

M-4a

ATTACHMENT 1

WIND TURBINE SAFETY CONSIDERATIONS

Vestas is one of the leading wind turbine manufacturers, with approximately 70% market share worldwide. Based on its prominence in the world market, the Vestas Safety Manual (32 pages) is a credible source of safety information. Nordex is another well know manufacturer of wind turbines. Its Safety Manual (130 pages) likewise is considered a credible source of information on the subject of safety.

On page 3 of the Vestas Safety Regulations for Operators and Technicians Manual, point # 2. – Stay and Traffic by the Turbine, Vestas personnel are instructed to stay away from a turbine by 400 m (1312 ft) unless it is necessary. Taken in context, this distance would apply to normal operating conditions. (See Exhibit 1)

Under abnormal operating conditions, Vestas expands this distance in consideration of the safety of its employees. This is evidenced by the Vestas Confidential Health and Safety Instruction manual for a Falmouth MA wind farm. Page 10 of this manual addresses the situation of a free spinning “runaway turbine”. In that manual, instructions are for no one to be allowed within a 1640 feet (500 m) radius. (See Exhibit 2)

The Nordex Safety Manual also addresses safety in the context of a fire. On page 52, under section 9.3 Fire, it states:

DANGER FALLING TURBINE PARTS *In case of a fire in the nacelle or on the rotor, parts may fall off the wind turbine. In case of a fire, nobody is permitted within a radius of 500 m from the turbine. (See Exhibit 3)*

Given that these standards apply to employees who are familiar with the safety implications of wind turbines and are equipped to deal with abnormal conditions, it is indefensible, from a safety perspective alone, to specify in a wind ordinance designed to protect the public health, safety and welfare a setback that is less than 1640 feet.

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Safety Regulations for Operators and Technicians

V90 – 3.0MW/V100 – 2.75MW

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1. Introduction

A turbine connected to the grid implies certain elements of danger if it is handled without exercising proper caution.

For safety reasons, at least two persons have to be present during a work procedure. The work must be properly carried out in accordance with this manual and other related manuals. This implies, among other things that personnel must be instructed in and familiar with relevant parts of this manual.

Furthermore, personnel must be familiar with the contents of the “Substances and Materials” regulations.

Caution must especially be exerted in situations where measurement and work is done in junction boxes that can be connected to power.

Consequently the following safety regulations must be observed.

2. Stay and Traffic by the Turbine

Do not stay within a radius of 400m (1300ft) from the turbine unless it is necessary. If you have to inspect an operating turbine from the ground, do not stay under the rotor plane but observe the rotor from the front.

Make sure that children do not stay by or play nearby the turbine. If necessary, fence the foundation. The access door to the turbine must be locked in order to prevent unauthorized persons from stopping or damaging the turbine due to mal-operation of the controller.

3. Address and Phone Number of the Turbine

Note the address and the access road of the turbine in case an emergency situation should arise. The address of the turbine can often be found in the service reports in the ring binders next to the ground controller. Find the phone number of the local life-saving service.

Vestas Confidential - Falmouth

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2.6.1 Special vehicles

Important: Protect the environment: stop engines when vehicles are not in use.

- Drivers of special vehicles, such as extra wide or high vehicles, must only drive onto the site with prior agreement with the supervisor/site manager who will advise as to the preferred route and possible site risks.
- The supervisor/site manager will also arrange for auxiliary vehicles, if necessary.

2.7 In Case of Runaway Operation

A runaway operation is almost impossible, as it would require several circumstances to happen at the same time

- If a runaway operation should occur, the plant must be evacuated immediately by running upwind, and access to the surrounding area in a radius of at least 500 metres must be restricted.

Vestas advises to **“evacuate by running upwind ...access to the surrounding area in a radius of at least 500 meters [1640 ft.] must be restricted.”**

The WT itself is adequately protected against damage by comprehensive lightning protection measures. However, persons inside or in the proximity of a WT are still at risk. ■ Initially, proceed as in a grid failure ■ Leave and lock the WT ■ Wait at a safe distance from the WT until the thunderstorm has passed Do not re-enter the WT until the thunderstorm has passed.

9.3 Fire

DANGER

FALLING TURBINE PARTS

In case of a fire in the nacelle or on the rotor, parts may fall off the wind turbine. In case of a fire, nobody is permitted within a radius of 500 m from the turbine.

NOTE The WT is equipped with ABC powder fire extinguishers for fighting incipient fires. At least one fire extinguisher is located in the tower base near the door and another in the nacelle near the Topbox. This makes it possible to extinguish burning solids and liquids, as well as fires in electrical systems of up to 1,000 V. These fire extinguishers are not suitable for extinguishing a fire on the high-voltage elements, see Chapter 9.3.2 "Fire in medium-voltage switchgear or transformer".

9.3.1 Fire in the WT

■ Remove any persons from the danger area ■ If possible, disconnect the burning object from the grid ■ Fight the fire with available means if there is any chance of success ■ If the fire cannot be extinguished or if there is no chance of success, call the fire department ■ Inform the responsible Remote Monitoring