

6. Check that all straps are straight and close fitting and that the buckles are closed correctly.  
(Fig. 24)



Fig. 24: Safety harness correctly fitted

#### 6.2.4 Travelling Safety Hook

As a rule, the WTG is provided with two travelling safety hooks, which are stored together with the safety harness.

The manufacturer's instructions for use of the travelling safety hook are to be followed.

In combination with the safety harness, the travelling safety hook is a safety device for ascending/descending the tower via the ladder. Should somebody slip off the ladder, the travelling safety hook clamps on tightly to the safety rail and prevents a fall. The system consists of a fixed guide, fastening elements, and a travelling arrestor device. A steady straight-line ascent and descent of the ladder without the user leaning back in the harness is best way to ensure that the travelling safety hook runs freely.



**Warning!**

**Beware of hand injuries!**

A free running travelling safety hook can crush your hands if you grasp the device or the safety rail.

Keep your hands on the sides of the ladder during the ascent/descent.

## Using the travelling safety hook

1. Insert the travelling safety hook into the retaining eyes of the safety harness.
2. Push the travelling safety hook into the guide rail mounted on the ladder.
3. Ascend and descend the ladder slowly and carefully.



Fig. 25

## 6.3 Protective Equipment for Measurements on Live Components



Danger!

Danger! Electricity!

Contact can cause extremely serious injuries and even death.

Life-threatening hazard!

Special PPE is required for measurements on live components. This provides protection against electricity flowing through the body, e.g. as a result of touching live components in operation. Furthermore, it provides protection against accidental arcs caused by insulation breakdowns e.g. as a result of switching operations under load.

There are 5 danger classes, which require different protective clothing.

Danger class	Cal/cm <sup>2</sup>	Clothing
0	1.2	Untreated cotton
1	5	Fire-resistant shirt, fire-resistant trousers
2	8	Cotton underwear, fire-resistant shirt, fire-resistant trousers
3	25	Cotton underwear, fire-resistant shirt, fire-resistant trousers, fire-resistant overalls
4	40	Cotton underwear, fire-resistant shirt, fire-resistant trousers, fire-resistant overalls, double-layer protective jacket and trousers

Cal/cm<sup>2</sup> denotes the unit up to which the PPE resists the released energy.

A hard hat with a full-face visor and safety gloves are also required for each danger class.

## 6.4 Hooking Points

As a rule, the hooking points are marked in yellow and are designated with a statement of the permissible safe work load. These hooking points are to be used with a safety harness and lanyard with a fall arrest block to provide protection in areas where there is a danger of falling.



### Exchange of the rail

The nose cone rail and nacelle rail must be exchanged after any fall!

## 6.5 Abseiling Device

Not all wind turbine generator systems are supplied with an abseiling device. There is sometimes only a certain number of devices, especially in larger wind farms.

The abseiling device (e.g. abseiling device AG 10 K – RK Sicherheitstechnik) has a rope which is long enough for the respective height of the tower of the WTG.

The abseiling device is stored in a lead-sealed equipment bag, which is located in a net beside the hatchway to the roof of the nacelle.



Fig. 26: Equipment bag in the net

The abseiling device is used by the personnel to abseil from high workplaces. It is not a fall arresting device, instead it is used primarily for the rescue of personnel in the event of an accident or fire. In case of fire, it can be used to abseil from the roof of the nacelle of the WTG as a 2nd escape route.

As a rule, the hooking points for the abseiling device are marked in yellow and are designated with a statement of the permissible safe work load. The abseiling device is attached to the hooking point by means of a snap hook or to the roof rail by means of a sling rope and a snap hook.

**Attention!****Danger of accident with a defective abseiling device!****In an emergency, your life could depend on the abseiling device working properly!**

As a result, check the integrity of the seal of the equipment bag on each visit to the nacelle. The abseiling device is pre-assembled and is ready for use immediately after it has been removed from the equipment bag.

Carry out an additional visual inspection of the abseiling device immediately before use.



It is easy to operate the abseiling device incorrectly in emergency situations. As a result, ensure that you know how to operate the device and are familiar with the abseiling operation. Please also read the operating manual.

