

Appendix E
bij het Veiligheidsplan
SAFETY AT
OFFSHORE WIND PARK
RIJNVELD NOORD/OOST

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PREPARED BY



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1 Introduction

This document describes provisions, regulations and operations in relation to safety at offshore wind park Rijnveld Noord/Oost.

The wind park Rijnveld Noord/Oost consists of 72 wind turbines and one high voltage offshore station. All offshore wind turbines are identical, type V90, made by Vestas and have a variable speed. The V90 wind turbine has three upwind rotor blades. The rotor diameter is 90 m. The hub height of the rotor-axis of the wind turbines is between 62 m and 65 m above LAT.

The electrical infrastructure consists of the 22 kV cables from the wind turbines to the offshore high voltage main station. This power station transforms the 22kV to 150 kV for efficient energy transportation. One 150kV cable transports the electrical energy towards a 150 kV station onshore.

The wind turbines can be accessed by boat using the landing platform or the offshore access system.

The turbines can be recognized by a number which will be on top of the nacelle for recognition from a helicopter and at the side of the tower for recognition from a boat.

To access the wind turbines special training is required.

The document outlines the responsibilities and obligations of parties involved (e.g. Supervisors, Personnel, Client) in relation to safety.

2 Safety

2.1 Safety management

2.1.1 Supervisor's obligation and responsibility

The responsibility of the supervisor involves making the safety procedures comprehensible and relevant to the personnel on all levels involved, planning for, implementing and supervising appropriate safety measurements and keeping necessary records thereof.

On board of the service vessel the Captain shall maintain a register of all personnel (incl. Consortium's personnel and visitors) on board on a daily basis.

Each new employee will receive induction from his/her supervisor with the outlines of his/her job, including the safety aspects thereof.

2.1.2 Employee's obligations and responsibility

The employees are responsible for their own activities and for the protection of themselves and others. They are also responsible for the prevention of damage to the environment.

- Each individual employee is responsible to carry out his/her work in a safe manner and in accordance with the requirements of the Consortium Health, Safety and Environment Protection Policy.
- Each individual employee shall familiarise himself/herself with and make use of any information issued by the Consortium relating to safety and working environment matters.
- Each individual employee shall inform his/her supervisor and/or the safety officer and/or the safety manager of any potential hazard which he/she may identify during his/her work.
- No one shall undertake any tasks unless he/she has received adequate instruction and information, appropriate tools and equipment or protective clothing. If in doubt he/she shall seek guidance in procedures or contact his/her supervisor.
- Each employee has a duty to ensure that he/she does not compromise the safety and integrity of any plant equipment and to carry out his/her tasks in such a manner that his/her own safety or the safety of others is not endangered.

2.1.3 Other

All project personnel will be obliged, and also visitors to the site locations and vessels will be encouraged, to actively contribute to the safety of the work and to identify any safety topic.

2.1.4 Safety Meetings

In order to maintain and enhance the safety awareness of site personnel and crew members on vessel, toolbox or informal safety meetings will be held every fortnight. During the meetings possible hazards, problems on the job and related safe practices will be emphasised and discussed. Meetings will be attended by all personnel directly involved in the operations and will be chaired by the safety co-ordinator. Toolbox meetings will be organised before undertaking any non-routine or unusual activity.

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The outcome of the toolbox meetings will be on the agenda of the project group meeting, attended by the project leader, the site manager and the safety co-ordinator. It will also be discussed on the Safety Committee, summoned every second month.

All safety meetings will be minuted with action items and copy of the minutes will be sent to all the project safety managers

2.2 Risk Management

It is standard procedure of the Consortium to carry out an identification of hazard in relation to the various activities to be carried out and to make an assessment of the risks for personnel, equipment and materiel.

Well in advance of the actual activities the project team will carry out a hazards identification during a risk assessment meeting. For each hazard a critical factor will be established.

