

History

Liftech

Michael Jordan
Structural Engineer
First Container Crane Design - 1958



3 of 30

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Mike Jordan of Liftech designed the structure for the world's first modern container crane that was built by Paceco in Alameda, California. Mike and Liftech have been an integral part of the evolution of container cranes since then.

1964

Michael Jordan Consulting Engineer

1974

Jordan/Casper/Woodman/Dobson

1977

Liftech Consultants Inc.


2022


McKay International Engineers joined
Liftech Consultants Inc.

Today

Staff	31
Owners	14
Engineers	21
MS	18
PhD	1

Licenses
AK, AL, AR, CA, FL, GA, HI,
LA, MA, MD, MS, NJ, NY,
OR, PA, SC, TX, VA, WA,
BC Canada, Guam





5 of 30

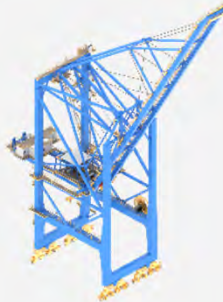
Today we have 31 staff including 21 engineers. Our main office is in Oakland, California, but we have three employees in Shanghai and one at Port Everglades.

Liftech is a small niche business specializing in equipment, marine structures, and heavy lift systems.

Projects

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Crane Design



7 of 30

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Liftech has designed many new crane systems. For container handling cranes, in addition to designing the structure of the world's first crane, we designed the structures of the first low profile and articulating boom cranes.

This slide also includes some of the more recent systems we have developed including APMT's FastNet and our articulating balance crane that significantly reduces storm wind wheel loads.

Low Profile Crane Design, Port Everglades, Florida

Elevating Girder Crane Design, Virginia Port Authority

Articulating Boom Design

Balance Crane Design

FastNet Crane Design, APM Terminals

Machinery-on-Trolley Crane Design, Port of Singapore Authority

Crane Procurement



8 of 30

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Procurement services are many including performance specifications, concept design, bid evaluation, design review, fabrication review, shipping and on and offload review, and commissioning. Services include bulk equipment in addition to container cranes.

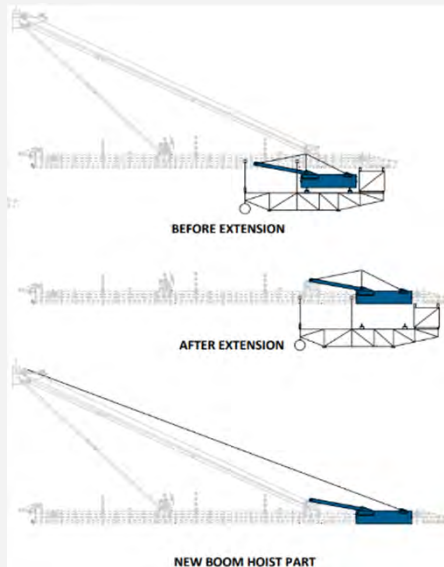
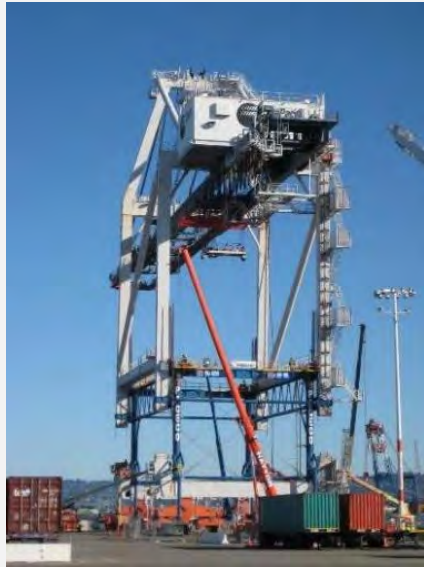
Virginia Port Authority NIT Crane, Norfolk, Virginia

Truss Boom Crane Procurement, China (Client: Confidential)

Dual-Hoist, Tandem-Lift Crane Procurement, China and Singapore

Unloader Structural Design Review, South America (Client: Confidential)

Crane Modifications



9 of 30

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Modification engineering includes the design of modification systems such as jacking and boom extension systems, as well as design or design review and fabrication review of the modifications.

