



Case-study – Yaw drive monitoring

Two yaw drives failed silently, the nacelle couldn't move. Nobody knew until the crane arrived.

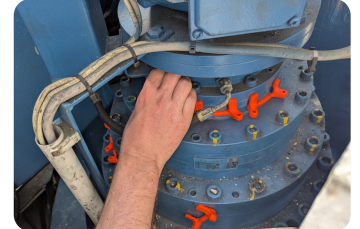
Customer

RWE

16-year-old On-shore wind park, UK

What happened

Both yaw drives on a turbine failed, but nobody noticed. The first drive seized, and the second one kept "dragging" it along until it too gave out. With both drives on a single motor, current monitoring couldn't distinguish which drive was healthy and which wasn't. The nacelle locked in position. The only fix: remove the entire nacelle by crane to replace both drives. The operation team wanted to know if the same problem was brewing in other turbines across the park.



Challenge

Yaw drives are a blind spot. There's limited standard monitoring, motor current can't separate individual drive loads since both connect to one motor. Failures go undetected until the yaw locks completely. On an ageing park, the question isn't just "is it broken", it's "how much life is left across the fleet."

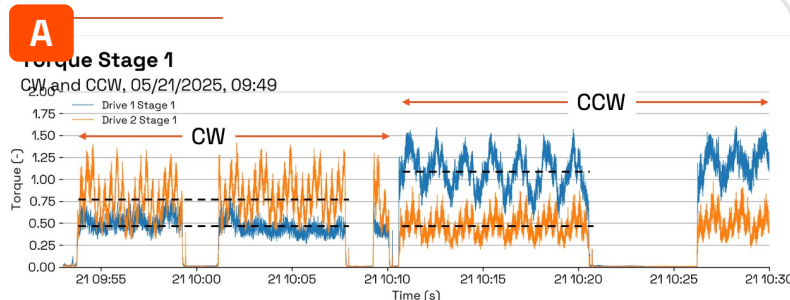
Solution

GearUp sensor strips were retrofit-installed on two yaw drive gearboxes. The fiber-optical sensors measure individual torque per drive during yaw events, in both CW and CCW direction, revealing exactly how the load is shared between the two drives on a turbine.

Result

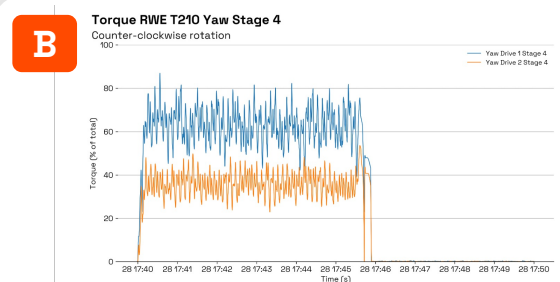
The measurements showed a 65/35 load split between the two drives; one drive was carrying nearly twice the load of the other. This imbalance directly explains the sequential failure pattern. The data provides the baseline for remaining life estimation across the fleet.

Test results



Yaw event:

During active yaw movement, drive #1 (blue) carries roughly twice the torque of drive #2, visible in both CW and CCW directions.



Sustained imbalance:

Across multiple events, the load splits ~65/35, one drive is heading for failure while the other appears underloaded.

65 / 35%

Load split between drive #1 and drive #2

16 yr

Park age, remaining life estimation needed

2x torque

Overloaded drive had double load as other

0

Prior monitoring on yaw drives