Surging imports of low-priced mobile cranes threaten the ability of the U.S. mobile crane industry to support this country’s critical infrastructure needs and to reliably supply the U.S. military with the highest quality, most innovative mobile cranes in the world.

Volumes Increased at Cut Rate Prices

- U.S. mobile crane imports increased from 1,337 units in 2014 to 3,375 in 2019, surging into the U.S. market at historic levels.
- Import prices declined over the last five years with 2019 prices down 13% from 2014 levels.

Since 1961, Manitowoc has supplied cranes for military applications.

- Vice President Mike Pence upon visiting Manitowoc’s production facility in Shady Grove, Pennsylvania: “I’m proud to say, this company has also stepped forward to help us provide for the common defense, designing and manufacturing cranes for the Armed Forces of the United States.”
- Manitowoc has a long history of Department of Defense contract awards
  - Defense Logistics Agency (“DLA”) Troop Support;
  - U.S. Army Tank-automotive and Armaments Command (“TACOM”);
  - United States Air Force, Navy, Army, Marines, U.S. Coast Guard;
  - The U.S. Army Corp. of Engineers.
- Manitowoc produces rough terrain, industrial and boom truck cranes for military use.
- In 2019, Manitowoc fulfilled all of the U.S. military’s needs for all-terrain and boom truck cranes and half of the U.S. military’s needs for rough terrain cranes.
- Manitowoc’s Grove AT422T has supported U.S. military operations throughout the United States and in hostile environments around the world.
- Manitowoc was recently awarded a contract to supply the GMK4060HC, an armor-plated, highly-engineered all-terrain mobile crane of which 25% of parts and components were sourced from American small businesses. No other domestic suppliers exist to supply the GMK4060HC.
Manitowoc cranes support U.S. critical infrastructure across all 16 identified sectors.

- Manitowoc cranes were immediately deployed to Ground Zero in New York City following the 9/11 terrorist attacks, helping to assist the hundreds of first responders in removing debris.

- Critical to the nation’s transportation sector, Manitowoc cranes are seen on highways, building bridges, and facilitating the construction and upkeep of airports, tunnels, and railways.

- The energy and nuclear reactor sectors rely on Manitowoc cranes to lift and set wind towers and turbines, to service electricity-generating facilities, to install and secure the electrical grid, and to build, service, and maintain the nation’s nuclear energy capacity.

- Manitowoc cranes are used at government facilities such as NASA’s Kennedy Space Center in Florida, by the U.S. Army Corps of Engineers to maintain and service dams across the U.S., and by commercial contractors to build iconic buildings across the United States.

Without relief from surging imports, Manitowoc’s ability to secure the U.S. national defense and critical infrastructure is threatened.

- Since 2014, demand for mobile cranes in the United States has softened. With declining demand and surging imports, domestic mobile crane producers have lost significant market share to imports.

- Even after undertaking cost-cutting measures, Manitowoc was faced with the unenviable choice of lowering prices to uneconomic levels in order to meet import competition and retain market share or attempt to maintain rational prices at the risk of losing sales to lower-priced imports.

- Manitowoc’s inability to raise prices to generate more favorable financial results makes its operating margins on its U.S. produced mobile cranes unsustainable and inadequate to support the level of reinvestment that is necessary to support Manitowoc’s continued product leadership and innovation.

- Given Manitowoc’s market leadership, such impairment to Manitowoc’s operations threatens the competitiveness of the domestic mobile crane industry and its ability to support critical infrastructure with the highest quality and most innovative cranes.

About Manitowoc. Founded in 1902, The Manitowoc Company, Inc. is the largest U.S. mobile crane manufacturer and a critical partner with the U.S. military. The company employs approximately 1,400 American workers in the United States, mostly at its facility in Shady Grove, Pennsylvania, where the company manufactures mobile cranes it sells in the U.S.
Before the
UNITED STATES DEPARTMENT OF COMMERCE

PETITION OF THE MANITOWOC COMPANY, INC. UNDER SECTION 232 OF THE TRADE EXPANSION ACT OF 1962 FOR RELIEF FROM IMPORTS OF MOBILE CRANES THAT THREATEN NATIONAL SECURITY

Dated: December 19, 2019
# TABLE OF CONTENTS

I. Introduction and Executive Summary ..................................................................................... 1  
II. Legal Standard ......................................................................................................................... 5  
III. Product Scope .......................................................................................................................... 8  
IV. Overview of the Domestic Mobile Crane Industry ................................................................. 8  
    A. Manitowoc .............................................................................................................. 8  
    B. Other Domestic Producers .................................................................................... 10  
V. Description of the Product ..................................................................................................... 11  
    A. Rough Terrain Cranes ........................................................................................... 11  
    B. Lattice Boom Crawler Cranes ............................................................................... 12  
    C. Industrial Cranes ................................................................................................. 13  
    D. Truck Mounted Cranes .......................................................................................... 14  
    E. Boom Truck Cranes ............................................................................................... 15  
    F. All-Terrain Cranes ................................................................................................ 16  
VI. Production Process ................................................................................................................ 17  
VII. Manitowoc Is the Dominant Supplier of Mobile Cranes to the U.S. Military ...................... 18  
VIII. The Importance of Mobile Cranes to U.S. Critical Infrastructure ....................................... 22  
IX. Foreign Sources of Mobile Cranes ........................................................................................ 33  
    A. The Japanese Mobile Crane Industry .................................................................... 34  
    B. The German and Austrian Mobile Crane Industry .................................................. 36  
    C. The Chinese Mobile Crane Industry ..................................................................... 37  
X. Imported Mobile Cranes Have Impaired the Condition of the U.S. Mobile Crane Industry 40  
    A. U.S. Mobile Crane Imports Have Surged Since 2014 .......................................... 41  
    B. The U.S. Industry Lost Market Share to Imported Mobile Cranes ....................... 41  
    C. Manitowoc Has Endured Unsustainable Harm to Its U.S. Production Operations 42  
XI. Imported Mobile Cranes and an Impaired Domestic Mobile Crane Industry Threaten the  National Security of the United States.................................................................................. 44  
XII. Request for Relief ................................................................................................................. 48  
XIII. Conclusion ........................................................................................................................... 49
I. **INTRODUCTION AND EXECUTIVE SUMMARY**

Pursuant to Section 232 of the Trade Expansion Act of 1962 and 15 CFR § 705.5, The Manitowoc Company, Inc. (“Manitowoc”), the largest U.S. producer of mobile cranes in the United States,\(^1\) applies for trade relief on imported mobile cranes and subassemblies thereof. Imports of mobile cranes have increased significantly and harmed Manitowoc and the domestic mobile crane industry, threatening the industry’s ability to supply mobile cranes to the United States Department of Defense and to support the country’s critical infrastructure needs.

On August 1, 2019, Vice President Mike Pence, joined by Deputy Secretary of Labor Patrick Pizzella and Congressman John Joyce, visited Manitowoc’s Shady Grove, Pennsylvania factory to address the Trump Administration’s economic achievement in creating 6 million new jobs, including 140,000 jobs in Pennsylvania. Citing Manitowoc’s recent repatriation of production of key mobile crane products to the United States, the Vice President confirmed Manitowoc’s important contribution to the economy and the U.S. military. Vice President Pence stated:

…we’re here today at Manitowoc’s largest manufacturing facility, where this company has invested nearly $50 million in the last three years alone, and hired more than 350 new workers right at this site. That’s real progress for Pennsylvania and America. (Applause.)

Manitowoc has worked hard to bring design and manufacturing jobs back to the United States. In fact, just last year, this company unveiled one of its newest product lines: the MLC100, which is the only 100-ton crawler crane that’s proudly made in the USA. (Applause.) And this great company — you can applaud that. That’s incredible. Wow. (Applause.)

And this company has brought millions of dollars in economic growth to Pennsylvania and the Shady Grove community. You’ve shown that American innovation is alive and well. And launching more than 20 new products in the last three years, you’ve stepped up. And also, I’m proud to

---

\(^1\) Manitowoc’s U.S. mobile crane business operates under Grove U.S. LLC, a wholly owned subsidiary of The Manitowoc Company, Inc.
say, this company has also stepped forward to help us provide for the
common defense, designing and manufacturing cranes for the Armed
Forces of the United States. (Applause.)

Thank you for what you do to make America safe and secure. (Applause.)

Indeed, since 1961, Manitowoc (and its predecessor companies) has supplied the U.S.
government with cranes for military applications. Over that 58 year period, Manitowoc has an
extensive history of Department of Defense contract awards through Defense Logistics Agency
(“DLA”) Troop Support, U.S. Army Tank-automotive and Armaments Command (“TACOM”),
and directly with the United States Air Force, Navy, Army, Marines, U.S. Coast Guard, and the
U.S. Army Corp. of Engineers.3 Such military cranes are built upon Manitowoc’s market
leading commercial mobile cranes, but designed, engineered and modified in the United States to
meet the military’s specifications. These military cranes have deployed to theaters of operation
throughout the world.

In addition to supplying the U.S. military, Manitowoc’s mobile cranes are vital to U.S.
critical infrastructure, which in turn is tied directly to U.S. national security. For example,

---

2 See Exhibit 1.
3 See Exhibit 2 (Confidential).
Manitowoc cranes were among the first pieces of heavy equipment brought to Ground Zero in Lower Manhattan after the September 11, 2001 terror attacks and remained there for years while the World Trade Center site was rebuilt.

Today, Manitowoc mobile cranes remain essential in meeting U.S. strategic objectives with respect to each of the 16 critical infrastructure sectors designated by the President of the United States, including the defense industrial base, transportation systems, dams, energy, communications, and nuclear reactors. Current applications include, among others, Bath Iron Works’ construction of the U.S. Navy’s next generation DDG 1000 Zumwalt-class destroyer warship, the recent completion of the U.S. Army Corps of Engineers’ largest civil engineering project ever at Olmstead Dam, and the construction and refurbishment of the nation’s transportation and communications systems and power grid.

Vice President Pence rightly touted Manitowoc’s repatriation of certain crawler crane manufacturing to its Shady Grove, Pennsylvania factory. However, surging imports of mobile
cranes during the past five years have threatened the viability of that investment and Manitowoc’s U.S. mobile crane operations as a whole. Since 2014, mobile crane imports have increased a staggering 72 percent.\(^4\) Through lower prices, increasing volumes of mobile crane imports captured significant U.S. market share at the expense of the U.S. mobile crane industry. With overall demand for mobile cranes having declined since 2014, rising import volumes left Manitowoc with substantially lower production and sales volumes, forcing the company to shutter a manufacturing plant in Manitowoc, Wisconsin and eliminate the 638 manufacturing jobs associated with it. While the Vice President cited the U.S. manufacturing jobs in Shady Grove, Pennsylvania associated with Manitowoc’s recent repatriation of crawler crane production, Manitowoc’s total U.S. jobs remain well below 2014 levels. Despite Manitowoc’s difficult cost-cutting measures, Manitowoc’s remaining U.S. production assets are underutilized and its operating margins on its U.S.-produced mobile cranes have been unsustainable and are inadequate to support the level of reinvestment that is necessary to maintain Manitowoc’s product innovation. Intellectual property infringement by Manitowoc’s Chinese competitors with respect to important mobile crane technologies further challenges Manitowoc’s future competitiveness.

Without relief under Section 232, the continued harm endured by Manitowoc due to persistently increasing imports threatens the ability of Manitowoc to supply the U.S. military and to support critical infrastructure. The U.S. military would become largely dependent on foreign sources for mobile cranes, which are vulnerable to disruption by our foreign adversaries and are otherwise already supplying foreign governments. Moreover, the domestic mobile crane

\(^4\) See Exhibit 3.
industry would be ill-equipped to supply the higher volumes of mobile cranes that will be required to rebuild the country’s deteriorating critical infrastructure.

The ability of the domestic mobile crane industry to meet these military and infrastructure needs depends on a financially viable domestic manufacturing capability. Already Manitowoc has closed one of its manufacturing facilities and another domestic producer, Terex Corporation, sold a substantial portion of its mobile crane business to a Japanese competitor and shuttered its U.S. mobile crane production operations. The deterioration of the U.S. mobile crane industry also threatens the hundreds of U.S. companies that supply the industry with components such as steel, chassis, axles, engines, transmissions, hydraulics, tires, counterweights, wire harnesses and many more. In short, imported mobile cranes and the harm they cause to the U.S. mobile crane industry and its suppliers threaten the national security of the United States.

Manitowoc therefore requests that the Secretary of Commerce initiate an investigation under Section 232. Manitowoc is confident that the results of such investigation will demonstrate the urgent need for the President to impose relief in the form of border measures such as tariffs, quotas, and/or tariff rate quotas, as well as other initiatives to support the U.S. mobile crane industry.

II. LEGAL STANDARD

Section 232 of the Trade Expansion Act of 1962 (19 U.S.C. §1862) instructs the Secretary of Commerce to “immediately initiate an appropriate investigation” to determine the effect of imports of an article on the national security of the United States. 5 Within a period of

270 days, the Secretary shall determine whether an article is being imported “in such quantities or under such circumstances as to threaten to impair the national security,” and, if an affirmative determination is made, “shall so advise the President…”

The circumstances that should be considered in an investigation are described in 19 U.S.C. §1862(d), which states that the Secretary and President shall:

…without excluding other relevant factors, give consideration to domestic production needed for projected national defense requirements, the capacity of domestic industries to meet such requirements, existing and anticipated availabilities of the human resources, products, raw materials, and other supplies and services essential to the national defense, the requirements of growth of such industries and such supplies and services including the investment, exploration, and development necessary to assure such growth, and the importation of goods in terms of their quantities, availabilities, character, and use as those affect such industries and the capacity of the United States to meet national security requirements.

Further, Section 232 explicitly links the economic well-being of domestic industries to U.S. national security interests:

…the Secretary and the President shall further recognize the close relation of the economic welfare of the Nation to our national security, and shall take into consideration the impact of foreign competition on the economic welfare of individual domestic industries; and any substantial unemployment, decrease in revenues of government, loss of skills or investment, or other serious effects resulting from the displacement of any domestic products by excessive imports shall be considered, without excluding other factors, in determining whether such weakening of our internal economy may impair the national security.

---

7 19 U.S.C. § 1862(d).
8 Id.
While the definition of “national security” is not codified in the statute or Commerce’s regulations, the Secretary has concluded that “{n}ational security… encompasses U.S. critical infrastructure sectors…”\(^9\) In its recent Section 232 investigation of steel, Commerce evaluated the effect of imports on “16 designated critical infrastructure sectors,”\(^10\) including the “Critical Manufacturing Sector,” which encompasses machinery manufacturing such as construction equipment.\(^11\) Further, the Steel Report cited various statutory provisions that confirm the importance of domestic production capabilities and U.S. national security.\(^12\)

The regulatory framework at 15 CFR Part 705 describes the conduct of a Section 232 investigation and criteria the U.S. Department of Commerce (“Commerce”) shall use to determine whether any article threatens to impair U.S. national security. Along with identical criteria established by Section 232 (and discussed above), the regulations instruct Commerce to consider the effect of imports on “the restoration of domestic production capacity in the event of national emergency”\(^13\) as well as the “(e)xtent to which the national economy, employment, investment, specialized skills, and productive capacity is or will be adversely affected.”\(^14\)

---


\(^10\) See id.


\(^12\) See Steel Report at 2, footnote 5.

\(^13\) 15 CFR §705(5)(c)(6).

\(^14\) 15 CFR §705(5)(c)(7).
III. PRODUCT SCOPE

The products covered by this Petition are mobile cranes, whether assembled or disassembled, and major subassemblies thereof. Mobile cranes are imported into the United States under Harmonized Tariff Schedule subheadings 8426.41, which covers mobile cranes on tires, and 8426.49, which covers other mobile cranes, particularly those on crawler tracks.\(^{15}\) Mobile cranes may be controlled by an operator in a cab of the crane or by remote control.

Mobile crane subassemblies include complete hoist mechanisms and their major parts such as a jib; boom or boom sections, boom hoist, and winch; cabs; outriggers; chassis or base; and carrier (on wheels or crawler tracks) and may be imported under HTSUS subheading 8431.49.10.

Specifically excluded from the petition are (1) telescopic boom crawler cranes, and (2) all-terrain cranes that do not have axles spanning the width of the chassis at each wheel position connecting the left and right wheel end, and instead have a suspension cylinder that is bolted to the exterior of the carrier frame at each wheel location.\(^{16}\)

IV. OVERVIEW OF THE DOMESTIC MOBILE CRANE INDUSTRY

A. Manitowoc

Manitowoc has been a domestic producer of mobile cranes for nearly 100 years. Founded in 1902 in Manitowoc, Wisconsin originally as Manitowoc Dry Dock Company, and beginning crane production in 1925, Manitowoc has an unrivaled reputation as the world’s leading producer of lifting solutions. Over this last century, Manitowoc has cultivated a dedicated customer base and third-party distribution network across the United States. While

\(^{15}\) See Exhibit 4.

\(^{16}\) See Exhibit 5 (Confidential).
cementing its U.S. standing as a domestic manufacturer of cranes, Manitowoc has also developed
global brand recognition. In addition, Manitowoc has sold more than $850 million in mobile
cranes and crane parts to the United States military since 2000.

Manitowoc is an innovation leader for the mobile crane industry. Manitowoc’s U.S.
business has been granted nearly 80 patents covering various aspects of a mobile crane, most
recently in areas such as hydraulics, diagnostic systems, mobile communication device displays,
remote controllers, and counterweights. Manitowoc employs over 150 U.S.-based engineers to
develop and implement the latest technologies that contribute to the high quality, safety, and
innovation of Manitowoc’s U.S. produced mobile cranes. As discussed infra, Manitowoc’s
product leadership is challenged by the constant risk of intellectual property infringement by its
foreign competitors, with the U.S. International Trade Commission recently finding that a
Chinese mobile crane company infringed on Manitowoc’s technology and misappropriated trade
secrets relating to its crawler cranes.17

Manitowoc had produced mobile cranes in both Manitowoc, Wisconsin and Shady
Grove, Pennsylvania. Manitowoc acquired the Shady Grove facility in 2002 when it purchased
Grove Cranes, which had been based in Shady Grove since 1947.18 However, due to cost-cutting
initiatives necessitated by surging imports and other market conditions, in 2017 Manitowoc
closed its manufacturing facility in Wisconsin and consolidated its U.S. mobile crane
manufacturing activity at its Shady Grove location. As discussed in Section V, infra, Manitowoc
produces a wide range of cranes in Shady Grove, including rough terrain cranes, industrial
cranes, truck-mounted cranes, boom truck cranes, and retrofits its commercial all-terrain cranes

17 See Exhibit 6.
18 Shady Grove is located in Franklin County, just a few miles outside of Greencastle with a
population base of 3,996 and median household income of $58,031.
to meet military specifications for sale to the U.S. military. Manitowoc currently employs 1,600 workers in the United States.

**B. Other Domestic Producers**

In addition to Manitowoc, there are several other U.S. producers that either produce a narrower range of mobile cranes than Manitowoc or are owned by foreign competitors of Manitowoc.

Broderson Manufacturing Corp. is 100% American-owned and located in Lenexa, Kansas, where it produces primarily industrial carry deck cranes as well as certain small rough terrain cranes. Altec Industries of Birmingham, Alabama, and Elliot Equipment Company of Omaha, Nebraska, both produce boom truck cranes in the United States. Iowa Mold and Tool of Garner, Iowa, produces articulating boom cranes. Terex, Ltd. (“Terex”) had produced a range of mobile cranes in Oklahoma City, Oklahoma, but recently shuttered its Oklahoma City production operations after exiting the U.S. mobile crane business. Terex’s divestiture included selling its crawler and all-terrain crane business to Tadano, Ltd. (“Tadano”), a Japanese crane producer. Terex sold its boom truck and truck crane lines to Load King of Kansas City, Missouri. Terex’s only remaining crane models are manufactured outside of the United States.

There are also several domestic producers that are affiliated with foreign crane producers. Link-Belt is wholly-owned by Sumitomo Heavy Industries Construction Cranes Co., Ltd. (“Sumitomo”), a Japanese crane producer. Link-Belt produces rough terrain cranes, truck-mounted cranes, telescopic cranes, and all-terrain cranes in Lexington, Kentucky. Link-Belt is also a U.S. importer of small crawler cranes from Japan. Tadano Mantis is owned by Tadano of Japan and produces a telescopic crawler crane in Tennessee. Tadano also has a minority interest in Manitex, a producer of boom truck cranes in Georgetown, Texas.
V. DESCRIPTION OF THE PRODUCT

A crane is a large machine used for moving heavy objects by suspending them from a projecting arm or beam. A crane is generally equipped with a hoist rope, wire rope, or chains that can lift and lower materials and to move them horizontally. Cranes use one or more simple machines to create mechanical advantage to move loads beyond the normal capability of a human being.

Cranes are generally used in the transport industry to load and unload freight and to lift and place bridge, road, and rail sections. Cranes are used in the construction industry for the movement and hoisting of materials, while in the manufacturing industry, cranes are used for the assembly of heavy equipment and movement of goods. Cranes subject to this petition can be mounted on wheels or treads and are therefore, mobile. There are several types of mobile cranes produced in the United States. Because the end uses for certain mobile cranes overlap, all mobile crane imports covered by the scope of this investigation compete with domestically produced mobile cranes.

A. Rough Terrain Cranes

A rough terrain crane has a boom mounted on an undercarriage that sits atop four rubber tires that is designed for off-road use and at times pick-and-carry operations. Rough terrain cranes are produced with outriggers that are used to level and stabilize the crane for hoisting heavy objects. Such rough terrain cranes must be trailered to the worksite. Most have four-wheel drive and four-wheel steering for traversing unpaved terrain.
Manitowoc’s rough terrain cranes, an example pictured above, are produced to handle lift capacities ranging from 30t to 165t. Manitowoc sells rough terrain cranes to the U.S. military. Link-Belt also produces rough terrain cranes in the United States.

**B. Lattice Boom Crawler Cranes**

A crawler crane has its boom mounted on an undercarriage fitted with a set of crawler tracks that provide both stability and mobility. The main advantage of a crawler crane is its mobility and use, since the crane is able to operate on sites with minimal improvement and retains stability from its tracks without outriggers. The tracks also spread the crane’s weight out over a larger area, meaning that the crane can be stable even on wet or soft ground. A crawler crane is capable of traveling with a load and is often used in large construction projects and on barges. A relative disadvantage is its weight and size, which requires the crawler to be disassembled before transportation to a new jobsite.
Manitowoc’s product lineup includes 18 different models of lattice boom crawlers with lifting capabilities ranging from 80t to 2535t. Manitowoc’s lattice boom crawler cranes are sold under the Manitowoc brand. Manitowoc recently repatriated production of its smaller crawler cranes to the United States, as touted by Vice President Pence in his August 2019 visit to Shady Grove. The 2300t crawler crane was adapted for specific use in building Atlanta’s Mercedes Benz Stadium in consultation with the construction company. Link-Belt also produces small crawler cranes in the United States.

C. **Industrial Cranes**

Industrial cranes have a similar appearance to rough terrain cranes insofar as they also have a telescoping boom, but industrial cranes are more compact and are generally used for plant maintenance and material handling jobs. Such industrial cranes generally have a flat deck to allow for the crane to pick-and-carry smaller loads.
Manitowoc’s industrial cranes are produced to handle lift capacities ranging from 9t to 25t. Manitowoc’s industrial cranes are sold under the Shuttlelift brand. Broderson also produces industrial cranes in the United States.

D. **Truck Mounted Cranes**

A truck-mounted crane has two parts: the carrier, often referred to as the lower, and the lifting component which includes the boom, referred to as the upper. These two sections are mated together through a turntable, allowing the upper to swing from side to side. A truck-mounted crane can drive on public roads. While they are versatile because they can easily move from jobsite to jobsite, these cranes can only be used on improved surface jobsites.
Manitowoc’s truck cranes are produced to a lifting capacity of 50t to 115t. Manitowoc’s truck cranes are sold under the Grove brand. Link-Belt and Load King also produce truck cranes.

E. **Boom Truck Cranes**

Boom truck cranes are cranes mounted on a commercial truck chassis.

Manitowoc’s boom truck cranes are sold under the National Crane brand. These boom truck cranes are produced in two different configurations: stand-up or sit-down. The stand-up boom truck allows the operator to operate the crane from an outside control station or via remote control while the sit-down boom truck crane has a cab for the operator to sit in when operating.
the crane. Manitowoc’s boom truck cranes have a lift capacity of 9t to 60t. Altec Industries, Elliot Equipment, and Load King also produce boom truck cranes in the United States.

F. All-Terrain Cranes

All-terrain cranes are a hybrid mobile crane combining the roadability of a truck-mounted crane with the on-site maneuverability of a rough-terrain crane. It can drive on public roads and access all types of job sites using all-wheel steering. All-terrain cranes will generally be outfitted with outriggers for stability.

Manitowoc produces a unique all-terrain crane that possesses a proprietary independent suspension system, sold under the brand name MEGATRACK®. These cranes are currently produced at Manitowoc facilities in Wilhelmshaven, Germany and form the base for Manitowoc’s 4060HC, which is a modified all-terrain crane sold to the U.S. military and incorporates substantial value added in the United States in the form of engineering, parts and components. Manitowoc’s all-terrain cranes are sold under the Grove brand. Link-Belt produces certain all-terrain cranes at its facility in Lexington, Kentucky.
VI. PRODUCTION PROCESS

Manitowoc’s principal U.S. production campus is currently located in Shady Grove, Pennsylvania. Manitowoc’s manufacturing process is highly labor-intensive involving skilled workers to fabricate the numerous components of the crane. The production process begins at the plate shop where steel plate is laser cut to specified shapes. These steel components along with cut-to-length standard structural pipe are fabricated into structures by welders. These steel subassemblies are finished, painted, and subject to testing. The various subassemblies all feed into a central assembly line for a specific type and model of crane. At the assembly line, steel components are joined to one another, electronics are added, and depending on the specifications of a given crane, additional components or accessories are added, reflecting the great deal of optionality in the production and use of mobile cranes. After assembly, the cranes are inspected, calibrated, and tested by Manitowoc’s engineering team. The general production process is reflected in the images below.
Because the production process is manual with skilled workers performing the work, any curtailment in production and layoffs makes it particularly challenging for Manitowoc to ramp up production in times of national emergency and to meet other U.S. national security interests.

VII. MANITOWOC IS THE DOMINANT SUPPLIER OF MOBILE CRANES TO THE U.S. MILITARY

The Grove AT422T (pictured above) has supported U.S. military operations throughout the United States and in hostile environments around the world.

Table 1 below provides a historical list of Manitowoc’s military contracts, mainly with the U.S. Army. Exhibit 2, attached, presents a comprehensive list of government contracts with General Services Agency and Defense Logistics Agency. In addition, we have provided Manitowoc’s most recent CPARS performance evaluations in Exhibit 7 (Confidential).
A recent contract awarded to Manitowoc is for the supply of the GMK4060HC, an all-terrain mobile crane, pictured below.

In fulfilling this contract, Manitowoc used its field-tested, commercial, all-terrain mobile cranes that are substantially modified to meet the military’s specifications. Significant U.S. engineering
and design work was necessary to implement such modifications, which include providing for enhanced undercarriage clearance and retrofitting the cranes with armor plate produced by Southern California Gold Products, located in Oxnard California, using domestically produced DuPont Tensylon from North Carolina. Other U.S.-based modifications include the installation of blackout lights, outrigger pads, and the application of chemical-resistant paint. Of the parts and components sourced in the United States, almost 25% was sourced from small businesses.

The features on these cranes enable the U.S. Army to tackle projects on the most extreme sites to construct barriers, set up areas of operation, build bridges, tow vehicles, among many other uses. Another benefit for the Army is that the cranes are light enough to be transported by C5 and C17 aircraft, to quickly deploy to the areas they are most needed. Manitowoc has developed an extensive U.S.-based testing and training regimen for the GMK4060HC. The result is a hardened all-terrain crane that is custom-designed to meet the needs of the U.S. military and to protect the lives of military personnel.19

Beyond this specific contract award, Manitowoc has produced and sold thousands of other mobile cranes for use by the U.S. military over the last 58 years, including rough terrain, industrial, and boom truck cranes. Based upon publicly available data, for 2019 year-to-date, Manitowoc fulfilled all of the U.S. military’s needs for all-terrain and boom truck cranes and half of the U.S. military needs for rough terrain cranes.

---

VIII. THE IMPORTANCE OF MOBILE CRANES TO U.S. CRITICAL INFRASTRUCTURE

As noted, the Secretary of Commerce has concluded that “...national security… encompasses U.S. critical infrastructure sectors…” 20 PPD-21 on Critical Infrastructure Security and Resilience “advances a national unity of effort to strengthen and maintain secure, functioning, and resilient critical infrastructure.” 21 PPD-21 followed Homeland Security Presidential Directive 7, signed by George W. Bush on December 17, 2003, which identified the protection of critical infrastructure from terrorist attacks as a national priority in the wake of the events of September 11, 2001.

Indeed, the importance of mobile cranes in responding to a terrorist attack was evident as Manitowoc cranes were immediately deployed to Ground Zero in New York City, helping to assist the hundreds of first responders in removing debris.

---

20 Steel Report at 2.
Manitowoc crawler cranes remained at Ground Zero as an indispensable tool for the contractors that stayed on site over the years that followed. Manitowoc is proud of being able to support the effort to rebuild lower Manhattan.

As detailed below, Manitowoc cranes are integral to the United States’ 16 critical infrastructure sectors identified in PPD-21 whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof. For example:

**Defense Industrial Base Sector:** This sector includes the worldwide industrial complex that enables research and development, as well as design, production, delivery, and maintenance of military weapons systems, subsystems, and components or parts, to meet U.S. military requirements.
Manitowoc Cranes have been retrofitted to meet the military’s specifications for over 50 years and commercial Manitowoc mobile cranes form an essential tool used regularly by the U.S. military.22 Manitowoc provided cranes to the U.S. military for operations in the Iraq war for moving barriers to keep troops safe and otherwise allow military personnel to safely move large objects on base. Today, Manitowoc’s GMK4060HC is used by the U.S. Army in strategic areas of troop deployment.

Pictured below are Manitowoc mobile cranes at the Bath Iron Works’ construction of the U.S. Navy’s next generation DDG 1000 Zumwalt-class destroyer warship:

• **Government Facilities Sector:** This sector includes a wide variety of buildings, located in the United States and overseas, that are owned or leased by federal, state, local, and tribal governments.

Manitowoc has provided mobile cranes to the U.S. government through the General Services Administration for the construction and maintenance of government facilities. Pictured below is a Manitowoc crawler crane dismantling a section of the fixed service structure on launch pad 39B at NASA’s Kennedy Space Center in Florida.

---

22 See Exhibit 8 (Confidential).
**Transportation Systems Sector:** This sector includes aviation and the nation’s airports and heliports, the 4 million miles of roadway, 600,000 bridges, and 350 tunnels, the nation’s 361 maritime ports, passenger rail and mass transit systems, the 2.5 million miles of pipeline spanning the country, and 138,000 miles of active railroad.

Manitowoc’s nationwide distribution network sells cranes at retail or through rental agreements for major construction and refurbishment of the U.S. transportation system, including the current refurbishment of the bridges and tunnels of the nation’s highway system. In addition Manitowoc cranes are regularly seen working at airport construction and expansion projects throughout the country.

Pictured below is a Manitowoc 650t crawler crane on a barge installing a bridge section for the Fore River Bridge Replacement Project in Quincy, Massachusetts.
Below is an example of a Manitowoc rough terrain crane engaged in bridge work.
Illustrated below is a Manitowoc crawler crane used to replace a bridge in Ridgefield, Washington completed five months ahead of schedule:

- **Dams Sector:** Delivers critical water retention and control services in the United States, including hydroelectric power generation, municipal and industrial water supplies, agricultural irrigation, sediment and flood control, river navigation for inland bulk shipping, industrial waste management, and recreation.

  Manitowoc’s mobile cranes have been used by the U.S. Army Corps of Engineers to maintain and service dams and levees across the United States. Manitowoc cranes are also owned or rented to work on dams and associated facilities for other municipal level reservoirs.

  Pictured below are multiple Manitowoc cranes at the U.S. Army Corps of Engineers’ Olmstead Dam Project at the confluence of the Ohio and Mississippi Rivers between Kentucky and Illinois. The Olmstead Dam Project was one of the U.S. Army Corps of Engineers’ largest civil engineering projects ever, taking three decades, costing $3 billion, and took more than 45 million man hours to complete.
The photograph below shows two Manitowoc crawler cranes working at the Blue Stone Dam in Hinton, West Virginia.

- **Commercial Facilities Sector:** This sector includes sites that draw large crowds of people for shopping, business, entertainment, or lodging. Facilities within this sector operate on the principle of open public access.

