Enabling Connected Workers at Texmark Chemical's Refinery of the Future (RotF)

CB Technologies integrates an innovative Connected Worker Solution to deliver greater efficiency, productivity & safety for Texmark's Chemical Plant Workers.

"Texmark makes chemicals for the world. For nearly 50 years, we have been the bench-mark of quality in our industry."

David Smith
Founder & Owner
Texmark

Challenges

130
chemical pumps

35k
person-hours spent per year monitoring plant

>$1M
inspection program costs

What is the Refinery of the Future?

Changing demand patterns, complex initiatives & exponentially increasing data volumes are just a few of the challenges facing the highly competitive oil & gas industry. In order to overcome these complicated issues, companies like Texmark Chemicals (a Texas toll manufacturer) are turning to advanced Industrial Internet of Things (IIoT) technologies to modernize their business.

In tandem with a robust team of industry-leading partners (including Hewlett Packard Enterprise, Aruba, Deloitte, PTC, & more), CB Technologies is working to build Texmark a Refinery of the Future, featuring advanced IIoT capabilities. One of many solutions included in the Refinery of the Future project is CB Technologies' Connected Worker, delivering superior worker efficiency, productivity & safety.

Problem

Texmark is a crucial link in the petroleum product supply chain, & because it works with flammable, highly regulated materials, safety is paramount. Texmark's Chemical Plant Workers are tasked with conducting their duties in/around volatile environments, requiring them to be near process machinery handling high pressure, high temperature, & toxic fluids/gases, scattered across acres of landscape. Texmark must ensure that its facility is managed in ways that put worker & community safety first. However, due to the exceptionally competitive nature of their industry, Texmark must simultaneously drive plant efficiency & productivity.

Historically, Texmark has depended on physical inspections of process equipment to ensure all systems remain in working order. In most cases, the plant worker will need information about the equipment's performance at that specific moment, information about workflow conditions leading to/from an asset, data about that equipment's last maintenance service, or historical trends that might provide insight into its present condition. To access that data, the plant worker must call the Control Center & request a verbal read out performance characteristics on the equipment being inspected. Thus, these plant walk-downs can be time-consuming & labor-intensive – requiring plant workers to juggle communications gear while manually adjusting equipment settings, & reacting to responses in real-time.

Depending solely on physical inspections also carries risk, because it relies on employees who—based on years of experience—can tell if a pump is starting to malfunction by recognizing slight variations in its noise and vibrations. But what happens if an employee with that skill is out sick, or reaches retirement age? Texmark needs ways to institutionalize that type of intelligence and find ways to streamline these highly manual processes.

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Solution

Texmark's vision for next-generation worker safety, productivity & efficiency hinges on the emerging promise of IIoT: sensored devices combined with advanced analytics software. CB Technologies is integrating an innovative Connected Worker Solution into Texmark's Refinery of the Future to help generate insights, automate the worker's environment, & reduce the risk of human error.

Step one was establishing the digital foundation by enabling edge-to-core connectivity. CB Technologies & Aruba engineers deployed a secure wireless mesh network with Class 1 Div 1 access points & ClearPass for secure network access control. The wireless solution cost about half of what it would have cost to deploy a hardwired network.

Step two is utilizing that full-campus connectivity, combined with advanced data capture from distributed IoT sensors, & integrating advanced wireless devices & software to enable instant access to critical, real-time plant information. These devices completely overhaul the aforementioned maintenance procedures, making inspections & correctional adjustments much faster, easier, & safer.

Handheld Devices: Handheld tablets with custom, menu-driven software provide the Chemical Plant Workers with the ability to view live data on all connected assets.

- "Sensored" data streaming from plant assets in real-time (e.g., temperature, pressure, fluid levels, vibration readings, etc.)
- Operational data as reported on the Digital Control System in the Control Center
- Historic data such as schematics, diagrams, inspection/maintenance reports, analyses, etc.
- Additional software adds capabilities such as 3D modeling, digital measurements, risk analysis, predictive maintenance, & more

Hands-Free Devices: Computational hardware integrated in the Workers' safety helmets enables them to interact with people & machinery in a more productive manner.

- Small Augmented Reality (AR) screen – able to display key performance parameters relative to the asset being examined or tested
- Camera – to enable asset identification via a UPC Code
- Microphone – enabling communication with the Control Center or verbal commands/instructions to the SW applications in use

Results

Utilizing the Connected Worker Solution, Texmark's Workers can be radically more efficient. Workers now have instant access to, & an optional hands-free visual representation of, all relevant information tied to any connected plant asset. They can approach an asset (mechanical system) & use optical recognition (or signal triangulation - in the future) to determine which asset they are in front of, view real-time & historical information about the performance of the asset in question, verbally collaborate with the Control Center in a hands-free condition, & (if necessary) manually adjust controls on the asset (e.g., valve wheels, pressure devices, variable switches, etc.). All this while viewing live changes to associated key performance attributes of the asset on their AR screen.

Connected Worker also improves Texmark's worker safety by improving efficiencies and therefore reducing a worker's time in a hazardous plant environment.

"CB Technologies has a fantastic team," says Linda Salinas, VP of Operations at Texmark. "Everybody I work with at CB Technologies is a great listener. They're exceptionally good at gathering intel and learning about what our challenges are, what our pain points are, and really what the solution is that we're trying to drive towards."

"This innovative IIoT technology will help us become safer, more competitive, and better at everything we do."

Doug Smith
CEO, Texmark

Targets

0
incidents & unplanned outages

100%
satisfaction of customer SLAs

50%
reduction in planned maintenance costs

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