



CYIENT

CYIENT HELPS INCREASE MARKET SHARE THROUGH PRODUCT INNOVATION

100-ton cross-terrain truck crane developed

Customer

A global market leader in the world of heavy construction equipment manufacturing, this Fortune 500 Cyient, Inc. client provides diversified mechanical solutions for industrial applications ranging from infrastructure construction to surface mining and transportation. Today shipping to more than 170 countries, their chief products include cranes, aerial work platforms, material handling and processing systems, digger derricks and auger drills.

Business Need

In an effort to increase their market share, the client selected Cyient as its engineering partner to help develop its first ever 100-ton cross-terrain truck crane.

Client requirements for the finalized crane design included:

- Must be able to obtain road permits in all 50 U.S. states and in Canada
- Must meet Tier IV and RoW (rest of the world) emission requirements
- Must use existing superstructure and cab designs
- Must meet specified vehicle cost targets
- Must be road ready with completely functional prototype ready for launch within 11 months

The Solution

Working in close cooperation with the client's design staff, the Cyient engineering team began by conducting detailed market research, a careful and deliberate process that included a target market study, competitor product benchmarking and a feasibility study. A set of product specifications were then developed

to arrive at an agreed-upon vehicle definition, incorporating significant Cyient contributions to the crane's major subsystem designs. These systems included the frame, decking, fenders, x-type outriggers, outrigger hub, superstructure, suspension systems, lower and upper cab and boom hydraulics. In addition, the Cyient team helped to develop the crane's Tier IV/RoW engine, powertrain integration, and electrical/pneumatic systems integration.

The final design was then digitally validated using FEA (finite element analysis), CFD (computational fluid dynamics) analysis and hand calculations in order to assure quality and full compliance with the norms and regulations in place throughout the United States and Canada, including:

- Emission regulations and standards
- Intermodal roadability regulations
- Axle load control regulations for heavy vehicles
- Safety regulations and standards

While these critical project design, management and support tasks were conducted by our onsite engineering team, our offshore team located in India focused on the detailed work necessary to optimize the project's cost and schedule planning. Combining our concurrent engineering approach, 40% reuse of existing parts and a strong ownership of component sourcing, our teams successfully achieved all the milestone results required by this project.

Specific elements in this project's success included:

- Efficient collaboration with the client to develop a complete SOW (statement of work) and machine definition documents, as well as a project plan that addressed project governance, intermediate deliverables scheduling and estimated resource

requirements

- Building and coordinating a global team of more than 30 engineering experts to execute the project
- Completing design and FEA verification of the truck frame, outriggers and center section, followed by the integration and FEA validation of the existing superstructure and cab
- Completing the engine/powertrain integrations and installations in compliance with Tier IV and RoW emission standard requirements
- Developing and designing all crane subsystems, including vehicle suspension, hydraulics and electrical architectures
- Efficiently sourcing all necessary subassemblies and components from a list of approved vendors, in cooperation with the client's supply management team
- Reconfiguring operator environment (lower and upper)
- Completing manufacturing drawings and other project documentation, including design references necessary for compliance with various regulatory requirements
- Supporting the prototype build and physical machine validation

Client Benefits

The client received a completed crane prototype according to their specifications achieving the following project goals and success metrics:

- Accelerated product development cycle
- Reduced total engineering cost (over 45,000 hours)
- Targeted machine cost successfully achieved
- Effective use of existing designs for key vehicle systems and subsystems
- Desired product completed and ready for full production launch within 11 month stipulated

time frame, without delay

- Significant (30%) cost savings on materials and manufacturing, as a result of aggressive weight reductions and inclusion of reusable components. Weight optimization on the deck design alone resulted in cost savings in excess of \$30,000 per machine unit.

Conclusion

This client's successful 100-ton truck crane development project stands as a perfect example of the power of collaboration engineering partnerships, from the earliest stages of vehicle definition to the final process of prototype development.

Together as a team, Cyient and this client completed their crane project in just 11 months, meeting or exceeding all time cost and performance expectations set out by the client.

About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, network and operations management services to global industry leaders. We leverage the power of digital technology and advanced analytics capabilities, along with our domain knowledge and technical expertise, to help our clients solve complex business problems. As a Design-Build-Maintain partner that takes solution ownership across the value chain, we empower our clients to focus on their core, innovate, and stay ahead of the curve.

Relationships lie at the heart of how we work. We partner with organizations in ways that best suit their culture and requirements. With nearly 14,000 employees in 21 countries, we combine global delivery with proximity to our clients, functioning as their extended team. Our industry focus spans aerospace and defense, medical, telecommunications, rail transportation, semiconductor, utilities, industrial, energy and natural resources.

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