Manitowoc mobile cranes can be seen at major construction sites across the country. As buildings are built in more dense spaces and more frequently
using heavy precast concrete forms, Manitowoc’s crawler cranes are nimble enough to operate in tight quarters but have high capacity ratings to lift precast building components into place. In addition, Manitowoc produced high capacity crawler cranes used to build iconic sports stadiums in the United States including Mercedes Benz Stadium in Atlanta, Georgia and AT&T Stadium in Dallas, Texas. Manitowoc telescopic cranes are also used for lifting precast panels for commercial facilities construction. Additionally, Manitowoc mobile cranes are used for facilities maintenance and modification (e.g., moving HVAC equipment on top of roofs).

Pictured below are Manitowoc crawler cranes used in the construction of the $1.2 billion Globe Life Field, the new home of the Texas Rangers Major League Baseball team:

- **Critical Manufacturing Sector:** This sector identifies several industries that serve as core competencies, including primary metals manufacturing, machinery manufacturing, electrical equipment, appliance, and component manufacturing, and transportation equipment manufacturing.

Manitowoc has been referred to in the crane industry as “The Manitowoc Engineering Company” due to its ability to design cranes to meet any lift requirement and to troubleshoot lifting challenges in the field. In the event of a manmade or natural disaster, Manitowoc’s engineering capabilities and production line can serve the United States in a time of need. Manitowoc industrial cranes are used throughout the manufacturing industry to move materials and components during the manufacturing process.
• **Communications Sector:** This sector provides an “enabling function” across all critical infrastructure sectors.

Manitowoc’s crawler cranes are used in the building of transmission towers due to the length of the lattice boom, which allows for hoisting to great heights. Manitowoc telescopic boom cranes are used during the erection of cellular communication towers and service and maintenance of communications infrastructure.

Pictured below is a 650t Manitowoc crawler crane mounted on a barge installing a transmission tower in Virginia.

• **Energy Sector:** This sector is also identified as providing an “enabling function” across all critical infrastructure sectors.

Manitowoc’s National Crane boom trucks service the oil and gas industry in the United States, bringing the United States to the forefront of energy independence. Previously, mast trucks handled a majority of work on oil and gas fields, but the work was cumbersome because operators were forced to move their mast trucks for every lift, rigging and un-rigging the winch mechanisms each time. With Manitowoc National Crane boom trucks,
crane operators are able to rig a boom truck for several lifts from the same spot, which is much more efficient, saving time and money for the oil and gas industry.

Pictured below is a crawler crane at Oklahoma Gas & Electric’s Sooner Generating Station in Red Rock, Oklahoma.

Manitowoc’s mobile cranes are used on wind farm sites, as pictured below.
Pictured below is Manitowoc’s National Crane boom truck at an electrical grid substation.
• **Nuclear Reactors, Materials, and Waste Sector:** This sector focuses on coordinating the security and resilience of the nuclear power reactors of the United States.

  In 1978, Manitowoc’s 4600 Series-3 Ringer crane was deployed in the building of a 2-unit, 1,900 megawatt nuclear power plant in Clinton, Illinois.\(^{23}\) Manitowoc’s industry-leading engineering team worked with the contractor to develop a 90-foot high fixed gantry upon which the Ringer was affixed. Today, Manitowoc’s industry-leading crawler cranes are used to meet lifting requirements in the confined spaces of nuclear plants.

  Mobile cranes are also used in other critical infrastructure sectors, including water treatment facilities to secure the nation’s water supply (Water and Wastewater Systems Sector), setting up server farms where the nation’s information technology resides (Information Technology Sector), erecting mobile treatment facilities in response to natural disasters or outbreak (Healthcare and Public Health Sector and Emergency Services Sector), erecting food manufacturing, processing and storage facilities (Food and Agriculture Sector), and moving large chemical tanks at manufacturing sites (Chemical Sector).

  Simply put, Manitowoc cranes are essential to virtually all of the U.S. critical infrastructure sectors described in PPD-21.

**IX. FOREIGN SOURCES OF MOBILE CRANES**

  There are numerous foreign mobile crane producers that supply the U.S. mobile crane market and are responsible for the surge in import volumes since 2014 and impairment of the domestic industry. The mobile cranes produced by these foreign suppliers and covered by the scope of the petition are the same mobile crane types produced by the domestic industry.

---

\(^{23}\) *See Exhibit 9.*
The global market has expanded substantially over the past decade, increasing over 600 percent based on industry data,\textsuperscript{24} notwithstanding recent softening in the U.S. market, as will be discussed \textit{infra}. While foreign mobile crane production capacity undoubtedly grew to fulfill the significant growth in global demand, this new mobile crane production capacity outside the United States poses a substantial threat of further increased U.S. imports in the coming years. Today, mobile crane producers located in Japan, Germany and Austria are the largest sources of imported mobile cranes into the United States.\textsuperscript{25} In Japan, Kobelco, Tadano, and Sumitomo are the leading companies that export cranes and crane subassemblies to the United States that directly compete with Manitowoc’s mobile cranes. Liebherr is the leading company in Germany and Austria that exports to the United States. Moreover, China has a large and sophisticated crane industry that has primarily served the domestic Chinese market, but undoubtedly has its sights set on the United States. With recent U.S. government findings that a Chinese mobile crane manufacturer infringed a Manitowoc patent and misappropriated its mobile crane trade secrets, the Chinese industry has made clear its designs on the U.S. market, and poses a substantial threat to the U.S. mobile crane industry.

A. \textbf{The Japanese Mobile Crane Industry}

The Japanese mobile crane industry is dominated by three major \textit{keiretsu}: Kobelco Construction Machinery Co., Ltd. (“Kobelco”), Tadano Ltd. (“Tadano”), and Sumitomo Heavy Industries Construction Cranes Co., Ltd. (“Sumitomo”). These companies each have facilities in the United States and established distribution networks.

\textsuperscript{24} See Exhibit 10 (Confidential).
\textsuperscript{25} See Exhibit 11.
Kobelco exports six different models of crawler cranes to the United States that range from an 80 ton to 275 ton capacity load. These products compete directly with Manitowoc’s lattice boom crawler cranes that possess the same maximum capacity loads. Kobelco Construction Machinery U.S.A. Inc. (KCMU), located in Katy, TX, is a wholly owned subsidiary of Kobelco and is responsible for the distribution of imported Kobelco crawler cranes in the United States. Kobelco has recently announced a “New Global Strategy” in which they proclaim to have a renewed commitment to international growth, specifically including expanding sales networks in the United States and developing new products to introduce to the market.

Tadano’s self-proclaimed “long-term goal…is to become No. 1 worldwide in the lifting equipment industry” and has designs on “further expanding production capacity.” Tadano produces seven models of rough terrain cranes in their facility located in Takamatsu, Japan for export to the United States. The maximum lift capacity ranges from 15 tons to 160 tons, comparable to the 11 models of Grove brand rough terrain cranes produced by Manitowoc. Tadano’s wholly-owned subsidiary Tadano America Corp. (U.S.A.) is responsible for the distribution of mobile cranes in the United States. Tadano has increased its sales over 25% from $262 million in 2013 to $330 million in 2018. Tadano has a stated mission to expand its market share in the North American market in the foreseeable future, and is already projecting a 30% increase in its net sales of mobile cranes in the United States.

26 See Exhibit 12.
27 See Exhibit 13.
28 Notably, as provided for in Exhibit 11, Tadano also owns two German mobile crane production facilities – Tadano Faun and Demag, the latter of which it acquired in 2019 from Terex.
Sumitomo is a Japanese manufacturer of construction cranes. Sumitomo wholly owns its American subsidiary, Link-Belt Cranes, located in Lexington, Kentucky. Link-Belt’s relationship with Sumitomo dates to 1962.29

In contrast to the United States, where these Japanese producers compete head-to-head with the domestic industry, Japan is a closed market and U.S. domestic producers cannot make commercial sales of cranes there.

B. The German and Austrian Mobile Crane Industry

Liebherr is a German manufacturing company that produces construction cranes in Germany and Austria. Liebherr produces mobile cranes in Ehingen/Donau, Germany, crawler cranes up to 300 tons in Nenzing, Austria, and mobile construction cranes in Biberach/Riss, Germany.30 Liebherr produces 15 models of lattice boom crawler cranes that range from 110 to 1,350 ton maximum lift capacity. It also produces two models of rough terrain cranes that have 90 and 100 ton lift capacities. Liebherr is a large, family-owned business with a divergent portfolio of goods and services, allowing it to cross-subsidize its mobile crane business.

In addition, Liebherr produces cranes built to contractual military specifications for military use by various European countries.31 These military sales date back to 1977. In 2017, Liebherr developed two military cranes for the German Army, receiving a 150 million euro contract for 71 cranes. In 2014, Liebherr provided four all-terrain cranes to the Swiss army procurement branch, the Armasuisse. These cranes were designed for the specific requirements

29 See Exhibit 14.
30 See Exhibit 15.
31 See id.
needed for bridge and pontoon construction. In 2002, Liebherr was awarded a contract for the French Army for 50 standard cranes with practical uses.\(^\text{32}\)

These sales reflect the fundamental need for governments to establish reliable domestic sources of mobile cranes to service military contracts, and the limited capacity that foreign companies such as Liebherr would have to supply the U.S. government in the absence of a viable U.S. mobile crane industry. In addition, were the United States to enter an armed conflict without the support of those countries that source from Liebherr, there is no certainty that Liebherr would be positioned to supply the U.S. military.

Other German mobile cranes producers include Sennebogen, Tadano Faun, and Demag (acquired by Tadano in 2019 from Terex).

**C. The Chinese Mobile Crane Industry**

The Chinese mobile crane industry is quickly growing into a global giant and is comprised of dozens — perhaps hundreds — of Chinese manufacturers of cranes. Through various means, including misappropriation, the Chinese industry has gained Western companies’ know-how and are now, or aspiring to be, world players.\(^\text{33}\) Though imports from China are currently limited,\(^\text{34}\) a growing and more sophisticated Chinese industry has the potential to significantly disrupt the U.S. market and threatens the viability of Manitowoc’s U.S. mobile crane business.

\(^{32}\) See id.

\(^{33}\) See Exhibit 16.

\(^{34}\) Mobile cranes classified under HTSUS subheadings 8426.41 and 8426.49 are currently subject to Section 301 tariffs of 25%. See Notice of Action and Request for Public Comment Concerning Proposed Determination of Action Pursuant to Section 301: China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, 83 Fed. Reg. 28,710, 28,714 (June 20, 2018) (List 1).
Xuzhou Construction Machinery Group Co., Ltd. ("XCMG") is a Chinese state-owned crane manufacturer that dominates the Chinese market and has expanded globally to become the fifth largest construction equipment company in the world. XCMG’s branch company, XCMG North America Corp., is responsible for product distribution in the United States.\textsuperscript{35} XCMG produces and exports truck, rough terrain, all terrain, crawler, and truck-mounted cranes. They produce 26 models of truck cranes that possess maximum lift capacities between 8 and 160 tons. Their 21 models of rough terrain cranes range from 25 tons to 200 tons of lift capacity. XCMG’s 12 models of all terrain cranes have lift capacities between 160 and 1200 tons. The 21 models of crawler cranes range from 55 to 2000 tons of maximum lift capacity. They produce 30 models of truck-mounted cranes that can lift between 4.2 and 40 tons.

Zoomlion is a Chinese manufacturer of mobile cranes, producing truck cranes, crawler cranes, rough terrain cranes, and all terrain cranes.\textsuperscript{36} Zoomlion produces 14 models of truck cranes with maximum lift capacities ranging from 17 tons to 93 tons. Their 7 models of crawler cranes have lift capacities of 100 to 500 tons. Zoomlion produces 6 models of rough terrain cranes with maximum lift capacities that range from 33 to 110 tons. Their 3 models of all terrain cranes have lift capacities between 165 and 330 tons. Zoomlion targeted the United States in its planned expansion in overseas markets for the 2018 Fiscal Year.\textsuperscript{37}

Sany Heavy Industry Co., Ltd. ("Sany Heavy Industry") is China’s largest engineering machinery manufacturer and one of the largest equipment manufacturers in the world. Sany Heavy Industry produces a full range of mobile and other construction cranes with lifting

\textsuperscript{35} See Exhibit 17.
\textsuperscript{36} See Exhibit 18.
\textsuperscript{37} See id.
capacity from 25t to 1600t.\textsuperscript{38} Sany Heavy Industry sold cranes to the United States through Sany America, Inc. (“Sany America”). Though its presence in the United States has been limited to date, Sany has stated its intentions in the United States “to gain more understanding of the high-end market . . . {and} {o}ne day we will be there for more.”\textsuperscript{39} In an effort to increase market share in the United States, Sany misappropriated Manitowoc’s trade secrets. In 2015, the U.S. International Trade Commission found that Sany Heavy Industry and Sany America’s crawler crane infringed upon a patent covering Manitowoc’s Variable Position Counterweight Technology and that Sany Heavy Industry and Sany America misappropriated six Manitowoc trade secrets, thus violating Section 337 of the Tariff Act of 1930. The ruling led to the Commission issuing an exclusion order, barring Sany from importing and selling in the United States Sany’s SCC8500 crawler crane.\textsuperscript{40} While Manitowoc received some relief through the Section 337 litigation, it is simply a reminder that the Chinese industry has utilized illegal action to penetrate the U.S. mobile crane market at the expense of the U.S. mobile crane industry.

Founded in 1958, Guangxi LiuGong Machinery Co., Ltd. (“LiuGong”) is a Chinese construction machinery manufacturer whose reach extends to 100 different countries around the world through its vast network of over 300 dealers.\textsuperscript{41} They have offices worldwide, including LiuGong Construction Machinery N.A., LLC, which is located in Katy, Texas. LiuGong produces 6 models of truck cranes with maximum lift capacities ranging from 25 to 75 tons. In the United States, LiuGong maintains an expansive network of distributors for its various

\textsuperscript{38} See Exhibit 19. \\
\textsuperscript{39} See Exhibit 16. \\
\textsuperscript{40} See Exhibit 6. \\
\textsuperscript{41} See Exhibit 20.
product lines from coast to coast, thus having substantial capacity to enter the U.S. mobile crane market.

X. IMPORTED MOBILE CRANES HAVE IMPAIRED THE CONDITION OF THE U.S. MOBILE CRANE INDUSTRY

In recent years, a surge of imported mobile cranes has significantly impaired Manitowoc’s U.S.-based mobile crane manufacturing operations. Given Manitowoc’s market leadership, such impairment to Manitowoc’s operations threatens the competitiveness of the domestic mobile crane industry and its ability to support critical infrastructure with the highest quality and most innovative cranes. The deterioration in Manitowoc’s U.S. business also threatens Manitowoc’s ability to supply the U.S. military with the specialized mobile cranes it requires. The increase in imported mobile cranes therefore presents a significant threat to U.S. national security interests.

Faced with aggressive import competition, Manitowoc sought to maintain economic pricing and profit levels that were adequate to support the reinvestment necessary to maintain the company’s product leadership. Unfortunately, in a declining market, Manitowoc’s foreign competitors lowered pricing to increase their volumes and capture U.S. market share at the expense of Manitowoc and the entire U.S. mobile crane industry. Lower sales volumes forced Manitowoc to shutter its Manitowoc, Wisconsin production facility, underutilize other assets, and reduce U.S. manufacturing and engineering jobs. This resulted in Manitowoc enduring weak financial performance in relation to its U.S. production, and reduced capital investment, all of which challenges Manitowoc’s future competitiveness and its position to support U.S. national security interests.
A. U.S. Mobile Crane Imports Have Surged Since 2014

As shown in Table 2 below, in the last five completed years, *U.S. mobile crane imports* have increased by 72 percent, from 1,337 units in 2014 to 2,305 units in 2018. This surge continued in the most recent period of time, with mobile crane imports increasing from 1,557 units to 2,692 units when comparing year-to-date 2019 import volumes with year-to-date 2018 volumes.

<table>
<thead>
<tr>
<th></th>
<th>YEAR</th>
<th>YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>1,337</td>
<td>1,566</td>
</tr>
<tr>
<td>$/unit</td>
<td>324,155</td>
<td>341,284</td>
</tr>
</tbody>
</table>

*Source: USITC DataWeb HTSUS 8426.41.00 and 8426.49.00*

Import statistics also help explain how import volumes have increased so dramatically in recent years: uneconomic pricing. As reflected in Table 2 above, the average unit value ("AUV") for imported mobile cranes has declined from $324,155 in 2014 to $279,356 in 2018, a decline of 14 percent. Import AUVs dropped more significantly in the most recent period, with import AUVs decreasing by 18.1 percent from YTD 2018 to YTD 2019. While product mix issues can always be a factor when analyzing AUV trends for imported cranes, the significant decline in AUVs during a period in which production costs have increased is at least probative evidence of the price pressure that Manitowoc and the industry have faced from their foreign competitors.

B. The U.S. Industry Lost Market Share to Imported Mobile Cranes

Since 2014, demand for mobile cranes in the United States has softened. According to industry data, the U.S. mobile crane market experienced healthy demand in 2014. However, demand sharply declined from 2015 to 2017. While the industry rebounded somewhat in 2018,
and continues to improve through 2019, it has not recovered to levels reached in 2014. In short, the U.S. mobile cranes market has contracted significantly since 2014.

Given the decline in U.S. demand for mobile cranes, it follows that the surge in mobile crane imports since 2014 has resulted in domestic producers losing significant market share to imports. For example, sharply higher import volumes have significantly eroded Manitowoc’s U.S. market share in the lattice boom crawler crane segment. In addition, Manitowoc historically had been the market leader in the rough terrain mobile crane segment. However, in recent years, Tadano (Japan) has emerged as the current market share leader in this segment through its low-price leadership. Manitowoc has experienced similar trends in other key mobile crane segments where foreign competitors compete with U.S. producers on a head-to-head basis.

C. Manitowoc Has Endured Unsustainable Harm to Its U.S. Production Operations

Increasing volumes of imported mobile cranes at cut-rate prices placed significant pressure on Manitowoc. Even after undertaking substantial cost-cutting measures to maintain its competitiveness, Manitowoc was faced with the unenviable choice of lowering prices to uneconomic levels in order to meet import competition and retain market share or attempt to maintain rational prices at the risk of losing sales to lower-priced imports.

By and large, Manitowoc adopted the latter strategy, as reflected in relatively consistent AUVs for its U.S. produced mobile cranes since 2014. However, in doing so, Manitowoc lost significant market share, as discussed supra. And given the declining market, it also suffered significantly lower production and sales volumes throughout the past five years.

42 See Exhibit 21 (Confidential).
43 See Exhibit 22 (Confidential).
Manitowoc undertook significant cost-cutting initiatives to maintain the company’s competitiveness and support the economics of its U.S. mobile crane operations. This included closing a crane manufacturing operation in Manitowoc, Wisconsin, and consolidating the company’s U.S. mobile crane production operations at Shady Grove, Pennsylvania. Even by reducing capacity and consolidating operations in Shady Grove, Manitowoc’s capacity utilization is severely depressed. With reduced capacity and lower production and sales volumes, Manitowoc made the difficult decision to reduce its U.S. workforce by several hundred jobs, including a substantial number of manufacturing and engineering employees.44

Notwithstanding these difficult and substantial cost reduction efforts, Manitowoc could not avoid depressed gross margins on sales of its U.S.-produced mobile cranes. Such substantially reduced gross margins relative to 2014 reflects the impact of surging mobile crane imports and Manitowoc’s inability to raise prices to generate more favorable financial results. Indeed, Manitowoc’s operating margins on its U.S. produced mobile cranes since 2014 were unsustainable and are inadequate to support the level of reinvestment that is necessary to support Manitowoc’s continued product leadership and innovation. This is confirmed by Manitowoc’s modest and declining U.S. capital expenditures since 2014.45

Manitowoc’s weak financial performance for its U.S. mobile crane operations also threatens the hundreds of U.S. companies that supply Manitowoc with components such as steel, chassis, axles, engines, transmissions, hydraulics, tires, counterweights, wire harnesses and many more. Manitowoc purchases hundreds of millions of dollars in components from small and medium-sized U.S. companies every year, helping to support thousands of U.S. manufacturing

44 See Exhibit 23 (Confidential).
45 See id.
jobs. A financially weakened Manitowoc places these suppliers and associated American jobs at risk.

Finally, Manitowoc is vulnerable to intellectual property misappropriation and infringement by its foreign competitors. As discussed supra, Manitowoc is a market leader in developing new mobile crane technologies, with the company’s U.S. business having been granted nearly 80 patents. However, these technologies are at risk of misappropriation and infringement, as evidenced by the recent U.S. International Trade Commission determination that Sany Heavy Industry Co., Ltd. a Chinese mobile crane manufacturer, and its U.S. affiliate, Sany America, Inc., infringed on a Manitowoc crawler crane patent and misappropriated six Manitowoc trade secrets. The U.S. government imposed an exclusion order that prevents the U.S. importation of certain Sany crawler cranes. Sany’s infringement and misappropriation reflects the constant risk of intellectual property theft by foreign mobile crane competitors and the burden it imposes on Manitowoc’s ability to remain a viable U.S. producer and market leader for mobile cranes.

In sum, the foreign mobile crane industry and the increasing volume of U.S. mobile crane imports have significantly impaired Manitowoc’s U.S. mobile crane operations.

XI. IMPORTED MOBILE CRANES AND AN IMPAIRED DOMESTIC MOBILE CRANE INDUSTRY THREATEN THE NATIONAL SECURITY OF THE UNITED STATES

As discussed above, imported mobile cranes have significantly impaired the performance of Manitowoc and have otherwise been an anchor for prices in the U.S. mobile crane industry generally. Such impairment threatens the ability of Manitowoc to supply mobile cranes to

46 See Exhibit 6.
support critical infrastructure and to supply the U.S. military. As such, imported mobile cranes threaten the national security of the United States. Without relief under Section 232, imported mobile cranes will continue to undermine the ability of Manitowoc, and the U.S. mobile crane industry as a whole, to invest at levels necessary to develop and manufacture the highest quality and most innovative mobile cranes available to meet this country’s critical infrastructure and military requirements.

Indeed, the impact of imports on Manitowoc’s ability to support the U.S. military has already been felt. Given the financial constraints in expanding its product lineup, Manitowoc recently found itself unable to supply a primary defense contractor with a certain large mobile crane that would be used to support production of some of this country’s most critical naval assets.47

Should imports continue to gut U.S. mobile crane manufacturing capabilities, the United States would be largely dependent on imports to support critical infrastructure in the United States. As addressed supra in Section VIII, pursuant to PPD-21 there are 16 designated critical infrastructure sectors in the United States.48 Mobile cranes support virtually every critical infrastructure sector identified in PPD-21. Indeed, the familiar site of mobile cranes that every American sees while driving on our nation’s roadways and across its bridges is a reminder that mobile cranes are integral to the construction and repair of this country’s transportation systems.

With U.S. critical infrastructure in need of substantial reinvestment,49 increased volumes of mobile cranes will be needed to support these efforts. Just as Commerce previously reported

---

47 See Exhibit 24 (Confidential).
49 See Exhibit 25.
with respect to the U.S. steel industry, the ability of the domestic mobile crane industry to continue meeting national security needs depends on the ability of Manitowoc and other U.S. mobile crane producers to compete and maintain a financially viable domestic manufacturing capability.50 This includes the need to have an adequately skilled workforce for manufacturing as well as to conduct research and development for future products. A continued loss of viable commercial production capabilities, along with a skilled workforce, will jeopardize the U.S. mobile crane industry’s ability to meet the full spectrum of national security requirements.51 Manitowoc’s reduced revenues for investment and employment already jeopardizes the ability of the domestic industry to meet these requirements.

Moreover, without import relief, the U.S. military would become largely dependent on foreign sources for mobile cranes, which are otherwise already supplying foreign governments. Key foreign suppliers of mobile cranes, particularly those in Japan and Germany, are geographically remote from the United States, making the mobile crane supply chain vulnerable to disruption from military hostilities, political turmoil, and natural disasters. While Japan and Germany are political allies of the United States, in the event of military conflict, our foreign adversaries can easily disrupt the supply of mobile cranes to the United States from overseas sources.

Notwithstanding the challenges associated with the military relying on foreign-sourced mobile cranes, the military requires cranes that are modified for its applications, and historically has sourced such mobile cranes from U.S. producers and U.S. suppliers of features like armor plating. There is no demonstrated capacity of foreign producers to supply the U.S. military with

50 See Steel report at 26.
51 See id.
what it requires in future years. For example, there is no evidence that foreign suppliers could produce a heavily armored all-terrain crane that is light enough to be transported on C5 and C17 aircraft as well as on naval ships. Moreover, many foreign mobile crane producers against whom U.S. producers compete are committed to long-term contracts with foreign governments to supply defense-ready cranes and thus likely are not in a position to supply the U.S. military, particularly in times of national emergency.

To be clear, Manitowoc would not be viable if it was completely reliant on U.S. military sales. However, Manitowoc’s commercial sales, much of which supports critical infrastructure, generate the revenue needed to sustain and grow the business, which in turn positions Manitowoc to be a reliable supplier and innovator for the U.S. military.

Finally, the continued impairment of the domestic industry due to increasing volumes of mobile crane imports will adversely affect revenues of federal, state, and local governments. While Vice President Pence acknowledged the importance of Manitowoc to the Shady Grove community, the company’s reduced market share and unsustainable financial performance on its U.S.-produced mobile cranes portends substantially reduced tax revenues and further cuts in employment that will negatively impact government revenues. Moreover, a shrinking and weakened supply chain that results from Manitowoc’s diminished financial performance will lead to further reduced government revenues and overall employment.

The U.S. domestic industry constitutes the most secure source of mobile cranes for the U.S. military and for the nation’s critical infrastructure. A U.S. mobile crane industry that is not financially viable to invest in the development of new technologies, facilities, and product development — and to retain skilled workers — will be unable to meet the needs of the U.S. military and U.S. critical infrastructure sectors. Manitowoc’s highly skilled workers, a great deal
of which are trained welders, are capable of continuing to supply the highest quality, most innovative mobile cranes in the world. Protecting this source of supply is far superior to relying on foreign sources in times of military hostilities, political turmoil, and natural disasters.

XII. REQUEST FOR RELIEF

Manitowoc is seeking import relief to stop the harm and threat of further harm caused by increased volumes of mobile crane imports to the domestic mobile crane industry and the threat such imports present to U.S. national security interests. Such relief should mitigate mobile crane import volumes and restore the industry to a level of financial performance that permits Manitowoc and other U.S. producers to reinvest in their operations and continue to reliably supply the U.S. military and support critical infrastructure with the highest quality, most innovative mobile cranes in the world.

Consistent with these goals and the President’s authority to “adjust the imports of the article and its derivatives so that such imports will not threaten to impair the national security,”52 Manitowoc believes that the establishment of tariffs constitutes an appropriate mechanism for achieving these goals. Tariffs would permit imports to continue supplying the U.S. market, while at the same time ensuring that the domestic mobile crane industry would not experience further harm due to additional surges of mobile crane imports. As mobile crane imports and their subassemblies currently enter the United States duty free, a restoration of economic prices and mitigation of import volumes depends on the President imposing sufficient tariffs on mobile crane imports.

Beyond tariffs, Manitowoc urges the President to consider other mechanisms to address the threat to U.S. national security presented by mobile crane imports. As the President previously remarked in his State of the Union address, the country needs “to rebuild and revitalize our nation’s infrastructure.” In this regard, the President should continue his leadership in working with the U.S. Congress to pass a robust national infrastructure bill, which would undoubtedly spur demand for construction equipment such as mobile cranes.

In addition, the President should adopt measures to maximize U.S. content of mobile cranes used in rebuilding our country’s infrastructure. Thus, government procurement rules should ensure that to the extent possible, mobile cranes used in construction funded by the government should be manufactured in the United States or contain substantial U.S. content.

Manitowoc will offer further details on recommendations for import relief during the course of the investigation, and Manitowoc reserves the right to modify its proposals for relief based on the development of the factual information in the investigation.

XIII. CONCLUSION

This petition establishes that surging imports of low-priced mobile cranes threaten the ability of the U.S. mobile crane industry to support this country’s critical infrastructure needs and to reliably supply the U.S. military with the highest quality, most innovative mobile cranes in the world. In a U.S. market that has declined since 2014, mobile crane imports have increased significantly, taking substantial market share from the domestic industry across a variety of mobile crane segments. Lower sales volumes already have forced Manitowoc to shutter a U.S.

53 See “Remarks by President Trump in State of the Union Address” (Feb. 6, 2019) (available at https://www.whitehouse.gov/briefings-statements/remarks-president-trump-state-union-address-2/).
manufacturing facility, endure depressed capacity utilization, and cut hundreds of U.S. jobs.

Manitowoc’s weak financial performance in relation to its U.S. mobile crane production during this period has resulted in lower capital expenditures, threatening the company’s market leading position and ability to help rebuild this country’s critical infrastructure and to continue to reliably supply the U.S. military.

For the reasons discussed in this petition, Manitowoc urges the Secretary of Commerce to immediately initiate an investigation under Section 232 and recommend that the President impose relief to address the harm to the domestic mobile crane industry and threat to U.S. national security presented by increasing volumes of mobile crane imports.
<table>
<thead>
<tr>
<th>No.</th>
<th>Narrative Description</th>
<th>Public/Confidential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vice President Mike Pence Visits Manitowoc</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>2</td>
<td>Manitowoc’s List of Government Contract Awards</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>3</td>
<td>USITC DataWeb Import Statistics</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>4</td>
<td>Harmonized Tariff Schedule of the United States</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>5</td>
<td>Fact sheet regarding independent suspension system</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>6</td>
<td>USITC Opinion (Excerpts) and Limited Exclusion Order</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>7</td>
<td>CPARS Performance Reviews</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>8</td>
<td>Example of Defense Industrial Base Sector Use of Cranes</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>9</td>
<td>Example of Nuclear Reactor Use of Cranes</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>10</td>
<td>Global Shipment Data</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>11</td>
<td>List of Global Mobile Cranes Producers</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>12</td>
<td>Kobelco Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>13</td>
<td>Tadano Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>14</td>
<td>Sumitomo/Link-Belt Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>15</td>
<td>Liebherr Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>16</td>
<td>Cranes Today: Made in China</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>17</td>
<td>XCMG Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>18</td>
<td>Zoomlion Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>19</td>
<td>Sany Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>20</td>
<td>LiuGong Company and Product Information</td>
<td>PUBLIC</td>
</tr>
<tr>
<td>21</td>
<td>U.S. Market Shipment Data</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>22</td>
<td>Manitowoc U.S. Market Share Data</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>23</td>
<td>Manitowoc U.S. Operating and Financial Data</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>24</td>
<td>Naval Submarine Project Opportunity</td>
<td>CONFIDENTIAL</td>
</tr>
<tr>
<td>25</td>
<td>Condition of US Infrastructure</td>
<td>PUBLIC</td>
</tr>
</tbody>
</table>
Exhibit 1
Mike Pence visits Manitowoc to promote USMCA

August 1, 2019

By Bill Trembisky

The American Congress must ratify the United States-Mexico-Canada Agreement (USMCA) if it wants to boost its manufacturing exports, according to Mike Pence, Vice President of the United States of America.

On Aug. 1, Pence visited The Manitowoc Company’s facility in Shady Grove, Pennsylvania to promote the pending trade deal with Canada and Mexico.

“To keep the American economy rolling, President Trump and I believe we need to level the playing field for American workers by having trade deals that put American jobs and American workers first,” Pence told a crowd of about 1,000 Manitowoc employees. “That’s just what we’re here to do.”

A modernized NAFTA

The USMCA, if approved, would modernize NAFTA, the tri-lateral trade agreement between the United States, Canada, and Mexico.

According to the Trump administration, the trade deal would secure access to the United States’ two largest export markets, and ensure North America’s manufacturing competitiveness.

“The time has come. The opportunity is before us to pass the largest trade deal in American history. The time has come for congress to pass the US Mexico Canada Agreement,” Pence said. “I’ve been travelling all across the country telling the story of the USMCA and the difference it’s going to make.”

A call for help

https://www.equipmentjournal.com/construction-news/mike-pence-usmca/
During his speech, Pence called upon his audience of Manitowoc employees to contact their representatives in Washington, DC and request that the USMCA is ratified.

“Mexico already started to make the changes to labour laws they agreed to. Canada’s done the same thing,” Pence said. “Now it’s time for congress to do its job and approve the USMCA. And approve it this year.

“People working in manufacturing need to be heard from.”

'That giant sucking sound’

A study by the United States International Trade Commission shows the USMCA would create an additional 176,000 American jobs and add $68 billion to its economy. Overall, there are 12 million American jobs across the country that are supported by trade with Canada and Mexico.

