CB closing, LT18 is set and auto restoration is blocked)
6. NOT IN403. (The CB is racked out)
7. LT04. (Maintenance mode is on)

Auto Restoration block is reset if any of the following occurs:

1. Rising edge of 52A.
2. Rising edge of the SCADA AR reset from RB1.
3. Rising edge of RMB2A (AR Enabled) is received.

4. Falling edge of LT04 (maintenance mode is turned off).

Auto restoration will pick up (SV18T) if all of the following occur:

1. RMB5A (Comms OK) is received.
2. RMB2A (AR enabled) is received.
3. 34.5kV Bus #1 is Hot
4. ROKA (Mirrored Bit Channel A is good)
5. Source is ready (115Kv BUS is hot)
6. NOT LT18 (Auto Restoration is not blocked)
7. NOT TRIP (Trip is not still picked up).
8. NOT 52A (CB is not already closed).

Circuit Breaker will CLOSE if any of the following occurs:

1. RMB4A (Remote Enabled) is received AND CC.
2. IN301 (Breaker Close initiate).
3. SV18T (Auto Restoration) is picked up for 20 seconds.

### **Ports F&2**

PROTO = SEL  
SPEED = 19200  
PF BITS = 8N1  
P2 BITS = 8O2  
PF T\_OUT = 30  
AUTO = N  
RTSCTS = N  
PF FASTOP = Y  
P2 FASTOP = N

### **Port 1**

IPADDR =  
    ➔ 11F1: 10.241.7.2  
    ➔ 11F2: 10.241.7.9  
SUBNETM = 255.255.255.0  
DEFRTR = 10.241.7.1  
ETCPDA = N  
FASTOP = Y  
NETASPD = AUTO  
TPORT = 23  
TIDLE = 30  
FTPUSER = SUBOPS  
E61850 = N  
EMOD = 0  
EDNP = 1  
DNPNUM = 20009  
DNPADR = 1  
DNPIP1 = 10.241.7.21

DNPTR1 = TCP  
DNPUDP1 = 20009  
REPADR1 =  
    ➔ F1 : 2  
    ➔ F2 : 9  
DNPMPA1 = 1  
DVARAI1 = 1  
ECLASSB1 = 1  
ECLASSC1 = 3  
ECLASSA1 = 2  
DECPLA1 = 0  
DECPLV1 = 0  
DECPLM1 = 2  
ANADBA1 = 2  
ANADBV1 = 2  
ANADBM1 = 2  
TIMERQ1 = I  
STIMEO1 = 1.0  
DNPINA1 = 0  
ETIMEO1 = 5  
UNSOL1 = N  
ESNTP = OFF

### **Port 3**

PROTO = MB8A  
SPEED = 19200  
RBADPU = 60  
CBADPU = 1000  
RXID = 2  
TXID = 1  
RXDFLT = XXXXXXXX  
RMB1PU – RMB8DO = 1

### **Revision Log**

A – Issued For Review (9-4-2012)  
0 – Issued For Construction (9-13-2012)  
1 – Issued For Record (4-18-2013)  
2 – Issued For Record (5-31-2013)

**EXTERNAL NOTE**

CODE NE8311305

**From:** Gamesa Wind USA

**To:** IBERDROLA

**Department:** Service Engineering

**Date:** 06/07/2013

**TOPIC:** Description of integrated Fire detection and protection systems G8X - IBD Groton WF

**INDEX**

1	AIM .....	1
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**1 AIM**

To describe the systems integrated in the G8X turbines installed at Groton WF for fire detection and protection as well as the main safety instruction related to fire hazards.

**2 SCOPE**

Gamesa G8X turbines installed at Groton Wind Farm, New Hampshire, USA

**3 BACKGROUND**

This External Note (NE) has been developed to answer a request from Delooff, Karl (Iberdrola Director - Environment, Health, Safety and Security) related to “*Groton Gamesa Turbine Fire Prevention Features*”.

This document contains a list of the features of the Gamesa G8X turbine that addresses:

- Fire prevention
- Fire suppression
- Health & Safety Procedures and Work Instructions related to fire issues and hazards

This document will become part of a public record.



## 4 DESCRIPTION

### 4.1 FIRE PREVENTION

This chapter describes the safety measurements that are carried out by Gamesa wind turbine generators, in order to prevent the occurrence of a fire. It focuses on the different sensors tripping the switchgear, the logic involved in this process.

#### 4.1.1 SWITCHGEAR TRIP LOGIC

Gamesa G8X wind turbines are equipped with different sensors directly or indirectly involved in the fire detection or prevention. In case that any of these sensors detect a malfunction that could result into the appearance of a fire in the wind turbine generator, they all are capable of tripping the MV switchgear, disconnecting the wind turbine from the grid and reducing the most critical source of danger this way. The logic involved in this disconnection is presented in the following scheme:

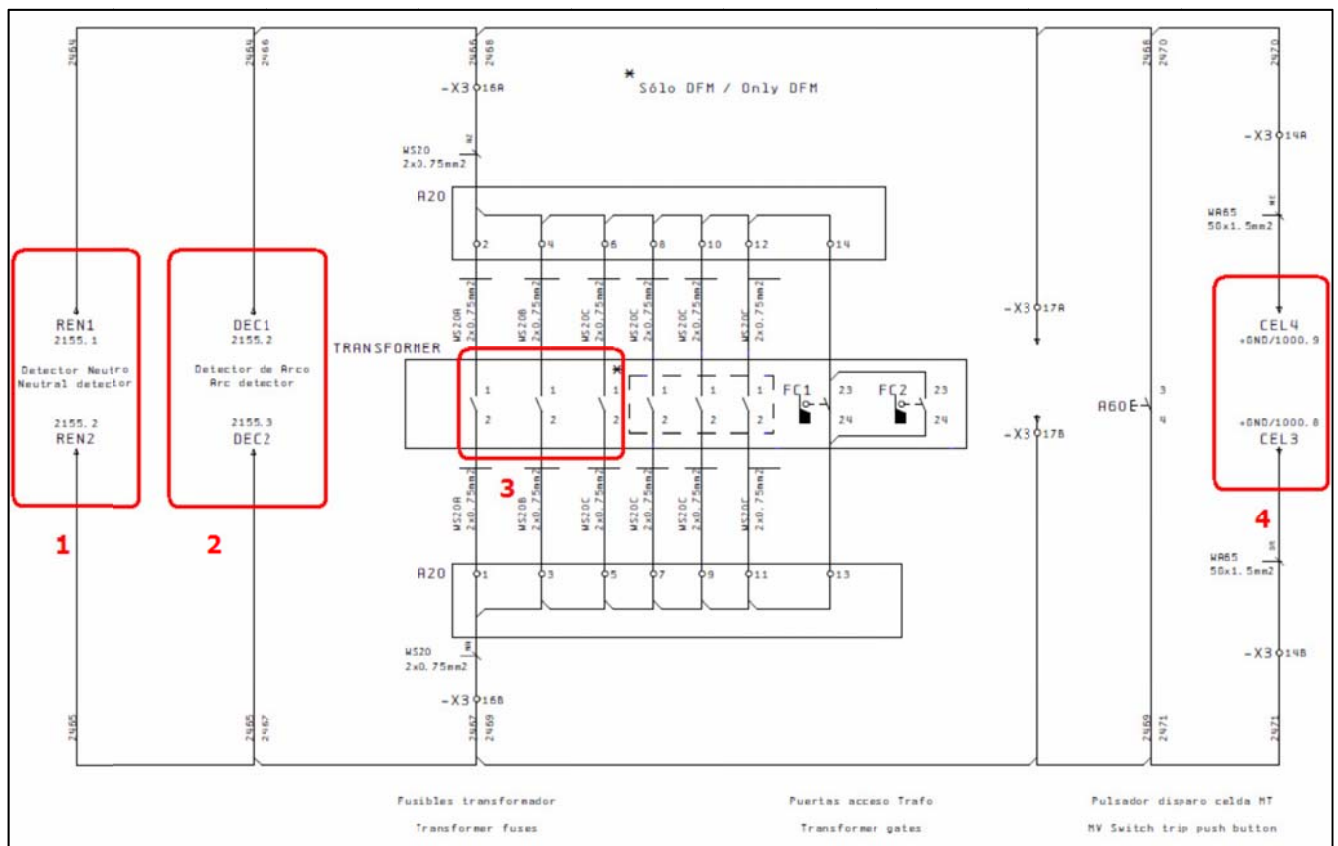


Figure 1 - Switchgear Trip Logic

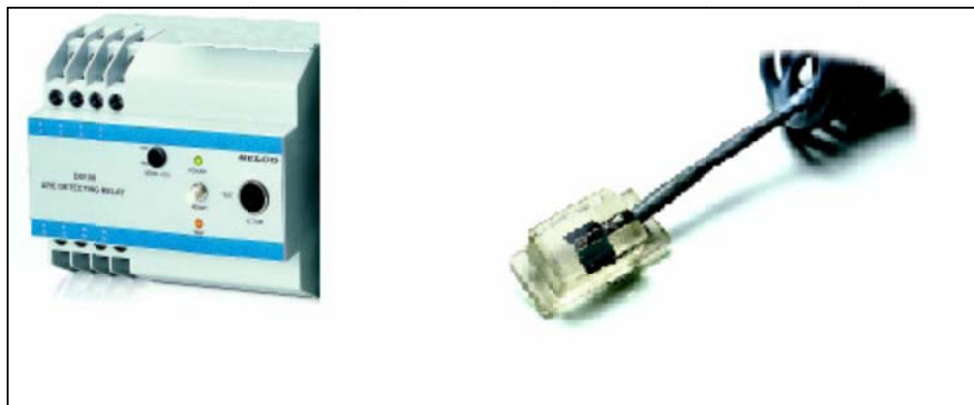
All the vertical branches in Figure 1 close the circuit passing through the switchgear relay, so if any of the switches in the figure is closed, the relay will be energized, tripping the switchgear. The switches marked red are directly or indirectly involved with the fire prevention.

