Crane Accidents:

A Study of Causes and Trends to Create a Safer Work Environment

1983-2013

Jim D. Wiethorn, P.E.

Principal/Chairman

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Bellevue, Washington

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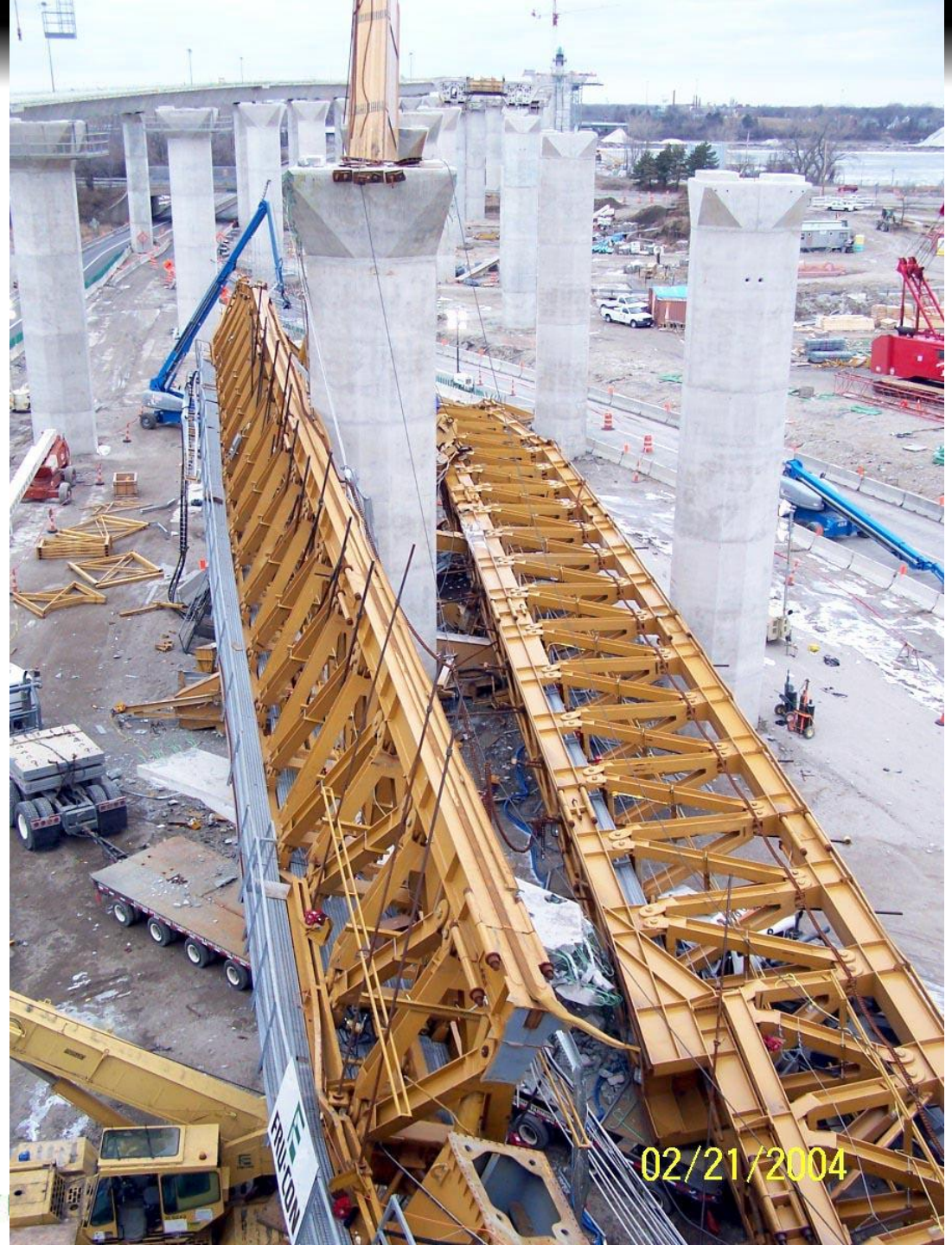
Toledo, Ohio



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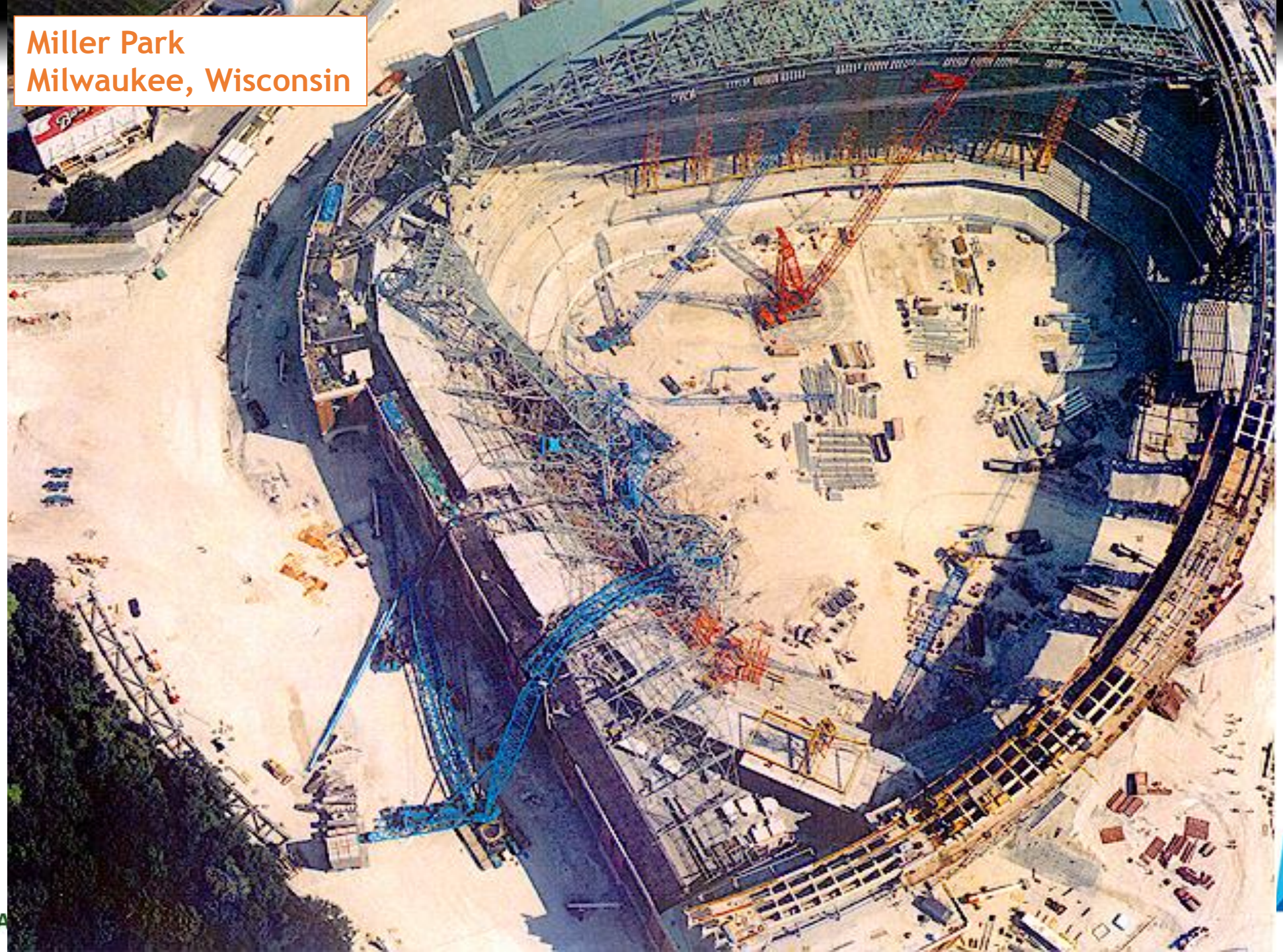

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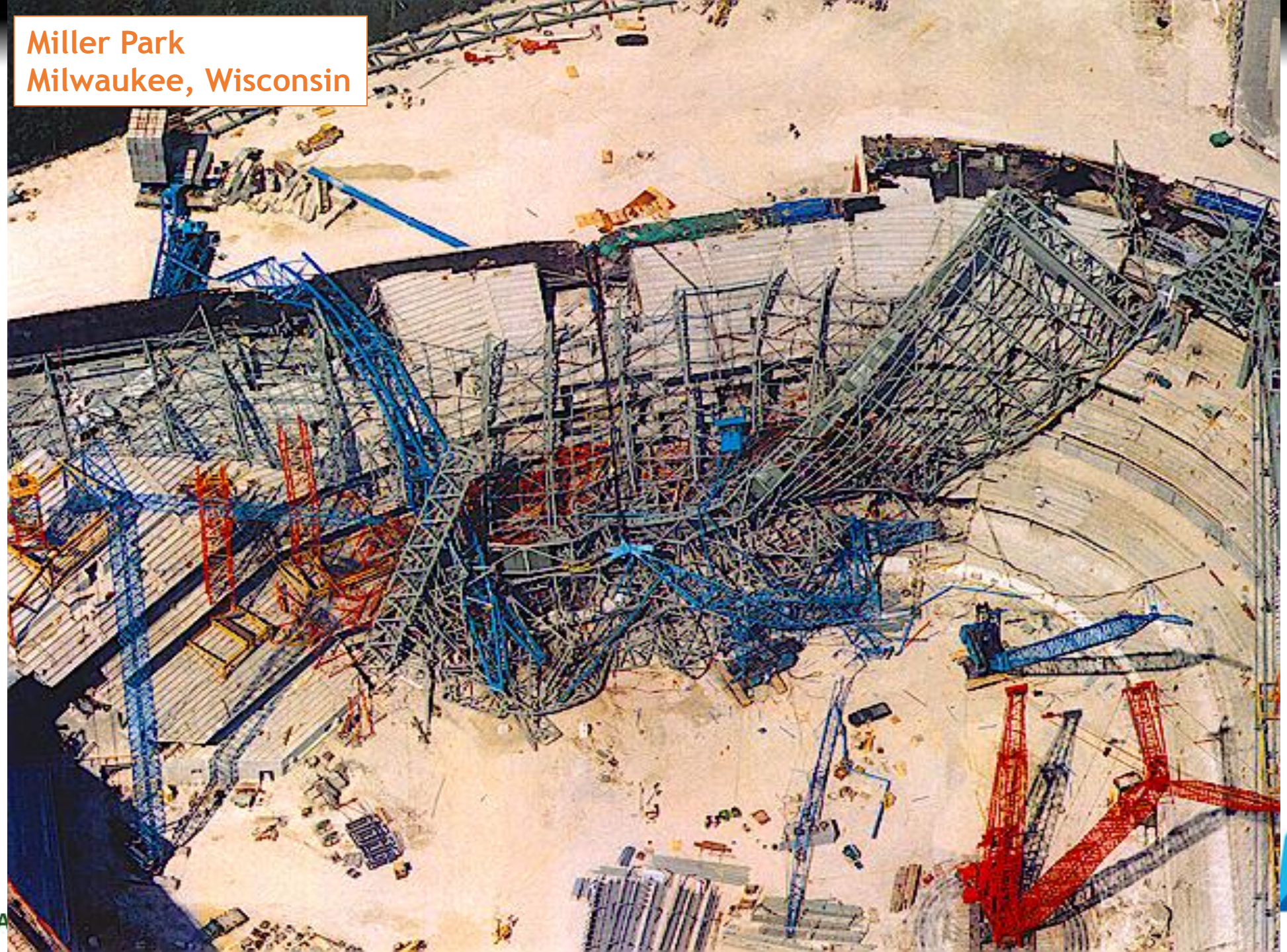

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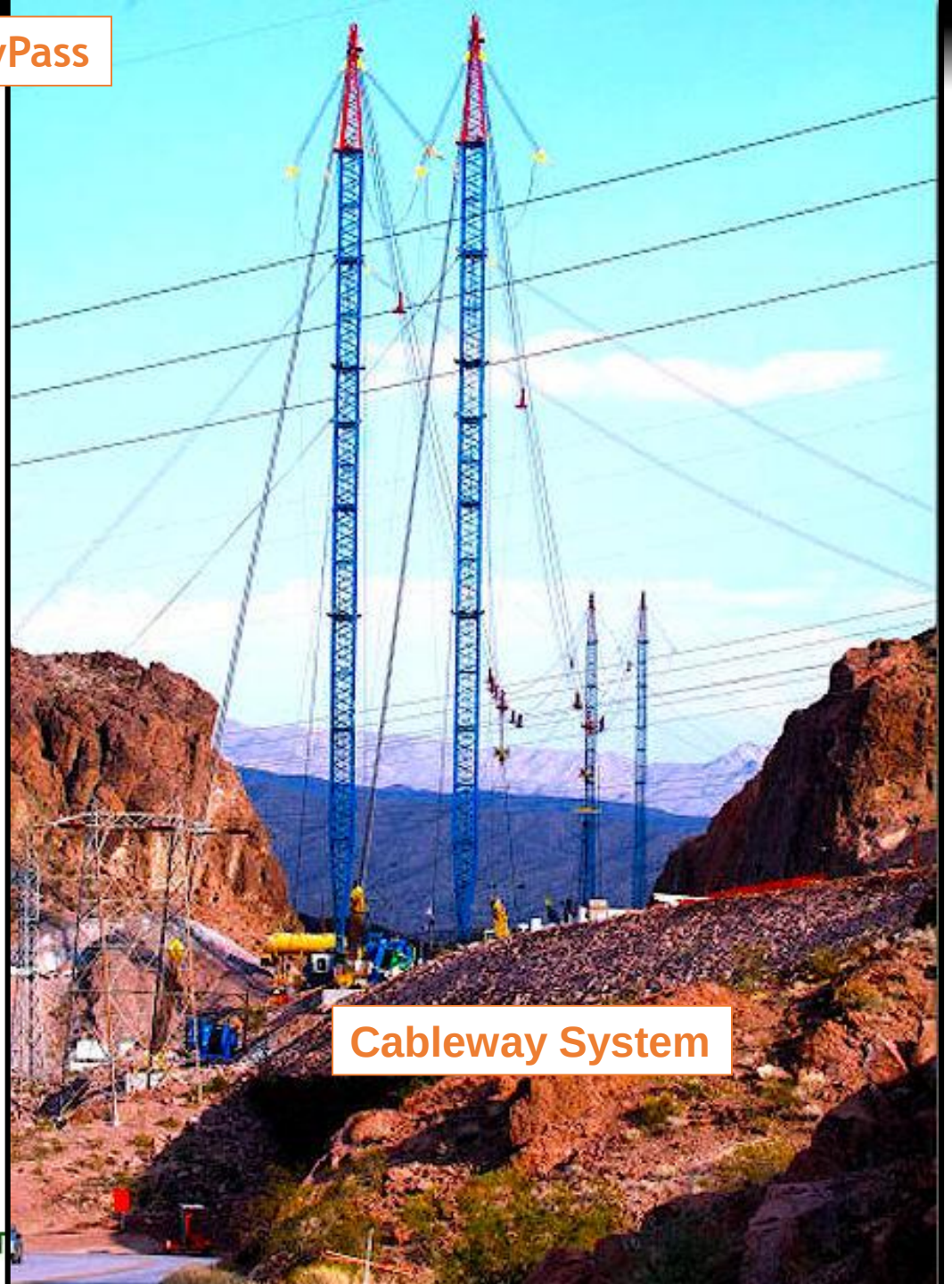
Hoover Dam ByPass



Cableway System

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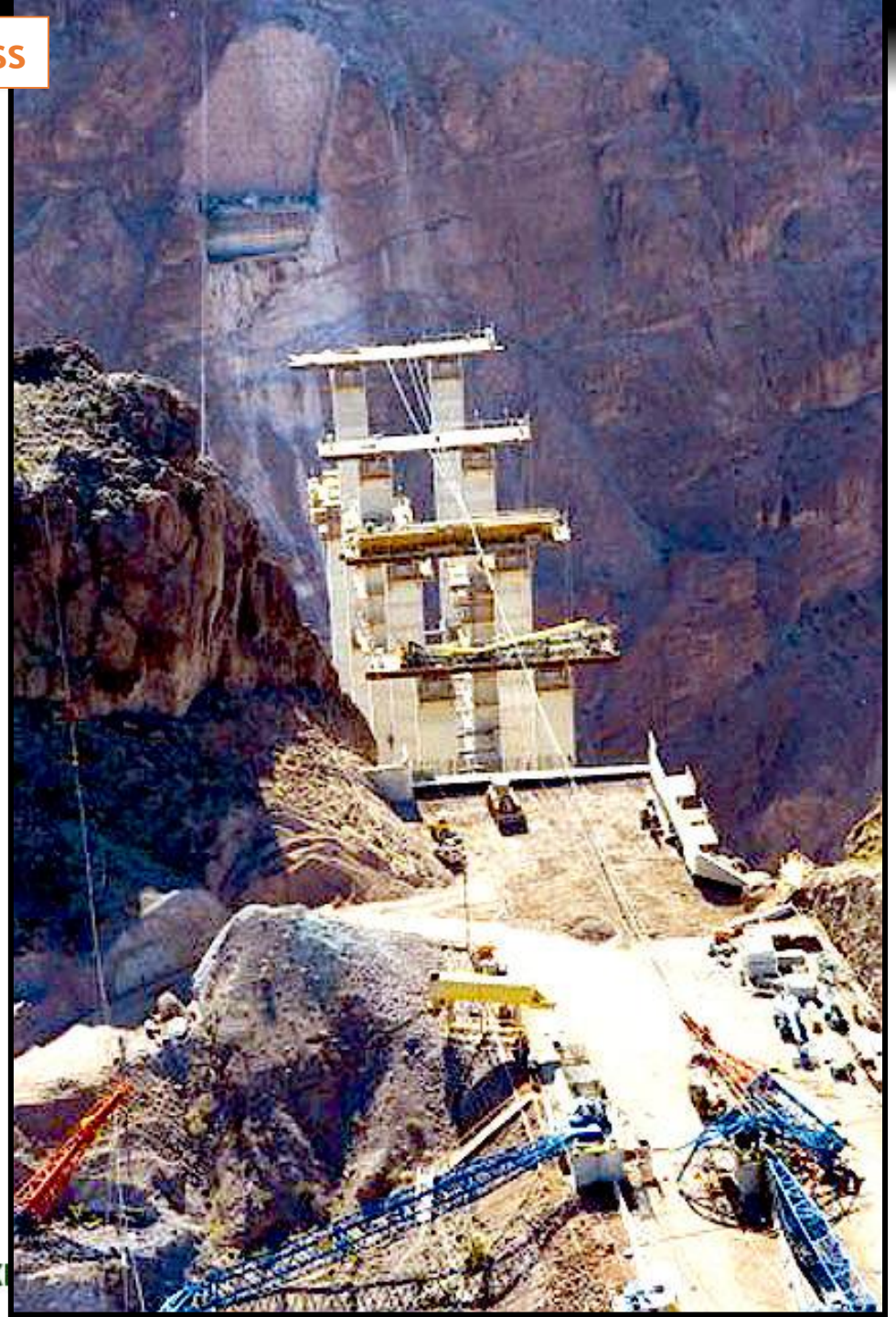
Hoover Dam ByPass