As well, equipment manufacturers alone support 1.5 million jobs in the US and Canada.

“When congress passes the USMCA, I promise the days of that giant sucking sound from south of the border are over,” Pence said. “The truth is, under the USMCA, as the President says, ‘the American worker is going to win like never before.’ But we have to get it done. The clock is ticking.”

Pence talks Manitowoc

Pence also praised Manitowoc for its commitment to manufacturing in the United States.

“We’re here today at Manitowoc’s largest manufacturing facility where this company has invested nearly $50 million in the last three years alone and hired nearly 350 new workers right at this site. That’s real progress,” Pence said. “Manitowoc has worked hard to bring design and manufacturing jobs back to the United States.”

The Vice President also applauded the creation of the MLC100 — Manitowoc’s latest crane model.

“The MLC100 is the only 10 ton crawler crane that’s made in the USA,” Pence said.

“You’ve show them that American innovation is alive and well by launching nearly 20 new products in the last three years. You’ve stepped up. You’re a story of American success.”

‘A true champion’

Alongside Manitowoc, Pence’s speech was also hosted by the Association of Equipment Manufacturers (AEM). Denis Slater, president of AEM, praised Pence’s efforts to boost American manufacturing.

“The vice president is really a true champion for manufacturing and the men and women who make America,” Slater said. “He and President Trump know that when the equipment manufacturing industry is strong, America is strong also.”
REMARKS

Remarks by Vice President Pence at the Association of Equipment Manufacturers “I Make America” Event

ECONOMY & JOBS

Issued on: August 1, 2019

Manitowoc Cranes
Shady Grove, Pennsylvania

11:46 A.M. EDT

THE VICE PRESIDENT: Well, hello, Pennsylvania! (Applause.)

AUDIENCE: USA! USA! USA!

THE VICE PRESIDENT: It is great to be with all of you. To Secretary Pizzella, Congressman Joyce, all the great local leaders who are here, but especially the red-shirt-wearing men and women of this incredible company, it is great to be here at the country’s only American-owned and American-produced crane company. Let’s hear it for the whole team here at Manitowoc. (Applause.)

And I’m here to get some business done; I don’t know about the rest of you. (Laughter.) Because we are here to make sure that American manufacturing keeps growing right here in Pennsylvania and all across America! (Applause.) And I thank you for that warm welcome. I really do.
And, by the way, it’s a particular joy for me to be traveling today with my shift foreman. (Laughter.) Would you all join me in welcoming my wonderful wife of 34 years? The Second Lady of the United States, Karen Pence, is with us today. (Applause.) And she just said, “You should tell them all to sit down.” (Laughter.)

So, thank you all. Thanks for the warm welcome.

I also want to thank this remarkable organization that’s helped bring us all together today from all across the state of Pennsylvania. You’ve stood strong with this administration, helping us bring momentum in manufacturing. You’re putting American jobs and American workers first. So join me in thanking the leadership of the team at the Association of Equipment Manufacturers that proves every day that you make America. (Applause.)

And before I get started, let me — let me mention one other person who I know loves the Keystone State, who loves American manufacturing, and is the best friend American manufacturers have ever had in the Oval Office. I bring greetings from the 45th President of the United States of America, President Donald Trump. (Applause.)

You know, from our very first day in office, President Trump promised the American people that we were going to get back to hiring and growing America; we were going to be growing wages for American workers. As the President said, “When we grow American manufacturing, we don’t [just] grow...jobs and wages...we grow [the] America[n] spirit.” And that’s exactly what we’ve done. And President Donald Trump has been delivering on that promise every single day.

In just two and a half years, this President has put American jobs and American workers first. He’s actually signed more laws cutting federal red tape, already, than any President in American history, unleashing American manufacturing. (Applause.)

He signed the largest tax cut and tax reform in American history. And under this President, the war on coal is over! (Applause.)

You know, all of you here know, at this great company, that low-cost energy is the lifeblood — it’s the lifeblood of American manufacturing. Pennsylvania coal plays a vital role in keeping electricity affordable for our businesses and our families.
So I’ll make you a promise: While all these Democrats running for President continue to embrace a radical environmental agenda and a Green New Deal, and make promises even to eliminate coal and fossil fuels, this President and this administration will always put American jobs, American workers, and American energy first. (Applause.)

So we’ve been making great progress, keeping the promises that we made to the people of Pennsylvania. And I’ll tell you what: You look at the results of what we’ve done. All of us, together, have been able to accomplish with this President in the lead, and it’s just been amazing.

Since Election Day 2016, businesses large and small across this country have created 6 million new jobs, including 140,000 good-paying jobs right here in Pennsylvania. (Applause.)

The unemployment rate has hit a near 50-year low. And the unemployment rate for African Americans and Hispanic Americans has hit the lowest level ever recorded. The American Dream is working again for every American. (Applause.)

And I know all of you here at Manitowoc don’t have to have me tell you, but wages are rising again. They’re rising all across this country. In fact, they’re rising at the fastest pace that they have in more than 10 years. And the good news is they’re rising most rapidly for hardworking blue-collar Americans. The forgotten men and women of America are forgotten no more. (Applause.)

You know, what a difference two and half years makes. You know, it was the summer of 2016 — some of you may remember — the last President in the Oval Office actually saw this country lose 200,000 manufacturing jobs. And he actually said that we were never going to get those jobs back. Remember that talk? I mean, the last President actually said, “What magic wand do you have?” Right? Well, we didn’t need a magic wand to bring American manufacturing back, we just needed President Donald Trump in the White House. (Applause.) That’s right. You know.

I mean, the truth is, since 2016 Election Day, businesses across this country have created more than 500,000 manufacturing jobs across this country, including 5,000 good-paying manufacturing jobs right here in Pennsylvania. (Applause.)

American manufacturing is making an incredible comeback. In fact, 2018 was not only the best year for manufacturing job creation in more than 20 years, but it also marked the highest level of optimism among manufacturers ever recorded.
I mean, manufacturing is back. And the truth is, I’m proud of the progress we’ve made. I’m proud of the promises that this President and our allies in Congress have kept in rolling back taxes and red tape, unleashing American energy, and also fighting for free and fair trade deals.

But the truth is, the real credit goes to all of you. And the comeback in American manufacturing is happening because of the men and women of this country who work in this great industry. And it’s thanks to great companies like Manitowoc in this economy that American manufacturing is rallying all across the country.

I mean, we’re here today at Manitowoc’s largest manufacturing facility, where this company has invested nearly $50 million in the last three years alone, and hired more than 350 new workers right at this site. That’s real progress for Pennsylvania and America. (Applause.)

Manitowoc has worked hard to bring design and manufacturing jobs back to the United States. In fact, just last year, this company unveiled one of its newest product lines: the MLC100, which is the only 100-ton crawler crane that’s proudly made in the USA. (Applause.) And this great company—you can applaud that. That’s incredible. Wow. (Applause.)

And this company has brought millions of dollars in economic growth to Pennsylvania and the Shady Grove community. You’ve shown that American innovation is alive and well. And launching more than 20 new products in the last three years, you’ve stepped up. And also, I’m proud to say, this company has also stepped forward to help us provide for the common defense, designing and manufacturing cranes for the Armed Forces of the United States. (Applause.) Thank you for what you do to make America safe and secure. (Applause.)

But I know the management team here knows that you wouldn’t have the success here at Manitowoc except because of the people that are gathered here today: all of you wearing the red t-shirts. And I’m hoping somebody gives me one before I leave today. (Laughter.)

Like one of Manitowoc’s manufacturing quality specialists, I’m told, from here in Shady Grove, who started with this company 23 years ago — I’m told in all that time, he’s been a model employee somebody that people say is positive, thoughtful, quick study, always willing to chip in when the job needs to get done.
He's an integral part of the team here at Manitowoc, but he is somebody who also will tell you that he understands that no title he'll ever have here at this company is going to be higher than the one holds at home, spelled: D-A-D. And along with his wife, Pamela, and their children Brittany and Payton, he donates his time and his treasure, and is a devoted and active member of Lifehouse Church. So would you join me in recognizing a long-time member of the Manitowoc family, Steve Yost? Where are you, Steve? (Applause.) Great job.

We're also joined today by a manufacturing engineer who has worked at Manitowoc for 24 years. She’s done just about every job a person can do here: deburrer — whatever that is. I’ve got something I can look up on the plane now. Drill press operator, material handler, scheduler, supervisor. You name it, she’s done it.

And today, she's one of this company’s most experienced engineers, but she's somebody who's always willing to give advice, always willing to offer a helping hand to coworkers. And when she isn’t literally making America grow, or spending time with her partner Randy, another vital part of Manitowoc’s team, she’s giving back to this community. Including, I’m told, just over a month ago, she again volunteered at the nine-day-long Mont Alto Volunteer Firemen’s Carnival. And I’m sure a lot of you checked that out. I’m really into firemen’s carnivals myself.

So would you all help me in showing all of our appreciation for Mel Barnes for what she does here? She’s an incredible person. (Applause). Where are you, Mel? Great job.

You know, I mentioned Steve and Mel mostly because of — I don’t have time to mention all of you. They’re really emblematic, though, of each and every one of you. You’re renewing American manufacturing, you’re making Pennsylvania stronger, you’re making America stronger. So give yourselves a round of applause — this whole Manitowoc team. You’re a story of American success. (Applause.)

The truth is, everything we’ve been able to accomplish over the last two and a half years is because of your hard work, your integrity, your work ethic, and your professionalism. So I wanted to come here and just say congratulations, but also to say thank you. Thank you for supporting the President. Thank you for supporting our allies in Congress who have stood with us to move an agenda that is reviving American manufacturing.
But I also came out here today because we need your help, and we need Pennsylvania to stand strong. Because for all of the progress we’ve made, that’s just what this businessman-who’s-turned-President calls a “good start.”

And to keep the American economy rolling, President Trump and I believe we’ve got to level the playing field for American workers by having trade deals that put American jobs and American workers first. And that’s just what we’re here to do. (Applause.) It’s a big deal.

I mean, from Europe to the Indo-Pacific, we’ve been negotiating deals that are free, fair, and, as the President likes to say, “reciprocal” trade. We’re working as we speak with Japan on a free trade agreement. We’re talking to the European Union. Once the UK goes through Brexit, we’ve told them we’re ready to go to work with them. And, of course, we all know we finally have a President who is standing strong and demanding that China open its markets to U.S. goods, and treat American workers and American companies fairly. (Applause.) And he’ll keep standing strong, I promise you.

But we’ve got an opportunity before us. You’ve already heard about it from this podium. And the people who serve you in Washington, D.C. need to hear from you about it. Truthfully, the time has come, the opportunity is before us, to pass the largest trade deal in American history. The time has come for Congress to pass the U.S.-Mexico-Canada Agreement. (Applause.)

This agreement is a good deal for Pennsylvania. And it’s a good deal for American workers and American agriculture. And we’ve got to get it done. We’ve got to get it done this year.

In fact, I’ve been traveling all across the country telling the story of the USMCA and the difference that it’s going to make not only in manufacturing, but literally in industries all across this country. And I probably don’t have to tell you all working in this industry — and I met a guy today who’s actually worked at this company for 45 years. There’s a lot of people who have done a lot of living here and been with this company.

A lot of you have been here long enough to remember when NAFTA was adopted back in the 1990s. So I probably don’t have to tell you about the impact that NAFTA had on many of our communities across this country.
I talked to a fella who said that when he started here, when this company had a different name, there was some 3,000 employees here. And yet, we saw NAFTA come along; I saw it over in the Hoosier State. And despite all the promises of what it would mean, we literally saw almost entire communities hollowed out, factories that were shuttered and closed. Jobs were moved south of the border under that NAFTA agreement.

And this President, when we were out there campaigning three years ago, he said we could do better. He said we could renegotiate that deal in a way that put American jobs and America first. And that’s what we’ve done with the USMCA. (Applause.)

And when Congress passes the USMCA, I promise you that the days of that giant sucking sound south of the border are over. The USMCA, we believe, is going to benefit 2 million manufacturing jobs, including 42,000 jobs right here in the Keystone State.

According to the International Trade Commission, the USMCA is going to add about $70 billion in investments and create as much as 175,000 new American jobs. And that’s just at the beginning. You know, in total, American exports to Canada, we think, are going to increase by about $20 billion. Exports to Mexico are going to increase by $14 billion. And Pennsylvania has got a big stake in all of it.

And the Keystone State, as all of you know, is America’s 10th largest exporting state. A hundred and seventy-seven thousand jobs here in Pennsylvania depend on exports. And Pennsylvania exports $15 billion in goods to Canada and Mexico — more than a third of the total. Think about that. More than a third of what you make here and you grow here in Pennsylvania is exported to Canada or Mexico. And now we have a new deal that’s going to make it more possible to create more here and sell more there.

We believe, under the USMCA, those numbers, as big as they are, are just going to continue to grow. It’s going to create more jobs, more opportunity, and more prosperity right here in Pennsylvania. The USMCA is a big win for the Keystone State.

And it’s essential that we get it passed by the Congress. The truth is, under the USMCA, as the President says, the American worker is going to win like never before. But we got to get it done. The clock is ticking. It’s why we’re all out here today in the sunshine — because I need your help. I mean, the President has done his job.
We negotiated a deal that’s put American jobs and American workers first. Mexico has already started to make the changes in their labor laws that they agreed to under this deal. And they’ve started to move approval. Canada has done the same thing. Now it’s time for Congress to do their job and approve the USMCA, and approve it this year. (Applause.)

And make no mistake about it — make no mistake about it: You all are going to be the difference-makers. And American manufacturers and people working in manufacturing need to be heard from. The voice of Pennsylvania needs to be heard from. This is a great state, with a great history, that plays and enormously important role not just in American manufacturing and agriculture, but in the American economy.

So I want to encourage each and every one of you: Talk about what you’ve heard from this podium, today. And talk about this growing economy that we’re in today and how it’s going to continue to grow and continue to prosper if we can get the USMCA done.

I want you to reach out to all of the elected representatives that you have in Washington, D.C., from Pennsylvania, and tell them we need the USMCA this year to keep Pennsylvania and America growing.

Now, let me save you a phone call and tell you you’re not going to have to call the 13th District Congressman. (Laughter.) He hasn’t been there long, but he’s already emerged as a leader, and he is on the point leading the fight for free and fair trade. Join me in thanking Congressman John Joyce. He is doing a phenomenal job for Pennsylvania. (Applause.) John, thank you.

We’ve got John’s support and we’ve got his strong leadership and voice, but we need the support of every member of the House of Representatives from Pennsylvania. So leave here today and call every Republican, call every Democrat.

I served in Congress for 12 years. I always viewed the fact that I represented the whole state of Indiana when I was in Congress from one district. So, folks, just call up congressmen in both political parties and tell them, “I ran into Mike the other day.” (Laughter) “He showed up at Manitowoc, and this guy is incredibly excited. He told me for all the good things that are happen, even more can happen. Pennsylvania can grow even more.” And just tell them I told you because they know it to be true.
And while you’re at it, why don’t you call both of your senators. Senator Pat Toomey and Senator Bob Casey need to support the USMCA for Pennsylvania and America. (Applause.)

But you’ll be the difference. Make no mistake about it. So let your voice be heard.

Well, listen, I want to let you get in, out of the sun, but I am going to take some time. Karen and I want to say hello to as many of you as time permits.

And in the days and weeks ahead, I’ll just make you promise: President Trump and I are going to keep fighting every single day for all the policies that Pennsylvania voted for in that election two and a half years ago. Policies that are reviving this economy. Three hundred and fifty new jobs at this company alone over the last two and a half years. Amazing to think about it. But, really, we’re just getting started.

So I just — I want to thank you for the warm welcome today. You know, I truly do believe — I truly do believe that with your continued support; with your energetic work and creativity at a great company like Manitowoc; with the great leadership that this company has, it’s investing in those three most beautiful words, “Made in the USA” — (applause) — with strong support from partners in Congress; with President Donald Trump in the White House; and with God’s help, we’re going to make Pennsylvania and America more prosperous than ever before. We’re going to make Pennsylvania and America safer than ever before. And to borrow a phrase, we’re going to keep making America great again.

Thanks everybody. God bless you. Let’s go get the USMCA done, Pennsylvania! (Applause.)

END

12:09 P.M. EDT
Exhibit 2

Confidential – Not Susceptible to Public Summary
Exhibit 3
<table>
<thead>
<tr>
<th>PERIOD</th>
<th>CTY_NAME</th>
<th>units</th>
<th>fas</th>
<th>fas $/unit</th>
<th>units</th>
<th>fas</th>
<th>fas $/unit</th>
<th>units</th>
<th>fas</th>
<th>fas $/unit</th>
<th>units</th>
<th>fas</th>
<th>fas $/unit</th>
<th>units</th>
<th>fas</th>
<th>fas $/unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ARGENTINA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AUSTRALIA</td>
<td>8</td>
<td></td>
<td>5,252,103</td>
<td>2</td>
<td></td>
<td>2,720,500</td>
<td>2</td>
<td></td>
<td>2,720,500</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fas</td>
<td></td>
<td></td>
<td>fas</td>
<td></td>
<td></td>
<td>fas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AUSTRIA</td>
<td>4</td>
<td></td>
<td>656512.9</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
</tr>
<tr>
<td></td>
<td>BELGIUM</td>
<td>159</td>
<td>163</td>
<td>3,076,150</td>
<td>466,007</td>
<td>33003.5</td>
<td>222000</td>
<td>77</td>
<td>298</td>
<td>77</td>
<td>637</td>
<td>3,625,480</td>
<td>19,236,715</td>
<td>12,677,686</td>
<td>17,818,611</td>
<td>125,405,849</td>
</tr>
<tr>
<td></td>
<td>BRAZIL</td>
<td>9</td>
<td></td>
<td>625512</td>
<td>2</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>CANADA</td>
<td>2</td>
<td></td>
<td>525,103</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>CHILE</td>
<td>8</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>CHINA</td>
<td>131</td>
<td>87</td>
<td>3,076,150</td>
<td>466,007</td>
<td>33003.5</td>
<td>222000</td>
<td>77</td>
<td>298</td>
<td>77</td>
<td>637</td>
<td>3,625,480</td>
<td>19,236,715</td>
<td>12,677,686</td>
<td>17,818,611</td>
<td>125,405,849</td>
</tr>
<tr>
<td></td>
<td>COLOMBIA</td>
<td>8</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>CZECH REPUBLIC</td>
<td>1</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>DENMARK</td>
<td>1</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>DJIBOUTI</td>
<td>8</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>DOMINICAN REPUBLIC</td>
<td>1</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>FINLAND</td>
<td>5</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>FRANCE</td>
<td>32</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>GERMANY</td>
<td>87</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>GHANA</td>
<td>1</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>GUATEMALA</td>
<td>2</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>HONG KONG</td>
<td>1</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
<tr>
<td></td>
<td>INDIA</td>
<td>1</td>
<td></td>
<td>656512</td>
<td>2</td>
<td></td>
<td>2720500</td>
<td>2</td>
<td></td>
<td>11185720</td>
<td>159</td>
<td>110</td>
<td>1163</td>
<td>2</td>
<td>107,810,768</td>
<td>126,250,480</td>
</tr>
</tbody>
</table>

Source: Official Bureau of Census Import Statistics
<table>
<thead>
<tr>
<th>Period</th>
<th>Annual</th>
<th>YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDONESIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRELAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITALY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td>134</td>
<td>142</td>
</tr>
<tr>
<td>fas</td>
<td>8,150,467</td>
<td>9,319,595</td>
</tr>
<tr>
<td>fas /unit</td>
<td>75,000</td>
<td>75,000</td>
</tr>
<tr>
<td>MALAYSIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEXICO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>fas</td>
<td>160,000</td>
<td>236,000</td>
</tr>
<tr>
<td>fas /unit</td>
<td>80,000</td>
<td>80,000</td>
</tr>
<tr>
<td>NEW ZEALAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORWAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>fas</td>
<td>260,000</td>
<td>382,016</td>
</tr>
<tr>
<td>fas /unit</td>
<td>260,000</td>
<td>260,000</td>
</tr>
<tr>
<td>PERU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POLAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>fas</td>
<td>5,377,078</td>
<td>399,344</td>
</tr>
<tr>
<td>fas /unit</td>
<td>448,089.8</td>
<td>448,089.8</td>
</tr>
<tr>
<td>ROMANIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROMANIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAUDI ARABIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINGAPORE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOUTH AFRICA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPAIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWEDEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>fas</td>
<td>5,761,053</td>
<td>7,499,232</td>
</tr>
<tr>
<td>fas /unit</td>
<td>576,105.3</td>
<td>576,105.3</td>
</tr>
<tr>
<td>SWITZERLAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAIWAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fas /unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THAILAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>units</td>
<td>86</td>
<td>104</td>
</tr>
</tbody>
</table>

Source: Official Bureau of Census Import Statistics
<table>
<thead>
<tr>
<th>PERIOD</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,618,000</td>
<td>5,289,200</td>
<td>6,343,500</td>
<td>8,281,200</td>
<td>8,540,900</td>
<td>6,874,500</td>
<td>4,650,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas $/unit</td>
<td>53697.67</td>
<td>50857.69</td>
<td>54217.95</td>
<td>53427.10</td>
<td>56190.13</td>
<td>56814.05</td>
<td>56713.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>units</td>
<td>7</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas</td>
<td>660,925</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>53,500</td>
<td>53,500.00</td>
<td>53,500.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas $/unit</td>
<td>94417.86</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>53500.00</td>
<td>53500.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TURKEY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>36,325</td>
<td>.</td>
<td>36325.00</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$/unit</td>
<td>160000.0</td>
<td>80000.00</td>
<td>.</td>
<td>60000.00</td>
<td>60000.00</td>
<td>60000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>units</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas</td>
<td>160,000</td>
<td>.</td>
<td>240,000</td>
<td>.</td>
<td>60,000</td>
<td>60000.00</td>
<td>60000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UKRAINE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>160,000</td>
<td>.</td>
<td>240,000</td>
<td>.</td>
<td>60,000</td>
<td>60000.00</td>
<td>60000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas $/unit</td>
<td>160000.0</td>
<td>80000.00</td>
<td>.</td>
<td>60000.00</td>
<td>60000.00</td>
<td>60000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>units</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNITED ARAB EMIRATES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas $/unit</td>
<td>324154.9</td>
<td>341284.3</td>
<td>347060.0</td>
<td>360979.8</td>
<td>279356.4</td>
<td>313533.2</td>
<td>256644.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNITED KINGDOM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>898,956</td>
<td>1,478,635</td>
<td>2,561,813</td>
<td>2,293,270</td>
<td>5,896,957</td>
<td>139,530</td>
<td>552,001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas $/unit</td>
<td>179791.2</td>
<td>184829.4</td>
<td>256181.3</td>
<td>208479.1</td>
<td>737119.6</td>
<td>27906.00</td>
<td>138000.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>units</td>
<td>1,337</td>
<td>1,566</td>
<td>1,940</td>
<td>1,483</td>
<td>2,305</td>
<td>1,557</td>
<td>2,692</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fas $/unit</td>
<td>324154.9</td>
<td>341284.3</td>
<td>347060.0</td>
<td>360979.8</td>
<td>279356.4</td>
<td>313533.2</td>
<td>256644.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Official Bureau of Census Import Statistics
Exhibit 4
<table>
<thead>
<tr>
<th>Heading/Subheading</th>
<th>Stat. Suf.-fix</th>
<th>Article Description</th>
<th>Unit of Quantity</th>
<th>Rates of Duty 1</th>
<th>Rates of Duty 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8424 (con.)</td>
<td></td>
<td>Mechanical appliances (whether or not hand operated) for projecting, dispersing or spraying liquids or powders; fire extinguishers, whether or not charged; spray guns and similar appliances; steam or sand blasting machines and similar jet projecting machines; parts thereof: (con.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8424.90</td>
<td>00</td>
<td>Of fire extinguishers</td>
<td>X</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8424.90.05</td>
<td>00</td>
<td>Of simple piston pump sprays and powder bellows</td>
<td>kg</td>
<td>Free (A, AU, B, BH, CA, CL, CO, D, E, IL, JO, KR, MA, MX, OM, P, PA, PE, SG)</td>
<td>45%</td>
</tr>
<tr>
<td>8424.90.10</td>
<td>00</td>
<td>Of sand blasting machines</td>
<td>X</td>
<td>Free (A, AU, B, BH, CA, CL, CO, D, E, IL, JO, KR, MA, MX, OM, P, PA, PE, SG)</td>
<td>Free 4</td>
</tr>
<tr>
<td>8424.90.20</td>
<td>00</td>
<td>Of steam and similar jet projecting machines</td>
<td>X</td>
<td>Free (A, AU, B, BH, CA, CL, CO, D, E, IL, JO, KR, MA, MX, OM, P, PA, PE, SG)</td>
<td>Free 6</td>
</tr>
<tr>
<td>8425</td>
<td></td>
<td>Pulley tackle and hoists other than skip hoists; winches and capstans; jacks:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8425.11.00</td>
<td>00</td>
<td>Pulley tackle and hoists other than skip hoists or hoists of a kind used for raising vehicles:</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8425.19.00</td>
<td>00</td>
<td>Winches; capstans</td>
<td>No</td>
<td>Free 6</td>
<td>35%</td>
</tr>
<tr>
<td>8425.31.01</td>
<td>00</td>
<td>Overhead traveling cranes, transporter cranes, gantry cranes, bridge cranes, mobile lifting frames, straddle carriers and works trucks fitted with a crane:</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8425.41.00</td>
<td>00</td>
<td>Other machinery, self-propelled:</td>
<td>No</td>
<td>Free 6</td>
<td>35%</td>
</tr>
<tr>
<td>8425.42.00</td>
<td>00</td>
<td>Other jacks and hoists, hydraulic</td>
<td>No</td>
<td>Free 6</td>
<td>35%</td>
</tr>
<tr>
<td>8426</td>
<td></td>
<td>Overhead traveling cranes on fixed support</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.11.00</td>
<td>00</td>
<td>Mobile lifting frames on tires and straddle carriers</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.12.00</td>
<td>00</td>
<td>Other</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.19.00</td>
<td>00</td>
<td>Tower cranes</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.20.00</td>
<td>00</td>
<td>Portal or pedestal jib cranes</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.41.00</td>
<td>00</td>
<td>Works trucks fitted with a crane</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.49.00</td>
<td>00</td>
<td>Other</td>
<td>No</td>
<td>Free 4</td>
<td>35%</td>
</tr>
<tr>
<td>8426.91.00</td>
<td>00</td>
<td>Designed for mounting on road vehicles</td>
<td>No</td>
<td>Free 6</td>
<td>35%</td>
</tr>
<tr>
<td>8426.99.00</td>
<td>00</td>
<td>Other</td>
<td>No</td>
<td>Free 6</td>
<td>35%</td>
</tr>
<tr>
<td>Heading/Subheading</td>
<td>Stat. Suffix</td>
<td>Article Description</td>
<td>Unit of Quantity</td>
<td>Rates of Duty</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
<td>---------------------</td>
<td>-----------------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>8431</td>
<td></td>
<td>Parts suitable for use solely or principally with the machinery of headings 8425 to 8430:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8431.10.00</td>
<td></td>
<td>Of machinery of heading 8425:</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Of machinery of subheading 8425.11 or 8425.19&lt;sup&gt;2&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8431.20.00</td>
<td></td>
<td>Other&lt;sup&gt;3&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8431.31.00</td>
<td></td>
<td>Of machinery of heading 8427&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Of machinery of heading 8428:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8431.39.00</td>
<td></td>
<td>Of machinery of heading 8428:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Of passenger or freight elevators other than continuous action, skip hoists or escalators.</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>8431.41.00</td>
<td></td>
<td>Buckets, shovels, grabs and grips.</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>8431.42.00</td>
<td></td>
<td>Bulldozer or angledozer blades.</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>8431.43</td>
<td></td>
<td>Parts for boring or sinking machinery of subheading 8430.41 or 8430.49:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8431.43.40</td>
<td></td>
<td>Of offshore oil and natural gas drilling and production platforms</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>8431.43.80</td>
<td></td>
<td>Other</td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Of oil and gas field machinery:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tool joints, whether or not forged.</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drill pipe fitted with tool joints.</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other&lt;sup&gt;3&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Of other boring or sinking machinery.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heading/Subheading</td>
<td>Article Description</td>
<td>Unit of Quantity</td>
<td>Rates of Duty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8431 (con.)</td>
<td>Parts suitable for use solely or principally with the machinery of headings 8425 to 8430: (con.) Of machinery of heading 8426, 8429 or 8430: (con.) Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Of machinery of heading 8426</td>
<td></td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Of machinery of subheadings 8426.11, 8426.19 and 8426.30</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Of mobile lifting frames, straddle carriers and works trucks fitted with a crane</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attachments for mounting on machinery:</td>
<td></td>
<td>Free&lt;sup&gt;1&lt;/sup&gt;</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Backhoe attachments</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Front-end loader attachments</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rippers and rooters</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other &lt;sup&gt;25&lt;/sup&gt;</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parts of coal or rock cutters and tunneling machinery:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cast axle housings</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parts of backhoes, shovels, clamshells and draglines:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cast axle housings</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Road wheels</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wheel and tire assemblies</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other &lt;sup&gt;35&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scraper bowls for scrapers of subheadings 8429.30 and 8430.69.01</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track links</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cast axle housings</td>
<td>No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steel forgings</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Road wheels</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wheel and tire assemblies</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other &lt;sup&gt;35&lt;/sup&gt;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Exhibit 5

Confidential – Not Susceptible to Public Summary
Exhibit 6
UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of
CERTAIN CRAWLER CRANES AND COMPONENTS THEREOF

Investigation No. 337-TA-887

COMMISSION OPINION

I. INTRODUCTION

On July 11, 2014, the presiding administrative law judge ("ALJ") issued his final initial determination ("ID") in this investigation, finding a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("section 337"). Specifically, the ID found a violation of section 337 with respect to claims 1, 2, 5, 8, and 23-26 of U.S. Patent No. 7,546,928 ("the '928 patent") and misappropriation of Trade Secret Nos. 1, 6, 14, and 15. The ID found no violation of section 337 with respect to claims 6, 10, and 11 of the '928 patent, claim 1 of U.S. Patent No. 7,967,158 ("the '158 patent"), and Trade Secret Nos. 3 and 4. The Commission determined to review the ID in part with respect to: (1) importation of the accused products; (2) infringement of the asserted patents; (3) estoppel; (4) the technical prong of the domestic industry requirement; and (5) the asserted trade secrets.

Upon consideration of the record in this investigation, including the parties' submissions, the Commission has determined the following: (1) claims 1, 2, 5, 6, 8, 10, and 11 of the '928 patent are not infringed; (2) claims 23-26 of the '928 patent are infringed by the SCC8500 crane with the original UltraLift package; (3) claim 1 of the '158 patent is not infringed; (4) to take no position on the ID's estoppel findings; (5) the domestic industry requirement has been satisfied; and (6) Trade Secret Nos. 1, 3, 4, 6, 14, and 15 are protectable and have been misappropriated by
II. BACKGROUND

A. Procedural History

The Commission instituted this investigation on July 17, 2013, based on a complaint filed by Manitowoc Cranes, LLC ("Manitowoc" or "Complainant") of Manitowoc, Wisconsin. The complaint alleges violations of section 337(a)(1)(B) by reason of infringement of certain claims of the '928 and '158 patents and that an industry in the United States exists or is in the process of being established as required by subsection (a)(2) of section 337. The complaint further alleges violations of section 337(a)(1)(A) by reason of trade secret misappropriation, the threat or effect of which is to destroy or substantially injure an industry in the United States or to prevent the establishment of such an industry. The Commission’s notice of investigation named Sany Heavy Industry Co., Ltd. ("Sany Heavy") of Changsha, China, and Sany America, Inc. ("Sany America") of Peachtree City, Georgia, as respondents (collectively "Sany" or "Respondents"). The Office of Unfair Import Investigations ("OUII") was also named as a party to this investigation.

On November 15, 2013, Manitowoc filed a motion seeking to amend the complaint and notice of investigation to assert (1) additional patent claims (i.e., claims 6, 8, 10, 11, and 23-26 of

---

the '928 patent), (2) additional trade secrets, and (3) an additional unfair act. On December 13, 2013, the ALJ issued an ID (Order No. 10) granting the motion with respect to the additional patent claims and certain of the additional alleged trade secrets, but denying the motion with respect to one of the additional trade secrets, and the additional unfair act. On January 15, 2014, the Commission determined not to review the ID's determination.²

On February 12, 2014, the ALJ granted Manitowoc's unopposed motion that it had satisfied the economic prong of the domestic industry requirement with respect to the asserted patents and the domestic industry requirement with respect to the asserted trade secrets. Order No. 17 (Feb. 12, 2014). The Commission determined to review the ID in-part.³ Specifically, the Commission modified the ID's findings to specify that Manitowoc satisfied the economic prong under section 337(a)(3)(A) for its investments in plant and equipment and under section 337(a)(3)(B) for its investments in labor and capital. The Commission took no position on whether Manitowoc satisfied the domestic industry requirement under section 337(a)(3)(C). The Commission did not review the ID's finding of injury or threat thereof under section 337(a)(1).

