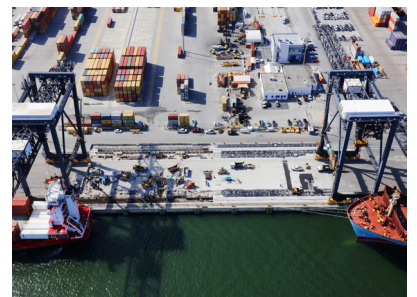
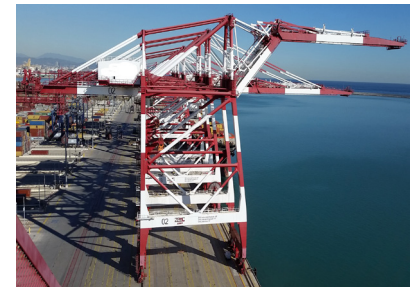


MECHANICAL AND ELECTRICAL ENGINEERING SERVICES

Liftech Consultants Inc.



Liftech
LIFTECH CONSULTANTS INC.

Liftech Consultants Inc. is a consulting engineering firm, founded in 1964, with special expertise in the design and procurement of dockside container handling cranes and other complex structures. Our experience includes design for wharves and wharf structures, heavy lift structures, buildings, container yard structures, and container handling equipment. Liftech's merger with McKay International Engineers in 2022 allows us to provide expert in-house structural, mechanical, and electrical engineering services. Our national and international clients include owners, engineers, operators, manufacturers, riggers, and maintenance firms.

Design Philosophy

We design functional, environmentally sound structures and equipment for the most economical total cost of ownership. We believe in converting natural resources and labor into usable facilities and machines that are highly functional and aesthetic. We take a project-first approach and work with owners, engineers, contractors, and inspection firms to ensure successful projects for all parties.

Mechanical Designs for Container Handling Equipment

We design custom mechanical systems for many different applications at marine terminals and similar locations around the world. We have worked with many of the world's well-known crane manufacturers to develop concepts, review details, and test and troubleshoot designs.

For IMPSA, we developed a unique arrangement for the trim-list-skew-sag system on their ultralight STS crane concept.

For Paceco/MES, we helped investigate various dual-hoist-tandem-40 (DHT40) concepts.

For ZPMC, we helped develop and refine the DHT40 crane concept including the ball-and-clamp connection between the headblocks which is now their standard. We also developed the modified headblock twistlock design and the unified trim-list-skew-sag machinery, both of which are now their standard on hundreds of cranes.

We have also developed many custom concepts to satisfy our clients' unique needs. Some of these have seen widespread adaptation in container cranes over the years.

Developed the hydraulic antisway system including separating sheaves on the trolley.

Developed the articulating boom reeving and linkage arrangement for locations with moderate air-draft restrictions that do not require a full low profile crane design.

Worked with Ceres Amsterdam to develop the unique ship-in-a-slip concept where vessels are worked on both sides by mostly traditional STS cranes.

Worked with VPA to develop the unique elevating girder crane allowing the entire upper works of an STS crane to be adjusted to five discrete operating locations to minimize cycle times when working smaller vessels.

Worked with APMT to develop the FastNet concept where a very high density of cranes could work a single vessel.

Mechanical and Electrical Designs for Custom Heavy Machinery and Facilities

Our expertise in heavy material handling machinery and electrical systems allows us to provide meaningful design input into a wide range of equipment types and the facilities that support them. This includes equipment such as heavy land based and floating cranes, dry and liquid bulk material handling systems, shipyard revolving and gantry cranes, goliath cranes, mining equipment, horizontal transport systems, shore power systems, standby power systems, electrical power distribution, and automatic fail-over systems.

We often assist with electrical system analysis including power demand simulations, voltage drop studies, power quality analysis, and circuit protection coordination studies. We work with owners, terminal operators, port authorities, and specialists on energy conservation, clean power, and zero emissions plans. We are experienced in repowering, hybrid-electric, fuel cell, and full electric conversions for diesel powered equipment.

Equipment Procurement

We provide equipment procurement assistance to port authorities, shipping lines, terminal operators, construction companies, and equipment owners. Our services range from preparing specifications to complete assistance from the initial needs assessment through final acceptance and warranty, including concept design, crane load studies, technical specifications, bid evaluation, comprehensive design review, quality assurance audits, fabrication oversight, testing and commissioning, and warranty and maintenance support services.

Liftech created the first comprehensive technical specifications for STS container cranes and has continuously improved them to remain the industry-leading specifications in use today. We have written specifications to assist in procuring hundreds of container cranes and other specialty equipment. We work with the crane owner to develop site-specific and other requirements tailored to the owner's needs. Our specifications include provisions for structural, mechanical, electrical, controls, automation, reliability, manufacturing, documentation, testing, seismic performance, materials, coatings, and many other requirements.

Equipment Assessment, Maintenance, Modification, and Upgrades

We help clients by assessing heavy equipment and providing recommendations for maintenance, modification, or purchase. Our services include condition surveys, useful life assessment, reliability studies, maintenance and inspection programs, repair procedures, and modification designs. On container handling cranes, we design modifications for improving reliability, increasing the lift height, extending the outreach or backreach, increasing capacity, changing rail span, improving maintenance, and modernizing with drive, controls, and machinery upgrades. We carefully design systems and procedures used to raise cranes while dramatically decreasing the out-of-service time for the crane.

Liftech helps clients resolve persistent maintenance and reliability issues through improved designs and modifications of existing equipment. Using a combination of experience, analysis, testing, and known good designs, we can help identify the root cause of failures and design practical modifications to reduce or eliminate causes of downtime and ease maintenance burdens.

