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		Record ID:	
Ref: Analysis Emergency Preparedness, Define emergency preparedness measures			

Antrim Wind Farm

Onshore Emergency Response Plan

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1 Introduction

The purpose of this Emergency Response Plan is to outline to all employees, contractors and visitors the actions that they are to take in the event of an emergency situation arising at the Antrim Project Site ("project site" or "the project").

This plan addresses the foreseeable emergencies that may occur at the project site and the details the procedures and actions to be taken by those employees and explains broadly what rescue and medical first aid duties are to be performed and by whom.

2 Abbreviations and Definitions

3 Responsibility and Authority

EHS Manager in Projects (EMiP)	Develop the basic Emergency Response plan based upon the hazard risk assessment of the location of the project. Complete and update the emergency response plan based upon locally obtained information.
Site EHS Officer	Co-operate with Siemens EHS Manager in Projects about updating this EHS Plan and ensure that it is available on site Facilitate medical services for non-life threatening, serious injuries requiring ambulance, and serious injuries requiring helicopter. If there are issues with these services, communicate the issues to the EMiP and PM. Facilitate face-to-face meetings with local medical facility. Facilitate face-to-face meetings with the fire response team. Conduct emergency drill(s) as outlined in section 11 of this procedure prior to the first nacelle being erected and have that drill entered into the Incident Reporting Tool. Ensure that all persons who are present on site have access to emergency instructions and contact information. Ensure that emergency response equipment is present on site at all times, and strategically placed to provide 30 minute response to all turbines where technicians are working. This equipment is to be maintained in serviceable condition / in a ready state at all times. Ensure that all workers and visitors on site have received site emergency and evacuation instructions.
Segment EHS Manager	Responsible for the segment EHS emergency management setup as well as for the appointment and briefings of responsible persons.
Market Unit	Responsible for performing role as Crisis Support Team for regional company in the affected country with advice and support from the Security Officer. Responsible for business continuity planning.

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Regional Company	Responsible for crisis management.
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4 Potential emergency scenario assessment

Emergency response cards through XX shall always be a part of the emergency response plans as these scenarios are not based upon the location or the area, but inherent to the construction of a wind farm.

The below matrix provides different potential emergencies that might be present based upon the location / area of the wind farm site. If any of the below scenarios are present then an emergency response card shall be contained in the emergency response plan. (Ensure that the emergencies listed below that apply to the site have been included in the site EHS Plan.)

Potential emergency	Potential exists
Hurricanes or typhoons	
Tornados	
Flooding	
Earthquakes	
Tsunami	
Dangerous plants, insects or animals	
Riots, or civil unrest, terrorism	

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5 Emergency Notification List

	Name / Organization / Address	Phone number / e-mail
Fire :	[Name, address, local phone number]	
Police: []	[Name, address, local phone number]	
Ambulance	[Name, address, local phone number]	
Hospital	[Name, address, local phone number]	
Clinic	Name, address, local phone number	
Siemens Site Office		
Siemens Site Manager		
Installation Lead		
Siemens EHS Officer		
Siemens Project Manager		
Head of Segment EHS	[]	Phone number e-mail
EMiP	[]	Phone number e-mail
Crisis Management Coordinator Henrik Laidlow-Petersen	[]	(+45 9942 2896 or +45 2555 4647 cmpgr.pg@siemens.com
Country Crisis Manager		
Client Site Manager name		(Phone number e-mail
Other []		

Note: The general listing of responsibilities / services can be changed by the EMiP to be compatible with the organizational setup of the project and the local country / area.

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6 Wind Farm Map, Turbine Locations and Assembly Points

Site Address:

Site Map:

Assembly Points:

In the event of an emergency all Siemens / contractors/visitors personnel must gather at the designated assembly point.

- **Onsite assembly point: address**
- **Offsite assembly point: address**

See the site map at the page **XXX**

GPS information is recommended to list:

Turbine Coordinates

WTG Number	Easting/Longitude	Northing/Latitude
T1	Example:266603	Example:2058551
T2		
T3		
T4		
T5		
T6		
T7		
T8		

Note: Indicate which coordinate system is being used, such as GPS
(Global Positioning Satellite – Digital Degrees or DMS (degrees, minutes, seconds));
UTM (Universal Transverse Mercator) etc.

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7 Identification and Alignment with Medical Services

- Upon mobilization, the Site EHS Officer shall establish 24 hour medical care arrangements for site personnel based upon three levels of severity:
 - Non-life threatening injuries (Normal work hours and off shift work hours)
 - Serious injuries
 - Life threatening injuries
- A face-to-face alignment meeting shall be performed to cover the following topics with the medical clinic identified for non-life threatening injuries:
 - Confirmation that the facility is able to perform certain medical treatments as previously identified during project preparation
 - Introduce Siemens, contact persons and contact details and the type of work we perform and the location.
 - Explain our return to work injury/illness process and the use of the medical release form.
 - Confirm payment options
 - Clarify worker's compensation insurance process, if available
- Information gathered on each of the medical providers listed above should include: name of provider, address, contact person, telephone number, email, and means of contact, response time, and capabilities of the emergency resource and need to be clearly listed in the EHS or Emergency response Plan.

8 Identification and Alignment with Fire, Environmental and Community Services

- Upon mobilization, the Site EHS Officer shall establish fire, environmental and community arrangements for site personnel based upon three types of responses:
 - Fire
 - Hazardous Material Response / Cleanups
 - Police Department – Industrial action, bomb threats, community evacuations, etc.
- A face-to-face alignment meeting shall be performed.
- If appropriate, determine if there will be cost for use of services (environmental cleanup / response).
- Information gathered on each outside service providers used should include: address, contact person, telephone number, and means of contact, response time, and capabilities of the emergency resource.
- Once the emergency resources are identified, the Site EHS Officer should coordinate with these resources to effectively prepare for potential emergency situations. Coordination should include, as necessary:
 - Providing documentation of plans, procedures and/or maps of the site to the fire department or other responders;
 - Site tours for fire and medical response emergency resources;
 - Introduction/meet and greet of the fire, police and medical response resources to the site management teams (where possible to be held at the project site). This may require subsequent meetings.

