At a frac sand facility, sand moves from rail cars up a conveyor system into a storage silo. Keeping the facility running is a top priority.

The OpsWatch is a device that monitors low level impact and vibration of equipment while in operation. It records these values and reports changes in the impact / vibration signature in real time. These changes can be used as early warning signs that part of the system being monitored is beginning to experience unexpected stresses and these stresses can eventually trigger system failure. Unplanned downtime in any operation results in additional operating costs ranging anywhere from overtime wages, costs of express shipping new parts to losing customers because of unmet delivery schedules.

To begin the experiment, transload facility set up the OpsWatch device to monitor a sand conveyor and determine the normal operating characteristics of the conveyor system. During that time, the system was monitored by both the facility personnel and the SpotSee support team.

In May, the OpsWatch system was monitoring one of the sand silo elevators at the facility. An unexpected impact spike was recorded. In the hours following the spike, the OpsWatch began recording “chatter.” Something was causing frequent low impacts that were not part of the normal signature of the equipment. The maintenance team stopped the elevator and investigated the issue. It was discovered that the elevator required service. After the service was performed and the elevator was restarted, the chatter was no longer recorded and the facility avoided equipment degradation and potential failure.
In the example below, on July 8th, the elevator system in the silo started to back up and a spike was recorded. Over the next day several days, the elevator belt and buckets were out of alignment and the system was not operating at peak performance. The facility operations team was able to make an adjustment and the system was returned to normal operation.

Elevators / conveyors out of adjustment are not the only hazards encountered in a frac sand facility. In one instance, a railcar loaded with sand had water leak into the load. Instead of standard, dry sand, the conveyor was moving wet sand. The weight of the sand was significantly increased. When the wet sand landed on the conveyor, the system had to work much harder to move the sand. As the weight continued to build on the conveyor, so did the vibration. Because the sand did not flow into the silo as expected, the material began to back up on the conveyor which further stresses the conveyor system. The operator reacted to the alarms and shut down the conveyor.
However, the warnings of the OpsWatch were not always heeded and the consequences to the facility were significant. In one instance, the OpsWatch system recorded increasing vibration values beginning 19 days before an incident, but the alarms were not addressed by the operations team. This particular case resulted in equipment failure and downtime for the facility.
ShockWatch® Label Case Study

Door to Door Protection

With delivery routes averaging 500 miles and some as long as 2,000 miles, a lot can happen to an HJC shipment between the loading time and delivery. "Operating our own fleet isn’t an option for our business," says Walls. "So we needed a way to get our freight partners as engaged and accountable in careful handling as we are. ShockWatch indicators were an easy solution."

With the consultation and approval of his General Manager, Walls initiated a trial of ShockWatch impact indicators. After just a month, HJC made indicators mandatory across all of its four distribution centers, along with ShockWatch alert tape and ShockWatch 100G impact indicator labels for small parcels. Today, every HJC shipment has ShockWatch impact indicators on board.

"When we decided to make this investment in ShockWatch technology, we also instituted a complete review of our shipping processes," adds Walls. "We switched to a thicker pallet wrap and increased our use of corner guards and extra banding. But it’s the ShockWatch impact indicators and alert tape that provide an actual visual reminder to every driver and fork lift operator to slow down and do things right."

Great Results in Savings and Service

After one year of using ShockWatch products and bolstering its packing and shipping procedures, HJC slashed freight claims from $300,000 down to $86,000, a 65% savings.

Walls reports that customer response to the new process has been overwhelmingly positive, and customers willingly participate in the program by checking indicators and reporting activations. Remarkably, HJC’s carrier partners are on board as well, in part because the program focuses on prevention, not finger-pointing. "Our goal is to get customers their orders in great condition and eliminate delays and headaches for them," says Walls. "ShockWatch products keep that objective front and center."

Down the Road

Because HJC’s ShockWatch program has been so successful, it is considering requiring similar measures from its own suppliers on inbound deliveries. The company is also considering ShockWatch temperature indicators to protect its shipments that contain cold-sensitive spray adhesives.

SpotSee™ OpsWatch Case Study

In another case, escalating impact and vibration peaks were detected by the OpsWatch. The conveyor was not inspected and allowed to continue running. Unfortunately, not only did the facility have to deal with a conveyor failure but 210 tons of frac sand were dumped into an equipment area. The removal of the sand required specialized equipment and cost the company over $20,000 in cleanup costs alone.

Unexpected impacts and unacceptable vibrations can result in significant costs to your operation. SpotSee experts are available to assist you in developing a monitoring system that allows you to know what is happening before failure occurs. For information on an OpsWatch shock and vibration monitoring program, fill out a contact form at spotsee.io or email us at info@spotsee.io.