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LIFTING the FUTURE: SLEW CRANES in a Booming Global Market

In the dynamic world of construction and industrial operations, few pieces of equipment have proven as transformative as the slew crane. With its ability to rotate 360 degrees and handle heavy loads with precision, the slew crane has become a cornerstone of modern lifting technology. From towering skyscrapers to sprawling manufacturing plants, ports, and renewable energy projects, slew cranes are reshaping how industries approach heavy lifting tasks, **Equipment Times** explores.



As the global construction equipment market continues to evolve, the slew crane stands out as a versatile, efficient, and increasingly indispensable tool. This feature article delves into the history, technology, applications, and market trends of slew cranes, offering a comprehensive look at their role in today's construction landscape and beyond.

The concept of cranes dates back to ancient civilizations, where rudimentary lifting devices powered by human or animal labor were used to move heavy objects. However, the modern slew crane owes its origins to the Industrial Revolution, a period that saw advancements in steel production, hydraulic systems, and mechanical engineering. The introduction of slewing mechanisms—allowing cranes to rotate their loads—marked a significant leap forward. By the 19th century, slewing cranes were being employed in dockyards and

early industrial settings, offering a level of flexibility that fixed cranes could not match.

Fast forward to the 20th century, and the slew crane evolved into the sophisticated machine we know today. The integration of electric motors, advanced hydraulics, and later, automation technologies, expanded its capabilities, enabling it to lift heavier loads with greater precision. Today's slew cranes are a testament to centuries of innovation, combining robust engineering with cutting-edge technology to meet the demands of modern industries.

WHAT MAKES SLEW CRANES UNIQUE?

At its core, a slew crane is defined by its ability to rotate its boom or jib 360 degrees around a fixed base or mobile platform. This slewing action is made possible by a slew ring or slewing bearing—a large, circular

component that connects the crane's upper structure to its base, allowing smooth rotation. The design provides unparalleled flexibility, enabling operators to position loads precisely without repositioning the entire crane.

Slew cranes come in various forms, including tower cranes, mobile slew cranes, and crawler cranes, each tailored to specific applications. Tower cranes, for instance, are a staple on high-rise construction sites, where their height and reach are critical. Mobile slew cranes, often mounted on trucks or wheeled chassis, offer mobility and quick setup, making them ideal for smaller projects or sites with limited space. Crawler slew cranes, with their tracked bases, excel in rugged terrains, such as those found in mining or wind energy installations.

Key features of modern slew cranes include high lifting capacities (ranging from a few tons to over 1,000 tons



in some models), advanced control systems, and safety enhancements like collision avoidance sensors and load moment indicators. These attributes make slew cranes adaptable to a wide range of tasks, from lifting steel beams to installing wind turbine components.

APPLICATIONS ACROSS INDUSTRIES

The versatility of slew cranes has cemented their place across multiple sectors. In construction, they are indispensable for erecting buildings, bridges, and infrastructure projects. Their ability to lift heavy materials to great heights with precision has made them a go-to choice for urban development, where space is often constrained, and accuracy is paramount. For example, in the construction of skyscrapers, tower slew cranes hoist steel girders and concrete panels, streamlining workflows and reducing manual labour.

Beyond construction, slew cranes play a vital role in manufacturing, where they move large components along assembly lines, minimizing downtime and boosting productivity. In the shipping industry, slew cranes dominate ports, efficiently loading and unloading cargo from vessels. The rise of renewable energy has further expanded their footprint, with slew cranes being used to install massive wind turbine blades and towers, often in remote or offshore locations.

The mining sector also relies heavily on slew cranes, particularly crawler models, to handle heavy machinery and raw materials in challenging environments. As industries diversify and projects grow in scale, the adaptability of slew cranes ensures they remain relevant across these varied applications.

TECHNOLOGICAL ADVANCEMENTS DRIVING

INNOVATION

The slew crane market is being reshaped by rapid technological advancements. Automation and remote-control systems are at the forefront, allowing operators to manage cranes from a safe distance, improving both efficiency and safety. For instance, some modern slew cranes feature telematics and GPS tracking, providing real-time data on performance, load conditions, and maintenance needs. This data-driven approach helps operators optimize operations and reduce downtime.