9 Training

- At the site induction the site EHS officer shall document training of employees, contractors and visitors on this Emergency Response Plan. Routine re-briefing on emergency response should be provided throughout the project.

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10 Drills

- Prior to the first nacelle being erected one of the following drills shall be conducted:
 - Serious injury to a person building the rotor.
 - If a dummy is available, a person falls from mid tower platform to base.
 - All drills should be recorded in the Incident Report Tool.

11 Emergency Communication

At the Antrim Wind Farm, Siemens will provide each crew with a two-way radio set up with a dedicated emergency channel. If an open UHF radio channel is to be used for this purpose, prior monitoring should take place to ensure its use does not conflict with local landowners or emergency services. Note: some wind turbines, cell phones maybe needed in place of radios for two-way radio communication due to the topography of the site. At the completion of erection of each wind turbine, a communication assessment shall be performed to ensure communication capability from tower internals. Any deficiencies shall be documented in EHS KRIMA and corrective actions established.

- Site Office to Turbine Crew Emergency Notification
 - In case of an emergency situation, (i.e. evacuation of the site), a call on the emergency channel will go out to all crews with information from Siemens Site Management with instructions on how to respond, the severity of the situation, and what precautions should be followed.
- Turbine Crew to Site Office Emergency Notification
 - In case of an emergency situation, (i.e. an accident or fire), the crew to contact the site management immediately on the emergency channel and inform them of the incident and obtain instructions on how to respond to the emergency situation.
 - The site management will arrange for the required Emergency Services needed, by dialing **XXX**. In case of need for external Emergency Service on site (I.e. Ambulance) you can order the Emergency Service to arrive at below Emergency Points:

String Road #1 (example)
Emergency Point 1: address

Turbines 1 – 10 (example)
Emergency Point 2: address

See the site map at page **.

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12 Life threatening Accident / Illness on the Ground

Person	Action
On-scene Person	<ul style="list-style-type: none"> Stop the machinery or if chemical incident contact site management to understand hazards of chemical from the Safety Data Sheet(if applicable) Contact Site Management or EHS using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. Provide lifesaving first aid Assist rescue personnel as needed Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. Contact EHS-Officer Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EMiP in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is completed and results of tests are known.

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13 Fire and Explosions

Minor fires: Assess and attempt to control with a fire extinguisher

If unsuccessful: Evacuate.

Person	Action
On-scene Person	<ul style="list-style-type: none"> Utilize fire extinguisher if qualified and trained Notify all personnel in the turbine to evacuate immediately. If personnel are incapacitated, attempt to rescue persons in the turbine/area. Contact Site Management or EHS using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. In case of heavy smoke – attempt to get to the lowest point. Provide lifesaving first aid in a safe area. Assist rescue personnel as needed When outside keep clear of turbine and up wind of the fire. Retreat away from toxic fumes and falling debris and fire and wait for rescue personnel. Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical/fire-extinguishing help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. Gather persons – Count Persons. When EVERYBODY is out – stop the turbine. Contact EHS-Officer Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EMiP in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until initial diagnosis is given and results of tests are known.

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14 Electrical accidents

Person	Action
On-scene Person	<ul style="list-style-type: none"> Switch off the source power, if save to do so. Do NOT touch the casualty until the power has been switched off. Contact Site Management or EHS using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. Ensure AED is immediately provided to the location of the injured person following any electrical incident, regardless of condition. In case of heavy smoke – attempt to get to the lowest point. Initiate lifesaving first aid in a safe area. Continue first aid until emergency responders arrive. Assist rescue personnel as needed Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. When evacuated from the turbine, the casualty must be submitted to a medical examination at the hospital, including ECG and urinalysis testing. Contact EHS-Officer Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EMiP in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until initial diagnosis is completed and results of electrocardiogram ECG/EKG/urinalysis testing is known to medical personnel (initial diagnosis). Start investigation

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15 Large Spill of Oils or Chemicals

Person	Action
On-scene Person	<ul style="list-style-type: none"> Contact Site Management or EHS using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. Identify the source and shut off valves, pumps, etc to stop the spill from occurring if safe to do so. Obtain and wear correct personal protective equipment prior to attempting any clean up Reduce the impact of the spill and clean up to fullest extent possible by available means – follow the Safety Data Sheet information (e.g. use of spill kit, first aid kit etc. Make every attempt to prevent contamination to bodies of water Seal off the area to avoid other employees from exposure. Assist rescue personnel as needed Secure the incident scene
Site Management	<ul style="list-style-type: none"> If outside medical/ spill response is needed contact emergency services and determine the meeting location if not the turbine. Provide as much information as known to emergency services to allow provision of adequate response numbers and type Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. Gather persons – Count Persons. When evacuated from the turbine, the casualty must be submitted to a medical examination at the hospital. Contact EHS-Officer Contact Project Manager as soon as practicable and safe to do so Contact environmental authority if needed Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EMiP in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until initial diagnosis is given and results of tests are known.

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16 Evacuation from Turbines

In case of an accident, in which employee(s) are working in the nacelle or in the upper part of the tower, an evacuation may be necessary via direct descent from the nacelle to the ground using the emergency evacuation kit located in the nacelle.

Evacuation equipment is located in the nacelle. The equipment is a type MILAN, and can be used for emergency evacuation of personnel in a harness, or stretcher evacuation of an injured person, if descent through the tower is impossible.