The cable going from this circuit to the switchgear relay is named WA65 in the Gamesa Supply. It is a 230V 5Gx1.5mm<sup>2</sup> cable that goes from the top to the ground cabinet and to the switchgear.

- Switch number 1 trips the switchgear whenever there is a fault to earth producing a leakage current enough to trip the neutral protection relay in the neutral cable. The neutral relay will close the switch till this fault is cleared. This avoids the possibility of an indirect contact produced by an isolation failure that could produce an accident, including a fire.
- Switch number 2 trips the switchgear whenever an arc is detected in the transformer compartment. This will automatically interrupt the power supply feeding the arc. This switch has a mechanical interlocking that must be triggered manually once the arc was detected, so a damage inspection of the possible damages and manual opening of this switch is required if an arc is produced.
- The three number 3 switches trip the switchgear if any of the transformer fuses melt. This avoids a possible fire that could originate in the transformer due to this occurrence. It is necessary to replace the fuse, before this switch can be opened again.
- Switch number 4 is tripped by the PLC (Programmable Logic Controller) alarms. There are two alarms in the PLC logic capable of tripping the switchgear. The first one is set by a smoke sensor device. This alarm trips the wind turbine if smoke is detected in the nacelle. The second alarm is set by PT100 sensors in the transformer windings. If the temperature of the transformer windings becomes too high, the wind turbine will be tripped, in order to prevent the transformer from burning. Both alarms can only be reset locally in the wind turbine control touch-screen. Therefore it is not possible to reconnect the wind turbine remotely without going to the machine and inspecting the possible damages.

#### 4.1.2. DETECTING DEVICES

**Arc Detector:** The arc detector consists on an arc detecting relay placed in the top cabinet. This relay is connected to a light sensitive detector suitably placed in the transformer compartment. This arc detector trips the relay as soon as the light produced by an arc in the transformer is detected. The supplier of the arc detectors installed by is SELCO. See technical datasheet for further details.



**Figure 2 - Arc Detector**

**PT100 Sensors:** Three PT100 sensors are placed in the most critical point of each transformer winding in order to detect abnormal temperatures that could result in a fire occurrence in the transformer. If any of the PT100 measured temperatures is above 165°C the switchgear will be tripped by the PLC. An alarm will be set in the PLC as well and the wind turbine is set to emergency status. This alarm can only be reset locally in the wind

## EXTERNAL NOTE

CODE NE8061303

turbine control touch-screen. ABB is the transformer supplier from Gamesa and all their transformers are equipped with these three PT100 sensors. See technical data sheet for further details.

**Smoke detector:** A smoke detector device is placed in the ceiling of the wind turbine nacelle, between the top cabinet and the generator. If this sensor detects smoke, the switchgear will be tripped by the PLC. An alarm will be set in the PLC as well and the wind turbine is set to emergency status. This alarm can only be reset locally in the wind turbine control touch-screen. See technical datasheet of Notifier for further details.



Figure 3 - Smoke Detector

### 4.2 FIRE SUPPRESSION (Fire Extinguishers)

Apart from the electrical protection system described above, Gamesa G8X wind turbines are equipped with two fire extinguishers. There is one fire extinguisher placed in the nacelle, close to the top cabinet and the second one is placed in the tower base close to the wind turbine door. The position of both extinguishers can be seen in figures 4 and 5 below:

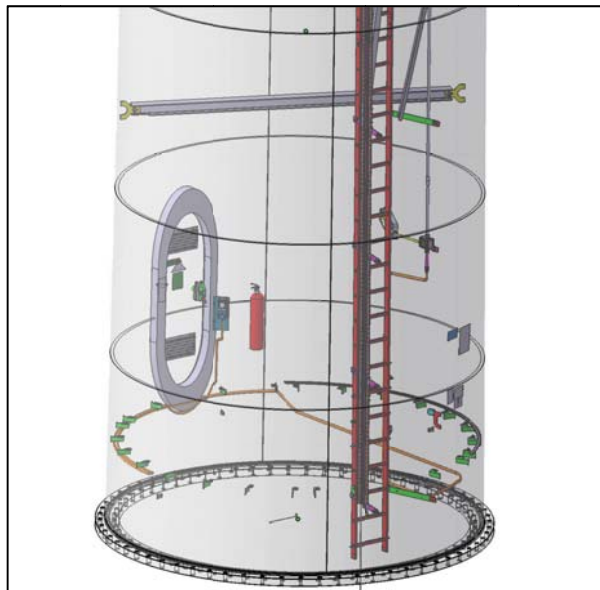
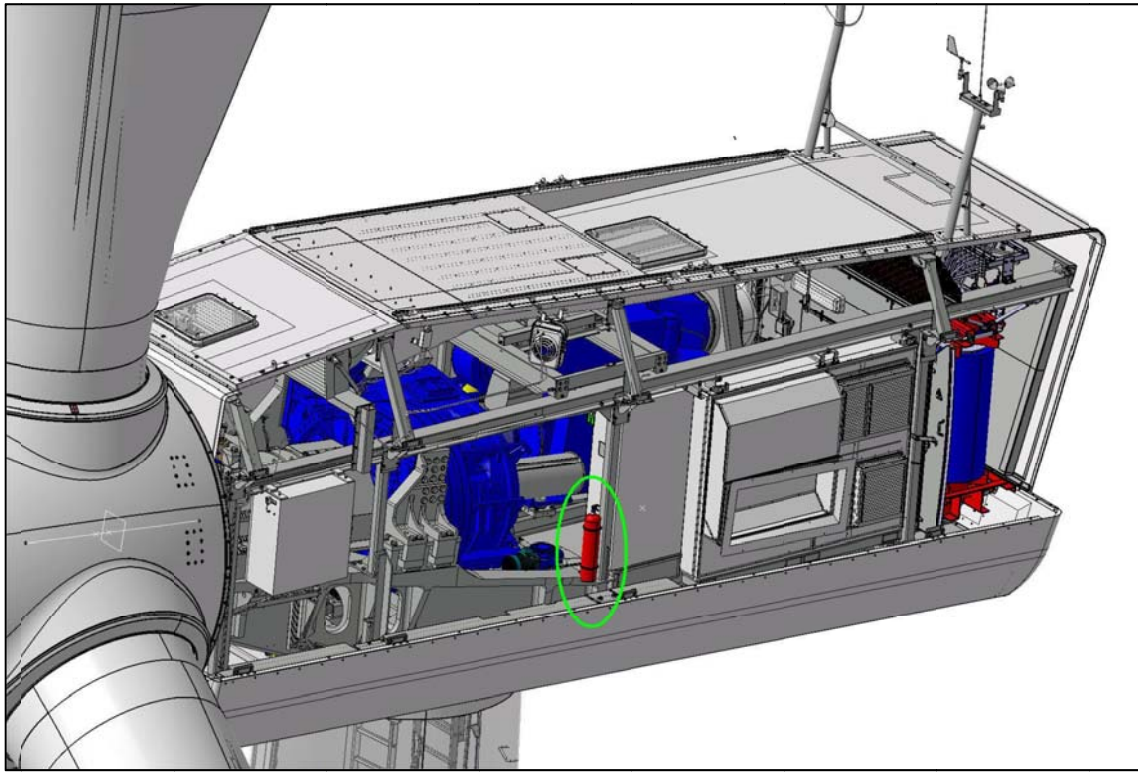


Figure 4 - Extinguisher placed in the tower base



**Figure 5 - Extinguisher placed in the nacelle**

### **4.3 HEALTH & SAFETY PROCEDURES AND WORK INSTRUCTION RELATED TO FIRE ISSUES AND HAZARDS**

This chapter presents the Health and Safety procedures related to fire issues and hazards

#### **DOCUMENT PS.MM1**

#### **0.9. WIND TURBINE EVACUATION IN CASE OF EMERGENCY:**

##### **0.9.1. Evacuation in case of **fire**:**

- If a fire breaks out inside the wind turbine, consider the possibility of fighting it **as long as the safety of people is not compromised and persons involved have proper training**. Bear in mind the size of the fire and the resources available. The portable extinguishers in the wind turbine or in the transportation vehicle are only effective in the initial stage of a fire. Once the fire has taken on considerable dimensions, they should not longer be used.
- The way in which the wind turbine should be evacuated will depend on the relative position of the people in relation to the fire. Whenever possible, evacuation should take place using the habitual access routes (tower ladder). Do not use the lift in the event of a fire, it could delay and complicate the evacuation. As a general rule, the following criteria should be applied:
  - Zero level fire in the wind turbine and staff on the same level. Evacuation should be carried out through the door of the wind turbine tower.