An evidentiary hearing in this investigation was held March 25 through 28, 2014.

On July 11, 2014, the ALJ issued his final ID finding a violation of section 337 with respect to claims 1, 2, 5, 8, and 23-26 of the '928 patent and misappropriation of Trade Secret

² Notice of Commission Determination Not to Review an Initial Determination Granting-in-Part Complainants' Motion to Amend the Complaint and Notice of Investigation (Jan. 15, 2014).

Nos. 1, 6, 14, and 15. The ID found no violation of section 337 with respect to claims 6, 10, and 11 of the '928 patent, claim 1 of the '158 patent, and Trade Secret Nos. 3 and 4.

On July 28, 2014, OUII, Manitowoc, and Sany each filed petitions for review.\(^4\) On August 5, 2014, the parties filed responses to the respective petitions for review.\(^5\)


On September 19, 2014, the Commission determined to review the ID in part. 79 Fed. Reg. 57566-68 ("Notice of Review"). The Commission determined to review the ID’s findings with respect to: (1) importation of the accused products; (2) infringement of the asserted patents; (3) estoppel; (4) the technical prong of the domestic industry requirement; and (5) the asserted trade secrets. Id. The Commission solicited briefing on 17 questions concerning whether the Commission should find a violation of section 337, and requested submissions concerning remedy, bonding, and the public interest.

\(^4\) Complainant Manitowoc Cranes, LLC’s Petition For Review of the Final Initial Determination ("Comp. Pet."); Petition of Respondents Sany America Inc. and Sany Heavy Industry Co., Ltd. For Review Of Final Initial Determination ("Sany Pet."); Office of Unfair Import Investigations’ Petition For Review-In-Part of Final Initial Determination ("OUII Pet.").

\(^5\) Respondents Sany America Inc.’s and Sany Heavy Industry Co., Ltd.’s Points and Authorities In Response to Complainant Manitowoc Cranes, LLC’s Petition for Review of the Final Initial Determination ("Sany Resp. to Comp."); Complainant Manitowoc Cranes, LLC’s Response to Respondents’ Petition for Review of the Final Initial Determination ("Comp. Resp. to Sany"); Combined Response of the Office of Unfair Import Investigations to Complainant Manitowoc Cranes, LLC’s and Respondents Sany America Inc.’s and Sany Heavy Industry Co., Ltd.’s Petitions for Review of the Final Initial Determination ("OUII Resp."); Respondents Sany America Inc.’s and Sany Heavy Industry Co., Ltd.’s Concurrence with the Office of Unfair Import Investigations’ Petition For Review-In-Part of Final Initial Determination ("Sany Resp. to OUII"); Complainant Manitowoc Cranes, LLC’s Response to the Office of Unfair Import Investigations’ Petition for Review-In-Part of Final Initial Determination ("Comp. Resp. To OUII").
On October 1, 2014, the parties filed initial submissions to the Commission’s Notice of Review. On October 8, 2014, the parties filed response submissions.

On December 3, 2014, the Commission determined to request additional briefing. On December 12, 2014, the parties filed initial submissions in response to the Commission’s Supplemental Notice. On December 19, 2014, the parties filed response submissions.


8 Notice of the Commission’s Determination to Extend the Target Date; Request for Written Submissions (Dec. 3, 2014) (“Supplemental Notice”).

9 Complainant Manitowoc Cranes, LLC’s Response to the Commission’s December 3, 2014 Request for Written Submissions (“Comp. 2\textsuperscript{nd} Comm. Br.”); Respondents Sany America Inc.’s and Sany Heavy Industry Co., Ltd.’s Initial Written Submissions in Response to Notice of the Commission’s Determination To Extend the Target Date; Request for Written Submissions (“Resp. 2\textsuperscript{nd} Comm. Br.”); Office of Unfair Import Investigations’ Response to Commission’s December 3, 2014 Questions (“OUII 2\textsuperscript{nd} Comm. Br.”).

10 Complainant Manitowoc Cranes, LLC’s Reply to Respondents’ and Staff’s December 12, 2014 Written Submissions to the Commission (“Comp. 2\textsuperscript{nd} Comm. Resp. Br.”); Respondents Sany America Inc.’s and Sany Heavy Industry Co., Ltd.’s Reply Submissions in Response to Notice of the Commission’s Determination To Extend the Target Date; Request for Written Submissions (“Resp. 2\textsuperscript{nd} Comm. Resp. Br.”); Office of Unfair Import Investigations’ Reply To the Responses of the Private Parties to the Commission’s December 3, 2014 Questions (“OUII 2\textsuperscript{nd} Comm. Resp. Br.”).
B. Products At Issue

Manitowoc accuses Sany’s model SCC8500 crawler crane (“SCC8500 crane”) that includes Sany’s UltraLift package of infringing the asserted the patents. Id at 6. Manitowoc asserts that the UltraLift package Sany first sold for importation is the “original” UltraLift design. Id. The “redesigned” UltraLift package is the design that was actually imported into the United States after institution of the investigation. Id. Manitowoc asserts that the SCC8500 crane infringes the asserted patents based on both designs of Sany’s UltraLift package. Id. Manitowoc’s trade secret misappropriation claims likewise extend to all configurations of the Sany SCC8500 crane. Id.

C. Overview Of The Patents At Issue

1. Overview of the ’928 Patent

The ’928 patent is entitled “Mobile Lift Crane with Variable Position Counterweight” and issued on June 16, 2009. The named inventors are David J. Pech and Kenneth J. Porubcansky. The ’928 patent “relates to lift cranes, and particularly to mobile lift cranes having a counterweight that can be moved to different positions in an effort to balance a load on the crane.” JX-0001 (’928 patent) at 1:13-16. Manitowoc asserts method claims 1, 2, 5, 6, 8, 10, and 11 and apparatus claims 23-26 of the ’928 patent, which are reproduced below:

1. A method of operating a mobile lift crane, the lift crane comprising a carbody having moveable ground engaging members; a rotating bed rotatably connected to the carbody such that the rotating bed can swing with respect to the ground engaging members; a boom pivotally mounted on a front portion of the rotating bed, with a hoist line extending therefrom[;] a mast mounted at its first end on the rotating bed; and a moveable counterweight unit; the method comprising:

   a) positioning the counterweight forward of a point directly below the top of the mast when no load is on the hoist line; and

   b) positioning the counterweight rearward of the top of the mast when the hoist line is supporting a load;
c) wherein the moveable counterweight is never supported by the
ground during crane pick, move and set operations other than
indirectly by the moveable ground engaging members on the carbody;
and wherein the top of the mast is defined as the furthest back position
on the mast from which any line or tension member supported from
the mast is suspended, and if no line or tension member is supported
from the mast, then the top of the mast is the position to which any
backhitch is attached; and wherein the position of the counterweight
unit is defined as the center of gravity of the combination of all
counterweight elements and any holding tray to which the
counterweights are attached, or otherwise move in conjunction with,
with all counterweight units on a crane that are tied together so as to
always move simultaneously being treated as a single counterweight
for purposes of determining the center of gravity.

2. The method of claim 1 wherein the counterweight is positioned by
extending and retracting a hydraulic cylinder.

5. The method of claim 1 wherein the carbody is not provided with any
separate functional counterweight.

6. A method of operating a mobile lift crane, the lift crane comprising a
carbody having moveable ground engaging members; a rotating bed
rotatably connected to the carbody such that the rotating bed can swing
with respect to the ground engaging members; a boom pivotally mounted
on a front portion of the rotating bed, with a hoist line extending
therefrom; a mast mounted at its first end on the rotating bed; at least one
hydraulic cylinder; and a moveable counterweight unit; the method
comprising:

   a) performing a pick, move and set operation with a load wherein the
      moveable counterweight is moved toward and away from the front
      portion of the rotating bed by extending and retracting the hydraulic
cylinder during the pick, move and set operation to help
      counterbalance the load, but wherein the counterweight is never
      supported by the ground other than indirectly by the moveable ground
      engaging members on the carbody during the pick, move and set
      operation.

8. The method of claim 6 wherein the counterweight is positioned forward
of a point directly below the top of the mast when no load is on the hoist
line; and the counterweight is positioned rearward of the top of the mast
when the hoist line supports a load.

10. The method of claim 6 wherein the mast is held at a fixed angle with
respect to the rotating bed during a pick, move and set operation.

11. The method of claim 6 wherein the pick, move and set operation
involves travel with a load on the hook.
23. A mobile lift crane comprising:
   a) a carbody having moveable ground engaging members;
   b) a rotating bed rotatably connected to the carbody such that the rotating bed can swing with respect to the ground engaging members about an axis of rotation;
   c) a boom pivotally mounted on a front portion of the rotating bed;
   d) a mast mounted at its first end on the rotating bed at a fixed angle compared to the plane of rotation of the rotating bed;
   e) a moveable counterweight unit suspended from a tension member connected adjacent a second end of the mast; and
   f) a counterweight movement structure connected between the rotating bed and the counterweight unit such that the counterweight unit may be moved to and held at a first position in front of the top of the mast and moved to and held at a second position rearward of the top of the mast;
   g) wherein the top of the mast is defined as the furthest back position on the mast from which any line or tension member supported from the mast is suspended, and if no line or tension member is supported from the mast, then the top of the mast is the position to which any backhitch is attached; and wherein the position of the counterweight unit is defined as the center of gravity of the combination of all counterweight elements and any holding tray to which the counterweights are attached, or otherwise move in conjunction with, with all counterweight units on a crane that are tied together so as to always move simultaneously being treated as a single counterweight for purposes of determining the center of gravity.

24. The mobile lift crane of claim 23 wherein the counterweight movement structure can move the counterweight over a distance of at least 10 meters.

25. The mobile lift crane of claim 23 wherein the counterweight movement structure can move and hold the counterweight at a position forward of the top of the mast such that the tension member is at an angle of over 5° compared to the axis of rotation.

26. The mobile lift crane of claim 23 wherein the counterweight movement structure can move and hold the counterweight at a position rearward of the top of the mast such that the tension member is at an angle of over 5° compared to the axis of rotation.
2. **Overview of the '158 Patent**

The '158 patent is entitled “Mobile Lift Crane with Variable Position Counterweight” and issued on June 28, 2011. It was filed on January 31, 2008, and is a continuation-in-part of the application that matured into the asserted '928 patent. JX-0002 ('158 patent). The named inventors are David J. Pech, Kenneth J. Porubcansky, Alan E. Pleuss, and John M. Lanning. The '158 patent “relates to lift cranes, and particularly to mobile lift cranes having a counterweight that can be moved to different positions in an effort to balance a load on the crane.” JX-0002 at 1:15-18. Manitowoc asserts claim 1 of the '158 patent, which is reproduced below:

1. A method of operating a mobile lift crane, the lift crane comprising a carbody having moveable ground engaging members; a rotating bed rotatably connected to the carbody such that the rotating bed can swing with respect to the ground engaging members; a boom pivotally mounted on a front portion of the rotating bed, with a hoist line extending therefrom; a mast mounted at its first end on the rotating bed; at least one linear actuation device; and a moveable counterweight unit; the method comprising:

   a) performing a pick, move and set operation with a load wherein the moveable counterweight unit is moved toward and away from the front portion of the rotating bed by extending and retracting the linear actuation device during the pick, move and set operation to help counterbalance the load, but wherein the counterweight unit is never supported by the ground other than indirectly by the moveable ground engaging members on the carbody throughout the pick, move and set operation, and wherein the counterweight is moved a greater distance than a stroke of the linear actuation device that causes the counterweight to move.

JX-0002 at 14:25-45.

**D. Overview Of Trade Secrets At Issue**

The trade secrets currently at issue in this investigation are: (i) an unfilled market need for certain types of cranes and Manitowoc’s plan to fill that specific need (Trade Secrets Nos. 1 and 6); (ii) Manitowoc’s detailed embodiment of a crane incorporating its 2nd Generation Variable Counterweight (“VPC”) technology (Trade Secret No. 3); (iii) Manitowoc’s decision
that its 2nd Generation VPC technology was desirable for use in wind power applications (Trade Secret No. 4); (iv) Manitowoc’s detailed cost and pricing information (Trade Secret No. 14); and (v) Manitowoc’s manufacturing processes and procedures (Trade Secret No. 15). ID at 7-8; see id. at 135, 165-167, 170, 171, 183 (providing the detailed description of each of the asserted trade secrets).

III. SALE FOR IMPORTATION

The ID found that Sany sold for importation into the United States an SCC8500 crane with an UltraLift package. ID at 11. Specifically, Sany Heavy entered into a contract with Sany America on December 6, 2012, for purchase of the SCC8500 crane with an UltraLift package. Id. at 9-12; CX-0278C. On December 13, 2012, Sany America executed an agreement to rent the SCC8500 crane to AmQuip Crane Rental (“AmQuip”). Id. at 11. The crane was delivered to AmQuip in March 2013 without the UltraLift package. Id. AmQuip was unsatisfied with the crane and returned it. Id. The ID found that, despite there having been a sale for importation of the UltraLift package on December 6, 2012, the UltraLift package was not imported at this point. Id.

The ID found that after institution of the investigation, Sany redesigned the UltraLift package. Id. The ID also found that the redesigned UltraLift package was imported into the United States and installed on the SCC8500 crane. Id. (citing Nape Tr. at 416).

The ID explained that, despite Sany’s argument that there was no actual sale of the SCC8500 crane within the United States, Sany Heavy sold the SCC8500 crane to subsidiary Sany America for importation into the United States. Id. at 10-12. The ID found that whether the original UltraLift package was ultimately imported and whether Sany received payment does not affect the fact that a sale for importation of the SCC8500 crane with the original UltraLift
package was made. *Id.* at 12. Therefore, the ID found that Sany sold for importation the
SCC8500 crane with the original UltraLift package. *Id.*

The Commission determined to review the ID’s findings on importation. 79 Fed. Reg. 57566-68 (Sept. 19, 2014).

The parties do not appear to dispute that the SCC8500 crane and redesigned UltraLift package were imported into the United States. ID at 10-12. Therefore, the Commission affirms the ID’s findings on this issue.

The parties’ dispute centers on what was sold for importation, whether it was the SCC8500 crane with the original UltraLift package, the SCC8500 crane with the redesigned UltraLift package, or both. *See e.g.*, Comp. Pet. at 6-10; Resp. Comm. Br. at 4-9; Comp. Comm. Br. at 1-8; OUII Comm. Br. at 4-8; Sany Post-Hearing Br. at 11.

Sany argues that the original UltraLift package could not have been sold for importation because it was never constructed and therefore it never existed. Sany Pet. at 5; Resp. Comm. Br. at 4-8. Sany further argues that under the U.C.C. a sale for future goods does not constitute a sale. Resp. Comm. Br. at 5-6. However, U.C.C. § 2-106(1) defines a “contract for sale” as including “both a present sale of goods and a contract to sell goods at a future time.” U.C.C. § 2-106(1). In *Enercon GmbH v. International Trade Commission* 151 F.3d 1376, 1381-83 (Fed. Cir. 1998) (“*Enercon*”), the Federal Circuit affirmed the Commission’s determination that the sale of goods to be delivered at a future date can constitute a “sale for importation.” In so doing, the Federal Circuit affirmed the Commission’s determination that the term “sale” in section 337 can include a contract for sale as defined by U.C.C. § 2-106(1). Consistent with the U.C.C. and *Enercon*, a sale of goods that have not been constructed can also constitute a contract for sale and therefore a “sale for importation.” Specifically, U.C.C. § 2-105(2) states that “[g]oods which are
not both existing and identified are ‘future’ goods.’ And the U.C.C. treats a sale for future goods as a contract for sale. U.C.C. § 2-105(2). Thus, the Commission finds that a contract for sale, which can cover the sale of future goods, can constitute a “sale for importation” and confer jurisdiction on the Commission.

Sany argues that its position that there was no sale for importation of the original UltraLift package is consistent with the holdings in Enercon and Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc., 699 F.3d 1340 (Fed. Cir. 2012) (“Transocean”), because, unlike the situation in those cases, here the goods (i.e., the crane with the UltraLift package) did not exist at the time of contract. Resp. Comm. Br. at 6-7. Sany contends that in Enercon the wind turbines existed and were specifically identified, unlike the situation in the present investigation. Id. at 6. However, the Court in Enercon did not consider or determine whether the wind turbines had been manufactured at the time of the contract. Enercon, 151 F.3d at 1383.

Sany also argues that the contract in Transocean included a detailed specification of the oil rig that was under construction and, therefore, Transocean is not inconsistent with Sany’s position. Resp. Comm. Br. at 7. However, the Court in Transocean found that the offer for sale of an oil rig that was not completely constructed and remained subject to change was still a “sale” within § 271(a). This is similar to Sany’s argument that the crane was not yet constructed and the design was not finalized. Moreover, the Federal Circuit’s decision in Transocean resulted from an appeal from a district court action and, therefore, the Court in its opinion did not define what constituted a “sale for importation” under section 337. Transocean, 699 F.3d at 1356-57.
Further, the evidence indicates that the only design Sany had contemplated by the time of the contract at issue, CX-0278C ("the December 2012 contract"), was the SCC8500 crane with the original UltraLift package. The December 2012 contract was for the sale of Sany’s SCC8500 crane in the “Standard Export Configuration with . . . UltraLift.” CX-0278C at SanyITCO0002473. By December 2012, Sany had begun marketing the SCC8500 crane with the UltraLift package. See CX-0133 (Email from J. Kennedy to L. Weyers et al. re: introduction of Sany SCC8500 (Jun. 5, 2012)) (a crane dealer told Manitowoc he had visited Sany’s facility and they had “introduced the 8500 crawler crane with ACE counterweight system”); CX-0042 (Article: Sara Ann McCay, Sany Launches 550 Ton Crawler crane, American Cranes & Transport Magazine (Dec. 20, 2012)) (specifying additional counterweight included in the UltraLift package, as well as boom and jib lengths associated with the UltraLift configuration); CX-0365C (Sany Press Release: SANY America Introduces 550-Ton Crawler Crane for Energy, Petrochemical, Infrastructure Projects (Dec. 19, 2012)) (describing operation of counterweight control system for the UltraLift package).

In particular, Sany’s own press release from December 2012 states the counterweight in the UltraLift package can be extended a distance of 52.5 feet, which makes clear the article is marketing the original design of the UltraLift package. CX-0365C; see also CX-0290C (Sany SCC8500 Product Guide); Lanning Tr. at 344-345 (confirming CX-0290C illustrates the original design of the UltraLift package, which permitted the counterweight to extend beyond the top of the mast, and explaining the UltraLift package was modified after the institution of this Investigation “such that the counterweight did not move as far.”). In addition, John Lanning, a former Manitowoc employee now at Sany, testified the design of the crane changed only after
institution of the investigation. Lanning Tr. at 344, 345-346. Based on this evidence, the Commission finds that the original UltraLift package was sold for importation.

Regarding the redesigned UltraLift package, in its petition for review Manitowoc asked the Commission to determine that the redesigned UltraLift package was not only imported but also “sold for importation.” See, e.g., Comp. Pet. at 9. The ID did not discuss whether the redesigned UltraLift package was “sold for importation.” See ID at 9-12. Manitowoc raised this point in its petition for review in the context of its argument that a finding of direct infringement is not necessary for indirect infringement liability when an article is “sold for importation.” Comp. Pet. at 9-10. There is no dispute the redesigned UltraLift package was actually imported, and therefore the Commission takes no position on whether the redesigned UltraLift package was sold for importation.

IV. U.S. PATENTS NOS. 7,546,928 AND 7,967,158

A. Infringement of the '928 Patent

Claims 1, 2, 5, 6, 8, 10, and 11 are the asserted method claims and claims 23-26 are the asserted apparatus claims of the '928 patent. The ID addresses the asserted method claims of the '928 patent in two groups. With respect to the first group, consisting of claims 6, 10, and 11, the ID analyzed direct infringement, contributory infringement, and inducement of infringement. ID at 47-58. With respect to the second group, consisting of claims 1, 2, 5, and 8, the ID analyzed direct infringement and inducement of infringement. Id. at 58-65. With respect to apparatus claims 23-26, the ID analyzed direct infringement and induced infringement. Id. at 68-71.
that “use” of a trade secret can occur when goods that embody a trade secret are marketed, the trade secret is employed in manufacturing or production, or it is relied on to assist or accelerate research or development. Restatement (Third) of Unfair Competition § 40, Comment c.

The ID’s findings of misappropriation are based on improper acquisition and circumstantial evidence that the products assisted or accelerated Sany’s research or development. The Commission finds that none of the ID’s conclusion of law or fact as summarized above are erroneous and therefore, affirms the ID’s findings of misappropriation.

VI. REMEDY, BONDING AND PUBLIC INTEREST

A. Remedy

Where a violation of section 337 has been found, the Commission must consider the issues of remedy, the public interest, and bonding. Section 337(d)(1) provides that “[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States . . . .” 19 U.S.C. § 1337(d)(1). The Commission has “broad discretion in selecting the form, scope, and extent of the remedy. . . .” Viscofan, S.A. v. U.S. Int’l Trade Comm’n, 787 F.2d 544, 548 (Fed. Cir. 1986). The Commission may issue an exclusion order excluding the goods of the person(s) found in violation (a limited exclusion order) or, if certain criteria are met, against all infringing goods regardless of the source (a general exclusion order). The Commission also has authority to issue cease and desist orders in addition to or in lieu of exclusion orders. See 19 U.S.C. § 1337(f).

The Commission generally issues cease and desist orders to respondents who maintain commercially significant inventories of infringing products in the United States. See, e.g.,
1. Limited Exclusion Order

Section 337(d)(1) requires that "[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States . . . ." 19 U.S.C. § 1337(d)(1). As discussed above, the Commission finds that a violation of section 337 has occurred with respect to certain asserted patent claims and the asserted trade secrets.

The parties agree a limited exclusion order should issue if the Commission finds a violation of the asserted patents or trade secrets. See e.g., Sany Post-Hearing Br. at 181; Manitowoc Post-Hearing Br. at 248. The Commission finds the appropriate remedy with respect to claims 23-26 of the ’928 patent is a limited exclusion order for the term of the patent.

For a violation of section 337 involving trade secrets, the Commission has stated the duration of the exclusion order for the trade secrets is the length of time it would have taken the respondent to develop the complainant’s trade secrets. See Certain Rubber Resins and Processes for Manufacturing Same, Inv. No. 337-TA-849, Comm’n Op. at 82-83 (Feb. 26, 2014). The Commission has previously explained that, when multiple trade secrets are at issue, the remedy may be determined by considering the trade secrets together. See, e.g., Certain Processes for the Manufacture of Skinless Sausage Casings and Resulting Product, Inv. No. 337-TA-148/169, USITC Pub. 1624, Comm’n Op. at 19 (Dec. 1984).

Based upon a balancing of a totality of the evidence presented, the Commission finds the length of the limited exclusion for the asserted trade secrets should be 10 years. The parties
dispute whether Sany would have ever developed the SCC8500 crane without misappropriating Manitowoc's trade secrets. Here, each of the trade secrets at issue is related to the development and marketing of the SCC8500 crane. Specifically, Sany utilized Trade Secret Nos. 1 and 6 to determine if there was need for a new crane and then utilized Trade Secret Nos. 3 and 4 to design a new the crane for wind applications. Trade Secret No. 15 was used to manufacture the new crane design misappropriated by Trade Secret Nos. 3 and 4. Finally, Manitowoc used Trade Secret No. 14 to price the newly developed crane.

The evidence shows that with respect to the manufacturing trade secrets in Trade Secret No. 15, the boom manufacturing would have taken Sany approximately one year to develop. Manitowoc's welding processes were developed over 50 years, and there is testimony in the record that Sany's welding processes were 25 years behind Manitowoc's processes. CX-0454C at Q/A 357-60, 377; Weyers Tr. at 59; Lanning Tr. at 327. Likewise, Manitowoc's Charpy requirements trade secret was developed over many years. CX-0456C, Q/A 66. In contrast, Trade Secret No. 3 became public approximately 18 months after Sany hired Mr. Lanning. [[]. Manitowoc Post-Hearing Br. at 258. Furthermore, Manitowoc asserts that it is unlikely that Sany would have determined the pricing information of Trade Secret No. 14, but provides no evidence in support. Balancing the 25 years of baseline knowledge Manitowoc had in its manufacturing processing with the shorter lead times provided to Sany through misappropriation of Trade Secret Nos. 1, 3, 4, and 6, the Commission determines the

17 Manitowoc and OUII both acknowledge that when there are multiple trade secrets at issue, they are not considered independently. Comp. Comm. Resp. Br. at 66; OUII Comm. Br. at 55.
appropriate duration of the exclusion order with respect to the asserted trade secrets is 10 years.\textsuperscript{18, 19}

\textsuperscript{18} Commissioner Schmidtlein finds that the duration of the limited exclusion order for the asserted trade secrets should be 25 years.

The Federal Circuit has explained that “the duration of relief in a case of misappropriation of trade secrets should be the period of time it would have taken respondent independently to develop the technology using lawful means.” \textit{Viscofan}, 787 F.2d at 550. In this case there is unrebutted evidence suggesting that it would have taken Sany 25 years to independently arrive at Manitowoc’s welding techniques. Specifically, the evidence shows that Jim Hoffman, a Manitowoc employee with welding expertise, told Mr. Lanning during a Sany plant tour that the welding of crawler cranes at Sany was about where Manitowoc was when it began welding high strength steels more than 25 years ago. CX-166 at 1143855; Lanning Tr. at 324. Mr. Hoffman’s assessment is reflected in an internal Sany email between Mr. Lanning and his supervisor and is not disputed by Sany. \textit{Id}. The assessment occurred around the time Manitowoc’s methods for processing large weldments were misappropriated by Sany. \textit{See} ID at 194-196; CX-166 at 1143855. The evidence also shows that one of Manitowoc’s core competencies lies in making large weldments and it took Manitowoc over 50 years to develop its welding techniques. ID at 190; Weyers Tr. at 59: 7-14; CX-0454C (Weyers WS) at A:376-377. By contrast, there is no evidence in the record indicating it would have taken Sany only 10 years to independently arrive at Manitowoc’s welding techniques. Thus, based on the undisputed record, Commissioner Schmidtlein finds that the length of the remedy for the asserted trade secrets should be 25 years.

The Commission’s opinion in \textit{Sausage Casings} does not compel a different result, nor does it stand for the proposition that when multiple trade secrets are at issue the remedy must be determined by considering the trade secrets together. That case involved trade secrets covering individual steps of a process for manufacturing sausage casings. There, the Commission rejected Respondent Viscofan’s position of a relatively short remedy length based on the time it would have required Viscofan to discover each individual trade secret. \textit{See} Comm’n Op. at 19. Instead, the Commission determined to consider the trade secrets collectively as part of the complete manufacturing process. \textit{Id}. at 19-21. To do otherwise in that case, the Commission explained, “ignores the interrelationships between and among the trade secrets and technology involved” and would have led to an inequitable result by having too short of a remedy. \textit{See} id. at 19, 21. The Commission found Complainant Union Carbide’s position “most persuasive” and granted a 10-year remedy. \textit{Id}. at 20-21.

Here, the trade secrets at issue are not individual steps of a process and do not appear to be as interrelated as in \textit{Sausage Casings}. Commission Schmidtlein is not persuaded that Manitowoc should be provided a 10-year remedy, instead of a 25-year remedy, simply because it suffered the misappropriation of other trade secrets with shorter development times. In her view, doing so deprives Manitowoc of the remedy it would otherwise deserve. Accordingly, based on the facts of this case she finds that the length of the remedy for the asserted trade secrets should be the trade secret with the longest development time, which the evidence shows is 25 years for Manitowoc’s welding techniques. In the alternative, the trade secrets could be assessed individually, on a trade-secret-by-trade-secret basis, for purposes of determining the duration of
2. Cease and Desist Order

The Commission may issue cease and desist orders to respondents found to have violated section 337 in addition to, or instead of, an exclusion order. See 19 U.S.C. § 1337(f)(1). Under Commission precedent, cease and desist orders are generally warranted with respect to respondents that maintain commercially significant inventories in the United States of the product found in violation of section 337 that could be sold to undercut the remedy provided by an exclusion order. See e.g. Certain Laser Bar Code Scanners and Scan Engines, Components Thereof and Products Containing Same, Inv. No. 337-TA-551, Comm'n Op. at 22-23 (June 14, 2007). Complainants bear the burden of proving that respondents have commercially significant inventories of infringing products in the United States. Certain Sleep-Disordered Breathing Treatment Systems and Components Thereof, 337-TA-890, Comm'n Op. at 49 (Jan. 16, 2014).

As discussed above, Sany has imported one crane into the United States; it has never imported the original UltraLift package which is a required component of the infringing article with respect to claims 23-26 of the '928 patent. Accordingly, the Commission finds there is no the remedy. See Certain Apparatus for the Continuous Production of Copper Rod, Inv. No. 337-TA-52, Comm'n Op., at 67 (Nov. 1979). This approach would have the benefit of achieving the goal of ensuring that Manitowoc obtains appropriate relief for trade secrets with longer developments times while also ensuring that any relief that is provided is not overly long in duration for trade secrets that may have shorter development times.

Commissioner Kieff joins the majority with respect to the outcome regarding the length of time for the general reasons relating to the balance of the evidence outlined in the accompanying text in the body of the opinion. Without suggesting they are adopted by others, he writes separately here to just make clear that he does not adopt either of the seeming rule of thumb approaches that appear to be suggested by either the majority or Commissioner Schmidtlein: what might be called a “Sausage Casings considered together” rule of thumb, which appears to be important to the majority's framework, or a “longest development time” rule of thumb, which appears to be important to Commissioner Schmidtlein's framework.
commercially significant inventory in the United States for the SCC8500 crane with the original UltraLift package and declines to issue a cease and desist order for the patent-based section 337 violation.

With respect to the trade secret violation, the Commission finds the one crane imported into the United States is a commercial significant inventory in light of the products at issue. The market for the SCC8500 cranes is small, and, therefore, even a single crane is a commercially significant inventory. Accordingly, the Commission issues a cease and desist order against Sany America with respect to the asserted trade secrets for a period of 10 years.20

B. Bonding

During the 60-day period of Presidential review, imported articles otherwise subject to remedial orders are entitled to conditional entry under bond. 19 U.S.C. § 1337(j)(3). The amount of the bond is specified by the Commission and must be an amount sufficient to protect the complainant from any injury. Id.; 19 C.F.R. § 210.50(a)(3). The Commission frequently sets the bond by attempting to eliminate the difference in sales prices between the protected domestic product and the product found in violation based upon a reasonable royalty. Certain Microsphere Adhesives, Process For Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, Comm'n Op. at 24, USITC Pub. No. 2949 (Jan. 1996). Where the available pricing information is inadequate, however, the Commission has set the bond at 100 percent of the entered value of the accused product. See, e.g., Certain Voltage Regulators, Components Thereof and Products Containing Same, Inv. No. 337-TA-564, Comm'n Op. at 79-80, USITC Pub. 4261 (Oct. 2011). However, the complainant

---

20 For the reasons explained above in footnote 18, Commissioner Schmidtlein finds that the duration of the cease and desist order should be 25 years.

The Commission finds that the amount of bond should not be set based on a price differential in this investigation because the Manitowoc crane and the SCC8500 represent two different classes of cranes. See ID at 203-204. Notably, the Manitowoc crane sells for approximately $27 million while the SCC8500 crane sold for $2.77 million. CX-0017C; Kennedy Tr. at 443; CX-0279C. Similarly, the lifting capacity of the Manitowoc crane is 2300 tons while the lifting capacity of the SCC8500 crane is 500 tons. ID at 203-204. In addition, no reasonable royalty is available because Manitowoc has not licensed the asserted patents. Accordingly, the Commission sets the bond at 100 percent of the entered value during the period of Presidential Review.

C. Public Interest

Section 337(d) and (f) of the Tariff Act of 1930, as amended, directs the Commission to consider certain public interest factors before issuing a remedy. When determining whether to issue remedial orders upon finding a violation of section 337, the Commission weighs the effect of the orders on four public interest factors: (1) the public health and welfare, (2) competitive conditions in the United States economy, (3) the production of like or directly competitive articles in the United States, and (4) United States consumers. 19 U.S.C. § 1337(d), (f). The Commission considers these public interest factors in determining the appropriate remedy in each investigation.