Person	Action
On-scene Person	<ul style="list-style-type: none"> Assess the situation Contact Site Management or EHS using emergency channel for help and provide them with the nature of injuries, turbine number and the location in turbine. If passage through the tower is impossible <ol style="list-style-type: none"> Stay calm, make your way to the top of the turbine if possible and stay there until the rescue personnel arrive Maintain communication with supervisor/rescue personnel Open, if necessary, hatches to ensure that fresh air is available. If it is necessary to evacuate the turbine – choose the safest way out. Secure and inspect rescue equipment. If time is available, read through the evacuation procedure and ensure everyone involved understands their responsibility /duty. Find suitable anchor point and prepare the equipment. Evacuate the turbine – see pictures 1-11 next page. Assist rescue personnel as needed Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. Gather persons – Count Persons. When evacuated from the turbine, the casualty must be submitted to a medical examination at the hospital. Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is given

**** Your Personal Harness shall be worn at all times in the nacelle unless a risk assessment has been carried out to justify removal.**

All turbine kits shall have an evacuation harness included in the event of damage to primary working at heights harness.

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Evacuation from Turbine- SWT 2.3VS (Similar to 1.0, 1.3, 2.0 and 2.3 CS):

1



Secure equipment in certified anchor points.

2



Prepare harness from evacuation equipment.

3



Put on harness by stepping through the Leg loops.

4



Adjust harness and back

5



Height on the back support is adjusted

6



Anchor point lock

7



Anchor harness in evacuation equipment

8



Remove evacuation hatch

9



Throw out rope (opened)

10



Start evacuation and hold on to the rope

11



Let go of the rope after having passed evacuation hatch

12



Personal protection equipment (PPE) is primary choice

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Evacuation from Turbine-SWT 3.0-DD:



Attach the evacuation device to the approved anchor point above the evacuation hatch.



Prepare harness from evacuation equipment.



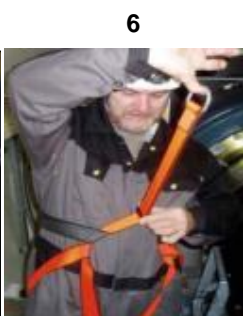
Put on harness by stepping through the Leg loops.



Adjust harness and back



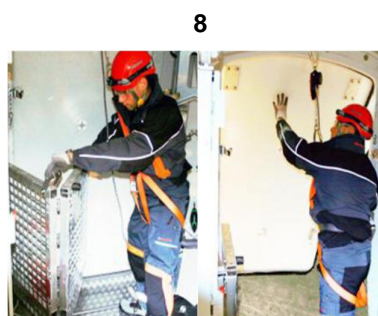
Height on the back support is adjusted



Anchor point lock



Anchor harness in evacuation equipment



Remove safety barrier and open the hatch



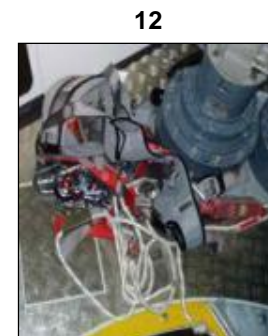
Throw out rope (opened)



Start evacuation and hold on to the rope



Let go of the rope after having passed evacuation hatch



Personal protection equipment (PPE) is primary choice

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17 Wind Turbine Rescue

Below are links to the Direct Drive (DD) and the Geared (G) platform wind turbine rescue descriptions based upon the different rescue zones identified in PRO 15833 Working at Height, Rescue from height and visitors in Wind Turbine Generator.

The rescue procedures contained in these two documents have been assessed and specific training developed with practical rescue procedures for the following scenarios:

- Rescue from tower ladder
- Rescue from inside generator (DD specific)
- Rescue from the blade and hub
- Rescue from top of spinner / rotor
- Rescue from bottom of spinner / rotor
- Rescue from cellar / basement
- Rescue from under the gear box (G specific)
- Rescue from under the yaw system
- Rescue from behind power unit / transformer unit

Direct Drive Wind Turbine Rescue Descriptions

Geared Wind Turbine Rescue Descriptions

Wind Turbine Rescue Descriptions should be downloaded from the link above and kept as a hardcopy which is applicable to the WTG type on the project site.

Person	Action
On-scene Person	<ul style="list-style-type: none"> Assess the situation Contact Site Management or EHS officer using emergency channel for help and provide them with the nature of injuries, turbine number and the location in turbine. Assist rescue personnel as needed Evacuate and rescue in a turbine tower– see pictures on previous pages. Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. When evacuated from the turbine, the casualty must be submitted to a medical examination at the hospital. Contact EHS-Officer Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is given

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18 Thunderstorm and lightning

Introduction

When thunderstorm activity is forecasted, site supervision should monitor closely the site actual weather conditions and / or the internet weather radar for the formation and location of thunderstorms.

Level 1 Lightning Alert – Lightning Within 48 to 80 km (30 TO 50 miles)

Level 1 Lightning Alert is defined as confirmed lightning between 48 and 80 km (30 – 50 miles) from the center point of the monitoring area where work is being performed.

In a Level 1 Lightning Alert, all personnel are to be made aware of the lightning in the area and should be prepared to stop work and seek shelter as the storm moves closer.

Work crews not yet deployed need to stand-by until “all clear” is communicated. Note - Site EHS and site supervision can make a determination based upon the direction of the storm if it is safe to deploy the technicians.

Level 2 Lightning Alert – Lightning Within 48 km (30 miles)

Level 2 Lightning Alert is defined as confirmed lightning less than 48 km (30 miles) from the center point of the monitoring area where work is being performed.

In a Level 2 lightning alert all personnel are to stop work immediately and seek shelter (exit WTG) until the storm passes and an “all clear” is communicated.

An “all clear” is given when lightning is greater than 48 km (30 miles) out from the site for greater than 30 minutes.

Level 3 Lightning Alert – Thunder is heard

Level 3 Lightning Alert is when thunder is heard at the site.

In this case the thunderstorm is likely to be with 15km (10 miles) of the site.

Personnel are not likely to have time to leave the WTG and must immediately proceed to one of the safe zones in the WTG (the platforms under the yaw section and at ground level – but not in front of electrical cabinets). Sit or stand at the center of the platform and do not touch the tower wall.

30/30 Rule

If you are not able to receive instructions from the site supervision / EHS on the location and direction of the thunderstorm, use the 30/30 Rule to decide on emergency actions:

If you see a lightning strike, count out 30 seconds. If you hear thunder within those 30 seconds, then the storm is close enough to stop the job for 30 minutes. Seek shelter within the WTG tower sections if in the nacelle or hub.