## EXTERNAL NOTE

CODE NE8061303

PS.MM1 - additional illumination needs to be set up in a project:

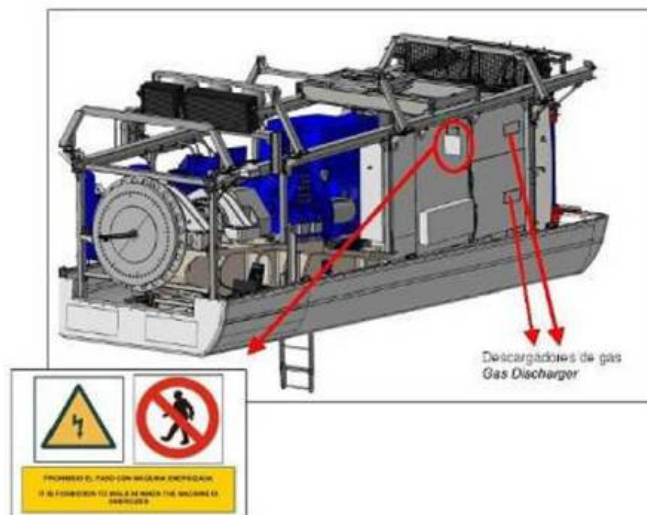
- Lighting systems used must not lead to risk of electric shock, fire or explosion, thus complying with that which is set forth in specific regulations in force to this effect.

PS.MM1 - Hot works:

- Whenever carrying out tasks in which sparks are generated, special working permission must be requested from GCT. Before carrying out this task, clean the surrounding area of remaining oil, make sure there is a portable extinguisher to hand and if necessary use fireproof blankets.

PS.MM1 - Gas dischargers:

- **Gas discharger:** These dischargers consist of sealed gates which are opened by the excess pressure caused by a short circuit in the busbar zone. These dischargers are installed to protect people from blows, burns or intoxication that could occur if the front doors of the cabinet were to break, with this short circuit occurring due to gases that are expelled through the rear of the cabinet (Ingeteam V1-V2 and ABB), left lateral part (DAC), on the ground (Ingeteam V3 and the Ingeteam cabinet of G47)... preventing operators from suffering said damages. The gases that are expelled are evacuated outside the nacelle using its ventilation system.
- The gases expelled by the dischargers in the TOP cabinet are typical of a combustion process ( $SO_x$ ,  $NO_x$ , CO,  $CO_2$ ) and more specific gases due to the combustion of special materials that form the components present in the cabinet. The gases produced by a short circuit are toxic, and have a very high temperature which could cause serious burns. Also, the gates may hit employees. For these reasons, it is prohibited to move around the areas of the cabinet where these dischargers are installed when the wind turbine is energised and there is a risk of tools, elements of the cabinet falling... which could come into contact with the connection and cause a short-circuit or make a connection loose (also leading to a short-circuit). These areas where the dischargers are installed and that may be areas where workers pass by to access other parts of the wind turbine, they are shown on prohibition notices like for example the one illustrated in the following photo.
- If any of the dischargers are open, de-energise the machine according to procedure, check whether there has been a short circuit, re-seal the dischargers with a nylon bolt and energise the machine according to procedure.



## DOCUMENT PS.MM4

## EXTERNAL NOTE

CODE NE8061303

This document applies to the energization process

- The personnel carrying out the energization must be supplied with at least two fire-extinguishers which ensure 10B:C efficiency (EQ.WF.USA.013) and are suitable for electrical fires (CO<sub>2</sub>). If using fire extinguishers, do not enter the tower because of the risk of suffocation. Keep out of the tower and apply the fire extinguishers from the door.

In the Commissioning safe practices we have the following:

- When a generator is used for operations, a CO<sub>2</sub> extinguisher is required in close proximity in order to fight possible fires started by the set. The generator must have a ground fault circuit breaker and be earthed using a copper wire and rod, with closed casing. It must be fitted with a tray which avoids leakage onto the ground, and the fuel required to power the generator must be stored properly.
- **Machine Commissioning:**
  - When performing tests on the condensers, keep the panel door closed.
  - Before performing inspections on the condensers check that they are de-energised and that ten minutes have passed since they were de-energised, in order to reduce possible hazards of direct contact with the accumulated charge.
  - Before starting the machine, check that the condenser door is closed, to reduce the consequences of a possible explosion.
  - Before coming down from the machine it must be ensured that all protective measures, especially the gearbox brake, are correctly in position. The gearbox brake protections not only protect the machine operator but also prevent sparks from the brake from causing a fire risk. Due to the risk of fire, the area adjacent to the gearbox must be especially free of any flammable material. In addition the rotor must be checked to make sure it is not stuck, that the emergency button is not pressed and that the nacelle is clean and tidy.
  - With the exception of the G8X/90 DTC wind turbines, no-one must remain inside the wind turbine while the grid is being connected; an order must be given from the ground and operators must come exit the tower before the grid connected.
- Workers are advised to keep a safe distance from the turbine and for the door to be kept open if any anomalies are detected. Wait a few minutes following connection to the mains power grid before entering, having first checked that the start-up sound is normal.
  - If any anomalies are detected in the turbine, it must be immediately disconnected from the mains power grid.
- When a generating set is used for operations, an ABC Type Fire Extinguisher (EQ.WF.USA.013) is required in close proximity in order to fight possible fires started by the set. The auxiliary generating set must have a Ground Fault Interrupter and be grounded using a copper wire and rod, with closed casing. It must be fitted with a tray which avoids leakage onto the ground, and the fuel required to power the generating set must be stored using proper containers.
- Clean the area where you are installing the auxiliary generating set of materials and substances that may cause a fire.
- When work is carried out on the control panels, follow the instructions given in PS-MTO.7 "Inspection, Repair of Control Equipment" and C-PRL-006-2007 Working with G8x Electrical Cabinets, Communication Fiber Disconnection Procedure and Working in Snow and Icy Conditions.

## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Monday, June 24, 2013 7:50 AM  
**To:** Ronald.Anstey@dos.nh.gov  
**Subject:** Groton Wind

Ron,

It is my understanding that you have now received all the drawings you had requested. Please let me know if there is anything still outstanding.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Monday, July 01, 2013 11:36 AM  
**To:** Anstey, Ronald  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew  
**Subject:** RE: Groton Wind

Ron,

My apologies – I thought the materials had been sent. I will look into it.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

---

**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Monday, July 01, 2013 11:32 AM  
**To:** Epstein, Mark  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew  
**Subject:** RE: Groton Wind

Hi Mark,

The only plans that we have received are the structural plans for the support building. I have not received a site plan, tower/nacelle plans, or fire suppression plans.

Regards,

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Monday, June 24, 2013 7:50 AM  
**To:** Anstey, Ronald  
**Subject:** Groton Wind

Ron,



It is my understanding that you have now received all the drawings you had requested. Please let me know if there is anything still outstanding.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
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## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Wednesday, July 03, 2013 12:03 PM  
**To:** Anstey, Ronald  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew  
**Subject:** RE: Groton Wind

Ron,

My apologies. I have chased this down, and we will have hard copy site and tower plans sent to you next week. In addition, I have had lengthy discussions on the fire suppression issues and while I am obviously not a technical expert, I have taken it upon myself to get you what you this next week as well.

Have a good holiday.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@iberdrolaRen.com](mailto:Mark.Epstein@iberdrolaRen.com)

---

**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Monday, July 01, 2013 11:32 AM  
**To:** Epstein, Mark  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew  
**Subject:** RE: Groton Wind

Hi Mark,

The only plans that we have received are the structural plans for the support building. I have not received a site plan, tower/nacelle plans, or fire suppression plans.

Regards,

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Monday, June 24, 2013 7:50 AM

**To:** Anstey, Ronald  
**Subject:** Groton Wind

Ron,

It is my understanding that you have now received all the drawings you had requested. Please let me know if there is anything still outstanding.

Thanks.

Mark



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## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Friday, July 12, 2013 10:09 AM  
**To:** Anstey, Ronald  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew; Delooff, Karl (kdelooff@iberdrolaren.com)  
**Subject:** RE: Groton Wind  
**Attachments:** NE8311305 - Description of integrated Fire detection and protection syst....pdf; 11F#\_r2\_2013-05-31.pdf; Groton Fire Suppression 07 12 13.pdf; Groton Fire Suppression 07 12 13.pdf

Ron,

As discussed, attached is a full description of the Groton Fire Safety System, including supporting documentation. I believe you should also have received all of the drawings by now, but if there is anything outstanding, please let me know.

Thanks, and have a good weekend.

Mark



**Mark Epstein**  
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**To:** Anstey, Ronald  
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Mark



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## **Groton Wind Project Fire Safety System and Approach**

Groton Wind LLC (“Groton”) focuses on safety concerns, including fire safety during the development, engineering, procurement, construction and now operation of the Groton Wind Project. While it is possible to break down any system to its individual components and attempt to rate each of them for safety, that approach only gives part of the story and does not consider the entire risk abatement in the system. Instead, Groton has taken a systemic approach to safety for the Groton Wind Project.

