



CASE STUDY

May - Dec 2023

Location – Western Sweden

Wind Farm Site of 114 turbines



PROJECT OVERVIEW

Defect and issue

Following construction of a 114 WTG site in Sweden, only 2 weeks after official client handover, one of the turbines collapsed...!! Following this, an investigation to identify the root cause was launched.

It was found that during construction of each tower, the work had often been carried out in extremely low temperatures. In addition, questions around both storage and handling in these conditions may have impacted the bolt quality. There was also “white corrosion” found on tower bolts.

Another issue raised, was with torque value measurements not being accurate and the method by which the towers were bolted together being called into question.

From this analysis, it was decided that all fasteners on every flange section should be replaced.

This resulted in the exchange of approx. 62,000 + nuts & bolts (approx. 540 per WTG) on 113 standing WTGs.

Evidence of “White Corrosion”



Examples of the removed bolt sets



Solution

The client then looked to order and free issue the 62,000 fasteners needed to carry out the scope. To maintain a good storage environment for the bolts & nuts, a tent was constructed at the compound, large enough for a fork lift truck to easily manoeuvre crates of fasteners into vans for transport to the WTGs.

The tent was also heated to maintain correct storage of the fasteners.

We sourced the correct tooling required for the work which resulted in 3 x sizes of torquing machines, together with associated pumps and all relative sockets.

TENT construction and finished article



Torquing Tooling



Action

Our 16 technicians (who were assembled in teams of 4), then systematically started in Turbine Nos 1 – 4, looking at removal & replacement of approx. 572 bolts per turbine.

The logistics of actually getting all 572 fasteners up to the turbine, and transporting (via the WTG lift) was very challenging, as a total weight of 200kg was the max load that the service lifts could see.

So all nuts & bolts were sent to the 5 x various WTG platforms via the service lift and positioned for replacement, with all old fasteners sent back in the lift to ground level, and taken back to the compound to dispose of.



Project Highlights

- Job completed safely with zero lost time incidents
- Project completed on time
- Engagement and support with customer and Wind Farm Site owner
- Client commented throughout the project, that we showed fantastic communication within the team, producing great documentation and a great overall performance
- Project Manager - "1StopWind did a tremendous job and everyone I have spoken to is happy about the execution and the progress made through the project. Please forward our thanks to the team on site"

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