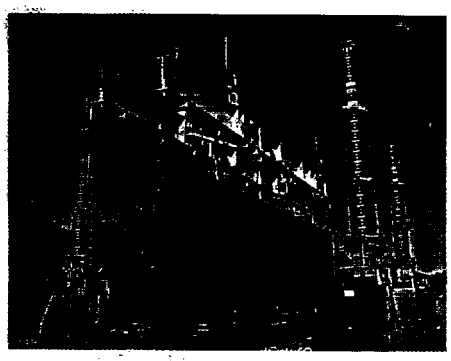
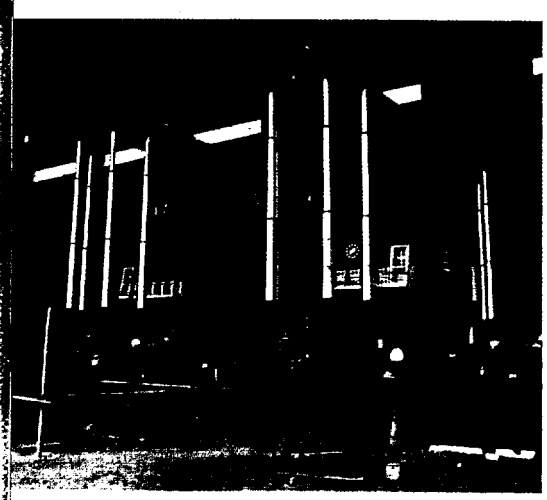
Docket S030
Ex. 59

Classification

Regulators in the US are deciding whether or not to incorporate new language to include hydraulic gantries (also known as hydraulic lift systems) under the same regulatory umbrella that covers cranes. NORMAN HOFFMAN and WILLIAM HALE examine how this might affect users of hydraulic gantries



Using an hydraulic gantry system to offload a 75 US ton boiler tube bundle from a railcar



Malaysian heavy lift and transport specialist

The most general definition of a crane is that it is a device that lifts and moves heavy loads. Hydraulic gantry systems also do this, but in a way that is different from what is generally thought of as a crane. Hydraulic gantries are portable lifting systems usually used to straddle, lift, and move very heavy loads. Typical applications include offloading a transformer from a rail car, picking a power generator from a transporter and setting it directly on its elevated foundation, or handling and placing heavy precast bridge segments.

The use of hydraulic gantries has increased steadily since they were developed in the 1970s. Hydraulic gantries were originally, and still are, made by assembling a multi-stage telescopic hydraulic cylinder, or ram, onto a wheeled base frame. This assembly is typically called a leg, or a unit. A separate header beam is then placed on top of two adjacent legs to form the system. Hanging from the header beam is rigging that attaches to the load to be lifted. Gantry systems can be made up from one, two, or even four pairs of legs and each leg is independently extendable or retractable. Systems are usually set up on steel tracks for smooth and level travel.

Hydraulic gantry systems occupy minimum space and have high lifting capacities – up to 750 US tons (680 tonnes) for four-leg systems. Though not necessarily as nimble or versatile as cranes, hydraulic gantries are adaptable and, because of their size, can work where traditional cranes cannot, for example, in confined spaces or where headroom is restricted inside buildings.

Cost effectiveness is another benefit – purchase price is roughly 1/8 that of a crane with equivalent lifting capacity. And maintenance costs are a similar fraction of those of a crane, so there is significant potential to reduce costs.

Developments in gantry design include structural boxes, or booms, to resist lateral loading that now enclose the once bare hydraulic cylinders. Pinning, wedging, or cam systems are also available to temporarily secure a load for safety or other reasons. Jacking crews are developing innovative uses for the systems and applying them to a variety of tasks, for example, installing generators and other machinery, tailing operations, and even bridge installation. Manufacturers are increasing the lifting height and devising new and more functional attachments, for example, rotators and side shift systems. Extensometers and monitoring feedback systems are being attached to the systems so that operators have more information to make important lifting decisions.

The increasing use of hydraulic gantries can be attributed to their ability to compete favourably increased use, the need for safety becomes more apparent to avoid near misses and untimely accidents.