The evidence in the record does not indicate that the remedial orders raise any public health and welfare concerns. Furthermore, although the market for crawler cranes is small, there
are other competing products in the market. For example, when Manitowoc conducted its market research it determined its competitor Liebheer was leading the market as the supplier of cranes for wind applications. JX-0027C at MANITOWOC 0807372-73. Moreover, Manitowoc produces its cranes in the United States, while Sany produces cranes outside the United States such that there is not likely to be an adverse impact on the production of like or directly competitive articles in the United States. Finally, we find no evidence that the remedial orders would have an adverse impact on U.S. consumers. Therefore, the Commission finds, based on the record evidence, that the public interest factors enumerated in sections 337(d) and (f) do not preclude issuance of the remedial orders.

VII. CONCLUSION

For the forgoing reasons, the Commission issues a limited exclusion order based on a finding of violation of section 337 by reason of infringement of claims 23-26 of the '928 patent and misappropriation of Trade Secret Nos. 1, 3, 4, 6, 14, and 15. The Commission also issues a cease and desist order against Sany America for violation of section 337 by reason of misappropriation of Trade Secret Nos. 1, 3, 4, 6, 14, and 15.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: May 6, 2015
UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C. 20436

In the Matter of
CERTAIN CRAWLER CRANES AND COMPONENTS THEREOF

Investigation No. 337-TA-887

LIMITED EXCLUSION ORDER

The United States International Trade Commission ("Commission") has determined that there is a violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), in the unlawful importation, sale for importation, or sale within the United States after importation by Respondents Sany Heavy Industry Co., Ltd. and Sany America, Inc. (collectively "Respondents") of certain crawler cranes and components thereof covered by one or more of claims 23-26 of U.S. Patent No. 7,546,928 ("the ’928 patent") and by reason of misappropriation of Manitowoc’s Trade Secret Nos. 1, 3, 4, 6, 14, and 15 asserted in this investigation (the "Manitowoc Trade Secrets").

Having reviewed the record in this investigation, including the written submissions of the parties, the Commission has made its determination on the issues of remedy, public interest, and bonding. The Commission has determined that the appropriate form of relief is a limited exclusion order prohibiting the unlicensed entry of crawler cranes and components thereof manufactured abroad by or on behalf of the Respondents or any of their affiliate companies, parents, subsidiaries, licensees, or other related business entities, or their successors or assigns using any of the Manitowoc Trade Secrets and/or that are covered by one or more of claims 23-26 of the ’928 patent.
The Commission has also determined that the public interest factors enumerated in 19 U.S.C. § 1337(d) do not preclude the issuance of the limited exclusion order, and that the bond during the Presidential review period shall be in the amount of one hundred percent (100%) of the entered value of the crawler cranes and components thereof that are subject to this Order.

Accordingly, the Commission hereby ORDERS that:

1. Crawler cranes and components thereof that are manufactured abroad by or on behalf of, or imported by or on behalf of, Respondents or any of their affiliated companies, parents, subsidiaries, or other related business entities, or their successors or assigns, using any of the Manitowoc Trade Secrets, are excluded from entry for consumption into the United States, entry for consumption from a foreign trade zone, or withdrawal from a warehouse for consumption, for a period of ten (10) years from the effective date of this Order, except under license of the owner of the Manitowoc Trade Secrets or as provided by law.

2. Crawler cranes and components thereof covered by one or more of claims 23-26 of the '928 patent that are manufactured abroad by or on behalf of, or imported by or on behalf of, Respondents or any of their affiliated companies, parents, subsidiaries, or other related business entities, or their successors or assigns, are excluded from entry for consumption into the United States, entry for consumption from a foreign trade zone, or withdrawal from a warehouse for consumption, for the remaining term of the patent, except under license of the patent owner or as provided by law.

3. Notwithstanding paragraphs 1 and 2 of this Order, the aforesaid cranes and components thereof are entitled to entry into the United States for consumption,
entry for consumption from a foreign trade zone, or withdrawal from a warehouse
for consumption, under bond in the amount of one hundred percent (100%) of the
entered value of such articles pursuant to subsection (j) of Section 337 of the
Tariff Act of 1930, as amended (19 U.S.C. § 1337(j)), and the Presidential
Memorandum for the United States Trade Representative of July 21, 2005 (70
Fed. Reg. 43,251), from the day after this Order is received by the United States
Trade Representative, and until such time as the United States Trade
Representative notifies the Commission that this action is approved or disapproved
but, in any event, not later than sixty days after the receipt of this Order.

4. At the discretion of U.S. Customs and Border Protection ("CBP") and pursuant to
the procedures it establishes, persons seeking to import crawler cranes and
components thereof that are potentially subject to this Order may be required to
certify that they are familiar with the terms of this Order, that they have made
appropriate inquiry, and thereupon state that, to the best of their knowledge and
belief, the products being imported are not excluded from entry under one or more
of paragraphs 1-2 of this Order. At its discretion, CBP may require persons who
have provided the certification described in this paragraph to furnish such records
or analyses as are necessary to substantiate this certification.

5. In accordance with 19 U.S.C. § 1337(l), the provisions of this Order shall not
apply to crawler cranes and components thereof that are imported by or for the use
of the United States, or imported for and to be used for, the United States with the
authorization or consent of the Government.
6. The Commission may modify this Order in accordance with the procedures described in Rule 210.76 of the Commission’s Rules of Practice and Procedure (19 C.F.R. § 210.76).

7. The Secretary shall serve copies of this Order upon each party of record in this.

8. Notice of this Order shall be published in the Federal Register.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: April 16, 2015
PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached COMMISSION ORDER has been served by hand upon the Commission Investigative Attorney, Andrew Beverina, Esq., and the following parties as indicated, on April 16, 2015.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Manitowoc Cranes LLC:

Mark L. Whitaker, Esq.
BAKER BOTTS LLP
1299 Pennsylvania Avenue, NW
Washington, DC 20004-2400

On Behalf of Respondents Sany Heavy Industry Co., Ltd. and
Sany America, Inc.:

Bryan G. Harrison, Esq.
MORRIS, MANNING & MARTIN LLP
1600 Atlanta Financial Center
3343 Peachtree Road, N.E.
Atlanta, GA 30326
Exhibit 7
Confidential – Not Susceptible to Public Summary
Exhibit 9
MANITOWOC 4600 SERIES-3 RINGER ENGINEERED INTO POWER PLANT PROJECT

...FROM THE START

RINGR is expected to be a key factor in reducing construction time. Its high capacity and long reach enables contractor to fabricate and install large sub-assemblies of containment plate work on site. RINGER has precision-spotted seven 24' x 124' steel containment liner plate rings, weighing up to 141 tons each with rigging.

BALDWIN ASSOCIATES, Clinton, Illinois, is the general contractor for construction by ILLINOIS POWER COMPANY of a new 2-unit 1,900 megawatt nuclear power plant located near Clinton, Illinois. BALDWIN ASSOCIATES, a joint venture sponsored by POWER SYSTEMS, INC., Schaumburg, Illinois, includes partners FRUIN-COLNON CORPORATION, St. Louis, Missouri; KELSO-BURNETT COMPANY, Chicago, Illinois; and MccARTIN-McaULIFFE MECHANICAL CONTRACTORS, INC., East Chicago, Indiana.

Designated the Clinton Power Station, the first 950 megawatt unit is scheduled for operation in 1981. Two rural electric cooperative groups, WIPCO and SOYLAND, will share in ownership of the station.

For this project, ILLINOIS POWER needed a high capacity crane that could work without guy wires and place containment rings ranging in weight from 95 tons to 141 tons. In addition, for each sub-assembled ring's massive 24' x 124' size, a boom hinge point 90' above ground level was required to provide the necessary clearance between boom and load.

Main Illustration: A Manitowoc 4600 Series-3 RINGER equipped with 220' boom, 80' mast and 840,000-pound auxiliary counterweight, swings a 24' x 124' containment ring weighing 140 tons, with rigging, over previously erected sections.

Right: The RINGER's long reach enabled BALDWIN to make lifts in work areas of containment liner fabrication yard without interrupting work in other areas in close proximity to the containment.

Therefore, based on BALDWIN ASSOCIATES’ recommendation, ILLINOIS POWER purchased a Manitowoc 4600 Series-3 RINGER® and mounted it on a 90' high fixed gantry. The rings were then individually lifted from their fabrication site, swung 180°, and precision-spotted within a 1/4" tolerance. All ring lifts by the RINGER were made at a 185' radius.

Following ring placement, the RINGER will be utilized to set various internal components. Among its heaviest lifts will be a 125-ton polar crane rail, a 94-ton biological shield, a 65-ton drywell head, and eight 40-ton drywell wall sections.

In addition to the 4600 RINGER, two Manitowoc 4100W Towercranes also work at the Clinton site. Each crane, equipped with 183' tower and 170' boom, works as a general service crane spotting forms, setting steel, and placing concrete components in the powerblock area.

Plan a high capacity Manitowoc RINGER into your next power plant project from the start for job-proven performance you can count on. Contact Dept. 7731: MANITOWOC ENGINEERING CO., (A division of The Manitowoc Company, Inc.), Manitowoc, WI 54220.
Exhibit 10

Confidential – Not Susceptible to Public Summary
Exhibit 11
Foreign Producer Contact Information

JAPAN:

Kobelco Construction Machinery Co., Ltd. (Kobelco)
Address: 5-15, Kitashinagawa 5-chome, Shinagawa-ku, Tokyo, 141-8626, Japan
Phone: +81-3-5789-2121

Tadano Ltd. (Tadano)
Address: 4-12, Kamezawa 2-chome, Sumida-Ku, Tokyo 130-0014, Japan
Phone: +81-3-3621-7750

Sumitomo Heavy Industries Construction Cranes Co., Ltd. (Sumitomo)
Address: 9-3 Higashi Ueno 6-chome, Taito-ku, Tokyo 110-0015 Japan
Phone: +81-3-3845-1379

Kato Works Co., Ltd.
Address: 9-37, Higashi-ohi 1-chome, Shinagawa-ku, Tokyo 140-0011
Telephone: +81 3 3458-1115
Fax: +81 3 3458-1151

GERMANY:

Liebherr-Werk Ehingen GmbH
Address: Dr.-Hans-Liebherr-Straße 1, 89584 Ehingen/Donau, Germany
Phone: +49 7391 502-0
Email: info.lwe@liebherr.com

Liebherr-Werk Biberach GmbH
Address: Memminger Straße 120, 88400 Biberach an der Riß, Germany
Phone: +49 7351 41-0
Email: info.lbc@liebherr.com

Liebherr-Components Biberach GmbH
Main office
Address: Hans-Liebherr-Straße 45, 88400 Biberach an der Riß, Germany
Phone: +49 7351 41 0
Email: info.cob@liebherr.com

Tadano Faun GmbH
Address: Faunberg 2, 91207 Lauf an der Pegnitz, Germany
Phone: +49 9123 185 0
Demag Cranes & Components GmbH
Address: Postfach 67, 58286 Wetter, Germany
Phone: +49 (0) 2335 92-0

Sennebogen Maschinenfabrik GmbH
Address: Hebbelstraße 30, 94315 Straubing, Germany
Phone: +49 9421 5400

AUSTRIA:

Liebherr-Werk Nenzing GmbH
Address: Dr. Hans Liebherr Straße 1, 6710 Nenzing, Austria
Phone: +43 50809 41-0
Email: info.lwn@liebherr.com

CHINA:

Xuzhou Construction Machinery Group Co., Ltd. (XCMG)
Address: 26 Tuolanshan Road Jinshanqiao Development Zone Xuzhou, Jiangsu Province
Xuzhou, 221004 China
Phone: 86-516-8756-5621

Zoomlion Heavy Industry Science and Technology Co., Ltd. (Zoomlion)
Address: Zoomlion Science Park, Yinpen South Road 361, Changsha City, Hunan Province, China
Phone: 0086(731)-88997340 / 0086(731)-88928271

LiuGong Machinery Co., Ltd. (LiuGong)
Address: Guangxi LiuGong Machinery Co., Ltd., No.1 Liutai Road, Liuzhou, Guangxi, 545007, China
Phone: +86 772 388 6125
Email: overseas@liugong.com

Sany Heavy Industry Co., Ltd. (Sany)
Address: Sany Industrial City Sanyi Rd Econ Tech Dvpt Zone Changsha, 410100 China
Phone: 86-731-8688-3842

Fushun Yongmao Construction Machinery Co., Ltd. (Yongmao)
Address: YONGMAO Industrial Park, No.2, 2 Road, Qianling, Fushun, Liaoning, P.R.China. 113126
Phone: 86 024-57648899 57649988
Email: sun@yongmao.com.cn
Sichuan Changjiang Engineering Crane Co. Ltd. (Changjiang)
Address: QianCao Industrial Park, Jiangyang District, Luzhou City, Sichuan, 646006 China
Phone: 86-830-3581-773

Tai’an Dongyue Heavy Industry Co., Ltd.
Address: No. 379, Longtan Road, High-tech Zone, Tai’an City, Shandong Province
Phone: 0538-8932099
Email: dongyue@chinadongyue.com

Liaoning Fuwa Heavy Industry Machinery Co. Ltd.
Address: 2 Shuangyang Road Shuncheng, District Fushun, 113126 China
Phone: 86-24-5764-2558
Exhibit 12
About **Kobelco Construction Machinery U.S.A. Inc. (KCMU)**

– Crane Division –

Kobelco’s Crane division was officially created in the fall of 2003. In October of 2003, Kobelco moved into a new parts, service, & sales facility located in Houston, Texas.

Kobelco Crane division focuses entirely on the crawler crane market, currently offering 7 models ranging from 85 tons – 600 tons. We are a wholly owned subsidiary of Kobelco Construction Machinery Co., Ltd., Tokyo, Japan, and a division of Kobe Steel. KCMU is the western hemisphere distribution point for new Kobelco Lattice Boom Crawler Crane products. In addition to the new crane products, KCMU also provides parts, service support and administers warranty policy for its dealers and customers.

KCMU’s list of products starting with the CK850G-2 (85 ton), CK1100G-2 (110 ton), CK1200G-2 (120 ton), CK1600G-2 (160 ton), and CK2750G-2 (275 ton), is the result of the best ideas and technologies in the world. Our machines are engineered for efficiency, comfort, durability and productivity to provide the lowest cost of ownership in the industry!
A New Global Strategy for Supplying Machines Throughout the World

Kobelco Cranes unveils the new crawler cranes "G-series" with lifting capacities ranging from 85 to 275 U.S. tons for North America and 60 to 250 metric tons for Europe. A complete re-design, upgraded and improved.

KOBELCO is one of the first Japanese construction machinery manufacturers to begin developing crawler cranes for the export market. Today, we have a full line-up of cranes designed specifically for customers abroad, and KOBELCO cranes are on the job throughout North America and many other parts around the world.
Continuing our operations as an independent company, we have renewed our commitment to even more energetic and accelerated international growth, with an expanded sales network centered on the U.S and Europe, stronger sales and service capabilities in the quickly growing Chinese market, and aggressive development of new demand in the Middle East and Russia.

In this way, KOBELCO will continue to strengthen its presence as an international brand that offers ever higher levels of technological excellence and operational stability, and will continue to earn the trust and loyalty of customers both in Japan and abroad.
KOBELECO CONSTRUCTION MACHINERY USA INC
10845 Train Court
Houston, TX 77041
U.S.A.
Tel: +1-713-856-5755
Fax: +1-713-856-9072

KOBELECO CONSTRUCTION MACHINERY CO., LTD.
17-1, Higashigotanda 2-chome
Shinagawa-ku, Tokyo,
141-8626
Japan
Tel: +81-3-5789-2121
Fax: +81-3-5789-3372

KOBELECO CRANES EUROPE LTD. (UK)
Unit 9, The Felbridge Centre
East Grinstead, West Sussex RH19 1XP
U.K.
Tel: +44-1342-301122
Fax: +44-1342-326987

KOBELECO CONSTRUCTION MACHINERY EUROPE B.V. (Netherlands)
(The Netherlands branch office)
Argonweg 135, 1362 AD,
Almere,
The Netherlands
Tel: +31-36-549-5510
Fax: +31-36-549-5520

KOBELECO CONSTRUCTION MACHINERY MIDDLE EAST and AFRICA FZCO (U.A.E)
P.O. Box 17442
Jebel Ali Free Zone, Dubai, U.A.E.
Tel: +971-4-881-3291
Fax: +971-4-881-3299

KOBELECO CRANES SOUTH EAST ASIA PTE, LTD.
60, Pandan Road
Jurong, Singapore 609294
Tel: +65-6268-1308
Fax: +65-6268-2490
LIFTING YOUR OPERATING PROFIT

Kobelco’s Crane division is a global leader in the manufacturing of hydraulic lattice-boom crawler cranes, servicing the North and South American markets.
**CK800G-2**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max. Lift Capacity:</strong></td>
<td>80 US Tons</td>
</tr>
<tr>
<td><strong>Max. Boom Length:</strong></td>
<td>200 ft</td>
</tr>
<tr>
<td><strong>Max. Boom + Jib Length:</strong></td>
<td>180 ft + 60 ft</td>
</tr>
</tbody>
</table>

The Kobelco CK800G-2 Crawler Crane is designed from the ground up for reliable operation, convenient maintenance and easy transport. The CK800G-2 features a new engine that complies with the latest EPA Interim Tier IV standards. The cranes have also been designed with new energy saving assist systems known as the “G-modes”, which can achieve up to a 30% savings in fuel consumption. The “G-modes” include the auto idle stop system, energy saving winch control system, and the engine RPM limitation system. Other re-design features of the new G series includes: compact structure allowing for greatly improved transportability, larger cab design, LMI touch screen, counterweight detection device, improved counterweight self-installation mechanism, and newly improved (short) control levers. Kobelco is renowned for smart engineering and an unwavering focus on creating the best value package for lifting solutions.
## CK850G-2 Hydraulic Crawler Crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Lift Capacity:</td>
<td>85 US Tons</td>
</tr>
<tr>
<td>Max. Boom Length:</td>
<td>200 ft.</td>
</tr>
<tr>
<td>Max. Boom + Jib Length:</td>
<td>180 ft + 60 ft</td>
</tr>
</tbody>
</table>

The Kobelco CK850G-2 Crawler Crane is designed from the ground up for reliable operation, convenient maintenance and easy transport. The CK850G-2 features a new engine that complies with the latest EPA Interim Tier IV standards. The cranes have also been designed with new energy saving assist systems known as the “G-modes”, which can achieve up to a 30% savings in fuel consumption. The “G-modes” include the auto idle stop system, energy saving winch control system, and the engine RPM limitation system. Other re-design features of the new G series includes: compact structure allowing for greatly improved transportability, larger cab design, LMI touch screen, counterweight detection device, improved counterweight self installation mechanism, and newly improved (short) control levers. Kobelco is renowned for smart engineering and an unwavering focus on creating the best value package for lifting solutions.
CK1100G-2 Crawler Crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Lift Capacity:</td>
<td>110 US Tons</td>
</tr>
<tr>
<td>Max. Boom Length:</td>
<td>200 ft</td>
</tr>
<tr>
<td>Max. Boom + Jib Length:</td>
<td>190 ft + 60 ft</td>
</tr>
</tbody>
</table>

The Kobelco CK1100G-2 Crawler Crane Crane is designed from the ground up for reliable operation, convenient maintenance and easy transport. The CK1100G-2 features a new engine that complies with EPA Tier IV Final standards. The cranes have also been designed with energy saving assist systems known as the “G-modes”, which can achieve up to a 30% savings in fuel consumption. The “G-modes” include the auto idle stop system, energy saving winch control system, and the engine RPM limitation system. Other features of the new G-2 series includes: compact structure allowing for greatly improved transportability, larger cab design, LMI touch screen, counterweight detection device, improved counterweight self-installation mechanism, and newly improved (short) control levers. Kobelco is renowned for smart engineering and an unwavering focus on creating the best value package for lifting solutions.
**SPECIFICATIONS & LIFTING CAPACITIES**

**DEALER LOCATOR**

<table>
<thead>
<tr>
<th>CAB &amp; CONTROLS</th>
<th>ENGINE</th>
<th>UPPER MACHINERY</th>
<th>LOWER MACHINERY</th>
<th>HYDRAULICS</th>
<th>MAINTENANCE</th>
<th>G-MODE</th>
<th>LMI MONITOR</th>
</tr>
</thead>
</table>

**The G-series** cab gives the operator better visibility, mobility, and a relaxed environment to enhance efficiency. The cab design is on an isolated cab base frame which reduces vibration during crane operation.

**Increased Cab Size**
The increased space from 77.34' to 109.5', gives the operator more room in which to perform crane operations, also adding more leg room and a wider cab door for ease of entry.
CK1200G-2 Crawler Crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Lift Capacity</td>
<td>120 US Tons</td>
</tr>
<tr>
<td>Max. Boom Length</td>
<td>230 ft</td>
</tr>
<tr>
<td>Max. Boom + Jib Length</td>
<td>200 ft + 70 ft</td>
</tr>
</tbody>
</table>

The Kobelco CK1200G-2 Crawler Crane is designed from the ground up for reliable operation, convenient maintenance and easy transport. The CK1200G-2 features a new engine that complies with the latest EPA Interim Tier IV standards. The cranes have also been designed with new energy saving assist systems known as the “G-modes”, which can achieve up to a 30% savings in fuel consumption. The “G-modes” include the auto idle stop system, energy saving winch control system, and the engine RPM limitation system. Other re-design features of the new G series includes: compact structure allowing for greatly improved transportability, larger cab design, LMI touch screen, counterweight detection device, improved counterweight self installation mechanism, and newly improved (short) control levers. Kobelco is renowned for smart engineering and an unwavering focus on creating the best value package for lifting solutions.
The G-series cab has been completely re-designed to give the operator's better visibility, mobility, and a relaxed environment to enhance efficiency. The new cab design is on an isolated cab base frame which reduces vibration during crane operation.
CK1600G-2 Crawler Crane

Max. Lift Capacity: 160 US Tons

Max. Boom Length: 250 ft

Max. Boom + Jib Length: 200 ft + 100 ft

The Kobelco CK1600G-2 Crawler Crane is designed from the ground up for reliable operation, convenient maintenance and easy transport. The CK1600G-2 features a new engine that complies with the EPA Tier IV Final standards. The cranes have also been designed with new energy saving assist systems known as the “G-modes”, which can achieve up to a 30% savings in fuel consumption. The “G-modes” include the auto idle stop system, energy saving winch control system, and the engine RPM limitation system. Other features of the new G-2 series includes: compact structure allowing for greatly improved transportability, larger cab design, LMI touch screen, counterweight detection device, improved counterweight self-installation mechanism, and newly improved (short) control levers. Kobelco is renowned for smart engineering and an unwavering focus on creating the best value package for lifting solutions.
### SPECIFICATIONS & LIFTING CAPACITIES

![Crane Image](image)

### DEALER LOCATOR

### CAB & CONTROLS | ENGINE | UPPER MACHINERY | LOWER MACHINERY | HYDRAULICS | MAINTENANCE | G-MODE | LMI MONITOR
---|---|---|---|---|---|---|---

**The G-series** cab gives the operator better visibility, mobility, and a relaxed environment to enhance efficiency. The cab design is on an isolated cab base frame which reduces vibration during crane operation.

**Increased Cab Size**
The increased space from 77.34' to 109.5', gives the operator more room in which to perform crane operations, also adding more leg room and a wider cab door for ease of entry.
CK2750G-2 Crawler Crane

**Max. Lift Capacity:** 275 US Tons

**Max. Boom Length:** 300 ft

**Max. Boom + Jib Length:** 250 ft + 100 ft

The Kobelco CK2750G-2 Crawler Crane is designed from the ground up for reliable operation, convenient maintenance and easy transport. The CK2750G-2 features a new engine that complies with EPA Tier IV Final standards. The cranes have also been designed with new energy saving assist systems known as the “G-modes”, which can achieve up to a 30% savings in fuel consumption. The “G-modes” include the auto idle stop system, energy saving winch control system, and the engine RPM limitation system. Other features of the new G-2 series includes: compact structure allowing for greatly improved transportability, larger cab design, LMI touch screen, counterweight detection device, improved counterweight self-installation mechanism, and newly improved (short) control levers. Kobelco is renowned for smart engineering and an unwavering focus on creating the best value package for lifting solutions.
The **G-series** cab gives the operator better visibility, mobility, and a relaxed environment to enhance efficiency. The cab design is on an isolated cab base frame which reduces vibration during crane operation.

**Increased Cab Size**
The increased space from 77.34' to 109.5', gives the operator more room in which to perform crane operations, also adding more leg room and a wider cab door for ease of entry.
MEET OUR NEW BIG BROTHER
CK330G-2
Kobelco Construction Machinery USA has rolled out the first unit of the new CK3300G-2, a lattice-boom crawler crane that offers 330-ton capacity as a standard lift crane and can be equipped with fixed jib, heavy fixed jib, or luffing jib, as well as heavy-lift or super-heavy-lift attachments.

Jack Fendrick, vice president of the crane division of Kobelco Construction Machinery, USA, said that the CK3300G-2 offers exceptional versatility, excellent lifting capacity, a comfortable operator’s cabin, Kobelco’s typical built-in reliability, and easy transportation and assembly.

Both rugged and versatile, the CK3300G-2 is well suited to work in a full range of applications across a wide variety of industries from pile driving to steel erection, tilt-wall work, equipment placement, and heavy lifting.

Fendrick expects the CK3300G-2 to become North America’s new standard in the 300-ton class of lattice-boom crawler cranes. He said Kobelco did its research before designing the new machine, so it offers the features that customers want most and delivers capacities that compete with or are higher than those of its competitors.

**Long Reach, High Capacities**

The basic crane can lift 330 tons at an 18.1’ radius on 78’ of boom. Maximum boom length is 295’, and maximum capacity on the long boom is 187,300 lbs. at radii from 39.7’ to 55’.

The standard fixed jib can lift up to 58,600 lbs. at a 40.7’ radius. Its length ranges from 40’ to 100’. The maximum combination is 256’+100’.

The heavy fixed jib is made from the butt, top, and one 40’ insert of the luffing jib, for a total length of 98’. Its maximum capacity is 88,200 lbs. at a 72.2’ radius. The maximum combination is 236’+98’.

The luffing jib can lift up to 260,200 lbs. at a 44’ radius. The shortest combination of boom and luffing jib is 98’+78’. The longest combination on the standard crane is 197’+217’.

Kobelco’s Super Heavy Lift attachment can be used with the main boom or the luffing jib for excellent capacities on longer boom lengths and longer radii. Kobelco says that the CK3300G-2 equipped with the Super Heavy Lift attachment can compete with cranes in the 400- to 500-ton class.

**Cab and Controls**

The enclosed cab is the same one used on other Kobelco crawler cranes, so operators will feel comfortable and familiar with it. It is designed for operator comfort, easy operation, and excellent visibility. Extra-wide windows and up to 15.8° of cab tilt offer excellent visibility. The load-moment indicator features a 12” touch screen that is easy to use and delivers all the essential data an operator needs. The
pilot-pressure hydraulic controls are responsive and reliable.

Modular Transportation

All transportation modules are 10' or less in width, and the base machine's main shipping module weighs 116,200 lbs. with the mast on, or just 93,615 lbs. with the mast removed. If the mast needs to be removed to meet shipping weight requirements, its 26-part boom-hoist reeving stays intact to speed up crane assembly. The machine can self-assemble, if shipped with the mast in place, and four hydraulic translifter jacks for raising the main shipping module off the trailer come standard. To minimize the number of truckloads, jib sections can nest inside boom sections, and the counterweights are designed for shipment with boom sections to optimize trucking efficiency. The entire crane with 295' of boom and full counterweight can ship in 17 truckloads.

Compact Footprint

The CK3300G-2 delivers its high capacity and long reach in a relatively small footprint. The crawlers are 32'10" long and have an overall stance width of 26'7" (equipped with 52" standard crawler pads). The counterweight tailswing measures just 23'11". Clearance from the ground to the bottom of the counterweight is 5'2".

Made for Rough Ground

Designed to handle the rough or slippery ground often found on construction sites, the CK3300G-2 features wide...
crawlers and what Kobelco says is the highest ground clearance in its class. Average ground-bearing pressure with 78’ standard boom, 308,700-lb. upperworks counterweight, 88,200-lb. carbody counterweight, and 386-ton load block is about 19.9 psi. Each crawler has a drive motor at each end for smooth, steady, powerful traction. The tracks can counter-rotate to deliver maximum maneuverability. All track rollers are sealed and need no maintenance. Maximum gradeability is 20% (11.3°).

Fast, Powerful Performance
The two standard load-hoist drums are powered hydraulically, both offer 57,035-lb. single-line pull on the first layer, and 33,045 lbs. of rated pull on all layers. Each is grooved for 28 mm rope, offers up to 377 fpm line speed, and can spool up to 1,969’ of rope for storage. Free-fall drums are optional. The swing system uses two hydraulic motors driving pinions that mesh with an internal swing gear on the triple-row swing bearing. Because the bearing has an internal swing gear, it has a larger overall diameter for more stability. Maximum swing speed is 1.7 rpm.

New Engine
The CK3300G-2 features a new diesel engine from Scania. The six-cylinder DC13 084A complies with EPA Tier 4 Final emission regulations and delivers 450 hp at 2,100 rpm, or 1,663 lb.-ft. of torque at 1,300 rpm. The exhaust after-treatment system uses easy-to-maintain selective catalytic reduction (SCR) which simply requires filling the diesel exhaust fluid (DEF) tank periodically.

KCross
The Kobelco Remote Observation Satellite System, or KCross, is standard on all G-2 Series models. It lets the owner monitor the crane from his or her desktop.
Exhibit 13
Consolidated Financial Results (Comprehensive)
For Second Quarter of FY 2019

(April 1, 2019 through September 30, 2019)

In August 2019, Tadano Ltd. celebrated the 100th anniversary of its founding.

Notes:
1) Tadano Ltd. provides this comprehensive financial results report in order to supplement the previously released quantitative report with qualitative information concerning business results for the period under review. Unless otherwise stated, no amendments have been made to the quantitative information herein.

2) Forward-looking statements contained in this report are based on information available as of the date this report was prepared. A variety of factors may cause actual results to differ from projections.

◇ The acquisition of the Demag Mobile Cranes business (Hereafter “Demag”) completed on July 31, 2019. In this report, Demag is treated as follows:

- FY2019 First Half Consolidated Financial Statements: B/S of Demag is included.
- FY2019 Business Performance Forecast: P/L of Demag for 5 months from August to December 2019 is included.
- Trends in Global Demand for Mobile Cranes: Crawler Cranes are excluded.
- Market share: Demag products are excluded.
Net Sales by Product

### Net Sales by Product

<table>
<thead>
<tr>
<th>Product</th>
<th>FY 2018 First Half</th>
<th>FY 2019 First Half</th>
<th>Increase / Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Cranes</td>
<td>48,515</td>
<td>64,199</td>
<td>64.0% 16,683 32.3%</td>
</tr>
<tr>
<td>Truck Loader Cranes</td>
<td>9,605</td>
<td>11,265</td>
<td>11.2% 1,659 17.3%</td>
</tr>
<tr>
<td>Aerial Work Platforms</td>
<td>9,208</td>
<td>9,507</td>
<td>9.5% 299 3.3%</td>
</tr>
<tr>
<td>Other</td>
<td>14,943</td>
<td>15,332</td>
<td>15.3% 388 2.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>82,272</td>
<td>100,304</td>
<td>100% 18,031 21.9%</td>
</tr>
</tbody>
</table>

Outside Japan sales ratio: 46.0% → 46.0%

### Breakdown of Mobile Crane Sales Inside and Outside Japan

<table>
<thead>
<tr>
<th>Region</th>
<th>Inside Japan</th>
<th>Outside Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>17,915</td>
<td>24,984</td>
</tr>
<tr>
<td>Outside Japan</td>
<td>30,600</td>
<td>39,214</td>
</tr>
</tbody>
</table>

### Sales Trends by Market Outside Japan

Sales grew 21.9% compared to the same period of the previous fiscal year. Sales grew 40.5% in North America, 8.8% in Asia and 19.9% in Middle East, but fell 9.5% in Europe compared to the same period of the previous fiscal year.

Notes:
- Other markets comprise Oceania, Africa, and the CIS.
- The exchange rates indicated above are average rates over each period. (Since the fiscal year of subsidiaries outside Japan ends in December, full-year rates are averages for January–December; interim rates are averages for January–June.)
- Euro figures for FY 2001 and earlier have been converted from Deutsche Mark.
Trends and Forecast of Construction Investment in Japan

Government investment is expected to remain unchanged in FY2020. Private investment is expected to slightly decline in the residential sector and slightly increase in the non-residential sector.