There are three major potential sources of fire ignition in a wind turbine: mechanical, electrical, and environmental. Groton has given each potential source strong attention:

Mechanical ignition sources are typically overheated moving parts that are not carrying electricity. Historically, these have been bearings, high speed shafts, or generator components. Turbine design, parts sourcing, and maintenance techniques have significantly advanced, including the use of improved sensors to determine early failure indicators, and the High Speed Shaft is engineered to be a sacrificial link between the gear box and the generator. This allows for rapid preventive maintenance ahead of failure, eliminating or significantly limiting the potential source of fires.

Electrical ignition sources have been eliminated or substantially minimized by use of breakers and switches attached to sophisticated computerized diagnostics. These sense either faults or conditions leading to potential faults and open the appropriate switches or breakers to eliminate the source of current that might lead to ignition. The speed of the opening has materially decreased over the past several years as technology has improved. In addition, the Groton Wind Project uses arc flash sensors to eliminate an additional risk of ignition in those areas where arc flash is a potential issue.

Environmental ignition sources include lightning and the worker actions upon the turbine. Lightning protection has been incorporated into the turbine design to allow for the safe passage of energy to a grounding system in the foundation system. Work controls, worker training, and safety equipment are used to reduce or eliminate worker started fires. Although no system is perfect, the Groton systems have a proven track record of preventing worker initiated fires.

In support of these efforts, Groton believes that it has the most robust fire prevention and suppression system currently available. The main points of the system are:

- Remote sensing to open string breakers in substation under appropriate conditions
- Cycle time for various switch and breaker openings set to the minimal reliable settings
- Opening main breaker or down tower switch before relevant work is performed on a tower, eliminating the energy available to start a fire

- The Gamesa Turbines for the Project include Direct Switchgear Trips, Neutral Detectors, Arc Detectors, Switches on the Transformer Low Side Fuses, PLC Related Switchgear Trips, PT100 Temperature Sensors and Nacelle Smoke Detectors. (A separate Gamesa document that describes the Gamesa G8X fire prevention protocol is included.)
- The Gamesa Lightning Protection System uses conducting “pucks” embedded in the blades that ground to the tower shell and to a grounding grid incorporated into the turbine foundation.
- All turbines have built-in fire and heat monitoring. The turbines can be monitored on site by a full suite of monitoring sensors, tools, and displays. This system includes a predictive maintenance tool that allows the equipment to be either maintained or shut down before failure. We have also attached a description of the controls of the substation and down-tower switchgear system.
- There is 24/7 NERC-CIP National Control Center which provides full control of the Project, including the ability to control or shut down individual turbines or substation equipment or system wide if warranted.
- The substation has NERC-CIP compliant battery backup systems that will enable shut down the system, if warranted, even if power is disrupted from either the grid or the wind farm.
- All site vehicles carry a 10lbs ABC Fire Extinguisher, AED, and additional fire suppression equipment that is delivered into the work area before any physical work is begun on any turbine.
- Work procedures are designed to eliminate or minimize ‘hot’ work. When hot work is required to be performed, an advance permit is required which includes the presence of at least 2 15lbs ABC or 3 10lbs ABC Fire Extinguishers and Fire watches to be established and not released until full cold conditions are verified or sufficient time has passed for all heat sources to fully dissipate.
- All site personnel are trained on Fire Prevention
- All site personnel are trained on Fire Extinguishers (PASS)
- All site personnel are trained and qualified Electrical Workers or are in a training billet under direct supervision of qualified personnel
- No smoking or open flames are permitted in or around the turbines (with the exception of flames or other heat sources as a component of permitted hot work.)
- All turbines have cleared surrounding areas to prevent fire from spreading to the adjacent area.
- Access roads are maintained for normal access and for fire and first responder equipment. with special equipment and provisions for winter and inclement weather.
- At least two training drills are scheduled annually with local fire departments – one under summer conditions and one under winter conditions with additional drills scheduled upon request of either the first responders or the wind Project.

- All maintenance crews bring along a Crew Rescue Bag (2 fire blankets, 1 smoke detector, 2 eye wash bottles, 1 first aid kit, and 1 Deus Descent Kit)

These components are fielded as a system, and not as individual components. The various settings, components, and controls schemes are designed to work together to enhance safety and reliability. Our people who work in and live around our Projects are our first concern. We also value our wind turbines and equipment and want to keep them viable for the entire life of the project. As such, Groton is continually evaluating the state of the art in terms of fire suppression<sup>1</sup>. Groton believes that its system, as described, represents the best means of addressing the risk of fire at the Groton Wind Project.

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<sup>1</sup> Groton is working with its vendors to innovate and develop an effective system, but as of July, 2013, there is not an effective suppression system on the market. Although several vendors have aggressively pushed for their systems to be included and can boast UL ratings for individual components, none have been systemically shown to be of any benefit and there are risks with any pressurized cylinder in the nacelle. Wind turbines are designed to have air cooling of the gearbox radiator system, hydraulic pitching system, inverters, generator, transformers, and the controls cabinet. Typical gas-based suppression systems require saturation and residence time to suffocate a fire, and limited testing has shown gas-based effectiveness only in the controls cabinet, which has by far the lowest risk of fire of all the major component groups. Given the pace of technological improvement, it is possible that these systems may have more benefit than risk sometime in the future.



## Epstein, Mark

---

**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**Sent:** Wednesday, July 17, 2013 2:07 PM  
**To:** Epstein, Mark  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew; Delooff, Karl  
**Subject:** RE: Groton Wind  
**Attachments:** 3130053-S,FA Groton Wind Farm O&M Bldg 07-07-2013.pdf

Hi Mark,

Thank you for the information. I gave the information a quick scan and it appears to be the same information that was discussed with Karl over 2 years ago. At that time a fire suppression system was required and that suppression requirement has not changed. I will review the information to see if it changes our position. For your information I have attached the review comments for the O and M building. The comments were sent to Mike Witcher and we have not received a response as yet.

Thank you for your assistance.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Friday, July 12, 2013 10:09 AM  
**To:** Anstey, Ronald  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew; [kdellooff@iberdrolaren.com](mailto:kdellooff@iberdrolaren.com)  
**Subject:** RE: Groton Wind

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Thanks, and have a good weekend.

Mark



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Investigator Ron Anstey, CBO, CFI  
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**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Monday, June 24, 2013 7:50 AM  
**To:** Anstey, Ronald  
**Subject:** Groton Wind

Ron,

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## Epstein, Mark

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**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**Sent:** Monday, June 24, 2013 11:00 AM  
**To:** Epstein, Mark  
**Subject:** RE: Groton Wind  
**Attachments:** image001.gif

Hi Mark,

I have been out of state since last Tuesday. I will return to the office on Wednesday. I will check when I get back and let you know.

Thanks

Ron

-----Original Message-----

From: Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
Sent: Mon 6/24/2013 7:49 AM  
To: Anstey, Ronald  
Subject: Groton Wind

Ron,

It is my understanding that you have now received all the drawings you had requested. Please let me know if there is anything still outstanding.

Thanks.

Mark

Mark Epstein  
Senior Counsel  
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100 Matsonford Rd.

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[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com) <<mailto:Mark.Epstein@IberdrolaUSA.com>>

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## Epstein, Mark

---

**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**Sent:** Thursday, May 30, 2013 5:22 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; Labonte, Matthew; Delooff, Karl; SGeiger@orr-reno.com; Michael J. Iacopino  
**Subject:** RE: Groton Wind Farm

Hi Mark,

Thank you for your reply. I realize that you may be a late participant in this project, at least in your interaction with us, so please allow me to clarify a couple of points for you. Pursuant to state statute, the State Fire Marshal assumed the position on building inspector for the project since Groton does not have one. We did this through a letter to the Site Evaluation Committee before construction began. Given that fact, even though there may not be any occupancy requirements for Groton, there are for the state and they are being enforced through our office. In addition, Chief Thompson's letter is dated March 17, 2013, our meeting was April 24, 2013. We have been asking for plans well over two ago. Why would I have continued to request plans if it were no longer our jurisdiction?

Based on his letter, it does not appear that Chief Thompson performed any type of plans review for any of the structures. In addition a "very acceptable, maintained..." facility does not necessarily mean a code compliant facility. We will also have to schedule site inspections.

With regards to the fire suppression systems and "interplay of various systems", I fully understand the complexities of the process. The fire suppression in the turbines was the first requirement that we discussed at our first meeting almost three years ago. I also know that we are not the only jurisdiction requiring the suppression systems. As such, I suspect that the paperwork is readily available.

Because of the email confusion, I will extend the submittal deadline for plans to June 12, 2013. The remainder of the submittal including the fire suppression systems and a schedule for installation must be submitted no later than June 26, 2013. I have not discussed these new deadlines with Marshal Degnan, he is being copied on this email. If he disagrees with the dates he might amend them.

I look forward to receiving the required documents and bringing this project to a successful and safe conclusion.

Regards,

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [mailto:Mark.Epstein@iberdrolaren.com]  
**Sent:** Thursday, May 30, 2013 9:17 AM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; Labonte, Matthew; kdelooff@iberdrolaren.com; SGeiger@orr-reno.com  
**Subject:** RE: Groton Wind Farm

Ron,

My apologies again for the confusion on the email – apparently, I hadn't cleaned my old cards out of my bag when I pulled out the one that I gave to you. (I will spare you a list of the other things I found when I started rummaging around in there.)