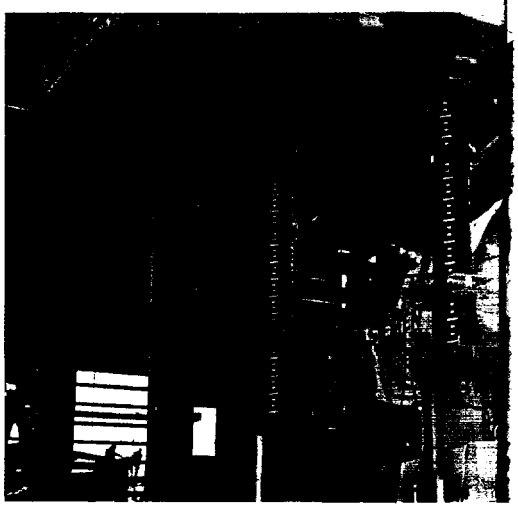
OSHA committee

In the US the Occupational Safety and Health Administration (OSHA) started its Crane and Derrick Negotiated Rules Committee (C-DAC) meeting in the middle of last year in Washington DC. This committee, consisting of selected crane industry stakeholders or representatives, is revising the cranes and derricks portion of regulation 29 CFR 1926.550 Cranes, Derricks, Hoists (Subpart N). This is the safety regulation that covers construction crane operations in the US and applies to any cranes used for construction work. (Maintenance and operating plant work is covered under a different OSHA regulation, which is not being revised at present.)

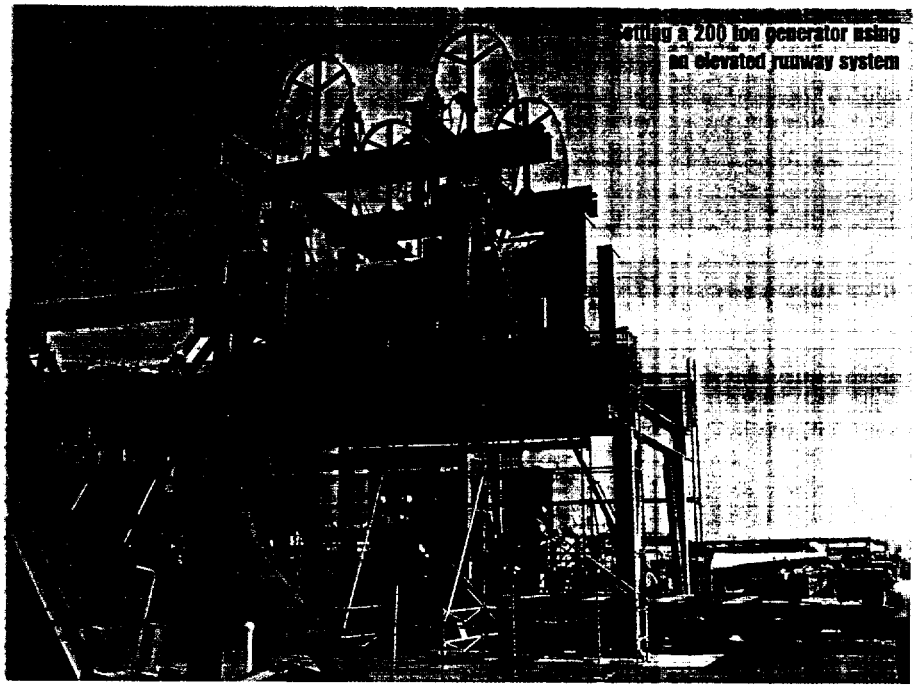
One of the many agenda items for the C-DAC committee is to discuss whether or not to classify hydraulic jacking systems as cranes. This classification has many implications for manufacturers, owners, and tradesman who operate these systems.

At present there are no specific regulations governing the use of hydraulic gantries. OSHA wants the C-DAC committee to consider and discuss the merits of regulating hydraulic gantries and to consider including them in Subpart N. The current rule revision provides an opportunity to generate rules that govern hydraulic gantry use. Some interests, however, may interpret unqualified inclusion in Subpart N as an undesirable classification of hydraulic gantries as cranes.

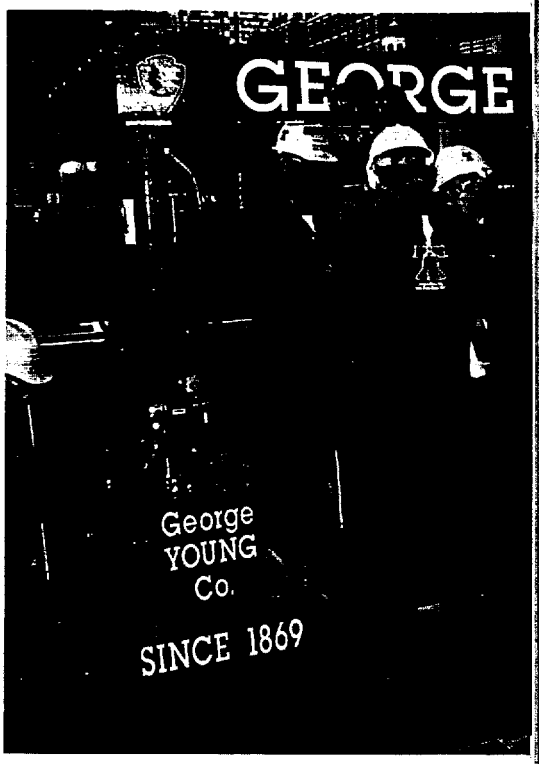
Opposed to potential classification as cranes are some labour organisations, which consider them to be "tools of the trade." A "tool of the trade" designation is important because a contractor has the flexibility to operate the systems using trades associated with the type of work being done, with,