Notes: All figures shown are nominal construction investment figures. Forecasts are from the Research Institute of Construction and Economy’s “Forecast of Construction Investment” (released on September 26, 2019)
**Trends in Demand for Mobile Cranes in Japan**

**Mobile Cranes**

**Market share in Japan: 53% → 53%**

Demand for hydraulic Mobile Cranes in Japan was 990 units (for FY2019 First Half, based on Tadano research), up 21% from the same period of the previous fiscal year.

⇒ Focusing on sales growth of large scale models in a climate of increasing demand.

This focus resulted in an increase in the percentage share of tonnage in Japan from 42% to 55%

Net sales in Japan were ¥24,984 million (139.5% of the same period of the previous fiscal year).

---

**[Rough Terrain Cranes]**

- Main models in the Japanese Mobile Cranes business account for 94% of demand in Japan (51% of North American demand)
- Cranes suited to urban use; essential to construction in urban areas. With compact bodies, these cranes perform well even in narrow areas (both front and rear axle steering)
- Able to operate the carrier and the crane from the same driver’s seat
- Japanese market: 8 models with 13 to 100 ton lifting capacity (produced by Tadano Ltd.)
  - Markets outside Japan: 11 models with 13 to 145 ton lifting capacity (produced by Tadano Ltd. and Tadano Escorts India Pvt. Ltd.)
- 16 models out of 19 have Hello-Net Telematics
- In Japan, these cranes travel on public roads; In North America, they are transported on trailers

---

**[All Terrain Cranes]**

- Large cranes for urban development, elevated driveways, and bridge construction in Japan, account for 6% of demand in Japan (88% of European demand)
- Outstanding long-distance mobility in addition to maneuverability (with versatile steering)
- Markets outside Japan: 13 models with 40 to 400 ton lifting capacity (produced by Tadano Faun GmbH in Germany)
- Japanese market: 7 models with 100 to 550 ton lifting capacity (produced by Tadano Faun GmbH in Germany and Tadano Ltd. in Japan)
- 14 models out of 20 have Hello-Net Telematics
- Demag brand: 15 models with 40 to 1,200 ton lifting capacity
- Disassembly required for transport on public roads in Japan. No disassembly required for transport in Europe

---

*Figures showing demand are rounded to the nearest ten units, while shares are rounded to the nearest whole share.
Mobile Cranes

[Truck Cranes]
- Cranes mounted on truck chassis for superior roadability;
- primarily for markets outside Japan, with demand in Japan accounting for a few units
- Outstanding long-distance mobility
- Japanese market: 3 models with 13 to 35 ton lifting capacity (produced by Tadano Ltd. in Japan)
- Markets outside Japan: 6 models with 30 to 75 ton lifting capacity (produced by Tadano Ltd. in Japan, Tadano Faun GmbH in Germany)
- 5 models out of 9 have Hello-Net Telematics.

[Crawler Cranes]
- Cranes mounted on undercarriage equipped with crawler tracks
- Outstanding mobility on rough terrain and soft foundations
- Transported on trailers from job site to job site

Lattice boom type
- Used for heavy construction (bridges, wind turbines, plants, etc.)
- Markets inside and outside Japan: 7 models with 400 to 3,200 ton lifting capacity on sale under the Demag brand (produced by Tadano Demag GmbH in Germany)

Telescopic boom type
- Used for utility work and construction, as well as for operations on rough terrain, on muddy terrain, and in tunnels.
- Markets outside Japan: 11 models with 27 to 120 ton lifting capacity (produced by Tadano Mantis Corporation in the United States)

Structure of the World Crane Industry
(Manufacturers of Hydraulic Cranes and Crawler Cranes)

Prepared by Tadano based on materials from the Japan Construction Equipment Manufacturers Association.
1. Crawler Cranes are excluded.
2. Mobile Cranes produced in Russia are excluded.
3. Starting from 2010 the graph includes Chinese construction cranes produced for export.

Mobile cranes produced in China for Chinese market are excluded. Mobile Cranes produced in Russia are excluded.

Demand trends in Chinese Market for Mobile Cranes produced in China are as follows:
2011: 35,000 units, 2012: 22,000 units, 2013: 17,000 units, 2014: 14,000 units, 2015: 9,000 units, 2016: 9,000 units, 2017: 20,000 units,
2018: 32,000 units.

Global demand for hydraulic Mobile Cranes rose from 3,950 units to 4,600 units
(Total demand 7,220 8,690 8,900 7,770 6,960 6,730 5,970 5,050 5,000 5,470 6,550 8,090 10,090 11,730 6,150 5,120 6,570 8,480 9,600 9,450 9,420 7,650 7,290 8,070 3,950 4,600)

Note: Colored lines indicate trends in annual demand as a percentage of the trough base year having the lowest demand in each market (assigned the value 1) (In North America and Europe the bottom year was 2010, and in Japan it was 2009.) Peak year Bottom year

1. TC 120 units, RC 170 units, AC 50 units
2. TC 50 units, RC 60 units, AC 800 units
3. TC 10 units, RC 930 units, AC 60 units

Trends in Global Demand for Mobile Cranes (Calendar-year Basis)

Demand in Europe

Demand in North America

Demand in Japan

Demand outside Japan

Demand in other markets

Demand in Middle East

Demand in Asia

Demand in Central and South America

TC
RC
AC

Mobile Cranes

Crane Category Demand Composition by Region (Calendar-year Basis)

Tadano’s share in the global market grew from 23% to 24%.

Global demand for hydraulic Mobile Cranes rose from 3,950 units to 4,600 units (January-June 2019, Tadano research), up 16% from the same period of the previous fiscal year.

1. Crawler Cranes demand is excluded. "TC" refers to Truck Cranes, "RC" to Rough Terrain Cranes, and "AC" to All Terrain Cranes.
2. Mobile cranes produced in China for Chinese market are excluded. Mobile Cranes produced in Russia are excluded.

* The above figures are Tadano estimates. Figures showing demand are rounded to the nearest ten units.
<Our mission in other regions>
Competing with Chinese manufactures

Overview of group companies in other regions

[Tadano Asia Pte. Ltd.]
Establishment: August 1996
Paid-in capital: 1 million SGD
Ownership: Tadano Ltd. 80%, Multico Infra-core Holdings Pte. Ltd. 20%
Location: Singapore
Line of business: Distribution and service of Mobile Cranes and other products
Representative and President: Kozo Hayashi
Number of employees: 17

[Tadano Oceania Pty Ltd]
Establishment: February 2010
Paid-in capital: 7.5 million AUD wholly-owned subsidiary of Tadano Ltd.
Location: Darra, Australia
Line of business: Distribution and service of Mobile Cranes and other products
Representative and President: Anthony Grosser
Number of employees: 52

[Tadano Escorts India Pvt. Ltd.]
Establishment: December 2018
Paid-in capital: 600 million INR Tadano Ltd. 51%, Escorts Ltd. 49%
Location: Faridabad, India
Line of business: Development, production, distribution, and service of Mobile Cranes
Representative and President: Satoshi Nakayama
Number of employees: 56

30 Companies Established or Acquired and
14 New Facilities Opened;
3 of these companies closed down
and 2 Companies as well as 2 Facilities were relocated
[Loader Cranes] Market share in Japan 49%→48%

Demand in Japan was 8,380 units (for First Half of FY2019, based on Tadano research), increased 10% from the same period of the previous fiscal year.

⇒The new legislation making safety devices mandatory and regulation restricting engine emissions of small trucks led to a rush of demand; net sales amounted ¥11,265 million (117.3% of the same period of the previous fiscal year).

- Mounted trucks, these small cranes allow operators to load, transport, and install cargo with a single unit.
- They are sold indirectly by truck dealers for use in logistics, landscaping, and construction industries.
- Numerous models are available for mounting on compact, mid-sized, and large trucks, with lifting capacities ranging from 0.49 to 15 tons.

- Regulators (In Japan) -
  • Primarily the Ministry of Health, Labour and Welfare (crane regulations)
- Major buyers and distinctive features -
  • Truck dealers
  • Sales tend to parallel truck demand.

[Business outside Japan]
- Tadano has focused its efforts on exports of Loader Cranes to strategic markets, exporting crane components for mounting on local trucks.
  Sales in First Half of FY2018: ¥800 million
  Sales in First Half of FY2019: ¥850 million
- Accelerating expansion outside Japan, including the opening of a manufacturing subsidiary in Thailand in April 2012.

Automatic moment limiter, a safety device, included as standard equipment

(Zoom-in) ZX360/300 series

SS-38F

Mounted trucks, these small cranes allow operators to load, transport, and install cargo with a single unit.

Numerous models are available for mounting on compact, mid-sized, and large trucks, with lifting capacities ranging from 0.49 to 15 tons.

- Major buyers and distinctive features -
  • Truck dealers
  • Sales tend to parallel truck demand.

[Loader Cranes] Market share in Japan 49%→48%

Demand in Japan was 8,380 units (for First Half of FY2019, based on Tadano research), increased 10% from the same period of the previous fiscal year.

- The new legislation making safety devices mandatory and regulation restricting engine emissions of small trucks led to a rush of demand; net sales amounted ¥11,265 million (117.3% of the same period of the previous fiscal year).

- Mounted trucks, these small cranes allow operators to load, transport, and install cargo with a single unit.
- They are sold indirectly by truck dealers for use in logistics, landscaping, and construction industries.
- Numerous models are available for mounting on compact, mid-sized, and large trucks, with lifting capacities ranging from 0.49 to 15 tons.

- Regulators (In Japan) -
  • Primarily the Ministry of Health, Labour and Welfare (crane regulations)
- Major buyers and distinctive features -
  • Truck dealers
  • Sales tend to parallel truck demand.

[Business outside Japan]
- Tadano has focused its efforts on exports of Loader Cranes to strategic markets, exporting crane components for mounting on local trucks.
  Sales in First Half of FY2018: ¥800 million
  Sales in First Half of FY2019: ¥850 million
- Accelerating expansion outside Japan, including the opening of a manufacturing subsidiary in Thailand in April 2012.

Automatic moment limiter, a safety device, included as standard equipment

(Zoom-in) ZX360/300 series

SS-38F

Mounted trucks, these small cranes allow operators to load, transport, and install cargo with a single unit.

Numerous models are available for mounting on compact, mid-sized, and large trucks, with lifting capacities ranging from 0.49 to 15 tons.

- Major buyers and distinctive features -
  • Truck dealers
  • Sales tend to parallel truck demand.
TABLE 55

<table>
<thead>
<tr>
<th>FY 2018</th>
<th>FY 2019 forecast</th>
<th>Tadano (Existing business)</th>
<th>Demag</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>Percentage</td>
<td>Amount</td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>Net sales</td>
<td>188,451 100.0%</td>
<td>228,000 100.0%</td>
<td>200,700 100.0%</td>
<td>27,300 100.0%</td>
</tr>
<tr>
<td>Operating income</td>
<td>15,835 8.4%</td>
<td>10,000 4.4%</td>
<td>14,500 7.2%</td>
<td>-4,500 -16.5%</td>
</tr>
<tr>
<td>Ordinary income</td>
<td>15,604 8.3%</td>
<td>10,000 4.4%</td>
<td>15,000 8.3%</td>
<td>-5,000 -33.3%</td>
</tr>
<tr>
<td>Net income attributable to owners of the parent</td>
<td>11,462 6.1%</td>
<td>5,000 2.2%</td>
<td>10,000 5.5%</td>
<td>-56.4%</td>
</tr>
</tbody>
</table>

FY 2019 business performance forecast was revised on October 30.

Mid-year and year-end dividends for FY19 include ¥1 memorial dividend.

Capital investment: ¥14,458 million
Depreciation: ¥2,984 million
Exchange rate (USD): ¥110.43
Exchange rate (EUR): ¥130.42

Figures for capital investment include leased assets.

The interim exchange rate of EUR was revised on October 30.

[ FY2019 Business Performance forecasts ]

Despite sales growth, operating income will decrease ¥5.8 billion due to increased costs and consolidation of Demag.
FY 2019 Forecast (Net Sales by Product)

### Mobile Cranes
- **FY 2018:** 117,556 (62.4%)
- **FY 2019 Forecast:** 153,100 (67.1%)
- **Demag (Existing business):** 131,150 (65.3%)
- **Increase / Decrease:** 21,950 (80.4%)

### Truck Loader Cranes
- **FY 2018:** 20,667 (11.0%)
- **FY 2019 Forecast:** 21,000 (9.2%)
- **Demag (Existing business):** 21,000 (10.5%)
- **Increase / Decrease:** 0 (-)

### Aerial Work Platforms
- **FY 2018:** 18,320 (9.7%)
- **FY 2019 Forecast:** 16,900 (7.4%)
- **Demag (Existing business):** 16,900 (8.4%)
- **Increase / Decrease:** 0 (-)

### Other
- **FY 2018:** 31,907 (16.9%)
- **FY 2019 Forecast:** 37,000 (16.2%)
- **Demag (Existing business):** 31,650 (15.8%)
- **Increase / Decrease:** 5,350 (19.6%)

### Total
- **FY 2018:** 188,451 (100%)
- **FY 2019 Forecast:** 228,000 (100%)
- **Demag (Existing business):** 200,700 (100%)
- **Increase / Decrease:** 27,300 (100%)

**Outside Japan sales ratio:** 48.5% → 55.5%

---

FY 2019 business performance forecast was revised on October 30.

---

FY 2019 Forecast (Net Sales by Destination)

### Europe
- **FY 2018:** 19,122 (10.1%)
- **FY 2019 Forecast:** 27,800 (12.2%)
- **Demag (Existing business):** 19,400 (9.7%)
- **Increase / Decrease:** 8,400 (30.8%)

### North America
- **FY 2018:** 40,412 (21.4%)
- **FY 2019 Forecast:** 57,200 (25.2%)
- **Demag (Existing business):** 46,600 (23.2%)
- **Increase / Decrease:** 10,600 (38.9%)

### Caribbean, Central and South America
- **FY 2018:** 1,445 (0.8%)
- **FY 2019 Forecast:** 1,700 (0.7%)
- **Demag (Existing business):** 1,600 (0.8%)
- **Increase / Decrease:** 100 (0.4%)

### Asia
- **FY 2018:** 13,775 (7.3%)
- **FY 2019 Forecast:** 13,700 (6.0%)
- **Demag (Existing business):** 12,500 (6.2%)
- **Increase / Decrease:** 1,200 (4.4%)

### Middle East
- **FY 2018:** 6,156 (3.3%)
- **FY 2019 Forecast:** 12,400 (5.4%)
- **Demag (Existing business):** 6,600 (3.3%)
- **Increase / Decrease:** 5,800 (21.2%)

### Other
- **FY 2018:** 10,469 (5.6%)
- **FY 2019 Forecast:** 13,700 (6.0%)
- **Demag (Existing business):** 12,650 (6.3%)
- **Increase / Decrease:** 1,050 (3.8%)

### Total (outside Japan sales)
- **FY 2018:** 91,381 (48.5%)
- **FY 2019 Forecast:** 126,500 (55.5%)
- **Demag (Existing business):** 99,350 (49.5%)
- **Increase / Decrease:** 27,150 (99.5%)

**Other** is comprised of Oceania, Africa and the CIS.

FY 2019 business performance forecast was revised on October 30.
We realized that in order to reach our long-term goal, which is to become No. 1 worldwide in the lifting equipment industry, we would need further expanding production capacity. Therefore, we purchased the prefectural government industrial land in the western Kozai district of the port of Takamatsu in November 2016. The first phase of the construction began in November 2017 and was finished in April 2019. The plant has begun full operation in August 2019.

### General Outline of New Plant

<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>Kozai Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Kozai Kitamachi, Takamatsu, Kagawa Pref.</td>
</tr>
<tr>
<td><strong>Site Area</strong></td>
<td>Approx. 200,000 m²</td>
</tr>
<tr>
<td><strong>Floor Area</strong></td>
<td>Approx. 47,000 m²</td>
</tr>
<tr>
<td><strong>Investment</strong></td>
<td>Approx. ¥21.5 billion</td>
</tr>
<tr>
<td><strong>Employees</strong></td>
<td>Approx. 200</td>
</tr>
</tbody>
</table>

* Phase I  Construction: (November 2017—July 2019)
* Phase II  Construction is yet to be determined.

- **The concept**
  - Under the concept of "Next Generation Smart Plant: Harmonizing the Balance of People and Machinery, Connecting to the Next Generation of Smart Manufacturing.", the plant is fitted with automated guided vehicles, an air-conditioning system for the assembly line, and highly advanced equipment, all of which have been incorporated into the design with the aim of greatly increasing productivity.
  - In addition, the finished products will be transported by barge from the port adjacent to the plant to ports in Kobe and Yokohama.

- **Expanding production capacity**
  - Shido Plant’s monthly rough terrain crane production capacity limit is 200 units.
  - Kozai Plant has a combined truck crane and large-scale, multi-axle rough terrain crane production capacity of 40 to 50 units per month.
  - In addition, it supplies high-quality main parts (booms, cylinders, etc.) to overseas plants.
◆ Acquisition of the Demag Mobile Cranes Business Completed (July 2019)

- Acquisition Price: $215 million (approx. 23.6 billion yen)
  *This price is equivalent to the enterprise value of the target company, and it is subject to adjustment post-closing.
- The Demag Mobile Crane business, currently owned by Terex, has over 100 years of history and experience in the design and manufacture of world-class, large-capacity all terrain cranes and crawler cranes. Through the acquisition of Demag, Tadano further seeks to meet customer needs with the addition of lattice-boom crawler cranes to our product lineup, as well as the enhancement of our all terrain crane lineup.
- Day 1 event was hosted in Germany on the day of completion of the acquisition.

Speech by the president for Day1 event

Group photo taken after the event
Rough Terrain Cranes

Tadano is the recognized world leader in the manufacturing of rough terrain cranes (https://tadanoamerica.com/2015/rough-terrain-cranes-definition/). Manufactured at our state of the art facilities in Takamatsu, Japan, Tadano’s rough terrain cranes are proven to be safe, reliable, and productive.

**ROUGH TERRAIN PRODUCT LINE**

**NEW GR-150XL-3**

**GR-350XL**

**GR-550XL**

**GR-750XL**

**GR-1000XL**

**GR-1200XL**

**GR-1600XL**


- Max Lift Capacity: 15 tons
- Max Boom Length: 18.0’ - 78.7”
- Max Lift Height: 97.5’
- GVW: 31,530 lbs


- Max Lift Capacity: 35 tons
- Max Boom Length: 31.8’ - 101.7’
- Max Lift Height: 145’
- GVW: 60,830 lbs


- Max Lift Capacity: 50 tons
- Max Boom Length: 35.1’ - 113.9’
- Max Lift Height: 165’
- GVW: 69,840 lbs


- Max Lift Capacity: 55 tons
- Max Boom Length: 35.1’ - 113.9’
- Max Lift Height: 165’
- GVW: 74,850 lbs
GR-750XL (https://tadanoamerica.com/product/gr-750xl/)

Max Lift Capacity: 75 tons
Max Boom Length: 36.1' - 141.1'
Max Lift Height: 200'
GVW: 97,620 lbs

GR-800XL (https://tadanoamerica.com/product/gr-800xl/)

Max Lift Capacity: 80 tons
Max Boom Length: 39.4' - 154.2'
Max Lift Height: 212'
GVW: 115,610 lbs

GR-900XL (https://tadanoamerica.com/product/gr-900xl/)

Max Lift Capacity: 90 tons
Max Boom Length: 39.4' - 154.2'
Max Lift Height: 212'
GVW: 115,610 lbs

GR-1000XL (https://tadanoamerica.com/product/gr-1000xl/)

Max Lift Capacity: 100 tons
Max Boom Length: 39.4' - 154.2'
Max Lift Height: 212'
GVW: 115,610 lbs


- **Max Lift Capacity:** 120 tons
- **Max Boom Length:** 39.4' - 183.7'
- **Max Lift Height:** 241.4'
- **GVW:** 123,460 lbs

---

**GR-1600XL** ([https://tadanoamerica.com/product/gr-1600xl-2/](https://tadanoamerica.com/product/gr-1600xl-2/))


- **Max Lift Capacity:** 160 tons
- **Max Boom Length:** 42.8' - 200.1'
- **Max Lift Height:** 302.5'
- **GVW:** 133,259 lbs
Exhibit 14
ABOUT LINK-BELT

History

IT ALL BEGAN IN THE FIELDS OF IOWA

The idea — Link-Belt — was born in 1874 when William Dana Ewart, a young farm implement dealer in Belle Plaine, Iowa, conceived an idea of a square detachable “link” for a chain belt ... a “linked belt.”

William Ewart recognized that harvesters with continuous chain belt drives made up of square links and flat links would wear unevenly and break in one spot. Once broken, the entire chain belt had to be taken back to the barn for needed repairs, thus delaying all harvesting.

CONTINUOUS INNOVATION FOR OVER 140 YEARS

As Ewart concentrated his efforts on refining a chain belt with detachable links that could be repaired in the field and would wear more evenly, he obtained a patent on September 1, 1874 for an “improvement in drive-chain.”

Over the next several years, Ewart was relentless in pursuing his idea of using link-belt chain as a foundation for all types of power transmission and materials-handling equipment. It was this driving ambition and the continuous innovation of the link-belt that led to the founding of the Link-Belt Machinery Company in 1880 and the Link-Belt Engineering Company in 1888.

Around the turn of the decade, these fledgling Link-Belt companies developed the ancestor of today’s Link-Belt construction equipment ... the first wide-gauge, steam-powered, coal-handling clamshell crane.

Through the turn of the century, steam-powered, heavy-duty coal handling cranes evolved into lighter, more versatile locomotive cranes that clearly set the foundation for all future crane and shovel designs.

THE NEW CENTURY BRINGS FORTH A CONSOLIDATED LINK-BELT

In 1906, the Link-Belt Company was formed in Chicago, Illinois, consolidating the efforts of the Link-Belt Machinery Company and the Link-Belt Engineering Company.

By 1922, the Link-Belt Company had introduced a full line of crawler-mounted crane-shovels to complement its line of locomotive cranes and material-handling equipment. This product line continued to grow, and by the late 1930’s, included a complete line of models ranging from 3/4 yd. to 2-1/5 yd. capacity.

LINK-BELT INTRODUCES HYDRAULIC CONTROLS

Link-Belt had already built a reputation as an innovator when, in 1936, it introduced power hydraulic controls. Later known as “Speed-O-Matic,” these hydraulic controls soon made obsolete all other systems and became the standard of the crane-shovel industry.

In 1939, Link-Belt Company purchased the Speeder Machinery Corporation and merged its machines with Speeder's smaller machines (3/8 to 3/4 yd.) to form the Link-Belt Speeder Corporation, a wholly-owned subsidiary of Link-Belt Company, that eventually located in Cedar Rapids, Iowa.

This consolidation gave the new corporation a complete line of machines with centralized manufacturing, sales and engineering that yielded substantial growth and profit for the next 30 years.

In 1949, the revolutionary full-function design concept was introduced and, in combination with Speed-O-Matic hydraulic controls, launched Link-Belt Speeder to the forefront of the crane-shovel market worldwide.

These exclusive design originals culminated in the flagship model, LS-98, in 1954, that went on to become one of the most successful pieces of construction equipment ever built. Production of this one model continued for over 42 years with over 7,000 units being shipped.

In 1967, the FMC Corporation merged with the Link-Belt Company, and Link-Belt Speeder later became the Construction Equipment Group of FMC Corporation, marketing Link-Belt construction equipment products worldwide.

Shortly thereafter, FMC began an aggressive, long-term capital expansion plan that saw the manufacturing facilities and product line rapidly expand, right up to the eve of the difficult economic times of the early 1980's.

A GLOBAL JOINT VENTURE FORMS

In 1986, the Link-Belt Construction Equipment Company was formed as a joint venture between FMC Corporation and Sumitomo Heavy Industries, formalizing a relationship dating back to 1962.
In 1998, in a reorganization to focus on cranes, the excavator product line was spun off from the Link-Belt Construction Equipment Company. The LBX Company, a stand-alone, joint-venture company was formed between Sumitomo Construction Machinery Co. and Case Corp. to market and sell Link-Belt Excavators.

Today's Link-Belt Cranes is a dynamic, highly-focused organization with headquarters in Lexington, Kentucky that is a wholly-owned subsidiary of Sumitomo Heavy Industries.
Address inquiries to:

Sumitomo Heavy Industries Construction Cranes Co., Ltd.
9-3, Higashi-Ueno 6-chome, Taito-ku, Tokyo 110-0015, Japan
Phone: 81-3-3845-1387 Facsimile: 81-3-3845-1394
http://www.hsc-cranes.com
In April 2018, Sumitomo Heavy Industries Construction Cranes Co., Ltd. set forth with a new brand name, HSC CRANES. As a global expert in the field of cranes, the name HSC is indicative of our inherent commitment:

**H: High-quality  S: Satisfaction  C: Confidence**

With outstanding products built on these three key phrases, HSC CRANES endeavors to forge even stronger ties with all customers and deliver true satisfaction, to enhance the lifestyles, cultures and societies of people around the world. HSC CRANES, always ready to take on new challenges.
Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>SCX550-3</th>
<th>SCX800-2</th>
<th>SCX800A-3</th>
<th>SCX1000A-3</th>
<th>SCX1200-3</th>
<th>SCX1500A-3</th>
<th>SCX2000A-2</th>
<th>SCX2800-2</th>
<th>SCX2800A-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lattice Boom Crawler Cranes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. lifting cap. (t)</td>
<td>15.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
<td>35.0</td>
<td>40.0</td>
<td>45.0</td>
<td>50.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Max. boom length (m)</td>
<td>13.0</td>
<td>15.0</td>
<td>18.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
<td>35.0</td>
<td>40.0</td>
<td>45.0</td>
</tr>
<tr>
<td>Lifting tower crane</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. lifting cap. (t)</td>
<td>15.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
<td>35.0</td>
<td>40.0</td>
<td>45.0</td>
<td>50.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Max. tower length (m)</td>
<td>13.0</td>
<td>15.0</td>
<td>18.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
<td>35.0</td>
<td>40.0</td>
<td>45.0</td>
</tr>
<tr>
<td>Engine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>XE140H</td>
<td>XE140L</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
</tr>
<tr>
<td>Rated output (kW)</td>
<td>115</td>
<td>135</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Swing speed (°/min)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Hoist speed (m/min)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ground contact pressure (kPa)</td>
<td>780</td>
<td>850</td>
<td>870</td>
<td>1170</td>
<td>910</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating weight (t)</td>
<td>33.4</td>
<td>75.1</td>
<td>76.0</td>
<td>1040</td>
<td>122.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>SCX1500A-3</th>
<th>SCX2000A-2</th>
<th>SCX2800-2</th>
<th>SCX2800A-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lattice Boom Crawler Cranes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. lifting cap. (t)</td>
<td>15.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Max. boom length (m)</td>
<td>13.0</td>
<td>15.0</td>
<td>18.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Lifting tower crane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. lifting cap. (t)</td>
<td>15.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Max. tower length (m)</td>
<td>13.0</td>
<td>15.0</td>
<td>18.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Engine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
<td>QD67</td>
</tr>
<tr>
<td>Rated output (kW)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Swing speed (°/min)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Hoist speed (m/min)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ground contact pressure (kPa)</td>
<td>1000</td>
<td>1110</td>
<td>1240</td>
<td>1290</td>
</tr>
<tr>
<td>Operating weight (t)</td>
<td>139.0</td>
<td>186.0</td>
<td>221.0</td>
<td>231.0</td>
</tr>
</tbody>
</table>
### Lattice Boom Crawler Cranes

<table>
<thead>
<tr>
<th>Model</th>
<th>6000SLX STD</th>
<th>6000SLX SL-B</th>
<th>SCX800HD-2</th>
<th>SCX900HD-2</th>
<th>SCX1200HD-2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lattice Crane</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Lifting Cap.</td>
<td>600 T/9.0 m</td>
<td>650 T/9.0 m</td>
<td>650 T/10.0</td>
<td>900 T/10.0</td>
<td>900 T/10.0</td>
</tr>
<tr>
<td>Bas. Boom Length</td>
<td>240</td>
<td>270</td>
<td>290</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>Max. Lifting Cap.</td>
<td>1,130</td>
<td>1,320</td>
<td>1,410</td>
<td>2,200</td>
<td>2,200</td>
</tr>
<tr>
<td>Max. Boom Length</td>
<td>250</td>
<td>280</td>
<td>290</td>
<td>370</td>
<td>370</td>
</tr>
<tr>
<td><strong>Crawler</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Lifting Cap.</td>
<td>650 T/8.5 m</td>
<td>650 T/8.5 m</td>
<td>650 T/8.5 m</td>
<td>900 T/8.5 m</td>
<td>900 T/8.5 m</td>
</tr>
<tr>
<td>Max. Boom Length</td>
<td>2,200</td>
<td>2,200</td>
<td>2,200</td>
<td>3,200</td>
<td>3,200</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>Isuzu</td>
<td>Mitsubishi</td>
<td>Mitsubishi</td>
<td>Mitsubishi</td>
<td></td>
</tr>
<tr>
<td>Rated Output</td>
<td>51.77</td>
<td>54.5</td>
<td>57.0</td>
<td>57.0</td>
<td>57.0</td>
</tr>
<tr>
<td>Speed</td>
<td>17.0</td>
<td>16.5</td>
<td>15.0</td>
<td>15.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Ground Contact Pressure</td>
<td>1,300</td>
<td>1,460</td>
<td>1,290</td>
<td>1,290</td>
<td>1,290</td>
</tr>
<tr>
<td>Operating Weight</td>
<td>66.0</td>
<td>68.0</td>
<td>69.0</td>
<td>69.0</td>
<td>69.0</td>
</tr>
</tbody>
</table>

### Telescopic Boom Crawler Crane

<table>
<thead>
<tr>
<th>Model</th>
<th>650TLX</th>
<th>SCX550E</th>
<th>SCX700E</th>
<th>SCX800E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lattice Crane</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Lifting Cap.</td>
<td>65.0</td>
<td>65.0</td>
<td>75.0</td>
<td>75.0</td>
</tr>
<tr>
<td>Bas. Boom Length</td>
<td>30.0</td>
<td>30.0</td>
<td>30.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Max. Lifting Cap.</td>
<td>120.0</td>
<td>120.0</td>
<td>140.0</td>
<td>140.0</td>
</tr>
<tr>
<td>Max. Boom Length</td>
<td>160.0</td>
<td>160.0</td>
<td>160.0</td>
<td>160.0</td>
</tr>
<tr>
<td><strong>Crawler</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Lifting Cap.</td>
<td>90.0</td>
<td>90.0</td>
<td>90.0</td>
<td>90.0</td>
</tr>
<tr>
<td>Max. Boom Length</td>
<td>150.0</td>
<td>150.0</td>
<td>150.0</td>
<td>150.0</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>PEFM</td>
<td>PEFM</td>
<td>PEFM</td>
<td>PEFM</td>
</tr>
<tr>
<td>Rated Output</td>
<td>70.0</td>
<td>73.0</td>
<td>73.0</td>
<td>73.0</td>
</tr>
<tr>
<td>Speed</td>
<td>16.0</td>
<td>16.0</td>
<td>16.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Ground Contact Pressure</td>
<td>97.6</td>
<td>97.6</td>
<td>97.6</td>
<td>97.6</td>
</tr>
<tr>
<td>Operating Weight</td>
<td>70.0</td>
<td>73.0</td>
<td>73.0</td>
<td>73.0</td>
</tr>
</tbody>
</table>

Notes:
1. Models SCX3500-3 and SCX800E are designed with larger each and engine capacity is due to lower deck area. A higher power unit is available as an option for the SCX650 for SCX550E, SCX700E and SCX800E.
2. Figures shown for operating weight are valid for the crane application, configured with back boom, standard counterweights, standard truck tires, and standard optional hook block of normal lifting capacity. Figures shown for general pressure correspond to their operating weights.
3. Figures shown for engine output are based on manufacturers' specifications and may vary due to individual factors such as blend mixes, etc. Figures shown are for the crane application, configured with back boom, standard counterweights, standard truck tires, and standard optional hook block of normal lifting capacity. Figures shown for general pressure correspond to their operating weights.
Exhibit 15
Mobile and crawler cranes

Mobile cranes

The range of Liebherr mobile cranes extends from 35-tonne models to a heavy duty crane with a load capacity of 1,200 tonnes. High-speed all-terrain mobile cranes and telescopic truck-mounted cranes, compact cranes and heavy duty lattice boom cranes are used all over the world. Long booms, enormous load capacities, short erection times and high comfort and safety standards make our machines flexible and economical.
Crawler cranes

Our crawler cranes deliver outstanding load capacities of up to 3,000 tonnes together with massive hoist heights and radii. Variable boom systems extend their range of uses.

