

# Monitoring Critical Mining Conveyors

- Detect development problems before equipment fails.
- Minimize the financial impact of unplanned downtime.
- Reduce risk to technicians by reducing time spent near operating equipment.
- Avoid costly spares inventory.



*Emerson's online condition monitoring system uses a unique fault detection approach that is perfectly matched to the operating parameters of conveyors. It was the logical choice to preserve the integrity of our critical assets. - Spokesperson – One of the largest producers of iron ore in the world.*

## Introduction

Bulk conveyors are the lifeblood of your stockpile and process throughput in the mine. Downtime prevents you from meeting your mine plan and production goals.

Overland conveying or “truckless” mining systems are especially critical as they represent a single point of failure. Mines simply don't have spare conveyors.

With daily wear and tear, equipment is going to break; so an effective condition monitoring program is an industry best practice.

Condition monitoring systems provide additional information to operations and maintenance personnel by examining input data in much greater detail, often using advanced analysis methods to make sense of the data.

## See Conveyor Faults Before They Become A Problem

The CSI 6500 Machinery Health Monitor offers the earliest detection of conveyor faults. It monitors critical components continuously, supplying real-time machinery health information back to the control room or maintenance shop.

In addition, Emerson's unique PeakVue™ technology measures high frequency stress waves to detect rolling element bearing and gearbox issues earlier than traditional methodology.

Vibration data can be integrated with tribology reports and thermal signatures inside AMS Machinery Manager software for a comprehensive view of equipment health.

When a critical conveyor goes down and there is no spare part available, a general rule of thumb indicates between \$250k and \$500k per hour is lost production (gold, copper, silver mines) and approximately 10% of production time is lost to unplanned maintenance.

## Eliminate Needless Safety Risks

Implementing online monitoring systems reduces the risk to technicians in the field.

For periodic readings on less critical components, CSI 9420 Wireless Vibration Transmitters are ideal for accomplishing the same safety goal – vibration monitoring without exposing staff to machinery hazards.

## Minimize Negative Financial Impact

The ability to plan rather than react to a crisis, saves money. In order to minimize maintenance costs, you need to see faults early, understand their severity, and plan accordingly.

Implementing-only monitoring of the conveyor delivers early detection of developing faults so you can assess problem severity and take appropriate action.

## Product Description

Emerson's comprehensive approach to monitoring conveyors includes a combination of technologies, which utilize PeakVue impact monitoring. Emerson's combination of best-in-class technologies and services helps increase equipment effectiveness, reliability, and performance by allowing you to be proactive in your maintenance. Our scope for monitoring critical mining conveyors includes:

- CSI 6500 units for monitoring key drives, motors, and pulleys.
- CSI 9420 sensors for providing accurate monitoring in hard-to-reach locations like take up and tail pulleys.
- Rosemount 648 transmitters for wireless temperature measurements on bearings.
- AMS Machinery Manager and AMS Device Manager software.
- Engineering, installation, commissioning services.
- Project management and training.

## Early Problem Prediction

### CSI 6500 Machinery Health Monitor

The CSI 6500 is part of Emerson's AssetWeb digital architecture, which provides enterprise-wide information needed for real time decision making. Vibration data can be integrated with tribology reports and thermal signatures inside AMS Machinery Manager software for a comprehensive view of equipment health.

## Sensor Specifics

### CSI 9420 Wireless Vibration Transmitter

The CSI 9420 provides accurate vibration monitoring in hard-to-reach locations through Emerson's Smart Wireless self-organizing network.

Wireless vibration measurement is achieved by installing a wireless transmitter in close proximity to the sensor.

As part of Emerson's Smart Wireless solutions, the rugged CSI 9420 Wireless Vibration Transmitter connects quickly, easily, and economically to any machine. It delivers vibration information over a highly-reliable, self-organizing wireless network for use by operations and maintenance personnel.

Configuration, diagnostics, and alerts are imported into AMS Device Manager. The CSI 9420 is ideal for vibration monitoring applications, especially in hard-to-reach or cost prohibitive locations. For bulk conveyors, vibration monitoring is an effective means for detecting developing problems.

### Rosemount 648 Wireless Temperature Transmitter

The Rosemount 648 Wireless Temperature Transmitter delivers industry-leading temperature field reliability as a wireless process measurement with Best-in-Class specifications and capabilities. This is ideally suited for measuring temperatures on critical rollers and bearings.

## System Architecture

The ideal condition monitoring system has two main components: input cards installed in the CSI 6500, and one or more personal computers (PC) running the AMS Machinery Manager software.

The PCs, usually located in the mine's central control room, are often connected to the mine's automation system and to related PC-based software applications such as a data historian or an asset management system.

All of these connections are accomplished through hardwired digital data links and often Ethernet based. The connection from the CSI 6500 to the PC is usually redundant to increase uptime and ensure availability.

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