

## Customer Case Study

# Detection Of Bearing Degradation Saves \$0.7 Million Of Potential Lost Production

“The conveyer system, and the associated gear box, is a critical part of our operation and failures in these pieces of equipment which can have major impacts on production. with Nanoprecise’s RotationLF system, we were able to detect early stage degradation of a bearing in the gearbox and this allowed for preventive actions to minimize maintenance downtime”

### BACKGROUND

Nutrien is on a journey of continuous improvement for their operations and a significant part of that journey is digitization and automation of their business. Reliability starts with the right processes and mindset and then applying tools and technology on top of that drives amazing results and value.

### THE CHALLENGE

Potash mining is a challenging industrial environment and equipment uptime is critical to operational performance of these businesses.

Vibration monitoring on rotating equipment is a best practice for machine health monitoring and is being used by Nutrien for major conveyance systems.

Traditional hand held vibration monitoring on an intermittent basis is labour intensive, has difficulty for access and travel and has the potential to miss progression of equipment faults when data is not available full- time.

A failure of the gearbox or motor on an underground conveyor system could typically equate to unplanned down time of 8-12 hours and the subsequent loss of production not to mention the cost of repair or replacement.

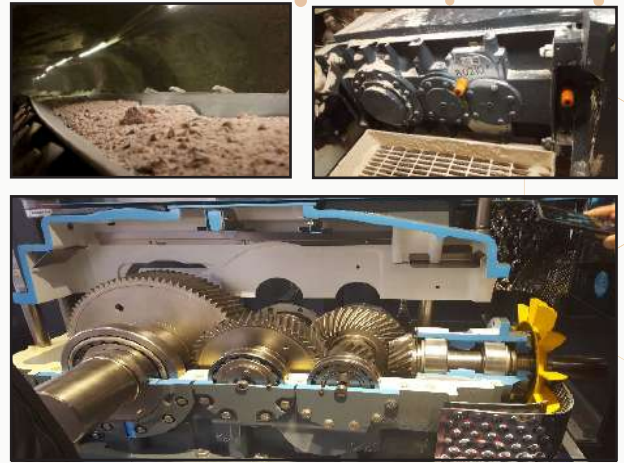


Nutrien produces and distributes over 25 million tonnes of potash, nitrogen and phosphate products for agricultural, industrial and feed customers world-wide. Combined with their leading agriculture retail network that services over 500,000 grower accounts, they are well positioned to meet the needs of a growing world.

## THE SOLUTION

The Nanoprecise RotationLF system was installed on a critical conveyor with sensors on the gearbox and motor assembly as a part of a larger site deployment for IoT and digitalization efforts.

This system was able to be deployed in the harsh environment with minimal effort due to the magnetic mounting bases for installing. A wireless communication system was established to avoid expensive wiring and installation costs, which is a recommended practice by Nanoprecise.



Once installed, battery powered wireless sensors started sensing and sending data to our cloud-based platform through an encrypted & secured network.

Nanoprecise not only detects anomalies but then proceeds to utilize Artificial Intelligence to diagnose the fault type and map the progression through stages of fault so that a remaining useful life can be predicted and appropriate notifications sent to the team responsible for the equipment and operations.