Hoover Dam ByPass

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Hoover Dam ByPass

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New York Tower Crane-51st

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Engineering

New York Tower Crane - 51st

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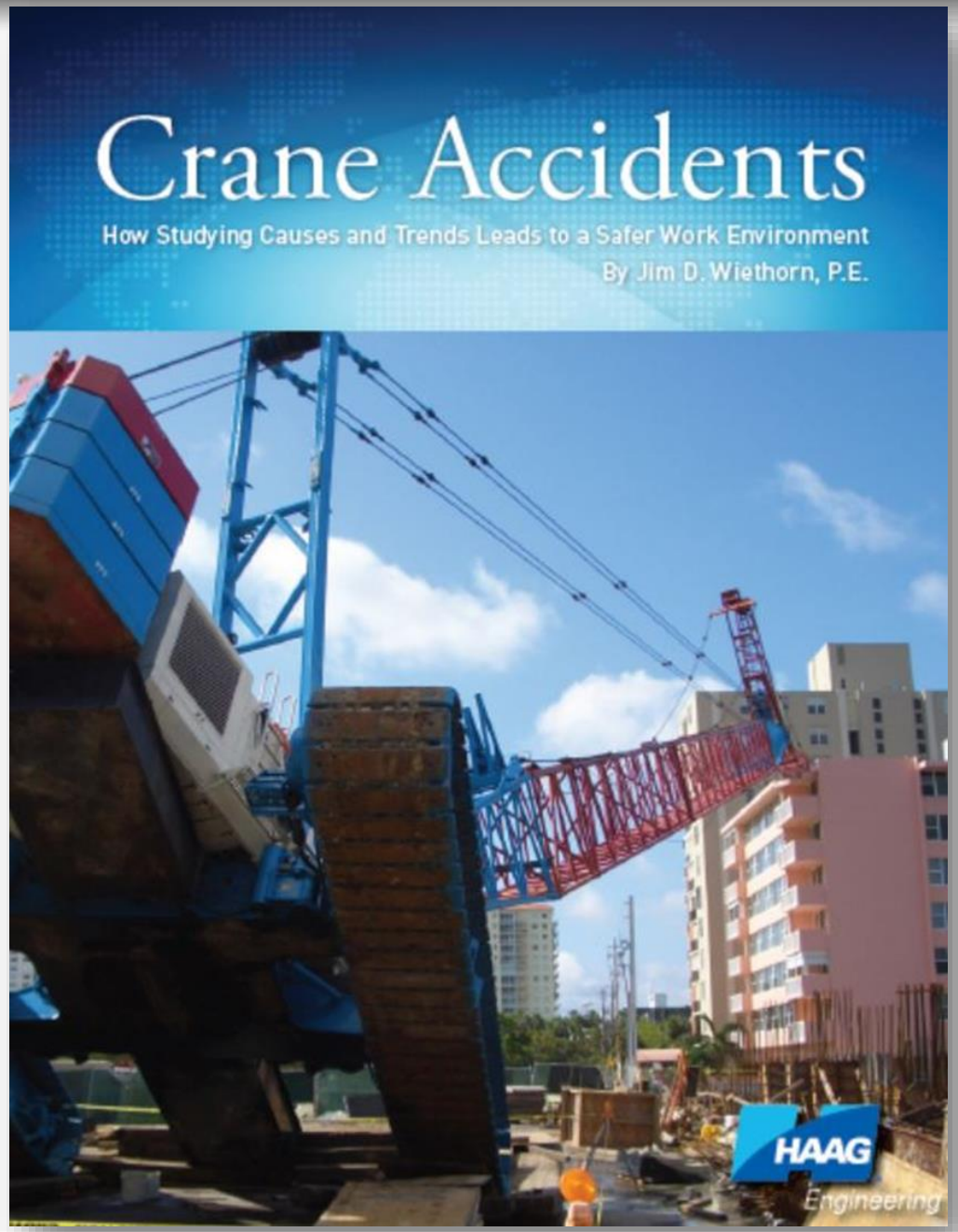
PUBLISHED
2014

HAAG SM
Engineering

www.haagglobal.com



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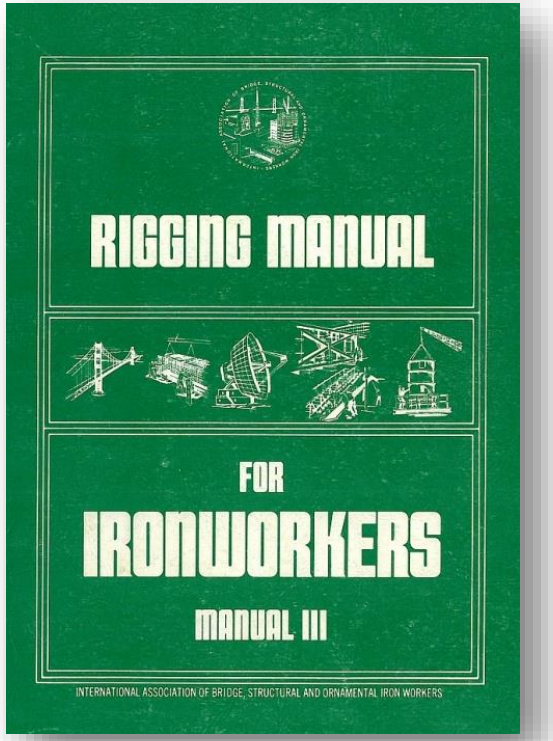
Study Development

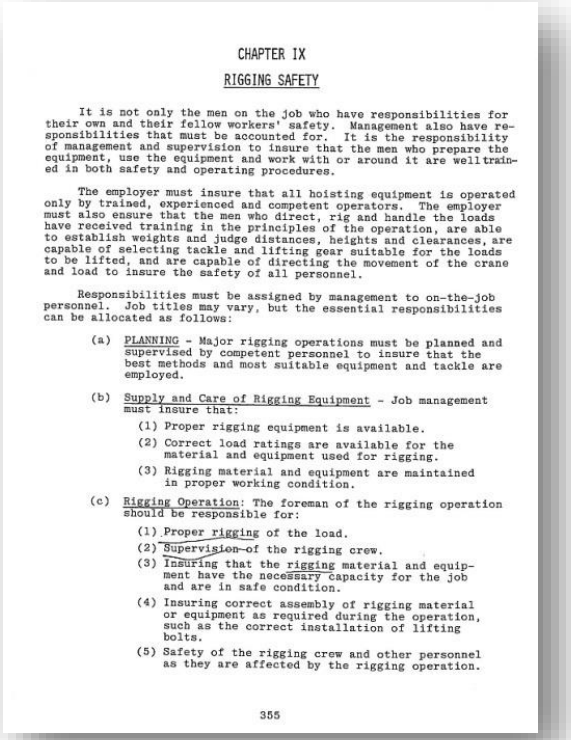
- Develop a Known Basic Parameter
  - Duties & Responsibilities of Crane Lifts
  - Apply current standards over the entire study
    - Track Changes/Improvements/Problematic Areas
- Develop Study Issues-Subject Matter Experts
- Develop Peer Reviewed Process-Authentication
- Have an Adequate Size Data Bank

Duties & Responsibilities

-Where It Began-

- **Iron Workers – 1960's**
  - **International Association of Bridge, Structural and Ornamental Iron Workers**





CHAPTER IX

RIGGING SAFETY

It is not only the men on the job who have responsibilities for their own and their fellow workers' safety. Management also have responsibilities that must be accounted for. It is the responsibility of management and supervision to insure that the men who prepare the equipment, use the equipment and work with or around it are well trained in both safety and operating procedures.

The employer must insure that all hoisting equipment is operated only by trained, experienced and competent operators. The employer must also ensure that the men who direct, rig and handle the loads have received training in the principles of the operation, are able to establish weights and judge distances, heights and clearances, are capable of selecting tackle and lifting gear suitable for the loads to be lifted, and are capable of directing the movement of the crane and load to insure the safety of all personnel.

Responsibilities must be assigned by management to on-the-job personnel. Job titles may vary, but the essential responsibilities can be allocated as follows:

(a) PLANNING - Major rigging operations must be planned and supervised by competent personnel to insure that the best methods and most suitable equipment and tackle are employed.

(b) Supply and Care of Rigging Equipment - Job management must insure that:

(1) Proper rigging equipment is available.

(2) Correct load ratings are available for the material and equipment used for rigging.

(3) Rigging material and equipment are maintained in proper working condition.

(c) Rigging Operation: The foreman of the rigging operation should be responsible for:

(1) Proper rigging of the load.

(2) Supervision of the rigging crew.

(3) Insuring that the rigging material and equipment have the necessary capacity for the job and are in safe condition.

(4) Insuring correct assembly of rigging material or equipment as required during the operation, such as the correct installation of lifting bolts.

(5) Safety of the rigging crew and other personnel as they are affected by the rigging operation.

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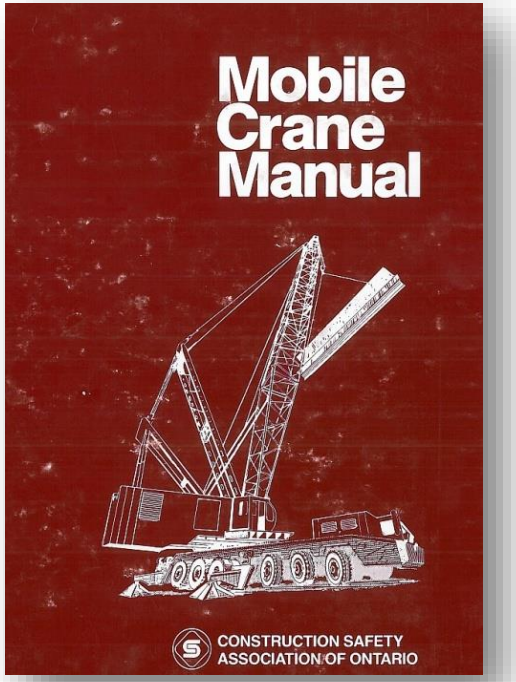
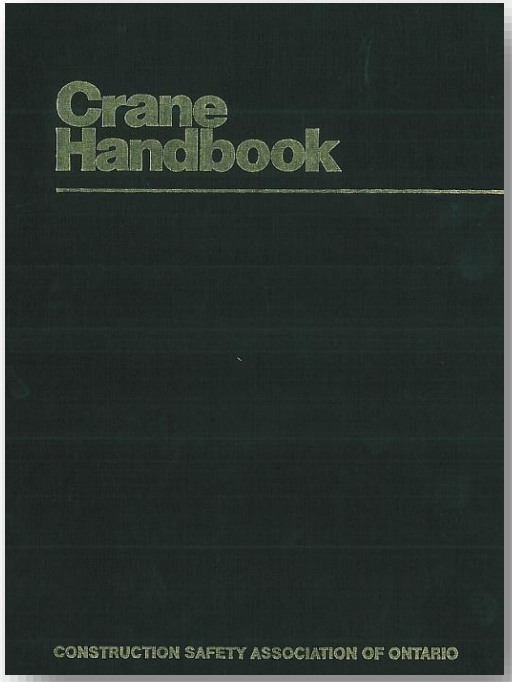
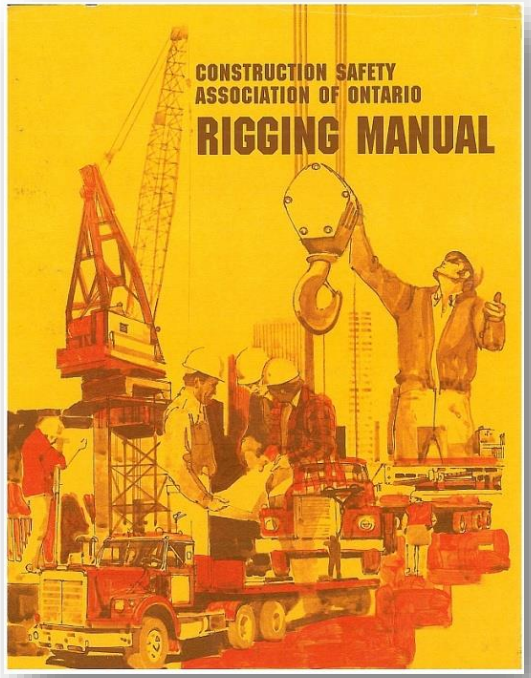
Publications by Don Dickie

- **Don Dickie – 1970 – 1998**

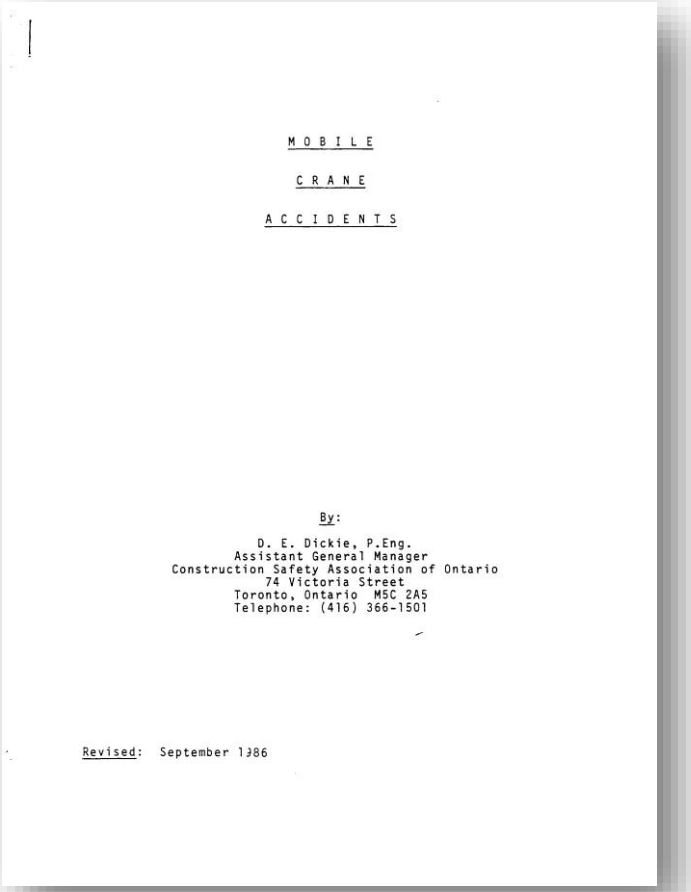






Don Dickie, P. Eng.

Construction Safety Association of Ontario



MOBILE

CRANE

ACCIDENTS

By:

D. E. Dickie, P.Eng.
Assistant General Manager
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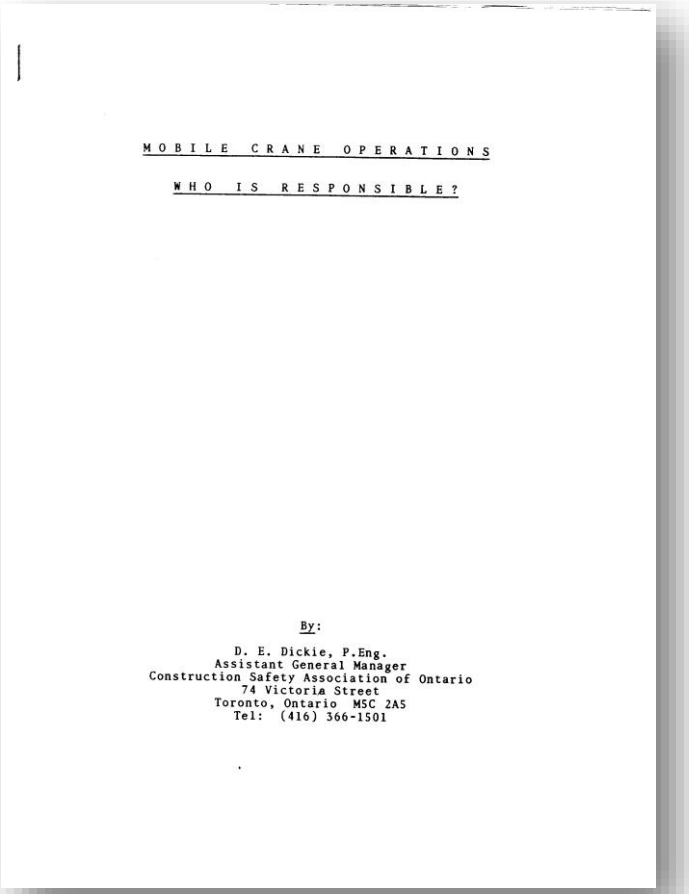
74 Victoria Street
Toronto, Ontario M5C 2A5
Telephone: (416) 366-1501

Revised: September 1986

Mobile Crane Accidents

September 1986



MOBILE CRANE OPERATIONS

WHO IS RESPONSIBLE?