Note: For individual countries / localities, the terminology of “levels” can be changed to meet local practices

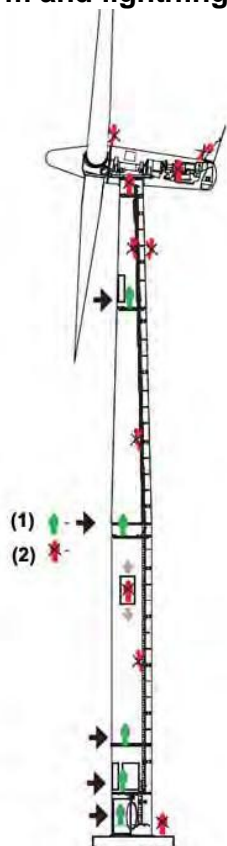
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Person	Action
On-scene Person	<ul style="list-style-type: none"> Remain in a safe location (see next page) inside of turbine. Contact Site Management using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. When the decision is made to evacuate, site personnel should leave the site and go to a safe location. Initiate lifesaving first aid if an incident resulting in injuries has occurred. Continue first aid until emergency responders arrive. Assist rescue personnel as needed Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. When evacuated from the turbine, the casualty must be submitted to a medical examination at the hospital. Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is given

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Thunder storm and lightning – Overview of safe areas



Note: The tower safe areas according to the above illustration are for guidance only, because tower configurations vary.

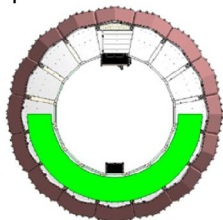
- (1) Safe area
- (2) Leave the area

All tower platforms, *EXCEPT THE YAW PLATFORM* are grounded and in general classified as safe areas. Do not touch the tower, ladder, and electrical components

Specific for platforms with electrical cabinets:

- If possible, choose platforms without electrical cabinets
- Stand to the side and as far away from electrical cabinets as possible and never in front of these. Keep cabinet doors closed.

Specific for BSS Bolted Steel Shell Tower:



In BSS Bolted Steel Shell Towers only the one half of the platform opposite the cable ladder is considered as safe zone.

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19 Winter weather and sudden sea side storms

Many sites may be subject to severe winter storms and sudden sea side storms which can bring heavy snow, ice, strong winds and freezing rain, as well as road closings, structural damage and power outages. Sites located in area which expects severe winter storms should:

- Be aware of changing weather conditions and should have procedures in place for early release of employees.
- They should also be prepared to shelter employees who become stranded at the site. This includes appropriate supplies of drinking water and comfort items.
- Following the emergency, they should repair any damage and remove snow and ice from parking lots, roads, walkways, work platforms and scaffolds.
- Consideration should be given to arranging welfare checks i.e. phone calls, to ensure employees have safely reached their destination, if departing in advance of severe winter storms.

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20 Hurricanes, Typhoons and Tornadoes

A- Hurricane / Typhoon / Tornado - Watch is issued

Early warning and accurate storm tracking are crucial and the site should have access to weather service information from radio or television about the path of severe storms and tornadoes.

Person	Action
On-scene Person	<ul style="list-style-type: none"> • Monitor radio, television, and computer for further information • Follow the precautionary actions <ul style="list-style-type: none"> ○ Check and verify adequacy of essential emergency equipment and supplies. ○ Begin to secure or store exterior equipment. No loose tools or equipment should remain in external areas. ○ Assemble equipment and materials to protect windows and other glass by boarding up or taping and to protect vulnerable doors by bracing. ○ Fill vehicle fuel tanks and obtain fuel for the emergency generators, if applicable. ○ Begin storing water in containers for emergency use or obtain supplies of bottled water. ○ Update all business records that may need to be removed or protected and computer data that will need to be backed up. • Stay in touch with site management
Site Management	<ul style="list-style-type: none"> • During storm season, ensure all vehicles are at least 50% fuelled at all times. • Monitor radio, television, and computer for further information • Implement Precautionary Activities: begin preplanning activities with the on-scene personnel for the threat of a hurricane/typhoon/Tornado. • Contact everyone on Emergency Channel and notify them of the situation timely.
Site EHS	<ul style="list-style-type: none"> • Monitor radio, television, and computer for further information • Take notes about the situation and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. • Accompany site management for notification and preplanning activities

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B- Hurricane / Typhoon / Tornado - Warning is issued

When warning is issued by the Local Weather Service, the project personnel in evacuation zones should be evacuated promptly when evacuation is issued by local officials. Remember that hurricane/typhoon and tornado evacuation routes can be closed by high winds or water many hours before a hurricane hits. If local officials do not recommend evacuation of the area, the project may still experience high winds and heavy rain generated by the hurricane.

Person	Action
On-scene Person	<ul style="list-style-type: none"> Follow the proactive actions <ul style="list-style-type: none"> Relocate vital business records and valuables to a safe location out of the area being evacuated. Backup computerized records and protect the backup copy. Relocate expensive equipment out of the area or move it to the most heavily constructed interior area of the facility. In the areas that could be subject to surge flooding, move equipment to levels above the possible surge level. Cover vulnerable equipment which cannot be moved with plastic sheeting to minimize damage in the event of roof leaks or broken windows. Brace inward opening exterior doors and any rollup doors. Close, lock, and board up large windows and glass doors. Board up or tape small windows. Turn off electricity and other utilities. Evacuate from the site and follow the evacuation routes as instructed by site management Prepare for loss of utilities for up to 72 hours, if no evacuation order issued. Stay in touch with site management.
Site Management	<ul style="list-style-type: none"> Notify to close the project if local officials recommend to evacuation or warranted. Accompany the site personnel to implement the proactive actions Contact everyone on Emergency Channel and notify them of the situation timely. Ensure that personnel have departed the facility before evacuation routes become impassable due to flooding or high winds.
Site EHS	<ul style="list-style-type: none"> Take notes about the situation and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany site management for notification and preplanning activities

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C- During The Hurricane:

It is assumed the project site will be closed.