This is the only way to ensure that the correct maneuvers are carried out in an emergency.

**6.5.1 Abseiling from the Roof of the Nacelle**

Abseiling can take place individually or in pairs. The abseiling device may be loaded with a maximum of 225 kg up to a rope pitch of 100 m. Abseiling takes place at a speed of 0.7 m/s. The abseiling speed is regulated by means of a centrifugal brake.

A typical abseiling operation is described in the following. The procedure described may vary depending on the abseiling device. As a general principle, always follow the instructions of the manufacturer of the respective abseiling device!

1. Put on your safety harness correctly.
2. Secure yourself against falling by means of the lanyard. Step out on the roof of the nacelle.
3. Close the roof hatch.
4. Break the lead seal on the equipment bag.
5. Remove the abseiling device from the equipment bag.

Leave the rope in the equipment bag.



6. Attach the abseiling device to the roof rail of the nacelle by means of the sling rope and the snap hook.
7. Secure the snap hook with the clamping nut.
8. Throw down the equipment bag with the rope.

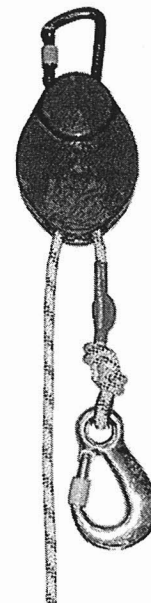


Fig. 27: Abseiling device

9. Check the condition and the correct functioning of the device.
10. Check the rope for loops and knots.



**Danger!**

**Interruption of abseiling through loops or knots!**

Loops or knots in the rope prevent abseiling, since the rope cannot run through the abseiling device if it has a knot. As a result, always check the rope carefully!

**REMOVE ALL LOOPS AND KNOTS FROM THE ROPE BEFORE YOU START ABSEILING!**

11. Hook the snap hook on the short end of the rope into the two textile chest rings of your safety harness.
12. Sit in front of the roof rail on the edge of the nacelle.
13. Ensure that the length of rope between the chest rings of your safety harness and the abseiling device is pulled taut.
14. Release the lanyard attached for your safety.
15. Slowly put your weight on the rope of the abseiling equipment.  
After you have let go of the nacelle and the roof rail, you will abseil at a speed of 0.7 m/s.

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16. After you have reached the ground, immediately release the snap hook from the chest rings of your safety harness.
17. A second person waiting on the roof can then hook in the snap hook of the end of the rope which is now at the top and abseil as described.  
The rope may have to be pulled through until the snap hook arrives at the top.
18. The device must be inspected by a technically competent person after a rescue or an abseiling exercise.

### 6.5.2 Care and Maintenance of the Abseiling Device

The textile components of the abseiling equipment may only be cleaned by the manufacturer.

If damage to the rope, snap hook or abseiling device is discovered, the escape equipment must be withdrawn from use and inspected by the manufacturer.

Under normal service conditions, a service period of 4-6 years can be assumed for the textile ropes.

The abseiling device must be inspected by a technically competent person or by the manufacturer after a rescue or an abseiling exercise or at the intervals recommended by the manufacturer at the latest.

## 6.6 Fire Extinguishers (optional)

Fire extinguishers are optional in the wind turbine generator systems (WTG). If fire extinguishers are supplied, the WTG is normally provided with a fire extinguisher in the tower and in the nacelle.



The locations of the fire extinguishers are identified by this sign.



**Danger!**

### **Danger: Electricity!**

De-energize the installation before using the fire extinguisher.

After actuation of the medium-voltage circuit-breaker, keep a safe distance of at least one meter from the fire when extinguishing!

**The fire extinguisher may only be used on electrical installations up to 1000V!**



Ensure that you are familiar with the function and the operation of the fire extinguisher. Only thus can you act quickly and purposefully in emergency situations.

The use of fire extinguishers must be practiced. The personnel deployed in the WTG must therefore be trained in fire-fighting at regular intervals.

The fire extinguishers must be regularly inspected by a technically competent person in accordance with the national regulations. A record of the check with the date must be permanently affixed to the appliance in an easily visible location. The directions for use (on the fire extinguisher) must be followed before fire-fighting.