By:

D. E. Dickie, P.Eng.
Assistant General Manager
Construction Safety Association of Ontario
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Toronto, Ontario M5C 2A5
Tel: (416) 366-1501

Mobile Crane Operations Who is Responsible

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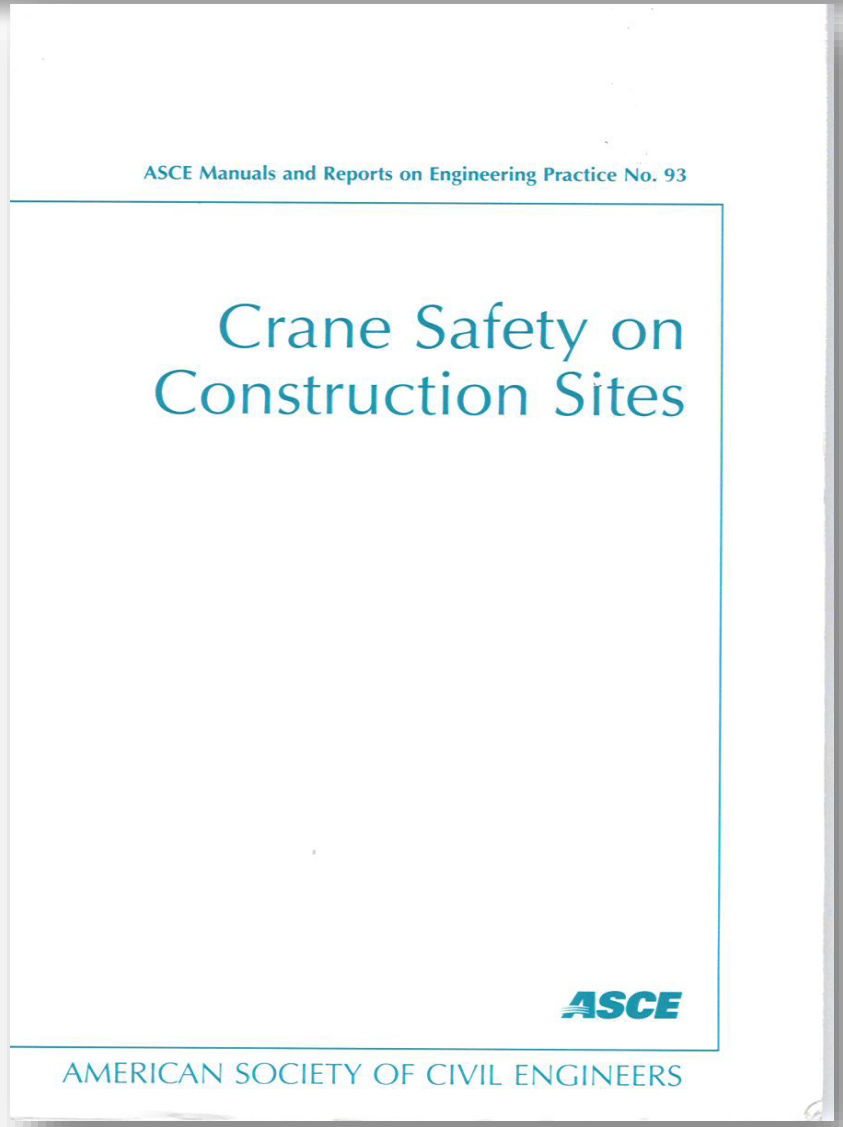

First Publication
in the United States
Specifically Dealing with
Duties & Responsibilities

ASCE Manuals and Reports on Engineering Practice No. 93
Published: 1998

1998
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2007

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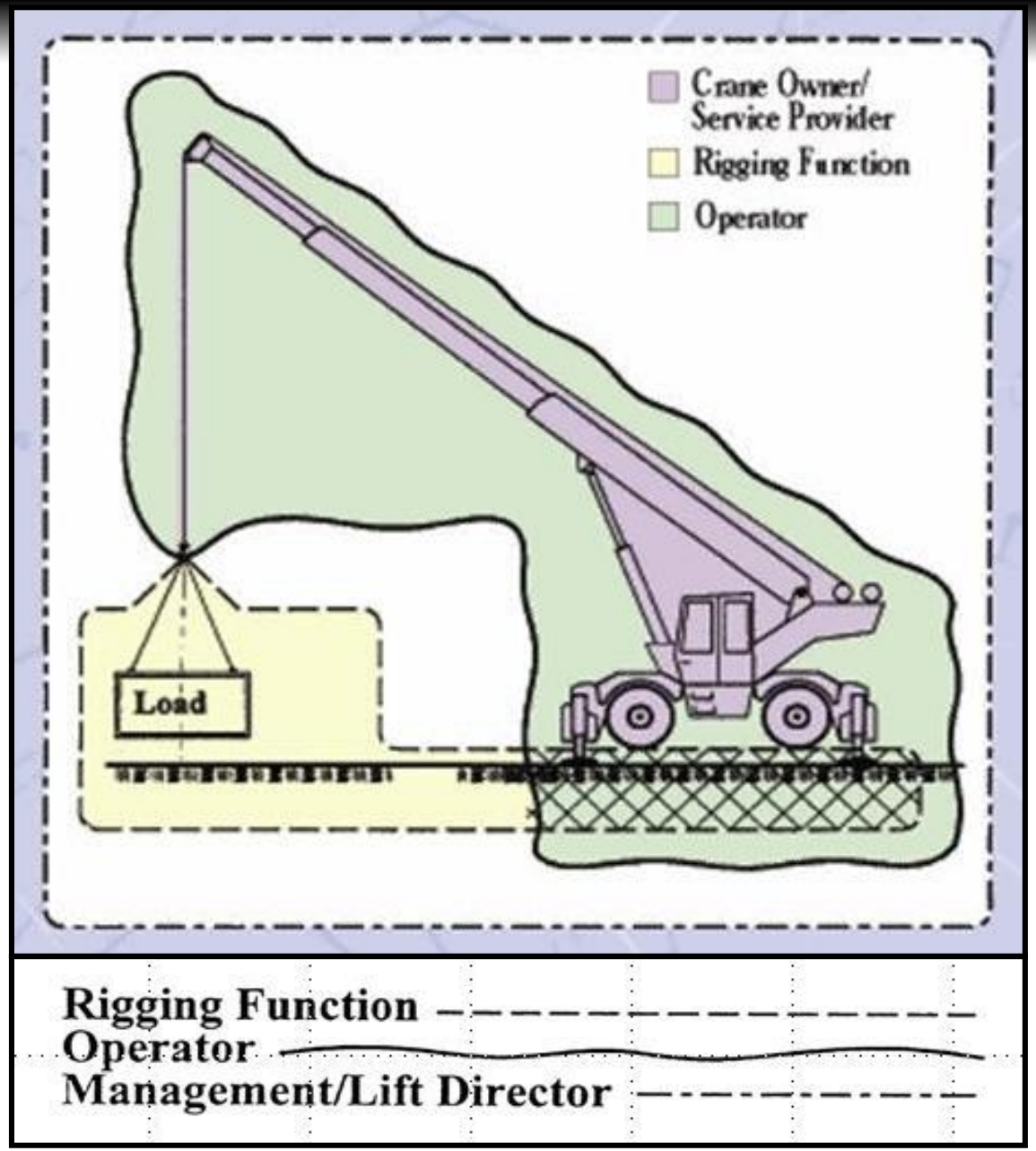
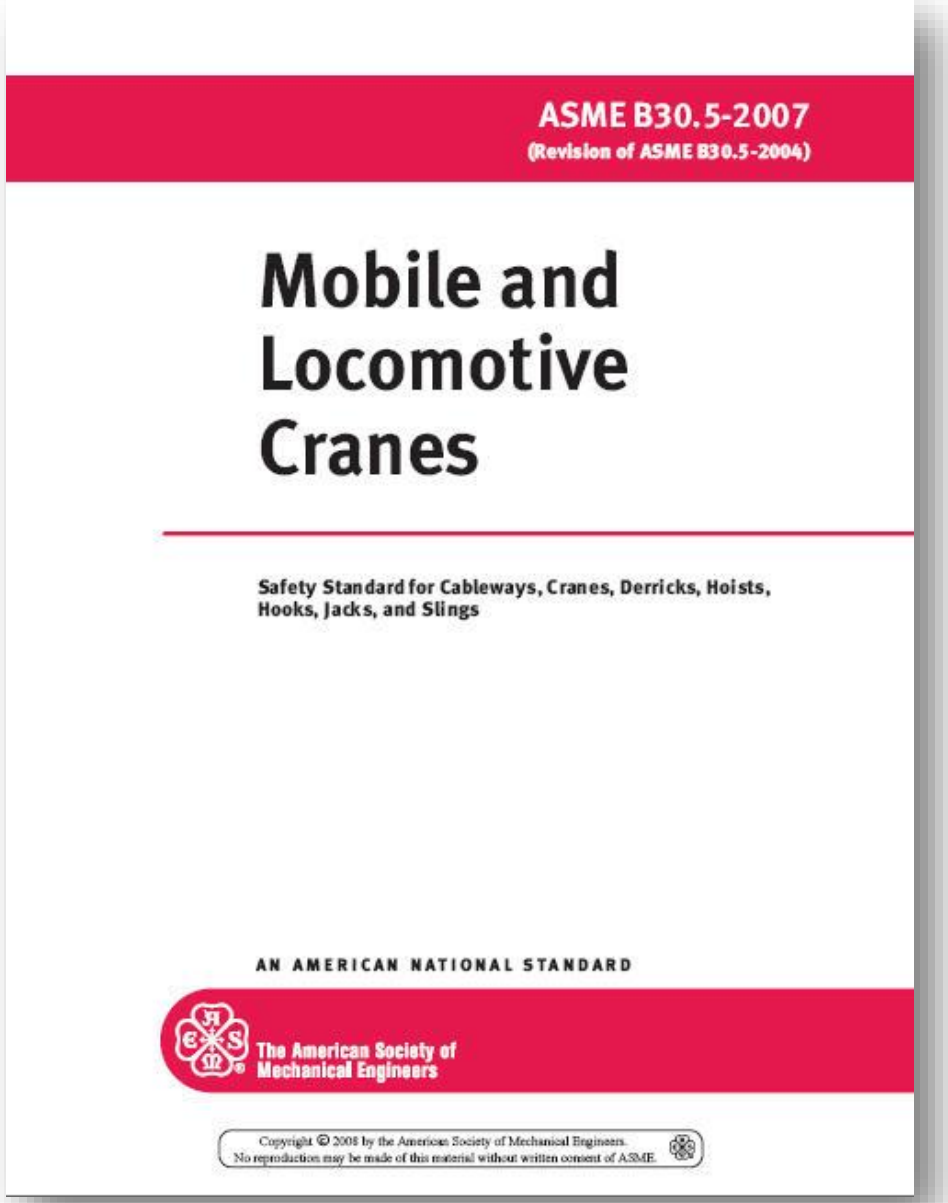


Primary Parties

ASCE 93 Zones Of Responsibilities



ASME B30.5-2007
(Revision of ASME B30.5-2004)

Mobile and Locomotive Cranes

Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings

AN AMERICAN NATIONAL STANDARD

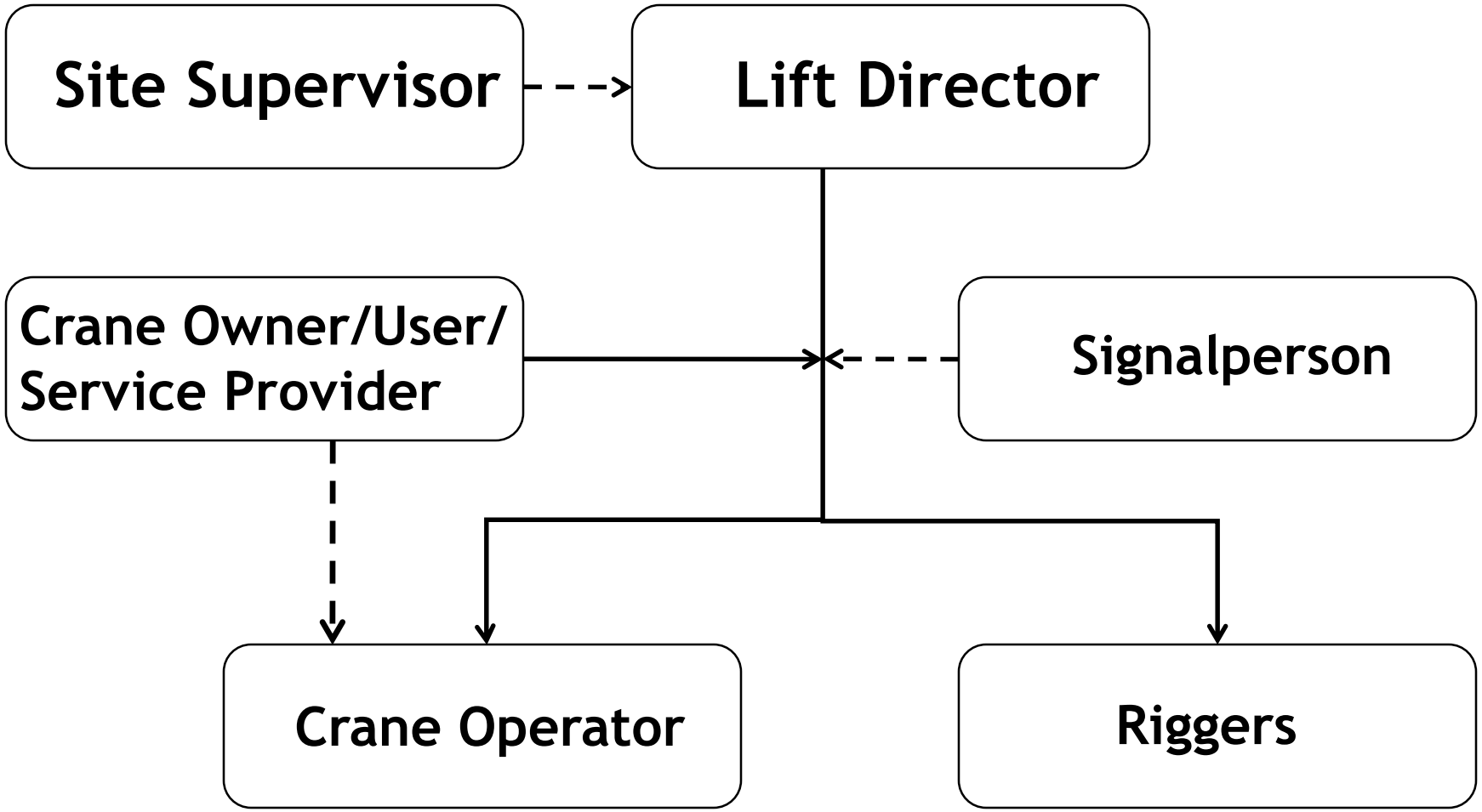
The American Society of Mechanical Engineers

Current National Consensus Standard

ASME B30.5-2007 Duties & Responsibilities

2007 - Present

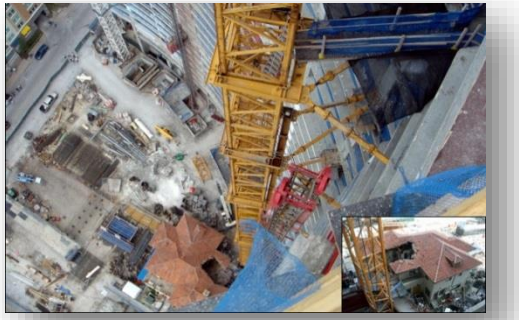
Responsibility Flow Chart



Study Development Sources

- Haag Engineering – Crane Accidents
  - Through December 2013 – 716 Assignments
  - Currently through February 201 – 904 Assignments
- Subject Matter Experts
  - Industry Consultants
  - ASME B30 Committee/Sub-Committee Members
  - NCCCO Committee Members
  - SC&RA Members

10 - Crane Study Categories



- **Commercial Construction**
  - Work with multiple users on a site
  - Almost Exclusive use of tower cranes
  - Consistent lifting but with different loads/radii
  - Lifts are often made in tight quarters-multiple workers
  - Multiple ranges of lifts: General, Production & Critical
- **Highway/Road & Bridge Construction**
  - Often lifts have to be done at night
  - More critical lifts-dual crane picks
  - Unprepared crane ways-continuous crane movement-native soil
  - Tight fits-complicated
  - Multiple Random Power Lines Over Roads

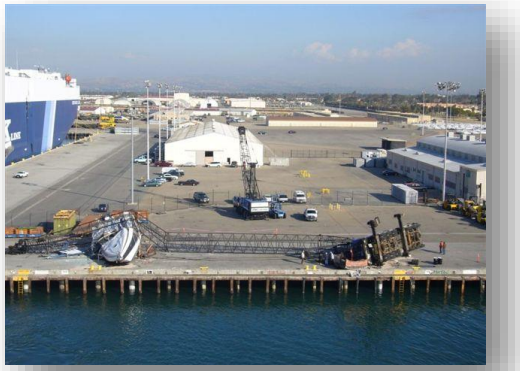
Crane Study Categories

- **Industrial/Manufacturing**
  - Greatest number of "certified" operators
    - First to controls gets to operate the crane
  - Continuous use 24/7-maintenance is problematic
  - Usually consistent or identical lifts
    - Moving product from one point to another
  - Irregular or complicated center-of-gravity calculations/lifting-piping

- **Residential Construction**
  - No qualified riggers – lack of rigging/lifting experience
  - Operator is often brought into the lift-held to a higher standard
  - Workers Do Not Understand Load Drift
  - Lack of Tag Lines

Crane Study Categories

- **Marine Industry**
  - 24-Hour operations
  - Multiple blind lifts during operations
  - General idea of weights but not known until lifted
  - Lifting off barges and ships



- **Mining Industry**
  - Maintenance-Potential chemical exposure
  - Unknown ability of riggers
  - Equipment can remain idle for a long period of time between uses
  - Multiple Shifts/Operators of a Single Unit