This slide shows the original STS crane jacking frame we designed for Bickerton Iron Works in the late 1990s, which was later sold to Paceco and our boom extension concept that does not require removal of the boom.

Accident Investigation, Crane Damage Review, & Repair



10 of 30

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We help with accident repairs including investigation, damage review including design of temporary securing, and design and oversight of the repairs. We have provided engineering and performed repairs as a design-build team on dozens of projects. We are familiar with what repair methods are practical such as heat straightening and repair requirements, for example plate flatnesses, straightness, boom alignment, wheel alignments.

Field Measurements & Testing

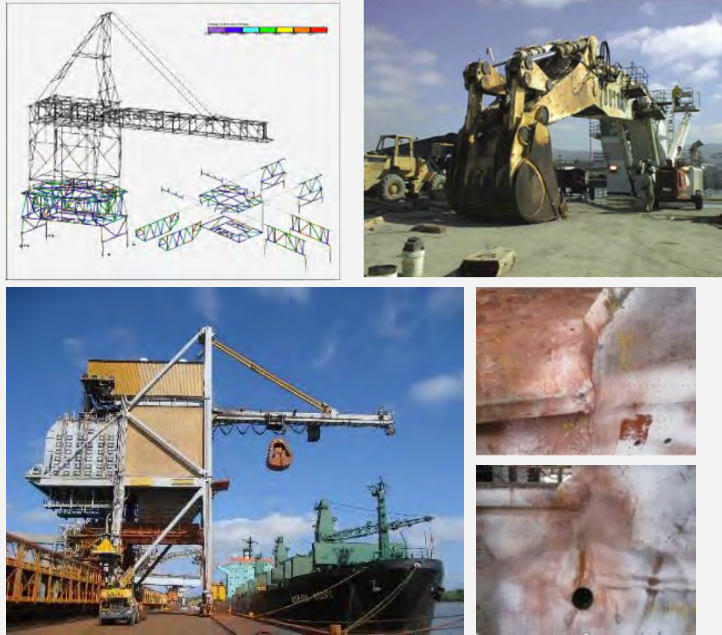


11 of 30

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Field measurements are commonly performed on projects with equipment having unacceptable deflections, fatigue cracking, or both. We have designed measurement and testing programs that have determined the cause and identified practical solutions. Measurements typically include strain gages, accelerometers, and the equipment control system data, and have also included other methods including dial gages and linear potentiometers.

Structural Maintenance



12 of 30

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Structural maintenance involves maintaining an acceptable structural reliability. We can analyze structures and calculate fatigue damage, then estimate structural reliabilities and required inspection intervals for use in inspection programs. Modifications are often designed to improve reliability.

Floating Cranes



13 of 30

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Liftech has designed significant portions of many floating cranes including these.

Top Left: AmClyde floating cranes, two vessels, one with twin 6,000 t and one with twin 7,000 t capacity cranes. Liftech assisted AmHoist with the boom designs.

Top Right: Left Coast Lifter, 1,700 t floating crane. Liftech provided design assistance and review services to American Bridge/Fluor Enterprises. The crane is used to build bridges including the San Francisco-Oakland Bay Bridge and New York's Tappan Zee Bridge.

Bottom Left: Matson barge crane used to deliver containers in the Hawaiian Islands.

Bottom Right: Various ship-mounted cranes with ZPMC ranging in capacity from 4,000 t to 20,000 t.

Heavy Lift, Rigging, & Transport



14 of 30

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We are familiar with lifting and moving hardware and designing heavy lift and move systems. We have designed systems for lifts up to 12,000 metric tons and are developing a lift system concept for erecting wind turbines.

