SAFETY SHEET
DELTA 4000 N149/4X TS125-01 AND TS105

RECORD OF CHANGES

REV.	DATE	DESCRIPTION
02	18/11/2022	Include technology with a 105 m tower. Update of wind speeds according to tower model.

AREA	WIND FARM
POST	OPERATION AND MAINTENANCE
TASK	Delta 4000 N149/4.X TS125-01 Wind turbines (with 125 m steel tower and CON Mass Dumper class 01) Delta 4000 N149/4.X TS105 Wind turbines (with 105 m steel tower and WITHOUT Mass Dumper)

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ACCESS TO THE DELTA 4000 WIND TURBINE	
RISK	PREVENTIVE MEASURES
General risks of the wind turbine (electrical contacts, falls from heights, etc.)	ENTRY FORBIDDEN TO UNAUTHORISED PERSONNEL! In towers model TS125-01 (125 m steel tower) with wind speeds greater than 15 m/s, it will be FORBIDDEN to go up to the nacelle due to the unlimited limitation imposed by the Mass Dumper. In 105 m steel towers, the speed limit is 20 m/s to climb the nacelle. The installation may be entered only by personnel suitably informed of its risks, duly trained in access and working techniques and properly equipped with the obligatory PPEs. Before starting any operation in the farm, attend the substation or control building or, at least, report your presence via telephone to the Wind Farm Manager/person responsible for the installation (Installation Manager). CECOER must be advised before entering any wind turbine. Place radio equipment at the base of the tower to communicate with the personnel in the wind turbine. Once in the turbine, a sign will be put on the entry door stating: “Operation forbidden, personnel working”. LOCAL and REMOTE blocking and signing of communications to prevent resetting without the authorisation of the technicians who are in the wind turbine. LIST OF OBLIGATORY PPEs - Obligatory use of the personal protection equipment required for each task: a) Safety footwear and helmet throughout the installation (wind turbine, farm, etc.). b) For working at height: - Safety helmet with chinstrap and headlamp - Safety footwear with non-slip soles - Harness - Avanti Runner 2000/2002 or Avanti Eagle DS anti-fall equipment - Double anchor line with energy absorber - Mechanical protection gloves - Anti-trauma devices c) A retractable anti-fall device will also be used for work on the fibre and exit to the outside of the nacelle cover. d) Eye protection for tasks with a risk of flying particles or fluids.

	e) Mechanical protection gloves in work that handles mechanical components, loads, tools, etc. Additional PPEs must be used in operations where so specified in the working procedures, safety sheets for chemicals and tool manuals (hearing, respiratory protection, etc.). OTHER NECESSARY EQUIPMENT - Tool fastening systems when there is a risk of them falling from height. - Emergency descent device: for work on the nacelle/tower. - Powder fire extinguishers: for any work with a risk of fire. MUSCLE DISORDERS - To prevent muscle disorders, a series of preliminary muscle stretching and warming up exercises will be done, personnel rotation, breaks, etc. Comply with the indications in the preventive resources instruction. Maximum number of persons in the nacelle: 6
Persons falling at the same level, persons falling to a different level	Take care on entering the wind turbine, especially on very windy days and when the steps are icy, wet or covered with snow. Always use the handrail when entering and exiting the turbine via the exterior tower ladder, as the door is at a considerable height. Avoid going up or down the ladder with both hands full. The surface area of the yards/work areas will be stable, clear of weeds and manholes without covers will be uncovered. To access the wind turbine doors, use the paths allocated for that purpose, avoiding movements down embankments, etc. If the rungs are covered in snow, ice, mud, oil, etc., clean them before use.
Trapping by the door	Take care when entering the wind turbine, especially on days with strong wind. Fix the door with the catch provided to prevent untimely closures or if there is no catch, keep the door closed. Do not have your hands full when closing/opening/blocking the door. Put your hands on the door handles to avoid trapping them. Under no circumstances should the tower door be locked close while work is being done in the wind turbine, whether the personnel is inside or outside.
Trapping by or between objects	Do not start work without first blocking the wind turbine's remote operation: all work inside and outside the turbine must be carried out with the machine stopped and its remote control disabled and blocked as per the LOTO technology communications sheet issued by Acciona.
Exposure to low frequency electromagnetic fields and electrical fields: converter line	Bear in mind that people with pacemakers or other similar medical implants with electronic devices may experience interference, in some models, at field levels lower than those established in the cited legislation. In this sense, any change in exposed personnel must be reported immediately and the opinion of the doctor responsible for the implant will be followed regarding their exposure. Inform workers that they must immediately notify if they are in the group of vulnerable people. Regarding people with implants, active and/or passive, (pacemakers, insulin pumps, metallic implants, Stent type implants, etc.), they must inform the company so they may be referred to health monitoring and the company can take preventive measures regarding limiting their exposure in these areas, according to the measures provided by health monitoring. Should it not be deemed appropriate to inform the company, they may inform the External Prevention Service. The workers will be prohibited from

