

## FIRE FIGHTERS GUIDANCE NOTE # 6-35

### ISSUE:    WIND TURBINES

Fires involving wind turbines may present a health and safety hazard to firefighters due to the electronics, flammable oils and hydraulic fluids that exist in the turbines. For example, up to 750 litres of hydraulic oil can be found in the nacelle. Electrical fires can also result from both shorts in equipment and surges that may result from lightning strikes. Additionally, secondary wind driven brush fires originating from wind turbine fires can also result in significant damage. Due to the height of wind turbines, firefighter health and safety may be endangered during a rescue from these turbines.

Fire departments should contact the owner(s) of the wind turbine(s) in their response area and establish the level of assistance that the fire department is able to provide. There may be opportunities for training and/or equipment to be provided to the local fire department from the wind turbine owner.

In cooperation with the wind turbine owner, fire departments should develop response safety plans that address issues such as:

- Access to sites and contact numbers (24/7) for site supervisory staff;
- Safe collapse zones;
- Rescue options for workers trapped in the nacelle in non-fire situations; and
- High-voltage components and combustible materials within the wind turbine.

### SAFETY CONCERNS AND FIREFIGHTING SAFETY PRECAUTIONS:

Although it is rare, there is a potential for wind turbines to catch fire. While some wind turbines may be equipped with suppression systems, others may not. Most fires in wind turbines will be caused by mechanical failure of the equipment within the nacelle or electrical issues and are fuelled by up to 750 litres of hydraulic oil in the nacelle as noted above.

Typically, a turbine fire does not last long enough to warrant aerial attempts to extinguish the fire. As such, it should be allowed to burn itself out while staff and fire personnel maintain a safe area around the turbine and protect against the potential for spot ground fires that might start due to sparks or falling material. Power to the affected turbine should be disconnected by qualified personnel to minimize the potential of an electrical shock hazard.

Although turbine tower collapses are rare, there is a potential of tower collapse due to various circumstances. The reasons for collapses vary depending on conditions and tower type, but have included blade strikes, rotor over-speed, cyclonic winds, and poor or improper maintenance of the torque bolts.

The fire department should establish a safe work perimeter around the base of the wind turbine when there is a risk of exposure to a collapse hazard. The distance of the safe work perimeter from the base should be determined on a case-by-case basis with regard to the height of the turbine, the size and weight of the components, and wind conditions (Note: although the majority of major components have fallen within 500 metres from the base, safe work perimeters may vary depending on the turbine in question and should be determined on a case-by-case basis).

#### References:

OHSA Clauses 25(2)(a), (d), and (h)

GN # 6-20 Electrical Hazards in Rescue and Fire Situations

Electrical Safety Handbook for Emergency Responders – Best practices for Coping with Electrical Hazards in Rescue and Fire Situations, [Hydro One Networks Inc., Electrical Safety Authority, Office of the Fire Marshal, and Public Services Health and Safety Association], revised 5<sup>th</sup> Edition, 2013.

[http://www.pshsa.ca/wp-content/uploads/2013/11/EELPWAEN0413-Electrical-Safety-Handbook\\_20131.pdf](http://www.pshsa.ca/wp-content/uploads/2013/11/EELPWAEN0413-Electrical-Safety-Handbook_20131.pdf)

Ontario Fire College Course: Solar Photovoltaic Systems, Wind Turbines and Firefighter Safety