Crane Study Categories

- **Arborists/Logging Industry**
  - Follows different standard-ANSI Z133
  - Unknown weights and control of load
  - Unknown rigging ability of climber who is also the Lift Director
  - Logging-24/7 repetitive operations
- **Agriculture Industry**
  - No qualified riggers – lack of rigging/lifting experience
  - Weight of load seldom known
  - Site obstructions-power lines
  - Creative uses of rigging

Crane Study Categories

- **Oilfield-Land Base Industry**
  - Maintenance Issues-Remote areas
  - Availability of qualified operators
  - Multiple types of lifts with multiple companies
  - 24-Hour operations

- **Oilfield-Offshore Industry**
  - Maintenance/Exposure Issues
  - Equipment idle for long periods of time
  - Sufficiently trained riggers
  - Dynamic loading and offloading boats
  - 24-Hour operations

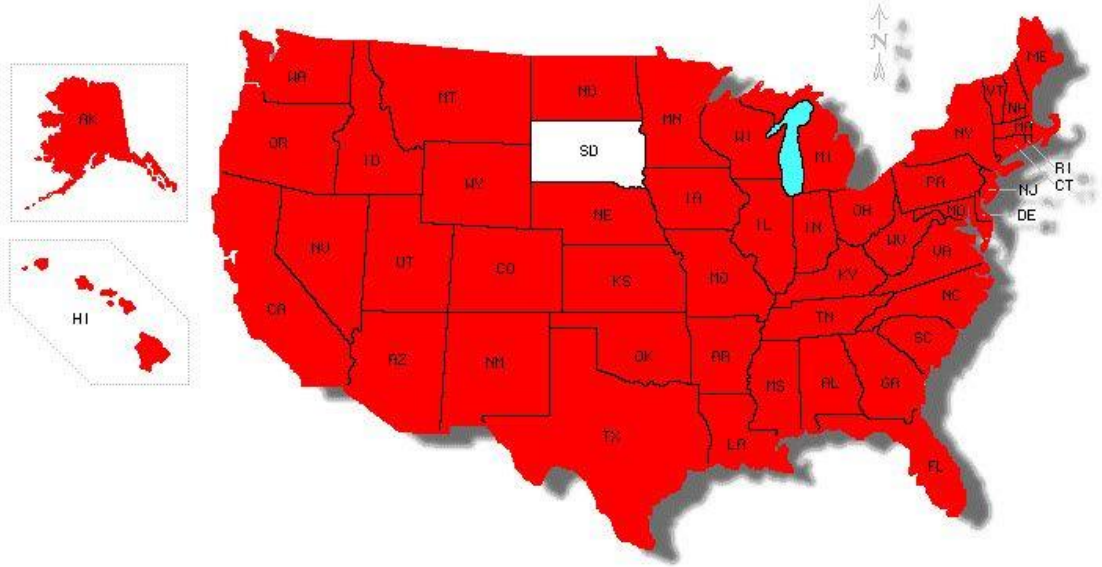
Study Breakdown by Section

- **Statistical Data**
  - Background/Crane Use
- **Collateral Data**
  - Damage Costs and Injuries/Deaths
- **Responsibilities of Parties**
  - Current B30.5 Guidelines
- **Causes of Accidents**
  - 14 Distinct Types of Accidents & Their Causes

Statistical Data

Data Bank

- **1983-2015: 716 (904) crane accidents-507 (600) Categorized**
- **Crane accidents in 49 of 50 States and** Internationally-South Africa-Brazil-Canada-Puerto Rico-Turks & Caicos-Virgin Islands, Grand Bahama Island
- Crane Types
  - **Tower**
  - **Mobile**
  - **Bridge**
  - **Hydraulic**
  - **Cableway**
  - **Derrick**
  - **Pedestal**
  - **Gantry**
  - **MEGA**
  - **Launching Girders**
  - **Other**



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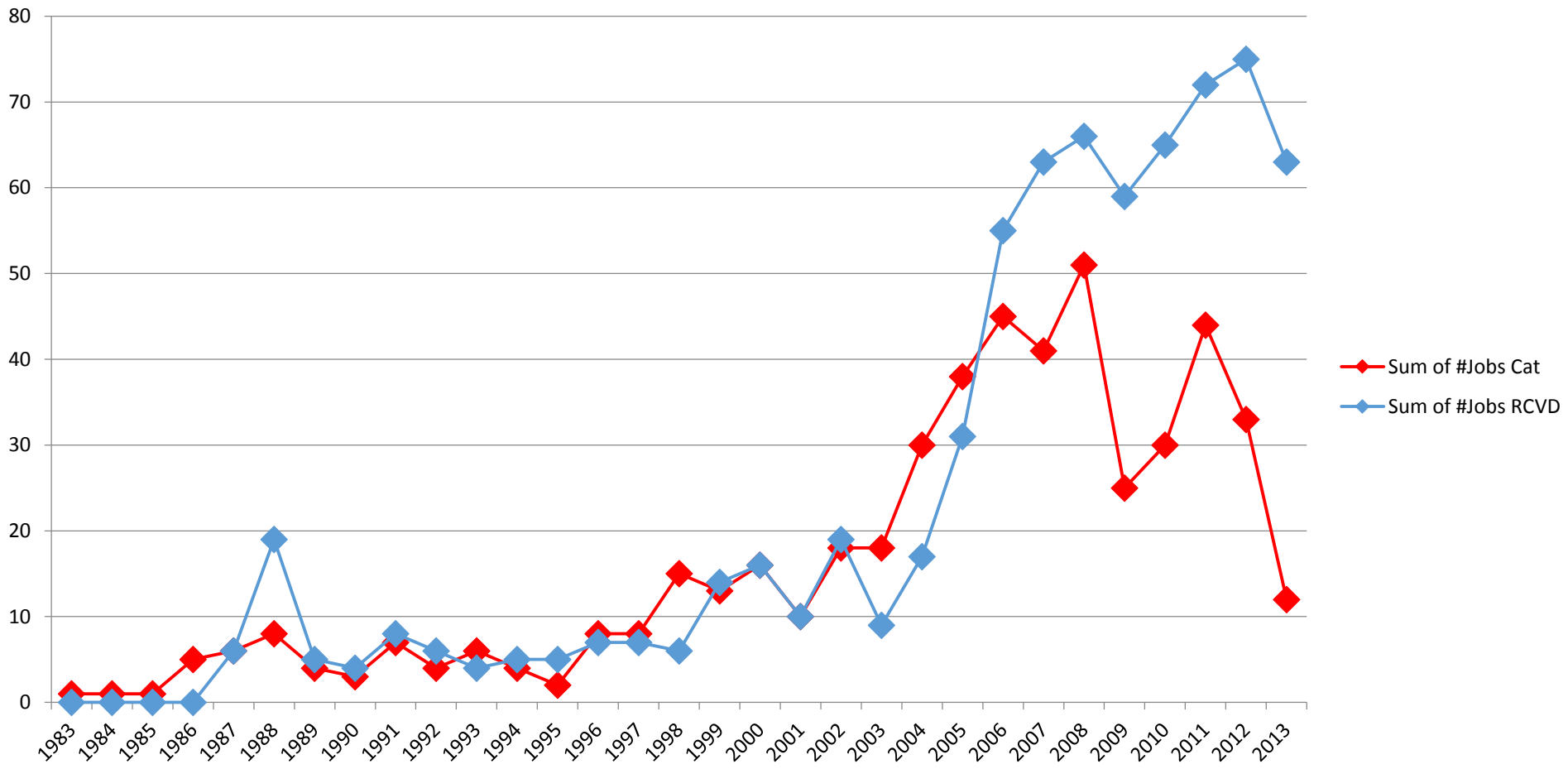
Jobs Received vs. Jobs Completed



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Crane Study Basis-Cases/Category

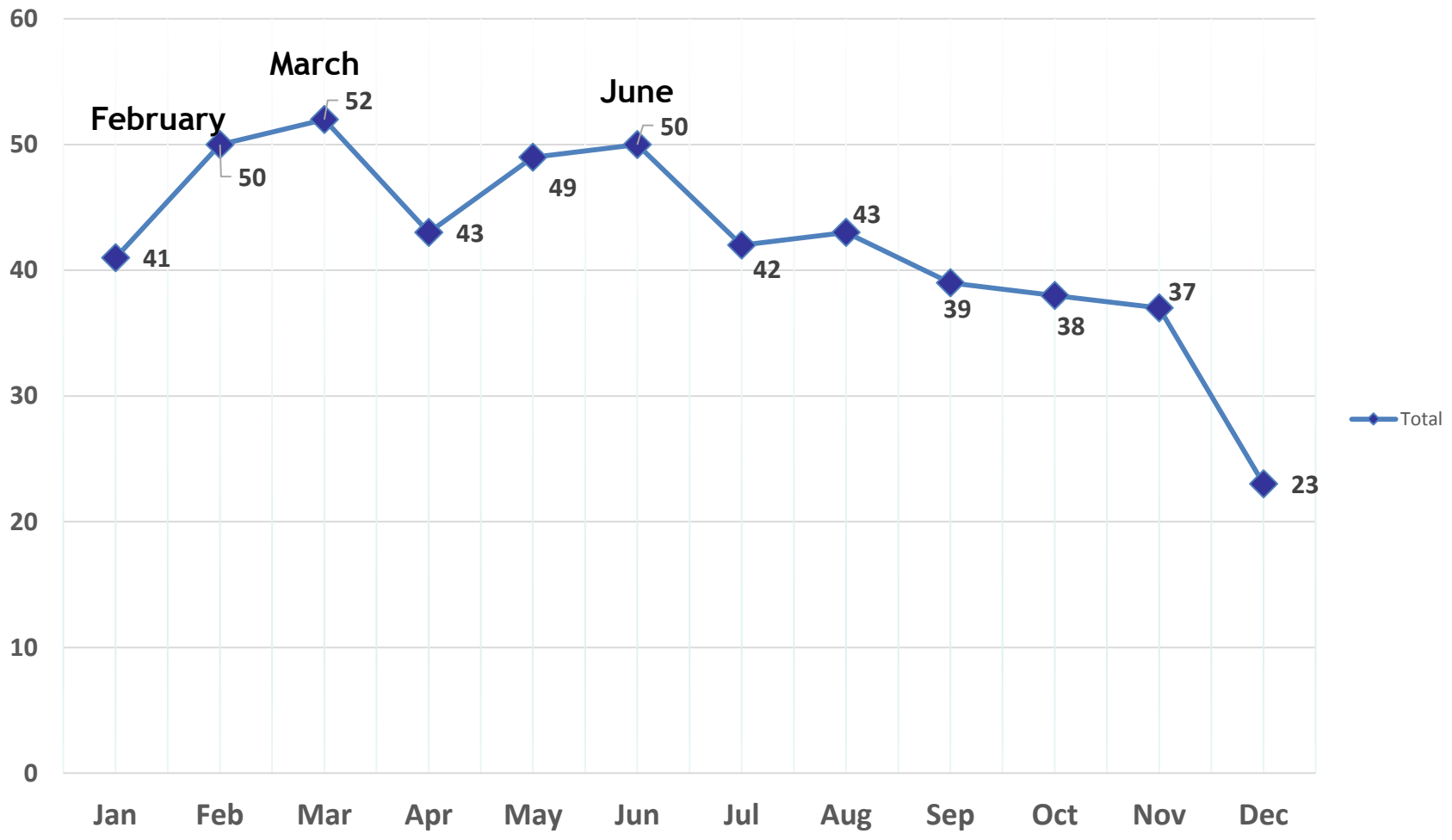
- 1983 - 2013
- 716 Crane Accidents
- 507 Accidents Categorized

	CASES	%
• Commercial Construction -	192	37.9
• Industrial/Manufacturing -	141	27.8
• Highway Construction -	57	11.2
• Residential Construction -	19	3.7
• Marine Industry -	33	6.5
• Mining Industry -	9	1.8
• Arborist/Logging -	7	1.4
• Oilfield-Land Base Industry -	31	6.1
• Oilfield-Offshore Industry -	17	3.4
• Agriculture Industry -	1	0.2
TOTAL	507	

Breakdown by Crane Types

• Mobile-Hydraulic	32.1	%
• Track Lattice	20.1	%
• Tower Crane	11.4	%
• Mobile-Lattice	10.8	%
• Mobile RT	8.3	%
• Overhead	4.7	%
• Special Crane	3.6	%
• Gantry	1.0	%
• MEGA	1.0	%
• Derrick	0.2	%
• Other	0.4	%

Total Number of Accidents By Month



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Collateral Data

Crane Study Basis-Deaths/Category

• 507 Accidents Categorized	# Deaths
• Commercial Construction -	55
• Highway Construction -	32
• Industrial/Manufacturing-	29
• Oilfield-Land Base Industry -	11
• Marine Industry -	10
• Residential Construction -	3
• Mining Industry -	3
• Arborist/Logging -	2
• Oilfield-Offshore Industry -	2
• Agriculture Industry -	0
TOTAL	147

Crane Study Basis-Deaths/Trade

- **507 Accidents Categorized**

	# Deaths
Other Field Personnel -	51
Operator -	38
Ironworker -	24
Rigger -	20
Management -	10
Pedestrian/Bystander -	3
Oiler -	1
Signal Person -	0
TOTAL	147

Crane Study Basis-Injuries/Category

• 507 Accidents Categorized	# Injuries
• Commercial Construction -	118
• Industrial/Manufacturing -	80
• Highway Construction -	29
• Oilfield-Land Base Industry -	13
• Oilfield-Offshore Industry -	13
• Residential Construction -	10
• Marine Industry -	9
• Mining Industry -	3
• Arborist/Logging -	3
• Agriculture Industry -	0
TOTAL	281

Crane Study Basis-Injuries/Trade

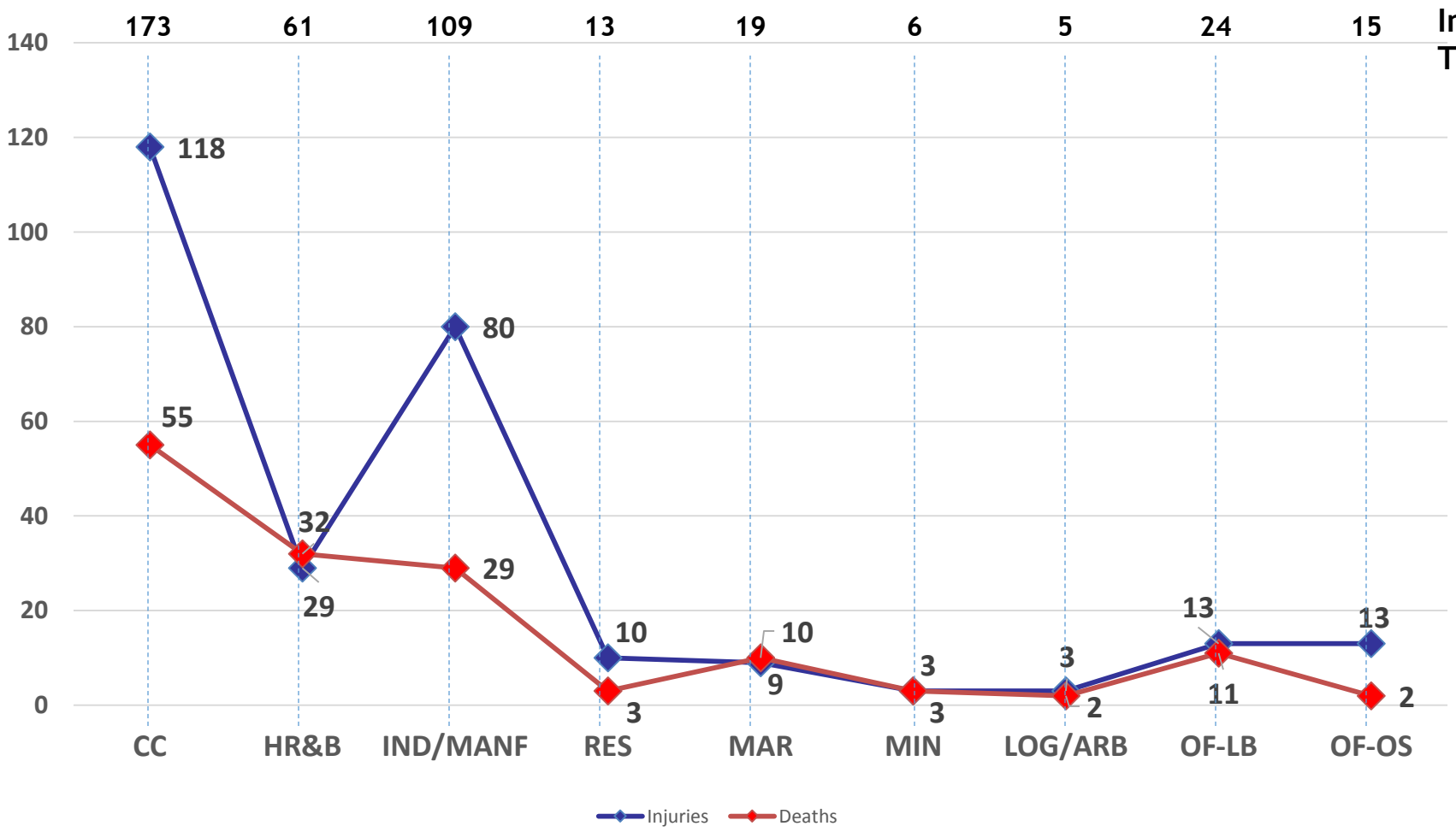
- 507 Accidents Categorized

	# Injuries
Rigger -	91
Other Field Personnel -	82
Ironworker -	50
Operator -	29
Pedestrian/Bystander -	14
Signal Person -	9
Management -	5
Oiler -	1
TOTAL	281

Load vs No Load On-The-Hook

- **Load On-The-Hook**
  - 356 Incidents 70.2%
- **No Load On-The-Hook**
  - 151 Incidents 29.8%