	approaching the affected areas until Health Monitoring has assessed the case.
Blocks of ice/snow falling from the rotor and nacelle	Under no circumstances must anybody ever approach a wind turbine from which pieces of ice/snow are falling, neither in a vehicle nor on foot.
Falling objects	A safety perimeter must be cordoned off and signposted before working with hanging loads or with a risk of falling objects, as established in the marking instruction or, failing that, measures must be taken to guarantee that nobody who is external to the works can enter the risk area.
Wasp stings	Pay attention at the entrance to the wind turbine, door and ladder, as these are ideal places for wasps. If anyone suffers from diagnosed allergic reactions to any animal stings or bites, they must always travel with emergency treatment prescribed by their doctor.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: STAY ON GROUND	
RISK	PREVENTIVE MEASURES
Falling objects	Do not remain on the ground while work is being carried out at higher levels or loads or tools are being handled inside the tower if there is no effective intermediate protection against falling objects or tools.
Electrical contacts (bottombox and switchgear)	Work with electrical risk must be carried out by authorised or qualified workers only, as per Royal Decree 614/2001 on electrical risk. Strict application of the Five Golden Rules: 1. Disconnect power sources. 2. Prevent any possible reconnection. 3. Check for the absence of power. 4. Earth and short circuit. 5. Delimit the working area. Use suitable personal protection equipment for the power that is going to be worked on for those tasks for which it is established by law and in which there is a risk of electrical arc or contact: fireproof, dielectric gloves and protection screen. The equipment for electrical work must be revised as per the manufacturer's maintenance instructions and current legislation.
Explosion (switchgear operation)	At all times respect the operating sequence as set by the manufacturer. If there is a problem, do not force the control and report the incident. Do not operate switchgear with a low hexafluoride level. Follow the set procedure for resetting switchgear. Do not stay in the ground area while the wind turbine is being connected.
Fire	Try to put out the fire with hand-held extinguishers as long as this does not cause a serious risk to persons. If the fire spreads, activate the wind farm's Self-protection Plan. Whenever undertaking work with an electrical risk or risk of fire, first ensure that an extinguisher is at hand.

Hexafluoride poisoning (switchgear)	If hexafluoride leaks, open the door to ventilate the area. Since this gas is denser than air, a leak will accumulate at floor level, displacing the oxygen. Therefore, do not crouch down with a hexafluoride leak but leave the area and leave the door open for ventilation.
Trapping by the lift	Do not enter the lift's vertical plane at ground level, keep the lift area door closed while the lift is moving.
Falls	Should any section of tramex be removed from the ground, signpost the area. Do not leave the ground with sections of tramex removed.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: WORK UNDER THE TRAMEX ON THE GROUND	
RISK	PREVENTIVE MEASURES
Collisions, impacts against objects, falls, slips	Take great care to avoid collisions and impacts. Wear mechanical protection gloves. Do not leave tramex parts in unstable positions. Mark the access area while the tramex is being removed.
Electrical contacts	Entry is forbidden with power in the line. To enter the pit, the installation must be discharged, both the transformer and the feeder cables installed in the pit. Follow the "step by step" instruction for the technology.
Fire	Try to put out the fire with hand-held extinguishers as long as this does not cause a serious risk to persons. If the fire spreads, activate the wind farm's Self-protection Plan. Whenever undertaking work with a risk of fire, first ensure that an extinguisher is at hand.
Falling objects	Do not remain in the same vertical plane as work being carried out at higher levels or while loads or tools are being handled on a higher Tramex. Keep tools away from the area of the hatch and platform floor openings to prevent falling objects.
Forced postures, strains, etc.	All tasks that require adopting non-ergonomic postures for long periods must be accompanied by rest breaks to alleviate the physical effort caused by the task. To reduce the duration of the task, the use of automatic/hydraulic tools is recommended whenever possible. Use tools and equipment that facilitate work being executed safely. If the work requires kneeling, personnel should be given knee pads.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: HAILO LIFT	
RISK	PREVENTIVE MEASURES
General risks of the lift (electrical contacts, falls from heights, etc.)	The lifts can only be used by suitably trained personnel. It is strictly forbidden for the lift to be used by untrained personnel, those who have not mastered the instruction manual, and who cannot prove it with a record in this regard. The lift can only be used by a maximum of two people at the same time and cannot exceed the Maximum Working Load for the equipment.

