ORBCOMM™

CONNECTING THE WORLD'S ASSETS

CASE STUDY

Mining Company Ups the ROI with Remote Fuel Level Monitoring and Vehicle Telematics

Los Pelambres is a copper mine located in Salamanca, Chile and owned in part by Antofagasta Minerals. The mine is the seventh largest producer of copper in the world and sits at an elevation of over 3,000 meters above sea level in the Andes Mountains. More than 365,000 tons of copper is transported every year through 50 square kilometers of uneven terrain.

The Customer Challenge

At Los Pelambres, 55 Komatsu mining trucks play a critical role in the mining of copper and other minerals. These super-large dump trucks, used to move the copper along the different processing centers, are known throughout the industry for their reliability and are often used in remote and difficult applications. In an effort to maximize asset utilization, the mine adopted a fast refueling system that would reduce refueling time from 25 to approximately 5 minutes.

This initiative to improve operations came with an unexpected series of issues that offset the intended goal. Specifically, the rupture of the factory-installed fuel sensors due to pressure. Without a working fuel sensor, drivers had to guess when it was the right time to refuel and could only estimate how much fuel actually needed to be added back into the tank.

As it turns out, guessing rarely paid off. Drivers sometimes waited too long to refuel and the tank went empty causing air to leak in. This repair added five additional hours to the refueling process as air would need to first be removed. Most often, however, tanks were filled to maximum capacity only 0.6% of the time, which ended up significantly increasing the number of refueling stops. Because no one could optimize the refueling schedule, drivers often travelled to the same refueling center at the same time, which caused long lines and delays.

These issues and the ensuing consequences not only negated the intended benefits of adopting the new refueling method; they actually increased down time and negatively impacted revenue at the mining site.

To address the issues created by the fast refueling system, Los Pelambres invited a group of companies to submit a proposal for a solution that would:

1. Equip the trucks with a ruggedized fuel sensor that would withstand the pressure from the fast refuelling system
2. Relay fuel level and truck location data back to a centralized application over cellular or satellite depending on network availability to ensure uninterrupted connectivity
3. Include an application with a user-friendly graphical interface that would display the position of trucks as well as tank levels in real-time. The application would also allow the control center to monitor alarms based on user-defined thresholds.