More than cranes

In addition to our high-performance products we offer a reliable, worldwide customer service. Used cranes, trainings, technical support and, of course, numerous insights into the world of cranes complete our offer.
Customer magazine

The magazine for customers and friends of mobile and crawler cranes. Here you will find some extraordinary crane impressions and stories!

Sales & Service

Our customers can rely on a worldwide sales and service network. Search here for the right contact partner.

- Find contact

Production sites

- Ehingen/Donau, Germany (mobile and crawler cranes)
- Nenzing, Austria (crawler cranes up to 300 tonnes)
- Biberach/Riss, Germany (mobile construction cranes)

Used cranes

Liebherr is also specialises in used mobile and crawler cranes. We ensure the safety and durability of the cranes by our global service network.
LR crawler cranes from Liebherr

LR crawler cranes with lattice booms are used all over the world, wherever very heavy loads need to be moved safely and economically. Maximum mobility and economy is ensured by the compact dimensions and easy to transport weights of the crane components.
<table>
<thead>
<tr>
<th>Model</th>
<th>Max. load capacity</th>
<th>Max. hoist height</th>
<th>Max. radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR 1110</td>
<td>110 t</td>
<td>104 m</td>
<td>57 m</td>
</tr>
<tr>
<td>LR 1130.1</td>
<td>137 t</td>
<td>125 m</td>
<td>84 m</td>
</tr>
</tbody>
</table>
LR 1160.1
Crawler crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load capacity</td>
<td>160 t</td>
</tr>
<tr>
<td>Max. hoist height</td>
<td>135 m</td>
</tr>
<tr>
<td>Max. radius</td>
<td>85 m</td>
</tr>
</tbody>
</table>

LR 1200.1
Crawler crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load capacity</td>
<td>220 t</td>
</tr>
<tr>
<td>Max. hoist height</td>
<td>148 m</td>
</tr>
<tr>
<td>Max. radius</td>
<td>95 m</td>
</tr>
</tbody>
</table>
LR 1250.1
Crawler crane

Max. load capacity  250 t
Max. hoist height  148 m
Max. radius  95 m

LR 1300.1 SX
Crawler crane

Max. load capacity  300 t
Max. hoist height  169 m
Max. radius  113 m
### LR 1350/1
Crawler crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load capacity</td>
<td>350 t</td>
</tr>
<tr>
<td>Max. hoist height</td>
<td>152 m</td>
</tr>
<tr>
<td>Max. radius</td>
<td>110 m</td>
</tr>
</tbody>
</table>

### LR 1400/2
Crawler crane

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load capacity</td>
<td>400 t</td>
</tr>
<tr>
<td>Max. hoist height</td>
<td>164 m</td>
</tr>
<tr>
<td>Max. radius</td>
<td>120 m</td>
</tr>
</tbody>
</table>
LR 1500
Crawler crane

Max. load capacity: 500 t
Max. hoist height: 164 m
Max. radius: 144 m

LR 1600/2
Crawler crane

Max. load capacity: 600 t
Max. hoist height: 187 m
Max. radius: 152 m
LR 1600/2-W
Crawler crane

- Max. load capacity: 600 t
- Max. hoist height: 166 m
- Max. radius: 144 m

LR 1750/2
Crawler crane

- Max. load capacity: 750 t
- Max. hoist height: 191 m
- Max. radius: 156 m
LR 1800-1.0
Crawler crane

Max. load capacity 800 t
Max. hoist height 200 m
Max. radius 152 m

LR 11000
Crawler crane

Max. load capacity 1,000 t
Max. hoist height 220 m
Max. radius 184 m
LR 11350
Crawler crane

Max. load capacity  1,350 t
Max. hoist height   196 m
Max. radius        164 m

Sales & Service

Our customers can rely on a worldwide sales and service network. Search here for the right contact partner.

- Find contact
Crawler crane technology

Liebherr crawler cranes combine innovative technologies with clear practical benefits. Their features include economy and performance.

Time-tested in action

Dizzying heights and massive loads: Our mobile and crawler cranes delight experts and fans all over the world with their performance.

Close to the customer

For challenging crane jobs, Liebherr is at your side to provide advice and support. We ensure your job is a complete success by providing technical assistance.
LRT 1090-2.1
Rough-Terrain Crane

The LRT 1090-2.1 features superb all-terrain manoeuvrability. The standard VarioBase® ensures that the Liebherr rough-terrain crane delivers a high level of safety and performance. The hydro-mechanical telescoping system with rope pull technology enables the telescope to be extended to the required length quickly and easily.

Max. load capacity  90 t
Telescopic boom    47 m
Max. hoist height  66 m
Max. radius        50 m
Number of axles    2
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load capacity</td>
<td>90 t</td>
</tr>
<tr>
<td>at radius</td>
<td>2.50 m</td>
</tr>
<tr>
<td>Telescopic boom from</td>
<td>12.00 m</td>
</tr>
<tr>
<td>Telescopic boom up to</td>
<td>47.00 m</td>
</tr>
<tr>
<td>Lattice jib from</td>
<td>10.5 m</td>
</tr>
<tr>
<td>Lattice jib up to</td>
<td>19.0 m</td>
</tr>
<tr>
<td>Drive engine/make</td>
<td>Cummins</td>
</tr>
<tr>
<td>Drive engine</td>
<td>6-Zylinder-Diesel</td>
</tr>
<tr>
<td>Drive engine/power</td>
<td>194 kW</td>
</tr>
<tr>
<td>Number of axles</td>
<td>2</td>
</tr>
<tr>
<td>Drive/Steering standard</td>
<td>4 x 4 x 4</td>
</tr>
<tr>
<td>Driving speed</td>
<td>25.00 km/h</td>
</tr>
<tr>
<td>Total ballast</td>
<td>12.00 t</td>
</tr>
</tbody>
</table>
LRT 1100-2.1
Rough-Terrain Crane

The LRT 1100-2.1 features superb all-terrain manoeuvrability. The standard VarioBase® ensures that the Liebherr rough-terrain crane delivers a high level of safety and performance. The time-tested TELEMATIK telescoping system delivers high lifting capacities over the entire working range.

- Max. load capacity: 100 t
- Telescopic boom: 50 m
- Max. hoist height: 69 m
- Max. radius: 54 m
- Number of axles: 2
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. load capacity</td>
<td>100 t</td>
</tr>
<tr>
<td>at radius</td>
<td>2.50 m</td>
</tr>
<tr>
<td>Telescopic boom from</td>
<td>12.60 m</td>
</tr>
<tr>
<td>Telescopic boom up to</td>
<td>50.00 m</td>
</tr>
<tr>
<td>Lattice jib from</td>
<td>10.5 m</td>
</tr>
<tr>
<td>Lattice jib up to</td>
<td>19.0 m</td>
</tr>
<tr>
<td>Drive engine/make</td>
<td>Cummins</td>
</tr>
<tr>
<td>Drive engine</td>
<td>6-Zylinder-Diesel</td>
</tr>
<tr>
<td>Drive engine/power</td>
<td>194 kW</td>
</tr>
<tr>
<td>Number of axles</td>
<td>2</td>
</tr>
<tr>
<td>Drive/Steering standard</td>
<td>4 x 4 x 4</td>
</tr>
<tr>
<td>Driving speed</td>
<td>25.00 km/h</td>
</tr>
<tr>
<td>Total ballast</td>
<td>14.00 t</td>
</tr>
</tbody>
</table>
Flexible military cranes – in use all over the world

Liebherr uses all its vast experience for designing special cranes for military purposes. Our military cranes are in demand with the army, air force and navy; they have proven themselves all over the world with repair, resupply and engineering units.

Bespoke mobile cranes for military use

Liebherr has manufactured more than 800 military cranes with lifting capacities from 10 to 500 tonnes since 1977. The product range extends from standard cranes with additional options to specially developed vehicles for military purposes.

Mobile cranes from Liebherr are suitable for both on-road and off-road use. They feature great economy and are very flexible in use. To satisfy special technical requirements and special solutions, Liebherr uses time-tested components which have been used many times on standard cranes.

Special technical equipment for military cranes

The equipment versions for military cranes may include the following, depending on requirements:

- Rescue winches
- Towing hitches
- Tyres with emergency features
- Emergency hydraulic controls
- Various load handling equipment
- Special containers for transporting special accessories

Reference projects: Military cranes from Liebherr

G-BKF armoured rescue crane

Economy through flexibility
The G-BKF from Liebherr is an armoured rescue crane on a four-axle mobile crane chassis. It has excellent off-road capability and great manoeuvrability. The G-BKF is flexible and economical to run since it is equipped both for hoisting loads and for rescuing vehicles.

Its 20.9-metre telescopic boom enables the G-BKF to handle loads of up to 20 tonnes quickly and precisely. Fitted with two rescue winches and a towing hitch at the rear, it can be used to rescue and tow a wide range of different vehicles.

Great mobility
The all-terrain chassis on the G-BKF features the very latest chassis and powertrain technology to provide excellent handling even on difficult terrain.

Armoured Mobile Crane G-LTM 1090-4.2

The G-LTM 1090-4.2 from Liebherr is an armoured mobile crane on a four-axle all-terrain chassis. It has excellent off-road capability and great manoeuvrability. The G-LTM 1090-4.2 is a flexible mobile crane with a powerful 35.7-metre telescopic boom. It can handle loads up to 36.6 tonnes quickly and precisely.

The all-terrain chassis of the G-LTM 1090-4.2 features the very latest chassis and powertrain technology to provide excellent handling even on difficult terrain. A six-cylinder Liebherr diesel engine in the undercarriage, which develops 330 kW and torque of 2,335 Nm, provides the LTM 1090-4.2 with all the power it needs.
For passenger protection the G-LTM 1090-4.2 is equipped with an armoured driver’s cabin as well as and armoured crane cabin.

50 Liebherr mobile cranes for the French Army

Swiss military cranes for bridge construction
The G-BKF from Liebherr is an armoured rescue crane on a four-axle mobile crane chassis. It has excellent off-road capability and great manoeuvrability. The G-BKF is flexible and economical to run since it is equipped both for hoisting loads and for rescuing vehicles.

Open video

LTM standard cranes at a glance

Liebherr LTM cranes feature all-terrain chassis as standard. That enables them to move on public roads and off-road.

LTM mobile crane product overview

Mobile crane technology

Liebherr is the global market leader in mobile cranes. We continuously develop new technology to benefit our customers.

Innovative mobile crane technology
Exhibit 16
After some poor years for the crane market in China, government initiatives and a booming construction sector are focussing minds on global expansion. Julian Champkin reports.

China has been a focus for the global construction industry for decades. “China is the most important market in the world. It has huge potential for cities to grow. Those cities will need infrastructure, roads, sewerage systems.” So said Guangyu Nie, head of Liebherr parts division in Shanghai, in November 2018, reaffirming his company’s 40-years commitment to the Chinese market. He was speaking at Bauma China, the largest trade show for cranes and construction equipment in Asia.

There have been some slow years in the Chinese crane market recently. Now, though, business is booming. Bauma China was generally acknowledged as the busiest for several years, both for numbers of exhibitors and for numbers of visitors. And one thing became very clear there: that the pace of change within China is extraordinary.

“China is a unique place for us,” says Norbert Dudek, vice-president and general manager for Terex Cranes Asia. “I think it’s a unique place for anyone who manufactures cranes. 15 or 20 years ago, imported cranes—not just our cranes—made up around 70–75% of the cranes sold in China. Today the figure is around 5–7%. That is because the local manufacturing base has increased so dramatically.”

There are indeed dozens – perhaps hundreds – of Chinese manufacturers of cranes. Their reputation used to be as makers of cheap and cheerful cranes that bore more than a passing resemblance to Western models but whose quality was sometimes more than doubtful.

There were also the cranes made by joint venture operations between Chinese and Western manufacturers. It seemed a good business plan. The Chinese gained Western companies’ know-how and brand reputation; the Western companies hoped for lower labour costs and access to Eastern markets. Joint ventures have had mixed fortunes, however, not infrequently ending in acrimony or lawsuits. That may be coming to an end. The Chinese government has recently relaxed ownership laws, even in sensitive sectors like the automobile industry and construction; it is now possible for foreign concerns to own even 100% of a Chinese plant. “The era of joint ventures is over,” says Andreas Boehm, CEO of Liebherr International. The gain goes both ways: the stronger Chinese makers are no longer needing western brand reputation. “Among Chinese manufacturers, their own brands are being optimized now.”

There are still some companies like that; but the major companies in China are now aspiring to be world players, or are world players already; and they recognise very well that to maintain that position they need reputations for reliability—and for aftersales service and support. The language of the top executives of the top companies at Bauma was hard to distinguish from that of top executives anywhere: they spoke of the soft power that comes from selling more than just a crane. Brand-building has come to China. But the Chinese company leaders have the added elements of confidence in rapid growth, both at home and in the export market, and of huge economies of scale, both
domestically and which, with encouragement, can also be translated into the export market as well.

Consider XCMG. A state-owned company, it started in 1989. “We are currently ranked number six in world class machinery manufacturers,” says vice president Hu Xiangyang. “Now we are a global construction arm.” The company’s aim is to develop into a world class enterprise—and it is well on the way to that ambition.

“We are striving to reform innovation. Our industrial technology strategy is to move from the middle to the high end of the value chain. Only by innovation can we survive the technological upgrade of the industry. We will do so by using such things as Big Data, making our machines smarter, more energy efficient. Smarter equipment means a brighter future,” he says. XCMG makes tower cranes, telebooms and crawlers, but also construction and mining machines of all kinds. On display at Bauma was a driverless off-road dump truck, controllable remotely; in the not too distant future we may expect similar technology in their cranes. “High end is the end that we look for,” says Hu; “High added value, high reliability. Innovation is the key to the 21st century, and we hope to lead the market with innovative solutions.” Those who look on Chinese-made cranes as cheap and cheerful largely copying Western technology will be in for a rude shock.

Consider also Sany. In contrast to XCMG it is privately owned, founded 20 years ago by four university class-mates who still maintain day-to-day control. Now with 1,400 employees, its specialisations include tower cranes and hoists as well as construction machinery; but it strong as well in concrete, wind power, even banking and insurance.

“Most of China knows our brand” says Kim Lee, vice president for international business, who began his crane career at Terex. He is proud of the fact that Sany was the first manufacturing company in China to use robotic arms in manufacturing.

It is also a company that well sees the advantage of branding for added value. “Sany has manufactured big tower cranes for many years,” he says. “From the moment when we first entered the tower segment our philosophy was to add more value for the customer.”

For that reason they started big: they made large-capacity cranes. “We avoided price competition. There is more price pressure at smaller capacities. Sany’s market position is to be the premium supplier and to give premium solutions. So we started [in mobile cranes] by offering big capacities, of 100t and over. In crawlers, we have our 3,600t, which is a very big machine indeed.”

“A good enough product, a cheap price, but with no service or aftersales support. That is the image of some Chinese brands outside China. We do not want to follow this approach,” he says. “After many years of hard work, this high-end positioning of our products is now widely accepted by our customers. They understand the difference between Sany and other Chinese products.”

“In the past our sales people persuaded customers by saying “Our product is more expensive, but is much better.” But today I tell them to say “Our product is as good as a premium top brand, but we have a price advantage.” That should be our priority. Our benchmark is Liebherr, not Chinese brands.

“It took years of hard work to become accepted as a better brand; but this has now been achieved.

“We continue our focus on big tonnages; but we are strong enough now to focus on the smaller capacities also, because our quality is now acknowledged as better. So today our smallest crawler is 50t, our largest is 3,600t. Our market share is 43% across the range within China, so we dominate the market.” That, he says, is how Sany became number one in China.

We have mentioned the extraordinary pace of change in China. “Being very fast-growing is an advantage,” says Kim. Not least in the export market.
Sany’s ambitions are global. The company began exporting just ten years ago, in 2008. “In the UAE we are very advanced. In India we have been number one for many years. We have a big presence in Kuwait. Singapore is good for us, the middle east is best for us.” Sany claims to have captured 75% of the Kuwaiti market in just two years.

And despite the rapid pace of export advance, Sany’s planning is long-term. As witness its strategy for Europe and the US: “In Northern Europe we have a small market share, but it works for us,” says Kim. “I don’t think that we can overtake Liebherr in Europe, but then Liebherr has no chance of overtaking Sany in China!

“In the US we have had a presence for ten years. Our purpose there is not to have mass sales in the near future; it is to gain more understanding of the high-end market, of customer demands. We want to learn from them. At the moment we are there for learning. One day we will be there for more.”

A third major Chinese player is Zoomlion. They too are concentrating on intelligent digitisation in their machines.

“We cannot predict the future” says vice president Guo Xuehong, “but we can imagine what it can be like. And it will be about intelligent machines. So we are gradually upgrading our products and gradually improving them and creating new functions. We can give the operators machines that are simpler to operate, that make their work easier.”

And he, like vice president Hu of XCMG, can point to intelligent products that dispense with an operator altogether. “We have a 130t crane that users can control remotely. It can absolutely avoid dangers around it. It learns and manages the working scenarios. That makes work easier and safer. Now our machines have a brain and can think.

“Our main core continues to be studying new product fields. It is crucial that we see the changes and do the right thing to improve our palette,” he says. “We will keep creating new products that will feed the future: we will make future products for the future needs of our customers.”

You could call Sany, Zoomlion and XCMG the Big Three, though that is an oversimplification since there are other large and ambitious Chinese manufacturers. All of them increasingly are eyeing export markets. In this they are both implementing and being assisted by the Chinese Government strategic initiative known as ‘One Belt, One Road’ or nowadays more simply as Belt and Road. Broadly, the Belt is the construction of improved overland transport links to Europe and Asia; the Road is maritime links to India and Africa. China is planning on carrying out construction projects in more than 60 countries along these routes. Belt and Road has been variably described as a 21st century silk road or a marketing campaign for Chinese investment around the world. Since first announced by President Xi Jinping in 2013, some estimate that China has invested more than $210bn in the initiative to date, the majority of it in Asia, and that Chinese construction companies have secured contracts worth more than $340bn in contracts in the countries reached by it. The initiative is expected to cost more than $1tn (£760bn) by its completion date of 2045.

“Belt and Road is helping our sales,” says Kim of Sany. “We even have a vice-president in charge of it. Many projects inside China are local: when they are finished, they are finished. But Belt and Road is a foundation to build on. It looks outward to other countries, and leads to other projects in turn. Many Chinese companies are involved in it, and many of them are our clients. So we work with them. In China they love the service we give them; when they go abroad, they work with us also. In some countries they are new or have little presence; we can support them there because we do have a presence in those countries as we have been there for some years. It is win-win for both of us.”

Yongmao, a Chinese company making tower cranes, tells a similar tale. It is certainly export-minded: it says that around 50% of its production goes
overseas. "We are trying to expand into Europe and the US," says sales manager Jonas Tan. "We have a 64t flat-top working on the expansion of Helsinki airport. I think that may be the largest tower crane in Finland. Elsewhere in the world One Belt One Road has really helped. We and others have sold a lot of equipment for it. For instance, we have sold two 120t flat-top tower cranes for a power station in Indonesia."

Western crane manufacturers with a presence in China are also noticing the effect of Belt and Road. Terex is one. "Over the last few years we have seen many changes, and one of the biggest is the Belt and Road initiative," says Dudek. "Because what it actually does is that it facilitates a lot of our customers in China to go overseas. Over the past two years we have seen a real increase in crane customers venturing overseas, to a great extent in South-East Asia, but also to the Middle East. The Belt and Road initiative focuses Chinese minds on looking abroad. And the good thing for us is that we can really help them in that.

“Some of the issues crane owners would normally face, such as registering their machines overseas, or safety requirements which are very different than in China—we can assist them with that because our machines are already working in those countries and are safety qualified already; so they can bring their machines straight in and actually start getting on with the job.

“The other thing that is very important, more so even than the machine, is that we have the support structure. We can give the same seamless support overseas that we do in China. If a customer has one of our machines in China—it does not have to be a new machine, it might be one that is two or three years old—we will have serviced it and warranted it, and that information goes into a global system. So when the machine actually moves out, it might be to Saudi Arabia, to Kuwait, or anywhere in the world, our service technicians locally there already have the bill of health for it. There is no ramping up from the beginning; everybody will know what the machine is, when it was bought, its history, what have we done to it, any major issues it has had… So when the machine is operating outside of China the ‘hand-over’ really is seamless. This seamless process is giving our customers peace of mind when they go overseas.

“It is, after all, for many of them the first time they have operated outside China. It is traumatic; they just don’t know how to do it. We can be with them wherever they go. That is a distinct advantage we have over small local crane-makers and it really is a reassurance for crane owners."

Liebherr is finding the same. "Belt and Road is giving outside contact to many more Chinese companies," says Boehm. "One Belt One Road has meant that Chinese construction companies no longer view China in isolation," says Eric Phua, sales director of the mobile and crawler division. "It is making Chinese companies go outside. They need someone to support them. We have presences already in the countries where they are going; so we can help them."

A choice for Western companies is to manufacture in China, since labour costs and closeness to Asian markets are both strong arguments to do so, or to remain solely Europeor US-based manufacturers. Liebherr makes earthmovers and aircraft components in China; but it does not make cranes there, and has no plans to do so. It cites reputational reasons: "Quality for us is central to our brand," says Phua “and German manufacture is known for quality. If we were to move out of Germany we would have to be sure that the savings would outweigh the costs. There is a lot of talk but we have a firm belief that to build in one location is better: the brand recognition must not suffer."

Others square that circle. Comansa, for example, builds in China at its Hangzhou plant, and in Spain, and says that quality standards are uniform throughout. Some key components are best European brands sourced from Germany or Europe. Frequency inverter controls, for example, are from Germany, gearboxes are from Siemens’ Chinese facility, swing bearings are a
German brand made in China, wire rope is European. Programme and setting functions are designed in the Spanish head office and modified for Chinese customer needs.

Belt and Road is affecting the crane sector, but it is benefitting primarily crawlers and telescopics rather than tower cranes like Comansa’s. But China is the largest market in the world for tower cranes. And another government initiative is causing their sales, also, to increase.

China is promoting prefabrication and pre-cast concrete sections for high-rise building. Components therefore are getting heavier. Tower cranes therefore need to be of larger capacity to lift them.

“Almost everyone in the tower crane business in China is thriving” says Tan of Yongmao. “The reason is the push to use precast sections to expedite production. A major problem is a lack of skilled workers in the construction industry.” That, and the need for speedy construction to keep pace with demand, is behind the government’s action. “So builders are now changing from smaller tower cranes to medium ones, of 18t – 20t capacity; because of this, tower cranes in China are booming.”

“The total volume of the tower cranes market in China is about CNY800m—that’s the domestic sales volume” says Comansa export manager Robin Hu. “Sales of tower cranes have more than doubled in the first three quarters of 2018 compared to the whole of 2017. For export, data runs for a different period, so is not directly comparable, but export sales – mainly to southeast Asian countries, including India and Australia, are also very good.

“And demand is for heavier loads. It used to be 5t–10t capacities that were most asked for. Now it is 25t–50t. There is much more prefabrication, and much more heavy steel in high-rise buildings. So market demand for tower luffing cranes is growing.”

It may therefore be no coincidence that two major western companies launched new tower cranes at Bauma Shanghai in November 2018. Manitowoc launched the Potain topless MCT565; and Comansa introduced two new luffers, the 24t CML310 and the 18t CML280. Both the Manitowoc and the Comansa offerings are made in China.

“We are expanding our factory in Hangzhou; we have acquired new land there to increase production capacity,” says Hu. Comansa are expecting to export the cranes to Thailand, Malaysia, Philippines, Vietnam, India. “Their market is all over south-east Asia, the Middle East and Africa,” says Hu.

The Chinese market is therefore curious mix of state guidance and free-wheeling enterprise, of state-owned companies and private ones, some home-grown, some western, of high quality and low, of huge domestic markets and equally-huge worldwide ambitions. Logical it might not be; but it is certainly alive and it is certainly going places.

The 400t SCC4000 lattice-boom from Sany
Exhibit 17
Our Commitment
Xuzhou Construction Machinery Group Co., Ltd. (XCMG) was founded in 1943. Since then, XCMG has stood at the forefront of the Chinese construction machinery industry and developed into one of the domestic industry’s largest, most influential, and most competitive enterprise groups with the most complete product varieties and series.

XCMG is the 5th largest construction machinery company in the world. It is ranked 65th in the list of China’s Top 500 Companies, 44th in the list of China’s Top 100 Manufacturing Enterprises, and 2nd in the list of China’s Top 100 Machinery Manufacturers.

XCMG North America
XCMG North America Corp. is a branch company of Xuzhou Construction Machinery Group, Ltd (XCMG) in China. Based in the United States, XCMG North America Corp. provides world-class construction machineries to the U.S. market as well as American standard service and spare parts supply. Our company is involved into a diverse of projects with partners of national operation network. A wide range of products is being well accepted by the U.S. customers, including earthmoving machinery, road-building machinery, hoisting machinery etc. We are, and will always committed to product improvement and technology innovation to further meet the needs of the US market and our customers.

XCMG is dedicated to its core value of “Taking Great Responsibilities, Acting With Great Morals, and Making Great Achievements” and its corporate spirit of being “Rigorous, Practical, Progressive, and Creative” in order to keep moving towards its ultimate goal of becoming a leading world-class enterprise capable of creating real value.

XCMG For Your Success!

Marketing Network
As part of its commitment to implementing the “Going Global” strategy, XCMG has established a product sales network that covers more than 183 countries and regions and set up more than 300 XCMG distributors overseas to provide users with comprehensive marketing services. XCMG’s annual export value has exceeded US$ 1.6 billion, and it has maintained its place as the industry
Home > PRODUCTS > Hoisting Machinery

Class

Category

Model

SEARCH

PRODUCTS

Truck Crane

Rough-terrain ...

All-terrain Crane

Crawler Crane

Tower Crane

Truck-mounte...
Exhibit 18
(4) The Group was selected as one of the top 100 innovative enterprises in China, ranking first in the construction machinery industry, and our "multi-axis vehicle electro-hydraulic servo steering system, steering control method and multi-axis vehicle" patent was awarded the China Patent Excellence Award.

(IV) Internationalization reaching a new level
The Group continued to focus on key countries and regions and intensified its efforts in overseas markets. In accordance with the principle of “leading, intensifying and penetrating”, the Group speeded up the layout planning and upgrade of overseas production bases to form a local manufacturing cluster along the “One Belt, One Road”.

1. Continuously strengthened the layout planning of key overseas markets. The Group focused on key regions, key product lines, components and service capabilities, continuously promoted local operations and expanded overseas markets to achieve coverage and stability in key markets around the world.

2. Continuously advanced the expansion and upgrade of overseas bases. The Group speeded up the expansion and upgrade of CIFA from Italy from a regional company specializing in concrete equipment to a comprehensive global company covering concrete, engineering and construction products with production and manufacturing operation covering the Middle East and North America. The Group fostered the establishment of an independent operational entity by m-tec in China, in order to introduce the German high-end manufacturing and service standards to China. The construction of the China-Belarus Industrial Park project was gradually proceeded. The Group speeded up the progress of local operations in India and prepared for the construction of new factories in India, in order to establish a comprehensive production and manufacturing base integrating research, production and sales along the “One Belt, One Road”.

3. Continuously promoted global resource integration. The Group acquired 100% of equity interests in Wilbert from Germany, a globally leading manufacturer of tower cranes, and entered into the European high-end tower crane market to achieve global coverage of full range of products in the tower crane business.

(V) Promoting management reform in-depth, significantly improving operational quality
During the Reporting Period, the Group continuously strengthened its management platform, innovated management tools and improved management capabilities, achieving a new level of management standards and operational efficiency.
HIGHLIGHTS

- 7 section 10m main boom, up to 33m heavy-duty or light-duty, or optional max. lift height reaches 78m.
- Leading counterweight design capacity, with 105% lifting torque of base boom, 335% lifting torque of fully-extended boom.
- Superior strength and advanced materials with high reliability and durability.
- Fully optimized operating experience: easy to drive and adaptable for multi-scenario.
- Self-levelling hydraulic control system with high reliability and ease of operation.
- Low cost with high return, maintenance cost flat.
- Environmentally friendly and modern flange plate design offers better view in the cab, more comfort and safer operation.
### LIFTING PERFORMANCE

#### Lifting Capacity on 5F-1 Boom - Fixed Jib Length = 7m

<table>
<thead>
<tr>
<th>Boom Length (m)</th>
<th>12</th>
<th>16</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>28</th>
<th>32</th>
<th>36</th>
<th>40</th>
<th>45</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Lifting Capacity on 5F-1 Boom - Fixed Jib Length = 11m

<table>
<thead>
<tr>
<th>Boom Length (m)</th>
<th>12</th>
<th>16</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>28</th>
<th>32</th>
<th>36</th>
<th>40</th>
<th>45</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### LIFTING PERFORMANCE

#### Lifting Capacity on 5F-1 Boom - Fixed Jib Length = 15m

<table>
<thead>
<tr>
<th>Boom Length (m)</th>
<th>12</th>
<th>16</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>28</th>
<th>32</th>
<th>36</th>
<th>40</th>
<th>45</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Note:** The tables display lifting capacities in metric tons (t) for different boom lengths. The columns represent different boom lengths ranging from 7m to 15m. The rows indicate the corresponding lifting capacities at those lengths.
## Features

**Maneuverability and robust drive**
1. Easy-wheel-tractor: 3-wheel or 4-wheel transmission
2. Fully hydraulic steering system
3. Volute steering: front-wheel steer four-wheel steer and rear-wheel steer short vehicle length
   - Easy steering and cornering provide the same with maximum swiveling capability and flexibility in narrow job sites.

**Excellent off-road capability**
- Large tread diameter and deep tread pattern offer excellent off-road capability.

**Strong gradability**
1. Canister electronically controlled steering, autotransmission and powertrain design provide reliable power output.
2. Even in the condition of the soft soil and loose, the engine frame be functional.
3. Four-wheel drive hydraulics suspension and special tires optimize the vehicle's drive performance to its maximum, suitable for any bad roads and jobsites.

**Pick-and-carry operations**
1. The large turning radius has the ability to pull up, carry, load, and improve the working efficiency greatly.
2. Pick-and-carry operations and "In Time"/"Out Time" system are suitable for large-scope stock and narrow job sites.
3. Superior pick-and-carry ability during short-distance travel can integrate convenience to the users.

**Single cab design**
1. Ergonomic design with large windows to provide a panoramic view.
2. Side window is equipped with a variety of types of guards, which can release the driver's or operator's fatigue, thus improving working efficiency.
3. The design is smooth and height-adjustable, suitable for the operator's needs.
4. Double-dashbar and adjustable seats advanced dust box technology, error check and audible & acoustical alarm ensure the safety and high efficiency of the operation.