As to your question below, it is my understanding that, because the local fire chief assumed jurisdiction over the project (as shown in the attached letter), that is where the determination of occupancy is made, which is the reason the plans hadn't been provided earlier. Having said that, to accommodate your request, we will have a full set of plans sent to you by the end of next week.

On the issue of the fire suppression systems, we are gathering the technical details. As you can imagine, the interplay of the various systems that allow the electrical systems to be shut down in fractions of a second involve the interplay of several of our equipment manufacturers, and it is my understanding that we do not have on hand the materials you requested in the appropriate form. We have asked that those materials be provided to us as soon as possible, though it may be a few weeks before we have everything. I have asked Karl to provide you with deliveries of whatever we can provide in late June, along with further details on how we are working to ensure the delivery of any materials that are outstanding.

In order to ensure that there is no further communication concern, my cell phone is (610)772-1363. Though I generally respond best to email, if, for some reason I don't respond, that number will always get my attention.

Thanks.

Mark



**Mark Epstein**  
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**From:** Anstey, Ronald [mailto:Ronald.Anstey@dos.nh.gov]  
**Sent:** Wednesday, May 29, 2013 12:55 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; Labonte, Matthew; Michael J. Iacopino  
**Subject:** FW: Groton Wind Farm  
**Importance:** High

Mr. Epstein,

I have tried sending this email to you twice and it kept coming back as undeliverable. I was given this email address to try. I look forward to hearing from you. As of today, I still have not received anything from Karl.

Regards,

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Anstey, Ronald  
**Sent:** Tuesday, May 28, 2013 5:49 PM  
**To:** 'mark.epstein@iberdrolausa.com'  
**Cc:** Degnan, J. William; Labonte, Matthew  
**Subject:** FW: Groton Wind Farm  
**Importance:** High

Good afternoon,

I sent this email to you on 5/17/13 and have not had any response. I am checking to make sure that you received it

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Anstey, Ronald  
**Sent:** Friday, May 17, 2013 2:56 PM  
**To:** 'mark.epstein@iberdrolausa.com'  
**Cc:** Degnan, J. William; 'Michael J. Iacopino'; Labonte, Matthew  
**Subject:** Groton Wind Farm  
**Importance:** High

Good afternoon Mr. Epstein,

I was a pleasure meeting you last month in Groton. When we spoke you indicated that you were the person to notify if we were not getting the information that is required for your project. On 4/25/13, the day after our meeting, Karl DeLooff emailed me and indicated that he was going to provide plans to us as soon as he could get them printed. To date no plans have been submitted to this office for review. To print plans for structures the have already been built should take a matter of hours, not weeks. We have been waiting for plans for over two years and it appears, even after our meeting, nothing has changed. Consequently we must establish the following dead lines.

Iberdrola will provide a complete set of plans for all structures on the Groton site to the State Fire Marshal's Office no later than May 31, 2013. The plans must be complete and shall include, but not be limited to, structural, mechanical, and electrical details. In addition, fire suppression plans for the turbines (nacelles) must also be included. If the plans are not received by this office by May 31, 2013 we will issue a stop work order for every structure on the site. Given the fact the there were never any plans submitted for review, there were never any compliance inspections conducted and certificates of occupancy have not been issued, the site is still deemed to be under construction.

I will be out of the office for training next week. However, I will be checking my emails. I will have my cell phone as well, my number is 603-703-2498. I look forward to hearing from you.

Regards,

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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## Epstein, Mark

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Section Chief, Engineering and Plans Review  
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I was a pleasure meeting you last month in Groton. When we spoke you indicated that you were the person to notify if we were not getting the information that is required for your project. On 4/25/13, the day after our meeting, Karl DeLooff emailed me and indicated that he was going to provide plans to us as soon as he could get them printed. To date no plans have been submitted to this office for review. To print plans for structures that have already been built should take a matter of hours, not weeks. We have been waiting for plans for over two years and it appears, even after our meeting, nothing has changed. Consequently we must establish the following dead lines.

Iberdrola will provide a complete set of plans for all structures on the Groton site to the State Fire Marshal's Office no later than May 31, 2007. The plans must be complete and shall include, but not be limited to, structural, mechanical, and

electrical details. In addition, fire suppression plans for the turbines (nacelles) must also be included. If the plans are not received by this office by May 31, 2013 we will issue a stop work order for every structure on the site. Given the fact there were never any plans submitted for review, there were never any compliance inspections conducted and certificates of occupancy have not been issued, the site is still deemed to be under construction.

I will be out of the office for training next week. However, I will be checking my emails. I will have my cell phone as well, my number is 603-703-2498. I look forward to hearing from you.

Regards,

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Thursday, July 18, 2013 3:16 PM  
**To:** Anstey, Ronald  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew; Delooff, Karl; Emmett, Doren  
**Subject:** RE: Groton Wind

Ron,

Sorry for the delay in getting back to you on this, but no one here had any idea who Mike Witcher was. (Apparently, he is a local representative of a vendor for the O&M building manufacturer who dealt with one of subcontractors.) In any event, now that the company has the questions, we will review and get back to you.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

---

**From:** Anstey, Ronald [mailto:Ronald.Anstey@dos.nh.gov]  
**Sent:** Wednesday, July 17, 2013 2:07 PM  
**To:** Epstein, Mark  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew; Delooff, Karl  
**Subject:** RE: Groton Wind

Hi Mark,

Thank you for the information. I gave the information a quick scan and it appears to be the same information that was discussed with Karl over 2 years ago. At that time a fire suppression system was required and that suppression requirement has not changed. I will review the information to see if it changes our position. For your information I have attached the review comments for the O and M building. The comments were sent to Mike Witcher and we have not received a response as yet.

Thank you for your assistance.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Friday, July 12, 2013 10:09 AM  
**To:** Anstey, Ronald  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew; [kdelooff@iberdrolaren.com](mailto:kdelooff@iberdrolaren.com)  
**Subject:** RE: Groton Wind

Ron,

As discussed, attached is a full description of the Groton Fire Safety System, including supporting documentation. I believe you should also have received all of the drawings by now, but if there is anything outstanding, please let me know.

Thanks, and have a good weekend.

Mark



**Mark Epstein**  
Senior Counsel  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

---

**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Monday, July 01, 2013 11:32 AM  
**To:** Epstein, Mark  
**Cc:** Michael J. Iacopino; Degnan, J. William; Labonte, Matthew  
**Subject:** RE: Groton Wind

Hi Mark,

The only plans that we have received are the structural plans for the support building. I have not received a site plan, tower/nacelle plans, or fire suppression plans.

Regards,

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Monday, June 24, 2013 7:50 AM  
**To:** Anstey, Ronald  
**Subject:** Groton Wind

Ron,

It is my understanding that you have now received all the drawings you had requested. Please let me know if there is anything still outstanding.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
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[Mark.Epstein@iberdrolaRen.com](mailto:Mark.Epstein@iberdrolaRen.com)

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## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Thursday, July 25, 2013 2:16 PM  
**To:** 'Ronald.Anstey@dos.nh.gov'  
**Cc:** 'J.William.Degnan@dos.nh.gov'; 'MIacopino@bclilaw.com'  
**Subject:** Re: O &M Building

Ron,

We are reviewing the questions. I will touch base with you when I get back into the office next week.

Thanks.

Mark  
Mark Epstein  
Senior Counsel  
Iberdrola Renewables  
New Address:  
2 Radnor Corporate Center, Suite 200  
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Radnor PA 19087  
(484)654-1885  
[mark.epstein@iberdrolaren.com](mailto:mark.epstein@iberdrolaren.com)

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**To:** Epstein, Mark  
**Cc:** Degnan, J. William <[J.William.Degnan@dos.nh.gov](mailto:J.William.Degnan@dos.nh.gov)>; Michael J. Iacopino <[MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)>  
**Sent:** Thu Jul 25 11:00:02 2013  
**Subject:** O &M Building

Hi Mark,

I received a letter from Brian Shedd of Construx, Inc. in Plymouth NH. Construx apparently was the sub-contractor that erected the O&M building. He was not aware that plans were supposed to be submitted to our office and considers the project complete. I spoke with Brian on the phone and he is awaiting some direction from either you or Cianbro. He is willing to assist us in completing the project. His phone number is 603-536-3533. We will require a response to the review questions. Let me know how you would like to proceed.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Thursday, August 01, 2013 2:04 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com; Emmett, Doren  
**Subject:** RE: O &M Building

Ron,

Just to give you an update, but the records are being reviewed on this.

Thanks.

Mark



**Mark Epstein**  
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**Sent:** Thursday, July 25, 2013 2:17 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)  
**Subject:** RE: O &M Building

Great, thanks

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
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**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)  
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Thanks.

