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November 5, 2003

MEMO TO: **U.S. Department of Labor, Occupational Health and Safety Administration Cranes and Derricks Negotiated Rulemaking Advisory Committee**

FROM: **ADSC Safety Committee**

RE: **Proposed Crane and Derrick Rulemaking**

INTRODUCTION:

The ADSC: The International Association of Foundation Drilling is an international trade association comprised of foundation drilling and anchored geo-support contractors, manufacturers and suppliers, and engineering and design professionals from both public and private sectors, as well as professors and students engaged in construction and or engineering related education programs. Our Vision Statement reads, "To continue to be the world leader in the research, development, education and the design of drilled shafts and complementary geo-support construction".

We believe we are a proactive association addressing such topics as quality control, improving installation techniques, and most importantly safety. There are established committees specifically formed to undertake the challenges associated with the deep foundation and geo-support industry, and we draw from our members and outside sources (equipment manufacturers, engineering research, and OSHA to name a few) to formulate proactive procedures to perform our work professionally.

With this in mind The ADSC offers our position on the subject: Should equipment designed for the installation of foundation or geo-support systems be considered a "crane" by definition and subject to new standards formulated in the revision of 29CFR 1926 Subpart N?

BACKGROUND:

The purpose of this section is to define the operational characteristics of "drill rigs" manufactured for the drilled shaft construction industry, specifically in reference to the winch function. These "rigs" either manufactured in the United States, Europe or Asia, typically feature a vertical mast from which different components can be attached to perform a variety of foundation installation procedures, primarily drilling shafts and driving a structural element into the earth's surface. This presentation will focus on equipment used for the installation of drilled shafts.

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A drill rig is an earth-excavating machine designed to excavate a circular shaft into which concrete is typically placed. The finished product, commonly known as a drilled shaft, is used as a support for structures. Drill rigs utilize a rotatable kelly, affixed to the structure of the drill rig, to which an excavating tool is attached. When a drill rig is set up to drill a shaft, the base of the unit (either a crawler undercarriage or a rubber tired vehicle with outriggers) remains stationary. Because the base unit remains stationary, functionality common to all drill rigs include rotational and horizontal positioning of the kelly. This functionality allows the kelly to be accurately positioned over the shaft without moving the base unit, and facilitates the discharge of spoils away from the shaft.

Many drill rigs are equipped with a primary and auxiliary winch. The function of the primary winch is to raise and lower the rotary head, the vertical kelly bar, and the cutting tool into and out of the shaft. This is considered a "guided load" for the load remains at a fixed distance from the vertical mast at all times. The auxiliary winch is used to position excavating tools (e.g. augers) and other necessary materials to the drill rig for attachment to the kelly or for placement in the shaft. To properly position the tool or material within the proximity of the drill rig or the shaft, it is sometimes necessary to use the horizontal or rotational features of the drill rig. In order to do this, the item being located must clear the ground. During this locating process, the required clearance between the ground and the item being positioned is only a few feet.

The drilling process can only take place within the limits defined by the maximum swing radius of the drill rig. The position of the kelly and the mast to which it is affixed are restricted to this limit. For placement of any materials into the shaft, this limit must necessarily be reduced so that the mast and kelly are retracted away from the shaft, allowing clearance to the top of the shaft. Besides the winch line being operated at less than the maximum drilling radius of the drill rig, the capacity of the winch on drill rigs is less (approximately 50 to 75% depending on the manufacturer) than of any loads applied on the drill rig during the excavation process. Pressure regulators limit the pulling capacity of the winch on a drill rig, and there are no provisions for multi-parting the winch line.

Manufacturers of drilled shaft drilling equipment do not indicate any lifting capacities for their respective units because they are designed as excavating equipment, not hoisting equipment. They do specify drilling depths, diameters, horsepower, torque, equipment weights, length, width, and service winch capacity. Drill rigs do not have load charts common to cranes because the lifting capacity of the service winch is specifically limited (the line cannot be multi-parted), the lift radius is limited to the operating radius of the kelly, and the service winch capacity at this point in always less than the capacity available to raise the kelly and tooling with the main hoist winch. Manufacturers do provide warnings both in the operation manual and at the operator's station that the service winch be used in accordance with the instructions provided. (See attached excerpts from manufactures material and ADSC information).

Additionally, it is our belief that it would be difficult for the drill rig manufacturers to engineer a retrofit "load chart" system similar to that of a crane, for the numerous rigs that are currently in use today or in the future. A load rating exists for all drill rigs, and it is simply the full capacity of the winch within the limited lifting zone of the operating radius of the kelly. It is very possible that some manufacturers are no longer in business, yet their equipment continues to operate, making retrofit impossible in many cases. The manufacturers will contend that their respective equipment is built according to the standards that govern this type of excavating equipment and load capacity or "load chart" ratings are not required.

CONCLUSION:

The ADSC has created numerous training documents, booklets, a safety video, as well as performs training on production, quality control and safety. Operation of a drill rig safely is paramount to our working productively. Safe operation is taught during an OSHA 10 or 30 hour Construction Safety & Health training sessions, at our Drill Rig Operators School, and at our Supervisory & Management Personnel Training Institutes. Training is key to productive and safe operation. We believe our employers take advantage of these training sessions and operate drilling equipment safely.

A "drill rig" used in drilled shaft construction does not meet the current definition of a crane per the existing 29CFR1926 Subpart N. They do not meet the definition of a crane as defined by ASME B30.5a-2002, as a drill rig's primary function is for "excavating work and other uses not considered to be lifting services". Other types of foundation installation equipment's primary function can be described as driving a structural member into the soil, and any hoisting performed by the auxiliary winch, is incidental to the driving of the foundation member. These types of equipment are not designed nor intended to be as a lifting or material-handling devices as their primary function.*

Instead of considering the drill rig as a crane, perhaps the new standard should address how the drill rig is used. If it is used solely for drilling and handling of the rig's tooling with the mast in a vertical position then the unit should be operated, inspected and maintained as recommended by the manufacturer and documented by the user. This is mirrored by the existing CFR1926.550(a)(1) – *"General requirements. The employer shall comply with the manufacturer's specifications and limitations applicable to the operation . . . "* If the drill rig is used ***beyond the manufacturers specifications***, then the user must have specific written permission from the manufacturer for such hoisting operations, or a hoisting plan created by a registered professional engineer for the specific intended use of the drill rig hoist system. In each case the maximum parameters of the drill rig's lifting capabilities should be clearly spelled out and then only operated under those conditions.

If drill rigs and or other types of "self-contained" foundation installation equipment were designed and manufactured to operate as material handling devices, capable of hoisting and lowering loads at various working radii, then they would have to built to different manufacturing standards. Supplementary hoisting using an auxiliary winch with a strictly limited working zone, limited hoisting capacity and the inability to lower the load beyond a finite radius simply make this type of equipment impractical to use as a "crane", and therefore should not considered as one.

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