
WHAT'S THE RISK? BEST PRACTICES TO REDUCE THE LIKELIHOOD OF STRUCK-BY INJURIES FROM HEAVY EQUIPMENT AND CRANE ACTIVITIES

3rd Annual National Stand-Down to Prevent Struck-by Incidents

PRESENTERS



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The California FACE Program

Occupational Health Branch
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BACKGROUND

On June 10, 2020, an excavation operator (trainee) died after being struck by a bucket that disconnected from the automatic coupler.

10 June 2020

18 June 2020

On June 18, 2020, a laborer died after being struck by a bucket that disconnected from the automatic coupler and landed in the trench that he was working in.

FEDERAL OSHA FAT/CAT REPORTS

Year	State	Incident
2019	WI	Excavating storm sewer; CAT excavator and CB linkage
2014	AZ	Installing concrete pipe; CAT excavator and JRB coupler
2012	NV	Bolting backflow preventer; Komatsu excavator and JRB coupler
2009	NC (2)	Working in trench killed by failure of quick coupler
2007	CA	Working in trench; Link Belt excavator

Laborer Dies After Being Struck by Detached Excavator Bucket

Wisconsin Case Report 03WI003

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Crushed, Broken Stone)

Fatal Machinery Accident
July 17, 2019

Northeast Aggregate Corporation
Northeast Aggregate Corporation
Swanton, Franklin County, Vermont
ID No. 43-00585

CASE # 1

- A construction heavy equipment operator (trainee) died after being struck by an excavation bucket that came loose from the quick coupling device attached to the end of the boom.
 - After removing two loads of dirt from a trench, the decedent swung the boom of the excavator over to the side and exited the cab, leaving the boom elevated. As he was walking toward the boom, the bucket detached from the quick coupler and fell to the ground striking him.
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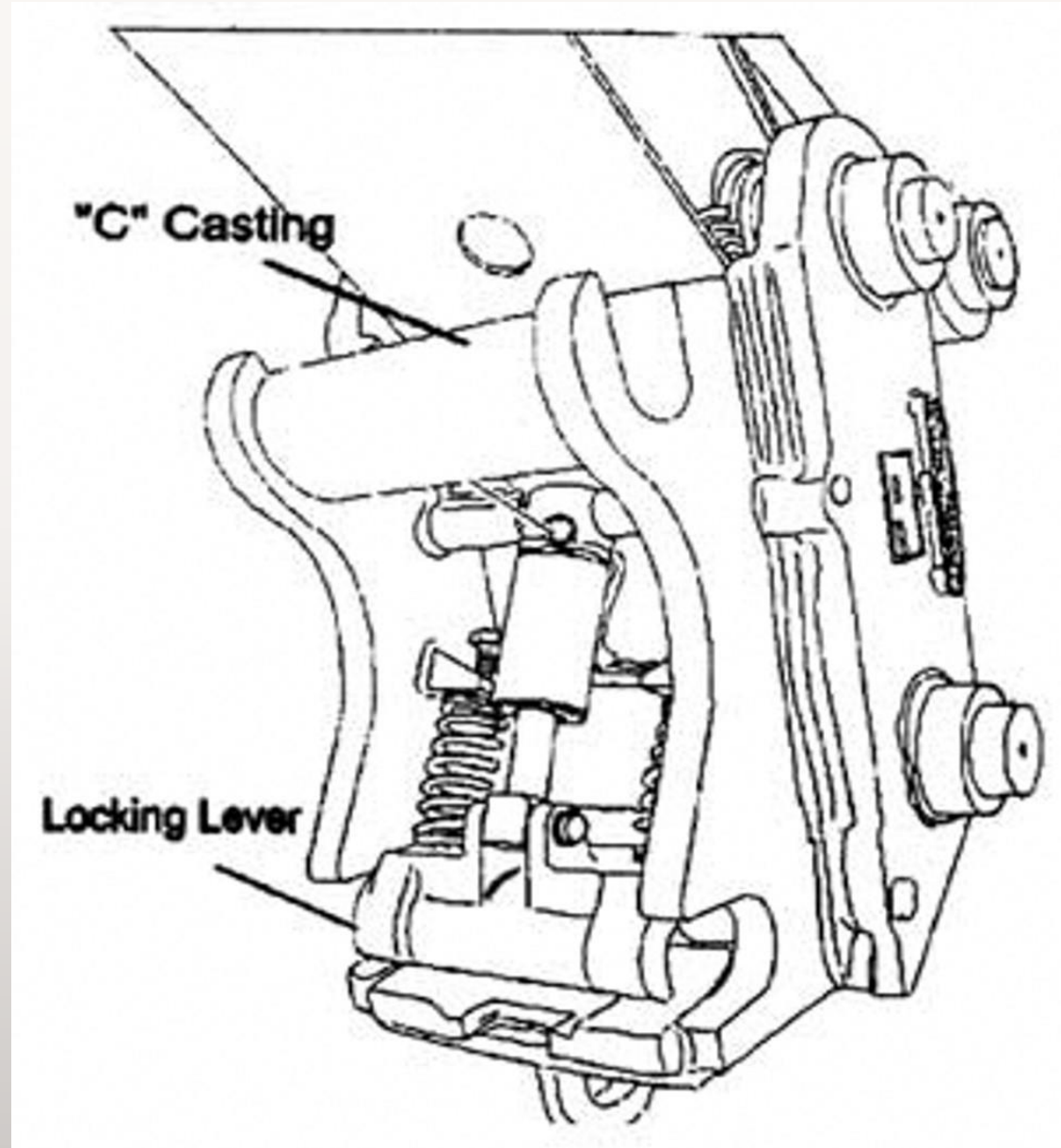
QUICK COUPLER DESCRIPTION