Mark

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**Cc:** Degnan, J. William <[J.William.Degnan@dos.nh.gov](mailto:J.William.Degnan@dos.nh.gov)>; Michael J. Iacopino <[MIacopino@bcililaw.com](mailto:MIacopino@bcililaw.com)>  
**Sent:** Thu Jul 25 11:00:02 2013  
**Subject:** O &M Building

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Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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## Epstein, Mark

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**From:** Epstein, Mark  
**Sent:** Thursday, August 01, 2013 4:13 PM  
**To:** 'Ronald.Anstey@dos.nh.gov'  
**Cc:** 'J.William.Degnan@dos.nh.gov'; 'MIacopino@bclilaw.com'; Emmett, Doren; Clayton, Michael  
**Subject:** Re: O &M Building

Ron,

We are in the process of reviewing the permits to figure out the full details of our obligation.

Thanks.

Mark  
Mark Epstein  
Senior Counsel  
Iberdrola Renewables  
New Address:  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
(484)654-1885  
mark.epstein@iberdrolaren.com

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**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William <J.William.Degnan@dos.nh.gov>; MIacopino@bclilaw.com <MIacopino@bclilaw.com>; Emmett, Doren  
**Sent:** Thu Aug 01 13:02:32 2013  
**Subject:** RE: O &M Building

Hi Mark,

Thanks for the update. I reviewed the fire detection and protection plan that you submitted. It is the same material that was discussed 2 years ago when we required the automatic fire suppression. No automatic fire suppression plans were included in this most recent submittal.

Have a nice weekend.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**From:** Epstein, Mark [mailto:Mark.Epstein@iberdrolaren.com]  
**Sent:** Thursday, August 01, 2013 2:04 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com; Emmett, Doren  
**Subject:** RE: O &M Building

Ron,

Just to give you an update, but the records are being reviewed on this.

Thanks.

Mark



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**Sent:** Thursday, July 25, 2013 2:17 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com  
**Subject:** RE: O &M Building

Great, thanks

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com  
**Subject:** Re: O &M Building

Ron,

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Thanks.

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**To:** Epstein, Mark  
**Cc:** Degnan, J. William <[J.William.Degnan@dos.nh.gov](mailto:J.William.Degnan@dos.nh.gov)>; Michael J. Iacopino <[MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)>

**Sent:** Thu Jul 25 11:00:02 2013

**Subject:** O &M Building

Hi Mark,

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Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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STATE OF NEW HAMPSHIRE DEPARTMENT OF SAFETY

John J. Barthelmes, Commissioner

***Division of Fire Safety***

**Office of the State Fire Marshal**

J. William Degnan, State Fire Marshal

Office: 110 Smokey Bear Blvd., Concord, NH

Mailing Address: 33 Hazen Drive, Concord, NH 03305

PHONE 603-223-4289, FAX 603-223-4294 or 603-223-4295

TDD Access: Relay NH 1-800-735-2964 ARSON HOTLINE 1-800-400-3526



August 12, 2013

Mr. Michael Iacopino  
Brennan, Caron, Lenehan & Iacopino  
85 Brook Street  
Manchester, NH 03104

RE: Groton Wind, LLC

Dear Mr. Iacopino,

On October 17, 2010, a letter was submitted by the State Fire Marshal to the Site Evaluation Committee regarding Groton Wind, LLC. That letter referenced the requirements of RSA 155-A:7, which states that when a municipality does not have a building inspector that the State Fire Marshal has the authority to enforce the State Building Code in that municipality. The October 17<sup>th</sup> letter indicated that the State Fire Marshal was in fact going to invoke that authority and act as the building official for this project. In addition, the State Fire Marshal is charged with insuring that the State Fire Code is enforced throughout the state.

The state fire and building codes require that plans be submitted to the authority having jurisdiction, which in this case is the state fire marshal, for review prior to the commencement of construction. The purpose of the plan submittal is so that the plans can be reviewed to insure compliance with applicable codes. At the start of this project the fire marshal's office was in contact with a representative of Iberdrola Renewables. Investigators from this office did visit the Lempster Wind Farm and a facility under construction in New York State. However, Iberdrola did not submit any plans for review.

Fire safety is addressed on pages 73- 74 of the Decision Granting Certificate of Site and Facility With Conditions. On page 74 Mr. Edward Cherian, project manager testified that the State Fire Marshal's Office had refined it's position on fire suppression and now "requires only compliance with the [intent of the codes not the actual specifications]." Mr. Cherian's statement is not true. Our visits to the other Iberdrola sites revealed that a water based fire suppression system, especially in northern New Hampshire, or a total flooding gaseous system would be unreasonable. For that reason the State Fire Marshal mandated an automatic fire suppression system that would be installed to cover the individual hazard areas such as the bearing oil and transformers.

On April 24, 2013 at your invitation I attended a meeting in Groton regarding the wind project. Until that meeting, the last correspondence that we had with Iberdrola was via email on April 5, 2011. In that email, in addition to the normally required structural, site, fire protection plans etc., we required plans for automatic fire suppression in the nacelles. Up to that time our office still had not received any plans for review. The project has been constructed without the required plans review or any in process inspections.

NFPA 1, 2009 edition, 18.2.3.1.4 states: "When fire department access roads cannot be installed due to location on property, topography, waterways, nonnegotiable grades, or other similar conditions, the AHJ shall be authorized to require additional fire protection features."

NFPA 850, 2010 edition also requires a fire protection design. Section 10.5.3.5.1 addresses fire protection in the nacelles. The State Fire Marshal, as the authority having jurisdiction should have been involved in the fire protection design discussion at a very early stage.

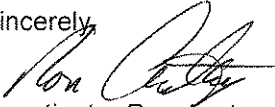
Since the April 24, 2013 meeting Iberdrola has submitted a site plan and plans for the O and M building. Plans for the towers and fire suppression have not been submitted for review. The plans for the O and M building were reviewed by this office. Comments on the plans were sent to the sub-contractor that erected the structure and Iberdrola on 7-07-13. We have not received any reply to those comments.

Iberdrola did not submit plans for review prior to or during construction of the project. Iberdrola did not schedule any inspections during the construction of the project. Certificates of Occupancy as required by the State Building Code have not been issued for any of the structures on the site. This project is still considered an active construction site. Given the fact that the safety of the public cannot be insured due to Iberdrola's failure to comply with the NH State Fire Code and the NH State Building Code the State Fire Marshal is strongly considering issuing a stop work order on the site. This would cease all operations until compliance with the applicable codes has been satisfied and verified by the State Fire Marshal's Office

Iberdrola has not complied with the requirements of the Decision Granting Certificate of Site and Facility With Conditions, and the State Fire Marshal's would recommend that the Site Evaluation Committee mandate that all operation on the site cease until all safety concerns, plans reviews, and required inspections have been completed and approved.

Please contact me via email at [Ronald.d.anstey@dos.nh.gov](mailto:Ronald.d.anstey@dos.nh.gov) or by phone at 603-223-4289 should you have any questions

Sincerely,



Investigator Ron Anstey, CBO, CFI  
Section Chief, Plans Review and Engineering.  
Bureau of Building Construction and Safety

## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Thursday, August 15, 2013 2:55 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com; Emmett, Doren; Clayton, Michael (mclayton@iberdrolaren.com)  
**Subject:** RE: O &M Building

Ron,

I apologize for the delay in getting back to you, but we wanted to confirm internally the history of the permitting on the project.

As we see it, there is nothing in our permit that requires us to install fire suppression equipment in the towers. The only reference we are aware of in the permit is the obligation to “maintain any fire alarm systems, sensor systems and fire suppression equipment that is installed”. While we certainly do maintain the sensor and alarm systems that are installed, we do not believe this language requires us to install any additional systems. This is particularly true given that, as I understand it, the issue of making a fire suppression system a requirement was expressly raised to the SEC during the permitting process, but they made the decision to not include it as part of the permit.

If we are missing something in the permit that does expressly require us to install a fire suppression system, we are certainly happy to review.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
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phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

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**From:** Anstey, Ronald [mailto:Ronald.Anstey@dos.nh.gov]  
**Sent:** Thursday, August 01, 2013 4:03 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com; Emmett, Doren  
**Subject:** RE: O &M Building

Hi Mark,

Thanks for the update. I reviewed the fire detection and protection plan that you submitted. It is the same material that was discussed 2 years ago when we required the automatic fire suppression. No automatic fire suppression plans were included in this most recent submittal.

Have a nice weekend.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Thursday, August 01, 2013 2:04 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com); Emmett, Doren  
**Subject:** RE: O &M Building

Ron,

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Thanks.

Mark



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**Sent:** Thursday, July 25, 2013 2:17 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)  
**Subject:** RE: O &M Building

Great, thanks

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**To:** Epstein, Mark  
**Cc:** Degnan, J. William <[J.William.Degnan@dos.nh.gov](mailto:J.William.Degnan@dos.nh.gov)>; Michael J. Iacopino <[MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)>  
**Sent:** Thu Jul 25 11:00:02 2013  
**Subject:** O &M Building

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Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Tuesday, August 20, 2013 4:16 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; MIacopino@bclilaw.com; Emmett, Doren; Clayton, Michael; SGeiger@orr-reno.com; Cherian, Ed (Echerian@iberdrolaren.com); Delooff, Karl (kdelooff@iberdrolaren.com)  
**Subject:** RE: O &M Building

Ron,

Thanks for a copy of your letter.