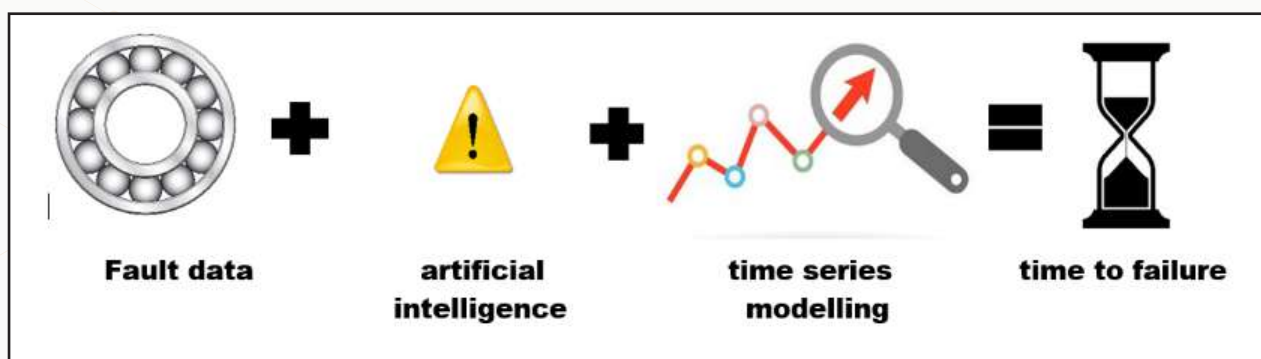
## THE RESULT

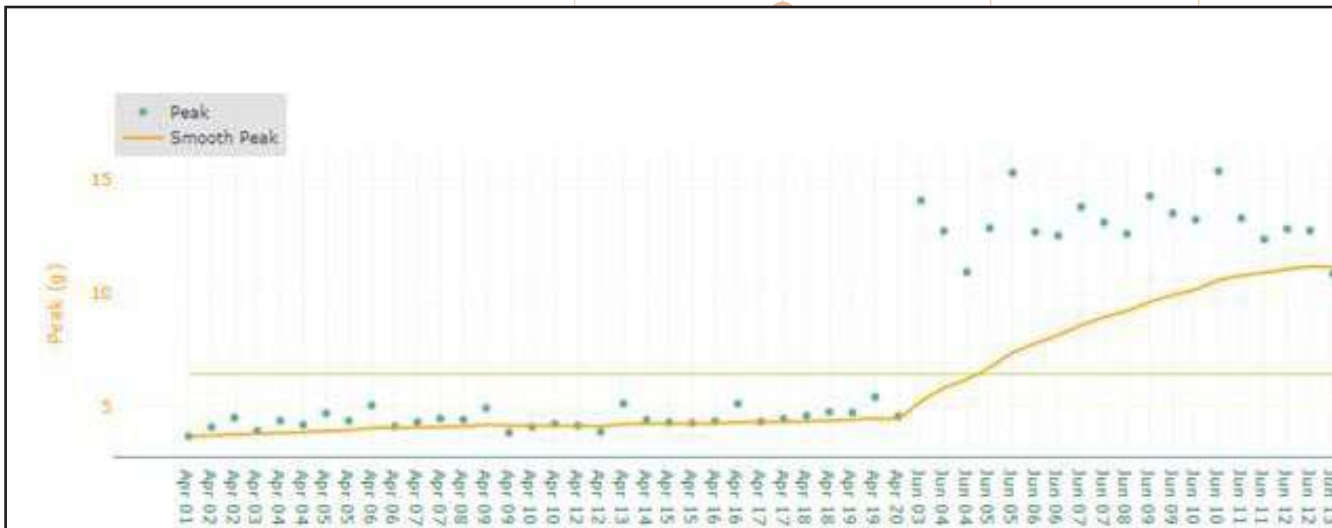
A fault on the multi-stage gearbox was detected and identified correctly, as a Ball Pass Frequency Inner (BPFI) signature by the RotationLF system. This was an early stage failure that remained stable for several weeks and will allow for planned maintenance rather than an emergency unplanned down time event at the site.

Feedback from Nutrien clarified the ability to plan for maintenance significantly reduces down time for a conveyor system from 8-12 down to 4-6 hours. Each critical conveyor delivers an average of 2000 tons of raw ore per hour with a final yield of 35% on that ore and a sale price of \$250/ton of final product. This equates to \$175,000 per hour of lost production.