	Before using the lift, preliminary checks must be done to guarantee its correct condition according to the supplier's instruction and maintenance manual. It is strictly forbidden to use a lift that has not been certified by the supplier, that is blocked by maintenance personnel, or whose correct condition is not guaranteed after a preliminary inspection carried out by the user. If damage or defects are detected in this inspection, during operation, or circumstances appear that are susceptible to compromising safety, immediately stop use and inform the Wind Farm Manager so they may organise its block and put up a sign stating "OUT OF SERVICE" until it is repaired and put back in operation. Do not use the equipment until the error has been remedied. All lift tests, repairs and replacements of components must be done by qualified workers authorised by the manufacturer. Always bear in mind that because a person is trained to use the lift does not mean they are qualified to carry out any repairs to it, and in the event of a breakdown, they are limited to informing the Wind Farm Manager so they may organise its block and put up a sign on the equipment until it is repaired and put back in operation. All new or repaired components that are installed in the lifts must be certified by the manufacturer. A life that is out of service for any reason must be disconnected from the power to prevent its accidental use and blocked using the LOTO procedure. It is prohibited to bridge any installed safety system and to travel in it on automatic mode. Use of the lift is prohibited in the event of a fire. In towers model TS125-01 (125 m steel tower) With wind speeds greater than 15 m/s, it will be PROHIBITED to climb the tower, therefore, it will be the speed limit for the use of elevators. In 105 m towers, the speed limit is 20 m/s for use of the elevator and access to the tower. The service lift is NOT a goods lift, so tools must be sent up using the hoist. If it is necessary to transport something (small tools and without exceeding the MWL of the equipment), this will be in a bag and will NOT block the lift exit in case an emergency evacuation must be done. When using the lift in automatic mode, do so from outside the perimeter enclosure, having previously checked that no anti-fall equipment, clothes or loose elements have become trapped in any element of the lift. It is prohibited to remain within the lift enclosure when in use.
Persons falling to a different level when using the lift	The preferred means of ascending to and descending from the nacelle is the lift, leaving the ladder solely reserved for emergencies, lift faults, etc. The lifts must be used only by personal duly trained in the instructions for use and the standards for action in an emergency. Before using any lift, check that its revisions are up to date (see the information on the relevant label) and carry out the preliminary checks before using it. Also check that the lifeline has been revised in case it has to be used. Personal protection equipment against falls from a height must be worn at all times (harness, double anchoring cable and anti-fall device). During use, also remain anchored to the anchorage point at the top of the lift. The lift's maximum load must be respected and safety devices must never be tampered with.

	Always remain anchored to a fixed point. Do not release the anchoring cable from the lift until attached to the ladder of the landing platform. In the opposite direction, do not release the anchoring line until secured with it inside the lift. Do not carry tools or objects in your hands that make it difficult to hold on. Support/grip only on firm and reliable structural parts. If the ladder opening is unprotected, remain anchored to a fixed point of the ladder.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: MOVEMENT AND STAYS ON INTERMEDIATE PLATFORMS	
RISK	PREVENTIVE MEASURES
Trapping by the lift	Before using the ladder, first guarantee that the lift is not going to be used at the same time. Do not cross the lift path when it is being used. The manufacturer's preliminary checks must be carried out before each use. Always travel inside and with all doors and hatches closed. Before starting its movement, always ensure the lift path is free of obstacles. The lift's maximum load must be respected and safety devices must never be tampered with. Do not use the ladder before ensuring that the lift is blocked and cannot be started. Movements outside the cabin are prohibited. Always travel inside and with all doors and hatches closed.
Persons falling to a different level using the ladder	Before using the ladder, first guarantee that the lift is not going to be used at the same time. Before ascending, check that the lifeline has been revised, place the anti-fall device correctly and check that the retention system functions as intended. If the lifeline is NOT APT, ascent to the nacelle can only be done using the ladder to eliminate a serious and imminent risk that affects the turbine. Always ascend and descend the ladder attached with the fall arrester to the lifeline; the ascent with double cable will only be permitted in justified cases (extraordinary or emergency situations). When moving on the ladder, the hands must be free. Caution when ascending or descending if shoe soles are soaked in grease or oil from an unexpected spillage. Caution when moving from the ladder to the tower platform and vice versa, pay attention to the distance between both elements. WARNING: Landings do not have an automatic folding mechanism. Ensure that the landings are correctly folded when about to move again. The ladder is equipped with folding landings every 9 m. Use them if you feel tired and have not reached any platform. Do not rest hanging from the anti-fall device. When disembarking on the platforms, do not release the anti-fall device until it has been secured with one of the anchoring lines. Caution when ascending or descending if the rungs or shoe soles are soaked in grease or oil. Always ascend or descend on the ladder anchored to the lifeline with the anti-fall device.