### 6.6.1 Operating principle of the fire extinguisher – An example

As a general principle, always follow the instructions of the manufacturer of the respective fire extinguisher.

1. Remove the safety tab (1).
2. Press down the fire-extinguishing button (2).
3. The perforating disk of the CO<sub>2</sub> cylinder (3) is opened and the CO<sub>2</sub> released for charging the tank. The appliance is ready for use.
4. The extinguishing agent, which is under pressure, flows through the riser pipe (4) to the valve armature.
5. After the fire-extinguishing button has been pressed, the extinguishing agent flows through the hose line to the spray fog nozzle (5).
6. The jet of extinguishing agent can be interrupted at any time by releasing the fire-extinguishing button.

(Contents of the fire extinguisher: 5 kg)

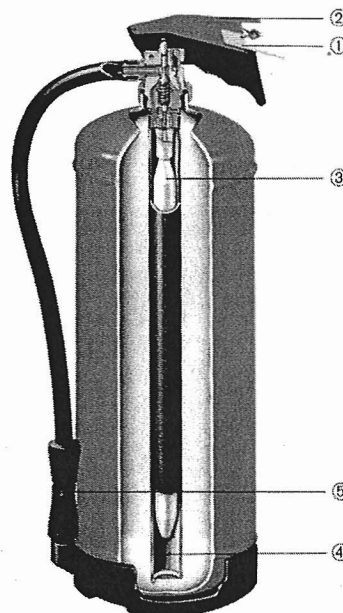


Fig. 28: Fire extinguisher - An example

### 6.6.2 Types of Fire Extinguisher

		Substances to be extinguished			
		Solid, glowing substances	Liquid substances or substances becoming liquid	Gaseous substances, also under pressure	Flammable metals (use only with a powder nozzle)
Types of Fire Extinguisher	Dry powder extinguisher with ABC dry powder	+	+	+	-
	Dry powder extinguisher with BC dry powder	-	+	+	-
	Dry powder extinguisher with metal fire powder	-	-	-	+
	Carbon dioxide fire extinguisher	-	+	-	-
	Water extinguishers (also with additives, e. g. wetting agent, antifreeze or corrosion inhibitor)	+	-	-	-
	Water extinguishers with additives which also extinguish liquid substances or substances becoming liquid in combination with water	+	+	-	-
	Foam extinguisher	+	+	-	-

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## 6.7 First Aid

First aid is used for the initial treatment of an accident victim until the arrival of a doctor or until transport to a hospital, in order to avert a life-threatening situation or to prevent secondary injury.



There is a legal obligation to carry out rescue measures provided that this is possible without considerable self-endangerment.

The plant may never be entered alone, so that a second person can send an emergency call. If the interphone has a landline connection, the emergency call can be made via the interphone. An operational cellphone is to be carried at all times, in order to be able to ensure rapid assistance in an emergency.

Proceed as follows in the case of an accident:

1. Keep CALM!
2. In the case of serious accidents and injuries, notify a rescue-center by interphone or cellphone.
3. Render first aid immediately.
4. Secure the scene of the accident.
5. Report all accidents (near-accidents, minor accidents, serious accidents) to your immediate supervisor. Also notify the EHS department of GE Energy.



**ATTENTION!**

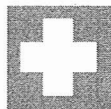
**Keep access to the WTG clear!**

The access roads to the plant must be kept clear at all times and be negotiable by car, in order to guarantee rapid and problem-free first aid in an emergency.

### First Aid Box (Optional)

The provision of wind turbine generator systems (WTG) with first aid boxes is optional.

A first aid box is located in the nacelle of the wind turbine generator system for the treatment of minor injuries. Any material removed is to be replaced immediately after use.



This sign identifies the location of the first aid box in the nacelle.

## 7 Safety Devices

The safety devices of the WTG comply with the requirements of the following standards:

- DIN EN ISO 13857: 2008 - 06 – Safety distances to prevent danger zones from being reached by the upper limbs and lower limbs.

The unauthorized removal or the overriding (by-passing) of safety devices is a punishable offence. Any liability claim is invalid in the case of damage.