Equipment Relocation

We provide engineering for transporting heavy equipment, oil processing modules, offshore oil structure components, bridges, and other miscellaneous equipment on barges and ships. Our services include, evaluating equipment suitability for the new location and designing needed modifications, developing or reviewing the procedures for moving the object onto and off of the transport vessel, designing attachments to the vessel, designing required reinforcing for the object and/or vessel structures, reviewing the object and vessel structures for voyage forces, and reviewing the wharf (or wharves) for the crane transport loading.

Repair, Failure Analysis, and Expert Witness

We are often called upon for consultations for damaged machines and accident investigations. Liftech uses our industry leading expert knowledge, familiarity with a wide range of designs, and expert analysis to provide clients with insight into the root cause of failures and for designing repairs and modifications to prevent reoccurrences.

Our repair services include assessing the situation, designing temporary securing, designing repairs, and reviewing the repair work. Repair projects typically include damage caused by fatigue, crane-to-crane and vessel-to-crane collisions, boom hoist failures, snag, storm wind, tornadoes, earthquakes, and others. Repairs typically involve replacing members, strengthening local areas, and heat straightening.

We are occasionally retained as an expert witness to assess accidents, evaluate repair estimates, and help resolve disputes.

Other Machinery

We provide design and review services for a variety of other machines that often require an understanding of mechanics and unique project circumstances. We are well suited to work on these designs due to our familiarity with dynamically loaded structures, good fatigue details, robust and low maintenance machinery and components, and reliable electrical and control systems that meet the project needs while minimizing the need for unique maintenance skills. We have designed unique solutions for medium voltage power trench maintenance, specialized gangplank winch systems, ultra compact heavy mover machines, and many others.

Advanced Analysis Software

In addition to high proficiency with industry standard 3D modeling and FEA software such as Inventor and ANSYS, Liftech has developed proprietary programs and routines for the design and analysis of quay cranes and other container handling equipment. These custom programs are capable of quickly designing or analyzing cranes to various international standards.

More Information

For more information, please visit the Liftech website at www.Liftech.net or call us at +1-510-832-5606.

			Mechanical and Electrical Services						
User/Client Name Project Location	Start Year	Description	Mechanical Design	Electrical Design	Procurement	Assessment	Modification	Testing & Commissioning	Failure Analysis
SSA Oakland, California	2024	RTG Crane Trolley Damage Repair	✓			✓			✓
Everport Terminal Services Oakland, California	2024	Terminal Infrastructure Testing and Reconfiguration		✓				✓	
TraPac Los Angeles, California	2024	Crane Relocation Study	✓	✓		✓			
Virginia Port Authority Norfolk, Virginia	2023	ZPMC Low Profile STS Cranes	✓	✓	✓				
Swinerton San Francisco, California	2023	Jib Crane Evaluation, Repair, and Uprating	✓	✓		✓	✓		
Reyes Larison JV California	2023	Derrick Barge Crane Modifications for Pile Driving	✓				✓		
Ceres Terminals/SSA Houston, Texas Baltimore, Maryland	2023	Hoist Lift Truck Forklift Mast Modifications	✓			✓	✓		✓
Confidential	2023	SANY Dual Trolley STS Cranes	✓		✓				
Port of Houston Authority Houston, Texas	2023	STS Cranes			✓				
SSIT Vietnam	2023	ZPMC STS Cranes	✓		✓				
Matson Dutch Harbor, Alaska Anchorage, Alaska	2023	STS Cranes	✓	✓	✓				
Massport/TranSystems Boston, Massachusetts	2023	Konecranes RTG Conversion to Diesel-Electric Hybrid	✓	✓	✓		✓	✓	
Port of Alaska/Jacobs Anchorage, Alaska	2023	Mobile Hose Tower Concept Design	✓	✓					
ZPMC Los Angeles, California	2023	City of Los Angeles Electrical Plan Check Permit		✓					
Mott MacDonald Portland, Oregon	2023	Crane Raise	✓				✓		

