

Crane Data				
Client	Year	Type	Location	Project Description
Virginia International Terminals	2008	ZPMC A-frame, twin girder boom	Portsmouth and Norfolk Virginia	Provided repair procedures for repairing fatigue cracking of equalizer beams.
APL	2008	Noell A-frame, monogirder boom	Pier 300 Port of Los Angeles	Provided repair procedures including temporary bracing and improved details for repairing fatigue cracking in pipe backstrut system.
APM Terminals	2008	Noell A-frame, monogirder boom	Pier 400 Port of Los Angeles	Performed study and provided repair concepts to significantly improve portal frame fatigue performance.
	2005-2007			Provided procedures to repair fatigue cracking in portal frame structure.
Hongkong International Terminals	2007	MES A-frame, box girder boom	HIT, Terminal 7 Hong Kong	Provided procedures to repair inner forestay connection plate failure.
Maher Terminals	2007	Paceco A-frame, plate girder boom	Maher Terminal Elizabeth, New Jersey	Assisted in repairing crane-ship collision damage to boom girders and boom ties. Repairs involved replacing sections of the boom and limited heat straightening.
Jakarta International Container Terminals	2007	Sumitomo A-frame, truss boom	Jakarta, Indonesia	Assessed crane damage resulting from boom hoist failure and provided repair concepts.
Matson Navigation Co.	2007	MES barge cranes and runways	Sand Island, Hawaii	Reviewed corrosion damage to two barge cranes and their runways, and provided repair procedures.
Yantian International Container Terminals	2006	Kone crane redundancy scheme	Shenzhen, China	Provided a design to obtain structural redundancy to protect against failures due to material laminations in FCM members.
Port of Felixstowe	2006	ZPMC A-frame, box girder boom	Felixstowe, UK	Assessed crane damage resulting from vessel collision, provided repair procedures.
APL	2005	ZPMC A-frame, box girder boom	Kaoshiung, China	Provided repair procedure, including details for the repair of ship-related damage to waterside leg.
Port of Oakland	2005	ZPMC A-frame, box girder boom	Berth 32	Assisted with heat straightening of damaged forestay members.

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Port Everglades	2005	Paceco A-frame, box girder boom	Midport Terminal	Reviewed ship damage to crane, developed repair procedure, oversaw repairs.
Virginia International Terminals	2004	Paceco A-frame, box girder boom	Newport News Marine Terminal	Reviewed ship damage to crane, designed temporary repairs to stabilize crane structure, designed repairs to crane stop structure.
Hongkong International Terminals	2004	MES A-frame, box girder boom	HIT, Terminal 7 Hong Kong	Provided repair procedures for repairing outer forestay connection plate failure.
Port of Oakland	2004	Hitachi A-frame, plate girder boom	Howard Terminal	Assisted in repairing collision damage to trolley and trolley stop structures. Repairs consisted of replacing and stiffening damaged members and heat straightening to realign wheels.
Termont Terminal	2002	Liebherr tango A- frame, truss boom	Termont Terminal Montreal, Canada	Assisted in repairing damage caused by wind-induced collision between cranes. Landside and waterside frames were distorted. Repairs involved heat straightening the frames to repair distortions and localized buckling damage.
Hongkong International Terminals	2001	MES A-frame, truss boom	HIT, Terminal 7 Hong Kong	Provided repair procedures for repairing corrosion damage to two MES truss booms.
Bickerton Iron Works	2001	Paceco A-frame, plate girder boom	Maher Terminal Elizabeth, New Jersey	Assisted in repairing ship collision damage to boom girders, boom ties, forestays, and forestay connection plates. Repairs involved heat straightening the forestay connection plates and replacing significant sections of the boom, waterside boom tie, and ends of several forestays.
Bickerton Iron Works	2000-2001	Paceco A-frame, plate girder boom	Yang Ming Terminal Los Angeles, California	On two occasions, we assisted in repairing minor ship collision damage. Repairs consisted of heat straightening and replacing localized buckling damage.

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Bickerton Iron Works	2000-2001	Krupp coal loader, plate monogirder	LAXT Los Angeles, California	<p>On two occasions, we assisted in repairing major fire damage to the boom and shuttle structures. On one occasion we assisted in repairing ship collision damage to the boom, shuttle, and chute structures.</p> <p>Repairs consisted of replacing significant sections of the structure, heat straightening, stiffening of deformed plates, realigning the entire boom, redesigning key components of the structural system to improve reliability.</p>
Rigging International	1999	Paceco A-frame, box girder boom	Pier 80, Port of San Francisco	Developed repair procedure and oversaw repairs of boom damaged from ship collision. Repairs consisted of plate replacement and heat straightening.
Holt Cargo Systems	1998	Paceco A-frame, truss boom	Navieras Terminal, San Juan, Puerto Rico	Provided a condition survey, reviewed securing, and reviewed temporary repairs to two cranes damaged by Hurricane George.
Paceco Espana	1998	Paceco post-Panamax, modified A-frame plate girder boom	Ferrol, Spain	Reviewed damage that occurred during the sea voyage transport of two Paceco cranes. Provided repair procedures and supervised damage repairs.
Port of Oakland	1998	Paceco low profile crane	Port of Oakland, California	Reviewed crane damage caused by collision with the wharf crane stops.
Virginia Port Authority	1998	Paceco A-frame, truss boom	Portsmouth Marine Terminals, Virginia	Provided repair procedures and supervised repair of crane damage caused by collision with the wharf crane stops. Repairs included realigning the truss boom.
Port of Oakland	1997	Krupp A-frame, plate girder boom	Port of Oakland, California	After a major ship collision, assisted with crane securing and repair procedures, and oversaw repairs.
Marine Terminal Systems	1997	Paceco A-frame, truss boom	PCT Terminal, Port of Los Angeles, California	Provided repair procedures for truss boom fatigue cracking.