Any point at which danger can arise and all drive units are provided with protective covers, which can only be undone and removed by means of tools. These protective covers may only be removed by qualified staff and only for the performance of service and maintenance or repair work. The protective covers are to be refitted immediately after completion of the work.

The owner / user of the WTG and the personnel deployed by him for operation, maintenance and repairs bear the responsibility for an accident-free work process.

### 7.1 Emergency Stop Pushbuttons

Any power-operated work equipment with dangerous movements must have one or - if necessary - several emergency control units for the prevention or reduction of an imminent or arisen danger, by means of which the dangerous movements can be stopped or rendered ineffective in another manner.

The emergency stop pushbuttons are not dependent on electronic logic.

Emergency stop pushbuttons (red mushroom pushbutton on a yellow base) are located on the control cabinet, the top box in the nacelle and the control cabinet in the hub.



Fig. 29: Emergency stop pushbutton



The EMERGENCY STOP pushbutton may only be pressed in situations, in which the safety of personnel or the WTGS and its components is threatened.

Pressing the emergency stop pushbutton causes the safety chain to open, and the rotor of the WTG is brought to a standstill via emergency braking. Initiation of the safety chain causes the rotor blades to travel to the feathering position in the [emergency] battery mode! In addition to this, the WTG is de-energized except for the control voltage.

### 7.2 Rotor Lock

The GE 1.5 series plants are equipped with two rotor locks.

### 7.2.1 Rotor Lock on the High-speed Shaft

The rotor lock on the high-speed shaft is located on the brake disk of the outgoing shaft of the gearbox. It must be engaged during all regular maintenance work on the drive train and for the physical inspection of the rotor hub.

Maintenance work on the drive train which requires the rotor shaft to be locked may only be carried out at wind speeds up to 15 m/s.

Maintenance work in the rotor hub may only be carried out at average wind speeds of less than 15 m/s. In this connection, the rotor lock on the high-speed shaft must be engaged. The rotor lock on the low-speed shaft **must not** be engaged.

If the turbine is unable to idle after a malfunction, the lock on the high-speed shaft must be engaged. It must be ensured that all three rotor blades are in the feathering position.

#### Engaging the Rotor Lock on the High-speed Shaft

1. Manual stop
2. Remove the locking pin of the rotor lock and advance the rotor lock as far as possible by means of the crank
3. If necessary, briefly actuate the "rotor brake" switch on the top box, in order to disengage the brake for a short time, thereby placing the brake disk in a better position.
4. Fully engage the rotor lock until the locking pin locks home again at the lower position.

### 7.2.2 Rotor Lock on the Low-speed Shaft

A lock is located on the rotor shaft flange of the low-speed shaft. This is only used for carrying out special work on the drive train. A sliding block or a sliding bolt which is guided in a fixture on the base frame is pushed onto the shaft flange in grooves or holes. The limit switch in the safety loop is opened as a result.

The rotor lock on the low-speed shaft may only be engaged up to the following average wind speeds:

- 8 m/s in the welded frame version up to 2004 (individual gusts up to a max. of 14 m/s)
- 12 m/s in the 1.5 xle (individual gusts up to a max. of 19 m/s).
- 15 m/s in the cast frame version and in the welded frame version from 2005 (individual gusts up to a max. of 24 m/s)

The current wind speed can be read on the SCADA display!



### Engaging the Rotor Lock on the Low-speed Shaft

1. Manual stop
2. Manually turn the blades to the 0 degree position
3. Position the rotor to engage the lock
4. Engage the rotor lock on the high-speed shaft
5. Actuate the service switch to disconnect the battery in the rotor hub
6. Engage the rotor lock on the low-speed shaft
7. If necessary, release the lock on the high-speed shaft after leaving the hub.

If the wind unexpectedly freshens, any installation work must be ended immediately, and the rotor lock must be disengaged in the reverse sequence.



ATTENTION!

Leaving the WTG with the rotor lock applied is strictly prohibited!

