Global Industries, Ltd.

OSHA Crane and Derrick Advisory Committee

Cranes on Barges

Steven Hebert, Corporate Safety Manager, Global Industries, Ltd.

Requirements for barge cranes are unlike any other cranes used in industrial applications anywhere else in the world. First, barge mounted cranes are exposed to environmental forces from the heave and roll caused by the various sea states in which they operate. In addition, because they are fabricated for specific purposes and environments, no two cranes are designed and built exactly alike. Finally, maintenance, inspection, and training remain in the forefront of any successful barge crane program.

As the oil industry evolved, the needs for more advanced cranes with greater lifting capacity and hook heights arose. In the Gulf of Mexico, oil and gas platforms were initially smaller and lighter, with the majority of fabrication completed in the field. Today, platforms are constructed in modular formats resulting in lifted weights of 500 to 900 tons. As the industry expands into the deeper waters in the Gulf of Mexico and other areas of the world, offshore structures become larger and heavier, requiring ever bigger and taller cranes for use in installation and maintenance works.

With typical crawler cranes, the manufacturers built those cranes to meet specific guidelines for weight and height limits. A manufacturer's name and a dedicated model number indicated dedicated weight and height limit. This is not the case for barge cranes in use today.

Global Industries uses its cranes, with lifting capacities ranging from 145 tons to 2000 tons, to provide offshore construction and support services including pipeline construction, platform installation and removal, and diving services to the oil and gas industry in the Gulf of Mexico, West Africa, Asia Pacific, Middle East/India, South America, and Mexico's Bay of Campeche.

Each area of the world in which Global operates has different sea conditions, and our engineers must consider this when preparing for the project. Environmental conditions such as sea state and wind velocity are factors in the use, inspection, and maintenance of each crane. For example, the U. S. Gulf of Mexico has relatively calm sea conditions year-round. However, those conditions differ from summer to winter, from coastal to deepwater, from the Louisiana to the Texas coast. Such is the case from one area of the world to another. Currently, Global has 14 derrick barges around the world including the only three Manitowoc Heavy Lift Cranes.

Second, barge cranes that appear to be identical may have significant differences in crane capabilities. Each barge crane is built for a particular sea state and barge design in mind. Safety factors are determined for potential side and shock loading incurred during the expected sea conditions. Duration of these conditions is also considered due to the slow nature of these very powerful cranes.

Finally, the crane manufacturer recommends maintenance and inspections procedures for barge cranes. Each unit was delivered with a specific operations and maintenance manual included. And no two manuals are exactly alike. On average, Global's derrick cranes are 20-30 years old and that in itself is an indicator of how well maintained these cranes are. Each crane has its own particular set of procedures.

Regarding inspection requirements, each crane is thoroughly inspected following each significant lift. Cranes are load-tested at five-year intervals with records maintained at each base of operations. Crane operators are certified annually. Preventative maintenance and management of change policies and procedures are continually reviewed worldwide.

The vessels themselves also undergo annual inspection as part of the regulatory requirements of OSHA, ABS (American Board of Shipping), and the U.S. Coast Guard. The crane has a major effect on stability when lifting and this effect is regulated by ABS and USCG. Foreign-flagged vessels, of which the *Hercules* is one, must also conform to ABS requirements.

Proper training is crucial for barge crane operators. All training is conducted according to OSHA and industry guidelines. Global has chosen to conduct crane operator training in house to ensure consistency in presentation and appropriate pass/fail rates. Employees joining the company as crane operators are tested on arrival and bi-annually throughout their employment.

Global Industries would like two things to result from this committee meeting. First, Preventive Maintenance policies and procedures should be required of all crane and barge crane users. Second, Management of Change policies and procedures should be required of these same users.

Global would be glad to sit on a subcommittee focused on barge cranes to include users, such as Global, and manufacturers, such as AmClyde.

We would like to thank Mr. John Hey of National Oilwell Services, the parent company of AmClyde Cranes, for his technical assistance. Mr. Hey was a design engineer at Clyde Cranes when the first barge cranes were constructed and briefed us on the history and development of these specially-built cranes. Mr. Hey indicated cranes on barges have evolved from mounting crawler cranes on decks of basic flat barges to the 2000-ton plus pedestal-mounted cranes with intricate ballasting systems built in to the barges used throughout the industry today.