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SHIP-TO-SHORE FUK STS CRANES

STS FEATURES

Advanced technology: Adopting ToPDOWN full 3D parametric design, automatic finite element analysis based on shell elements, virtual simulation and virtual-reality test fusion technology.

parametric design, automatic finite element analysis based on shell element, virtual simulation and virtual-real test fusion technology.

Verification technology: FUKE Marine has a powerful test and verification system, and the independently developed key components, control systems and automation subsystems have reached the leading level in the industry.



ADVANCED TECHNOLOGIES

High Efficiency, High Reliability, High Safety & Durability

High efficiency: FUKE STS spreader adopts high rigidity and high stability structure, large flow rate and high efficiency tilting system, which makes the spreader work accurately; ergonomic cab design and anti-vibration design make the operator get the best comfort while realizing high efficiency operation.

High reliability: FUKE configured spreader adopts special anti-impact and anti-loosening design, which makes the spreader have a low failure rate; the electrical components adopt standardized installation process, which solves the problem of declining sealing performance caused by on-site installation and improves the reliability of the electrical components. The front and rear beam connections adopt enhanced anchoring high precision manufacturing process, which reduces the vibration, impact and noise of the lintel during installation and improves the reliability of the STS.

High Safety: FUKE STS is designed and manufactured to meet the industry's highest safety requirements. The front beam access grille adopts embedded fall prevention design, and the floodlights are equipped with fall prevention chain, which is convenient for maintenance personnel to maintain and inspect, and greatly reduces the occurrence of accidents of falling objects from height.

High durability: FUKE STS is made of high-quality steel from world-renowned brands. The steel structure is analyzed by shell cell finite element analysis, and the local structure is calculated by solid cell finite element calculation, which reduces stress concentration.





REMOTE CONTROL OVERVIEW

FULL OPERATING MODES: remote manual/semi-automatic/landside full-automatic three operating modes to achieve the same or even better operating performance as the local mode

HIGH OVERALL EFFICIENCY: the comprehensive operation efficiency of the seaport can reach 28-30MOV/H, and the inland water terminal can be running at 24-26MOV/H

STABLE AUTOMATIC LOADING: the land-side horizontal transport equipment can achieve a one-button automatic loading with success rate of >95%

EXCELLENT PATH CONTROL: remote manual operation can be activated below the seaside safety height. normal operation can run automatically on the optimal path

AUTOMATION FEATURES

FAST RUNNING SPEED: the maximum steady-state speed of automatic anti-sway exceeds 90% of the full speed of the trolley, and the automatic anti-twist land-side automatic container setting time is within 25 seconds

ACCURATE TERMINAL TRUCK POSITIONING: multi-lane concurrent operation, can accurately detect the distance between multi-lane double container locks

MODULAR DESIGN: TCS system adopts modular design, the coupling degree of each functional module is low, making it stable and easy to expand

ULTRA-HIGH RELIABILITY: key systems adopt redundant technology and de-escalate emergency use to ensure the safety and effectiveness of the control system