Total Deaths/Injuries By Industry



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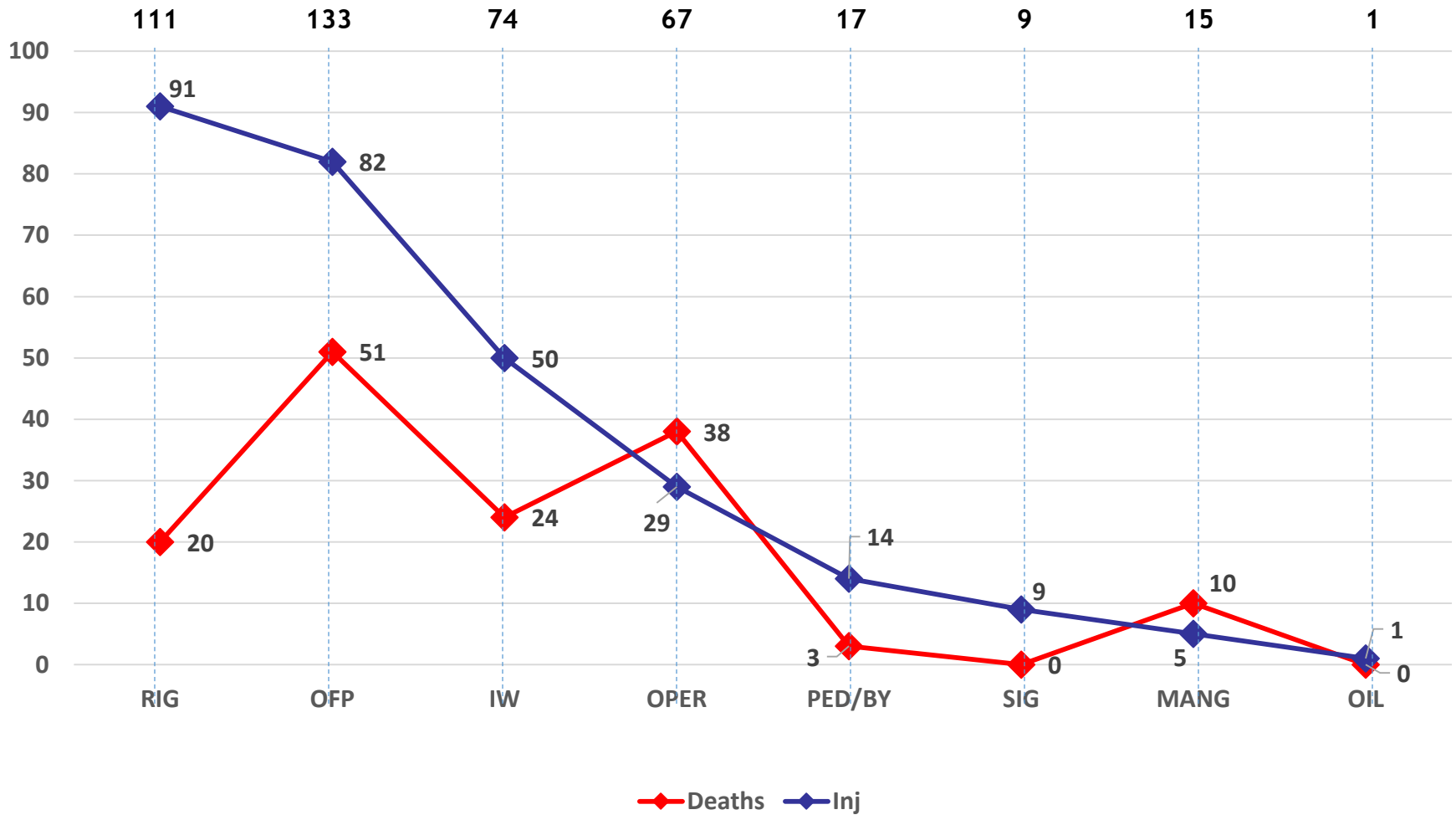
Total Deaths/Injuries By Trade



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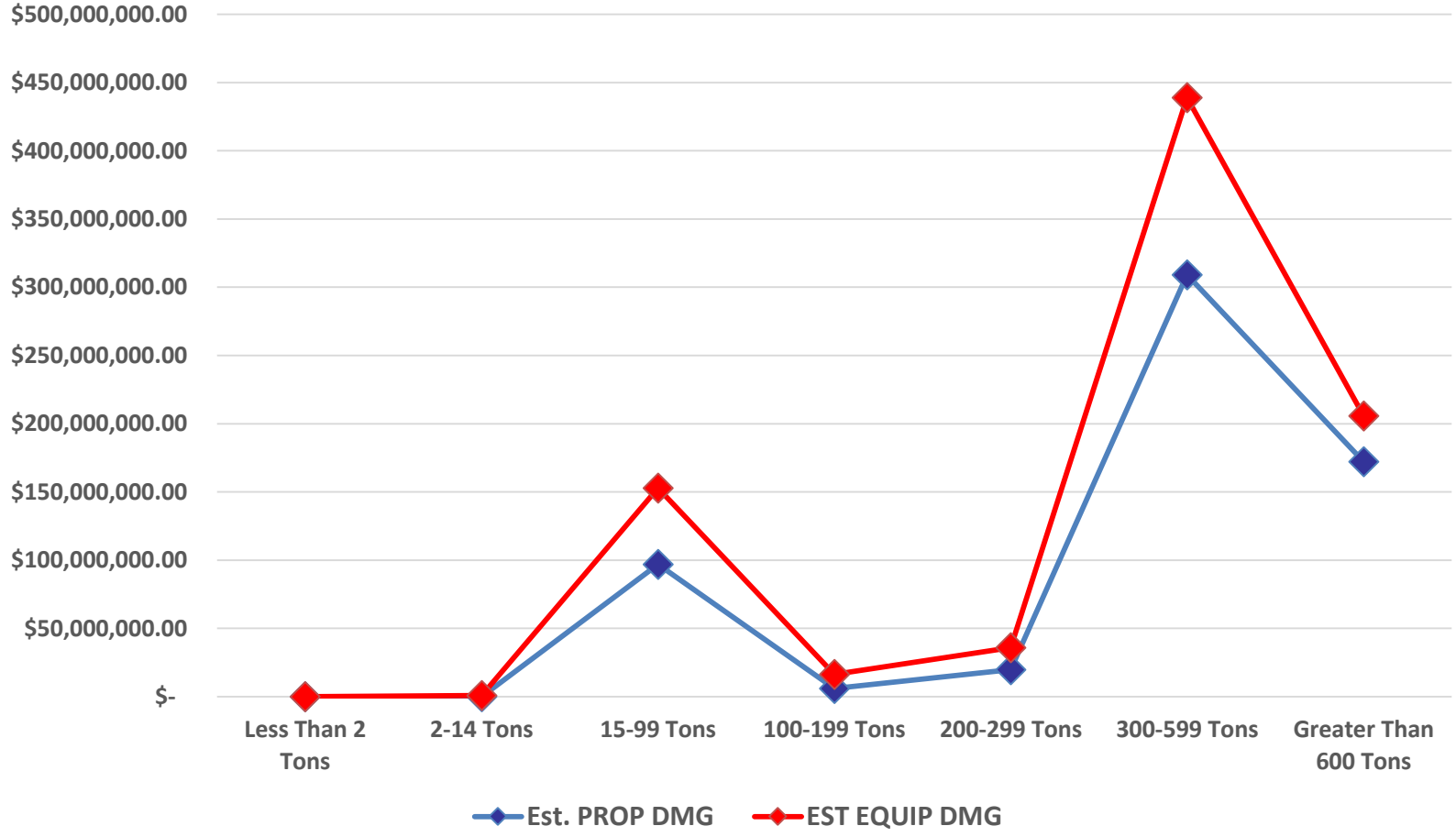
Estimated Property/Equipment Damage By Crane Size



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Responsibilities of Parties

Parties Involved With Lifts

- Site Supervisor
- Lift Director
- Rigger
- Operator
- Service Provider
- Owner/User
- Signal Person
- Other
- Crane Manufacturer
- Manufacturer of Load
- Maintenance/Inspection Personnel

Quantifying Contribution to Incident

- The responsible parties were categorized as either "primary" or "secondary".

- A PRIMARY responsible party has been defined as a party who failed in their responsibility in such a way that, without their breach of responsibility, the accident would not have occurred.

- A SECONDARY responsible party has been defined as a party whose breach of responsibility exacerbated the accident, but it would have occurred regardless due to other factors.

Typical Responsibility Assessment

Jack Breslin Center

Michigan State University

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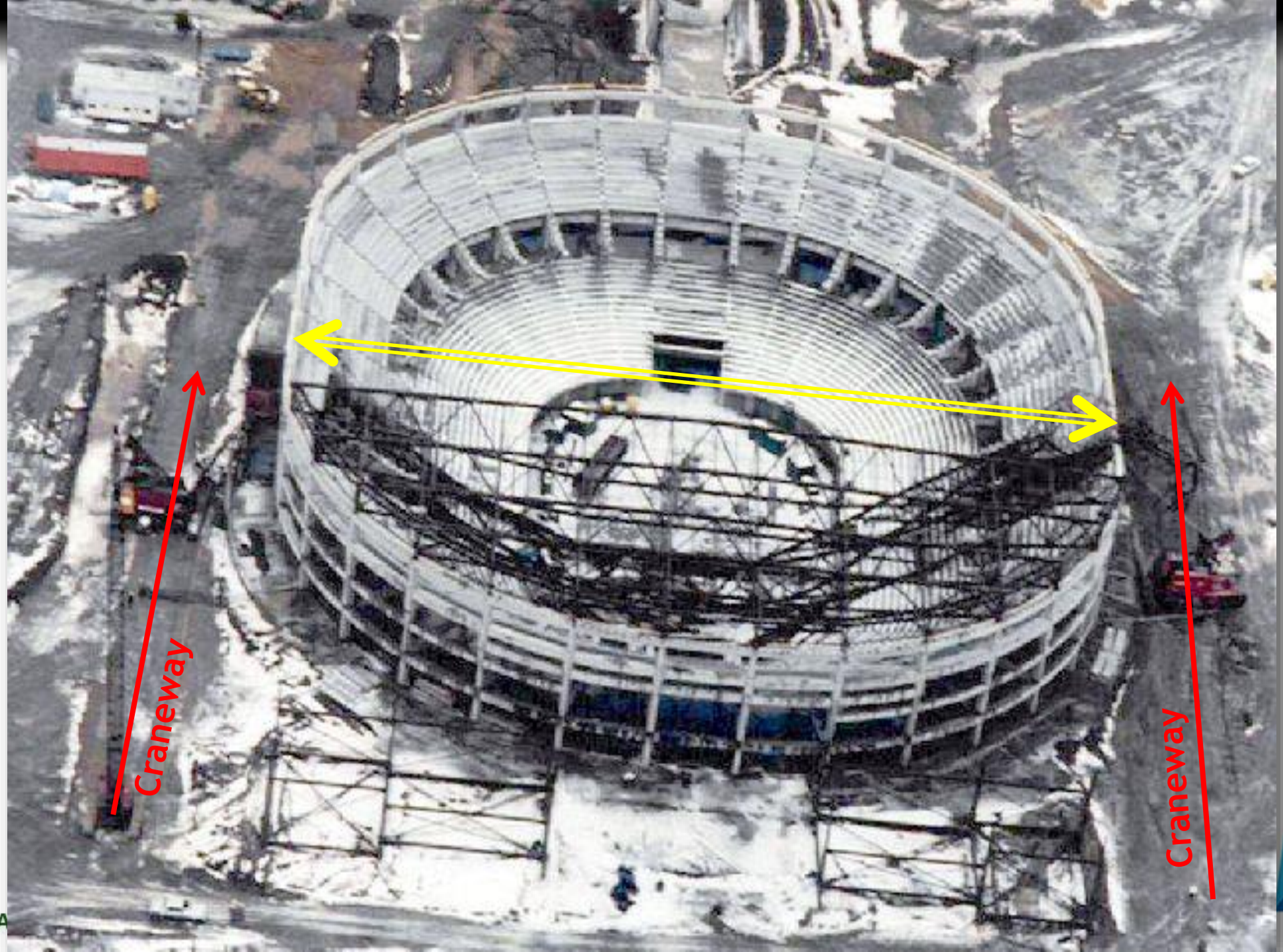

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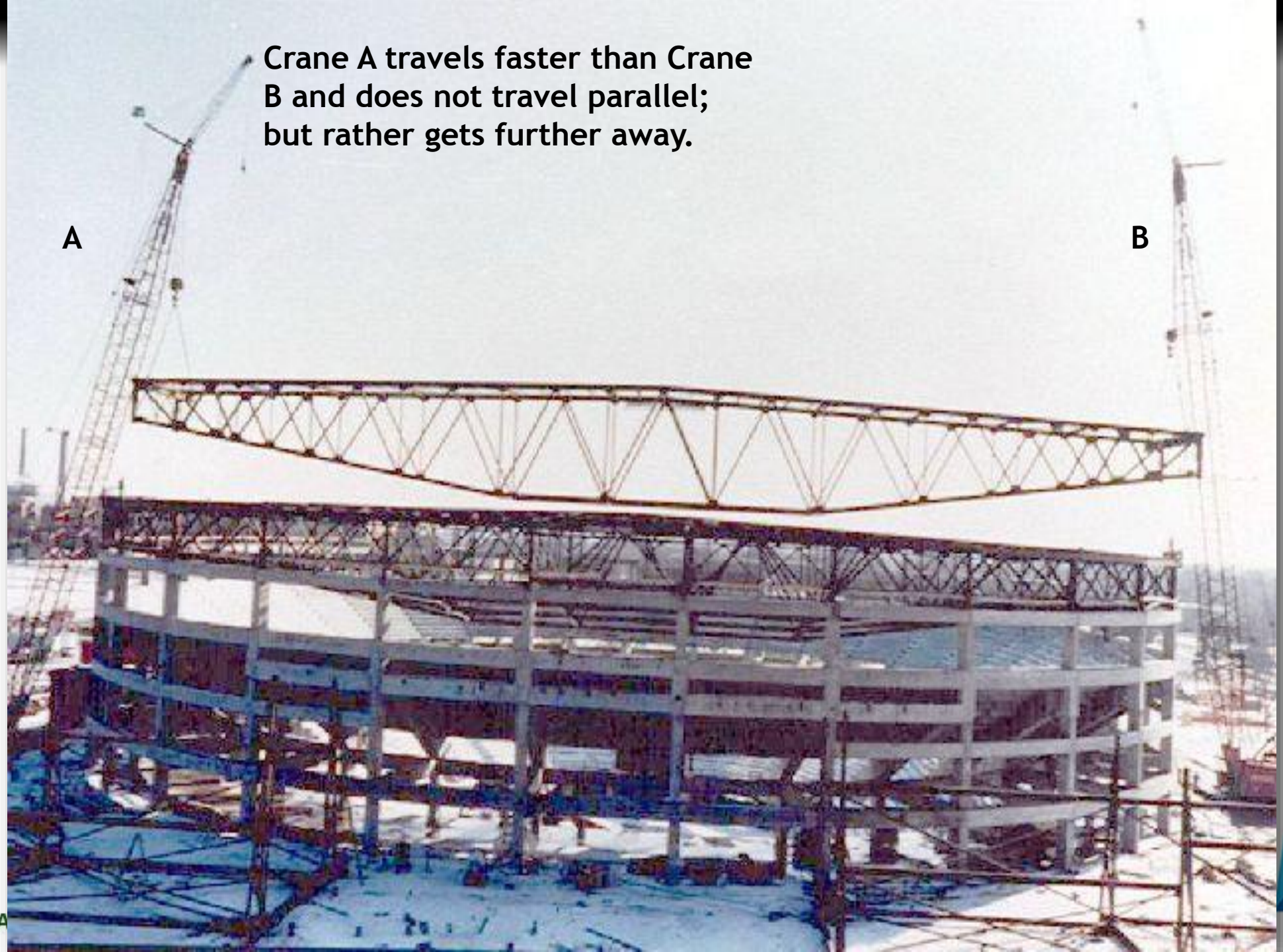
Breslin Area

- Dual pick and carry with a load using 2-4100's
- Operators would pick up the long span truss and travel to its designated location for placement.
- Hand signals were used rather than radios. One person gave the signal to the operator and the spotter on the roof; who in turn transfer the signal to the opposite side of the stadium to the other spotter; who then signaled the crane operator on the other side of the stadium
- There was no directional guidance or speed control for the operators to follow