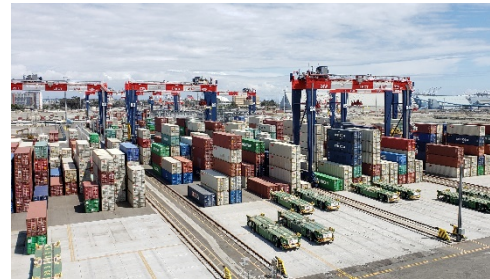
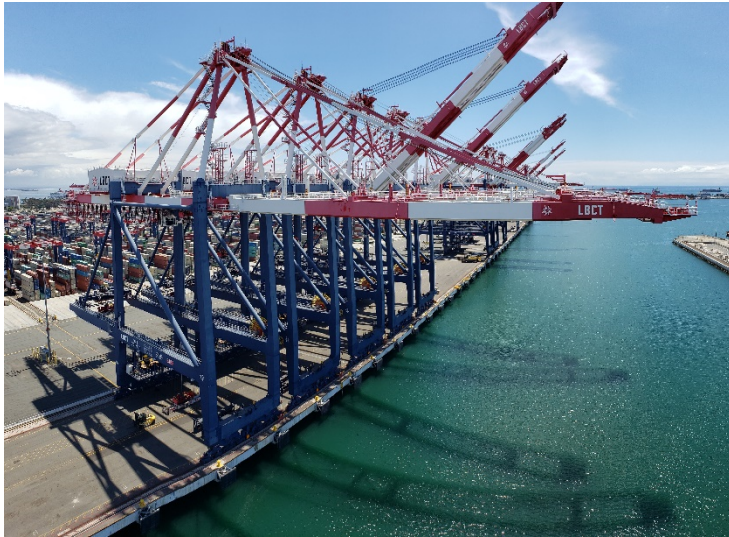
			Mechanical and Electrical Services						
User/Client Name	Start Year	Description	Mechanical Design	Electrical Design	Procurement	Assessment	Modification	Testing & Commissioning	Failure Analysis
POLB Pier J/P2S Long Beach, California	2022	Zero Emissions Impact Study	✓	✓		✓			
SSAM Manzanillo, Mexico	2022	RTG Conversion to RMG	✓				✓		
Maher Terminals Elizabeth, New Jersey	2022	Forestay Repairs	✓				✓		✓
Power Engineering San Francisco Area, California	2022	Boat Lift Repair and Modifications	✓			✓	✓		✓
Hongkong Int'l. Terminals Hong Kong	2022	ZPMC STS Crane Uprate Feasibility Study	✓				✓		
DOC Manufacturing San Francisco, California	2022	High Rise Construction Lift Design Evaluation	✓						
Modern Terminals Limited Hong Kong	2022	Noell STS Crane Main Hoist Reducer Replacement	✓				✓		
Port Everglades Broward County, Florida	2021	ZPMC Low Profile STS Cranes	✓	✓	✓			✓	
Port of Long Beach Long Beach, California	2021	Condition Assessment of Bulk Shiploader	✓	✓		✓			
Confidential	2021	SANY STS Cranes	✓		✓				
Evergreen Terminal Services Oakland, California	2021	ZPMC STS Crane Raises	✓	✓			✓		
Confidential	2021	Design Review of Revolving Crane	✓	✓					
SSA Atlantic Jacksonville Container Terminal Jacksonville, Florida	2021	ZPMC STS Cranes			✓				
Manzanillo Int'l. Terminal Panama	2021	ZPMC STS Cranes			✓				
San Antonio Terminal Internacional, SA San Antonio, Chile	2021	ZPMC STS Cranes			✓				
Maher Terminals Elizabeth, New Jersey	2021	Liebherr STS Cranes	✓		✓				

User/Client Name Project Location	Start Year	Description	Mechanical and Electrical Services						
			Mechanical Design	Electrical Design	Procurement	Assessment	Modification	Testing & Commissioning	Failure Analysis
Confidential	2021	Grab Bucket Unloader Boom Damage Assessment and Repair	✓			✓	✓		✓
Port Authority of Guam Guam	2020	STS Cranes	✓	✓	✓				
Maher Terminals Elizabeth, New Jersey	2020	Liebherr STS Cranes	✓		✓				
Everport Terminal Services Tacoma, Washington	2019	ZPMC STS Crane Raises	✓				✓		
LBCT Long Beach, California	2019	ZPMC Intermodal Yard Crane Failure Investigation and Repairs	✓			✓	✓		✓
Confidential	2019	HSHI Dual Trolley STS Cranes	✓		✓				
Everport Terminal Services Oakland, California	2019	ZPMC STS Cranes	✓	✓	✓				
Everport Terminal Services Los Angeles, California	2019	ZPMC STS Cranes	✓	✓	✓				
Evergreen Kaohsiung, Taiwan	2019	ZPMC STS Cranes	✓	✓	✓				
Confidential	2019	ZPMC Low Profile STS Crane	✓	✓	✓			✓	
Freeport Container Port Freeport, Grand Bahama	2018	12 MW Standby Power Plant	✓	✓					
National Park Service Channel Islands, California	2017	Custom Gangway Machinery at Anacapa and Scorpion Pier	✓	✓	✓			✓	
Confidential	2017	IMPISA STS Cranes	✓	✓	✓				
SSA Manzanillo Manzanillo, Mexico	2016	ZPMC STS Cranes	✓		✓				
Total Terminals Inc. Long Beach, California	2015	ZPMC STS Crane Raises	✓	✓			✓	✓	
Port of Tacoma Tacoma, Washington	2015	ZPMC STS Cranes	✓	✓	✓			✓	

User/Client Name Project Location	Start Year	Description	Mechanical and Electrical Services						
			Mechanical Design	Electrical Design	Procurement	Assessment	Modification	Testing & Commissioning	Failure Analysis
Port Everglades Broward County, Florida	2014	Samsung STS Cranes Modernization	✓	✓		✓	✓	✓	
SSA Manzanillo Manzanillo, Mexico	2014	ZPMC STS Cranes	✓		✓				
San Antonio Terminal Int'l. San Antonio, Chile	2014	ZPMC STS Cranes	✓		✓				
Manzanillo Int'l. Terminal Panama	2014	ZPMC STS Cranes	✓		✓				
Maher Terminals Elizabeth, New Jersey	2014	Liebherr STS Cranes	✓		✓				
Port of Gulfport Gulfport, Mississippi	2014	ZPMC STS Cranes	✓		✓			✓	
SSA, Tuxpan Port Veracruz, Mexico	2014	ZPMC STS Cranes	✓		✓	✓			
Evergreen Kaohsiung, Taiwan	2013	ZPMC STS Cranes	✓		✓				
Evergreen Los Angeles, California	2013	ZPMC STS Cranes	✓		✓				
Confidential	2012	Alliance Machine Works Goliath Crane	✓			✓	✓		
LBCT/Moffatt & Nichol Long Beach, California	2011	ZPMC STS Cranes, ASCs, and IYCs for Automated Terminal	✓		✓				
Freeport Container Port Freeport, Bahamas	2011	Hyundai STS Cranes High Wind Event Failure Assessment	✓			✓			✓
Massport Boston, Massachusetts	2010	Kocks Low Profile STS Cranes Assessment, Modification, and Drive Upgrades	✓	✓		✓	✓	✓	
American Bridge Flour JV San Francisco, California	2008	ZPMC 1700t Shear Leg Barge Crane	✓	✓	✓			✓	

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Crane Procurement Long Beach Container Terminal Port of Long Beach, California

Long Beach Container Terminal (LBCT) is a state-of-the-art facility debuting an unprecedented level of crane and yard automation in the United States. The ship-to-shore operations are handled by 14 ZPMC automated cranes with dual-hoist tandem capability on the shore trolley and a transfer platform with a fully automated secondary trolley for landside handling. The yard is comprised of 74 automated stacking cranes (ASCs) and five intermodal yard cranes (IYCs).