The top left photograph is of a containerized crane move system that used dollies to move container cranes. Top right is the Bigge 125D AFRD with maximum 4,000 short ton lift capacity. Two of these were built to construct nuclear plants, one in Georgia and one in Florida.

Bottom left is the roof erection for the Staples Center. Bottom right is a move system for a mining tunnel segment.

Voyage Bracing



15 of 30

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We have designed voyage bracing for STS cranes, RTGs, bridge sections, and other large components. Our designs consider the stresses in the braced structure and the shipping vessel and the load paths between them.

Barranquilla Container Terminal, Kocks Low Profile Crane Relocation, Miami to Barranquilla, Colombia

Kocks Low Profile Crane Modification and Relocation, Port of Oakland to Massachusetts Port Authority

MES Crane Modification and Relocation, Taiwan to Alaska, APL Limited

Bulk / Material Handling Equipment



16 of 30

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Bulk equipment experience is similar to container cranes, i.e., including procurement, assessment, modification, repair, seismic response.

Unloader Design Review, South America (Client: Confidential)

Rio Tinto Alcan Unloader Structure Assessment, Montreal, Quebec, Canada

Unloader Condition Survey, South America (Client: Confidential)

Port of Long Beach, Pier G Ship Loader

Shoring and Access Systems



17 of 30

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Related to our heavy lift experience, we have designed shoring and access systems including those shown in this slide for repair of a timber blimp hangar that was collapsing.

Wharves & Piers



18 of 30

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We have designed and reviewed many wharves and piers. Most of our design work has been in the Bay Area as part of competitive design-build teams. We are finishing a large crane girder project at Port Everglades.

Common reviews are for unusual large loads such as for offloads. We have performed many girder capacity studies including two comprehensive studies for the Port of Oakland and the Virginia Port Authority. Girder capacity studies typically result in justifying additional girder capacity.

Floating Systems

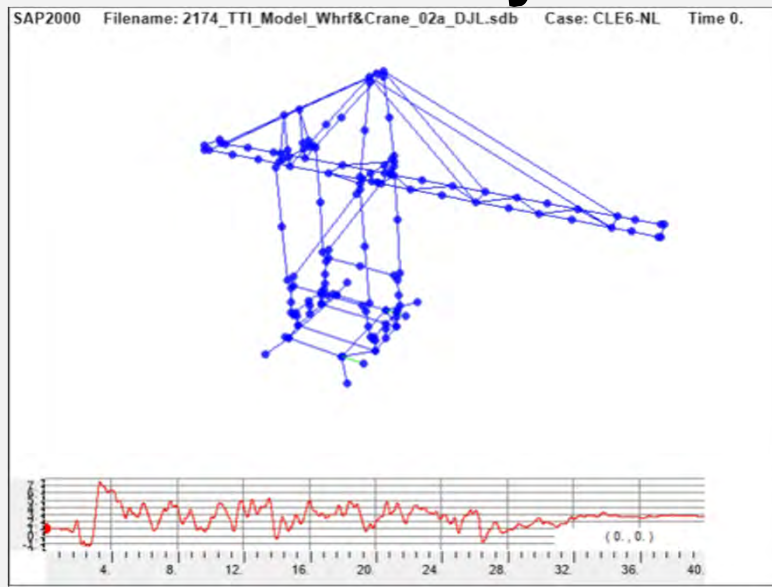


19 of 30

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We started designing ferry terminals in the Bay Area as part of competitive design-build teams and have designed over a dozen ferry float systems. We also recently designed a floating fire station for the City of San Francisco shown in the rendering on the bottom right.

