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Defending Crane Claims

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Author's Bios

Fred LeSage, CRIS

With decades of experience in engineering and project management, Fred has used his construction background to help clients worldwide adopt better safety and construction practices. That means reduced total exposure and cost of risk. As a member of the Advisory Board for Planet Underground TV and American Locator magazine, he has worked to promote damage prevention methods for underground utility contractors.

Before joining XL Group in September 2011, Fred first spent 20 years at Exelon Nuclear in a variety of roles, from pre-operational engineer to project manager on nuclear safety-related maintenance and construction projects. He took that experience to Zurich Services Corp. as a risk engineering consultant, serving construction clients and large wrap-up programs. He also consulted with clients and underwriters on the construction of nuclear power plants in China and the United Arab Emirates.

Fred earned a bachelor's degree in mechanical engineering at Bradley University. He is a certified Senior Nuclear Reactor Operator. He also holds a Construction Risk and Insurance Specialist certification.

James Mason, Ph.D., P.E.

Engineering and Materials Science from the University of California at Berkeley in 1986, his M.S. degree in Materials Science from the University of California at Berkeley in 1988 and his Ph.D. degree in Applied Mechanics from the California Institute of Technology in 1993. He later completed his Master's degree in Biology at the Illinois Institute of Technology in 2011.

Upon completion of his Ph.D., Dr. Mason became a member of the faculty at the University of Notre Dame. For twelve years at Notre Dame Dr. Mason performed funded research on mechanics, materials and bioengineering. At the end of the 2004-2005 school year, Dr. Mason took a position in Warsaw, IN managing the biomechanics research group at Zimmer Inc. During his time as a researcher, Dr. Mason published 60 articles in peer reviewed journals, given 83 presentations at technical conferences, symposia and meetings, been granted 6 patents and delivered 52 invited lectures at companies, conferences and universities. In December, 2011, Dr. Mason accepted a position as Principal Consultant at the Rimkus Consulting Group, Inc. In 2016 he accepted a position with ARCCA Inc. For the past eight years he has been providing analysis and opinions on biomechanics of injury, fracture and fatigue of metals, plastics and welds, corrosion and motor vehicle accident reconstruction to the legal professions and insurance industries.

Jeffrey D. Schulman, Esq.

As an executive partner of *Pillinger Miller Tarallo*, Jeffrey manages the firm's Upstate New York practice with offices in Syracuse and Buffalo. Specializing in complex multi-party litigation, construction, labor law, transportation and products liability, he has a broad and diverse expertise in general liability defense. Jeffrey has over 25 years of experience taking verdicts as a trial attorney and successfully arguing appeals in all four New York Appellate Courts. He has also negotiated countless multi-party lawsuits at non-binding mediations to resolution. His client base includes a diverse mix of real estate owners/developers, contractors, including crane equipment dealers, owners, and crane repair experts throughout New York State.

Jeffrey is admitted to practice in New York, all four U.S. District Courts in New York, the Second Circuit Court of Appeals and the State of Florida. He is a graduate of University of Michigan and Hofstra University School of Law, where he served as Member and Business Administrator of the *Hofstra Law Review*. He is an active member of the New York Bar Association, New York State Trial Lawyers Association and the Onondaga Bar Association. Jeffrey frequently lectures on current trending legal topics in the New York Labor Law, trial practice and risk transfer.

Mobile Crane Accidents and How They Happen

Fred LeSage

Ground Conditions

Mobile cranes can be set up almost anywhere. Of critical importance to the set up of any mobile crane are the ground conditions. Ground conditions as defined by OSHA's 1926.1400 standard is the ability of the ground to support the equipment (including slope, compaction, and firmness).

Ground conditions are almost infinitely variable due to soil differences, soil moisture, buried facilities, ground cover (asphalt, gravel, concrete, etc.), previous work...and probably other things. The standard requires that the controlling entity for any operation must ensure that ground preparations... are provided. Sometimes the controlling entity finds it difficult to determine the ground conditions and may be prevented from doing any type of preparation work. So sometimes the unexpected occurs during a lift resulting in a crane accident. When the problem has something to do with ground conditions, outrigger punch through is a common type of accident.

Outrigger punch through results in the crane tipping or sometimes toppling over completely. This can result in:

- Dropped loads.
- Injuries to the crane operator, ground workers or other people.
- Damage or destruction of the crane.
- Damage to pavement or support structures.

