



Romax InSight assists utility giant in securing a confident post-warranty future for Greater Gabbard offshore wind farm

Client

Scottish Southern Energy (SSE) is one of the **Big Six Energy Suppliers** in the UK. SSE works closely with Romax InSight who provides their vibration condition monitoring service using Fleet Monitor™.

Challenge

As the turbines leave warranty SSE are liable for any undiscovered failures and the associated financial risks. As part of the process SSE need a strong specialist partner to support them in their transition to in house O&M.

Solution

Through combination of a thorough understanding of the turbines derived from the monitoring service and the engineering expertise applied to the drivetrain inspections and reporting; Romax delivered a reduced scope end of warranty inspection campaign on time and to budget.

Benefits

Romax provides SSE with a condition monitoring services which gives advanced warning of major component failures allowing them to plan well in advance for jack up campaigns.

Greater Gabbard Wind Farm is the world's third largest operational offshore wind farm, at 504MW with 140 Siemens 3.6 MW wind turbines. The 147sqkm site, a 50:50 joint venture between SSE and RWE, is situated 23km off the Suffolk coast and is operated by SSE plc, the second largest supplier of gas and electricity in the UK. As part of the site turbine asset integrity management strategy and in support of an End of Warranty (EOW) programme, SSE selected Romax InSight to assist with major component vibration monitoring analysis and physical on-site inspections. The capabilities of Romax and their Fleet Monitor™ software and drivetrain expertise allow for improved transparency of the assets condition and forward planning **decision making**.

Data-Driven Approach with Fleet Monitor™ Reduces SSE Cost for Conducting EOW Inspections

Romax has been working with SSE at Greater Gabbard Wind Farm since 2012 performing "shadow" monitoring on their vibration and SCADA data and providing drivetrain inspections on selected assets. During this time Romax has delivered a value-adding service, empowering SSE to make better operational decisions on major component asset integrity. The shadow monitoring allowed SSE and Romax to build the expertise in advance of the end of warranty programme. Bruce Turner, Engineering Manager at SSE explains: "The monitoring service providing by Romax really empowers our engineering decision making".

Conducting an EOW inspection campaign on 140 turbines, offshore, is logistically challenging and expensive. Fortunately SSE had built great confidence in Romax's capability to identify turbines at risk. They took a data driven approach, leveraging the shadow monitoring and 'deep dive' health assessment near to EOW, to reduce the number of physical inspections needed. Alex Pucacco, Consultant at Romax InSight explains:

"The vibration and SCADA analytics allowed the health of each gearbox and main bearing to be rank ordered for assignment in a targeted inspection list. This list was split into two phases to allow inspections to be performed in favourable conditions and for the second phase to be increased in size should the damage found in the first phase of inspections justify. This allowed SSE significant claim preparation time ahead of their EOW deadline in the autumn".

The quality of the monitoring reports delivered by Romax InSight prior to the EOW was such that SSE was able to make the decision to significantly reduce the number of drivetrain inspections. The turbines inspected were targeted based on a **data-driven approach**. This targeted approach to inspection saved the customer a significant sum in the order of hundreds of thousands of pounds.



Romax staff on site at the offshore wind farm performing inspections

"We selected Romax for our End of Warranty inspections because they came highly recommended by other utilities, they provided a wrapped service and we were happy with the quality of reporting we had received from both their vibration condition monitoring service and their inspections. Their scientific approach of using the data to guide the inspections from previous failures and fault trending allowed us to compile strong end of warranty claims."

Bruce Turner

Engineering Manager

SSE

Using Field Pro™ Increases Efficiency and Quality of Inspections

To increase efficiency of inspections, Romax's service and inspection app, Field Pro, was used to gather all the inspection data uptower including borescope images which can be seamlessly uploaded into the inspection database. Field Pro is designed to save time on reporting, improve the standardisation of data capture and benchmark damage progression. For the project manager, Field Pro allowed terminology and data ready to review as each inspection is completed. For the inspector it reduces administration with a streamlined approach to the job.

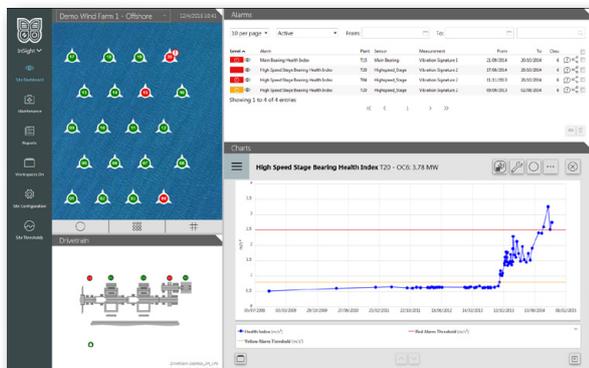
Field Pro is a further addition to the data-driven approach to wind farm O&M. Every inspection photograph and comment is recorded in a database for SSE, allowing the data to be mined for different purposes over the life of the asset.

SSE and Romax InSight: A Long-Term Engagement

Romax presents monthly vibration reports to the SSE engineering team via email with follow up technical meetings, during which site activities such as major component replacements, scheduled maintenance and oil and grease data are discussed. These add further data streams and context to Romax's monitoring service and Fleet Monitor software, which supplements the service.

Fleet Monitor was developed in-house by Romax and is designed to serve as a centralised independent tool for interacting with, and analysing reliability data; maintenance records, vibration data from CMS, SCADA data, oil and grease records and particle counters. These data records typically all exist in different software platforms provided by different suppliers. Fleet Monitor allows a monitoring engineer to interact with all this data forming a reliability passport for each turbine and then benchmarking these turbines with the rest of the SWT3.6 turbines monitored by Romax. This web based tool is very powerful, user friendly and serves as a knowledge transfer tool for any operator wishing to bring condition monitoring in house such as SSE.

As part of the service provided to SSE, a quarterly Health Assessment is also performed which reviews and presents the SCADA data across the fleet and allows SSE to focus their efforts on reducing downtime and increasing production through addressing outliers within the fleet in parameters such as yaw angle, bearing temperatures and grease alarms.



Screenshot of Fleet Monitor™ dashboard for wind farm monitoring



SSE and Romax staff at official completion of End of Warranty project

Benefits

- **Advanced warning** of failures using Romax's condition monitoring service
- **Increased inspection efficiency and reduced reporting time** using Field Pro
- **Data-driven end of warranty approach saving money and building stronger claims**
- **User-friendly and powerful knowledge transfer tool, Fleet Monitor is crucial to decision making and managing risk**

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