



Lecture on “Crane Safety on Construction Sites: Supervision and Management of Crane Operations”

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Ir. Prof. Dr Jeffrey Chiang holds several posts in IEM, namely Honorary Secretary of IEM, Past Chairman and committee member of Civil & Structural Engineering Technical Division and Chairman of Technical Committee on Earthquake. He is also Head of Civil Engineering at INTI International University.

On 11 August 2012, in collaboration with INTI International University, the IEM Civil & Structural Engineering Technical Division co-organised a half-day lecture on a topic related to crane safety on construction sites. The invited speaker was Professor Miroslaw Skiebniewski, who was then attached to the National University of Singapore as a Visiting Professor.

Professor Skiebniewski is the *A. James Clark Chair* Professor of Construction Engineering and Project Management in the A. James Clark School of Engineering at the University of Maryland, College Park, USA. He currently specializes in information technology applications to engineering project management for construction, including computer-aided management of construction equipment and web-based project management tools.

Construction is one of the most dangerous industries in terms of the number of injuries and the loss of life in most countries worldwide, including developed and developing economies. Crane accidents occupy a conspicuous place in construction accidents, bringing affecting project to a halt and resulting in spectacular losses of property, time, money, reputation and, most importantly, human life. The American Society of Civil Engineers' Construction Institute, with support from the U.S. Occupational Safety and Health Administration of the U.S. Department of Labor developed guidelines for identifying and addressing responsibilities with respect to construction worksite safety, including the safety of lifting heavy objects with the use of single and multiple cranes. This presentation will cover the salient points of the operational and safety guidelines of complex lifts, and discuss possible ways to take advantage of overseas best practices for construction project implementation in Malaysia.

Introduction

The focus of the lecture was on multi-crane lifting and alternative lifting methods such as:

- 1) Two cranes – horizontal load
- 2) Two cranes – vertical load
- 3) Tailing a vertical load
- 4) More than two cranes – horizontal loads

Multi-crane lifts

This is a preferred choice when the following situations arise:

- Handling long pieces
- When obstructions may restrict a single crane
- Utilization of equipment on site
- The extra capacity works well with the nature of the load
- Loads must be placed at an angle
- When dictated by center of gravity issues
- To offload from double-bolstered railcars or hauling equipment

In order to ensure safety requirements are adhered to, the following need to be considered:

- Nearly all crane and lifting safety plans mandate a reduction in chart capacity for multi-crane lifts (some exclude tail cranes)
- A greater chance of side loading either crane exists
- Load distribution can change if one crane get noticeably higher than the other
- Swinging and hoisting at the same time are not recommended
- If one crane fails, the other will have all of the load
- A first rate signaller is required as well as good communications

Methodology adopted in lifting

Professor Skiebniewski proceeded to elaborate on the usage of the two cranes in tackling horizontal loads such as lifting of long beams or girders and even dock platforms. He also explained on the intricacies in lifting huge prefabricated steel roof structure using more than two lifting cranes.

The other lifting scenarios involved lifting of vertical loads, which require higher level of planning and consideration for boom side clearance among other things. The use of tailing or an equivalent tailing device was described in the use of two crane lift especially in vertical lifts

Alternative lifting methods were also highlighted such as:

- Manual and hydraulic jacks
- Hydraulic gantries
- Jacking towers, and last but not least
- Helicopters

In all such lifting methods, safety considerations are always given top priority, with adherence to safety rules and regulations as prescribed by the relevant authorities. Lives are at stake in all lifting operations, even for a seemingly straightforward lift by a single crane.

At the end of the session, many participants raised pertinent queries which were fully explained by the speaker, who was given a rousing applause at the end, and a token of appreciation by the organisers.