Liftech worked with LBCT and Moffatt & Nichol to provide the technical specifications and design review services for the STS, ASC, and IYC crane procurements. Liftech's experience with dual hoist cranes, dual trolley cranes, automation projects throughout the world, and a long history with ZPMC procurements provided LBCT with the added level of confidence that is needed to complete the world-class terminal.

Reference:
Long Beach Container Terminal
Long Beach, California, USA

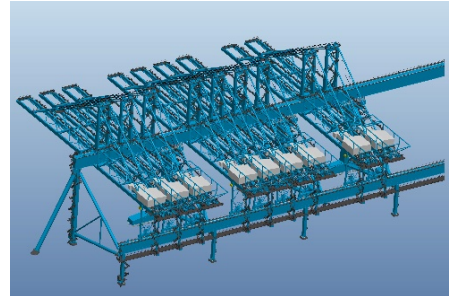
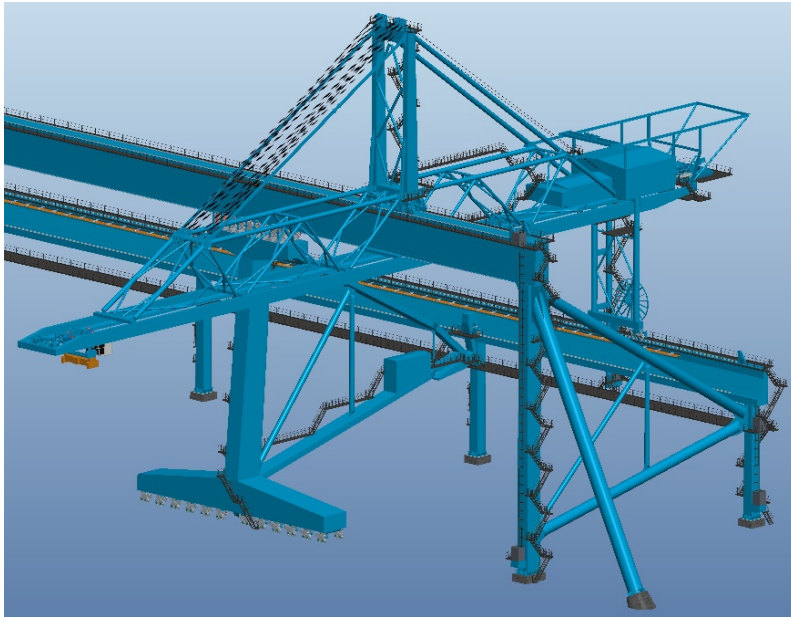


Container Crane Procurement Pier T, Port of Long Beach, California

The Port of Long Beach (POLB) purchased 14 STS cranes for their new wharf to service 22-wide vessels, noted as the largest US order for container cranes at the time.

Reference:
Port of Long Beach
Long Beach, California, USA

Liftech was retained by POLB for the duration of the procurement to provide engineering and project management services. Liftech provided turn-key procurement services from writing the technical specifications through acceptance testing and warranty support. Services included pre-bid meetings, request for bids and award, design review, coordinating third-party inspection services, and on-site manufacturing review. Liftech continued to support POLB and later Total Terminals International with maintenance and modifications as the cranes aged.



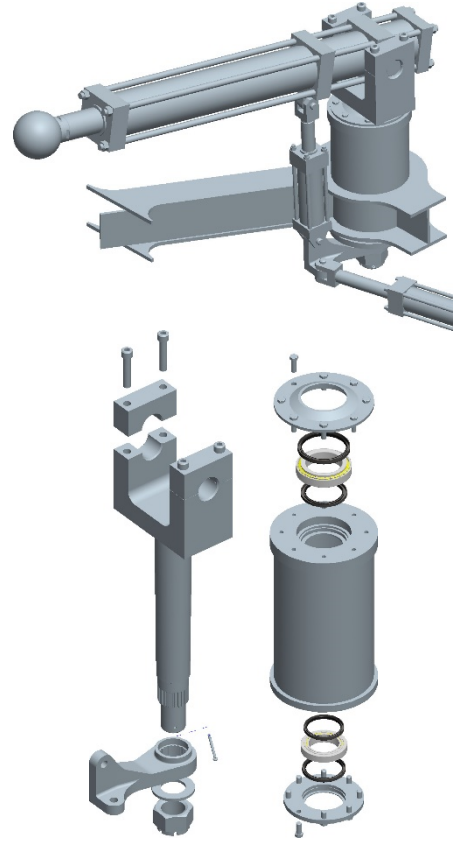
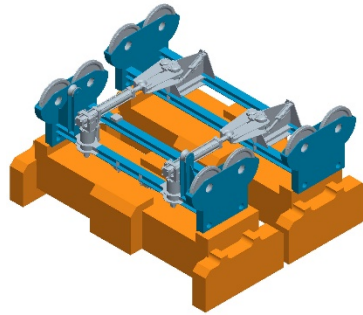
FastNet APM Terminals

Liftech worked with APM Terminals to conceptualize and design FastNet, a crane technology that enables STS gantry cranes to work seven out of eight adjacent bays of a large container ship. FastNet is estimated to deliver berth productivity of 450 moves an hour.