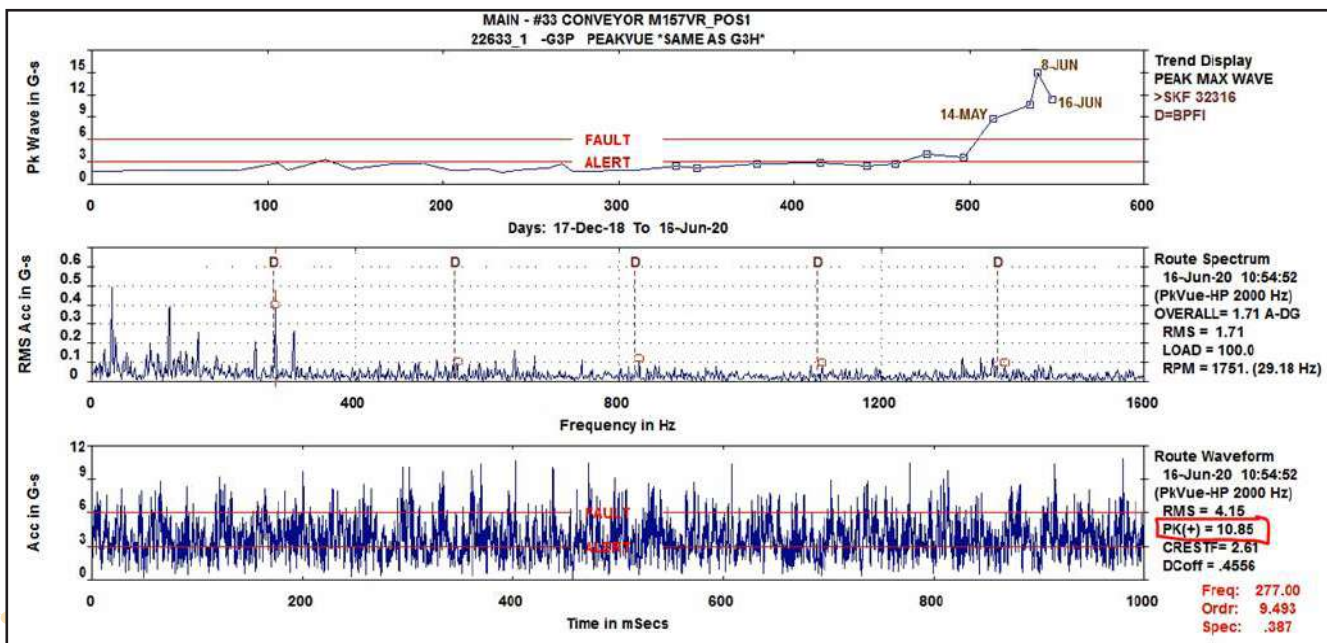
Nutrien with Benchmark Reliability checked the validity of Nanoprecise's measurements and predictions by collecting multiple routine vibration data. An Emerson CSI handheld vibration analyzer was used and confirmed the measurements taken by Nanoprecise. The vibration analyst then evaluated the results of the handheld and again confirmed the BPFI defect diagnosis provided by Nanoprecise.

This confirmation process has further reinforced that the monitoring, analysis and notices being generated by Nanoprecise can be trusted and provides advance notice for planning for maintenance and repairs. Together, the sensor technology and proactive maintenance provides substantial savings for down time.





Nanoprecise Measurement = Peak 11.1g-s



CSI Handheld = Peak 10.85g-s

## ABOUT NANOPRECISE

Nanoprecise specializes in the implementation of Artificial Intelligence and IoT technology for predictive asset maintenance and condition monitoring. Our timely and accurate diagnosis of machine faults provides our clients insights that allow them to make decisions that will save them considerable time and resources. Nanoprecise is headquartered in Edmonton, Canada with branches in Bangalore, India; San Diego, USA, and Newcastle, UK. We have managed to establish ourselves as a trusted solution provider in the asset management industry.

Talk to our experts

✉ solutions@nanoprecise.com

📍 North America +1 (780) 680-2693    Asia +91 75681 21121