Humatics technology increased Tata Steel’s Crane Automation System usage from 50% to 95% utilization

Tata Steel is an Indian multinational steel producer headquartered in Mumbai with manufacturing operations in 26 countries. It is among the top global steel companies, producing 27.5 million tons of crude steel each year. Critical to Tata Steel’s success is a precise and reliable position monitoring system for overhead bridge cranes that will help the company move towards a safer, more efficient, automated steelworks solution at their stockyards.

**Challenge**

Tata Steel is one of the largest steel producers in the world and heavily relies on overhead bridge cranes at their steel mills. These cranes operate in harsh, high-temperature environments where optical systems such as laser range-finders or typical wireless technologies often fail. The Mean Time to Repair (MTTR) for these optical sensors is high and their complexity makes identification of faults and downtime a time-consuming task. As steel production increases at Tata Steel, tolerance for costly steelyard crane maintenance downtime decreases.

Then there is the issue of worker safety. Operators often face dangerous scenarios when operating bridge cranes properly. And working crews regularly visit the yards for manual stock updates that result in accidents, injuries, and fatalities.

“The KinetIQ 100 precisely locates overhead cranes handling liquid hot metal, a critical application that no longer requires operators to manually perform this dangerous task.”

ABHLASH AGNIHOTRI
Sr. Manager, Automation Division, Tata Steel
Solution

Tata Steel leveraged a systems integrator, MACHINDIA, to increase crane positioning and automation efficiency at their steelyards. MACHINDIA required a technology that could overcome the high temperature and reliability issues with vision systems. The KinetIQ 100 was chosen for its highly precise two centimeter precision microlocation capabilities built for rugged industrial environments.

Humatics’ KinetIQ 100 units were used to calculate X-Y position at 2cm accuracy throughout a 400 x 40 meter steel yard. A crane’s position was derived in real-time via two KinetIQ 100 units placed on the bridge, and an additional unit placed on each of the three cranes. Data from each unit was then used to create business rules for stock-in, stock-out and internal mutation, sending work instruction position data to the crane computer’s user interface.

This Humatics Spatial Intelligence Platform system was deployed by MACHINDIA in a Tata Steel slab yard as well as across all of their steel melting shops. In the melting shops, a KinetIQ 100 system is used to augment an existing vision system in order to improve personnel safety. For the slab yard, Humatics technology was implemented to address productivity and efficiency issues in their active operations.

Results

- After 18 months of use at two steel melting yards in India, the installed Humatics systems are still deployed on cranes handling liquid hot metals without a single reported failure.
- Utilization of Tata Steel’s Crane Automation System has increased from an average of less than 50% when using solely optical sensors to 95% by adding Humatics technology to their solution.
- Operations managers are now able to focus more on steel stockyard productivity rather than continually worrying about crane asset maintenance and repair scheduling.
- Meeting industrial standards to reliably withstand harsh environmental conditions is no longer a concern. Previous rangefinder technology was unable to withstand the intense Indian summer heat, whereas the KinetIQ 100 units recorded a maximum of 78 °C without any failures.

With the Humatics’ Spatial Intelligence Platform successfully running at two steel melting yards, Tata Steel now plans to deploy systems at additional sites. For example, Humatics technology will be deployed at the massive Kalinganager production facility which produces over 2.8 million tons of steel per year. The goal is to automate an open stockyard with reach stackers and heavy forklifts manipulating steel slabs and coils. Optical sensor systems are unable to meet real-world operational requirements, whereas Humatics’ Spatial Intelligence Platform has proven its ability to overcome these hurdles in challenging environmental conditions.

“Working with MACHINDIA and Humatics to build a location management system for our overhead cranes is one the best decisions we’ve made. The result was a much simplified architecture for location tracking of Tata Steel’s cranes in the harsh industrial setting of a steel plant. Adding the KinetIQ 100 system from Humatics contributed significantly in increasing reliability and uptime of our automation system.”

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