Liftech designed the structures and developed concepts for new mechanical components to make this unique design work. Structural designs included the cranes, waterside and landside elevated girders, fixed landside girder supports, and moveable waterside girder supports. Mechanical designs included new boom hinge concepts, methods for retracting and latching the landside catenary support trolley and trolley reeving, a new system for equalizing loads on the tower frame, and waterside crane gantry traveling wheels using wire ropes.

Liftech performed detailed 3D modeling and renderings in-house.

Reference:
APM Terminals



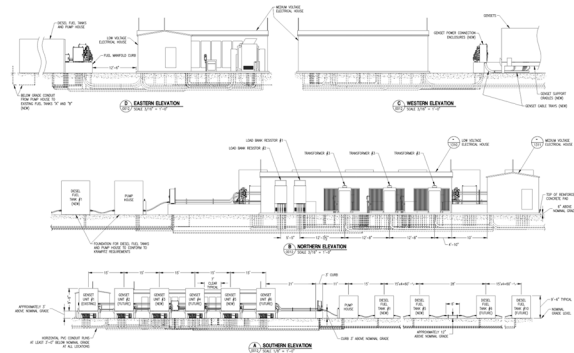
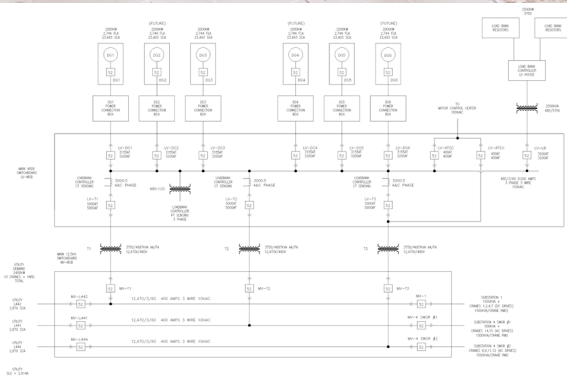
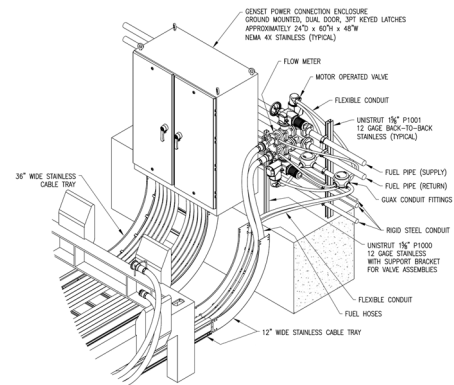
Dual Hoist Tandem 40 (DHT40) Design and Procurement Hutchison Ports, Yantian International Container Terminals Limited

Yantian International Container Terminals Limited (YICT) purchased eight DHT40 container cranes from ZPMC for expanding terminal operations. The cranes feature an 80 t hoist capacity and rank among the highest throughput capability in the world.

YICT retained Liftech for the mechanical engineering services pertaining to procurement. Services included specification development, pre-bid and bid evaluation services, design development with ZPMC, design review, manufacturing review, and testing and acceptance. Liftech worked closely with YICT and ZPMC on the development of hardware for reliable tandem 40 operation, including key areas such as headblock coupling and stowage.

Liftech also developed a rigorous crane testing procedure to validate the complex integration between hardware and software.

Reference:
Hutchison Ports
Kwai Chung, Hong Kong



12MW Standby Diesel Power Plant Design Freeport Container Port Freeport, Grand Bahama, The Bahamas

Liftech designed a complete 12MW diesel powered standby power plant for Freeport Container Port (FCP) to run the entire terminal in the event of widespread power failure on the island. Liftech designed and specified all mechanical and electrical aspects of the facility in-house including the medium voltage and low voltage switchgear and controls, fuel farm, pump house, electrical and fuel distribution systems and interconnects, fire suppression, transformers, and load back resistor system.

Key features of the standby power plant were the ability to swap in containerized 2MW diesel units using straddle carriers; quick disconnects for all fuel, electrical, and control connections; a 600,000 L (160,000 gallon) modular tank farm with automatic fueling control sufficient for ten days of full capacity run time; automatic fuel polishing with UV biocide, redundant filtering, and water separation for long diesel shelf life; ability to refuel and/or run off additional standard ISO containerized fuel tanks for extended run times; integration into FCP's existing yard fueling system to allow for regular daily draw down of tank farm; and full fire detection and suppression in all electrical rooms, each generator, and high capacity mist fire suppression in the outdoor fueling pad area.

Reference:
Freeport Container Port Limited
Freeport, Grand Bahama, The Bahamas



**STS Crane Procurement
Mississippi State Port Authority
Gulfport, Mississippi**

As part of their restoration program to recover from Hurricane Katrina, Gulfport constructed a new wharf and container terminal and purchased three new STS cranes from ZPMC.

Liftech was retained by Gulfport to provide turn-key engineering procurement services for the duration of the project. Liftech wrote the technical specifications, reviewed the submittal drawings and calculations, managed the manufacturing review including a local on-site inspection agency, lead the crane testing and commissioning, and provided warranty support.

Unique technical challenges included a modified gantry machinery and electrical design for flooding resilience and quick recovery.

