

Case Study

Partnering for improved machine reliability

Project Challenge:

A mining customer's maintenance strategies were producing good availability results for their 4100XPC DC and 4100XPC AC P&H shovels, but to achieve consistency, the customer wanted better visibility on potential upcoming causes of downtime. In this tough environment, major component failure events need to be controlled to minimize impact against budget, and an enhanced solution was required to improve margins and maximize shovel operation.

Solution Design:

We approached the existing customer about engaging in a trial period where the two would partner through **the company's** Smart Solutions offering to improve shovel reliability and avoid catastrophic failures on major components. The customer agreed to give us six months to prove the value of the offering at its coal mine in Australia.

The Smart Solutions team proposed implementation of a newly-developed automated monitoring system that trawls through machine data with the ability to detect any changes in component behavior to predict an onset of failure.

"The key for us was to create an algorithm that was sensitive enough to pick up small changes in component indicators while not creating unnecessary alarms," said **Trevor Griffiths**, product performance manager.

The strategy was to build on the existing partnership by employing new technologies and concepts to reach the next level of performance **needed in today's mining industry.**

Implementation needed to be quick **and effective, with a six month "proof of concept" plan to determine whether** the new approach would continue.

"Smart Solutions can provide visibility into machine issues ahead of time, giving us opportunities to avoid additional downtime and cost."

Customer maintenance superintendent



The Solution

Smart Solutions product specialists quickly identified areas of focus that would be prioritized to achieve improved reliability:

- Major Equipment: motors, transmissions, gearing, bearings
- Lubrication
- Air Supply



Major equipment monitoring provided the necessary risk management element, whilst air supply and lubrication were identified as systems that had the most impact on shovel reliability.

An engagement strategy was discussed and implemented that had clear lines of communication and accountability. Both companies understood that this needed to be a partnership with common goals and a unified approach.

Using collected sensor data, Smart Solutions experts deployed predictive models that could analyze real time **sensor data to determine if any of the identified major equipment or systems was starting to drift from “normal”** operation. On a daily basis, Smart product specialists would intercept any model detections and then report out with a recommended course of action, giving it a priority rating depending on the component type and severity of the detection.

With a system in place, the necessary change in culture was the final hurdle. In the first two months of implementation, a situation arose where an imminent failure condition was detected and reported, but not all recommended steps were followed, resulting in 38 hours of downtime that could have been avoided. Following that incident, team engagement and commitment rose, allowing greater successes to be achieved through the partnership.

The Results:

Toward the end of the six-month trial period, the combined shovel availabilities hit the target of 92 percent eight weeks in a row.

One of the main drivers of change, the need for consistency in machine availability, was now being achieved.

No major equipment failed during the six-month period. The benefits of the partnership were so clear that a planned review of the trial period was deemed unnecessary, and the customer decided to proceed with a long-term partnership. Working together with the Smart Solutions team, the customer continues to improve performance every week through new ideas and strategies developed.

“We now spend more time addressing small problems, which is eliminating larger issues. It’s a good space to be in.”

Customer maintenance superintendent