Collisions, impacts against objects	Wear mechanical protection gloves. Only one person will stay on the tower ladder.
Falling objects	Only one person can use the ladder at a time. Do not remain on the same vertical plane while work is being carried out at higher levels or loads or tools are being handled inside the tower. If it is necessary to raise or lower tools inside the tower, use certified equipment in good condition. Do not overload the bags to avoid trips. Tool bags must be closed. Do not carry loads/tools in your pockets. Use tool holding/fixing accessories. Do not leave loose material/tools on the platforms. Moving bags between platforms will be done slowly and carefully to avoid snagging and tipping of the load. Lifting bulky/heavy loads will be done on the outside of the tower using the hoist hatch.
Forced postures, strains, etc.	All tasks that require adopting non-ergonomic postures for long periods must be accompanied by rest breaks to alleviate the physical effort caused by the task. Use tools and equipment that facilitate work being executed safely, the use of automatic/hydraulic tools is always recommended whenever possible. If the work requires kneeling, personnel should be given knee pads. Do warm-up and stretching exercises before starting the ascent. Take regular breaks on the intermediate platforms and folding landings when ascending using manual means.
Fire or smoke in the tower	In the event of serious fire, activate the wind farm's Self-protection Plan and try to leave the installation as soon as possible to prevent injury , particularly from inhaling smoke. Use of the lift is prohibited in the event of a fire.
Persons falling to a different level	It is forbidden to climb on the handrails. Personal protection equipment against falls from a height must be used wherever there is no group protection or where the protection is not in good condition.
NORDEX DELTA 4000 WIND TURBINE	
FACTOR: MASS DAMPER (ONLY IN TOWER MODEL TS125-01, STEEL TOWER OF 125 M)	
Others (reduction of wind speed, etc.)	Mass Damper maintenance works cause the maximum access speed to the tower or nacelle to drop to 12 m/s.
Striking fixed objects	Take extreme care when passing underneath the Mass Damper or carrying out activities under it due to the risk of colliding with the support profiles.
Persons falling to a different level	Climbing on top of the Mass Damper without authorisation is prohibited. Any operation that requires climbing on top must be strictly defined and with the express authorisation of the person responsible for the installation.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ON THE YAW PLATFORM	
RISK	PREVENTIVE MEASURES
Falling from a height when moving from ladder to platform	Do not release the anti-fall device from the lifeline until secured by the anchoring cable. In the opposite direction, do not release the anchoring line until secured to the lifeline with the anti-fall device. Always remain anchored to a fixed point until the hatch is closed. Do not carry tools or objects in your hands that make it difficult to hold on. Support/grip only on firm and reliable structural parts. Always ascend or descend on the ladder anchored to the lifeline. Use of the anti-fall system is OBLIGATORY for using the ladder.
Falling objects	Keep objects and tools away from the platform opening. Do not work near the yaw platform or nacelle opening while there are persons on the lift landing platform or yaw platform respectively (working or just ascending to or descending from the machine). Gathered tools or material will be on the opposite side of the hatch. Take care that the anchoring cables do not drag the material making it fall through the hatch.
Fall to a different level	Keep the hatch closed during work on the yaw platform. In exceptional cases of needing to be on the hatch, remain anchored to an anchorage point.
Impacts/cuts with objects or tools	Take care not to collide with the upper end of the lifeline bar since it may have very sharp edges. Fasten the hatch in both the ascent and descent. Accompany its opening and closing with your hands. It is a heavy hatch and when open it can close suddenly.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ASCENT TO/DESCENT FROM THE NACELLE	
RISK	PREVENTIVE MEASURES
Persons falling to a different level	WARNING: THE NACELLE ACCESS LADDER IS SOME 4 METRES HIGH AND HAS NO LIFELINE. Instead there is a retractable cable at the top with a call cord to lower the hook of the retractable cable (or to put it away in a controlled manner). Access and descent are secured by this retractable device. Before ascending, check that the rail/ladder has been revised, place the anti-fall device correctly and check that the retention system functions as intended. When moving on the ladder, hands must be free. Caution when ascending or descending if shoe soles are soaked in grease or oil from an unexpected spillage.
Falling objects	If it is necessary to raise or lower tools in the tower, use suitable tool bags. Do not carry tools or materials in your pockets. It is prohibited to climb on to the roof protecting the transformer area. The floor cannot be walked on.
Fire or smoke in the tower	In the event of serious fire, activate the wind farm's Self-protection Plan and try to leave the installation as soon as possible to prevent injury, particularly from inhaling smoke. Use of the lift is prohibited in the event of a fire.

Impacts/cuts with objects or tools	When descending the ladder, do not release the hook suddenly, but do so gently, controlling the hook's ascent with the help of the rope attached to it. If a colleague is descending, wait your turn until the retractable hook is fully raised. Do not stick your head out because there is a risk of being hit by the retractable hook as it ascends.
Persons falling at the same level	Maintain cleanliness and tidiness. Any oil or grease stain must be removed because of the danger of slipping on it.
Striking fixed objects	Maintain cleanliness and tidiness and move in the nacelle with care and without haste.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: STAY IN NACELLE	
RISK	PREVENTIVE MEASURES
Falls when passing from the yaw platform to the nacelle and vice versa	Take great care when moving from the yaw platform to the nacelle and vice versa. Do not carry tools or objects in your hands that make it difficult to hold on. Support yourself only on firm and reliable structural parts. Maintain cleanliness and tidiness (clean passing spaces of oil and grease). Always remain anchored to a fixed point until the hatch is closed. To ascend the section of ladder that does not have a lifeline, use the retractable device installed on the nacelle. To do this, pull the cord to lower the hook and attach it to the harness. Now the ladder can be used safely. In reverse passage from the nacelle to the yaw platform, attach yourself to the retractable device, descend the ladder and once down unhook the retractable device and slowly let the cord retract until it is in its final position. Do not rotate the nacelle when in transit. Fasten the hatch in both the ascent and descent. Accompany its opening and closing with your hands. It is a heavy hatch and when open it can close suddenly.
Persons falling at the same level	Maintain cleanliness and tidiness. Any oil or grease stain must be removed because of the danger of slipping on it. Place non-slip materials in the passing spaces that are susceptible to falls: side of the frame, inside the hub, etc. Those areas designed for the purpose of preventing slips will be preferably used as passing areas.
Persons falling to a different level	Observe the following safety regulations before positioning yourself on the fibre: - Check the surface can be walked on. - Check there are no cracks or damage to the fibre that make you doubt its resistance. - If the surface cannot be walked on, attach yourself to a reliable anchoring point with the harness and energy absorber line. Do not overload the fibre surface , neither uniformly nor with spot loads. Whenever the hatch stays open, you must be attached by an anchoring cable to a secure point. Always keep the access hatch closed