## 7.3 Emergency Lighting

In the case of a power failure, emergency lighting provides light in the tower and the nacelle. The emergency lighting is equipped with an independent power supply (battery), which provides voltage for the lamps for approx. one hour after a power failure. The WTG must be left immediately if the emergency lighting is activated as the result of a power failure.

## 8 Residual Risks

Even if all the safety requirements are complied with, a residual risk remains during operation of the GE Energy 1.5 Series wind turbine generator systems.

Anyone who works on and with the WTG must be aware of these residual risks and follow the instructions which prevent these residual risks from resulting in accidents or damage.



**Danger!**

### **Danger of injury during ascent!**

The full-body safety harness must be put on and attached to the safety rail by means of the travelling safety hook during the ascent to the nacelle, in order to prevent the person ascending from falling. Any oil or grease deposits on the ladder must be removed immediately to prevent anyone from slipping while using the ladder.

Ensure that your footwear is clean!



**Warning!**

### **Falling objects hazard warning!**

An object may be unknowingly and unintentionally dropped and hit and cause injury to somebody.

For this reason, only one person at a time may climb a section of the ladder between two platforms. The hatch covers must be closed again immediately after they have been passed through.



**Danger!**

### **Life-threatening hazard - working under suspended loads!**

Never stand under suspended loads.



**Danger!**

### **Danger of falling from the nacelle!**

The nacelle has a roof hatch for accessing the hub. You are exposed to strong winds when climbing out through the hatch. Attach your lanyard to the outside rail from inside the nacelle. Climbing out is only allowed at wind speeds up to 15 m/s.

As a general principle, there is a falling hazard at all higher locations / workplaces.

## 8.1 Special Dangers – Electric Power

Note the following rules when carrying out any work on the electrical components of the plant, e.g. assembly, connection, opening of a device, maintenance:

1. DISCONNECTION
2. SECURE against re-connection
3. Ascertain safe isolation from supply
4. Ground and short-circuit
5. Cover up adjacent live components or provide them with barriers

In addition, ensure that all drives are at standstill.



### Caution! Danger from electrical voltage!

When switched on, electrical installations and machinery have live exposed conductors or rotating parts. They could therefore cause personal injury or death and material damage if the cover and the prescribed safety devices are removed, or in the event of incorrect handling and maintenance and in the case of improper use. The above stated safety regulations must therefore be complied with, particularly when removing a cover.

In addition to this, electrical energy is still present in devices with power electronics even after the supply voltage to the device has been switched off. These devices are secured against unauthorized access. After waiting an appropriate time for the device to discharge (e.g. capacitors), always check for residual voltage before starting work.

FOLLOW THE RESPECTIVE LOCKOUT/TAGOUT INSTRUCTIONS! (cf. Chapter 13)

In the case of malfunctions of the energy supply of the wind turbine generator system, actuate the EMERGENCY STOP button immediately if the plant has not already been switched off by the automatic control system.

Only use original fuses with the prescribed amperage!

In the case of repairs, care should be taken that design features are not modified, so that safety is compromised (e.g. leakage distances and sparking distances in air) and that distances are not reduced by insulation materials.

As a general principle, maintenance work may only be carried out by two persons, so that the second person can actuate the EMERGENCY STOP button in an emergency.

Only use insulated and approved tools.

The control system and interlocking as well as the monitoring and protective functions (thermal motor protection, speed monitoring, overcurrent, fault to ground, etc.) may not be set out of function, even during a test run.

## 8.2 Special Dangers – Hydraulic System

For maintenance work on the hydraulic system, maintenance staff must be completely acquainted with the hydraulic circuit diagram and must have been instructed about its function and the possible consequences of an operating error.

Prior to any work on the hydraulic accumulators, it must be ensured that the accumulator circuits have been depressurized. The shut-down device is clearly marked and independent of the system management.



**Danger through stored residual hydraulic energy!**

FOLLOW THE RESPECTIVE LOCKOUT/TAGOUT INSTRUCTIONS! (cf. Chapter 13)

## 8.3 Special Dangers - Noise

The A-weighted equivalent continuous sound intensity level in the tower and the nacelle exceeds the permissible 70 dB(A) during operation. For some work, it may be necessary to place the WTG in operation or carry out a test run while personnel are in the nacelle.