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Paceco Corporation	1997	Paceco post-Panamax, modified A-frame, plate girder boom	Port of Long Beach, California	Provided repair procedures and supervised heat straightening repairs to the damaged plate girder boom. Damage occurred because the boom was raised past its stowage position and bent around the apex structure.
Port Everglades Dept. of Broward County	1997	Paceco modified A-frame, box boom	Port Everglades, Florida	Provided repair procedures and supervised heat straightening repairs to the damaged plate girder boom structure damaged by a ship collision.
Port of Oakland	1996	Paceco modified A-frame, truss boom	Port of Oakland, California	Provided repair procedures for the truss boom fatigue cracking.
Israel Ports and Railways Authority	1995	Paceco modified A-frame, truss boom	Ashdod and Haifa, Israel	Provided repair procedures and supervised repairs to the booms of three cranes damaged by ship collisions. Repairs included heat straightening the boom members and realigning the boom using a push-pull jacking method developed by Liftech.
Sheedy Drayage Co.	1995	Modified A-frame, truss boom	Matson Terminals, Honolulu, Hawaii	After a ship collision, provided a condition survey, assisted with securing the crane, provided repair procedures, and supervised heat straightening repairs to the boom and portal frame. Repairs included realigning the boom using a push-pull jacking method developed by Liftech.
Korea Container Terminal Authority	1994	IHI modified A-frame, truss boom	Port of Pusan, Korea	Provided a condition survey and developed inspection and weld repair procedures to repair fatigue cracking on four cranes.
Korea Container Terminal Authority	1994	Paceco modified A-frame, truss boom	Port of Pusan, Korea	Provided a condition survey and developed inspection and weld repair procedures to repair fatigue cracking on four cranes.
Rigging International	1994	Star crane and Paceco modified A-frame	Maersk Terminal, New Jersey	Prepared salvage procedures to remove collapsed cranes caused by ship collisions.

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Murchison Terminales de Carga	1993	Davey Morris "Samba" type, truss boom	Buenos Aires, Argentina	Provided repair procedures and supervised repairs caused by ship collision. Repairs included heat straightening a leg section, replacing of a leg section, and boom straightening.
Roman Maritima	1992	Davey Morris "Samba" type, truss boom	Buenos Aires, Argentina	Provided repair procedures and supervised repairs caused by ship collision. Repairs included heat straightening a leg section, replacing of a leg section, and boom straightening.
Virginia International Terminals	1992	Paceco A-frame, truss boom	Portsmouth Marine Terminals, Virginia	Provided repair procedures to realign the truss boom of the crane using a push-pull jacking method developed by Liftech.
Rigging International	1991	Paceco modified A-frame, plate girder boom	Port of San Francisco, California	Provided repair procedures and supervised heat straightening repairs to realign a plate girder boom. Repairs were done at ground level using a unique repair procedure that did not rely on any external supports. Damage caused by ship collision.
APL	1990	IHI crane, plate girder boom	Port of Yokohama, Japan	Provided repair procedures and supervised heat straightening repairs to realign a plate girder boom. Damage caused by ship collision.
Empressa Nacional Portuaria	1990	Paceco modified A-frame, truss boom	Port of Honduras, Puerto Cortes, Honduras	Provided repair procedures and supervised repairs to the lower portal frame. Repairs included replacement of leg and portal sections. Damage caused by ship collision.
Sea-Land Services, Inc.	1987	Paceco low profile crane	Sea-Land Terminal, New Jersey	Provided condition survey of damage, assisted in securing the crane, and provided repair procedures. Damage caused by ship collision.
Maher Terminals	1986	Herbert Morris low profile crane	Maher Terminals, New Jersey	Provided condition survey of damage, assisted in securing the crane, and provided repair procedures. Damage caused by ship collision.

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Israel Port and Railways Authority	1983	Paceco modified A-frame, truss boom	Haifa, Israel	Provided heat straightening repair procedures and supervised in realigning the truss boom. Repairs were done with the boom in the operating position. The boom's lower chord had distorted into an S-shape as a result of the boom being dropped while raising the boom.