

Specialized Construction Methods: Hoisting and Marine

Daniel Hindman

IC-SAFE

Center for Innovation in Construction Safety, Health and Well-Being

Workshop on Initiative for Construction Safety Awareness
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How Do We Categorize Safety In Construction?

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Mechanistic Model

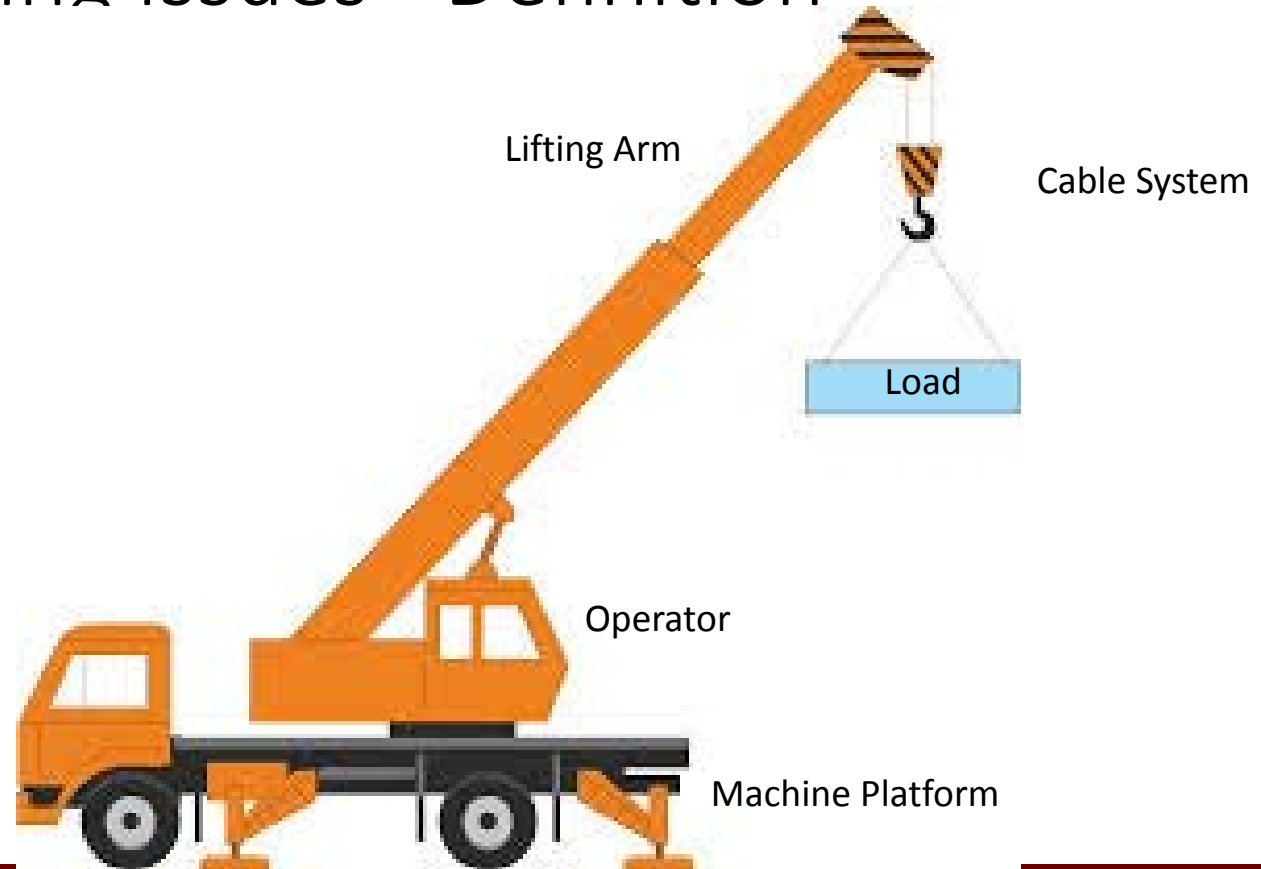
From an engineering view

1. Define system
2. Characterize component or task groups
3. Examine component or task groups individually
4. Order tasks and examine for synergistic effects

Examples

- Hoisting Issues
- Marine Construction

Hoisting Issues - Definition





Characterizing Components

- Load
 - Rigging Placement
 - CG of Load = CG Force Applied by Cables
 - Strength of Load Connection Locations
 - Balance of Load
- Cable System
 - Importance of Pick Calculations Before Loading
 - Ultimate Strength of Cable vs. Load
 - Use / Maintenance of Cable
 - All Safety Devices Working?



Characterizing Components (2)

- Arm
 - Maximum Capacity of Arm
 - Capacity is a Function of Length!
 - Maintenance Record of Arm / Extension
- Platform
 - Level location OR Adjusted Leveling
 - Cribbing In Place AND Secured
 - Full Extension of Supports
- Operator
 - Field of Vision
 - Experience Level With Equipment



Component Interactions

- Arm X Platform
 - Swinging Arm Away from Platform Supports to Cause Overturning
 - Exceeding Capacity of Arm – Overturning of Crane
- Cable System X Operator
 - Fast Movements of Cable System
- Load X Operator
 - Improper Rigging Location
 - Underestimating Total Load
 - Blind Picks



Blind Picks

- Very Difficult and Risky
- Why Are People Doing Blind Picks?
 - Do not want to move crane
 - “It’ll only take a second”
- Use of Remote Cameras to Avoid?



Marine Construction

- Same Tasks In Construction
- More Complex Environment
- Floating (Limited Stability) of Platforms

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Marine Construction

Devoted to the Marine Construction Industry

Photo Courtesy of:
Boyer, Inc.
Houston, TX

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John Boykin

Premier Issue Includes:

- Differentiating Subsurfaces
- Marine Construction Insurance
 - Slips, Trips & Falls
 - Falling Overboard
- Machinery & Equipment Hazards
 - Fire Hazards
 - Crossword Puzzle
- Work Safety & Hazardous
 - Confined Spaces
- Floation Devices & First Aid.

Much More....

Marine Construction

- First Issue in 2013
- Comprehensive List of Issues
- (And a Crossword Puzzle)

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Mechanistic Model of Marine Construction – Follow Project Timeline

- Planning
- Material Handling / Material Placement
- Pile Driving / Foundation Development
- Construction of Structure

Planning

- Permitting and Safe Transit Ways
- Environmental Footprint Considerations



Material Handling / Placement

- Location of Materials for Storage
- Location of Preparation Facilities
- Location of Equipment



Pile Driving / Foundation Development



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Construction of Structure

- Piles / Foundation Increase Stability of Structure
- Reduced Hazards Due to Weather / Water Surges
- Fall Hazards Into Water Remain For Exterior Work





Construction Hazards Are More Complex

- All Construction Hazards Associated With Terrestrial Projects Exist
 - Confined Spaces
 - Fires
 - Falls / Slips / Trips
 - Struck-by / Equipment
- Extraction of Injured Workers Is More Complex
- Worst Case: How Do You Medically Evacuate Someone vs. Conventional Jobsite?



Summary

- Use of Component Models Can Help Identify Safety Hazards
- Hoist Systems
- Marine Construction



Thank You!