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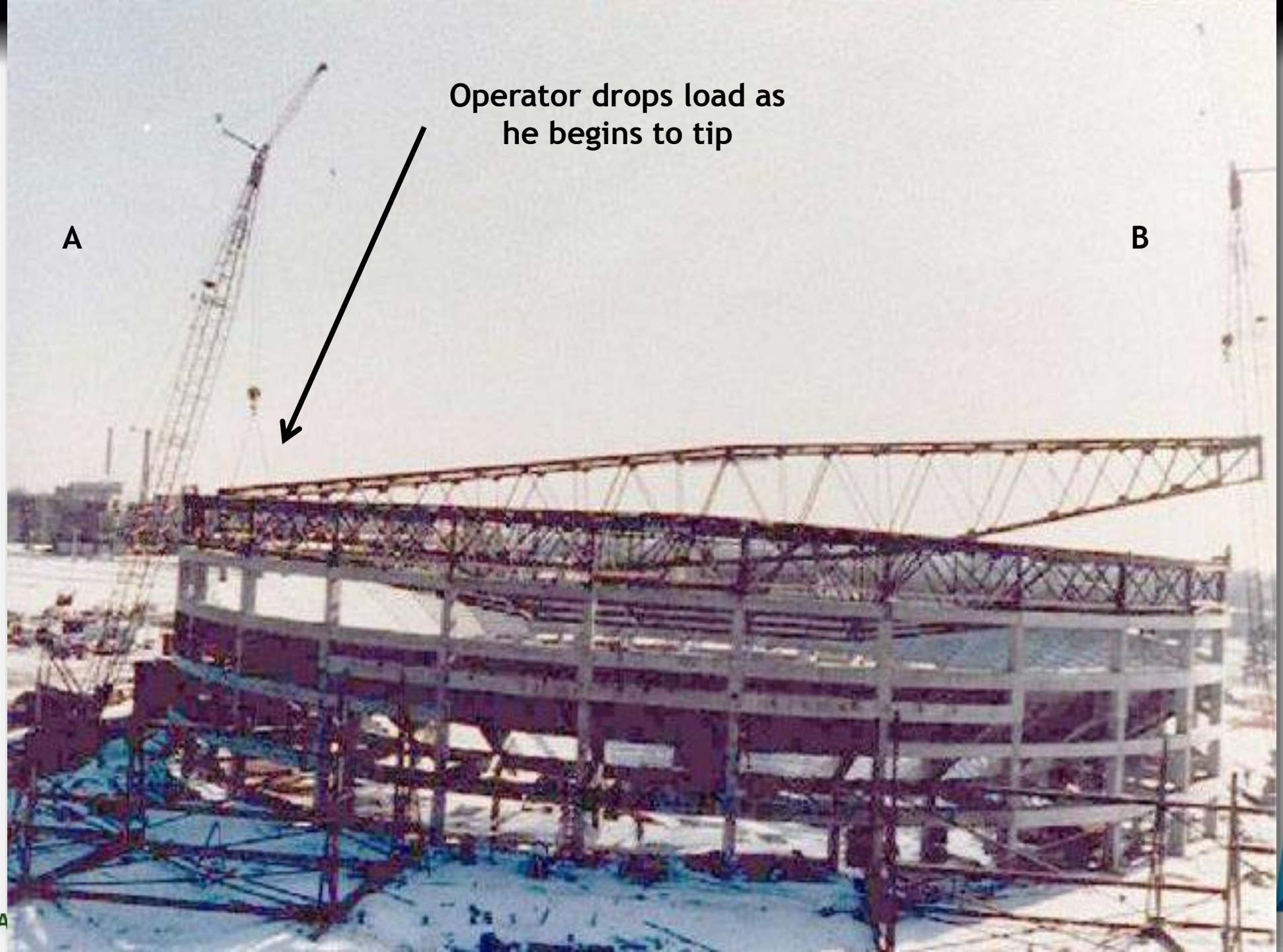

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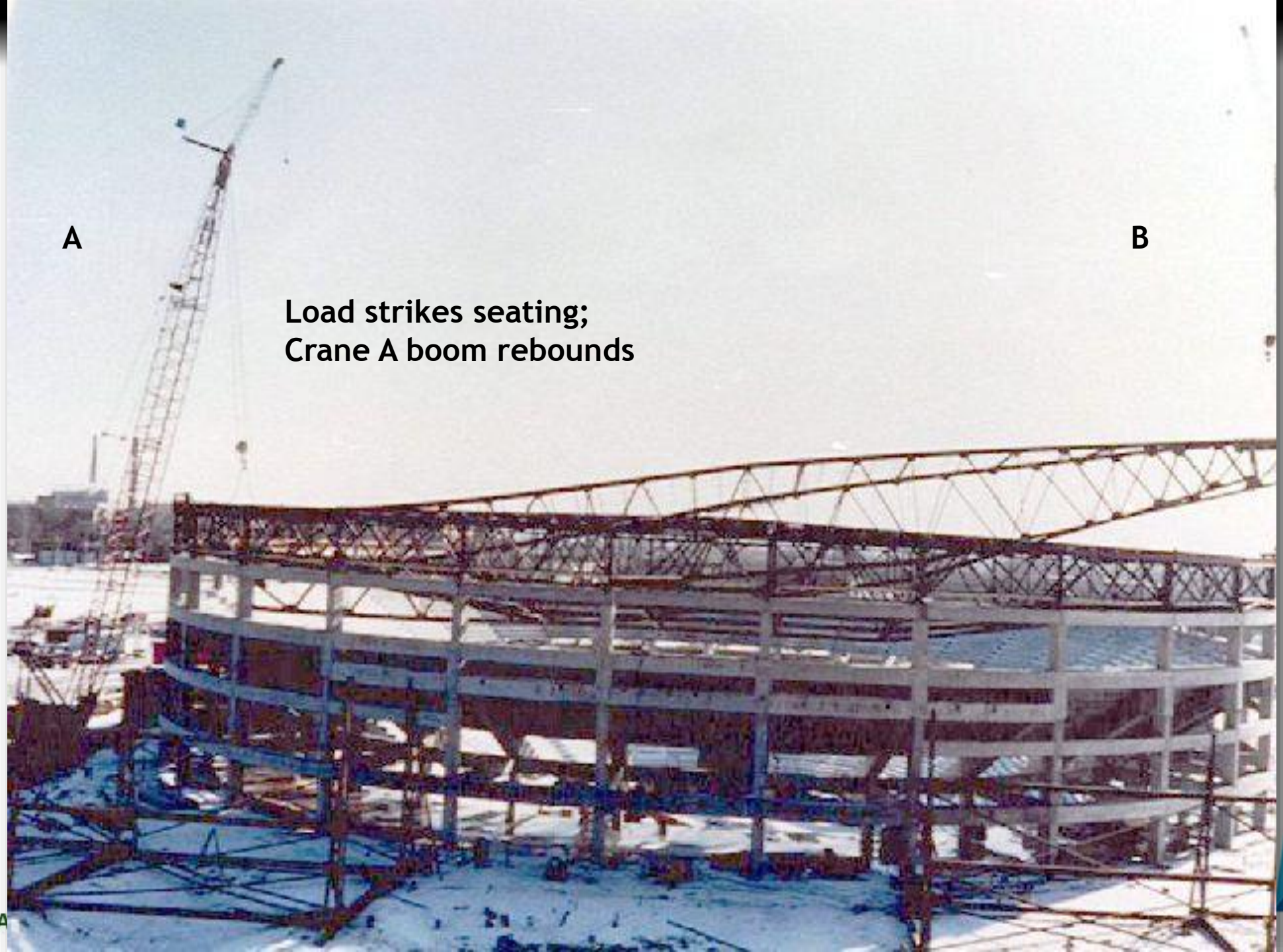

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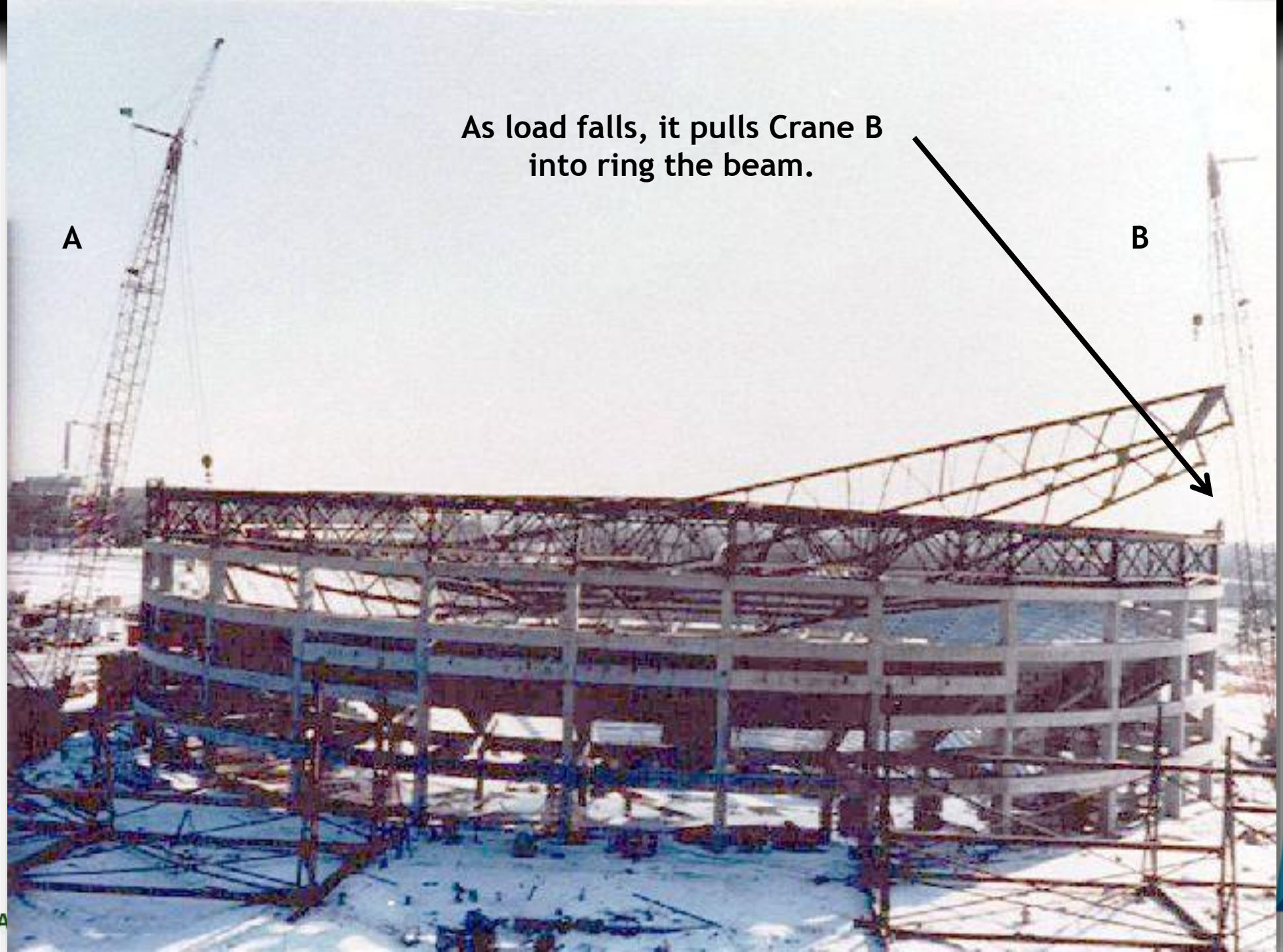

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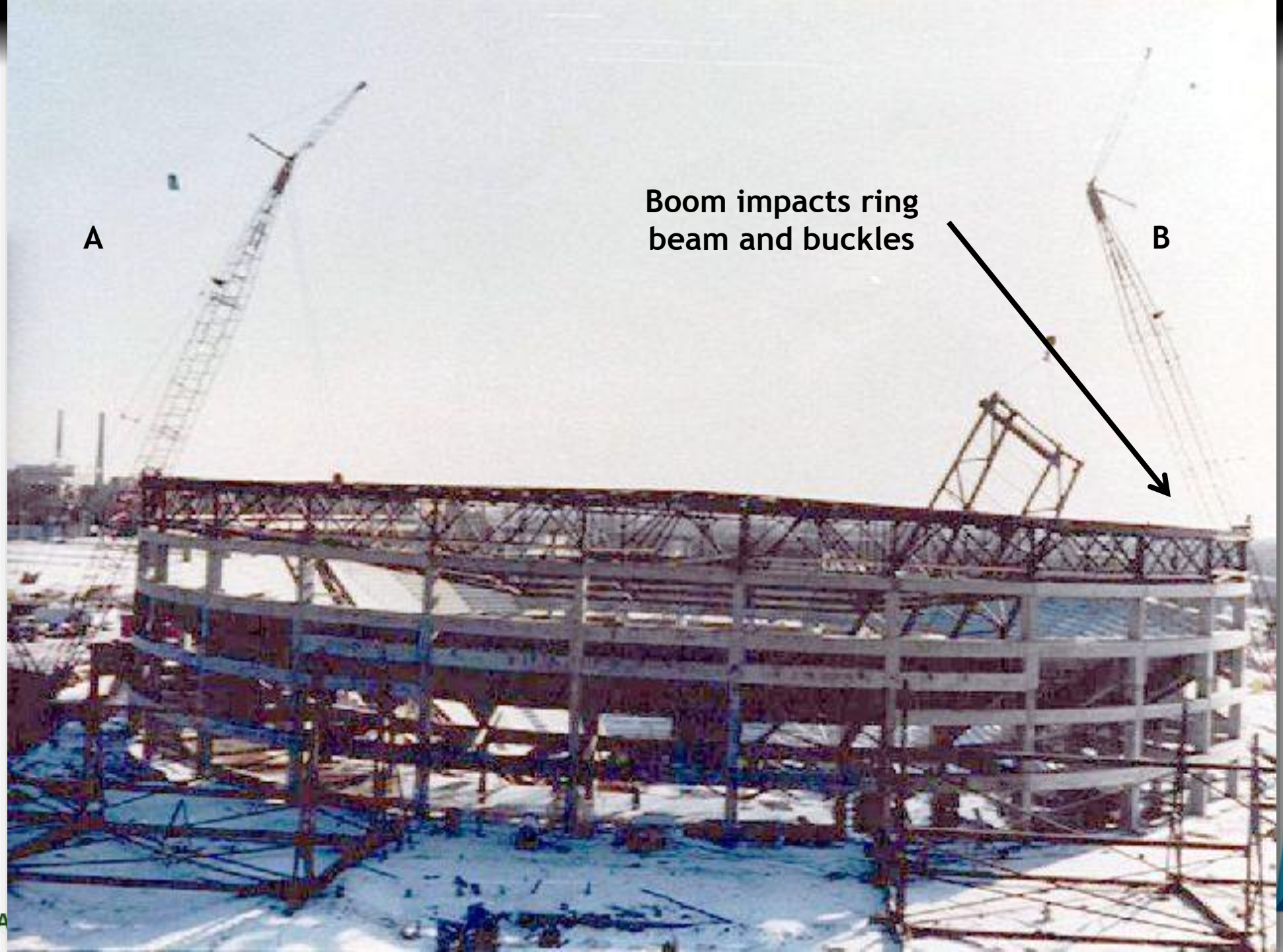

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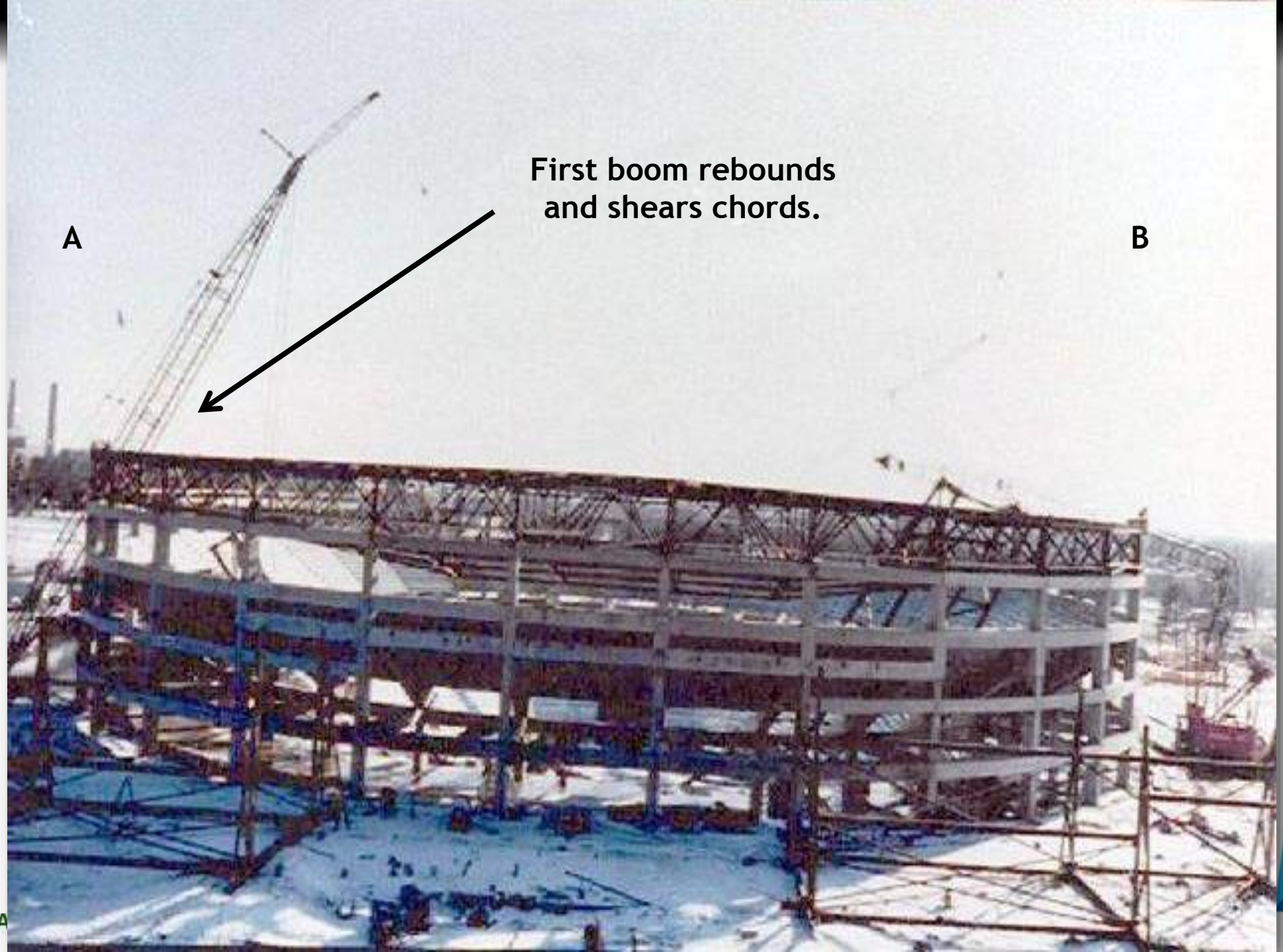

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Breslin Center - *Dual Pick*

Type of Lift/Operation: Critical

Noted Deficiencies:

- Lack of control line for parallel dual crane travel.
- Lack of station markers for uniform travel control.
- Lack of hardwired communication between operators.
- Lack of compacted crane-way for level travel.