ADVANTAGES OF STS AUTOMATION SUBSYSTEM

03

Terminal Truck Positioning System

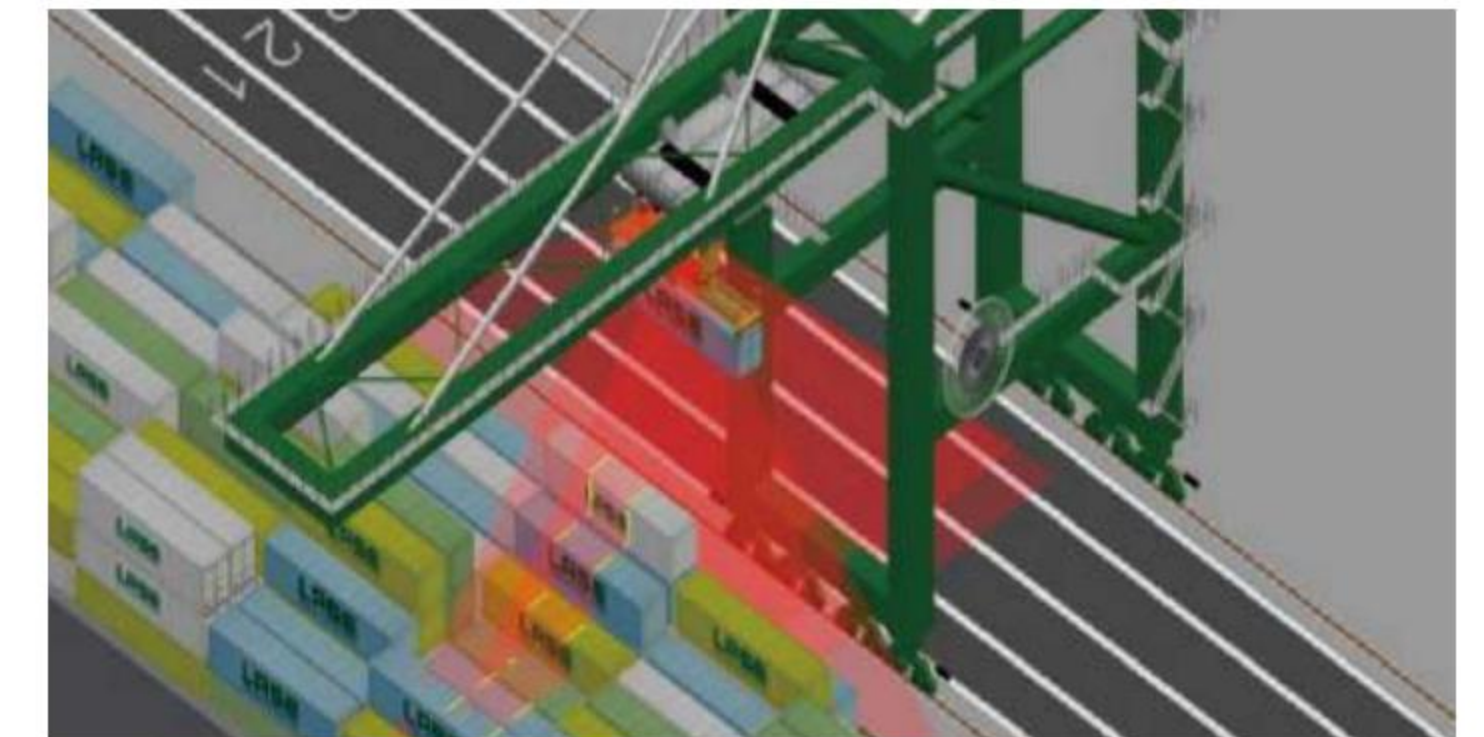
- The positioning accuracy of the cart
- Direction is better than $\pm 50\text{mm}$
The positioning accuracy of the trolley
- Direction is better than $\pm 50\text{mm}$
Yaw angle measurement accuracy
- Better than $\pm 0.2^\circ$
Measurement time $\leq 2\text{s}$