**Anybody carrying out work in the tower or the nacelle when the WTG is in operation must wear hearing protection as part of their personal protective equipment.**

## 8.4 Special Dangers - Icing

### 8.4.1 Ice Build-up on the Rotor Blades

Ice build-up on wind turbine generator systems (WTG) and, in particular, the shedding of ice from rotor blades can lead to problems if wind turbine generator systems are planned in the vicinity of roads, car parks or buildings at locations with an increased risk of freezing conditions, unless suitable safety measures are taken.

If people or objects near the wind turbine generator system (within the distance **R\***) could be endangered by pieces of ice thrown off during operation, GE Energy always recommends the use of an ice detector.

The ice detector is installed on the nacelle. It is possible to detect the build-up of a small amount of ice by means of the ice detector. If this is the case, the ice detector sends a signal to the turbine controller. The turbine controller disconnects the wind turbine generator system from the grid and the rotor is brought to a standstill or rotates at a very low speed. A message about the icy condition is displayed on the monitor in the turbine. In addition, a message is sent to the service station and the operator via modem. The turbine does not

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restart until the detector is free of ice or the operator has satisfied himself of the ice-free condition of the rotor blades, has acknowledged the ice alarm message and restarts the plant.

However, ice may form on the rotor blades considerably more quickly than on the ice sensor on the nacelle. As a result, there is a residual risk for the reliable detection of ice build-up on the rotor blades.

The detector on the nacelle must be set relatively sensitively, in order to ensure that the time from when ice starts to build up on the rotor blades until the detector sends a message about the build-up of ice is as short as possible. As a consequence, a certain number of spurious trippings cannot be excluded. Loss of energy yield may occur as a result of the spurious trippings.

If an ice detector is not used, it is advisable to cordon off an area around the wind turbine generator system with the radius  $R^*$  during freezing weather conditions, in order to ensure that individuals are not endangered by pieces of ice thrown off during operation (cf. also Section 11.1).

$$*R = 1.5 \times (\text{hub height [m]} + \text{rotor diameter [m]})$$

(Recommendation of the German Wind Energy Institute DEWI 11/1999)

#### 8.4.2 Icy Condition of the Access Route

During the winter months, access to the plants may be very slippery due to ice or hard-packed snow. There is an increased danger of slipping.

cf. Section 11.1 on approaching and entering WTGs which may be frosted.

#### 8.4.3 Icy Condition of the Tread of the Steps outside the Nacelle

In the winter months, the tread of the steps outside the nacelle can be icy as a result of ice and hard-packed snow.

### 8.5 Exceptional Dangers – Earthquakes

In the case of an earthquake, the operator must inspect the WTG for damage. The following procedure is recommended:

- Determination of the acceleration values in the tower top which arose during the earthquake (PCH BOX).
- Contact GE Energy, in order to agree on the further procedure and possible inspection schedules.

## 9 Safety Information for Individual Plant Components

### 9.1 Downtower Assembly

The downtower assembly is the electrical cabinet lineup consisting of:

- Power distribution cabinet (PDC)
- Converter filter cabinet (CFC)
- Converter bridge cabinet (CBC)
- Main control cabinet (MCC)



**Caution! Danger from electrical current!**

All personnel remaining in the WTG must be located between the person carrying out the measurements and the tower entrance during voltage measurements on the low voltage main distribution or on the low voltage main control panel.



**Attention! Check the work area / control cabinet before completion of the work!**

Remove all loose parts, tools and materials from the control cabinets. Tools and materials left in the control cabinets lead to unsafe working conditions for the service technicians when the plant is put into operation again.

Close and lock the control cabinets before returning to service.

### 9.2 Anemometer and Wind Vane

The anemometer and the wind vane are intensely heated in WTGs with cold weather equipment!



**Hot surface!**

Disconnect the anemometer and the wind vane from the supply and allow both to cool down prior to maintenance.

Physical contact may cause burns.

### 9.3 Top Box

The top box is the electrical cabinet that resides in the nacelle. The main purpose of the top box is to distribute power to the up-tower wind turbine components.