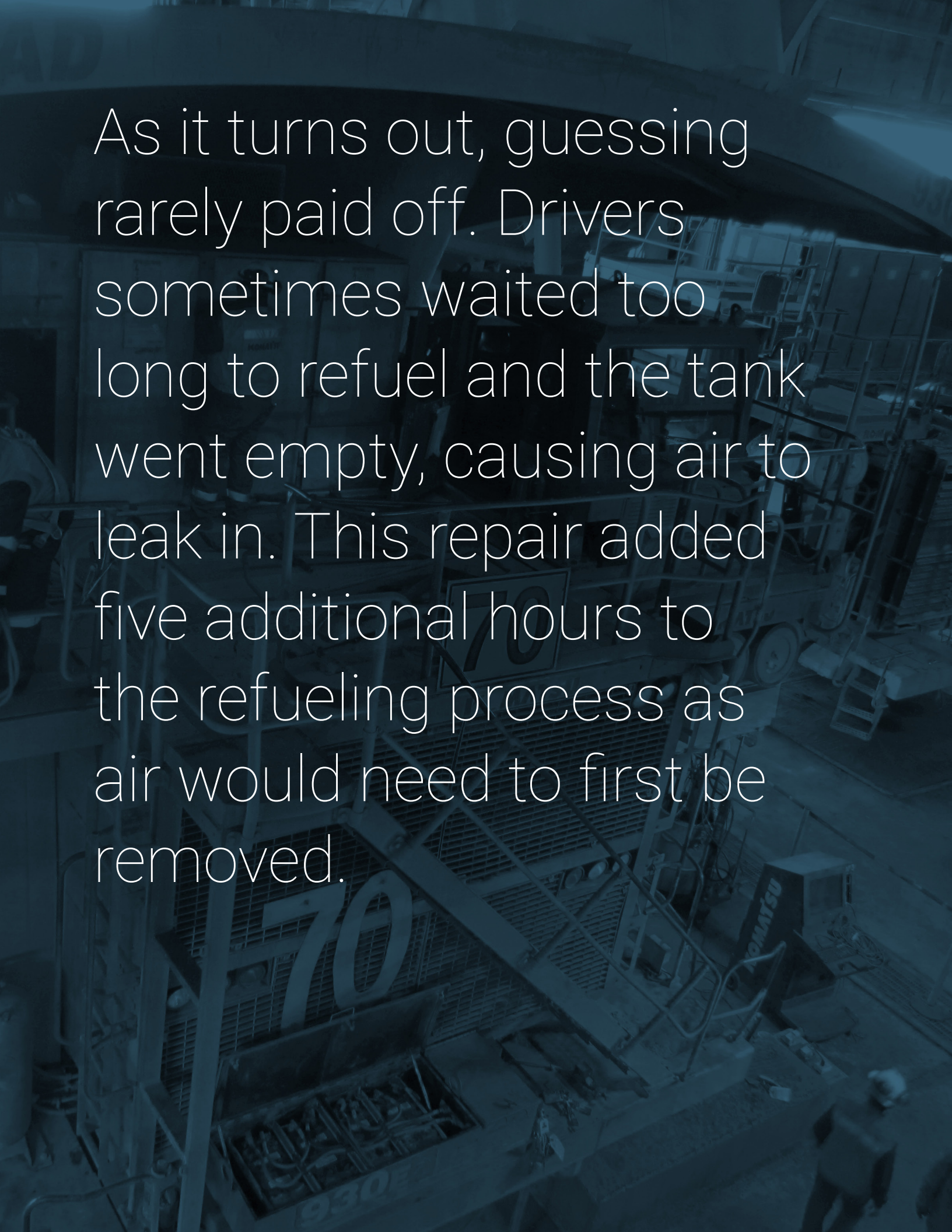
The Solution

The solution selected at Los Pelambres was developed by Tarco LTDA, a Chilean integrator that specializes in developing custom tracking and monitoring solutions for the mining industry. The PCR 1000—Tarco's state-of-the-art remote fuel monitoring system—constantly monitors tank levels and transmits tank-level data as well as other vehicle telematics data back to a centralized application in real-time using ORBCOMM's IDP-782 terminal. Since mining trucks operate in remote areas, satellite connectivity is a must to ensure the timely and consistent delivery of data. The IDP-782 transmits data over the cellular network when available and automatically switches to a satellite data service when cellular is down for uninterrupted connectivity. The ruggedized, fuel monitoring system is capable of withstanding extreme environmental conditions, including heat, cold, water, dust, altitude and vibration.

