



Photo Credit: Shermco Industries Inc.

What do you need to know?

- Always verify that power is off before approaching a potential victim or fighting an electrical fire. Injury, fatality or explosion may occur from contact with or water on a live circuit.
- Electrical hazards may become further complicated by working at heights. Be aware of established site rescue plans.
- Be sure to understand the nature and location of a potential fire to prevent lost time travelling to the wrong location or with the wrong equipment.
- Transformers at the substation and turbine tower contain oil for environmental control of components.
- Be aware that confined space conditions can occur on-site.
- Batteries and capacitors used at wind facilities may contain stored energy.
- Be aware of step-voltage concerns from fallen power lines or underground faults.



The Canadian Wind Energy Association, is the voice of Canada's wind energy industry, actively promoting the responsible and sustainable growth of wind energy.

The Occupational Health and Safety Committee works collaboratively to provide solutions to health and safety concerns specific to the wind industry in Canada.

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canwea.ca/operations-and-maintenance

Sources

CanWEA Best Practices for Wind Power Facility Electrical Safety
<https://canwea.ca/operations-and-maintenance/health-and-safety/>



Photo Credit: Siemens Gamesa.

Electrical Safety Awareness for First Responders

CanWEA Occupational Health and Safety Committee

Electrical Safety

Wind power generation facilities are distributed power plants with a range of low, medium and high voltage electrical infrastructure operating 24 hours a day.

What are the hazards?

Electrical components can be spread over a wide geographical area and can be categorized into four areas: wind turbine, electrical collection network, substation and transmission lines.

Each area may operate at a different voltage and carry the power of a communication signal, single generator, or a collection of generators and can be energized even when the turbine is stationary. It is important for first responders to understand the layout of electrical hazards at the facilities in their jurisdiction such as power transmission cables connecting the wind turbine tower, step-up transformers and the main substation.

Potential injuries

Personal injuries may span a range of minor electrical shock to electrocution and effects of high energy arc-blast. As with all power generation facilities the malfunction of electrical infrastructure may result in explosions, fires and energized surfaces. Resultant injuries can occur in multiple locations from the top of the wind turbine tower through to the central sub-station.

The importance of being aware

While incidents may be rare, due to the varied types of electrical infrastructure, first responders should understand the areas of the facility where injuries can occur during maintenance activities.

It is important to be aware of the distribution and diversity of hazards to workers

The role of wind farm staff

Wind turbine technicians are trained in high angle rescue, electrical safety and some first aid. They are typically the most qualified personnel on site to extract an injured worker. Emergency response plans are in place and rehearsed on site.

Communication with EMS and intermediate care is provided until first responders arrive.

Expectations of first responders

Wind farm staff depend on first responders to provide individual assessment, advanced care and transport of a patient after they are removed from the wind turbine or substation. Appropriate fire fighting equipment and capabilities are also expected from first responders.



Working with wind farm operators

Wind farm operators want to work closely with first responders to plan and train for the worst situations. Be sure to contact any facilities in your region to enable good communication and the best outcome from a potential incident.

Key facts

- Typical voltage ratings:
 - Wind Turbine Tower 690 V
 - Collector network 34.5 kV
 - Substation output 69 – 500 kV
- Wind operators are expected to follow local electrical safety regulations.
- Lock-out/tag-out systems are used to prevent hardware from being energized during maintenance operations.
- Wind farms can range in size from a single turbine to over 100 generators.