04

Ship Scanning System

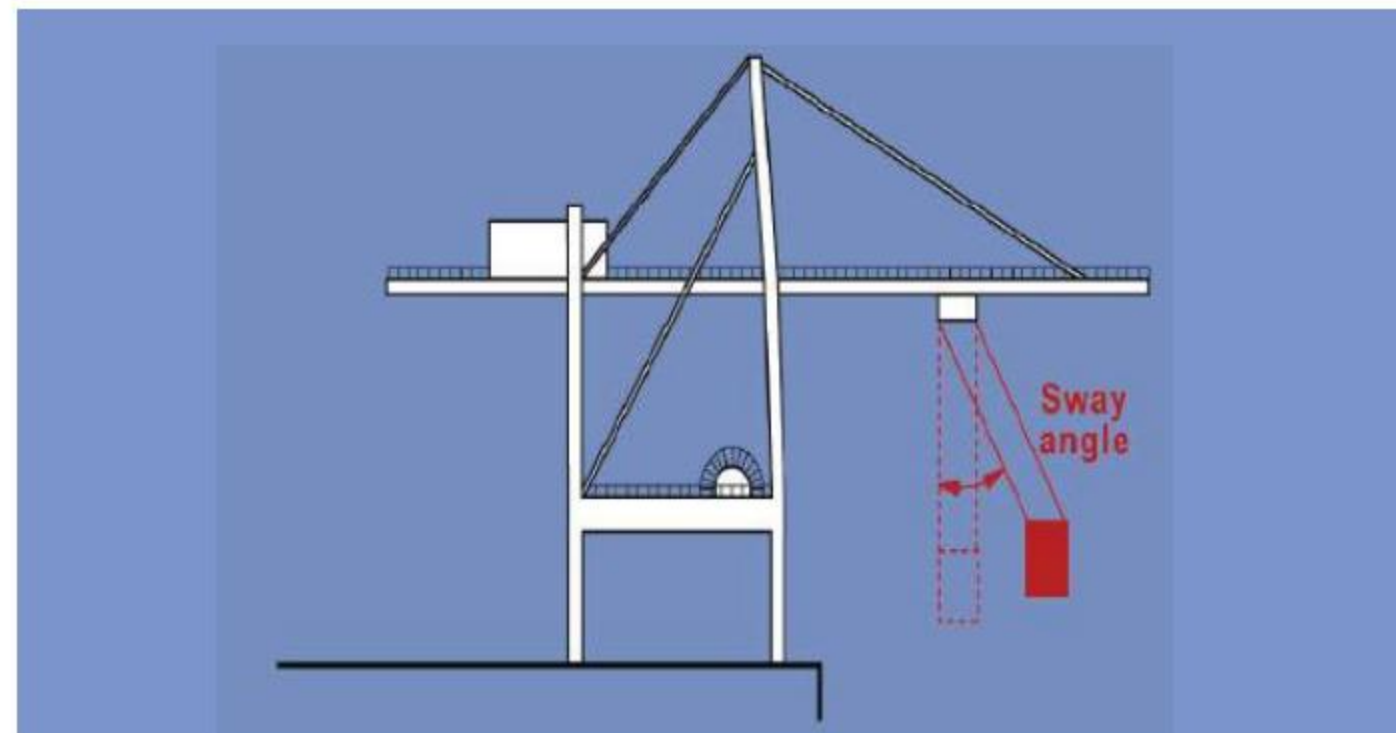
- Detection accuracy is not less than $\pm 80\text{mm}$
- Realize obstacle avoidance and optimize container operation path



01

Spreader Automatic Anti-Sway System

- Non-linear optimization method to achieve fast anti-sway operation, the maximum speed is close to 100% rated speed
- Optimal safe running path
- Swing angle of the spreader $< 0.5^\circ$



05

Landside Automatic Landing Technology

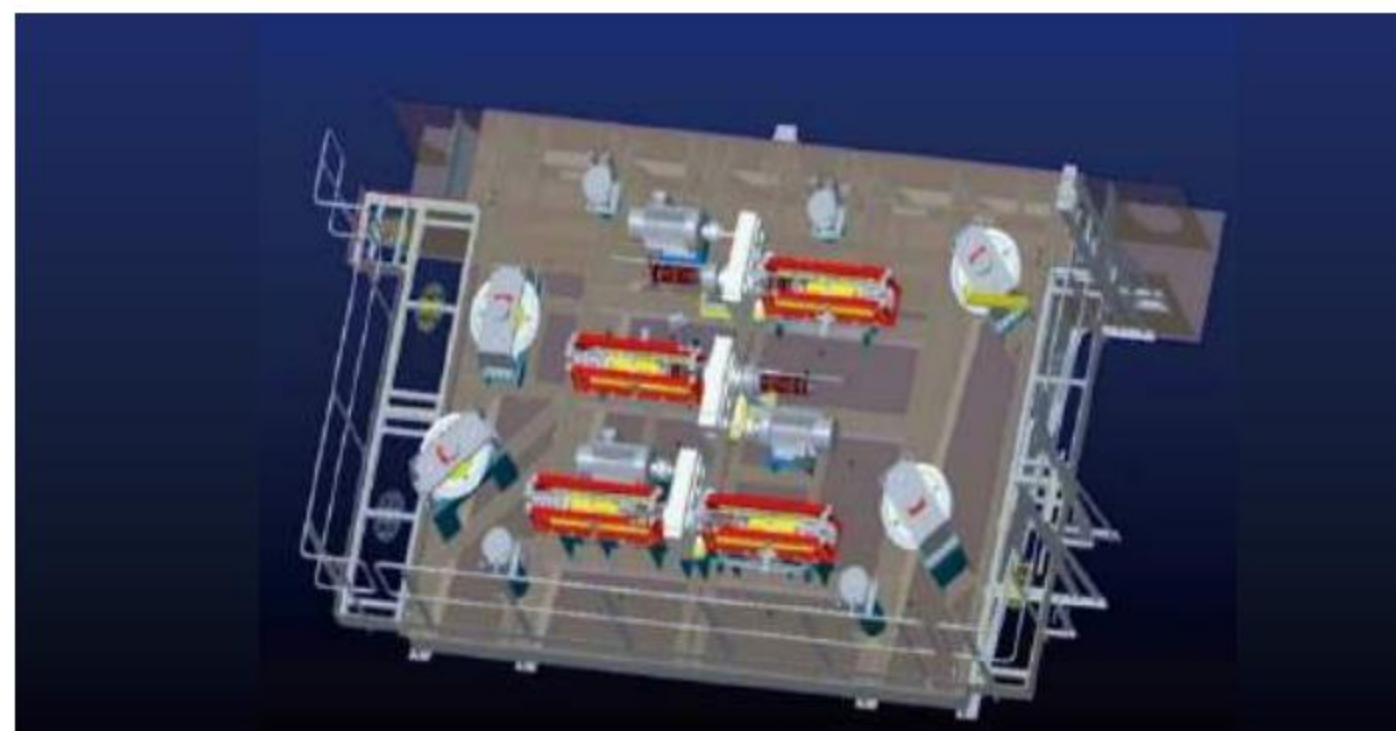
- Optimal control method
Spreader positioning $< \pm 50\text{mm}$
- Positioning adjustment time $< 10\text{s}$
- Dynamic pairing of terminal trucks, safe protection of the containers