Crane-Wharf Earthquake Interaction Analysis

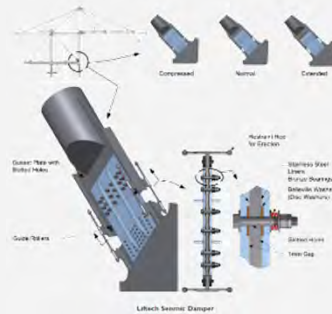
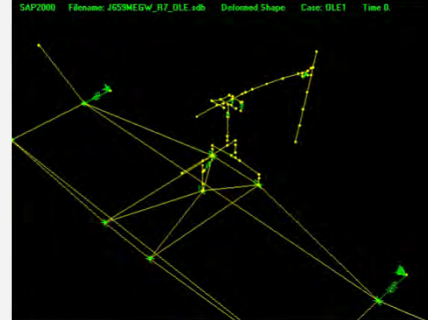
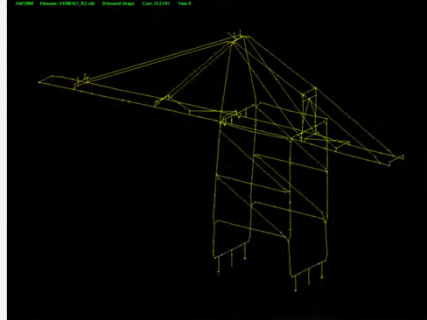


20 of 30

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We have performed over a dozen crane-wharf interaction studies to understand crane as well as wharf earthquake performance.

Seismic Design & Review



21 of 30



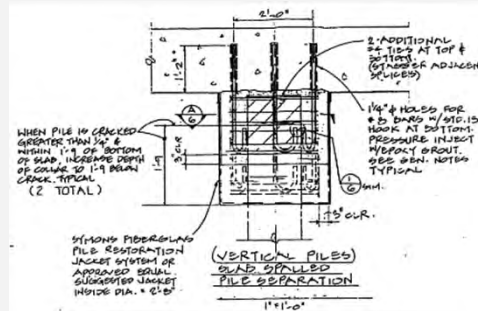
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We have analyzed dozens of systems including container handling equipment and a cement unloader. We have developed performance specifications suitable for equipment systems. We have developed isolation and damping systems to mitigate equipment response such as the friction damper shown at the bottom of this slide that was implemented at Port of Los Angeles Pier 300.

Post Earthquake Recovery

Rapid review of crane and wharf damage including crane-wharf interface

Rapid development of stabilization and repair procedures



22 of 30

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We are familiar with crane damage and repairs as well as expected wharf earthquake damage and repairs. We provide rapid evaluation and, if needed, stabilization, and have rapidly developed repair designs to limit downtime.

Terminal Electrification, Energy Storage, & Standby Power



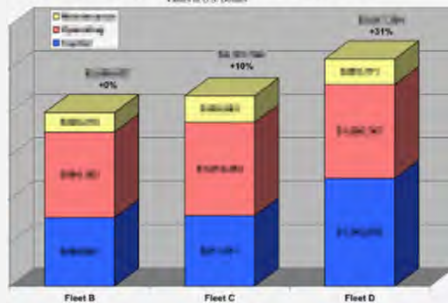
23 of 30

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We are familiar with equipment power requirements and terminal electrification, energy storage, and standby power including fuel generators and battery systems. This slide presents a backup generator system designed for an island port.

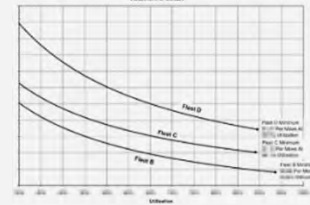
Engineering Studies & Cost Analysis

Present Value Cost For Equivalent Throughput At 50% Utilization
Values in U.S. Dollars