The result of the risk assessment meeting will be presented in a Hazid & Risk Assessment Report. This report will contain a list of identified hazards and for each hazard a table of the assessment of the risks. Each table will provide:

- Description of the operation
- Description of the activity
- Identified hazard
- Possible/potential effects to people and equipment
- Criticality factor for the risk
- Proposed risk reduction measures ("Plan van Aanpak")
- Any other safety requirement
- The residual risk

2.3 Personal Safety equipment

Personal protective equipment shall be understood as being any equipment, clothing or similar which is to be worn or carried by the user for protection against one or several risks which can endanger the user's safety or health.

During the performance of any work all personnel shall wear personal protective equipment where appropriate. The personal protective equipment shall give full protection against the risk it is intended to meet without acting as an irritant during work. It shall be designed to weigh as little as possible and be easy to put on and take off.

The user is responsible for the current and daily check of the equipment. The Consortium is, however, responsible for the yearly check if a such is prescribed.

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See Figure 1

1. Safety helmet with a chin-strap.
2. H-belt (delivered by Vestas).
3. Lanyards, one line with fall damping device, one line with shortening device (delivered by Vestas).
4. Fall safety device (delivered by Vestas).
5. Footwear with rubber sole properly tightened to the feet.

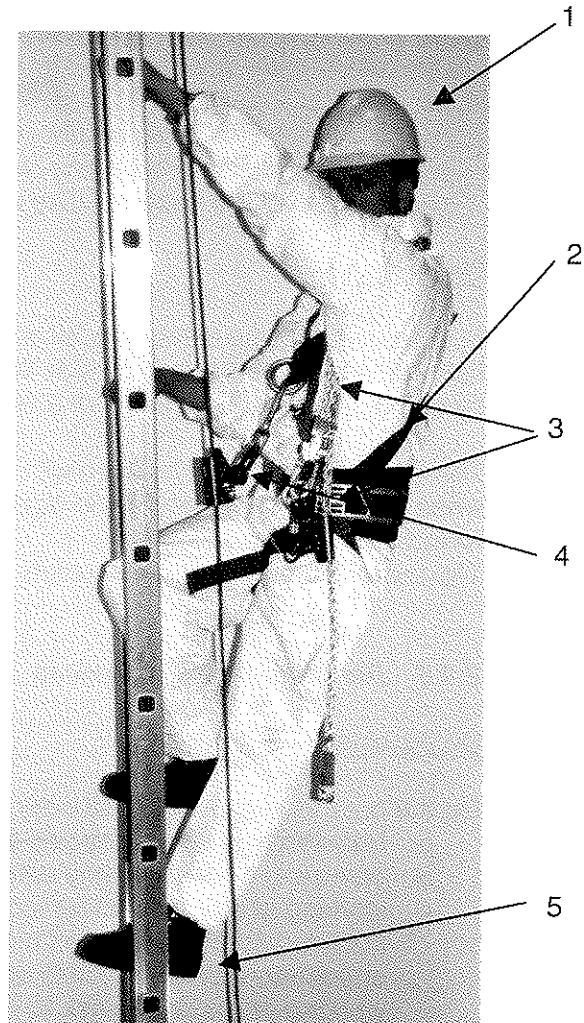


Figure 1

When climbing in the tower, the fall safety device must be fastened directly to the D-ring of the H-belt.

Before ascending the wind turbine has to be stopped.

Only one person at a time is allowed to ascend.

The safety equipment is to be checked before and after use.

If for some reason the service crew has to stay over for a longer period (estimated maximum time: 2 days) there is a survival kit available inside the tower.

This kit consists of:

- Medical kit, see Appendix "First aid kit"
- Sleeping bags
- Food and water supply
- Special clothing
- Flash light with back-up batteries
- Radio with back-up batteries
- Two-way telephone

2.3.1 Safety helmets

- The employer must ensure that:
 - the employees are provided with a helmet
 - the employees are instructed in the correct use of the helmet
 - instructions for use are available
 - The employees must use safety helmet where it is required.
- The helmet must be able to protect against shock from above and from the side.
- The helmet must be adjusted to the user.
- The user must inspect the helmet himself/herself and make sure the helmet is in order and that the expiry date of the helmet has not been exceeded.
- The helmet will not be called in for a check.