Safety is another area of innovation. Collision avoidance systems, equipped with sensors and cameras, detect obstacles and adjust crane movements to prevent accidents. Energy efficiency is also gaining traction, with manufacturers introducing hybrid and electric slew cranes that reduce fuel consumption and emissions. Regenerative braking systems, which capture energy during operation, are becoming standard in high-end models, further enhancing sustainability.

Materials science has contributed as well, with stronger, lighter components like high-strength steel and composites increasing lifting capacities without adding bulk. These advancements are not just improving performance—they're responding to broader industry trends like sustainability, urbanization, and the push for smarter, safer worksites.

THE SLEW CRANE MARKET: TRENDS AND GROWTH

The global crane market, of which slew cranes are a significant segment, is experiencing steady growth. Valued at approximately \$38.69 million in 2024, it is projected to reach \$58.99 million by 2033, growing at a compound annual growth rate (CAGR) of 4.8%, according to industry reports. Slew cranes, in particular, are

driving much of this expansion, fueled by rising demand in construction, infrastructure, and renewable energy.

One key trend is the increasing need for higher-capacity cranes. Mega-projects like high-speed railways, metro systems, and wind farms require equipment capable of lifting heavier loads to greater heights. In India, for example, government initiatives like "Make in India" and the Smart Cities Mission are spurring infrastructure development, boosting demand for slew cranes. Similarly, in North America, the U.S. construction boom—particularly in residential and data center projects—is a major growth driver.

The renewable energy sector is another catalyst. The global push for wind and solar power has led to a surge in demand for slew cranes capable of handling large, unwieldy components. Crawler slew cranes, with their stability and high lifting capacities, are especially sought after for wind turbine installations, where hub heights are increasing.

Urbanization is also reshaping the market. As cities grow denser, contractors favor compact, mobile slew cranes that can navigate tight spaces without sacrificing power. This trend is evident in Asia-Pacific, the fastest-growing region for crane sales, where countries like China and India are investing heavily in urban infrastructure.

Technological adoption is influencing market dynamics too. Manufacturers are integrating artificial intelligence (AI) and Industry 4.0 principles into slew cranes, enhancing precision and predictive maintenance. While these innovations drive growth, they also pose challenges—high upfront costs and the need for skilled operators can limit adoption, particularly in developing markets.

CHALLENGES FACING THE MARKET

Despite its growth, the slew



crane market faces hurdles. High maintenance costs are a persistent issue, as cranes require regular servicing to prevent breakdowns and ensure safety. The complexity of modern systems also demands skilled operators, a scarce resource in many regions due to labor shortages and inadequate training programs.

THE FUTURE OF SLEW CRANES

Looking ahead, the future of slew cranes is bright. The global shift toward sustainable construction will drive demand for electric and hybrid models, aligning with stricter emissions regulations. AI and automation will continue to enhance functionality, making cranes smarter and more autonomous. For instance, Andritz's AI-powered autonomous logyard crane hints at what's possible—cranes that operate with minimal human input, boosting efficiency and safety.

The rental market is another area of opportunity. As contractors seek cost-effective solutions, renting slew cranes for short-term projects is gaining popularity, particularly among small and medium enterprises. This trend could democratize access to advanced equipment, leveling the playing field across the industry.

Regionally, Asia-Pacific will likely remain a hotspot, fueled by rapid urbanization and infrastructure spending. North America and Europe will see steady growth, driven by renewable energy and smart city projects. Emerging markets in Africa and Latin America, though currently underdeveloped, hold untapped potential as industrialization accelerates.

Slew cranes are more than just heavy machinery—they're a symbol of human ingenuity and industrial progress. Their ability to adapt to diverse applications, from urban construction to offshore wind farms, underscores their enduring relevance. As

technology advances and market demands evolve, slew cranes will continue to rise, lifting not just materials but entire industries to new heights. For construction professionals, equipment manufacturers, and investors alike, the slew crane market offers a compelling story of innovation, growth, and opportunity—one that's set to shape the future of heavy lifting for decades to come.