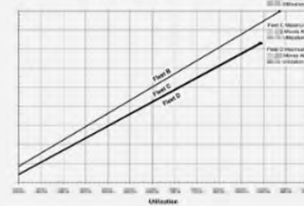


24 of 30

Cost Per Move Versus Utilization
Values in U.S. Dollars



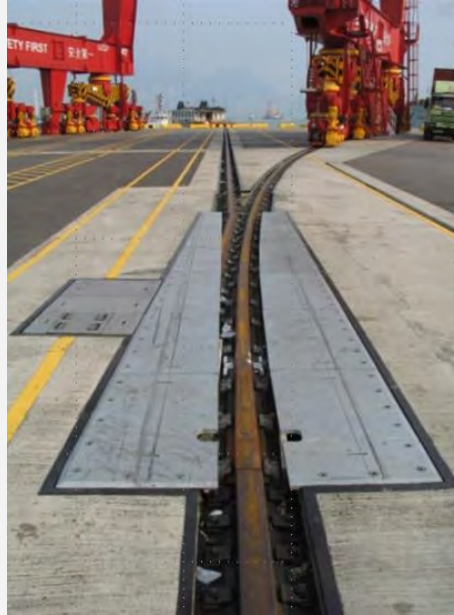
Estimated Throughput Versus Utilization



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We are familiar with container handling equipment costs and schedules and have contributed to studies to estimate values and evaluate options.

Crane Transfer Systems



25 of 30

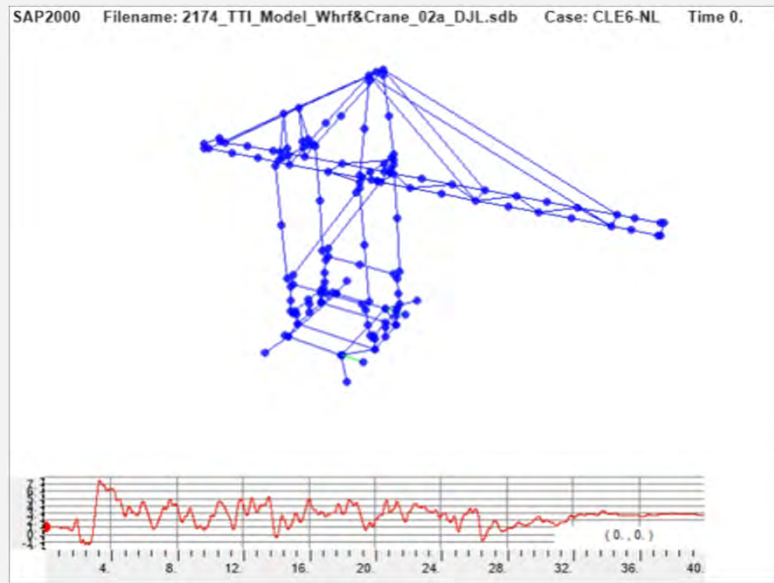
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We are familiar with a variety of crane transfer systems having designed dozens of curves, the crane system articulation, rail switches, a turntable system, and a shuttle carrier system. We are familiar with related design considerations such as power transfer.

Crane Transfer System Design, Berth 30, Port Everglades, Florida

Crane Turntable, Elizabeth, New Jersey

Wharf-Crane Interaction



26 of 30

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Click black strip to start video.

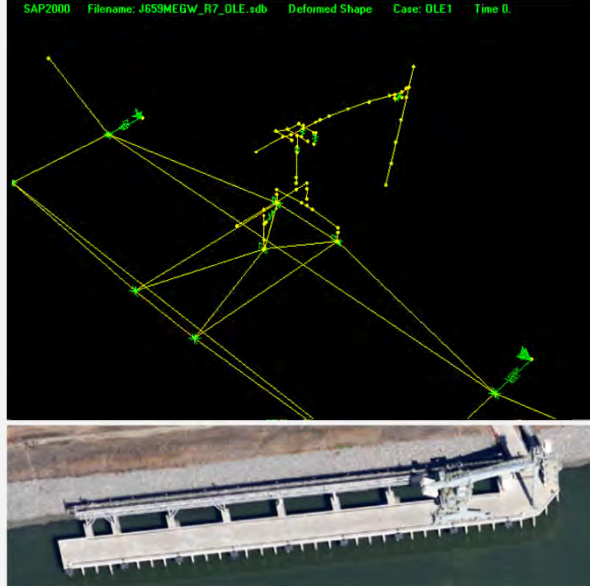
Seismic Review – Container Cranes



27 of 30

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Seismic Review – Cement Unloader



28 of 30

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Thank You



29 of 30

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