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In the wind turbine:

While working within the wind turbine the safety helmet shall always be worn during work or in places where there is a danger of touching live wires or where there is a risk of head injury:

- from materials, tools or other objects which topple, slip, fling out or fall down
- from projecting or swinging burden/loads
- caused by the head colliding with objects in confined spaces

On the boat:

In accordance to the safety regulations, all personnel and visitors on the boat must wear safety helmets whenever they are outside the accommodation. Safety helmets must not be modified by drilling, painting, decorating or attachment stickers.

The safety helmet must be fitted with a chin strap, which will be worn in position and secured when appropriate e.g. working in high winds, in elevated position, or in close proximity to a helicopter.

The use of aluminium or metal safety helmets is strictly forbidden.

2.3.2 Personal floating devicesOn the boat:

On the boat all personnel shall wear approved life vests or buoyant work vests when:

- transferring to/from any unit or structure at open sea or inland water
- operating or riding in any open or semi open water craft
- working at any over water location not equipped with handrail protection or working outside handrail protected areas. In addition the personnel shall be connected to the structures with safety belts and lifelines
- working on deck with risk to be thrown or washed overboard by wires, waves etc.
- during boat drills

The immersion suits (or equivalent) with a whistle, light and retro reflective material will be on board all units for all personnel and located in cabins if applicable.

During each boat drill, all persons will be checked if they are familiar with their immersion suit or life vest. After the drill, the immersion suits or life vests will be returned to their designated place and carefully checked.

Spare immersion suits/life vests will be stowed in the passengers accommodation, wheelhouse and near the lifeboat stations in appropriate, labelled boxes.

In the helicopter:

The life-vest worn inside of the helicopter may not be of a self inflatable kind (activated through contact with sea water): should the helicopter at water impact sink or turn over, the inflated life-vests will be an obstacle when leaving the helicopter, since it will force the passenger to the helicopter roof and thus prevent the passenger from leaving the helicopter.

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The manually inflated life vest used inside of the helicopter has one carbon dioxide filled cylinder, activated by pulling one of the red strings. The life vest can be in- or deflated using the mouth piece.



Figure 2

The life vest is fastened by a buckle, a waist strap and a crotch strap, all tightened properly. It is equipped with a spray hood, folded into the collar of the vest. It also has a transmitter, a whistle and a lamp, which runs on a fresh water battery, used to localise the person in distress.

During flight a survival suit must be worn. The survival suit has to be kept in a good condition, i.e. not torn and clean from e.g. oil spill. The zipper has to be closed and if the survival suit is equipped with a special locking device, e.g. zipper-fastener, this must be used. Documents are to be kept in special pockets on the survival suit.

When the survival suit is put on sharp edged objects, e.g. watch, should be removed. The life vests are only allowed to be taken off when inside the turbine or the tower.

The life vest is worn on top of the immersion suit and harness.

Hoisting:

When being hoisted the same life vest as onboard the boat is used, i.e. of a self inflatable kind. This means that the life vest has to be exchanged when leaving or entering the helicopter.

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2.3.3 Shoes

- It is mandatory that safety shoes/boots must be worn whenever outside the accommodation – on boat, in helicopter and whilst working inside the tower or turbine.
- The user of the protective footwear is responsible for the daily maintenance; if the shoes/boots are slippery through grease or mud, they have to be cleaned.
- The equipment will not be called in for check.
- Leggings can be used where there is danger/risk of sparks, molten metal splashes, corrosive substances.
- Knee protectors can be used where there is danger/risk of harmful effects of working while kneeling.
- In the accommodation area proper footwear should be worn.

2.3.4 Hearing protection

- The employer must ensure that:
 - The employees are provided with ear protectors if the noise level is very disturbing or the sound pressure level exceeds 85 dB.
 - The employees are educated in maintenance of the protective equipment.
 - Instructions for use are available
- The employee must use ear protectors if the work demands it. As a rule of thumb, hearing protection must be worn if a conversation at a distance of 1 m can not be followed.
- The user is responsible for the daily maintenance of the ear protectors.
- The equipment will not be called in for a check.