D- After The Hurricane:

Reentering Evacuated Areas

- If you evacuated the project, you may have difficulty returning quickly because road may be damaged, blocked by debris, or flooded in low lying areas.
- Access to storm damaged areas may be limited by local law enforcement personnel to keep people out of areas with dangerous conditions, to facilitate rescue and recovery work, and to limit access to unoccupied properties.
- Initially, entry to storm damaged areas may be limited to search and rescue personnel, law enforcement personnel, firefighters, utility crews, and road clearing teams. Once it is reasonably safe, property owners and essential employees will be cleared to enter the area, but may require a permit or pass, or be included in an access list maintained by the city. Contact the local emergency management office to determine the procedures for returning to storm damaged areas.

Person	Action
On-scene Person	<ul style="list-style-type: none"> • Re-entering evacuated area if it's notified by site-management. • Checking the Project: <ul style="list-style-type: none"> ○ Look for obvious structural issues. ○ Check for downed or dangling electrical power lines. ○ Stay away from downed or dangling power lines. ○ Report all damage observations to management. ○ Do not attempt to cross any fast flowing or newly formed water courses ○ Be aware of potential for exposed sewerage or contaminated water supplies, leaked chemicals etc ○ Be aware of dangers from wild animals who may have been affected • Stay in touch with site management.
Site Management	<ul style="list-style-type: none"> • Use the radio, television, or computer to obtain instructions before attempting to return to the project. • Notify site personnel to re-entering evacuated project.
Site EHS	<ul style="list-style-type: none"> • Take notes about the situation and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. • Accompany site management for notification to re-entering evacuated area

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21 Flooding

To determine if a site is subject to flooding, consider (1) the history of flooding in the area, the elevation of the site in relation to streams, rivers and dams, or contact local emergency management organizations and (2) if the site is subject to flooding. Based on this information, the site should consider implementing flood-proofing measures.

Early warning of flood is crucial and the site should have access to weather service information from radio or television about flood watches and warnings.

Person	Action
On-scene Person	<ul style="list-style-type: none"> Assess the situation Contact Site Management using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. When the decision is made to evacuate, site personnel should leave the site and go to safe location (higher ground). Notify all personnel in the turbine to evacuate immediately. If personnel are incapacitated, attempt to rescue persons in the turbine/area. Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> Coordinate with the local community's emergency response plan / emergency responders, and assistance for site personnel who need transportation. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Gather persons – Count Persons. When EVERYBODY is out – stop the turbine. Contact Project Manager once the situation is under control. Excavations that have been subject to flooding are extremely unstable. Prior to resuming work in an excavation the soil should be retested by a suitably competent Engineer and damaged benching/slopes or shoring systems inspected and repaired. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is given

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22 Earthquakes

Project facilities including the wind turbines, towers, foundations and substations are all designed for seismic class zoning at project site. The wind turbines are all equipped with an over vibration sensors which will automatically shut down the turbine in the event of a severe earthquake.

Injuries and fatalities can be reduced by properly storing heavy objects (not placing them above head level) and placing furniture to prevent displacement and overturning that will injure personnel.

Person	Action
On-scene Person	<ul style="list-style-type: none"> Keep calm and preserve your own safety before considering others Keep clear of any equipment that could fall, topple or cause crushing. When the initial shaking stops, contact Site Management to confirm your location and wellbeing. Be aware, aftershocks are common following earthquakes If requested to evacuate, use the site access roads and do not attempt to drive off road. If the site access roads are blocked or damages, consider another route. If up-tower, personnel should remain in place and take cover. If in a vehicle (onsite or roads), stop the vehicle and do not leave it during the earthquake. Do not stop on a bridge, at an underpass, or in a tunnel, and keep away from buildings at the side of the road (danger of collapse). Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> Coordinate with the local community's emergency response plan / emergency responders, and assistance for site personnel who need transportation. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Gather persons – Count Persons. When EVERYBODY is out – stop the turbine. Contact Project Manager once the situation is under control. Damage to the site should be assessed and repaired. Prior to starting work, all structures, including scaffolding, site facilities, platforms, electrical services and equipment such as cranes shall be inspected. Personnel shall only return to the work site once instructed to do so by their supervisor. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is given

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23 Dangerous plants/Insects/Animals

Person	Action
On-scene Person	<ul style="list-style-type: none"> Remove the injured person from the source of the danger, if necessary. Keep the Injured person still and calm. Contact Site Management using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. Seek medical attention as soon as possible. Apply first aid if you cannot transport the injured person to the hospital immediately. *First Aid Treatment will be dependent on the nature of the injury (ingestion, bite, skin contact) and source of the contaminant* <ol style="list-style-type: none"> Lay or sit the person down with the wound/bite below the level of the heart. Tell him/her to stay calm and still. Cover the wound/bite with a clean, dry cloth. Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> If outside medical help is needed contact emergency services and determine the meeting location if not the turbine. Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. Contact Project Manager once the situation is under control. Establish an accident EHS Review Committee consisting of Site Manager, EHS Manager and EHS Officer if appropriate.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA. Accompany the injured person to the clinic or hospital and wait until an initial diagnosis is given

NOTE:

This is very locally specific – input to be delivered by regional company EHS or alternatively Corporate Medical Services on a case-by-case basis.

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24 Major component failure

Person	Action
On-scene Person	<ul style="list-style-type: none"> Stop work and assess the situation Contact Site Management using emergency channel for help and provide them with the turbine number or the nearest turbine, service or county road. Secure the incident scene / do not disturb accident / incident area
Site Management	<ul style="list-style-type: none"> Contact everyone on Emergency Channel and notify them of the emergency and assign a person to meet the emergency service at the meeting location. Gather persons – Count Persons. Contact Project Manager once the situation is under control.
Site EHS	<ul style="list-style-type: none"> Respond to the incident location and ensure scene is secured. Take notes about the incident and contact EHS Coordinator / Manager in order for them to initiate an initial report in KRIMA.