The Committed Lift

Often when a crane is used to lift a load if there is a problem with how the load is rigged or the weight is greater than anticipated, the operator can stop the lift to allow adjustments or reconfiguration. However sometimes when a crane is used to lift a load, the load cannot simply be set back down if there is some sort of problem. In these situations, it is critical that the rigging be correct and that the weight of the load being lifted has been accurately determined before the crane takes on the load.

If the rigging design has not properly accounted for the center of gravity of the load or if the weight of the load has been grossly underestimated, the load may shift unexpectedly, or the crane may be overloaded. These situations can result in:

- Dropped loads.
- Injuries to the crane operator, ground workers or bystanders.

- Damage or destruction of the crane.
- Damage to adjacent property.

Equipment Failure

Cranes are complex machines that require regular maintenance and inspection to insure they will function as designed. Regular preventative maintenance required by the manufacturer must be performed. OSHA mandates three types of crane inspections. Inspections must be done by a competent person prior to every shift that a crane is in operation. Documented monthly inspections must be done by a competent person as well. Finally, annual comprehensive inspections by a qualified person of virtually every mechanical part of the crane must be performed and documented. OSHA's 1926.1400 standard provides a specific listing of components to be inspected at each interval. Manufacturers may specify additional inspection requirements.

Any defect identified during an inspection must be corrected before a crane is returned to service. If a defect gets missed on an inspection and goes undiscovered and uncorrected, a critical component may fail. Sometimes such failures can simply lead to a lack of productivity. If a crane does not work, it cannot be used. But sometimes a defect results in a failure that causes an accident. For example, a broken load line can will mean a dropped load potentially resulting in:

- Damage to or destruction of the load being lifted.
- Injuries to the crane operator, ground workers or bystanders.
- Damage to adjacent property.

Operator Error

Crane operators are people and despite being extensively trained and often being very experienced they sometimes make mistakes. Occasionally, one of these mistakes is a critical error that results in a crane accident. The tasks an operator performs, the types of cranes that are operated and the conditions under which cranes are operated are incredibly variable. It would be virtually impossible to describe all the types of errors that can result in a crane accident. But it is important to remember that crane operators are only human and human beings make mistakes.

The Role of Materials Science in Crane Failure Investigations

James Mason

Introduction

Crane failures can be caused by a number of factors including operator error or failure of a component. Operator error is often confirmed using witness testimony, security camera footage, or YouTube videos. Regardless of how it is confirmed, a conclusion that operator error was the cause is usually drawn by a crane operation expert or crane expert. On the other hand, while the possibility of failure of a component can be identified by a crane expert, it is most often confirmed by a materials scientist or engineer. In order to confirm that a failed component caused or contributed to the failure of crane, it is important that the failed component be preserved for further examination in a materials laboratory.

Materials Science is a field of study concerned with the creation, use and performance of materials in engineering. Metallurgy, the study of metals, is a subclass of materials science. Materials scientists are more broad than metallurgists because they study metals, polymers and ceramics (such as glass), and don't limit themselves to studying only metals. Within materials science, there are subspecialties, of course, that include failure analysis.

Failure analysis is technically part of the field of materials science in the area of materials performance study, because it is concerned with how materials fail or failed in use and can be fed back to materials formulation engineers to help improve the materials performance and prevent future failures. Regardless, failure analysis of materials involves both the study of the forces applied to that material (solid mechanics) and the determination of the mode of failure of the material itself. Basically, two questions are asked and answered.

- Were the forces on the material too high?
- Was the material too weak?

Modes of Material Failure

By looking at the component itself, particularly the fracture surface, the mode of failure can often be determined. The various modes of failure include, but are by no means limited to, fatigue, single event fracture, and corrosion, broadly speaking.

Fatigue

Fatigue failure leaves characteristic markings on the fracture surfaces that are highly recognizable to the materials scientist. Fatigue usually occurs over a long period of time due to

repeated loading and unloading of the component, as in picking up and place a load using a crane. It can be prevented by design but can be accelerated by poor material selection or poor material processing.

Single Event Fracture

When a component break in a single event, the fracture surface is examined to determine whether the component failed in a brittle fashion, like glass, or in a ductile fashion, like chewing gum. Generally, brittle fracture is the sign of a material processing problem. Ductile fracture is desired because it is commonly preceded by large deformation that can often be detected in a regular inspection.