During helicopter flight and when being hoisted hearing protection should be used.

2.3.5 Eye protection

- The employer must ensure that:
 - Signs indicate where eye protectors shall be used.
 - The employee is provided with eye protectors where it is necessary.
 - The employee is educated in the use of the eye protectors and is informed of the risk if the protective equipment is not used.
 - The employee is educated in maintenance and cleaning of the eye protectors.
 - Instructions for use are available.
- The employee must use eye protectors where work demands it.
- The user of the eye protectors is responsible for the daily maintenance.
- The equipment will not be called in for a check.

Eye protectors shall always be used:

- Where indicated by compulsory signs.
- If work is performed in dust and draught.
- Where angle grinder and rotating wire brush are used.
- Where sandblasting is carried out.
- Where work is performed on systems filled with liquid (especially if these systems are under pressure), e.g. hydraulic systems.
- Where spray painting is carried out.

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2.3.6 Hand protection

Gloves are used to protect against mechanical or chemical effects, burns, cold and heat. In the data sheets over consumables (Substances and Materials manual 947614) it will be pointed out which substances can affect the human body.

- The employer must ensure that the employees are provided with gloves and that the employees are educated in the necessity of using gloves.
- The employee must use the protective equipment if required, however, this will often be a personal judgement.
- When the protective equipment is worn out or polluted it must be destroyed.

2.3.7 Breathing protection

Breathing protectors shall protect against inhalation of polluted air and/or lack of oxygen. In the data sheets over consumables (Substances and Materials manual 947614) it will be pointed out when and which type of masks that are to be used.

- The employer must ensure that:
 - The employee is provided with suitable breathing protectors which fit the employee and which will not cause unnecessary inconvenience.
 - Breathing protectors will be used during work.
 - The employee is instructed and educated in the use of the protective equipment.
 - The employee maintains and cleans the breathing protectors.
 - Instructions for use are available.
- The employee must use protective equipment where it is required.
- The individual is responsible for the daily maintenance.
- Masks will be called in for a check.

2.3.8 Fall safety protective equipment

Each employee has his/her own personal harness to be used within the tower as well as when being hoisted by helicopter.

The helicopter company assumes responsibility for the harness being suitable also for hoisting.

- The employer must ensure that:
 - The employee is provided with suitable protective equipment.
 - The system does not cause unnecessary inconvenience during work.
 - The protective system is used when circumstances are available.
 - The employee is instructed and educated in the use.
 - The employee is informed of the risk/danger if the protective system is not used.
 - The employee is educated in maintenance and storage of the protective equipment.
- The employee must use protective system where it is required.
- The employee is responsible for the daily check of the equipment (wire breaks, cracks, wear or other damages).
- The protective equipment will be called in for a check once (1) a year. Any repair must be performed by a competent company, normally the supplier.

2.4 Life saving equipment

2.4.1 Safety equipment onboard the boat

All units will be equipped with the necessary lifesaving equipment in accordance with the regulations and will be regularly inspected and maintained.

The safety equipment onboard the boat mainly consists of:

- I. Life rafts/boats
- II. Personal floating devices
- III. Ringbuoys
- IV. Additional safety equipment

The Captain is fully responsible for inspection and maintenance of the lifesaving equipment.

I. Life rafts/boats

The lifeboats will be maintained in the best possible condition. They will be fully equipped with radio, water (if applicable), rations and pyrotechnics at all times.

Detailed instructions for use and maintenance are described in the available training manuals.

Launching /handling instructions will be displayed in the accommodation and inside the life raft/boat. It is of the utmost importance that the operating procedures for the releasing gear of the units lifeboats are fully understood.

II. Personal floating devices

As described in 2.3.2

III. Ringbuoys

In a man overboard situation a ring buoy will be thrown near the person even if the buoy is out of reach to mark the approximate position and assist in the rescue operation (for each unit check with Safety Plan on correct location).

IV. Additional safety equipment

Additional safety equipment may consist of e.g. portable radios and distress signals. The location of the equipment is shown on the unit's Safety Plan.