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25 Security incidents

Person	Action
On-scene Person	<ul style="list-style-type: none"> Assess the situation – risk to people, assets, processes or information? If safe then inform the supervisor of the situation and mitigate the risks. If the situation is not safe then alert the supervisor and relocate to a position of safety if possible i.e. the designated assembly point. If you cannot remove yourself safely from the threatening situation then stay calm, cooperate, do not provoke the threat, do not resist, avoid sudden movements, give short and precise answers, avoid eye contact and never pursue your attacker.
Site Management / Site Security Manager	<ul style="list-style-type: none"> For non-urgent incidents report incident information on http://www.siemens.com/incidentreporting For urgent cases contact the Regional Company Security Officer on +xx xxx xxx and the Division Security Officer 7/24 hotline on +45 2555 4647 The Corporate Security Office hotline can be used if contact cannot be established to the numbers above on +49 89 636 12345 Inform the Siemens Project Manager, who is responsible for communication with the customer if required. Report the incident to the local police, supported by the Regional Company Security Officer if required, and obtain copy of the report or receipt for submitting the report. Establish the loss (preferably in EUR) and secure evidence. Submit follow-up reports with the additional information and documentation on http://www.siemens.com/incidentreporting
Security Officer (regional company or division)	<ul style="list-style-type: none"> Advice and support Investigations

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26. Compliance incidents

Person	Action	
On-scene Person	DO	DON'T
	<ul style="list-style-type: none"> If a payment is not obviously due (for example a duty levied by an authority), ask for the legal basis for the payment demand and whether an official invoice or receipt will be issued. If in doubt whether the payment demand is legitimate, contact the responsible Regional Compliance Office or the CSO Hotline (+49 (89) 636 12345). If the payment demand is most likely unjustified - refuse to pay. If a situation of duress arise, i.e. a risk for life, limb or liberty – pay up. Document the incident and any payment truthfully and accurately and report the incident as quickly as possible to the responsible Regional Compliance Officer or the Compliance Officer responsible for you. Inform your line manager. 	<ul style="list-style-type: none"> Do not make any payment which is clearly unjustified and which goes directly to the pockets of the recipient. Do not yield (immediately) when the person demanding the payment attempts to put pressure on you. The "General recommendations for avoiding facilitation payments" provide useful guidance on how you can react to such attempts. Do not provoke the person demanding the payment to create a situation of duress. Do not attempt to conceal a payment, for example by paying out of your own pockets or by making false statements on your travel expense reimbursement form.
Site Management / Site Security Manager	<ul style="list-style-type: none"> For non-urgent incidents report incident information on http://www.siemens.com/incidentreporting For urgent cases contact the Regional Company Compliance Officer on +xx xxx xxx. The Corporate Security Office hotline can be used if contact cannot be established to the number above on +49 89 636 12345 Submit follow-up reports with the additional information and documentation on http://www.siemens.com/incidentreporting 	
Compliance Officer (regional company or division)	<ul style="list-style-type: none"> Advice and support Investigations 	

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Appendix A – Visualization of response levels

- Strategic level – Crisis Management
 - Tactical level – EHS Emergency Management
 - Operational level – Emergency Response
- Coordination with regional company (lead on crisis)
 - Reputation
 - Internal/external communication
 - Support for next-of-kin, repatriation of bodies, psychologic debriefings etc.
 - Stakeholder management
 - Legal damage limitation, insurance etc.
 - Resource allocation for e.g. business continuity

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- Coordination of support for staff evacuated to different hospitals
- Support staff who might need clothes, have lost passports, require temporary shelters etc.
- Coordinate rescue operation with ambulance service, search & rescue, police etc.

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- EHS Hazard Analysis
- Mitigation of identified hazards
- Respond to suddenly arisen situation
- Priorities: Save life and assets

EXAMPLE ON HOW A SCENARIO COULD MATERIALISE

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SWT 3.0 DD Rescue Description

Answers for Energy.

SIEMENS

Foreword

A compiled Rescue Description with standard rescue procedures for emergencies is Siemens Wind Power's Standard Operating Procedure.

The purpose of the Rescue Description is to communicate rescue procedures for various accidents and rescue scenarios for this Siemens Wind Turbine model. The Rescue Descriptions are primarily intended for Siemens Wind Power's Customers' Health, Safety and Environment departments. The rescue procedures in this document are based on the official Siemens internal *Working at Height, Rescue from Height and Visitor in Wind Turbine Generator* document, which determines safety, training requirements and Rescue Zones when working at heights in Siemens Wind Turbines. This wind turbine has been evaluated according to the requirements of the Global Wind Organization's Working at Heights and Siemens internal Advanced Rescue safety training and practical rescue procedures for this turbine have been developed. The rescue procedures in this document are individually evaluated and developed to comply with the official Siemens internal *Working at Height, Rescue from Height and Visitor in Wind Turbine Generator* requirements and the aforementioned safety training.

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3. Evacuation of Two Persons from the Nacelle 9

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Disclaimer

This description of rescue procedures is intended to serve solely as an outline of procedures and is in no way a substitute for proper training, experience, and good judgment. No guide can predict every situation nor anticipate the abilities of each reader. You must assume responsibility for your own safety and the safety of others while working at height. It is the reader's responsibility to seek qualified instruction on safe working and rescue at height and ensure compliance with Siemens Training Standards standard work procedures. This document is published with no liability to the authors, editors, or any person associated with Siemens Wind Power.

1. Rescue from the Ladder

Description

This chapter describes the procedures of rescuing a casualty from the inside and outside of the ladder brackets in a turbine tower, respectively. This rescue requires the Global Wind Organization approved "Working at Heights" safety training.



Inside of ladder brackets:

- Secure the rescue device to a structural anchor point above the casualty.
- Attach the rescue device to the casualty and "lift and lower" to transfer casualty's body weight to the rescue device.