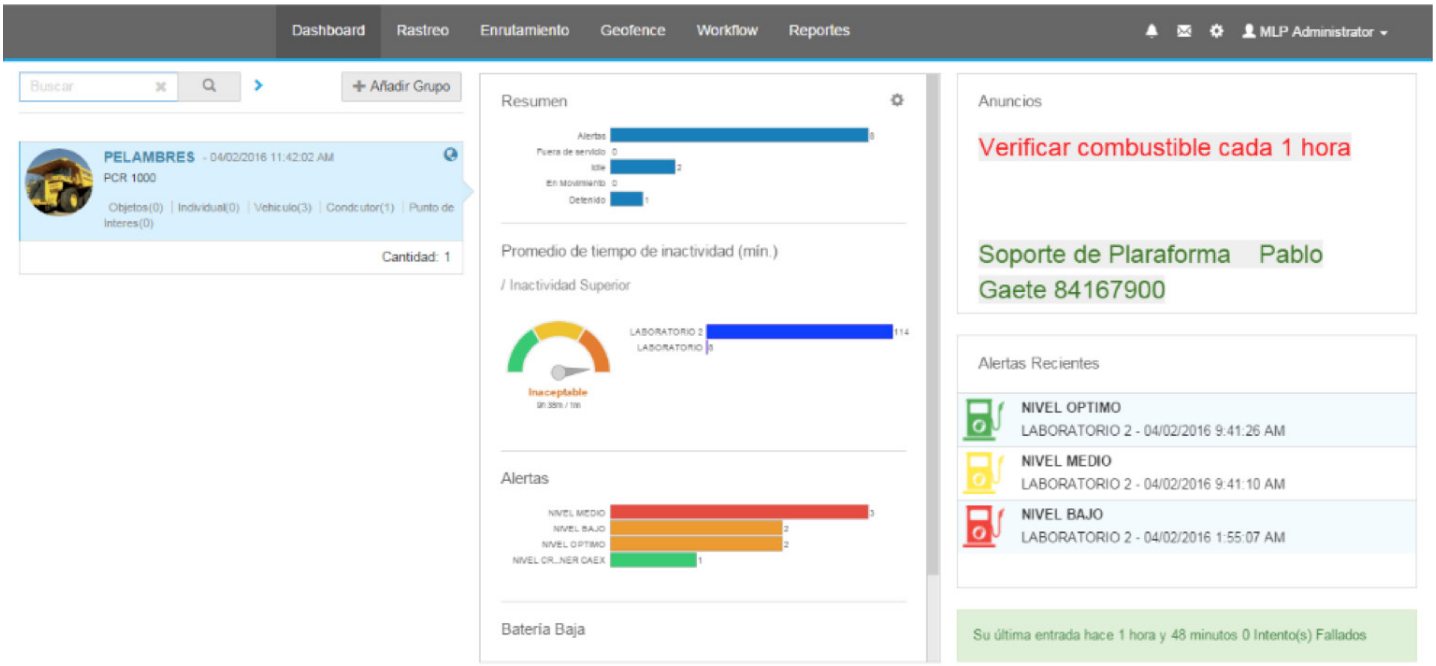
ORBCOMM'S IDP-782

To solve the refueling issues, ORBCOMM's IDP-782 dual-mode terminal continuously collects, processes and transmits data from the truck. When it comes to managing alarms, the terminal is programmed to identify user-defined thresholds and send only relevant information over the air to minimize data transmission costs. The PCR 1000 remote fuel monitoring system gives the control center complete visibility into refueling operations and an easy-to-use interface that displays truck location and tank levels in real-time.

With data received from the IDP-782, the control center's operator is able to leverage the application to easily identify trucks with 10% fill levels and quickly dispatch the driver to the most efficient refueling center. Historical data and advanced reports are also available to help operators identify fuel consumption patterns and implement more efficient refueling practices.



As it turns out, guessing rarely paid off. Drivers sometimes waited too long to refuel and the tank went empty, causing air to leak in. This repair added five additional hours to the refueling process as air would need to first be removed.



Complete visibility into refueling operations

The Outcome

By implementing the PCR 1000 remote fuel level monitoring system, an additional 1,200 liters of fuel can be added to the tanks at each refueling stop. This reduces the number of stops per month by 10 for each truck and adds approximately four additional hours of work time over the same period. During this time, trucks are able to process an additional 4,000 tons of copper, which has had a significant impact on the company's bottom line.

Los Pelambres' centralized approach to the refueling process provides greater visibility into the trucks, improves efficiencies and maximizes profitability. According to Pablo Gonzalez, EDT Manager Product Support Group for Komatsu South America, the PCR 1000 is a viable alternative for managing the refueling process as it seamlessly attaches to the trucks' tanks without posing any risks or limitations to their operation.

Furthermore, the vehicle telematics data collected and transmitted via the IDP-782 provides a way to streamline service scheduling and support preventative maintenance practices. This helps prolong the life of the vehicle by reducing wear and tear and ultimately translates into operational savings.

The solution also supplies valuable data for asset utilization. Upon analysis, mine operators were able to identify that the same amount of minerals could be processed with fewer trucks. And, because operational costs are quite high for each truck, this provided a way to improve the company's profitability.

About Tarco

Tarco is a Chilean provider of innovative technology solutions for monitoring and control, data acquisition, process automation and process optimization applications. Tarco understands the needs of the mining industry and continually delivers solutions that help improve overall efficiencies and productivity.

www.tarco.cl

About ORBCOMM

ORBCOMM Inc. (Nasdaq: ORBC) is a leading global provider of Machine-to-Machine (M2M) communication solutions and operates the only commercial satellite network dedicated to M2M. ORBCOMM's unique combination of global satellite, cellular and dual-mode network connectivity, hardware, web reporting applications and software is the M2M industry's most complete service offering. Our solutions are designed to remotely track, monitor, and control fixed and mobile assets in core vertical markets including transportation and distribution, heavy equipment, industrial fixed assets, oil and gas, maritime and government.

www.orbcomm.com