Case Study

i-ALERT®

i-ALERT Diagnostics Early Bearing Defect Detection

Problem

- Early Stage Bearing Defects are not identified by an overall increase in vibration.

- Leveraging portable high end equipment with specialist vibration experts on regular balance of plant assets takes a long time and have a high cost.

- The regular site personnel don't have the time to analyse all their machines on site on a regular basis.

Bearing Defect	Typical Overall	Life Expectation
New Bearing	3.8mm/s	100%
Stage 1	3.8mm/s	<20%
Stage 2	3.8mm/s	<10%
Stage 3	4.0mm/s	<5%
Stage 4	4.5mm/s	<1%
Failure	>11mm/s	0%

Diagnostic

- An i-ALERT Diagnostics system was set up on a number of assets utilising the recommended number of sensors to provide maximum fault detection potential. This included a sensor on the drive end and non-drive end of both a pump and motor.

- Initial diagnostics were carried out on the machine and minor structural looseness was immediately detected. The issue could not be resolved in the short term, but the pump was allowed into service due to the continuous online monitoring capability of the i-ALERT SENSOR with the GATEWAY.

- Baselines for the initial conditions were then set, by capturing 3 sets of vibration spectrums on all 4x sensors for the pumpset.

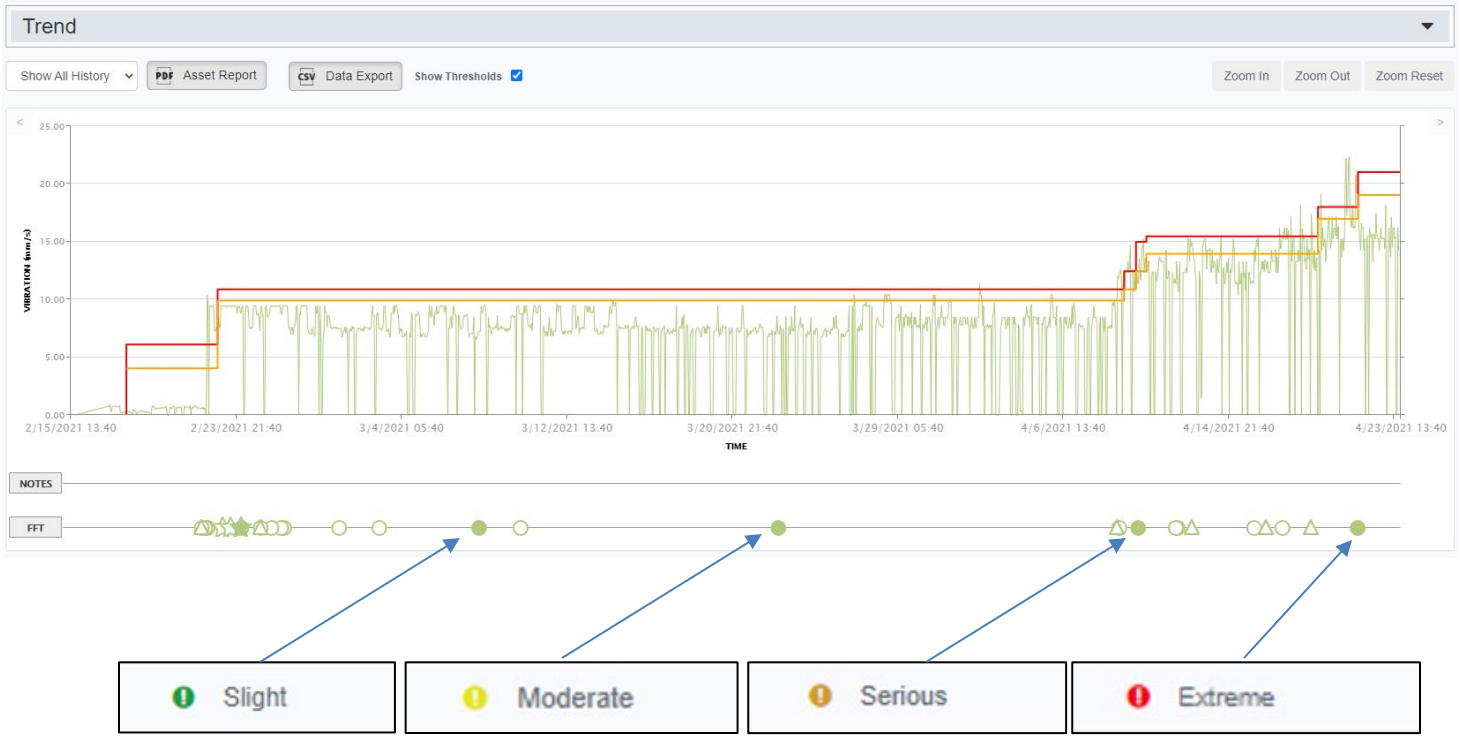
- Remote vibration spectrum captures while the pump was running were conducted on a routine basis, and an early stge (Stage 1/2) was detected by the i-ALERT Diagnostic as a "Slight Pump Drive End Roller Bearing Wear" fault.

- This was followed by a Stage 2 detection with an elevation to "Moderate Pump Drive End Roller Bearing Wear" fault.

- At this stage the overall vibration trend had not increased.

- Subsequently, the Stage 3 detection occurred when the overall vibration crossed the alarm threshold and the Diagnostic changed to "Serious Pump Drive End Roller Bearing Wear".

- As the overall vibration continued to increase, the diagnosis increased to "Extreme Pump Drive End Roller Bearing Wear", at this point the pump was removed from service.



Benefits

- Originally the pump was entered into service to keep the production running after the diagnostic identified the existing issues with the foundation, allowing the operator to decide to run the pump as long as possible.

- The online monitoring, diagnostic accuracy and sensitivity allowed the operator to continue to run the pump as long as possible and extend the time until repair, without creating a higher cost of unplanned downtime and excess equipment damage from a catastropic machine failure.

- The i-ALERT Diagnostics detected early stage bearing defects prior to the overall increase in the vibration.