SIEMENS

5th June, 2013

Neil Kiely
179 Lincoln St, Suite 500
Boston, MA 02111

Mr. Kiely,

Thank you for your recent inquiry about the risk of fire associated with the Siemens SWT 3.0-113 direct drive turbine. The letters lists some of the key features we have in our turbine that we have incorporated to reduce risk of fire.

Siemens 3.0-113 turbine uses the pioneering **direct drive technology which eliminates gear box and consequently the gear box oil from the nacelle**. This significantly reduces the flammable material that can potentially contribute to an up tower nacelle fire. In addition to this unique design feature our turbines have following features to reduce risk of fires.

Lightning Protection

Siemens lightning protection system is based on IEC 61400-24: 2010- Part 24 Lightning Protection standard and the standard for building technology IEC 62305-1-4 ED 1.0: 2006 lightning protection level 1. The nacelle canopy is fabricated as a Faraday cage that provides a high level of protection against lightning. Please see the attached Siemens Wind Turbine Lightning Protection exhibit for further details.

Transformers and Electrical Cabinets

One source of potential fires in wind turbine nacelle is the high-voltage transformer placed inside the nacelles. As a result Siemens direct drive design **places the transformers outside the turbine** which helps to reduce the fire risk up-tower. In addition to this smoke detectors are placed in side key electrical cabinets. Please see attached Fire Prevention (incl. Active Fire Fighting System) Siemens Wind Turbines, Small Direct Drive First Wind – Maine Projects for further details.

Brake system

Like most of the modern turbines, Siemens 3.0-113 direct drive uses hydraulic pitch to idle/ stop the turbine the mechanical disc brake is used primarily in the service mode. Thus minimizing the heat built up at the mechanical brake.

Active Fire fighting System

Although it is not currently available, we are developing an Active Fire Fighting System (AFFS) that can be installed in the nacelle. The AFFS will be a standalone system with its own UPS. If a fire is detected, the smoke detectors will signal an alarm that is transmitted to the wind turbine controller, and an extinguishant will be released. The extinguishant used will neither harm people nor the environment. Our analysis shows

SIEMENS

that this feature is not necessary and we are not aware of a fire in the nacelle of any of our direct drive turbines.

Maintenance:

Extensive training is given to Siemens technicians and the work instructions that are required to follow by technicians take in to account the OSHA requirements.
All welding, burning, flame cutting, metal grinding, heat shrinking or other operations suitable of a causing high temperatures are kept a minimum and have to be pre-authorized by the in-line manage. During the scheduled maintenance any excessive Grease or oil found within the turbine is cleaned

Based on this features and maintenance practices we believe the Siemens SWT 3.0-113 direct drive turbine is designed to minimize any potential fire risk.

Kind regards,

Vishal Arole
Technical Sales Manager
Siemens Energy Inc.