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TARIFF IMPACT

SPECIAL FOCUS
TRAINING & SKILLING IN MINING

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twin technologies will redefine the very fabric of material movement. Whether it's placing concrete segments for metro projects, stacking containers at a smart port, or automating an e-commerce fulfillment center, MHE will continue to be the silent engine powering India's industrial growth story.

In conclusion, the material handling equipment industry is undergoing a transformation that goes far beyond machines and mechanics. It is embracing a future where efficiency meets intelligence, sustainability aligns with profitability, and innovation drives competitiveness.
As India charts its course toward becoming a global manufacturing and infrastructure powerhouse, MHE will remain a critical enabler—quietly but powerfully lifting the weight of the nation's ambitions.

LEADERS SPEAK...

Pinaki Niyogy, Chief Operating Officer & Chief Technology Officer, TIL, said, "At TIL Limited, we're taking a systematic, customer-focused approach to technology integration. Our R&D centers have developed sophisticated IoT frameworks that enable real-time performance monitoring across our equipment range. These systems continuously capture operational data, including load characteristics, engine performance, hydraulic pressures, and structural stresses, which is then analysed to predict maintenance needs before failures occur. Through our global strategic partnership, we've incorporated intelligent monitoring systems into our machines that provide operators with comprehensive performance metrics and operational guidance. Our latest models incorporate several significant engineering advancements that address the evolving requirements of modern construction and material handling operations. To enhance load capacity and operational efficiency, we've redesigned our boom structures using advanced stress analysis techniques, optimising the distribution of high-strength steel to create lighter yet stronger components. This approach has increased lifting capacities without compromising safety margins, allowing our equipment to handle heavier loads while maintaining energy efficiency."

Manjunath S, Director - MH Sales, SIOP, Marketing, Doosan Bobcat India, said, "Doosan Bobcat is enhancing its forklifts by integrating automation, IoT, telematics, and robotics to improve safety, efficiency, and productivity. The company is developing advanced sensor systems to detect obstacles and support autonomous functions, enabling safer and smarter operations. In its manufacturing processes, Bobcat uses intelligent visual systems to boost inspection accuracy and streamline material handling, reducing time and errors. These efforts reflect a strong commitment to innovation, with a focus on improving operational performance, real-time monitoring, and predictive capabilities. The integration of these technologies' positions Bobcat at the forefront of next-generation forklift design and functionality. Bobcat forklifts feature several design and engineering enhancements aimed at boosting load capacity, operational efficiency, stability, and manoeuvrability. High-strength structural components and reinforced frames allow the machines to handle heavier loads while maintaining durability. The Guardian Stability System (GSS) enhances safety by actively monitoring speed and mast tilt to reduce tip-over risks. To improve performance in tight spaces, Bobcat forklifts—such as the BNT series—are designed with a compact chassis and tight turning radius for better manoeuvrability. Additionally, high-visibility masts and low-profile dashboards improve operator sightlines, ensuring more precise and efficient load handling in confined environments."

Neville Mevawala, Head of Sales & Marketing, Material Handling Equipment, a part of Godrej Enterprises Group, said, "The material handling equipment market is undergoing significant transformation globally and in India. Key trends include automation integration with AI-powered solutions revolutionizing warehouse operations, sustainable equipment designs focusing on electric, and IoT connectivity enabling predictive maintenance and real-time tracking capabilities.

E-commerce growth is accelerating technology adoption, while compact equipment designed for tight spaces is addressing urban warehousing challenges. The industry is also moving toward flexible, modular solutions that can adapt to changing business requirements. At Material Handling Equipment business of Godrej Enterprises Group, we're driving innovation through our comprehensive approach to equipment design and functionality. Our electric forklift range balances efficiency with performance requirements, addressing the market's growing demand for sustainable solutions. We are set to launch India's first IoT-enabled forklift trucks, empowering fleet owners to monitor equipment performance across multiple locations and optimize fleet utilization and maintenance costs through proactive, data-driven interventions." ■

Safety remains our paramount concern at TIL, reflected in our integration of advanced safety technologies across our equipment range.

PINAKI NIYOGY
Chief Operating Officer & Chief Technology Officer, TIL

What are the current trends driving the material handling equipment market in India and globally?

The material handling equipment market is undergoing a significant transformation, and infrastructure development remains the primary catalyst, particularly in India, where national initiatives like PM Gati Shakti and the National Infrastructure Pipeline are creating unprecedented demand for advanced equipment. We're witnessing projects of increasing scale and complexity that require machines with greater capacity, precision, and flexibility. Simultaneously, sustainability has emerged as a defining trend, with customers seeking equipment that minimises environmental impact through reduced emissions and improved energy efficiency. This has accelerated the development of electric and hybrid solutions, including hydrogen fuel cells and lithium-ion battery-powered equipment.

Digitalisation represents another transformative trend, with IoT integration enabling real-time monitoring and predictive maintenance capabilities that enhance operational efficiency and reduce downtime. Safety innovations continue to evolve rapidly, with advanced features like overload protection, automated stability control, and improved operator visibility becoming standard requirements. Finally, we can see a marked shift toward equipment with extended lifecycles and

circular economy principles, where machines are designed for durability, repairability, and eventual recycling. At TIL Limited, our 80-year legacy has positioned us to respond effectively to these trends while maintaining our core commitment to engineering excellence and manufacturing prowess.