Reference:
Mississippi State Port Authority at Gulfport
Gulfport, Mississippi, USA



Goliath Gantry Crane Evaluation and Procurement Newport News Shipbuilding, Newport News, Virginia

To support the anticipated critical lifts involved with refueling efforts at Newport News Shipyard, Huntington Ingalls Industries (HII) sought to ensure the reliability of the operation by modifying their existing goliath crane or procuring a new crane to replace the existing crane.

Reference:
Huntington Ingalls Industries
Newport News, Virginia, USA

Liftech was retained to author the technical specifications for the procurement and perform surveys and studies of the existing crane. The specifications were written to include provisions ensuring compliance with US Naval requirements. In addition, the nature of the anticipated cargo required additional redundancy and reliability characteristics to perform the lifts without interruption.



**Electrical Power Demand Study
Port Newark Container Terminal
Newark, New Jersey**

In preparation for the Panama Canal expansion, Port Newark Container Terminal (PNCT) expanded their container crane capabilities with a series of STS procurements. PNCT is planning an additional procurement for their wharf, which could bring their total STS fleet to 14.

Liftech worked with PNCT and CH2M Hill to conduct a study of anticipated electrical demand to support a total fleet of 14 STS cranes. Liftech conducted a comprehensive analysis of expected power demand using empirical data from existing cranes, establishing crane diversity factors, evaluating expected crane cycle times and container weights, and estimating power quality. The power study allowed PNCT to prepare their electrical infrastructure in advance of receiving additional cranes.

Reference:
Port Newark Container Terminal
Newark, New Jersey, USA

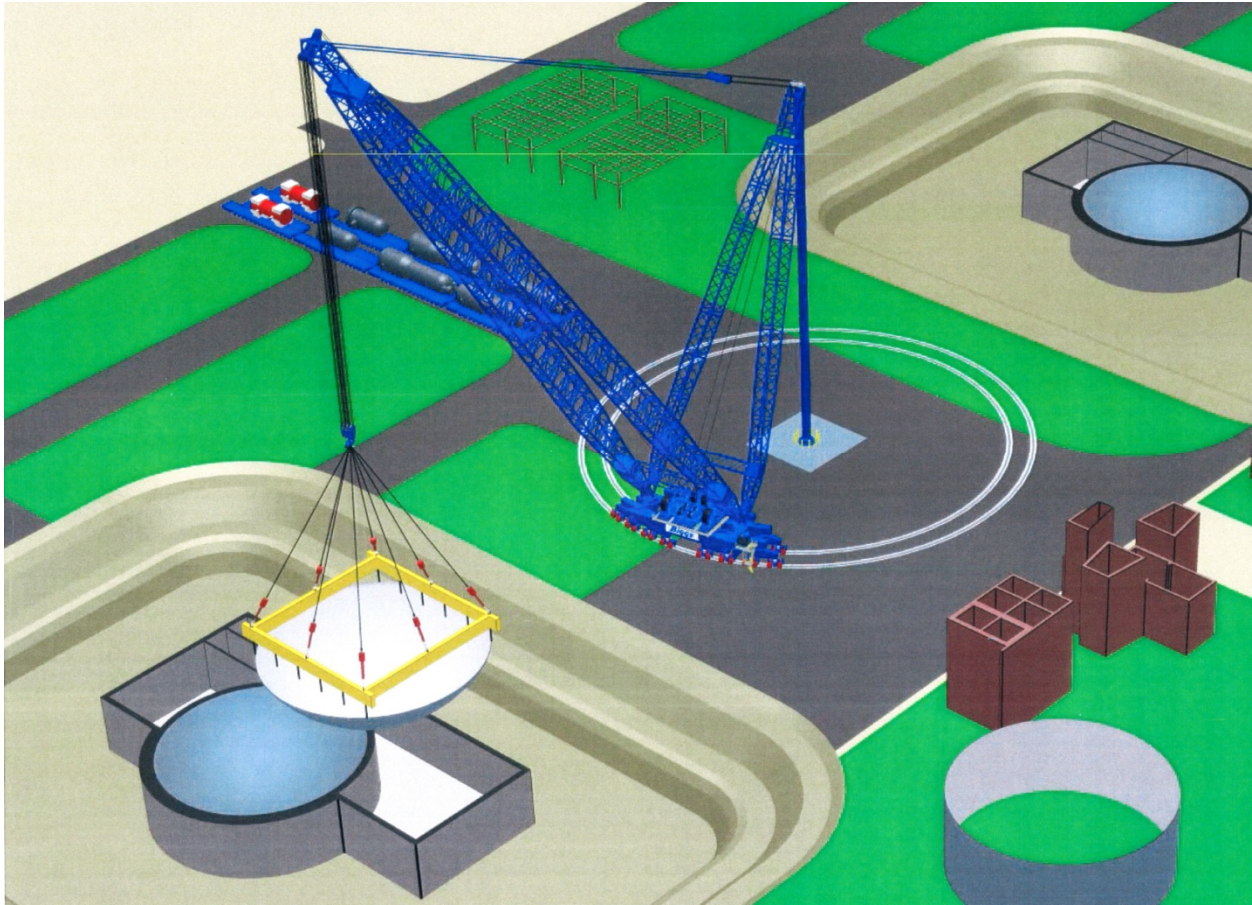


Triple Spreader for 480 Foot Rail SSA Marine, Stockton, California

To unload long span continuous length of railroad rail at their Stockton facility, SSA required a custom-built triple spreader assembly that is attached to synchronized shipboard cranes.

Reference:
SSA Marine
Stockton, California, USA

Liftech provided SSA with the complete spreader design, drawings for manufacture, and operating and maintenance documentation. The primary consideration in the design was its necessity to be stowed in identical, modular sections when not in use. Each spreader beam consists of two identical half beams that are fastened as a complex joint. The connection to the five-rail bundle is via twelve rail handlers that are actuated with an onboard pneumatic system.