02

Spreader Automatic Anti-Twist System

- Anti-twist control success rate $\geq 95\%$
- Rotation angle convergence time $\leq 25\text{s}$
- Steady-state error of rotation angle $\pm 0.3^\circ$



06

Intelligent Tally System

- Container number recognition rate $\geq 98\%$
- Container door direction recognition rate $\geq 98\%$
- Recognition rate of truck number $\geq 98\%$
- The capture rate of the damaged picture of the container is $\geq 99\%$
- Hatch cover recognition rate $\geq 99\%$



MANUFACTURING STRENGTH



01

Blanking Machine Capacity

Equipped with 2 automatic sorting lines, slitting robot workstation, edge milling machine, bending machine and other 100+ sets of high-precision equipment, with a monthly production capacity of 8,000 tons of steel plate preparation.



02

Welding and Coating Capabilities

Equipped with multiple automatic welding stations/lines; it can realize the internalization of large pieces of splicing, the internalization of large pieces of paint, and the automation and baking of small pieces of paint to ensure the welding and paint quality of steel structures.



03

Assembly and Debugging

Covering an area of 2.67 km², it has built 10+ large-scale workshops, with a workshop area of 500,000+ sqm and an outfield of 800,000+ sqm. It has an annual output of 50+ sets of STS and 200+ units of RTG/RMG.



UPGRADES AND REFURBISHMENT

SANY Marine has been actively participating in the upgrading and transformation of container terminals. Relying on **FUKE** Group's strong technical and manufacturing capabilities, SANY Marine has carried out services such as heightening and lengthening STS, automatic transformation, relocation and maintenance.

- **STS HEIGHTENING AND LENGTHENING**

Applicable to modern ships (super Panamax ships), improve container turnover efficiency and save costs

- **PORT EQUIPMENT RELOCATION AND DISMANTLING**

Meet the layout and planning of the terminal, increase terminal work efficiency, recycle used parts

- For large-scale renovation projects in South China and even in Southeast Asia, the equipment can be transported away from the customer's site and carried out at the Zhuhai base of **FUKE** Marine without occupying the space at customer's berth and site, minimizing the impact on the customer's terminal operation and reducing the customer's operation risk.