How is your company integrating automation, IoT, telematics, AI, and robotics into your machines?

At TIL Limited, we're taking a systematic, customer-focused approach to technology integration. Our R&D centers have developed sophisticated IoT frameworks that enable real-time performance monitoring across our equipment range. These systems continuously capture operational data, including load characteristics, engine performance, hydraulic pressures, and structural stresses, which is then analysed to predict maintenance needs before failures occur. Through our global strategic partnership, we've incorporated intelligent monitoring systems into our machines that provide operators with comprehensive performance metrics and operational guidance.

Could you explain the design and engineering enhancements made in your latest models to improve load capacity and operational efficiency, stability and structural strength, manoeuvrability in confined spaces?

Our latest models incorporate several significant engineering advancements that address the evolving requirements of modern construction and material handling operations. To enhance load capacity and operational efficiency, we've redesigned our boom structures using advanced stress analysis techniques, optimising the distribution of high-strength steel to create lighter yet stronger components. This approach has increased lifting capacities without compromising safety margins, allowing our equipment to handle heavier loads while maintaining energy efficiency.

Our reconfigured counterweight systems provide improved stability without excessive machine weight, striking an optimal balance between performance and transportability. For enhanced manoeuvrability in confined spaces, our Rough Terrain Cranes feature 4x4 wheel drive and four-wheel steering capabilities, allowing precise positioning in constrained work environments. The compact dimensions of these machines enable effective operation in urban construction sites and industrial facilities where space is limited. These innovations collectively represent our commitment to address

real-world operational challenges through thoughtful engineering rather than incremental feature additions.

What are the key innovations in hydraulic systems, powertrains, braking systems, and drive mechanisms used in your equipment?

Our hydraulic systems have undergone substantial refinement, incorporating proportional load-sensing technology that automatically adjusts flow and pressure based on actual requirements. This adaptive approach optimises energy consumption while delivering precise control during critical lifting operations. We've introduced multi-circuit hydraulic systems that prioritise essential functions during peak demand periods, ensuring that critical operations like boom movement and load stabilisation receive adequate power under all conditions. These systems feature enhanced filtration and cooling capabilities that maintain optimal fluid conditions even in extreme operating environments.

What role do advanced materials (high-strength steel, composites, etc.) play in the durability and performance of your machines?

Advanced materials like high-strength low-alloy steel are critical to the durability and performance of our machines. They help us build equipment that is lighter, stronger, and more reliable, which is ideal for demanding operational sites. Our products stand out through several key differentiators - in-built advanced safety features, ergonomic designs, and smart sensors to minimise risks. TIL cranes feature fully synchronised or sequence-synchronised rectangular or trapezoid booms made with low-alloy high-tensile steel, ensuring uniform load distribution and high lifting capacity. Our ReachStacker is the only global-standard model in its class,

fully made in India, offering the lowest cost of ownership. We also provide customisation, allowing our products to integrate seamlessly into customers' operations. At the end of the day, machine uptime drives customer profitability, so we design them to be highly reliable and built to last.

What are the latest safety technologies integrated into your machines (such as anti-tipping systems, proximity warning systems, collision avoidance, load sensors)?

Safety remains our paramount concern at TIL Limited, reflected in our integration of advanced safety technologies across our equipment range. Our Load Moment Indicators (LMI) constantly monitor lifting parameters, providing operators with electronic displays of critical information while automatically preventing operations that could compromise stability.

These systems incorporate anti-tipping protection that analyses multiple factors, including axle loading and load characteristics, to establish safe operating envelopes. Our all-glass cab designs significantly enhance visibility, complemented by cameras that eliminate blind spots and provide operators with comprehensive situational awareness.

Each TIL machine undergoes rigorous testing to verify these safety systems, ensuring consistent performance in the challenging conditions of Indian construction and mining operations.

What ergonomic improvements have been introduced to enhance operator comfort and reduce fatigue during long working hours?

Operator comfort directly impacts productivity, safety, and retention, driving our comprehensive approach to cabin ergonomics and control systems. Our latest ReachStacker model features completely redesigned operator environments based on extensive anthropometric research and user feedback. The cabins incorporate adjustable seating with advanced suspension systems that absorb vibration and shock while accommodating operators of varying physical dimensions. Climate control systems maintain optimal temperature and humidity regardless of external conditions, while enhanced sound insulation reduces noise fatigue during extended operations. We've significantly improved visibility through larger glass areas and optimised structural designs that minimise blind spots without compromising protective capabilities.

What training programs (operator training, maintenance training) do you offer to customers?

Our comprehensive training ecosystem addresses both initial equipment adoption and ongoing skill development. For operators, the programs are tailored to specific equipment models and applications, ensuring they develop both fundamental skills and specialised techniques relevant to their particular working environments. Maintenance personnel receive equally thorough training, covering routine servicing procedures, diagnostic techniques, and component replacement protocols. These programs emphasise preventive maintenance practices that extend equipment life and reduce unplanned downtime. ■