Responsibilities:

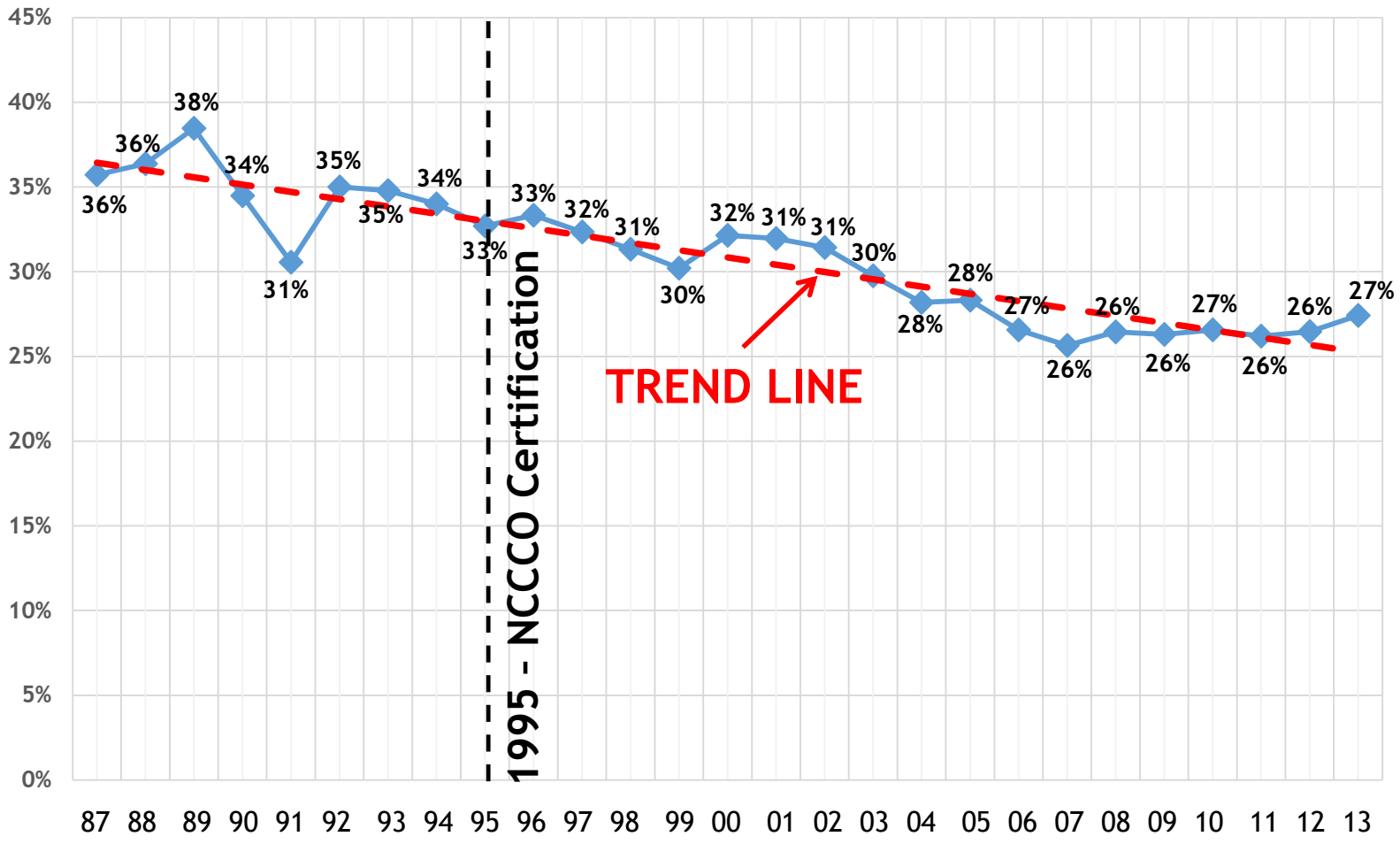
Primary: Lift Director

Secondary: Operator

Primarily Responsible (All Incidents)

• Operator	27.4 %
• Lift Director	24.9 %
• Rigger	21.3 %
• Site Supervisor	16.8 %
• Mechanical/Maintenance	6.1 %
• Crane Manufacturer	5.7 %
• Owner/User	4.1 %
• Other	4.1 %
• Manufacturer of Load	2.2 %
• Signal Person	1.9 %
• Service Provider	1.6 %

OPERATOR RESPONSIBILITY TREND-1987-2013



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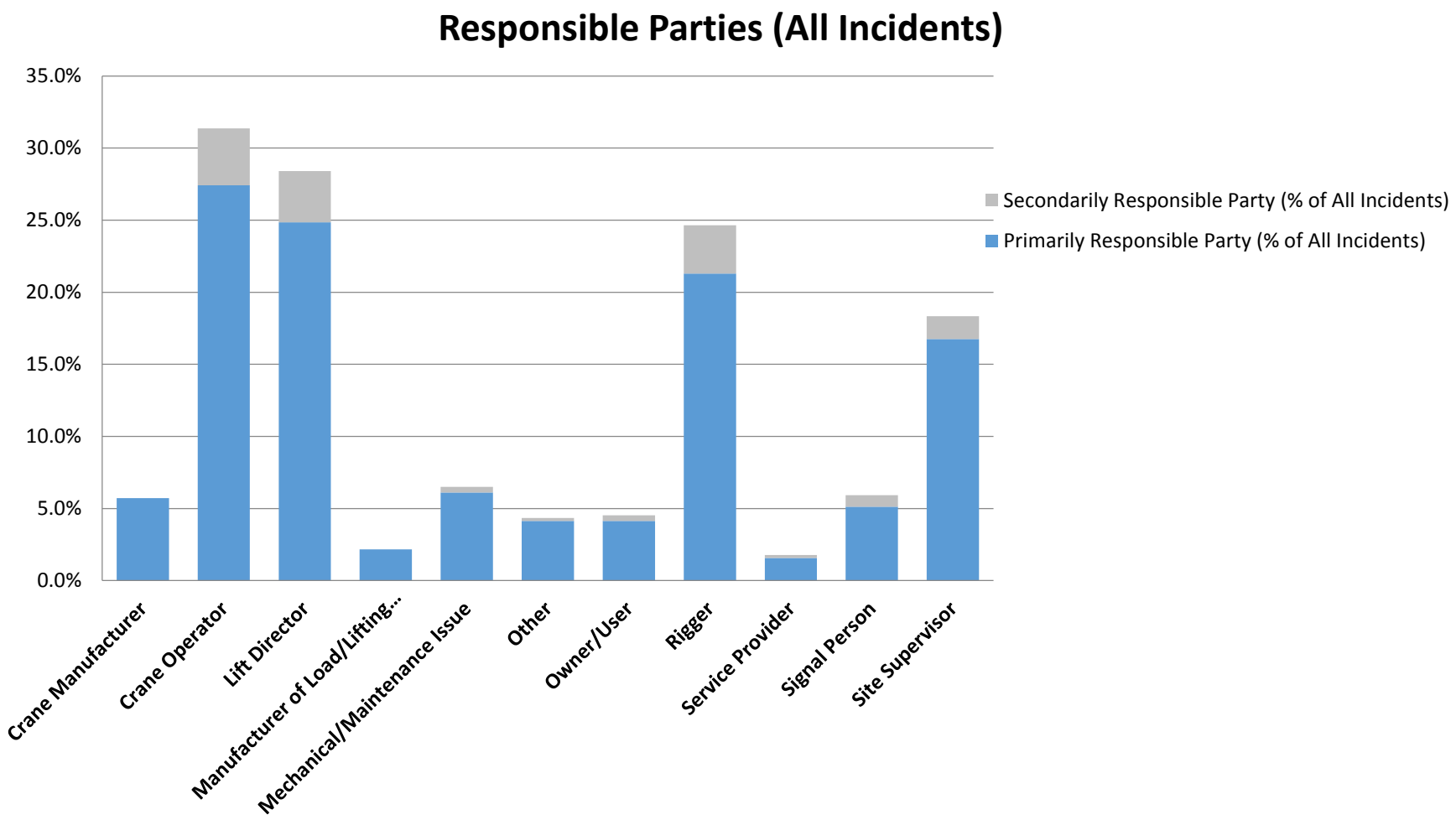
Secondary Responsible (All Incidents)

• Operator	3.9 %
• Lift Director	3.6 %
• Rigger	3.4 %
• Site Supervisor	1.6 %
• Service Provider	1.6 %
• Signal Person	0.8 %
• Mechanical/Maintenance	0.4 %
• Owner/User	0.4 %
• Other	0.2 %
• Crane Manufacturer	0.0 %
• Manufacturer of Load	0.0 %

Responsible Parties (All Incidents)



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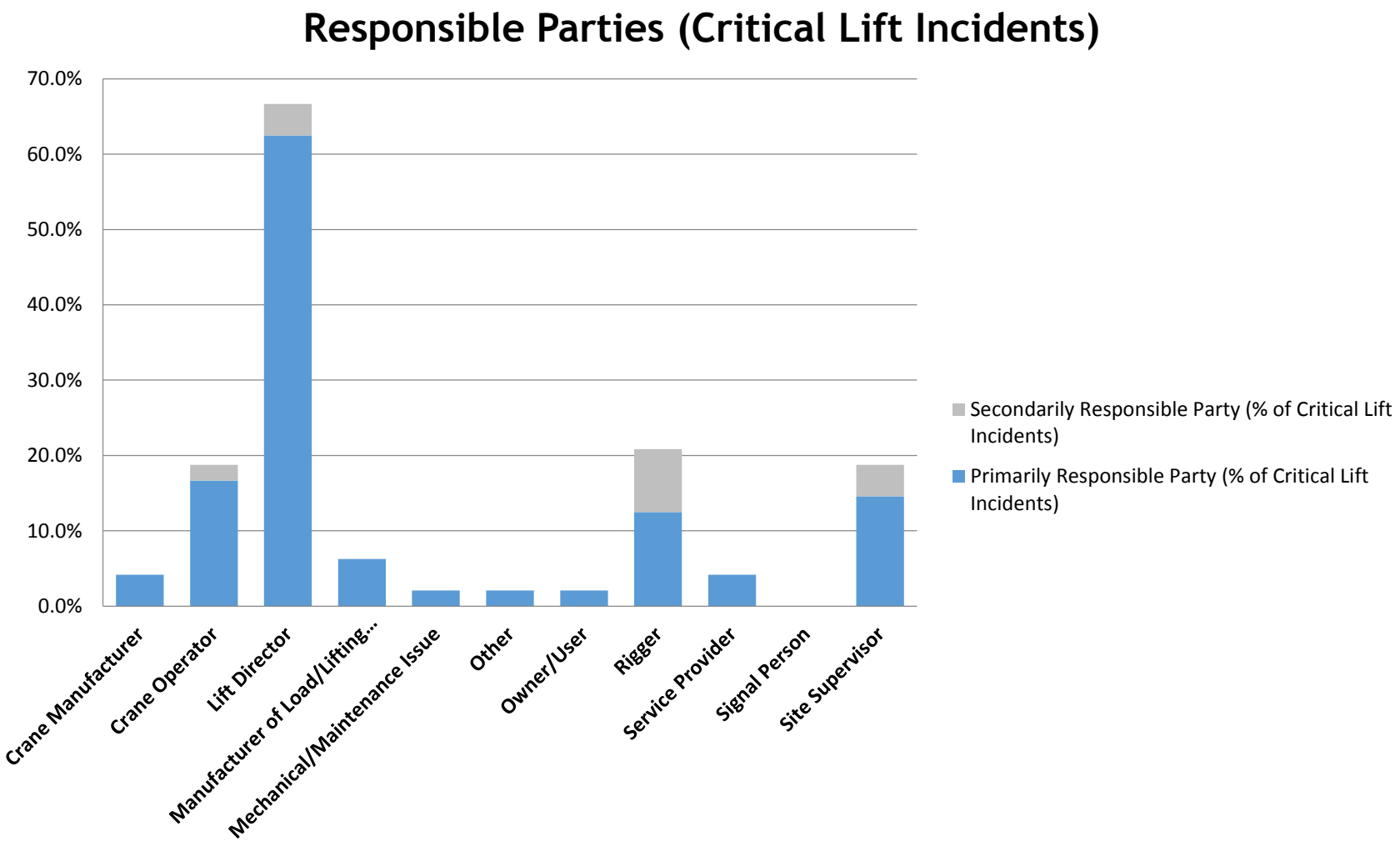
Critical Lifts



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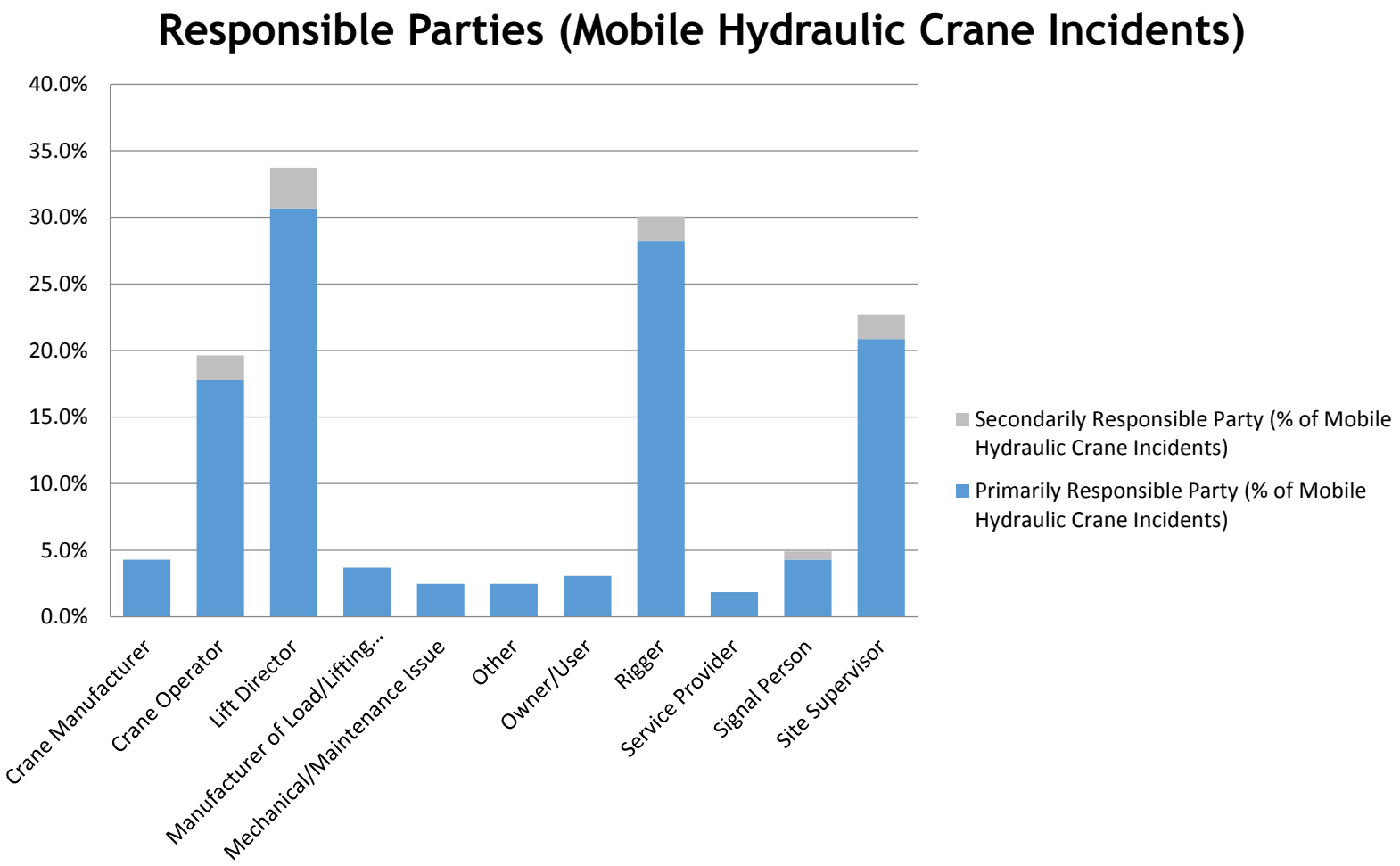
Mobile Hydraulic Crane Incidents