- Quick couplers are after-market devices, made by various manufacturers, that are installed at the outer end of booms on various types of construction and earth-moving machines.
 - They facilitate the rapid exchange of working tools or buckets.
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QUICK COUPLERS, CONT'D

- They are usually mounted on the machine by means of the pins that would otherwise be the mountings for the bucket or attachment.
 - The method of operation (picking up and releasing of buckets and attachments) determines the design of the coupler. There are many variations in the design of quick couplers.
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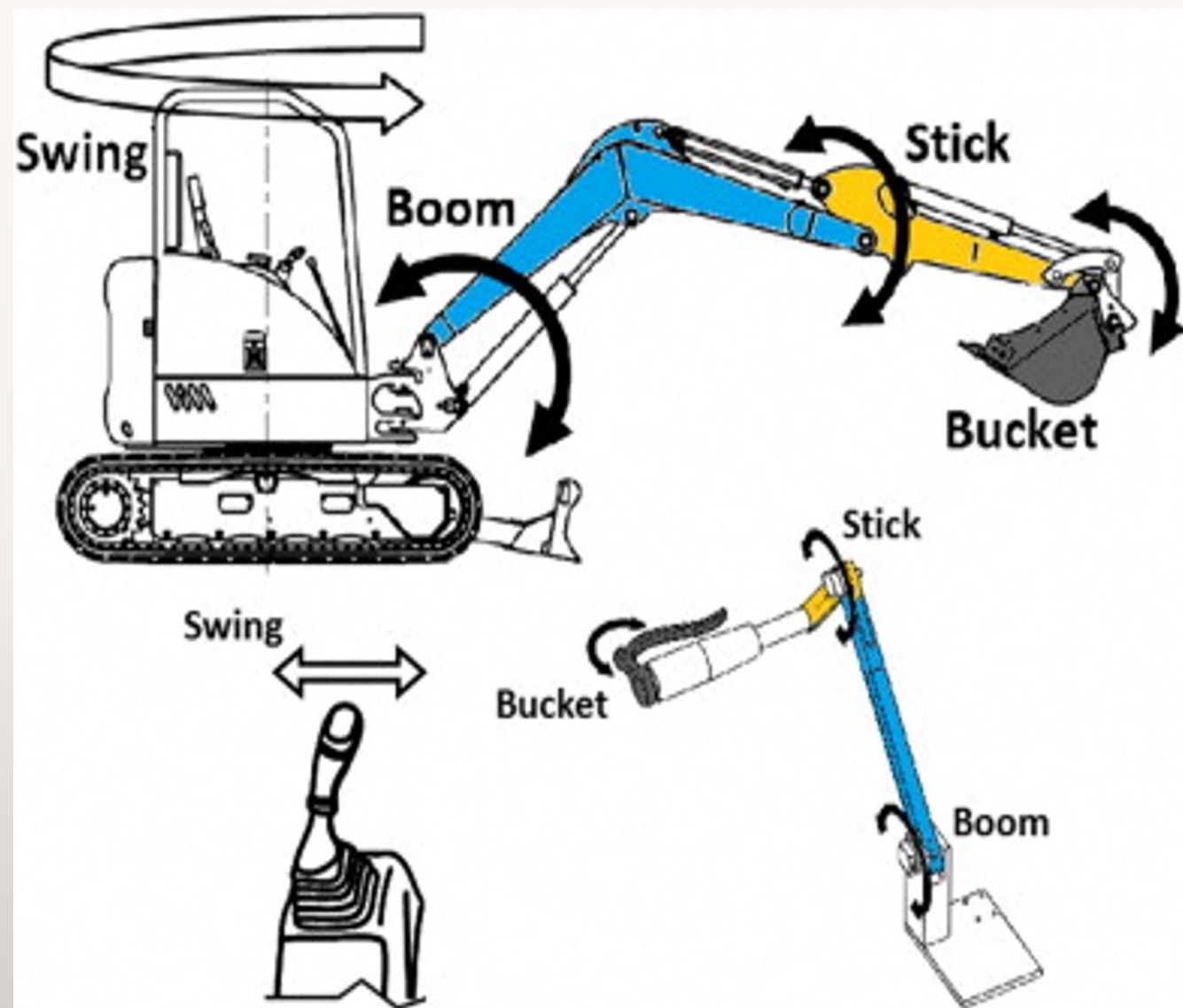