We are certainly happy to formally address this matter in a hearing before the SEC, but in the interests of using resources on substantive efforts rather than on a legal dispute, I am wondering if there is some intermediate solution that might address your concerns, particularly given that the strength of the record.

(For example, the Fire Marshall's office's lack of response to the letter that Mike Iacopino sent to Commissioner John J. Barthelmes on April 5, 2010 supports the idea that we weren't required to separately submit plans to the State Fire Marshall's Office. This is supported by RSA 162-H which has been clearly held to show that submission to the SEC expressly "envisions that all interests be considered and all regulatory agencies combine for the twin purposes of avoiding undue delay and resolving all issues 'in an integrated fashion'".)

On the question of the project itself, as I mentioned in my earlier email, the SEC formally addressed the concerns in your October 17, 2010 letter as part of the application process and expressly decided not to accept those requirements. (See, for example, page 74 of the SEC Decision.) I appreciate your desire to reintroduce those concerns and enforce additional requirements on the project, but to the best of our knowledge, no one in the town of Groton has made a request to your office to do so as required by RSA 155-A:7, I, and thus I am not sure I understand the basis for you to do so.

In any event, rather than spend time formally arguing over these issues, particularly given the current status of the project, I am hopeful there is, as I suggested, some other action we can take to satisfy your concerns.

Please let me know when we can set up a time to discuss.

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Mark



**Mark Epstein**  
**Senior Counsel**  
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100 Matsonford Rd.  
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[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

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Section Chief, Engineering and Plans Review  
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Have a nice weekend.

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**To:** Epstein, Mark  
**Cc:** Degnan, J. William <[J.William.Degnan@dos.nh.gov](mailto:J.William.Degnan@dos.nh.gov)>; Michael J. Iacopino <[MIacopino@bcililaw.com](mailto:MIacopino@bcililaw.com)>  
**Sent:** Thu Jul 25 11:00:02 2013  
**Subject:** O &M Building

Hi Mark,

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**Sent:** Tuesday, October 01, 2013 5:31 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William  
**Subject:** RE: O &M Building

Hi Mark,

Thanks for the invitation. Unfortunately my morning is full. I look forward to seeing you at the hearing.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**To:** Anstey, Ronald  
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Ron,

Do you want to take a few minutes before the hearing to talk? Absent unusual flight delays, I should be in Concord by 9:30/10:00 if you want to grab a coffee before the hearing. Give me a call on my cell (610)772-1363 and let me know.

Thanks.

Mark



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I look forward to our meeting.

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(For example, the Fire Marshall's office's lack of response to the letter that Mike Iacopino sent to Commissioner John J. Barthelmes on April 5, 2010 supports the idea that we weren't required to separately submit plans to the State Fire Marshall's Office. This is supported by RSA 162-H which has been clearly held to show that submission to the SEC expressly "envisions that all interests be considered and all regulatory agencies combine for the twin purposes of avoiding undue delay and resolving all issues 'in an integrated fashion'".)

On the question of the project itself, as I mentioned in my earlier email, the SEC formally addressed the concerns in your October 17, 2010 letter as part of the application process and expressly decided not to accept those requirements. (See, for example, page 74 of the SEC Decision.) I appreciate your desire to reintroduce those concerns and enforce additional requirements on the project, but to the best of our knowledge, no one in the town of Groton has made a request to your office to do so as required by RSA 155-A:7, I, and thus I am not sure I understand the basis for you to do so.

In any event, rather than spend time formally arguing over these issues, particularly given the current status of the project, I am hopeful there is, as I suggested, some other action we can take to satisfy your concerns.

Please let me know when we can set up a time to discuss.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

---

**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Thursday, August 15, 2013 5:08 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com); Emmett, Doren; Clayton, Michael  
**Subject:** RE: O &M Building

Hi Mark,

Attached is a letter that I delivered for presentation to the committee yesterday. It should cover the issue.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Thursday, August 15, 2013 2:55 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; [MIacopino@bcililaw.com](mailto:MIacopino@bcililaw.com); Emmett, Doren; [mclayton@iberdrolaren.com](mailto:mclayton@iberdrolaren.com)  
**Subject:** RE: O &M Building

Ron,

I apologize for the delay in getting back to you, but we wanted to confirm internally the history of the permitting on the project.

As we see it, there is nothing in our permit that requires us to install fire suppression equipment in the towers. The only reference we are aware of in the permit is the obligation to “maintain any fire alarm systems, sensor systems and fire suppression equipment that is installed”. While we certainly do maintain the sensor and alarm systems that are installed, we do not believe this language requires us to install any additional systems. This is particularly true given that, as I understand it, the issue of making a fire suppression system a requirement was expressly raised to the SEC during the permitting process, but they made the decision to not include it as part of the permit.

If we are missing something in the permit that does expressly require us to install a fire suppression system, we are certainly happy to review.

Thanks.

Mark



**Mark Epstein**  
**Senior Counsel**  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@iberdrolaRen.com](mailto:Mark.Epstein@iberdrolaRen.com)

---

**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Thursday, August 01, 2013 4:03 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; [MIacopino@bcililaw.com](mailto:MIacopino@bcililaw.com); Emmett, Doren  
**Subject:** RE: O &M Building

Hi Mark,

Thanks for the update. I reviewed the fire detection and protection plan that you submitted. It is the same material that was discussed 2 years ago when we required the automatic fire suppression. No automatic fire suppression plans were included in this most recent submittal.

Have a nice weekend.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Thursday, August 01, 2013 2:04 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com); Emmett, Doren  
**Subject:** RE: O &M Building

Ron,

Just to give you an update, but the records are being reviewed on this.

Thanks.

Mark



Mark Epstein  
Senior Counsel  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
phone: (484)654-1885  
fax: (484)654-1069

[Mark.Epstein@IberdrolaRen.com](mailto:Mark.Epstein@IberdrolaRen.com)

---

**From:** Anstey, Ronald [<mailto:Ronald.Anstey@dos.nh.gov>]  
**Sent:** Thursday, July 25, 2013 2:17 PM  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)  
**Subject:** RE: O &M Building

Great, thanks

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Epstein, Mark [<mailto:Mark.Epstein@iberdrolaren.com>]  
**Sent:** Thursday, July 25, 2013 2:16 PM  
**To:** Anstey, Ronald  
**Cc:** Degnan, J. William; [MIacopino@bclilaw.com](mailto:MIacopino@bclilaw.com)  
**Subject:** Re: O &M Building

Ron,

We are reviewing the questions. I will touch base with you when I get back into the office next week.

Thanks.

Mark

Mark Epstein  
Senior Counsel  
Iberdrola Renewables  
New Address:  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
(484)654-1885  
[mark.epstein@iberdrolaren.com](mailto:mark.epstein@iberdrolaren.com)

---

**From:** Anstey, Ronald <[Ronald.Anstey@dos.nh.gov](mailto:Ronald.Anstey@dos.nh.gov)>  
**To:** Epstein, Mark  
**Cc:** Degnan, J. William <[J.William.Degnan@dos.nh.gov](mailto:J.William.Degnan@dos.nh.gov)>; Michael J. Iacopino <[MIacopino@bcilaw.com](mailto:MIacopino@bcilaw.com)>  
**Sent:** Thu Jul 25 11:00:02 2013  
**Subject:** O &M Building

Hi Mark,

I received a letter from Brian Shedd of Construx, Inc. in Plymouth NH. Construx apparently was the sub-contractor that erected the O&M building. He was not aware that plans were supposed to be submitted to our office and considers the project complete. I spoke with Brian on the phone and he is awaiting some direction from either you or Cianbro. He is willing to assist us in completing the project. His phone number is 603-536-3533. We will require a response to the review questions. Let me know how you would like to proceed.

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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## Epstein, Mark

---

**From:** Delooff, Karl <kdelooff@iberdrolaren.com>  
**Sent:** Wednesday, October 02, 2013 7:05 PM  
**To:** ronald.anstey@dos.nh.gov  
**Cc:** Epstein, Mark; dan@periphman.com  
**Subject:** Groton Wind - Potential Suppression Technology

Ron:

As we discussed after the hearing today, we are looking at a technology that is newer and used in the computer server field and hazmat areas. I think it shows promise for protecting nacelles under real world conditions – not just the very low risk cabinets that current technology can protect.

Here is the link to the manufacturer's site: <http://www.periphman.com/index.shtml>

My contact is Dan Anderson – 720-746-1205, copied above.

Currently we are working with NREL in Golden, CO, to determine if we can use their GE 1.5 MW nacelle on the ground for proof of concept testing. We are discussing the protocols for the testing (for validity and forward compatibility with a potential ANSI/IEC standard) and for protecting their asset from potential damage during the testing – as we will likely have to generate a larger fire than what we would normally detect and suppress for testing purposes. We are looking for existing protocols that we could adapt to our scenario so that we don't invent something from whole cloth or perform a test that would be considered invalid later. So, I have asked Dan and NREL to research what standard tests could be performed in the nacelle environment. They are doing this at this time. I expect an answer from them this month.


If and when this is successful, I will be working with Gamesa to determine how to integrate this into the SCADA system. Since it is electronically actuated, this should be easier than other technologies.

If you have any suggestions, please let me know.

