CASE STUDY

Digital innovation in material management for a global EPC company in South Korea

Key facts:

Company: Hyundai Engineering Co., Ltd.

Industry: EPC for Refinery Development Master Plan

Project Site: Balikpapan, East Kalimantan, Borneo Island, Indonesia

Country: South Korea

Octave products used: Loop Materials Readiness *(Jovix)*

Introduction

Since 2021, there has been a noticeable increase in investments in industrial plant construction projects, especially with major South Korean Engineering, procurement, and construction companies landing significant petrochemical plant contracts in the Middle East and Africa. With the rise of large-scale global plant projects, the material supply chain has grown more intricate, necessitating off-site prefabrication and modularization as a key strategy. This shift reflects both material flow and the growing involvement of various project stakeholders, highlighting the importance of real-time visibility in supply chain management.

Meanwhile, Hyundai Engineering, a leading global EPC player, is addressing complex material management challenges through digital innovation. By selecting Octave Loop Materials Readiness in July 2023, Hyundai Engineering streamlined processes and mitigated construction delays and cost overruns by transitioning from manual processes to Internet of Things technology and digital transformation.

The company initially used Loop Materials Readiness to manage piping spools at the laydown near the construction site of the Balikpapan Refinery project on Borneo Island, Indonesia. The goal was to simplify inventory management and materials issue processes through digitalization and automation.

Pain points

Jobsite challenges before the Loop Materials Readiness implementation included the following:

- Piping spools inventory at the laydown near the construction site were managed manually, with their locations and statuses recorded on paper and Excel spreadsheets.
- Traditional approach to material inventory management frequently led to inaccuracies in data and delays in data entry.
- A significant time was spent tracking and tracing temporarily misplaced pipe spools, leading to construction delays and increased procurement costs.
- Inconsistencies in updating the location data of the piping spool inventory, coupled with data delays, had a negative impact on the completion of all issue processes.

Key benefits:

- Access to real-time material readiness information for precise construction schedule management.
- Implementation of automated material management processes on the construction site.
- Increased project performance and timesaving by having real time visibility into material locations.

The solution

To streamline the management of the piping spool inventory and material issue, passive RFID tags were affixed to each spool for precise location tracking. Handheld RFID readers were employed to scan the GPS coordinates of stored spools at the material laydown area. Subsequently, the location and status data of these spools were seamlessly transferred to the Loop Materials Readiness application server via automatic recognition technology. Material management coordinators and operators accessed accurate, real-time piping spool information through the user-friendly Loop Material Readiness web UI or mobile app interface.

When material issue requests originated from the construction site, a Loop Materials Readiness user swiftly finds the location and status of the respective spool, whether via web or mobile app. Field workers utilized handheld RFID readers and the Loop Material Readiness mobile app to navigate to the exact material location, guided by audio signals and visual mapping. Post locating as well as performing inspection of piping spools, the completion of materials issue was processed within the Loop Materials Readiness mobile app. The status data of issued spools was then transmitted to the Jovix application server, empowering the field construction management team to make informed decisions to the construction plan based on real-time insights.

Results

- Efficiency gains in updating and issuing material management, leading to time savings.
- Streamlined track and trace, resulting in reduced time spent locating materials during material issue.

- Reporting features that enabled proactive decision-making to solve issues before they impact construction schedule.
- Provided visibility into material location and cost savings from decreased material loss.
- Enhanced construction schedule adherence and productivity through the provision of real-time material data to the construction team.

Next steps

Based on these results, Hyundai Engineering has decided to deploy the next phase of Loop Materials Readiness in upcoming industrial plant projects. The goal is to digitize and automate the entire cycle of materials management processes on-site, encompassing receipt, inspection, transfer, issue, installation and return using Jovix. The goal of these efforts is to achieve a digital supply chain management strategy that eliminates risk factors of construction schedules, costs and safety through real-time operational data visibility and analysis for all critical material types.

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

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