**7,500 Ton A-frame Ring Derrick, 125D
Bigge Crane and Rigging
San Leandro, California**

Bigge developed the AFRD 125D to provide a solution for construction of new nuclear power plant sites in the United States. The high load capacity and extreme reach required unique machinery.

Reference:
Bigge Power Constructors
San Leandro, California, USA

Liftech worked with Bigge to provide peer review and alternate design investigation during the design phase, developing solutions for the unique functionality requirements. Liftech investigated alternate designs for the gantry wheel load equalization, crane leveling to compensate for varying foundation conditions, and bearing design for the vertical tension column. Liftech used detailed 3D models to develop detailed assembly and maintenance instructions.

Liftech's electrical engineers worked with Bigge to streamline and troubleshoot the field wiring and commissioning during initial setup.



**Failure Analysis – High Wind Event
Freeport Container Port Limited
Freeport, Grand Bahama, The Bahamas**

Unlike hurricanes, unexpected high wind events do not allow for special securing of cranes and rely on proper design and functioning of gantry braking systems. Unexpected and localized heavy winds caused several cranes to blow down the length of the wharf causing damage and toppling the end crane.

Liftech provided comprehensive recovery and failure analysis support to Freeport Container Port (FCP) allowing the safe securing of the cranes, a quick return to operations, and important insight into the cause of the failure and ways to mitigate damage in future unexpected high wind events during operations. Liftech performed a thorough forensic study and provided recommendations to decrease vulnerability and enhance the preparedness of the port in future situations.

Reference:
Freeport Container Port Limited
Freeport, Grand Bahama, The Bahamas



**Expert Witness and Failure Analysis – Bullivant Yacht Lift Accident
Port Hueneme, California, USA**

Liftech was retained to provide expert witness and failure investigation in the collapse of a truck crane while lifting a yacht. Liftech provided an expert opinion as to the chain of events leading to the cause of the accident. Liftech thoroughly evaluated photograph evidence, witness interviews, and technical data to help guide the case toward resolution.

Reference:
Bullivant Houser Bailey
San Francisco, California, USA



1,700 t Floating Crane Design Review “Left Coast Lifter” American Bridge/Fluor Enterprises

Liftech provided design assistance and review services to American Bridge/Fluor Enterprises (ABF) for procurement of a shear leg derrick. The derrick is used to erect the major components of the San Francisco-Oakland Bay Bridge self-anchored suspension span.

The crane with a 100-m boom has 1,700 t capacity at 60 degrees. The crane has two auxiliary hooks with capacities of 100 t and 10 t. The boom is configured to lay down for transport within the USA river system. The 100 ft wide x 400 ft long barge has removable floats for increased stability. The derrick and barge floats are made by ZPMC in China. The barge was fabricated by US Barge LLC in the United States and towed to ZPMC for mounting the crane.

Liftech’s services included development of the technical specifications, design review and assistance, and fabrication review assistance.

This project has received three awards. In 2010, it was awarded the Structural Engineers Association of Northern California Excellence in Structural Engineering Award in the Study/Research Guidelines category.

Also in 2010, it was awarded the Structural Engineers Association of California Excellence in Structural Engineering Award in the Special-Use Structures category.

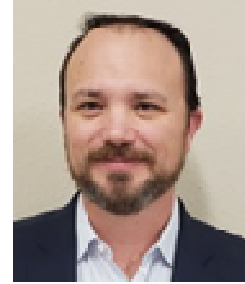
In 2011, it was awarded the National Council of Structural Engineers Associations (NCSEA) Excellence in Structural Engineering Award, Outstanding Project, in the Other Structures category. The Outstanding Project Award is the highest honor in the NCSEA Excellence in Structural Engineering Awards program.

Reference:
American Bridge Company
Coraopolis, Pennsylvania, USA

Nicholas Grebe

Vice President, Principal, Mechanical Engineer

Mr. Grebe has extensive experience performing conceptual and detailed designs of mechanisms and systems, analyzing dynamic mechanical systems, and developing designs and detailed drawings suitable for manufacture. He is responsible for developing purchase specifications and reviewing contractors' mechanical, hydraulic, and electrical designs for feasibility and contract compliance. He is experienced in reviewing heavy machinery and container crane controls including logic, interlocks, system architecture, and automation features. He provides project management, condition assessment, commissioning, troubleshooting, and acceptance testing of material handling equipment including container cranes and bulk loaders.



Al Siver

Senior Electrical Engineer

Mr. Siver is experienced with port facility and container crane design, crane raise and outreach design, drives upgrade design, standby power systems, design review, port electrical permit preparations, crane condition surveys, and forensic failure analysis. He has extensive experience in voltage drop, short circuit, relay and circuit breaker coordination studies, and arc flash studies of port facilities, cranes, ships, and buildings. Mr. Siver has experience with gantry crane electrification on many cranes including the ports of Los Angeles, Long Beach, Tacoma, and Gulfport, Port Everglades, Houston Port Authority, and Massachusetts Port Authority.



Steven Martinez

Senior Mechanical Engineer

Mr. Martinez is experienced in the design and analysis of container cranes and heavy lift equipment. His areas of expertise include specifications, component design, procurement, design review, testing, and commercial management. He is a project manager with a PMP certification and regularly manages procurement projects on behalf of clients. He has also worked on maintenance and repair programs and raising and uprating modifications. He is a licensed engineer in several states.