- Lower the casualty safely to the ground. Administer First Aid and seek medical assistance.



Outside of ladder brackets:

- Secure the rescue device to a structural anchor point above the casualty.



- Attach the rescue device to the casualty and "lift and lower" to transfer casualty's body weight to the rescue device.



If casualty needs to be passed *around an obstruction* during descent:

- Rescuer secures to the outside of the ladder above the casualty with an adjustable lanyard.
- Rescuer feeds the rescue device rope through a karabiner attached to the side D-ring of the rescuer's harness.
- Using their legs to generate deviation in the descent, the rescuer navigates the casualty past the obstruction. If necessary, this maneuver is repeated until at ground level. Administer First Aid and seek medical assistance.

2. Evacuation of One Person from the Nacelle

Description

This chapter describes the procedure of single person evacuation. This rescue requires the Global Wind Organization approved "Working at Heights" safety training.



- Open the evacuation kit and remove the evacuation device from the SEAL PAC.



- Attach the evacuation device to the approved anchor point above the evacuation hatch.



- Don the escape harness or use Personal Fall Protection Equipment. Connect the evacuation device to the harness.



- Remove safety barrier.



- Open the escape hatch door. Ensure 100% tie-off when opening escape hatch door.



- Ensure no one is standing below. Shout "ROPE". Throw the rope bag clear of the turbine and visually inspect the rope for knots and sufficient length.



- Person steps out of the escape hatch while supporting their own body weight by holding on to the long end of the rescue device line.
- Person safely clears from the nacelle and keeps the moving line away from their body during descent.
- Evacuate down to the ground (onshore) or monopile (offshore). If necessary, administer First Aid and seek medical assistance.

3. Evacuation of Two Persons from the Nacelle

Description

This chapter describes the procedure of a two person evacuation. This rescue requires the Global Wind Organization approved "Working at Heights" safety training.



- Open the evacuation kit and remove the evacuation device from the SEAL PAC.



- Attach the evacuation device to the approved anchor point above the evacuation hatch.



- Don the escape harness or use Personal Fall Protection Equipment. One person connects the evacuation device to the harness. The other person stands well clear of the evacuation hatch.



- Remove safety barrier.



- Open evacuation hatch. Ensure 100% tie-off when opening escape hatch.



- Ensure no one is standing below. Shout "ROPE". Throw the rope bag clear of the turbine and inspect the rope visually for knots and sufficient length.



- Connect both persons to the evacuation device.



- Persons step out of the escape hatch while supporting their own body weight by holding on to the long end of the rescue device line.
- Persons safely clear from the nacelle and keep the moving line away from their bodies during descent.
- Persons evacuate and progress downwards until both persons are safely on the ground. If necessary, administer First Aid and seek medical assistance.

4. Rescue from Inside the Generator

Description

This chapter describes the procedures of rescuing a casualty from inside the generator and evacuating the casualty from the nacelle. This rescue requires both the Global Wind Organization approved "Working at Heights" and Siemens internal "Advanced Rescue" safety training.



- Climb into the generator to access the casualty.
- Connect pulley system to casualty's harness.
- Using the pulley system, pull the casualty out from under the generator.



- Pull the casualty out of the generator and into the nacelle.
- Connect an adjustable lanyard to the casualty's harness as backup.
- Tighten adjustable lanyard each time the pulley is raised.



- Secure the casualty to the Spineboard.
- Attach an adjustable lanyard to the back of the Spineboard to secure the casualty.
- Tighten adjustable lanyard each time the pulley is raised.



- Move the casualty towards the escape hatch.



- The casualty is now ready for evacuation from the escape hatch.



- Open the evacuation kit and remove the evacuation device from the SEAL PAC.



- Attach the evacuation device to the approved anchor point above the evacuation hatch.



- Remove safety barrier.



- Open evacuation hatch. Ensure 100% tie-off when opening escape hatch.



- Ensure no one is standing below. Shout "ROPE". Throw the rope bag clear of the turbine and inspect the rope visually for knots and sufficient length.



- Evacuate the casualty head first through the escape hatch using the Spineboard, or the basket stretcher if available.



- Lower the casualty to the ground.

5. Rescue from the Blade in Rescue Zone 2, 2a & Rescue from the Hub

Description

This chapter begins with describing the procedures of rescuing a casualty from the blade in Rescue Zone 2 and 2a. To rescue a casualty from the blade in Rescue Zone 2, 2a, the casualty must be moved from the blade to the hub. This chapter subsequently transitions to rescuing a casualty from the hub and evacuating the casualty from the nacelle. This rescue requires both the Global Wind Organization approved "Working at Heights" and Siemens internal "Advanced Rescue" safety training.



Rescuing a casualty from the blade in Rescue Zone 2 and 2a:

- Remove all accessories from the casualty's harness and secure the casualty onto the Spineboard.



- Guide the casualty out of the blade by passing the casualty through the manhole and into the hub.

The casualty is now in the hub.



Rescuing a casualty from the hub:

- Remove all accessories from the casualty and fit the cervical collar.



- Using the pulley, pull the casualty close to the hub opening.



- Pull the casualty out of the hub and through the generator.



- Secure the casualty to the Spineboard.



- Bring the casualty towards the escape hatch.



- The casualty is now ready for evacuation from the escape hatch.



- Open the evacuation kit and remove the evacuation device from the SEAL PAC.



- Attach the evacuation device to the approved anchor point above the evacuation hatch.



- Remove safety barrier.



- Open escape hatch. Ensure 100% tie-off when opening hatch.



- Ensure no one is standing below. Shout "ROPE". Throw the rope bag clear of the turbine and inspect the rope visually for knots and sufficient length.



- Evacuate the casualty head first through the escape hatch using the Spineboard, or the basket stretcher if available.



- Lower the casualty to the ground.

7. Rescue from the Top of the Spinner

Description

This chapter describes the procedures of rescuing a person from the top of the spinner and evacuating the person from the nacelle, respectively. This rescue requires both the Global Wind Organization approved “Working at Heights” and Siemens internal “Advanced Rescue” safety training.