**Caution! Danger from electrical current!**

All personnel remaining in the WTG must be located between the person carrying out the troubleshooting and the nacelle exit during voltage measurements.



**Attention! Check the work area / control cabinet before completion of the work!**

Remove all loose parts, tools and materials from the cabinet. Tools and materials left in the control cabinets lead to unsafe working conditions for the service technicians when the plant is put into operation again.

Close and lock the control cabinets before returning to service.

## 10 Conduct in Emergency Situations

### 10.1 Conduct in Case of Fire

In principle the WTGS consists of fire-resistant materials. However



**Fire, naked flames and smoking are prohibited!**

If a fire does occur, however, **call the fire department immediately!**

State the following information:

- Name of the person calling
- What is on fire
- Where the fire is located (seat of the fire / location of the plant)  
(You will find the site coordinates on the nameplate)
- Wind direction and wind strength

Note the following information in the case of fire:

- Saving lives has priority over fire-fighting
- Alarm all personnel who are in the WTG

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- Use the escape routes described in Chapter 10.2 – ensure that you are familiar with the various escape routes.
- Do not use the hoisting passenger suspension device.
- Burning debris can be expected to fall down if there is a fire in the nacelle or the upper part of the tower.
- If the wind turbine generator system is still in operation, it must be stopped and a large area around the plant cordoned off.
- Close the door of the plant.

### 10.1.1 Fire-Fighting

Fire-fighting may only be carried out by immediately fighting an initial fire using the fire extinguishers available in the plant. The locations of the firefighting equipment in the tower and the nacelle are marked.

If the initial fire cannot be extinguished within a short time, abandon any further attempts to extinguish the fire and call the fire department immediately.

In addition to the direct danger from the fire, a combustion toxicity hazard and the danger of asphyxia could also arise. As a result, move in a crouched position if smoke develops and also crouch down when attempting to extinguish the fire.



#### Attempts to extinguish a fire may lead to very serious burns!

Do not make any attempts to extinguish the fire, since the appropriate fire-fighting methods cannot normally be carried out without restrictions (minimum clearances cannot be adhered to). Very serious burns could be the result.

### 10.1.2 Fire in the Tower - Person in the Nacelle

- Leave the WTG immediately via the second escape route (cf. Chapter 10.2).
- Abseiling device in the nacelle - emergency exit using the abseiling device

### 10.1.3 Fire in the Nacelle - Person in the Nacelle

- Attempt to extinguish the fire.

If unsuccessful:

- Leave the danger area immediately via the first escape route (cf. Chapter 10.2).
- Do **not** use the hoisting passenger suspension device.
- Do **not** use the abseiling device.

#### 10.1.4 Fire in the Transformer



**Danger!**

Do not make any attempts to extinguish the fire – High voltage!  
Conventional fire extinguishers are not suitable.

- Leave the WTG immediately.

In the case of transformers in the tower:

- Leave the WTG via the second escape route

In the case of transformers in the transformer station:

- Leave the WTG via the first escape route

Fire-fighting may only be carried out by trained personnel.

### 10.2 Escape Routes



**Attention!**

**Keep escape routes clear!**

The escape and rescue routes must be free of obstructions (tools, equipment, rubbish, etc.), in order to ensure that the turbine can be evacuated as quickly as possible in an emergency.

#### 10.2.1 First Escape Route

In case of fire, leave the plant immediately. The first escape route from the nacelle is down the ladder in the tower. The descent is facilitated and made safer by resting platforms every 6 m. Do not use the hoisting passenger suspension device.

#### 10.2.2 Second Escape Route

If the descent through the tower is no longer possible, use the second escape route. (Abseiling with the abseiling device). This either leads over the roof of the nacelle (hooking point on roof rail) or through the emergency descent hatch which may be present (hooking point directly beside the winch in the nacelle, which is also present in this case).

#### **Correct use of the abseiling device:**

- Put on your safety harness correctly.
- Secure yourself against falling by means of the lanyard.

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**Case No(s). 12-0160-EL-BGN**

Summary: Application of Champaign Wind LLC, Vol III, Part 34 electronically filed by Mr. Michael J. Settineri on behalf of Champaign Wind LLC