## Technical Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rated output + max. reserve</td>
<td>kW</td>
<td>116kW (+15)%</td>
</tr>
<tr>
<td>Max. rated output</td>
<td>kW</td>
<td>110kW</td>
</tr>
<tr>
<td>Max. output power</td>
<td>rpm</td>
<td>2150 rpm</td>
</tr>
<tr>
<td>Max. output power</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transmission</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overdrive ratios</td>
<td></td>
<td>1:1.25 (5) to 1:4.7 (2)</td>
</tr>
<tr>
<td>Numerical ratio</td>
<td></td>
<td>1:1.25 (5) to 1:4.7 (2)</td>
</tr>
<tr>
<td>L/H</td>
<td></td>
<td>1:1.25 (5) to 1:4.7 (2)</td>
</tr>
<tr>
<td>L/H</td>
<td></td>
<td>1:1.25 (5) to 1:4.7 (2)</td>
</tr>
<tr>
<td>Swing range</td>
<td></td>
<td>1.5-m/2.5-m</td>
</tr>
<tr>
<td><strong>Wheels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. front tread width</td>
<td>mm</td>
<td>1440 mm</td>
</tr>
<tr>
<td>Max. rear tread width</td>
<td>mm</td>
<td>1360 mm</td>
</tr>
<tr>
<td>Min. front tread width</td>
<td>mm</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Min. rear tread width</td>
<td>mm</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Min. front tread width</td>
<td></td>
<td>1000 mm</td>
</tr>
<tr>
<td>Min. rear tread width</td>
<td></td>
<td>1000 mm</td>
</tr>
<tr>
<td>Swing speed</td>
<td></td>
<td>0 - 2.0 m/s</td>
</tr>
<tr>
<td><strong>Hydraulic system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated working pressure</td>
<td>MPa</td>
<td>7.2 MPa</td>
</tr>
<tr>
<td>Rated maximum flow</td>
<td>L/min</td>
<td>145 L/min</td>
</tr>
<tr>
<td>Flow rate (at 10 bar)</td>
<td>L/min</td>
<td>100 L/min</td>
</tr>
<tr>
<td>Flow rate (at 20 bar)</td>
<td>L/min</td>
<td>75 L/min</td>
</tr>
<tr>
<td>Flow rate (at 30 bar)</td>
<td>L/min</td>
<td>50 L/min</td>
</tr>
<tr>
<td>Max. oil up</td>
<td>kg</td>
<td>10 kg</td>
</tr>
<tr>
<td>Max. oil down</td>
<td>kg</td>
<td>10 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic actuators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic cylinder</td>
<td>kW</td>
<td>19 kW</td>
</tr>
<tr>
<td><strong>Weights</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheelbase</td>
<td>mm</td>
<td>2010 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2010 mm</td>
</tr>
<tr>
<td><strong>Lifts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZOANEK RE55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Lifting capacity tables

#### Table 1

<table>
<thead>
<tr>
<th>Working radius [m]</th>
<th>Main boom [m]</th>
<th>5.00</th>
<th>7.50</th>
<th>9.00</th>
<th>12.00</th>
<th>15.00</th>
<th>18.00</th>
<th>21.00</th>
<th>24.00</th>
<th>27.00</th>
<th>30.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5</td>
<td>10.5</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
<td>8.00</td>
<td>7.50</td>
</tr>
<tr>
<td>4.8</td>
<td>11.0</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
<td>8.00</td>
<td>7.50</td>
<td>7.00</td>
<td>6.50</td>
</tr>
<tr>
<td>5.0</td>
<td>11.5</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
<td>8.00</td>
<td>7.50</td>
<td>7.00</td>
<td>6.50</td>
</tr>
<tr>
<td>5.5</td>
<td>12.0</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
<td>8.00</td>
<td>7.50</td>
<td>7.00</td>
<td>6.50</td>
</tr>
<tr>
<td>6.0</td>
<td>12.5</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
<td>8.00</td>
<td>7.50</td>
</tr>
<tr>
<td>6.5</td>
<td>13.0</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
</tr>
<tr>
<td>7.0</td>
<td>13.5</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
<td>9.00</td>
<td>8.50</td>
</tr>
<tr>
<td>7.5</td>
<td>14.0</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
</tr>
<tr>
<td>8.0</td>
<td>14.5</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
<td>10.00</td>
<td>9.50</td>
</tr>
<tr>
<td>8.5</td>
<td>15.0</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
</tr>
<tr>
<td>9.0</td>
<td>15.5</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
<td>11.00</td>
<td>10.50</td>
</tr>
<tr>
<td>9.5</td>
<td>16.0</td>
<td>16.00</td>
<td>15.50</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
</tr>
<tr>
<td>10.0</td>
<td>16.5</td>
<td>16.00</td>
<td>15.50</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
<td>12.00</td>
<td>11.50</td>
</tr>
<tr>
<td>10.5</td>
<td>17.0</td>
<td>17.00</td>
<td>16.50</td>
<td>16.00</td>
<td>15.50</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
</tr>
<tr>
<td>11.0</td>
<td>17.5</td>
<td>17.00</td>
<td>16.50</td>
<td>16.00</td>
<td>15.50</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
<td>13.00</td>
<td>12.50</td>
</tr>
<tr>
<td>11.5</td>
<td>18.0</td>
<td>18.00</td>
<td>17.50</td>
<td>17.00</td>
<td>16.50</td>
<td>16.00</td>
<td>15.50</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
</tr>
<tr>
<td>12.0</td>
<td>18.5</td>
<td>18.00</td>
<td>17.50</td>
<td>17.00</td>
<td>16.50</td>
<td>16.00</td>
<td>15.50</td>
<td>15.00</td>
<td>14.50</td>
<td>14.00</td>
<td>13.50</td>
</tr>
</tbody>
</table>

#### Table 2

<table>
<thead>
<tr>
<th>Main boom [m]</th>
<th>Over head</th>
<th>Over toast and front</th>
<th>Over head</th>
<th>Over toast and front</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.0 + 7.5</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
</tr>
<tr>
<td>30.0 + 6.3</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
</tr>
<tr>
<td>30.0 + 5.0</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
</tr>
<tr>
<td>30.0 + 3.8</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
<td>2.61</td>
</tr>
</tbody>
</table>
### Flexibility & Mobility, High Efficiency & Stability
- Leading operating speed and comprehensive efficiency surpass others among the industry by 10%.
- Brand-new optimized Hexagon main boom together with strong chassis frame, outriggers, making its lifting capacity as powerful as the 20T among the industry.
- By using LUDV main valve, the stable multi-movement operation is guaranteed.
- Gascoyne driving chain with WABIAI engine, FAST transmission and ZOOMLION axle enables it with lower maintenance cost.

### Main Technical Parameters

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. total lifting capacity</td>
<td>kg</td>
<td>6000</td>
<td></td>
</tr>
<tr>
<td>Max. hook line weight of hook block</td>
<td>kN</td>
<td>710</td>
<td></td>
</tr>
<tr>
<td>Max. lead moment of main boom (fully extended)</td>
<td>kN·m</td>
<td>4300</td>
<td></td>
</tr>
<tr>
<td>Max. lifting height of main boom (fully extended)</td>
<td>m</td>
<td>41.0</td>
<td></td>
</tr>
<tr>
<td>Max. lifting height of boom</td>
<td>m</td>
<td>38.5</td>
<td></td>
</tr>
<tr>
<td>Max. hook rope speed (Main winch)</td>
<td>m/min</td>
<td>120</td>
<td>AL (Up)</td>
</tr>
<tr>
<td>Max. hook rope speed (Auxiliary winch)</td>
<td>m/min</td>
<td>100</td>
<td>AL 3° Tower</td>
</tr>
<tr>
<td>Boom erection up time</td>
<td>s</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Boom telescoping out time</td>
<td>s</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Steering speed</td>
<td>r/min</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Max. diving speed</td>
<td>km/h</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Max. g acceleration</td>
<td>k</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Min. turning diameter</td>
<td>m</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>Min. ground clearance</td>
<td>mm</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Oil consumption per hundred kilometer</td>
<td>L</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Deadweight in driving condition</td>
<td>kg</td>
<td>23000</td>
<td></td>
</tr>
<tr>
<td>Complete vehicle ker mass</td>
<td>kg</td>
<td>22010</td>
<td></td>
</tr>
<tr>
<td>Front axle load</td>
<td>kg</td>
<td>5300</td>
<td></td>
</tr>
<tr>
<td>Rear axle load</td>
<td>kg</td>
<td>2680</td>
<td></td>
</tr>
<tr>
<td>Overall dimensions (L x W x H)</td>
<td>mm</td>
<td>12650 x 2500 x 3400</td>
<td></td>
</tr>
<tr>
<td>Outrigger spread (L)</td>
<td>m</td>
<td>6.95</td>
<td></td>
</tr>
<tr>
<td>Outrigger spread (W)</td>
<td>m</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Main boom length</td>
<td>m</td>
<td>9.8 – 30.8</td>
<td></td>
</tr>
<tr>
<td>Boom angle</td>
<td>°</td>
<td>-2 - 80</td>
<td></td>
</tr>
<tr>
<td>Rib length</td>
<td>m</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Offset</td>
<td>°</td>
<td>6 - 20</td>
<td></td>
</tr>
</tbody>
</table>

### Lifting Height Curve

![Lifting Height Curve](image_url)
### Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Unit</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. rated lifting capacity</td>
<td>kg</td>
<td>15000</td>
<td></td>
</tr>
<tr>
<td>Max. load moment of basic boom</td>
<td>t-m</td>
<td>575</td>
<td></td>
</tr>
<tr>
<td>Max. load moment of main boom</td>
<td>t-m</td>
<td>2500</td>
<td></td>
</tr>
<tr>
<td>Max. load moment of fully extended boom</td>
<td>t-m</td>
<td>394</td>
<td></td>
</tr>
<tr>
<td>Max. load moment of basic boom</td>
<td>t-m</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Max. lifting height of main boom</td>
<td>m</td>
<td>25.5</td>
<td></td>
</tr>
<tr>
<td>Max. lifting height of jib</td>
<td>m</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Max. hoisting speed (max winch)</td>
<td>m/min</td>
<td>120</td>
<td>These parameters do not include deflection of main boom and jib.</td>
</tr>
<tr>
<td>Max. hoisting speed (aux winch)</td>
<td>m/min</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Boom extension time</td>
<td>s</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Boom extension time</td>
<td>s</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Winch speed</td>
<td>m/min</td>
<td>1.2-3.2</td>
<td></td>
</tr>
<tr>
<td>Winch drum speed</td>
<td>t/min</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Turning diameter</td>
<td>m</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Max. ground clearance</td>
<td>m</td>
<td>325</td>
<td></td>
</tr>
<tr>
<td>Max. overall length</td>
<td>m</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>kg</td>
<td>29900</td>
<td></td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Unit</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall dimension (L x W x H)</td>
<td>mm</td>
<td>11000</td>
<td></td>
</tr>
<tr>
<td>Max. gantry radius</td>
<td>m</td>
<td>3.86</td>
<td></td>
</tr>
<tr>
<td>Max. gantry radius</td>
<td>m</td>
<td>3.86</td>
<td>These parameters do not include deflection of main boom and jib.</td>
</tr>
<tr>
<td>Tilt axis rotation</td>
<td>mm</td>
<td>355</td>
<td></td>
</tr>
<tr>
<td>Main boom length</td>
<td>m</td>
<td>103+40.4</td>
<td></td>
</tr>
<tr>
<td>Boom angle</td>
<td>°</td>
<td>45°</td>
<td></td>
</tr>
<tr>
<td>Jib length</td>
<td>m</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Offset</td>
<td>°</td>
<td>5, 15, 30</td>
<td></td>
</tr>
</tbody>
</table>
Features

Lifting capacity
- Continuous automatic protection ensures lifting capacity of crane is improved once and for all.
- Abrasive impeller, two sections (60° × 45°) make the machine more robust.
- Balanced design and low vibration increase the lifting capacity of the crane.
- Large capacity, high maneuverability for working stability.
- Optimized heat treatment and structure analysis and calculation methods to ensure the lifting capacity of the crane.

Overall View

Technical Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting performance</td>
<td>Max rated lifting capacity</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max布置 limit load</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max horizontal load</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max lifting weight (detected)</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max lifting weight(maximum)</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max lifting weight (detected)</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max horizontal limit load (detected)</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Max horizontal limit load (maximum)</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Hoisting limit load</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Lifting limit load</td>
<td>kg</td>
</tr>
<tr>
<td></td>
<td>Lifting speed</td>
<td>m/min</td>
</tr>
<tr>
<td></td>
<td>Slowing speed</td>
<td>m/min</td>
</tr>
<tr>
<td></td>
<td>Drilling</td>
<td>Max drilling speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min. drilling depth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min. ground clearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum lift height (maximum)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum lift height (detected)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum load</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum load</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall width</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall height</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum boom length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum boom angle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All-terrain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All-terrain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All-terrain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All-terrain</td>
</tr>
</tbody>
</table>
Exhibit 19
Sany Heavy Industry Is China’s Largest And The World’s Fifth Engineering Machinery Manufacturer
Sany Group Co. Ltd. was founded in 1989. The goals of Sany Group have always been “building a first-class enterprise, fostering first-class talent and making a first-class contribution to humanity”. Since the establishment of the company Sany Group has created the leading brand “Sany”. Currently Sany is one of the largest equipment manufacturers in the world. The core company of the group - Sany Heavy Industry was publicly listed on July 3, 2003. We were the first enterprise to successfully reform the shareholder structure and accomplish full circulation. Sany Heavy Industry made the “Global top 500 enterprises in market value” released by the Financial Times in July of 2011. Sany was the only Chinese Machinery company on the list.

Sany Products
Sany is an equipment manufacturer that mainly focuses on construction machines.

Concrete Machinery  (product/concrete/)
Hydraulic Excavators  (product/excavator/)
Hoisting Machinery  (product/crane/)
Road Machinery  (product/road/)
Piling Machinery  (product/piling/)
Wind Turbines  (product/wind/)
Port Machinery  (product/port/)
Mining Machinery  (product/mining/)

Get Support or Quote (https://www.sanyglobal.com/inquiry/)
Commercial Layout

In the face of new competitive environment and technical revolution, Sany is striving to manage its transition and has already expanded into fields of new energy, housing industrialization, finance and real estate.

Domestically Sany has six industrial bases in Beijing, Changsha, Shanghai, Shenyang, Kunshan and Urumqi. Abroad Sany owns four R&D and manufacturing bases in India, America, Germany and Brazil. At present the Sany Group has done business in over 120 countries and regions around the world.
Recently Xi Jinping, Li Keqiang, Zhang Dejiang, Yu Zhengsheng, Zhang Gaoli, Hu Jintao, Wen Jiabao and other national leaders spoke highly of Sany's commitment to self-dependent innovation. They fully recognized Sany's contribution to equipment manufacturing in China and had high expectation of Sany in the future.

Liang Wengen, the president of Sany Heavy Industry, is the founder of Sany Group. He is the representative of the 17th and 18th CPC National Congress and the representative of the 8th, 9th and 10th session of the National People's Congress. He has been awarded “National Model Worker”, “National Excellent Private Entrepreneur”, “Outstanding Builder of Socialist Causes with Chinese Characteristics”, CCTV China's Economic Figure of the Year”, “The Best Boss of China’s Listed Companies” and “Pioneer of China New Manufacturing” by Forbes Magazine.
Sany was awarded one of “the 100 most innovative companies” by Forbes Magazine and “the most innovative company in China” by Fortune Magazine. In addition to these prestigious honors, Sany has also received “the top 500 enterprises of China”, “the most competitive brand in China”, “the most iconic brand in China’s construction machinery industry” and “top 50 brands of Asia.”
### SAC300S ALL-TERRAIN CRANE
#### TECHNICAL PARAMETER

<table>
<thead>
<tr>
<th>Type</th>
<th>Item</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>Max. lifting capacity</td>
<td>300 t</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Overall length</td>
<td>18200 mm</td>
</tr>
<tr>
<td></td>
<td>Overall width</td>
<td>3000 mm</td>
</tr>
<tr>
<td></td>
<td>Overall height</td>
<td>4000 mm</td>
</tr>
<tr>
<td></td>
<td>Axle distance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Axle-1, 2</td>
<td>1550 mm</td>
</tr>
<tr>
<td></td>
<td>Axle-2, 3</td>
<td>3170 mm</td>
</tr>
<tr>
<td></td>
<td>Axle-3, 4</td>
<td>1550 mm</td>
</tr>
<tr>
<td></td>
<td>Axle-4, 5</td>
<td>2440 mm</td>
</tr>
<tr>
<td></td>
<td>Axle-5, 6</td>
<td>1550 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Overall weight</td>
<td>72000 kg</td>
</tr>
<tr>
<td></td>
<td>Axle load</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Axle load-1, 2, 3</td>
<td>12000 kg</td>
</tr>
<tr>
<td></td>
<td>Axle load-4, 5, 6</td>
<td>12000 kg</td>
</tr>
<tr>
<td></td>
<td>Rated power</td>
<td>440 kW/1800 rpm</td>
</tr>
<tr>
<td></td>
<td>Rated torque</td>
<td>2600 N.m/1300 rpm</td>
</tr>
<tr>
<td></td>
<td>Rated power</td>
<td>205kw/2200rpm</td>
</tr>
<tr>
<td></td>
<td>Rated torque</td>
<td>1100N.m/1200-1600rpm</td>
</tr>
<tr>
<td>Traveling</td>
<td>Max. traveling speed</td>
<td>80 km/h</td>
</tr>
<tr>
<td></td>
<td>Turning radius</td>
<td>12 m</td>
</tr>
<tr>
<td></td>
<td>Turning radius</td>
<td>14.4 m</td>
</tr>
<tr>
<td></td>
<td>Wheel formula</td>
<td>12 × 8</td>
</tr>
<tr>
<td></td>
<td>Min. ground clearance</td>
<td>360 mm</td>
</tr>
<tr>
<td></td>
<td>Approach angle</td>
<td>15 °</td>
</tr>
<tr>
<td></td>
<td>Departure angle</td>
<td>18 °</td>
</tr>
<tr>
<td></td>
<td>Max. gradeability</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Fuel consumption per 100km</td>
<td>≤ 114 L</td>
</tr>
</tbody>
</table>

#### Main Performance Data

<table>
<thead>
<tr>
<th>Temperature range</th>
<th>–20 °C ~ +50 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. rated range</td>
<td>3 m</td>
</tr>
<tr>
<td>Tail slewing radius of swingtable</td>
<td>5735 mm</td>
</tr>
<tr>
<td>Boom section</td>
<td>8</td>
</tr>
<tr>
<td>Boom shape</td>
<td>U-shaped</td>
</tr>
<tr>
<td>Max. lifting moment</td>
<td>Base boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom+jib</td>
</tr>
<tr>
<td>Boom length</td>
<td>Base boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom+jib</td>
</tr>
<tr>
<td>Outrigger span (Longitudinal×Transversal)</td>
<td>8.95 × 8.6 m</td>
</tr>
<tr>
<td>Jib offset</td>
<td>0°~30°~60°</td>
</tr>
</tbody>
</table>

| Working speed     | Max. single rope lifting speed of main winch (no load) | 130 m/min  |
|                   | Max. single rope lifting speed of auxiliary winch (no load) | 130 m/min  |
|                   | Full extension/retraction time of boom                  | 800 / 600 s |
|                   | Full lifting/descending time of boom                     | 65 / 90 s   |
|                   | Unloading speed                                          | 1.5 m/min   |
| Aircondition      | Aircondition in up cab                                   | Cooling / Heating |
|                   | Aircondition in low cab                                  | Cooling / Heating |

### SAC300S ALL-TERRAIN CRANE
#### OPERATION CONDITION

#### SAC300S ALL-TERRAIN CRANE
#### TECHNICAL PARAMETER

<table>
<thead>
<tr>
<th>Temperature range</th>
<th>–20 °C ~ +50 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. rated range</td>
<td>3 m</td>
</tr>
<tr>
<td>Tail slewing radius of swingtable</td>
<td>5735 mm</td>
</tr>
<tr>
<td>Boom section</td>
<td>8</td>
</tr>
<tr>
<td>Boom shape</td>
<td>U-shaped</td>
</tr>
<tr>
<td>Max. lifting moment</td>
<td>Base boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom+jib</td>
</tr>
<tr>
<td>Boom length</td>
<td>Base boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom</td>
</tr>
<tr>
<td></td>
<td>Full-extend boom+jib</td>
</tr>
<tr>
<td>Outrigger span (Longitudinal×Transversal)</td>
<td>8.95 × 8.6 m</td>
</tr>
<tr>
<td>Jib offset</td>
<td>0°~30°~60°</td>
</tr>
</tbody>
</table>

| Working speed     | Max. single rope lifting speed of main winch (no load) | 130 m/min  |
|                   | Max. single rope lifting speed of auxiliary winch (no load) | 130 m/min  |
|                   | Full extension/retraction time of boom                  | 800 / 600 s |
|                   | Full lifting/descending time of boom                     | 65 / 90 s   |
|                   | Unloading speed                                          | 1.5 m/min   |
| Aircondition      | Aircondition in up cab                                   | Cooling / Heating |
|                   | Aircondition in low cab                                  | Cooling / Heating |
Max. Lifting Capacity: 6160 t·m
Max. Crane Boom length: 84m
Max. Fixed Jib Combination: 84 m + 84 m
Performance parameters

### Performance Parameters of SCC5000A Crawler Crane

<table>
<thead>
<tr>
<th>Performance Index</th>
<th>Unit</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Rated Lifting Capacity</td>
<td>t</td>
<td>500 (6m working radius)</td>
</tr>
<tr>
<td>Max. Rated Lifting Capacity (with superlift)</td>
<td>t</td>
<td>500 (12m working radius)</td>
</tr>
<tr>
<td>Max. Rated Lifting Torque</td>
<td>t•m</td>
<td>3000</td>
</tr>
<tr>
<td>Max. Rated Lifting Torque (with superlift)</td>
<td>t•m</td>
<td>6160</td>
</tr>
<tr>
<td>Boom Length</td>
<td>m</td>
<td>24~84</td>
</tr>
<tr>
<td>Boom Length (with superlift)</td>
<td>m</td>
<td>36~84</td>
</tr>
<tr>
<td>Combined boom length</td>
<td>m</td>
<td>48~102</td>
</tr>
<tr>
<td>Combined boom length (with superlift)</td>
<td>m</td>
<td>78~126</td>
</tr>
<tr>
<td>Luffing jib length</td>
<td>m</td>
<td>24~72</td>
</tr>
<tr>
<td>Luffing jib length (with superlift)</td>
<td>m</td>
<td>24~84</td>
</tr>
<tr>
<td>Fixed short jib length</td>
<td>m</td>
<td>12</td>
</tr>
<tr>
<td>Longest boom combination (LJDB operating condition)</td>
<td>m</td>
<td>84+84</td>
</tr>
<tr>
<td>Boom luffing angle</td>
<td>°</td>
<td>30~85</td>
</tr>
<tr>
<td>Jib luffing angle</td>
<td>°</td>
<td>25~75</td>
</tr>
<tr>
<td>Max. single speed of main winch</td>
<td>m/min</td>
<td>0~115</td>
</tr>
<tr>
<td>Max. single speed of auxiliary winch</td>
<td>m/min</td>
<td>0~115</td>
</tr>
<tr>
<td>Max. boom luffing single speed</td>
<td>m/min</td>
<td>(0~60) × 2</td>
</tr>
<tr>
<td>Max. jib luffing single speed</td>
<td>m/min</td>
<td>0~120</td>
</tr>
<tr>
<td>Max. superlift luffing single rope speed</td>
<td>m/min</td>
<td>0~126</td>
</tr>
<tr>
<td>Slewing speed (without load)</td>
<td>r/min</td>
<td>0~1</td>
</tr>
<tr>
<td>Travel speed</td>
<td>km/h</td>
<td>0<del>1 (high speed) / 0</del>0.35 (low speed)</td>
</tr>
<tr>
<td>Gradient capability (with basic boom and with cab faced forwards)</td>
<td>%</td>
<td>30</td>
</tr>
<tr>
<td>Rated engine output power</td>
<td>kW/rpm</td>
<td>447/1800</td>
</tr>
<tr>
<td>Overall weight (including basic boom, 180t rear counterweight of basic machine, and 40t central counterweight)</td>
<td>t</td>
<td>400</td>
</tr>
<tr>
<td>Average ground bearing pressure (including basic boom, 180t rear counterweight of basic machine, and 40t central counterweight)</td>
<td>MPa</td>
<td>0.19</td>
</tr>
<tr>
<td>Rear counterweight of basic machine</td>
<td>t</td>
<td>180 (without superlift) / 140 (with superlift)</td>
</tr>
<tr>
<td>Superlift counterweight</td>
<td>t</td>
<td>250</td>
</tr>
<tr>
<td>Central counterweight</td>
<td>t</td>
<td>40</td>
</tr>
<tr>
<td>Max. transportation dimension of single piece (L x W x H)</td>
<td>mm</td>
<td>13090×3000×3200</td>
</tr>
<tr>
<td>Transportation Weight of Single Piece</td>
<td>t</td>
<td>48.8 (not including mast and winch) / 64.6 (including mast and winch)</td>
</tr>
</tbody>
</table>
Exhibit 20
About LiuGong

With a History spanning 60 years, LiuGong has learned, adapted and grown into an established name in machinery. Started in 1958, LiuGong brought the first modernized wheel loader to China in 1966, eventually expanding to 19 different product lines today. Learning on the way that every challenge no matter how small, no matter how difficult, is a chance for LiuGong to grow and improve. The continuous strive to rise to new challenges has lead LiuGong to work in the harshest of environments from the blazing heat of the Sahara to the unrelenting cold of the Antarctic and everything in between. More than just functionality, LiuGong focuses on the needs and wants of our customers. LiuGong understands that great machines have to be intuitive and ergonomic to allow for projects to get started quickly and run smoothly.

Attention to quality and the ability to get the job done has made LiuGong synonymous with reliability. With 20 manufacturing facilities, over 9500 employees, 5 R&D bases as well as 13 regional parts centers, LiuGong stays at the forefront of technology, production and supply logistics..

We know that equipment is nothing without a reliable service team that places you first. That’s why our world class manufacturing capabilities producing top of the line machines is supported by our vast network of more than 300 dealers in over 100 countries all certified and trained by LiuGong. It is our commitment to you, the customer, which has helped us get to where we are today.
LIFTING TO A NEW LEVEL

Elevate your work with LiuGong’s line of highly efficient cranes. The strong carrying capacity with our world class hydraulic system provides the best in hoisting and stability. By using LiuGong cranes you bring dependable efficiency and precision to your jobsite.
<table>
<thead>
<tr>
<th>Model</th>
<th>Max. Lifting Capacity</th>
<th>Max. Lifting Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC250A4</td>
<td>25 t</td>
<td>34 m</td>
</tr>
<tr>
<td>TC250A5</td>
<td>25 t</td>
<td>41 m</td>
</tr>
<tr>
<td>TC300A</td>
<td>30 t</td>
<td>34 m</td>
</tr>
<tr>
<td>TC500A</td>
<td>50 t</td>
<td>43 m</td>
</tr>
<tr>
<td>TC550C5</td>
<td>55 t</td>
<td>45.6 m</td>
</tr>
<tr>
<td>TC750C5</td>
<td>75 t</td>
<td>48.3 m</td>
</tr>
</tbody>
</table>
Exhibit 21
Confidential – Not Susceptible to Public Summary
Exhibit 22
Confidential – Not Susceptible to Public Summary
Exhibit 23

Confidential – Not Susceptible to Public Summary
Exhibit 24
Confidential – Not Susceptible to Public Summary
Exhibit 25
America's infrastructure is decaying — here's a look at how terrible things have gotten

Cadie Thompson and Mark Matousek  Feb 5, 2019, 12:30 PM

An aerial view of the damaged Oroville Dam spillway is shown. Dams in the US are aging. In fact, the average age of US dams is 56 years.  Dale Kolke / California Department of Water Resources via Reuters

- There's speculation President Donald Trump will discuss infrastructure in his State of the Union address on Tuesday.
• **America's infrastructure** is desperately in need of investment, according to the American Society of Civil Engineers. The ASCE estimates the US needs to spend some $4.5 trillion by 2025 to fix the country's roads, bridges, dams, and other infrastructure.

• **Trump reportedly "hates" major parts of the infrastructure plan** he unveiled in 2018, which proposed $200 billion in federal funding designed to finance new projects and repairs while incentivizing private investment.

President Donald Trump is expected to discuss infrastructure in his State of the Union address on Tuesday, but how exactly he plans to do so is unclear.

The Washington Post reports that White House press secretary Sarah Sanders told CNN on Tuesday that infrastructure could be an area of compromise for Democrats and Republicans, but according to The Wall Street Journal, Trump Administration officials pushed for the removal of a call for Congress to pass Trump’s infrastructure plan from an early draft of his State of the Union address.

Trump reportedly "hates" major parts of the infrastructure plan he unveiled in 2018, which proposed $200 billion in federal funding designed to finance new projects and repairs while incentivizing private investment.
Read more: *Uber and Lyft are having a terrible effect on public transportation, new research shows*

No matter what Trump says about infrastructure during his State of the Union address, one thing is clear: America's infrastructure is in dire need of repairs.

According to the American Society of Civil Engineers' 2017 *Infrastructure Report Card*, which is published every four years, US infrastructure gets a D+ grade. It got the same grade in 2013.

The ASCE estimates the US needs to spend some $4.5 trillion by 2025 to improve the state of the country's roads, bridges, dams, airports, schools, and more.

The report breaks down the state of infrastructure in 16 different categories. Here's a look at each category's final grade, according to the organization.

**Aviation: D**
Airports face a $42 billion funding gap between 2016 and 2025, according to the ASCE. Reuters/Lucas Jackson

Airports and air traffic control systems are in serious need of an update, the report found.

With some two million people per day coming through US airports, congestion is becoming a major problem. In fact, the report estimates that 24 out of the top 30 airports in the US could soon hit "Thanksgiving-peak traffic volume" one day a week.
**Bridges: C+**

There are about 56,000 structurally deficient bridges in the US, according to the latest data from the Federal Highway Administration. Matt Rourke/AP Photo

US bridges are aging.

Out of the 614,387 bridges in the US, more than 200,000 are more than 50 years old.
The report estimates it would cost some $123 billion just to fix the bridges in the US.
Officials inspect Oroville Dam's crippled spillway Tuesday, Feb. 28, 2017, in Oroville, Calif. Rich Pedroncelli/AP Photo

According to the report, there were some 15,500 high-hazard dams in the US in 2016.

Drinking Water: D
Los Angeles Department of Water and Power crews work to repair a juncture of a water main which ruptured near the University of California, Los Angeles on Sunset Boulevard. The pipe was 93 years old.  Damian Dovarganes/AP Photo

The pipes that carry America's drinking water are in critical need of attention.

According to the report, many of the one million pipes have been in use for almost 100 years. The aging system makes water breaks more prevalent, which means there are about two trillion gallons of treated water lost each year.

Energy: D+
Most power lines in the US were built in the 1950s and 1960s. shes_so_high/Flickr

Power interruptions could become more common if more attention isn't given to the US energy system, according to the report.

The majority of the transmission and distribution lines were built in the mid-20th century and have a life expectancy of about 50 years, meaning that they are already outdated.

Between 2016 to 2025, there's an investment gap of about $177 billion for infrastructure that supports electricity, like power plants and power lines.

Hazardous Waste: D+
About 22 million acres of land are used for hazardous waste programs. Susan Montoya Bryan/ AP Photo

The report describes the US infrastructure for hazardous waste as "generally adequate," however, it states that more than half of the US population lives within three miles of one of these waste sites.

Inland Waterways: D
Inland waterways help transport goods to different parts of the country. But the infrastructure that supports these waterways, like dams and locks, are getting old and causing delays.

In fact, about 50% of vessels using these waterways experience delays, according to the report.
Levees play a critical role in protecting communities from flood waters, but they aren't currently getting the attention they need.

During the next 10 years, there's a need for $80 billion to improve these structures, according to the report.

Parks and Recreation: D+
National parks in the US are in need of billions of dollars for repairs.  Thomson Reuters

The infrastructure that supports local parks and national parks needs improvement.

Roads, bridges, parking areas, trails, and campsites are just a few of the things that need repairs in our nation's parks.

The National Park Service even estimates that it reached $11.9 billion in deferred maintenance costs in 2015, according to the report.

Ports: C+
There are 926 ports in the US. These ports are responsible for almost $5 trillion in economic activity, according to the ASCE.  

David J. Phillip/AP Photo

Most overseas trade comes through US ports. And while our ports have a higher grade than most other infrastructure categories, there's still room for improvement.

For example, as ships get bigger, ports will need to make deeper navigation channels. Also, as congestion in ports increases, the freight network that takes shipments to and from ports needs to be improved so that goods are transferred more efficiently with fewer delays.

**Rail: B**
More than $25 billion is needed to repair and grow the railway system in the US. Getty Images/Tim Boyle

While freight railroads are in relatively good shape, passenger rail could use some upgrades, especially in the Northeast Corridor.

According to the report, the average age of Amtrak's backlogged projects in the Northeast Corridor is 111 years old. This includes bridges, tunnels, and a viaduct.
Crumbling roads cost Americans about $160 billion in wasted fuel in 2014, according to the report. Mario Anzuoni/Reuters
Roads in the US are in bad shape.

About 32% of urban roads and 14% of rural roads are in poor condition.

In fact, there's a $836 billion backlog of unmet capital needed to fix the highways and bridges in the US, according to a report by the US Department of Transportation.

**Schools: D+**

*Public schools don’t have the money they need to maintain their buildings.*  Scott Olson/Getty Images
Schools in the US are not getting the funding they need to maintain public school buildings.

About 24% of these buildings are in fair or poor condition, according to the report.

**Solid Waste: C+**

*Americans generated some 258 million tons of waste in 2014.*  Shannon Stapleton/Reuters

While municipal solid waste systems are mostly in fair condition, the ASCE recommends increased promotion of developing better systems for recycling.
Transit: D-
According to the ASCE, only 51% of US households can travel to a grocery store in their area by using public transportation. Flickr / MTAPhotos

Public transit is being used more and more, but it remains severely underfunded.

According to the report, it would cost about $90 billion to fix the backlog of transit system projects and that cost is estimated to grow to $122 billion by 2032.

Wastewater: D+
The demand for more water treatment plants is expected to grow by 23% over the next 15 years.  Wikimedia Commons

Currently, there are about 15,000 wastewater treatment plants in the US, but it's estimated we will need 532 new systems by 2032, which means we need to be investing more in wastewater infrastructure now.

The US needs to invest about $271 billion in the US wastewater infrastructure over the next 25 years, according to the report.