Collisions and impacts against objects	Move in the nacelle with care and without haste. Take great care when moving in the nacelle since the confined space greatly increases the risk of collisions and impacts. Maintain cleanliness and tidiness. Maximum number of persons in the nacelle: 6
Forced postures	All tasks that require adopting non-ergonomic postures for long periods must be accompanied by rest breaks to alleviate the physical effort caused by the task. To reduce the duration of the task, the use of automatic/hydraulic tools is recommended whenever possible. Use tools and equipment that facilitate work being executed safely. If the work requires kneeling, personnel should be given knee pads.
Entrapment in the yaw ring	Whenever this part of the wind turbine is accessed, the TOPBOX selector must be blocked using the LOTO procedure. Also, all the machines in the fleet have a locking out logical system between the rotor bolts and the hatch opening so that it is not possible to open the hatch without first having blocked the rotor. Application of the yaw ring grease is done automatically so this point does not generate a risk, although carrying out any task that requires working in that area must be done in an area furthest away from the cogs with the rotation gearbox. Any task that involves opening the hatch giving access to this area requires the blocking of the rotor. This will be done by blocking the slow shaft. The tasks requiring access to this space and, therefore, the use of the above procedure, are: - Access to the hub - Greasing the yaw ring - Cleaning under the slow shaft - Checking the anchoring point under the tramex - Any task involving access under the tramex Enter securing yourself to the anchoring points described, using anchoring lines and a safety harness.
Entrapment in the power train	It is forbidden to remove any protective guard without first blocking the power train mechanically. Only trained personnel may block the rotor, following the instructions for the purpose. Block and signpost as established in the LOTO sheet for the technology drafted by Acciona. Maximum wind speed for blocking the rotor: 12 m/s. Wear mechanical safety gloves. Never try to turn the disc by pulling it directly with your hands. The machine must always be stopped. Exceptionally, and only to carry out certain checks that cannot be done any other way, these tasks must be strictly defined and their corresponding risk assessment done. Whenever technically possible, inspections inside the gearbox will be done with the shaft blocked with a LOTO device and brakes applied. Putting your hands inside the gearbox, wear loose clothing, pendants, long hair, etc., is prohibited.

Flying objects (maintenance of the hydraulic unit, opening of the gearbox cover, etc.)	Everyone working on the hydraulic unit must be familiar with the hydraulic distribution schematic. In order to dismantle any part of the hydraulic circuitry, the circuit must be discharged, power sources closed and blocked and check absence of pressure. Wear suitable protective gloves to prevent injuries from contact with oil on the skin and wear goggles. In tasks that require opening the gearbox cover/valve, wait until the oil has cooled down.
Inhaling or ingesting harmful substances	Cleaning the rings body, general cleaning, those tasks that require opening the gearbox cover or valve involve exposure to chemical pollutants: oil mist, graphite dust, ring body metals, etc.). Therefore, it is necessary to: • Wait for the gearbox oil to cool down • Suitably ventilate the area • Use an A2 respiratory filter face mask and eye protection Chemical product packaging must be correctly labelled at all times. The PPEs and hygiene control measures set out in the safety sheet by the manufacturer of the chemical product in question must be used at all times and without exception.
Fire	Whenever carrying out work with a risk of fire, ensure that the means described in the Self-protection Plan are available. In the event of fire, try to put it out with manual extinguishing means without putting yourself at risk at any time. If it cannot be extinguished, leave the nacelle immediately, either by the ladder (preferably) or with the emergency descender. Remember that there is a real risk of suffocation, so breathing must be as gentle as possible. Protect the mouth and nose with a cloth, T-shirt or similar. All hot work requires a work permit. The hub has a visual alarm system with a code of colours that warns of situations of risk (high wind, fire, etc.). Before entering the hub, you must know the alarm signals that require evacuation of the hub.
Electrical contacts in electrical cabinets, electrical components and wiring	Keep electrical cabinet doors closed once work is complete. Work with electrical risk must be carried out by authorised or qualified workers only, as per Royal Decree 614/2001 on electrical risk. Strict application of the Five Golden Rules. Use suitable personal protection equipment for the voltage that is going to be worked on for those tasks for which it is established by law and in which there is a risk of electrical arc or contact: fireproof, dielectric gloves and protection screen. The equipment for electrical work must be revised as per the manufacturer's maintenance instructions and current legislation. ATTENTION: the switchgear cannot be handled or transformer voltage removed or restored with personnel in the nacelle. The personnel must descend to yaw level when these operations are going to be done.
Asphyxia	The cabinets in the nacelle are equipped with a CO2 firefighting sprinkler system; before opening these cabinets, disconnect this system at the unit. Remember to activate the firefighting system when leaving the nacelle.