dilemma



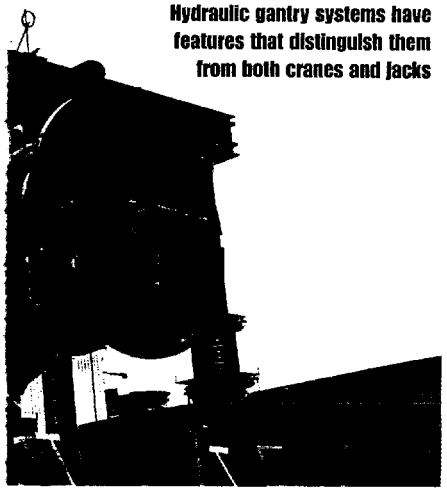
...ving a 200 ton generator using an elevated runway system



Moving the Liberty Bell. The bell, plus yoke, weighs 2380 pounds, well within the capacity of the hydraulic gantries

or example, ironworkers, boilermakers, or millwrights at the controls. If a government body, for example, OSHA was to classify hydraulic jacking systems as cranes, those jurisdictions where the operating engineer trades have authority would likely, and rightly, insist on using their constituents at the control panel. This would create consternation among the owners of these systems, as they would need to hire an operating engineer to pull the controls, which would add cost to the job.

The most heavily affected if this designation were to change would be smaller union hauling contractors who use these systems to assist and supplement their hauling work and do not employ operators since they do not own cranes. In addition, since other trades do the majority of the work associated with gantry activities, an operator hired strictly to run an hydraulic gantry might spend most of the time idle. In many instances an operator is needed anyway to run the small crane that is typically needed to assemble and disassemble the gantry system. An operator in the crew may not be a bad idea.



Hydraulic gantry systems have features that distinguish them from both cranes and jacks

Patent documents for hydraulic gantries on file with the US Patent and Trademark Office, do not equate gantry systems to jacks or cranes. The documents claim specific, unique features of the control system and of the header support interface that distinguish hydraulic gantries from cranes or jacks, which shows that the Patent Office recognises the assemblage as a unique, novel device and not as a crane or jack.

From the manufacturer's standpoint, OSHA classification of these systems as cranes may create unwelcome confusion with respect to their design. Some entities may interpret that hydraulic gantries would need to be designed as overhead gantry cranes, as in ASME B30.2 and B30.17, or as mobile cranes, as in ASME B30.5. Both B30.5 and B30.2 are far off the mark for applicability to hydraulic gantries because the functions and uses are significantly different. Loading considerations (lateral stability) and physical characteristics (for example, usually there is no wire rope) make hydraulic gantries quite different from B30.2 and B30.5 cranes.

As jacks?

Should hydraulic gantries be included in ASME B30.1, Jacks? Hydraulic jacking systems are more complicated than the jacks described in B30.1. The entire gantry system. B30.1 as it is, would need to be expanded greatly to satisfactorily incorporate features and components such as headers and wheeled bases that are unique to hydraulic jacking systems. The insufficiency of this situation can be illustrated by an analogy: just as it would be insufficient to include mobile cranes in the ASME B30.7 Base Mounted Drum Hoists, so would it be insufficient to include hydraulic gantry systems in ASME B30.1.

Unfortunately, there are no design or use criteria for these systems. Design is typically in-house and each manufacturer may have its own criteria. The best and only document that the industry has is the SC&RA publication, Recommended Practices for Hydraulic Jacking Systems. This booklet covers many important aspects of gantry operation, however, it would need significant expansion to thoroughly cover all the aspects of the subject.

These are just some of the issues and perspectives that hydraulic gantry system users are debating. With luck, industry stakeholders and OSHA may be able to negotiate a mutually agreeable classification and definition. Hydraulic gantries have advanced dramatically since their inception and they are being used in ever more creative ways. The number of available accessories is increasing, along with lifting capacities and heights. With the increasing number of hydraulic gantry systems in use, as well as an increasing incident rate, regulation of hydraulic gantries is a near certainty – just as it already exists for other types of lifting equipment. It remains for OSHA, in conjunction with the industry, to decide the nature and form of regulation. ■

ABOUT THE AUTHORS

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