CASE #2

- A construction laborer, working in a trench, died after being struck by an excavation bucket that came loose from its quick coupler.
- The operator of the excavator was curling the bucket into the boom when the bucket came loose, hitting the ground and then bouncing into the trench where the victim was working.













RECOMMENDATIONS

- Operators should always lower the bucket to the ground before exiting the cab and **never traverse beneath the boom** of the excavator or an elevated load.

In addition, employers should:

- Follow the manufacturer's recommendations* for **maintenance and inspection of the quick coupler** to prevent a malfunction of the quick coupler that could cause an unintended release of the attachments.

*** manufacturer approved and/or compatible attachments**

RECOMMENDATIONS

- **Train workers** in the proper use of quick couplers: making visual inspections; procedures for engaging attachments; and methods for testing connections.
 - Require workers to use the **proper procedures** for engaging excavation attachments and incorporating the procedures into the company's safety and health program.
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LIFT PLANNING FOR SAFETY NATIONAL STAND DOWN



*Heavy Lift, Rigging & Transport Solutions
Construction Engineers & Consultants
NDE, Reality Capture & Mapping*

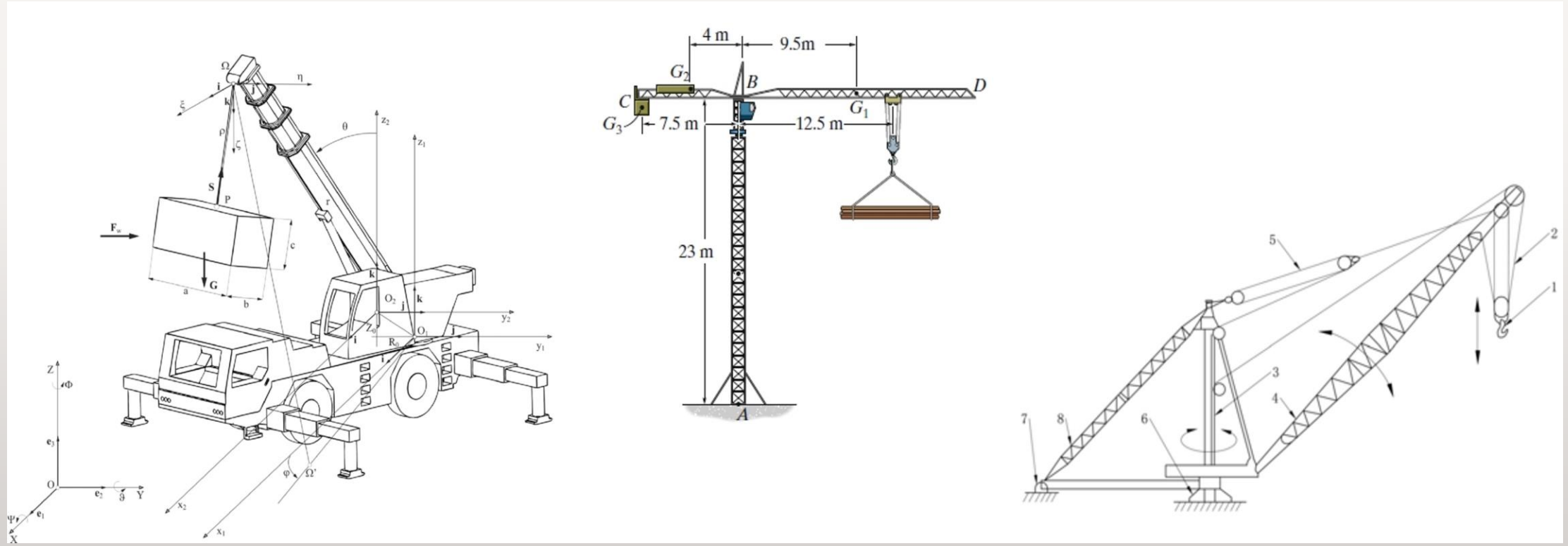
NO LIMITS. NO COMPROMISE.



Sims CRANE &
EQUIPMENT

PLANNING FOR LOAD *"MOVEMENT"* OR *"HANDLING"* - NOT JUST *"LIFTS"*...

- Commonly thought-of load handling equipment (LHE) in Lift Planning



OTHER LHE ALSO REQUIRES LOAD MOVEMENT PLANNING...

- *Strand Jacks & Gantries*
