

**USACE Interim Change #16**  
**Effective 28 April 2008**

**Multiple Lift Rigging**

**BACKGROUND:** USACE presently prohibits the practice of Multiple Lift Rigging (“Christmas Tree Rigging”) during steel erection/placement activities, reference EM 385-1-1, paragraph 15.A.08. The 2001 revision of the OSHA steel erection standard, 29 CFR 1926 Subpart R, contains specific guidelines for allowing multiple lift rigging in 1926.753(e). This standard was obviously reviewed in preparation of the 2003 version of the USACE Safety manual however USACE chose not to allow the use of multiple lift rigging (MLR) that for the majority of our projects, appeared to involve risks that are generally too great. However, accident statistics related to this activity do not support this position. The Steel Erection Industry does not have an increased number of reported accidents when performing MLR versus single lifts. For every argument against, there is an equally logical opposing argument:

- Fewer lifts of crane resulting in fewer crane swings reducing time frame of “overhead” operations and associated hazards
- Fewer crane swings results in less time for men to be elevated on the structure hence less risk/exposure to fall hazards
- Fewer crane swings/fewer lifts results in fewer men and less equipment on site reducing opportunity for human error, equipment error/failure and accidents
- Less lay-down area required making site/surrounding areas safer to site workers
- Less site logistics required
- Reduces time frame worksite areas are inaccessible to other trades and activities
- Reduces total project duration.

However, the accident statistics for the steel erection industry do support industry’s position that MLR is NOT a more hazardous activity than single lifts OR IF this practice is more hazardous, increased accident frequency is NOT occurring perhaps due to the level of required pre-planning, additional training and increased precautions necessary to perform MLR.

Based on this rationale, USACE has decided to allow the use of MLR during steel erection/placement activities by incorporating the OSHA 1926.753 Subpart R procedures, but with additional criteria based on other available standards and USACE experience. Attached interim change to EM 385-1-1, Nov 03 is being published at this time and is effective immediately.

**Section 15**  
**Rigging (effective 28 April 2008)**

Replace existing 15.A.08 with the following.

**15.A.08 MULTIPLE LIFT RIGGING.**

a. USACE allows multiple lift rigging practices for the purpose of erecting/placing structural steel ONLY. Strict compliance with this section and 1926.753 Subpart R shall be mandated.

b. A Multiple Lift **is considered a critical lift** and requires a carefully detailed, written critical lift plan per Section 16.C.18. In addition, all details and requirements of this section are required to be addressed in the Critical Lift Plan to include, as a minimum: identifying all multi-lift hazards on the job site, beam list; determining load capacity; determining weight of a member; proper crane hand signals; safety rules for Multi-lift rigging; maximum of 5 members; seven-foot rule; wind/environmental limits; safe route; power line issues; member/beam restrictions; crane requirements; marking centerlines; use of tag line; qualifications and/or certifications of the operator(s) and rigger(s) to be performing these operations; rigging equipment: wire rope slings, hooks & shackles; clean lay-down area; cribbing; storage/staging; personal protective equipment; specially designed Multi-lift rigging devices.

c. A multiple lift may only be performed if the following criteria are met:

(1) A MLR assembly is used;

(2) A maximum of five members are hoisted per lift;

**> If, at the planned boom angle and lift height, any load will be able to contact the crane boom or if the headache ball/load line wedge socket will be hoisted closer than 5 feet from the boom sheaves, the number of loads shall be reduced accordingly.**

(3) Only beams and similar structural members are lifted;

(4) All employees engaged in MLR shall be trained in the following:

(a) The nature of the hazards associated with multiple lifts;

(b) The proper procedures and equipment to perform multiple lifts required in this section and as per 1926.753(e).

(5) All loads shall be rigged by a qualified rigger.

(6) No crane is permitted to be used for a multiple lift where such use is contrary to the manufacturer's specifications and limitations.

(7) Components of the MLR assembly shall be specifically designed and assembled with a maximum capacity for total assembly and for each individual attachment point. This capacity, certified by the manufacturer or a qualified rigger, shall be based on the manufacturer's specifications with a 5:1 safety factor for all components.

(8) The total load shall not exceed:

(a) The rated capacity of the hoisting equipment specified in the hoisting equipment load charts;

(b) The rigging capacity specified in the rigging rating chart.

(9) The MLR assembly shall be rigged with members:

(a) Attached at their center of gravity and maintained reasonably level;

(b) Rigged from the top down; and

(c) Rigged at least 7 feet (2.1 m) apart.

(10) The members on the MLR assembly shall be set from the bottom up.

(11) Controlled load lowering shall be used whenever the load is over the connectors.

#### **Add to Definitions in Appendix Q:**

**Multiple lift rigging:** a rigging assembly manufactured by wire rope rigging suppliers that facilitates the attachment of up to five independent loads to the hoist rigging of a crane.

**Qualified Rigger:** Qualified rigger shall meet the following requirements: Be at least 18 years of age; Understand spoken and written English; Have basic knowledge and understanding of equipment-operating characteristics, capabilities, and limitations; Understand rigging principles as applied to the job for which they are to be qualified; Demonstrate to appropriate management personnel skill in using rigging principles (i.e., influence of

environmental hazards and overhead interferences, center of gravity - load, crane, combined, radius - changes in load, boom angle, rotation point, values of boom angle, boom length and load radius).