INDUSTRY VOICES

Manoj Agarwal, Vice President – Heavy Equipment Division, Action Construction Equipment (ACE), said, "India's

slew crane market is experiencing steady growth, driven by infrastructure expansion, industrial development, and rapid urbanization. Government initiatives like Make in India and Smart Cities are further boosting demand. Technological advancements, including automation and enhanced safety features, are improving operational efficiency. The port and shipping sector remains a key contributor, alongside the growing preference for rental and leasing solutions. Additionally, sustainability concerns are increasing the demand for energy-efficient cranes, while rising competition is driving cost optimization and greater localization in manufacturing. As a market leader in construction and material handling equipment, Action Construction Equipment Ltd. (ACE) is well-positioned to meet the growing demand for slew cranes. With expertise in manufacturing high-quality, technologically advanced cranes, ACE ensures industry-leading efficiency, reliability, and safety. The company's emphasis on localization, cost optimization, and a robust aftermarket support network provides long-term value to its customers. Additionally, ACE's focus on energy-efficient



and sustainable crane solutions aligns with the industry's shift toward eco-friendly equipment, reinforcing its commitment to innovation and sustainability."

Pinaki Niyogy, Chief Operating Officer & Chief Technology Officer, TIL, said, "As

a leading crane manufacturer, TIL Limited has recognised several key trends shaping the slew crane industry, driven by the growing scale of construction projects, increasing safety demands, and evolving lifting requirements. International players are now prioritizing cranes that offer greater operational safety, advanced control systems, and improved stability, ensuring compliance with stringent global safety standards. Projects such as high-rise buildings, metro rail networks, highways, and smart cities require cranes with enhanced load-bearing capabilities and greater maneuverability. In India, initiatives like the National Infrastructure Pipeline, Bharatmala, and Sagarmala are accelerating this demand. The need for higher lifting capacities, precise load placement, and efficient operations in confined spaces is driving advancements in slew crane design. Industries such as ports, mining, oil & gas, and renewable energy are also employing TIL cranes that can handle heavier loads while maintaining stability and precision. Modern slew cranes are equipped with advanced overload limiters and glide slew to ensure safe lifting operations. At TIL Limited, safety is a top priority; the cranes are engineered to comply with American, international, and national safety standards, ensuring the highest levels of reliability and operational security. To prevent catastrophic failures, we incorporate built-in redundancies in the designs, with all TIL products featuring a higher Factor of Safety (FoS)." ■





At TIL, our vision is to incorporate advanced digital technologies that enhance operational safety and efficiency.

PINAKI NIYOGY

Chief Operating Officer & Chief Technology Officer, TIL

How do you assess the current demand for slew cranes in India? Which industries are driving the growth?

Slew cranes are engineered to meet stringent International safety standards and play an integral role in global infrastructure development. In India, national priorities, large-scale expansion, and strategic initiatives have significantly increased the demand for slew cranes. Renowned for their versatility and ease of operation, these cranes offer precise load placement that enhances efficiency—whether lifting heavy materials at construction sites or maneuvering equipment in mines. All cranes at TIL Limited are equipped with advanced slewing functionality, which plays a critical role in numerous national projects. Their applications are indispensable across sectors, including mining, infrastructure, refineries, multi-modal connectivity, railways, metro construction, and Greenfield developments.

What are the key market trends influencing the slew crane segment?

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Projects such as high-rise buildings, metro rail networks, highways, and smart cities require cranes with enhanced load-bearing capabilities and greater maneuverability. In India, initiatives like the National Infrastructure Pipeline, Bharatmala, and Sagarmala are accelerating this demand. The need for higher lifting capacities, precise load placement, and efficient operations in confined spaces is driving advancements in slew crane design. Industries such as ports, mining, oil & gas, and renewable energy are also employing TIL cranes that can handle heavier loads while maintaining stability and precision.