- **EQUIPMENT AUTOMATION TRANSFORMATION**

The intelligence of the terminal or equipment facilitates terminal management, reduces costs, increases equipment operation efficiency and reduces the failure rate

- **PORT EQUIPMENT UPGRADES AND REFURBISHMENT**

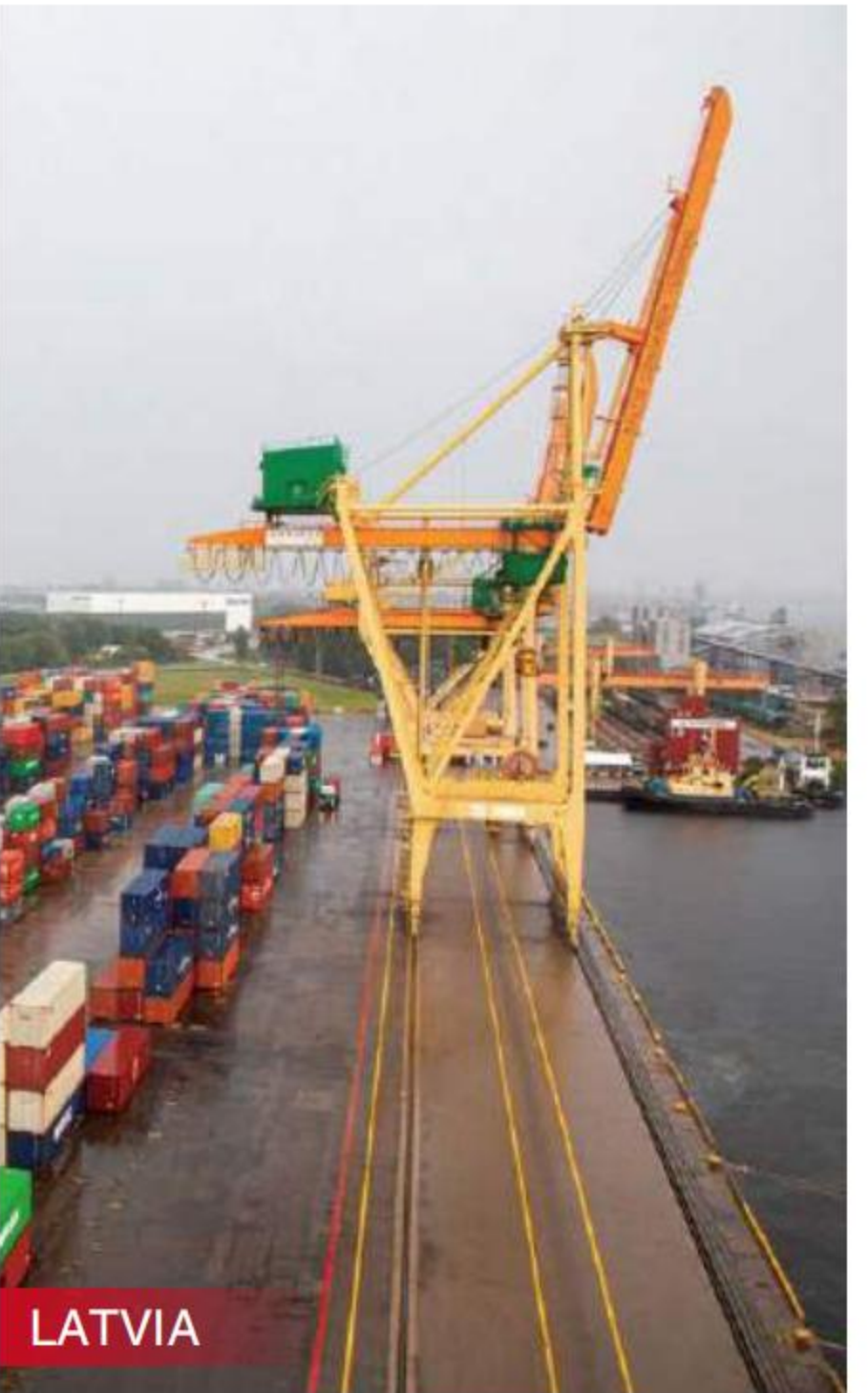
Assess equipment life and provide professional advice, restore equipment functions, extend equipment life, reduce equipment failure rates, and reduce equipment maintenance costs