- *Tuggers & Winches*
- *Jack & Slide / Skidding*
- *SPMTs & Heavy Haul*
- *Hoists, Chainfalls & Bull Rigging*



OTHER “STUFF” FUNCTIONS AS LHE AND ALSO REQUIRES PLANNING...

- *Excavators*
- *Telehandlers & Forklifts*
- *Concrete Pumps*



LOAD MOVEMENT PLANNING – WHEN?

- *Standard move? Critical move?*
- *Does every move need a plan?*

AB-SO-LUTELY!!!

LOAD MOVEMENT RISK MITIGATION SUMMARY...

- ***PRE-PLAN!!!!***
 - *Actively investigate & assess ahead of time... **AND IMMEDIATELY PRIOR TO STARTING WORK***
 - ***COMMUNICATE!!!!***
 - *Execute – **FOLLOW THE PLAN!!!***
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TOWER CRANE ERECTION

- PRE-ERECTION MEETING-DISCUSS THE DAYS EVENTS, ENSURE THAT EVERYONE INVOLVED IS AWARE OF THEIR RESPONSIBILITIES AND THE HAZARDS THAT GO ALONG WITH THOSE RESPONSIBILITIES.
- WRITTEN PROCEDURES SHALL BE DEVELOPED BY THE MANUFACTURER OR A QUALIFIED PERSON BEFORE WORK COMMENCES
- ENSURE CRANE HAS BEEN PROPERLY INSPECTED PRIOR TO DELIVERY
- PROPER COMMUNICATION SYSTEM IS IN PLACE BETWEEN THE SIGNALPERSON AND THE OPERATOR OF THE ASSIST CRANE
- ANY LAST-MINUTE JOBSITE CHANGES
- INSPECTION OF ALL RIGGING, CHAIN FALLS, SPREADER BEAMS, SLINGS, COME ALONGS AND ANY OTHER EQUIPMENT TO BE USED
- THE DAYS WEATHER
- OVERHEAD POWERLINES OR UNDERGROUND UTILITIES AND VAULTS
- TOWER CRANE MANUAL ON SITE
- PROPER TOOLING FOR TOWER MAST BOLTS OR PIN CONNECTIONS
- PERMITS OR ROAD CLOSURES
- MEMBERS OF ERECTION CREW HAVE THE PROPER CERTS OR LICENSES
- IF CRANE IS ELECTRICALLY POWERED ALL REGULATIONS ARE FOLLOWED ACCORDING TO LOCAL AUTHORITIES
- ENSURE THAT THE BASE SECTION MEETS PLUMB TOLERANCES SPECIFIED BY THE MANUFACTURER OR QUALIFIED PERSON