Explosion (power cabinet)	Cabinets will be opened after carrying the necessary actions to remove the power from the corresponding part of the cabinet. Only authorised/qualified personnel will open the power cabinet after having waited the necessary time for the capacitors to discharge. ATTENTION: the switchgear cannot be handled or transformer voltage removed or restored with personnel in the nacelle. The personnel must descend to yaw level when these operations are going to be done.
Persons falling to a different level: EMERGENCY EVACUATION	There is a solid anchoring point in the nacelle for fitting the descender if evacuation is necessary. This point is next to the hoist and the evacuation must be carried out through the lower hoist hatch. The point is elevated and has an extension (EN795 certified) to facilitate installing the descender at a height that ensures its correct control and operation. The descender must be installed with the hoist hatch closed; open it only when the descender has been fully assembled.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: LIFTING LOADS WITH THE HOIST	
RISK	PREVENTIVE MEASURES
Objects falling from the hoist hatch	Access to the wind turbine will be free from the risk of falling objects when lifting loads; to do this, the nacelle will be turned away from the door so that the entrance does not coincide vertically with the hoist. Keep the hoist hatch closed once the load has ascended to prevent it from falling, and if there are loads or if loads are handled near the hatch and they are susceptible to falling. Comply with the indications in the technology safety instruction. Before assembling the hoist, cordon off the area with a safety perimeter taking the movement of the loads into account. Comply with the indications in the marking instruction. Before using the hoist: • Check that the equipment's revision is up to date • Check that all parts of the lifting system are in good condition (shaft, chain, hook, motor, etc.) • Carry out the manufacturer's preliminary checks • It is forbidden to use it if any defect is found • Check no one is in the area of the vertical plane The nacelle technician must not start assembly operations until the wind turbine yard personnel are outside the cordoned-off area. This area may be entered only to connect or disconnect the load from the hoist hook when the chain is on the ground. Close the nacelle hatch (it will stay closed for as long as the work permits). Bags can only be unhooked when they are supported inside the nacelle. It is prohibited to unhook hoist loads if the hoist is in tension. Use tool bags with a closing system for lifting loads, they must be suitable for the size and shape of the loads. They must be in a good state of conservation with the EC mark and current revisions as set by the manufacturer. Before starting the operation, check that the loads are properly secured, correctly inserted in the tool bags with nothing protruding

	and without exceeding the MWL. It is forbidden FOR ANYTHING TO PROTRUDE FROM THE BAG EVEN IF IT IS TIED DOWN. If more than one bag is used, grabs must be used. There must be only one bag per hook. The hoist operator must watch the load at all times and must not leave the controls at any time. Take great care when passing loads into the nacelle to prevent the bags from catching or tipping over. If the load does not enter correctly, stop the hoist immediately. Make as many trips as are necessary to lift loads safely. In strong wind, loads must be held with a guide rope to prevent their hitting the tower. It is forbidden to raise small loads in strong wind without an effective system for controlling them from the ground. The worker guiding the load must remain outside the danger area away from any possible falling objects. It is forbidden to leave the area while loads are hanging. It is absolutely forbidden to leave loads hanging from the hoist hook. Keep tools away from the area of the hatch to prevent falling objects. It is prohibited to rotate the nacelle with the load lifting system installed. Once the load has ascended /descended, disconnect the system. Fix both hatches to prevent their unexpected closing. The loading area on the ground must be done at 90º from the hatch vertical.
Falls to the same level	Pay attention to the surroundings, so as not to trip over. Maintain cleanliness and tidiness in the nacelle passages, moving the bags out of the passageways. Loading/unloading of elements from the hoist will be done on a flat surface that can be accessed by the vehicle. Loading/unloading will not be done on inclines.
Fall to a different level	Whenever the hatch stays open and the hoist is in use, you must be attached by an anchoring cable to a secure point. Keep the area clean and tidy. Before opening the hoist hatch, open the two railings that close off the access on both sides of the passageway.
Collisions/accidents	It is prohibited to approach the load to guide it until it is at ground level.
Strains, entrapments	Make all the necessary trips to move the load safely to avoid pulling it. Tool bags must be suitable in size and shape for the loads and for the size of the hoist hatch in the turbine. Grip loads firmly and with great care. Use approved elements for lifting loads. Do not place the hands on moving parts. Wear mechanical safety gloves. Following these steps for loading heavy components: - Access the load point by car - Hook the load directly onto the hoist from the car - When the load is attached. Give instructions to the colleague to begin the ascent - Accompany the load until it is vertical The same steps will be followed in reverse for loading heavy components into the vehicle.

Collisions with the hatch due to accidental closure	Once open, ensure closure of the metal hatch to prevent its accidental closure

