



StressWave Case Study Wind Farm

StressWave offers condition monitoring insight that vibration is unable to provide - allowing for better management of asset health and maintenance

BACKGROUND

A wind farm with multiple MW class wind turbine generators had experienced multiple generator failures within a short time following beginning of operation. To help prevent further unplanned failures, the customer requested installation of a StressWave Condition Monitoring System.

CHALLENGE

Increased StressWave energy indicated beginnings of a generator and gearbox issue in a unit previously thought to be in good condition. The manufacturer had not yet detected any issue.

SOLUTION

System analysis detected the issue early. The use of analytical tools within the monitoring system showed high spectral energy on the Outer Race Defect Frequency and Ball Spin Frequency on the NDE. Of greater concern were the high spectral energy content (with side bands) and a skewed and elevated Histogram distribution indicating a severe condition on the DE. This signaled the beginning of a possible failure. In addition, there was evidence of issues in the gearbox including elevated spectral

energy at Low Speed Gear shaft turning speed and Planet Gear Mesh.

RESULTS

The early detection of these issues enabled the customer to prepare for servicing of the turbine. In addition, the continuous monitoring of the situation ensured the unit could be operated at conditions that allowed energy production but minimized the rate of degradation. The unit was able to be serviced in a scheduled outage period, resulting in approximately \$155,000 in cost savings. Savings included:

Logistics:

- Order of replacement generator; no expediting charges (\$30,000)
- Use of crane during scheduled period; no unscheduled call (\$125,000)

Operational Costs:

- Crew (20 man hours: \$800)