What are the latest technological innovations in slew cranes that enhance efficiency and performance? How are digitalization and automation transforming slew crane operations?

We are looking at a growing demand for equipment that is designed to reduce emissions and increase energy efficiency. At the same time, the integration of IoT and data analytics is driving a digital transformation across the industry. At TIL Limited, our vision is to incorporate advanced digital technologies that enhance operational safety and efficiency.

TIL mobile cranes are equipped with interlocks that prevent overloading, ensuring safer operations. Additionally, we



have implemented telematics solutions that enable real-time performance monitoring, while the advanced Load Moment Indicators (LMI) provide operators with electronic displays of critical parameters for improved decision-making.

What are the key safety features integrated into modern slew cranes? How do your slew cranes comply with evolving safety and environmental regulations?

Modern slew cranes are equipped with advanced overload limiters and glide slew to ensure safe lifting operations. At TIL Limited, safety is a top priority; the cranes are engineered to comply with American, international, and national safety standards, ensuring the highest levels of reliability and operational security. To prevent catastrophic failures, we incorporate built-in



redundancies in the designs, with all TIL products featuring a higher Factor of Safety (FoS).

Each crane undergoes a rigorous testing and quality assurance process, in line with the ISO 9001:2015 certification. Additionally, the ARAI certification underscores our commitment to meeting the most stringent benchmarks for safety, brake performance, steering control, and noise reduction—critical factors for ensuring safe and efficient crane operations in demanding construction environments.

We continuously update the testing protocols to align with evolving global safety and environmental regulations. Moreover, we actively engage with an extensive Pan-India network to gather real-time feedback, which helps us enhance the safety verification processes and ensure that TIL cranes perform reliably in diverse operational conditions.

What are the common operational challenges in using slew cranes, and how are they being addressed?

In large-scale construction and material handling, maneuverability is a critical challenge, as traditional cranes with large structures require significant space to operate efficiently. To address this, TIL Limited has introduced Rough Terrain (RT) Cranes with 4x4

wheel drive and four-wheel steering, making them compact and highly versatile. Unlike conventional cranes, these models can navigate confined job sites with ease, eliminating the need for extensive space to maneuver while ensuring operational efficiency and safety.

Another challenge in the industry is load mobility on-site. Truck cranes are designed for highway travel, but they must remain stationary while lifting loads, supported by outriggers that elevate the tires off the ground. However, modern construction demands cranes that can move with loads over short distances on job sites. TIL's RT Cranes are engineered to reposition loads safely, both while supported on outriggers and while moving on tires, providing the flexibility of a slew crane while maintaining safe operation.

Furthermore, load alignment is a key concern for lifting precision and crane longevity. TIL's advanced Glide Slew feature ensures that even if the hook and load are misaligned or the load is out of the operator's direct sight, the system prevents unwanted swing, thereby reducing gearbox stress and preventing premature wear. In contrast, cranes without this feature often suffer from structural damage, leading to higher ownership costs over time.

Finally, when a crane is stationary with an extended boom, swinging the load can

cause significant displacement, which may compromise safety and precision. TIL cranes are equipped with an advanced dynamic braking system, enabling smooth load repositioning and minimizing unintended displacement, ensuring greater control, stability, and safe operations in demanding lifting environments.

How do your products ensure durability and performance in demanding construction environments?

TIL cranes are meticulously engineered for durability and consistent performance, designed to withstand India's demanding operational environments. They are built with world-class components, delivering exceptional strength while optimizing weight for maximum efficiency and performance. Each model undergoes rigorous testing protocols, with a strong emphasis on total lifecycle value, reducing the overall cost of ownership for the customers. Furthermore, our unwavering commitment to excellence has strengthened partnerships with global industry leaders, enabling us to integrate cutting-edge technology into the TIL cranes. This approach ensures that TIL Limited delivers robust, high-performance material-handling solutions that keep pace with the rapid advancements and growing demands of the Indian industry. ■