OPERATION

- LOAD TEST TO BE PERFORMED AS PER MANUFACTURERS SPECIFICATIONS BEFORE CRANE IS PUT INTO SERVICE
 - SHIFT INSPECTION PERFORMED BY A COMPETENT PERSON PRIOR TO OPERATION AS PER OSHA 1926.1412(d)
 - OPERATIONAL AIDS, SAFETY DEVICES AND CONTROL MECHANISMS ARE ONLY PART OF THE SHIFT INSPECTION
 - OPERATOR MUST NOT ENGAGE IN ANY PRACTICE THAT CAN DIVERT HIS ATTENTION DURING OPERATION OF CRANE
 - WEATHER CONDITIONS MUST BE CONSTANTLY MONITORED DURING THE DAY
 - CONSTANT COMMUNICATION MUST BE KEPT BETWEEN SIGNALPERSON AND OPERATOR
 - PRE-SHIFT MEETING SHOULD OCCUR TO MAKE ALL PARTIES INVOLVED IN THE DAYS OPERATIONS AWARE OF THEIR RESPONSIBILITIES AND THE HAZARDS RELATING TO THEM
 - SAFETY DEVICES AND OPERATIONAL AIDS SHOULD NOT BE USED AS A SUBSTITUTE FOR GOOD JUDGEMENT AND SAFE OPERATION
 - CRANE MUST NOT BE OPERATED IN EXCESS OF ITS RATED CAPACITY
 - OPERATOR MUST OBEY AN EMERGENCY STOP SIGNAL IRRESPECTIVE OF WHO GIVES IT
 - OPERATOR MUST HAVE THE AUTHORITY TO STOP AND REFUSE TO HANDLE LOADS IF THERE IS A CONCERN AS TO SAFETY. A QUALIFIED PERSON MUST DETERMINE THAT SAFETY IS ASSURED
 - TAG LINES MUST BE USED TO CONTROL ROTATION OF ANY LOAD THAT COULD BE DANGEROUS
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DISASSEMBLY

- DISASSEMBLY OF THE CRANE IS MORE THAN JUST DOING EVERYTHING IN REVERSE
- CHANGES IN ACCESS ROADS AND JOBSITE LOGISTICS MUST ALWAYS BE TAKEN INTO CONSIDERATION
- STRUCTURES THAT WEREN'T PRESENT BEFORE THE ERECTION OF THE TOWER, INCLUDING THE ONE THAT THE CRANE MAY HAVE BEEN USED TO ERECT, WILL PRESENT CERTAIN CHALLENGES TO THE DISASSEMBLY
- TAILSWING OF THE TOWER CRANE COULD AFFECT THE ABILITY TO JACK THE CRANE DOWN TO A HEIGHT THAT IS ACCESSIBLE TO THE ASSIST CRANE
- DERRICKS MAY NEED TO BE ERECTED ON THE ROOF AND USED TO DISMANTLE TOWER CRANES THAT ARE MOUNTED ON THE TOP OF A BUILDING
- ALL WORK DURING THE DISASSEMBLY IS DONE AT EXTREME HEIGHTS, INCREASING THE NEED FOR THE PROPER SAFETY PROTOCOLS TO BE PUT IN PLACE
- PRE-SHIFT MEETING SHOULD TAKE PLACE BEFORE WORK BEGINS
- DURING DISASSEMBLY, THE PATH OF THE CRANE COMPONENTS IS NEVER A GUARANTEED THING, WHEN PINS OR BOLTS ARE DISCONNECTED THERE IS ALWAYS THE CHANCE THE COMPONENT COULD SHIFT UNEXPECTEDLY
- TAG LINES SHOULD BE USED WHENEVER SWINGING OF THE LOAD IS HAZARDOUS
- AGAIN, ALWAYS KEEP TRACK OF THE WEATHER



Site Control

Staging Lot





Designated Spotters



Fall Zone

Tag Lines



QUESTIONS?