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: WORKS ON THE TRANSFORMER	
RISK	PREVENTIVE MEASURES
Exposure to electromagnetic fields	There may be electromagnetic fields that exceed the predicted levels for particularly vulnerable workers (those who are pregnant, who wear pacemakers or other similar medical implants with electronic devices, metal implants, Stent type implants, etc.). Therefore, all sensitive or restricted personnel must be informed of these risks before entering. Inform workers that they must immediately notify if they are in the group of vulnerable people (those who are pregnant, who wear pacemakers or other similar medical implants with electronic devices, metal implants, Stent type implants, etc.). They must inform the company so it can take preventive measures regarding limiting their exposure in these areas and refer them to Health Monitoring to assess the case. Should it not be deemed appropriate to inform the company, they may inform the External Prevention Service.
Electrical contacts	The equipment for electrical work must be revised as per the manufacturer's maintenance instructions and current legislation. Work by unauthorised persons is forbidden. High Voltage. Danger of death. It will be necessary to open and ground the line before operating. Access to the Transformer area is prohibited if it is energised. All electrical work must be carried out as per Royal Decree 614/2001 on electrical risk: strict application of the Five Golden Rules, use suitable personal protection equipment for the voltage that is going to be worked on for those tasks for which it is established by law and in which there is a risk of electrical arc or contact according to the manufacturer's maintenance specifications and current legislation. Establish the same safety measures in those tasks in which the safety distances can be invaded with active parts from outside the methacrylate protection of the transformer. The flexible tubes of the electrical wiring that passes through the transformer area are not considered a suitable physical barrier so the installation should be discharged if it is necessary to wire or introduce metal elements in these conduits.
Collisions and impacts against objects	Take great care to avoid collisions and impacts, particularly when passing from the ladder to the nacelle cover through the hatch.
Falling objects.	Keep the vicinity of the hatch free from objects and tools that are susceptible to falling through the gap.
Fire (short circuit of a transformer component)	Try to put out the fire with hand-held CO2 extinguishers as long as this does not cause a serious risk to persons. If the fire spreads, activate the wind farm's Self-protection Plan. De-energise the wind turbine or the alignment.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ACCESS TO THE HUB	
RISK	PREVENTIVE MEASURES
Falls to the same and different levels	Move by securing yourself against falls from height at the different anchoring points before completely entering the hub. Check the position of the retractable device cord/safety line so it is not an obstacle to movement. Before starting the tasks, check the access covers to the blades are in good condition. Clean the passageways of oil and grease and previous tasks prior to starting work in the hub. Keep the work area suitably lit. Although the hub has a lighting system, it will have adequate artificial lighting devices to guarantee proper visibility inside the hub.
Trapping	Only trained personnel may block the rotor, following the instructions for the purpose. Block and signpost as established in the LOTO sheet for the technology drafted by Acciona. The maintenance team must be perfectly coordinated so there are no unforeseen movements and without warning the pitch system. Maximum wind speed for entering the hub: 12 m/s. All the machines in the fleet have a locking out logical system between the rotor bolts and the hatch opening so that it is not possible to open the hatch without first having blocked the rotor. The pitch rotation system of the blades will be blocked via LOTO. The pitch cannot turn with people inside the hub. If for any justified reason, it is necessary to carry out this operation, the task must be strictly defined and the corresponding risk assessment carried out.
Falling objects	Whenever work is going to be done in the hub, a safety area must be cordoned off at the base of the wind turbine to prevent people from entering the vertical plane of the rotor and the nacelle. If it is necessary to carry tools, use suitable tool bags to prevent them from falling and to keep your hands free. Do not carry loads in your pockets. Use tool holding or clamping accessories.
Forced postures	All tasks that require adopting non-ergonomic postures for long periods must be accompanied by rest breaks to alleviate the physical effort caused by the task. Wear knee pads. To reduce the duration of the task, the use of automatic/hydraulic tools is recommended whenever possible. Make all necessary trips to introduce tools/spare parts effortlessly.

