Vattenfall UK Wind Ltd

Repairs case study

Problem

Vattenfall UK operates Swinford Wind Farm, 11 x V90-2MW in rural Leicestershire. The site is operated by a small, dedicated team and uses a mixture of independent service providers to service and troubleshoot the wind turbines. This means that convenience, quick turnaround and efficiency are key to any minor component repairs operation. Vattenfall has also made commitments towards sustainability targets taking greater responsibility over waste streams from wind turbine operation.

There are a variety of electrical and mechanical components that comprise the V90-2MW, thankfully Andy Claridge, O&M Manager, is very organised and throws very little away. He stores broken components on site in a quarantined area and keeps them in the hope that they can be repaired.

Objectives

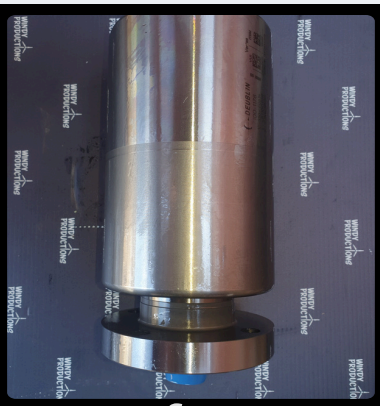
- Reduce O&M costs
- Reduce vulnerability to long spares lead times
- Reuse materials and reduce waste

101kg

Deferred from landfill

26%

Spare parts cost reduction



before

after

Hydraulic Rotating Union

Work performed

- Check tolerance of housing
- Re machine shaft
- Replace Seals

Testing

- Pressure test under rotation
- Leakage Rate

Generator Slip Ring

Work performed

- Check tolerance
- Replace insulation
- Replace spigot

Testing

- Flash test
- Connectivity

Windy Productions performed a visual assessment of the parts identified as repair candidates both on-site and remotely by photographs. We provisionally assessed the units for suitability of repair based on financial and technical viability. The parts were itemised, any damage was photographed and serial numbers were recorded. Based on the condition and category of the component, they were then sent to pre-vetted specialists based on their proximity, repair capabilities, equipment, pricing and testing abilities. Whilst in some instances we can offer a premium repair turnaround, there were no turbines down in this instance and timescales were not critical.

Once a price was agreed a repair is completed typically within a matter of weeks, the units are photographed, labelled with a repair date and affixed with a repair report. This report outlines the work and tests performed and any failure observations to support reliability engineering and wind technician understanding. This also gives the technicians confidence in the refurbishment and that the components are safe to go back into operation.

Due to the repair project success with Windy Productions we hope to continue to collaborate together in the future. We are always looking for opportunities to improve here at Swinford, we take pride in our work and Vattenfall are committed to sustainable resource use and circular economy.

Andy Claridge O&M Manager

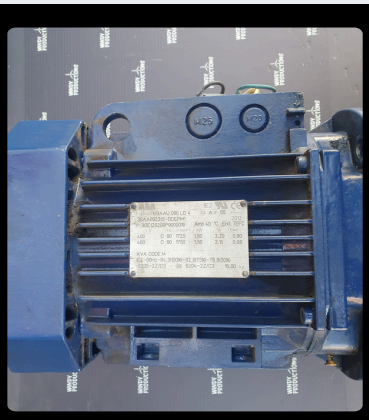
CT Modules

Work performed

- Replace wearing components
- Calibrate

Testing

- VMP Testing (controller)



Motors

Work performed

- DE bearing reworked
- Bearing seal overhaul
- Anti-track varnish applied

Testing

- Balanced
- Vibration
- 400V
- IR and Baker Surge

CMS Data Acquisition

Work performed

- No boot on power up
- Memory module reseated

Testing

- Boot up sequence

Solution

Assess

- Financial and technical viability
- Supply chain capability

Record

- Serial numbers
- Condition and damage observations

Quality

- ISO9001 approved RMA process
- 12 month warranty

Conclusion

As with all services there are opportunities for improvement. For example, in future when undertaking UPS (Uninterruptible Power Supply) repairs shipping the cabinet with spare batteries to test charging would allow this part to be repaired too. There is also an opportunity to better understand the net environmental benefits and metrics of repairs in terms of net carbon reduction and preservation of rare earth metals when considering logistics, extraction and manufacture and how to measure this accurately without it taking too much time or cost.