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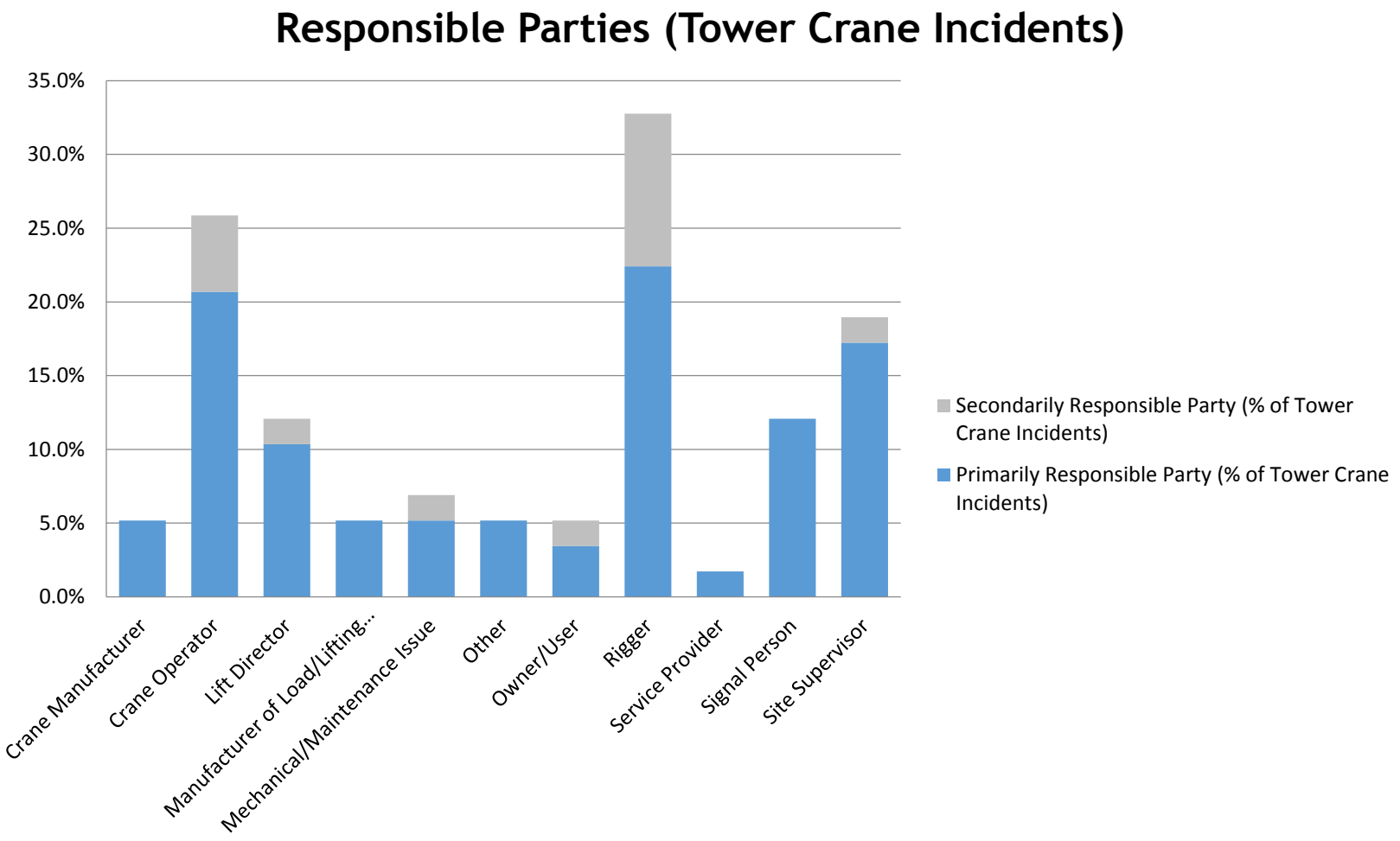
Tower Crane Incidents



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Causes of Accidents

Accident Types

• Crane Overturn	18.5	%
• Boom Collapse	18.5	%
• Crane Travel/De-Railed	15.8	%
• Unstable/Dropped/Lost Load	10.1	%
• Rigging Failure	5.9	%
• Power Line Contact	4.1	%
• Boom/Jib Dropped	3.9	%
• Assembly/Disassembly	3.4	%
• Landed Load Stability	2.4	%
• Two Block	1.8	%
• Trip/Slip/Fall/Jump From Crane	1.6	%
• Signaling	1.4	%
• Personnel Basket Failure	0.8	%
• Slewing Assembly Failure	0.6	%
• ***Worker Contact	33.9	%

Crane Stability Causes

Additional Load Suddenly Applied	4%
Crane Out Of Level	4%
Wrong Weight-Operator	8%
Crane Struck By Other Equipment	1%
Foundation Failure	3%
Improper A/D Procedures	6%
Insufficient-Removed CW	4%
Lifting Device Failed	1%
Lost Load-Stability	3%
Maintenance Issue	1%
Manufacturing Defect	3%
No Out-Boom Extended-No Load	2%
Op/Aid Turned Off/Disconnected	3%
Outrigger Failure-Soil	1%
Outrigger Failure-Structural	4%
Outriggers Not Extended	10%
Overload	49%
Pulling A Load-Lateral Load At Tip	2%
Soil Failure/Trench/Slope	7%
Signals	3%
Swing-Dynamic Loading	4%
Traveling The Crane-Drive/Rail	6%
Traveling w/Suspended Load	2%
Wind	6%
Wrong Set-Up-Mode-A2B	4%
Wrong Weight-By Others	9%
Wrong Weight-Not Known	6%
Mat Displacement	2%
Overriden-A2B	7%
Structural Failure	2%
Upper Not Locked-Rotates	3%
Use By An Unauthorized Person	1%
Wrong Weight-Demolition	4%
Wrong Wt-Fluids/Matls in Load	3%
Altered Or Damaged A2B	1%
Stuck Load	1%

Boom Collapse Causes

Boom Impact	9.3%
Dynamic Loading	7.0%
Foundation Design	1.2%
High Boom-Into Backstops	9.3%
Maintenance Issue	7.0%
Manufacturing Defect	9.3%
Operational Aid Turned Off/Disc	17.4%
Overload	29.1%
Overridden LMI or A2B	7.0%
Prior Damage/Repair To Boom/Jib	10.5%
Side Loaded	18.6%
Structural Failure	11.6%
Stuck Load	5.8%
Wind Loading-Boom/Tower	14.0%

Wrong Weight - Demolition	4.7%
Abuse-Lack of Maint.	3.5%
Additional Load is Suddenly Applied	1.2%
Altered Or Damaged A2B	1.2%
Crane Was Rigged Improperly	1.2%
Dynamic Loading	7.0%
Failure at Landed Load	1.2%
Tie-In Design	2.3%
Wrong Setup-Mode - LMI	2.3%
Wrong Weight - By Others	4.7%
Wrong Weight - Not Known	2.3%
Wrong Weight - Operator	2.3%
Wrong Weight - Fluids/Mats In Load	1.2%
Wind Loading-Load	1.2%

Use of Study to Improve Safety

- Identify those accident topics in each industry which are most problematic
- Implement internal lift planning and/or operational procedures
- Identify corresponding areas of certification or training trends

94% of all Crane Accidents Had Some Type of Human Intervention.

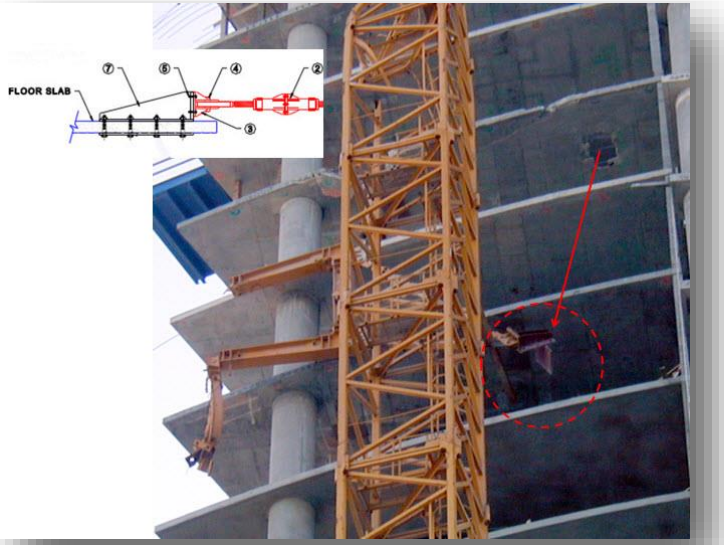
Therefore, training and educating personnel involved in lifts of their responsibilities is paramount.

Findings: Commercial

- The highest occurrence of accidents were associated with:
  - Unknown or wrong weight
  - Overriding or turning off the LMI
  - Rigging
  - External engineering design
  - Improper signals-Tower crane incidences

Engineering Issues

- Weight/Stability Calculations-Demolition
- Special Application-Field Changes-Speed
- Design Change/Refurbish-Other than OEM
- Tower Crane Base Design
- Tower Crane Floor Tie-In
- Shop-Built Crane



Findings: Industrial/Manufacturing

- Elevated number of accidents associated with operator errors in manufacturing
  - Reduce number of operators permitted to operate the crane
  - Operator Training in accordance with ASME & OSHA requirements-National Certification Program
- Complex shapes with unknown center-of-gravities in Industrial lifts

Findings: Highway/Road & Bridge

- Almost 50% of the accidents occurred with no load on the hook
  - The majority of the “no-load” accidents were associated with crane movement with poor or substandard preparation
  - Largest number of critical lift accidents
  - Secondary issues were crane movement on the site associated with power line contact
  - Third factor was A/D

Findings: Highway/Road & Bridge

- Significant number of complex and critical lifts corresponded to the highest percentage of Site Supervisor responsibilities
- Highest number of accidents with the boom striking stationary objects and collapsing
- Greater number of deaths than injuries per incident
- Demolition and erection of long span girders- Lateral Torsional Buckling.
  - >140 feet – PLAN YOUR PICK POINTS

Findings: Residential

- Lack of lift planning experience resulted in elevated accidents associated with the Lift Director and Rigging
- Workers lack of understanding of load drift-use of tag lines
- Instability of the load after being lifted confirmed problematic issues with rigging
- Lack of experience field personnel often required the operator to rig and direct the lift

Findings: Marine

- Boom close proximity to side of the ship resulted in multiple buckled booms
- Multiple objects are rigged for each lift-dislodged/falling portions of the load
- Most lifts are in the blind-multiple workers trying to control/place/pick load
- Workers touching or close proximity to load

Findings: Logging/Arborist

- Unknown weights-all estimates or best guess resulting in overturn
- Climber controls the operation (Lift Director)
  - Rigs the load that has unknown c.g.
  - Location of the cut determines the weight of the load
  - Once the tree is cut, the crane cannot release the load
- Lifting workers with the crane

Tip of the Iceberg

- Database provides nearly endless combinations of information
- Tailored charts can be produced to specific to Industries, Crane Types, Crane Sizes, Lift Types, Accident Types, Type of Collateral Issues, and many more
- Retrieve information about specific planned lifts to better understand potential issues and prepare better safety plans and lift plans
- Production of White Papers, Trends and Articles resulting from study data

Tower Crane Life Expectancy

An Examination of Recent Trends to Establish Age Limits-January 2015

HAAG Engineering

TOWER CRANE LIFE EXPECTANCY

AN EXAMINATION OF RECENT TRENDS TO ESTABLISH AGE LIMITS

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Matthew R. Gardiner, P.E.
Anthony E. Bond, P.E.
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TOWER CRANE LIFE EXPECTANCY

AN EXAMINATION OF RECENT TRENDS TO ESTABLISH AGE LIMITS

Over the past decade there have been increased discussions and attempts around the world to set and/or legislate a maximum service life of tower cranes, and in some cases mobile cranes based solely on their age. As a result of the recent publication *Crane Accidents: A Study of Causes and Trends to Create a Safer Work Environment, 1983-2013*, Jim D. Wiethorn, P.E., the Specialized Carriers and Riggers Association (SC&RA) approached Haag Engineering Co. to evaluate and compare the basis of these claims to our experience in crane accident analyses and Crane Study results. SC&RA submitted questions which their membership wanted addressed that relate specifically relate to the ages of the cranes. As part of our analysis, we examined the Crane Study results with respect to the crane ages at the time of the incidents to the actual causative factors of the accidents, with an emphasis on tower cranes. Additionally, we researched and addressed a variety of issues raised in support of and rebuttal to proposals for regulations in various parts of the world. The purpose of this analysis was to determine if any correlation exists between crane accidents and ages of cranes, to evaluate whether basis for these claims would suggest an age limit for such equipment.

HISTORICAL RESEARCH

The earliest known policy to stipulate calendar ages of cranes as a limit to their service lives was enacted in **Singapore** during October 2006, although development of the regulation first began in April 2004. The guidelines address imported tower cranes with both current registration and those seeking first time use in the country. The statutes governed the introduction of *used* tower cranes from other countries that met the following criteria.

1. First Time Use of A Tower Crane:
   - *Model and type-approved for use in Singapore and accompanied by a recent (not more than 2 years) inspection certificate from the statutory authority from the country it was used.*
   - *Any tower crane not manufactured in Singapore that is 5 years or older shall be subjected to an inspection by a third-party inspection agency acceptable to the Commissioner for Workplace Safety and Health.*
   - *Used tower cranes are not permitted in Singapore if the unit is 1) from a country that does not have requirements on statutory inspection; 2) the crane is 15 years or older (date of manufacture); 3) or the tower crane has an inspection certificate from a country that was last issued more than 2 years ago.*

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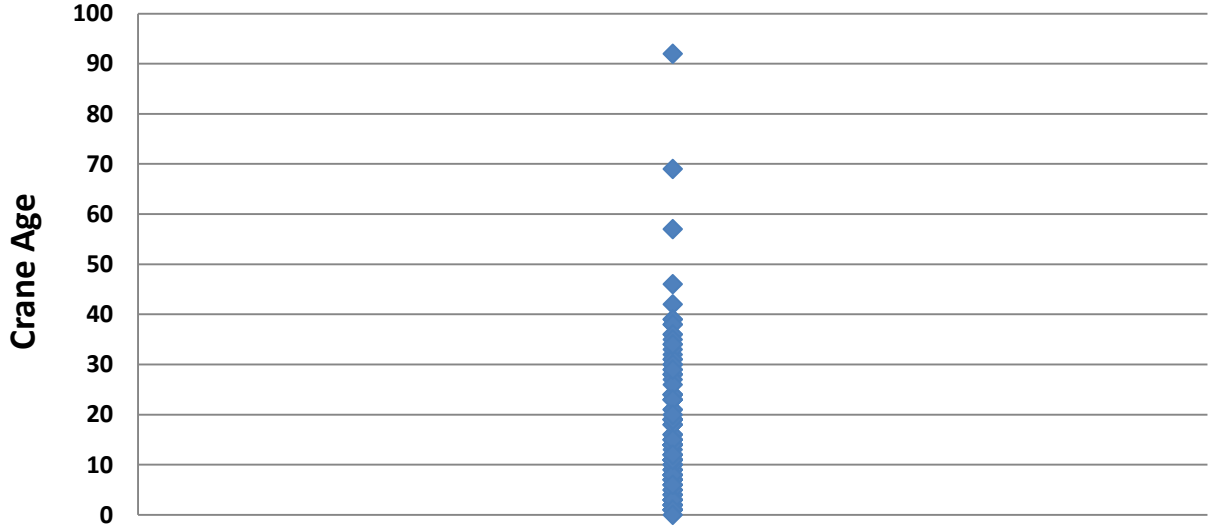
Age of Cranes at Time of Incidents

- Range from 0 to 92 years old
- Average age is 16.9 years
- Median age is 14 years
- Data confirmed there is no correlation between crane age and accidents



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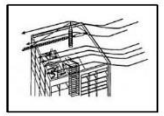
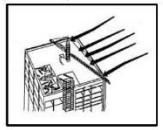
Wind vs Tower Cranes

What Really Happens?

Wind vs Tower Cranes:

What Really Happens?





Tower cranes can lift loads to heights that conventional cranes cannot approach. Their lack of mobility and needs for structural support (foundation) is outweighed by their ability to reach long distances at great heights. Since they are best suited for operating at great heights, concerns about high winds, particularly since lowering them to lesser elevations cannot be done easily. To overcome this perceived disadvantage, tower cranes are designed to swing (weathervane) with the wind, thereby minimizing the profiles exposed to the wind pressure. However, unlike conventional single vertical towers, tower cranes have additional built-in characteristics which provide additional resistance to wind effects.

In out-of-service configuration, the tower leans slightly toward the counterweight side of the tower. When a tower crane weathervanes properly, the jib rotates and aligns with the path of the wind. Wind forces must be quite strong to overcome this initial lean and push the tower back to vertical. With increasing wind pressure, the tower ultimately will lean opposite the counterweights, and with greater wind forces component members can experience loads exceeding their ultimate strengths.

This unique wind resistant design feature can be reduced or even eliminated by erroneous human intervention. During our years of examining tower crane failures, too often we have determined that operators, erectors and even management personnel have intervened in ways which led to the ultimate demise of tower cranes. Their well-intended actions led directly to crane failure. One repeated mistake derives from the myth that high winds will cause the upper of the tower crane to spin violently and cause failure of the crane. Believing this "myth", operators apply one brake to "slow" the rotation during high wind events. One operator interviewed explained that he was taught to apply a single brake prior to exiting the tower crane in anticipation of high winds for this very purpose. Similarly, inadvertent applications of the brake prior to high winds have occurred.

In 2003 during construction of FedEx Forum in Memphis, Tennessee, a severe thunder storm was approaching the city and emergency procedures were implemented. Emergency procedures included directives to the three tower crane operators to take their cranes out-of-service and seek shelter. One of the operators left the cab and began evacuation without manually disengaging the swing brake. When he reached the base of the tower and turned off the power, the spring loaded brakes manually set. Reported wind speeds were on the order of 105 mph, and the tower crane that was restrained could not weathervane. The involved tower crane base experienced distortion, but did not fail. Additionally, the tower was leaning about 40 feet. After the event, we found that the two properly prepared tower cranes had weathervaned and the damaged unit had not.

In 2012 as Hurricane Sandy approached New York City, workers prepared a luffing tower crane near the top of a 100-story building. Examination revealed four safety lanyards which workers had used to tie-off while inserting tower sections to raise the crane height, remained secured to the outrigger beam. Two of the lanyards wrapped around the outrigger beam remained tied off, reportedly to prevent the D-rings from striking the crane. The D-rings of the two remaining lanyards were pulled tight and fitted over protruding bolts on both sides of the slewing ring, effectively restraining the upper from rotating. During high winds, the upper could not weathervane because the lanyards restrained rotation. As wind speeds increased, frontal winds blew against the luffing boom and ultimately pushed it over the rear of the upper.

Perhaps the primary issue with companies leasing tower cranes is lessee (user) desire to have the company name prominently displayed on the counter jib of the tower crane. Tower cranes, often being the tallest structure on a construction project, are the preferred choice for advertising the project, developer or construction company. They become billboards in the sky. Around almost any site, there will be signs naming the general contractor in addition to the manufacturers or crane owner's signs. Wind effects on tower cranes are reduced drastically when users simply follow the manufacturer's recommendations and instructions when it comes to installing signs.

In most cases, the manufacturer calls for signs to be limited to 32 sq. ft. and to be placed in only specific locations. Incorrectly placed signs, and signs larger than the manufacturer recommends, increase the wind impingement area and can have dire consequences. Operation of the crane can be affected, and crane control, even in low wind conditions, can be difficult. In extreme cases, the crane will not weathervane due to the wind area

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Thank you!

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