Irritation to the skin, eyes and respiratory tract when handling damaged batteries	The blades' movement is electrically regulated and there are batteries in each blade. The batteries are in watertight compartments with a pressure relief valve. Check the absence of internal pressure before opening the compartments. If the batteries leak there may be a risk of exposure to the electrolyte liquid, which may cause irritation of the skin, eyes and respiratory tract by contact with the spilled liquid. Wear chemical protective gloves: neoprene gloves and safety goggles to protect against liquid splashes. If the electrolyte is hot because the battery has caught fire, toxic gases (hydrofluoric acid, carbon monoxide and carbon dioxide) may have been formed. Assess the quality of the interior air and if necessary use forced ventilation equipment. In case of contact with electrolyte, follow the suggestions below to minimise the possibility of injury: - Immediately flush the eyes with cold running water for at least 15 minutes - Immediately flush the skin with cold water for at least 15 minutes - Take off your clothes if they are dirty - Seek immediate medical treatment Before any operation that involves handling batteries, make sure there is a first aid kit in the nacelle and eyewash liquid. Use safety goggles and gloves in all operations involving batteries.
Electrical contacts in cabinets, electrical components and wiring	Work with electrical risk must be carried out by authorised or qualified workers only, as per Royal Decree 614/2001 on electrical risk. Strict application of the Five Golden Rules. Use suitable personal protection equipment for the power that is going to be worked on for those tasks for which it is established by law and in which there is a risk of electrical arc or contact: fireproof, dielectric gloves and protection screen. The equipment for electrical work must be revised as per the manufacturer's maintenance instructions and current legislation.
Emergencies	In the event of an emergency evacuation, the evacuation will be done by removing the hatch in the hub nose. The hub has a visual alarm system with a code of colours that warns of situations of risk (high wind, fire, etc.). Before entering the hub, you must know the alarm signals that require evacuation of the hub While in the hub, the harness must be worn at all times to facilitate extraction in the event of an evacuation, although no activity is done that has a risk of falling to a different level, it will not be necessary to attach the anchoring cables.
Explosions	WARNING: H2 leakage from the batteries could lead to an explosive atmosphere. Therefore, when opening the battery compartment, allow 15 minutes to ventilate the battery compartment before carrying out any work.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ACCESS TO THE INTERIOR OF THE BLADES	
RISK	PREVENTIVE MEASURES
Falls from heights	Check the state of the fibre, cover and screws before walking on it. Check that the soles of the shoes are not soaked in grease or oil. Adequate artificial lighting devices will be available to ensure proper visibility inside the blade. To access the base of the blade, with the blade in vertical, it will be necessary to descend using the ladder. Due to its size, this section of the ladder does not have a lifeline, but to facilitate extraction in the event of an emergency a harness will be worn at all times. The hatch that accesses the base of the blade, when the blade is vertical, cannot be closed if there are workers inside as it would affect the ventilation capacity, therefore, take great care and remain far from the opening.
Confined spaces	Work will not be done without a work and rescue protocol. Work will not be done unless there is an emergency rescue system available. There will be a minimum of 3 technicians to do the work. Access to the inside of the blade is confined space work. It is necessary to have a work permit with monitoring of the internal air quality by a continuous oxygen presence meter located inside while the work is being carried out. During access to the interior of the blade, one technician will be required in the hub and another in the nacelle. The technicians involved in the work must have training and be in possession of: - A specific rescue protocol for the turbine (its own, of the technology or the owners). - Training to act in an emergency inside a blade and to be able to demonstrate that they have carried out a practical rescue drill in a real installation. No one who cannot justify this fact may act either as a technician accessing the inside of the blade to carry out inspections or repairs, or as a watchman in the hub, or as a support technician in the nacelle. - The team members must have all the necessary equipment to be able to act in a rescue. The rescue kit will include escape equipment (EN 1146:2006 Respiratory Protective Devices. Self-contained open-circuit compressed air breathing apparatus incorporating a hood for escape) in case it is necessary to enter the interior of the blade and the quality of the air inside is not guaranteed. The harness must be worn at all times when inside the blade (if it is horizontal), to facilitate extraction in the event of evacuation. It will not be necessary to use anchoring cables inside the blade.
Inhaling or ingesting harmful substances	The handling or application of chemicals may generate an explosive, toxic or noxious atmosphere. Check the safety data sheet of the chemical before handling it. Install a ventilation system when making chemicals that have a limit value in the safety data sheet that must be monitored. Wear gloves and respiratory protection according to the instructions in the safety data sheet.
High temperatures	Establish special working rules to prevent dehydration, heat stroke, etc., such as starting the working day earlier in summer, increasing the numbers of breaks, drinking plenty of water, etc.
Persons falling at the same level	Possible presence of oil or moisture. Cleaning the work area and passageway before starting work.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ACCESS TO THE NACELLE COVER	
RISK	PREVENTIVE MEASURES
Falls from outside the nacelle	Secure yourself from falls from heights according to the safety procedure set for the technology: double anchoring cable plus retractable anti-fall device approved to work in falls of factor 2. 1. Hook the retractable anchoring device to a secure, fixed point inside the nacelle (beams near nacelle cover hatches). 2. The retractable cord will be connected to the harness before leaving the nacelle and will not be released until you return to it. 3. Attach yourself to the anchoring points marked in yellow on the nacelle cover using the wide-opening hooks, before completely leaving it. It is prohibited to have the two wide-opening hooks not attached to an anchoring point at the same time. Maximum wind speed for exiting to the exterior of the nacelle: 12 m/s. It is prohibited to go onto the nacelle cover if the surface is slippery from rain, ice or snow. Position the ladder well fixed and secured before opening the roof hatch. Any operation that involves going outside the nacelle in low visibility conditions, with snow or ice on the nacelle cover or with intense rain, will be strictly prohibited.
Falls to the same level	Place yourself firmly inside the nacelle to close the hatch. If it is necessary to go onto the nacelle cover to close the hatch, remain anchored to an anchorage point on the nacelle cover.
Trapping	The safe way to open/close the nacelle cover access hatch is by using the handles and not the edges. Open the hatch 180º so it is in a stable, safe position and to prevent it from accidentally falling on the worker.
Falling objects	Whenever work is going to be done on the nacelle cover, a safety area must be cordoned off at the base of the wind turbine to prevent people from entering the vertical plane of the rotor and the nacelle. Use tool holding or clamping accessories. All tools used on the outside must be tied down.
Strains when closing the hatch	With the hatch open at 180º, it may be impossible to lift up the hatch again (due to wind, the stiffness of the hinges, etc.). In this case, go outside and lift it slightly to facilitate closure.

NORDEX DELTA 4000 WIND TURBINE	
FACTOR: ACCESS TO THE YAW AREA	
RISK	PREVENTIVE MEASURES
Persons falling to a different level	Make sure you can walk on the fibre you are working on. If in doubt, attach yourself to an anchoring point using a harness and energy absorber line or retractable system. Take great care when near areas such as the hoist hatch. Do not leave any object of any kind on this hatch.
Trapping by or between objects	Any task that involves opening the hatch giving access to this area requires the blocking of the rotor. Access is only permitted after turning the TOPBOX selector to the STOP YAW position and applying the LOTO procedure following the defined locking out protocol. Only trained personnel may block the rotor, following the instructions for the purpose. Maximum wind speed for blocking the rotor: 12 m/s. Wear mechanical safety gloves.