- Lower the casualty from the top of the spinner using the rescue device.



- Guide the casualty out of the spinner by passing the casualty through the manhole and into the hub.



- Secure the casualty to the Spineboard.



- Bring the casualty towards the escape hatch.



- The casualty is now ready for evacuation from the escape hatch.



- Open the evacuation kit and remove the evacuation device from the SEAL PAC.



- Attach the evacuation device to the approved anchor point above the evacuation hatch.



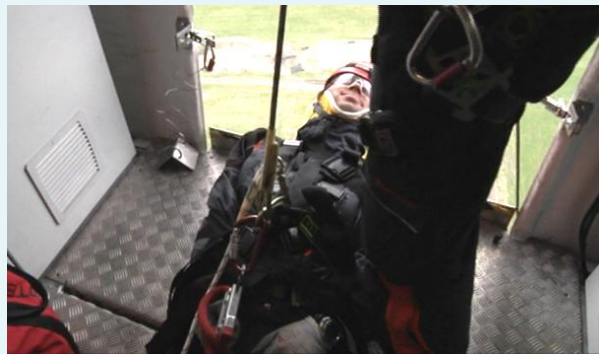
- Remove safety barrier.



- Open escape hatch. Ensure 100% tie-off when opening escape hatch.



- Ensure no one is standing below. Shout "ROPE". Throw the rope bag clear of the turbine and inspect the rope visually for knots and sufficient length.



- Evacuate the casualty head first through the escape hatch using the Spineboard, or the basket stretcher if available.



- Lower the casualty to the ground.

8. Rescue from the Bottom of the Spinner

Description

This chapter describes the procedures of rescuing a person from the bottom of the spinner and evacuating the person from the nacelle, respectively. This rescue requires both the Global Wind Organization approved "Working at Heights" and Siemens internal "Advanced Rescue" safety training.



- Remove all accessories from the casualty and place the cervical collar on the casualty.



- Raise the casualty from the bottom of the spinner using the pulley.



- Guide the casualty out of the spinner by passing the casualty through the manhole and into the hub.



- Secure the casualty to the Spineboard.



- Bring the casualty towards the escape hatch.



- The casualty is now ready for evacuation from the escape hatch.



- Open the evacuation kit and remove the evacuation device from the SEAL PAC.



- Attach the evacuation device to the approved anchor point above the evacuation hatch.



- Remove safety barrier. Ensure 100% tie-off when opening escape hatch.



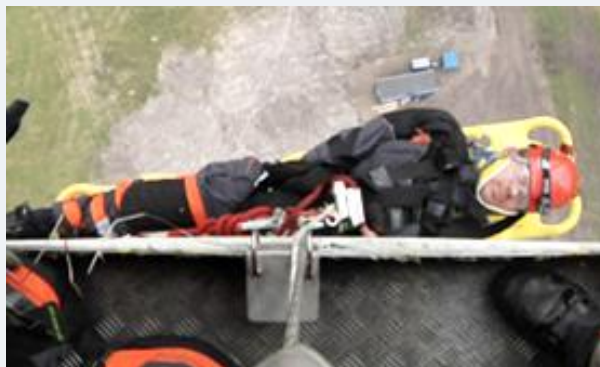
- Open escape hatch.



- Ensure no one is standing below. Shout "ROPE". Throw the rope bag clear of the turbine and inspect the rope visually for knots and sufficient length.



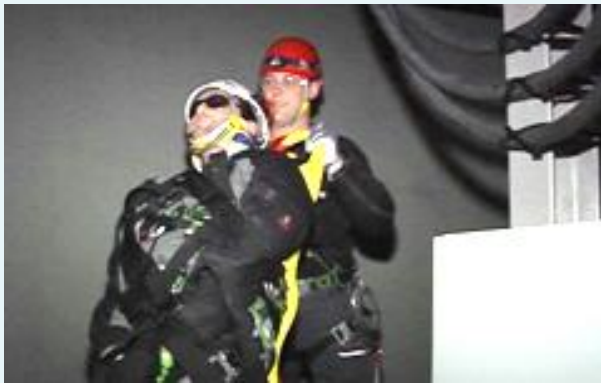
- Evacuate the casualty head first through the escape hatch using the Spineboard, or the basket stretcher if available. Lower the casualty to the ground.



7. Rescue from the Cellar

Description

This chapter describes the procedure of rescuing a person from the cellar. This rescue requires both the Global Wind Organization approved "Working at Heights" and Siemens internal "Advanced Rescue" safety training. This rescue is relevant for turbines designed with a cellar.



- Remove all accessories from the casualty's harness.
- Fit the cervical collar on the casualty.
- Secure the casualty to the Spineboard.
- Prepare pulley system for lifting casualty by attaching pulley to a structural or certified anchor point.
- Lift and twist walk the casualty towards the ladder and attach one end of the pulley system to the casualty.



- Attach an adjustable lanyard to the rear attachment point of the casualty's harness for backup. The adjustable lanyard is attached to a structural or certified anchor point.



- Attach the other end of the pulley system to a certified or structural or certified anchor point. Climb up the ladder and lift the casualty towards the platform.



- Back up the pulley system by tightening the adjustable lanyard each time the pulley is raised.



- Bring the casualty onto the platform and detach the pulley system from the casualty.



- Twist walk the casualty towards the next ladder and attach one end of the pulley to the casualty. Attach the other end of the pulley system to a structural or certified anchor point.
- Attach an adjustable lanyard to the rear attachment point of the casualty's harness for backup. The adjustable lanyard is attached to a structural or certified anchor point. Tighten the adjustable lanyard each time the pulley is raised or the casualty is lifted.



- Climb up the ladder to the next platform.
- Pull the pulley rope to lift the casualty to the next platform.



- Climb around the casualty and lift the casualty onto platform. Place the casualty on the platform floor.



- The casualty is now ready to be evacuated from the tower.