THE MAIN PARAMETERS

Model	FK-8070	FK-7065	FK-6565	FK-6540	FK-6562	FK-6128	FK-6046	FK-5048	FK-5058	FK-5039	FK-5054
Cases	China	Hong Kong SAR, China	China/Indonesia/Thailand/EU	China/Indonesia/Thailand	Thailand/Indonesia/Philippines	China/Thailand	Hong Kong SAR, China	Costa Rica/South Korea	Philippines/Malaysia	South Korea	India
Rated lifting capacity under spreader (t)	80	70	65	65	65	61	60	50	50	50	50
Rated lifting capacity under hook beam (t)	100	70	75	76	75	/	70	57	60	75	55
Out reach (m)	70	65	65	40	62	28	48.5	48	58	39	54
Back reach (m)	22	12.05	18	12	15	8.5	11.65	15	15	12	15
Rail span (m)	35	24.384	30	16	24.4	16	24.384	19.5	16	30.5	18
Lifting height above rail (m)	52	46	46	35	46	15	42	33	33	30	36
Lifting height below rail (m)	22	17	20	14	15	20	17	14	18	18	20
Net Width between legs (m)	≥ 18.3	≥ 18.3	≥ 18.3	≥ 18	≥ 18.5	≥ 17	≥ 18.3	≥ 16.18	≥ 16	≥ 18.3	≥ 18
Overall width (m)	≤ 27	≤ 27	≤ 27	≤ 27	≤ 27	≤ 28	≤ 27	≤ 30	≤ 27	≤ 27	≤ 27
Lifting speed (full load) (m/min)	90	65	75	50	80	50	70	62.5	75	70	90
Lifting speed (empty load) (m/min)	180	150	170	120	160	120	150	125	150	170	180
Trolley speed (m/min)	240	240	210	180	240	150	210	180	210	110	240
Gantry speed (m/min)	45	50	45	45	45	30	45	45	45	45	45
Single boom lifting time (min)	≤ 5	≤ 6	≤ 6	≤ 5	≤ 6	/	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5
Quantity of gantry wheels	4×10	4×8	4×10	4×12	4×12	4×12	4×8	4×12	4×12	4×8	4×14
Net Clearance of portal beam (m)	≥ 13.5	≥ 14	≥ 6	≥ 13	≥ 6	≥ 9.5	≥ 16.3	≥ 14	≥ 8	≥ 11	≥ 12.5

SUCCESSFUL CASES



SUCCESSFUL CASES



ANHUI, CHINA



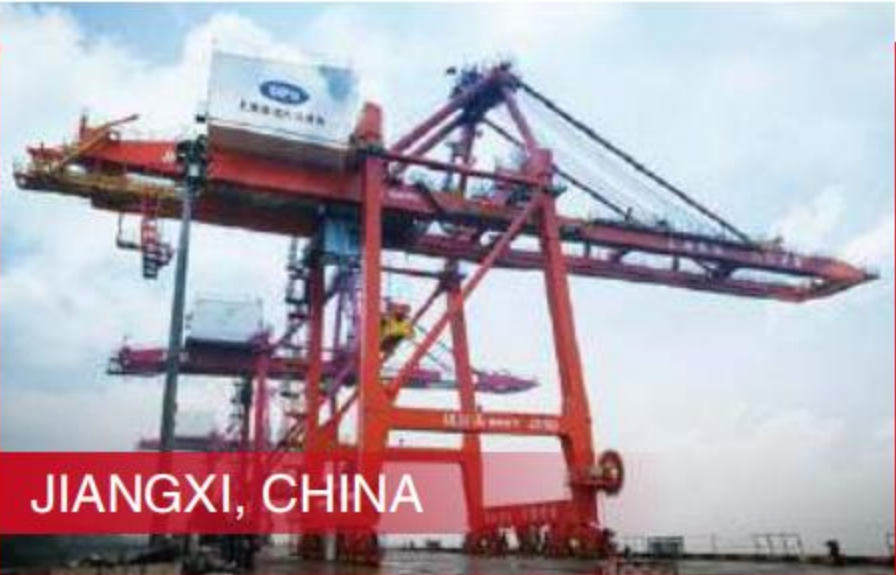
HUBEI, CHINA



GUANGDONG, CHINA



HONG KONG SAR, CHINA



JIANGXI, CHINA



HUNAN, CHINA



HUBEI, CHINA



ANHUI, CHINA



YIDU, CHINA



LIAONING, CHINA



GUANGDONG, CHINA



HONG KONG SAR, CHINA



WUHAN, CHINA



WUHAN, CHINA