



Trapping by brake disc



QSE alert

Associated non-conformity code: NC2018001962

This document contains public information and it is intended to share the lessons learnt from incidents and risk situations that could be of interest to others in the same sector as Acciona Energía.

This document may undergo updates due to the collection and analysis of better information, because of technical advances and the proposed measures etc. For this reason, it is very important to check with Acciona Energía for the latest versions of the issued alerts.

SCOPE

- Worldwide Local. Country:
- | | | | |
|--|--|---------------------------------------|--|
| <input checked="" type="checkbox"/> All Businesses | <input type="checkbox"/> Construction | <input type="checkbox"/> Production | |
| <input type="checkbox"/> All Technologies | <input checked="" type="checkbox"/> Wind Power | <input type="checkbox"/> Hydraulic | <input type="checkbox"/> Thermo-electric |
| | <input type="checkbox"/> Photovoltaic | <input type="checkbox"/> High voltage | |
- Others. Specify

FACTS

Description of the incident

A technician at an Acciona Energía plant suffered the amputation of the distal phalanx of the second finger on his right hand.

The accident occurred during the operation to mechanically block the rotor on the high-speed side (between the gearbox and the generator). The wind conditions at this time (approximately 3 m/s), were not sufficient to move the rotor alone, so that the technician decided to move the brake disc by hand instead of postponing the task until the wind speed increased. A sudden, unexpected start-up of the shaft caught the technician off-guard with his hand on the disc and caused trapping with the brake clip (fixed part).

The injured party was able to evacuate the turbine in the lift with assistance from his companion. Subsequently, he was taken to the nearest hospital where he was attended.

Causes

Immediate cause: **Directly moving the disc by hand** (which is against all instructions given in current work procedures and safety and health instructions).

Root cause: The rotor block on this turbine model is completely manual, making it necessary to have a window for inserting the blocking bolt into the brake clip. The problem is that the dimensions of this window allow a hand to be fully inserted and reach the moving parts inside.



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Close-up of the window in the brake disc protection for blocking the rotor.



Close-up of the bolt-insertion operation, with the technician correctly holding the blocking "T".

LESSONS LEARNT

- The rotor-blocking procedure is quite clear: **under no circumstances may the brake disc be moved by hand.** There is no reason to move a moving part, such as the brake disc or generator coupling by hand. If wind conditions are not right and the shaft cannot be moved by lowering blade degrees or a special tool for turning the shaft in the absence of wind is not available, then the operation must be postponed until wind conditions change.
- The **rotor** blocking window on the high-speed side **must be protected** in this turbine model in order to eliminate all possibility of being able to insert a hand and touch the brake disc. After investigating the accident, the Engineering Department's proposal to eliminate this risk is incorporated into Instruction 2018-000000049-INT.