Thanks,  
Karl



**Karl J. DeLooff**  
**Director - Environment, Health, Safety and Security**  
**Engineering and Construction**  
1125 NW Couch St., Suite 700, Portland, OR, 97209  
Cellular (610) 547-4393  
Fax (616) 892-9935  
[kdelooff@iberdrolaren.com](mailto:kdelooff@iberdrolaren.com)

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## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Thursday, October 03, 2013 6:06 PM  
**To:** 'Ronald.Anstey@dos.nh.gov'  
**Cc:** 'SGeiger@orr-reno.com'  
**Subject:** Re: Groton Wind - Potential Suppression Technology

Ron,

A quick question -- because the turbines have proprietary technology, we have an obligation to seek confidential treatment before sending them in. Do you have any objections?

Thanks.

Mark  
Mark Epstein  
Senior Counsel  
Iberdrola Renewables  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
(484)654-1885  
mark.epstein@iberdrolaren.com

---

**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**To:** Delooff, Karl  
**Cc:** Epstein, Mark; dan@periphman.com <dan@periphman.com>; karen.schlitzer@doj.nh.gov <karen.schlitzer@doj.nh.gov>; Degnan, J. William <J.William.Degnan@dos.nh.gov>  
**Sent:** Thu Oct 03 08:38:59 2013  
**Subject:** RE: Groton Wind - Potential Suppression Technology

Thanks Karl,

I'll contact Dan. You indicated that you might have a contact that is familiar with high pressure gas piping. I'm involved in another project and I am looking for resources in that industry.

Thanks

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Delooff, Karl [mailto:kdelooff@iberdrolaren.com]  
**Sent:** Wednesday, October 02, 2013 7:05 PM  
**To:** Anstey, Ronald  
**Cc:** Epstein, Mark; dan@periphman.com  
**Subject:** Groton Wind - Potential Suppression Technology

Ron:

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If you have any suggestions, please let me know.

Thanks,  
Karl



**Karl J. DeLooff**  
**Director - Environment, Health, Safety and Security**  
**Engineering and Construction**  
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## Epstein, Mark

---

**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**Sent:** Thursday, October 03, 2013 11:39 AM  
**To:** Delooff, Karl  
**Cc:** Epstein, Mark; dan@periphman.com; karen.schlitzer@doj.nh.gov; Degnan, J. William  
**Subject:** RE: Groton Wind - Potential Suppression Technology

Thanks Karl,

I'll contact Dan. You indicated that you might have a contact that is familiar with high pressure gas piping. I'm involved in another project and I am looking for resources in that industry.

Thanks

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Delooff, Karl [<mailto:kdelooff@iberdrolaren.com>]  
**Sent:** Wednesday, October 02, 2013 7:05 PM  
**To:** Anstey, Ronald  
**Cc:** Epstein, Mark; [dan@periphman.com](mailto:dan@periphman.com)  
**Subject:** Groton Wind - Potential Suppression Technology

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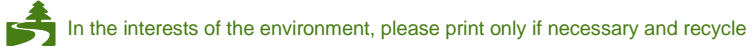
If you have any suggestions, please let me know.

Thanks,

Karl



**Karl J. DeLooff**  
**Director - Environment, Health, Safety and Security**  
**Engineering and Construction**  
1125 NW Couch St., Suite 700, Portland, OR, 97209  
Cellular (610) 547-4393  
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[kdellooff@iberdrolaren.com](mailto:kdellooff@iberdrolaren.com)



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=====



October 8, 2013

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

Dear Ron,

As requested, enclosed please find the first batch of drawings you requested, with the remainder to follow under separate cover. Please note that these documents are being submitted with the understanding that they will be kept confidential and will not be publicly disclosed. These documents contain trade secrets and competitively sensitive commercial information which Groton Wind does not disclose to anyone outside of its corporate organization or its authorized representatives, and that as such, the information is entitled to be protected from public disclosure under RSA 91-A:5, IV. See also RSA 350-B ("Uniform Trade Secrets Act")."

Please let me know if you have any questions or if you require anything further.

Sincerely,

*Mark Epstein*

Mark Epstein, Esq.

cc: Doren Emmett  
Susan Geiger, Esq.



October 9, 2013

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office  
33 Hazen Drive  
Concord, New Hampshire 03305

Dear Ron,

As requested, enclosed please find the remainder of the drawings you requested. Please note that these documents are being submitted with the understanding that they will be kept confidential and will not be publicly disclosed. These documents contain trade secrets and competitively sensitive commercial information which Groton Wind does not disclose to anyone outside of its corporate organization or its authorized representatives, and that as such, the information is entitled to be protected from public disclosure under RSA 91-A:5, IV. See also RSA 350-B ("Uniform Trade Secrets Act")."

Please let me know if you have any questions or if you require anything further.

Sincerely,

*Mark Epstein*

Mark Epstein, Esq.

cc: Doren Emmett  
Susan Geiger, Esq.



## Epstein, Mark

---

**From:** Epstein, Mark  
**Sent:** Thursday, October 10, 2013 2:10 PM  
**To:** 'Ronald.Anstey@dos.nh.gov'  
**Cc:** 'karen.schlitzer@doj.nh.gov'  
**Subject:** Follow-up on Drawings

Ron,

I believe you have now received all the outstanding drawings. Please let me know if there are any you still need.

Thanks.

Mark  
Mark Epstein  
Senior Counsel  
Iberdrola Renewables  
2 Radnor Corporate Center, Suite 200  
100 Matsonford Rd.  
Radnor PA 19087  
(484)654-1885  
mark.epstein@iberdrolaren.com

---

**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**To:** Delooff, Karl  
**Cc:** Epstein, Mark; dan@periphman.com <dan@periphman.com>; karen.schlitzer@doj.nh.gov <karen.schlitzer@doj.nh.gov>; Degnan, J. William <J.William.Degnan@dos.nh.gov>  
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Thanks Karl,

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Thanks

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

---

**From:** Delooff, Karl [mailto:kdelooff@iberdrolaren.com]  
**Sent:** Wednesday, October 02, 2013 7:05 PM  
**To:** Anstey, Ronald  
**Cc:** Epstein, Mark; dan@periphman.com  
**Subject:** Groton Wind - Potential Suppression Technology

Ron:

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## Epstein, Mark

---

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**Sent:** Thursday, October 10, 2013 2:10 PM  
**To:** 'Ronald.Anstey@dos.nh.gov'  
**Cc:** 'karen.schlitzer@doj.nh.gov'  
**Subject:** Follow-up on Drawings

Ron,

I believe you have now received all the outstanding drawings. Please let me know if there are any you still need.

Thanks.

Mark  
Mark Epstein  
Senior Counsel  
Iberdrola Renewables  
2 Radnor Corporate Center, Suite 200  
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**From:** Anstey, Ronald <Ronald.Anstey@dos.nh.gov>  
**To:** Delooff, Karl  
**Cc:** Epstein, Mark; dan@periphman.com <dan@periphman.com>; karen.schlitzer@doj.nh.gov <karen.schlitzer@doj.nh.gov>; Degnan, J. William <J.William.Degnan@dos.nh.gov>  
**Sent:** Thu Oct 03 08:38:59 2013  
**Subject:** RE: Groton Wind - Potential Suppression Technology

Thanks Karl,

I'll contact Dan. You indicated that you might have a contact that is familiar with high pressure gas piping. I'm involved in another project and I am looking for resources in that industry.

Thanks

Ron

Investigator Ron Anstey, CBO, CFI  
Section Chief, Engineering and Plans Review  
New Hampshire State Fire Marshal's Office

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**From:** Delooff, Karl [mailto:kdelooff@iberdrolaren.com]  
**Sent:** Wednesday, October 02, 2013 7:05 PM  
**To:** Anstey, Ronald  
**Cc:** Epstein, Mark; dan@periphman.com  
**Subject:** Groton Wind - Potential Suppression Technology

Ron:

As we discussed after the hearing today, we are looking at a technology that is newer and used in the computer server field and hazmat areas. I think it shows promise for protecting nacelles under real world conditions – not just the very low risk cabinets that current technology can protect.

Here is the link to the manufacturer’s site: <http://www.periphman.com/index.shtml>

My contact is Dan Anderson – 720-746-1205, copied above.

Currently we are working with NREL in Golden, CO, to determine if we can use their GE 1.5 MW nacelle on the ground for proof of concept testing. We are discussing the protocols for the testing (for validity and forward compatibility with a potential ANSI/IEC standard) and for protecting their asset from potential damage during the testing – as we will likely have to generate a larger fire than what we would normally detect and suppress for testing purposes. We are looking for existing protocols that we could adapt to our scenario so that we don’t invent something from whole cloth or perform a test that would be considered invalid later. So, I have asked Dan and NREL to research what standard tests could be performed in the nacelle environment. They are doing this at this time. I expect an answer from them this month.

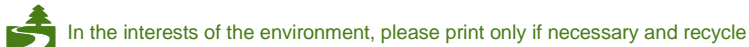
If and when this is successful, I will be working with Gamesa to determine how to integrate this into the SCADA system. Since it is electronically actuated, this should be easier than other technologies.

If you have any suggestions, please let me know.

Thanks,  
Karl



**Karl J. DeLooff**  
**Director - Environment, Health, Safety and Security**  
**Engineering and Construction**  
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