Jonathan Whalen

Mechanical Designer

Mr. Whalen is experienced in the design and analysis of various custom heavy machinery, container handling equipment, and various types of cranes and bulk handling equipment. His work includes detailed designs and analysis for low profile and traditional dockside container cranes, revolving pedestal cranes, and crane modifications and uprates. He assists with feasibility studies and testing procedures. He also provides troubleshooting, project management support, and technical administration.



Erik Soderberg

President, Structural Engineer

Mr. Soderberg is a skilled designer and project manager. He is experienced in the design, review, repair, and modification of a variety of structural and crane related systems including wharves, container cranes, and bulk loader structures. Other structures include crane lift and transfer systems and concrete and steel floats. He oversees the technical and contractual aspects of Liftech's projects in addition to his design work.



Jonathan Hsieh

Vice President, Structural Engineer

Mr. Hsieh is experienced in design, review, analysis, and modification of container cranes, bulk handling cranes, and special structures. His expertise includes crane procurement, fatigue failure investigation and repair, and computer modeling and analysis. He has also worked on structural maintenance programs, seismic design of container cranes, crane instrumentation, and voyage bracing.



Arun Bhimani

Founding Principal, Past President, Structural Engineer

Mr. Bhimani is an expert in all phases of container crane and wharf design. He has developed innovative solutions to container crane design problems, including a technique for combining analysis with heat straightening for repairing damaged container crane booms, the first seafastening design for transporting fully erected container cranes on barges, and a structural maintenance program used to periodically inspect cranes.



Catherine Morris

Vice President, Structural Engineer

Ms. Morris has a wide range of experience in the design of container cranes, buildings, and miscellaneous special structures. She has worked on all facets of container crane design including designing new cranes, reviewing crane designs, designing modifications, and voyage bracing. She has also reviewed and designed reinforcing for barge structures for transport of various equipment, designed chassis storage racks, and analyzed and designed equipment to lift and replace steam generators in nuclear power plants.



Nicholas Grebe**Principal, Mechanical Engineer**

Mr. Grebe has extensive experience performing conceptual and detailed designs of mechanisms and systems, analyzing dynamic mechanical systems, and developing designs and detailed drawings suitable for manufacture. He is responsible for developing purchase specifications and reviewing contractors' mechanical, hydraulic, and electrical designs for feasibility and contract compliance. He is experienced in reviewing heavy machinery and container crane controls including logic, interlocks, system architecture, and automation features. He provides project management, condition assessment, commissioning, troubleshooting, and acceptance testing of material handling equipment including container cranes and bulk loaders.

**Sugiarto Loni****Principal, Structural Engineer**

Mr. Loni has extensive management experience and design expertise with marine terminal structures including crane-wharf interface, container and intermodal yard structures, building facilities, and marine structures. He is responsible for contract negotiations, technical oversight, and quality assurance of project deliverables. His work includes managing a variety of engineering projects ranging from small projects with short duration to large projects with multi-discipline coordination. As project engineer, he performs civil and structural design of marine terminal facilities, seismic retrofit design of existing building structures, and civil and structural design of wharves and marine structures.

**Kenton Lee****Principal, Structural Engineer**

Mr. Lee is experienced in design, analysis, and project management of container cranes, floating cranes, rigging, and special structures. He specializes in container and floating crane procurement projects and crane modification projects. He is also involved in preparing structural maintenance programs. Some of the technical aspects of his work that are of special interest to him are steel connection design, wind effects on structures, wind tunnel testing, and structural fatigue of steel structures.

**Patrick McCarthy****Principal, Professional Engineer**

Mr. McCarthy is experienced in ship-to-shore and port yard container crane procurement, modification, reliability, and repairs. His work includes project management, condition assessment, and developing structural maintenance programs and repair procedures. He is Liftech's manager for developing crane technical specifications and helps clients with various aspects of the crane procurement process, including pre-bid assistance, post-award design and fabrication review, and post-delivery structural assessment. He also has expertise in wind provisions, has been involved in wind tunnel and other wind studies, and is an associate member of the Wind Load Subcommittee of ASCE 7.



Derrick Lind

Principal, Structural Engineer

Mr. Lind is experienced with project management, design, review, analysis, and modification of many types of structures, including container cranes, unique industrial equipment, buildings, wharves, and bridges. He specializes in all facets of crane modification, including crane raises, boom extensions, capacity upgrades, and wheel load feasibility studies. His work has included crane procurement, structural analysis and design, checking shop drawings, developing construction documents, and managing design teams and project budgets and schedules.



Anna Dix

Principal, Structural Engineer

Ms. Dix has experience in the design and analysis of various steel and concrete structures. Her focus is on ship-to-shore cranes and other structures that reside next to, in, or on top of the water, such as heavy lift and container handling equipment, wharves, and floating cranes. She likes earthquake and fatigue engineering topics and working with clients.



Leah Olson

Principal, Professional Engineer

Ms. Olson has managed multiple wharf and float projects, and has participated in the design, analysis, and modification of wharf and float structures, container cranes, steel barges, and other rigging structures. She has evaluated the behavior of various concrete and steel structures using finite element analysis (FEA) computer software. Her work includes project management, structural analysis and design, and site inspection and reporting.



Di Liu

Principal, Professional Engineer

Mr. Liu is an experienced designer and project manager. His work includes structural analysis, design review, modification review, and feasibility studies of container cranes, wharves, and other structures.



Tais Shiratsubaki

Principal, Professional Engineer

Ms. Shiratsubaki is experienced in project management and structural design, review, analysis, modification, and repair of various marine structures including container cranes, bulk material handling equipment, and special structures. She is involved in research and development and enjoys collaborating with clients to produce improved designs and solutions.