Corrosion

Corrosion requires moisture or water to occur. It does not require, necessarily, two different materials to be joined together, as is often taught in high school chemistry, as many experiments have been performed to show that a single drop of water on an electrically isolated piece of steel can lead to corrosion and rust formation. In investigating corrosion, interest is initially focused on the corrosion product. A chemical analysis of the corrosion product often identifies the corrosion material that caused the corrosion. In cranes, for example, chemical accidentally spilled on the component can combine with rain after the fact leading to corrosion. Wire ropes are often subjected to corrosion, in service.

Specific Crane Components

In crane failure there are a few specific crane components that have been known to fail causing the crane itself to fail.

Welds

Cranes are constructed with numerous welds throughout. When welds are created, two metals to be joined are melted along with a third metal to form a joint. The three components are held together long enough to solidify into one piece forming a joint. If one of the three metals is not fully melted, the joint is weak. The geometry of the three pieces after welding can be problematic, particularly if it is a “sloppy” weld. And lastly, because all three materials are heating enough to melt, everything close to the weld gets very hot, sometimes leading to embrittlement, i.e. changing the surrounding material from ductile to brittle.

Ropes

The crane lift large object using a system of pulleys and wire ropes. The wire ropes can break causing the crane to fail, drop its load unexpectedly and possibly collapse. The rope is made of individual metal strands that typically break, one-by-one, over time. The ropes should always be inspected according to appropriate protocols particular with attention paid to observing broken

wires if they exist. Once enough wires break in a given location, the entire rope breaks rapidly, sometimes unexpectedly, causing release of any load. When the wire rope breaks, each individual strand of the rope is examined to determine its mode of failure and deduce why it failed.

Sheaves

The pulleys used in a crane are called sheaves. Sheaves are typically made of a polymer or plastic to apply less stress on the ropes as they pass through. The sheaves themselves must be examined to determine their mode of failure. They are particularly susceptible to embrittlement over time and must be replaced periodically according to the manufacturer's instructions. Of some importance is the size of the wire rope that passes through the sheave. If miss-sized, either too small or too big, the wire rope can cause early failure of the sheave.

Defending Crane Cases in New York

Jeffrey Schulman

We are here to discuss potential exposure in New York for clients that have offered crane repair, maintenance or inspection. As we have discussed, crane ownership and exposure as a crane owner and operator, we believe that a focus on those entities that service cranes complete the picture for defending cases. We are going to give two case examples to demonstrate how to defend these types of clients.

An Accident During Hoisting Operations

First we will discuss an action arising out of an incident in January of 2017 at the Portegeville Bridge Project in Letchworth State Park. The railway bridge being constructed was brand new construction owned by Norfolk Railway, Plaintiff was injured when a set of 80,000 pound of steel girders struck him as they was being hoisted to set in place on a concrete abutment. Plaintiff sustained a traumatic degloving injury to his dominant hand and significant spinal injuries requiring multiple surgeries. Plaintiff an iron worker foreman was only thirty years old and now permanently incapacitated from any gainful employment.

There was significant accident investigation from plaintiff's employer, statements, reporting and photographs. The overwhelming and uncontroverted conclusion was that the cause of the accident was operator error.

Plaintiff sued the owner of the bridge and our client, the crane repairer. We then impleaded Plaintiff's employer via Third Party Summons & Complaint pursuant to our Work Order which contained a contractual indemnity provision.¹ The OSHA inspection forms used between our client and plaintiff's employer, who was also the owner of the crane, included an indemnification provision, requiring plaintiff's employer to indemnify and hold harmless our client from "all *claims, liabilities, fines, suits, demands, actions, costs and expenses of any kind in nature,*" except *our client's gross negligence.*

Importantly, our client did not provide any exclusive repair or maintenance on the crane. After the crane was set up on the project, our client, performed an OSHA inspection. They then assisted in reconfiguring the crane into a 360 degree "ringer" set up. At this time of this set up, the hoist brakes were replaced. The crane operator, an employee of the crane owner, testified at his deposition that to replace the hoist brakes, plaintiff's employer took used brake bands off of another crane because "they didn't want to take the time to order new brake linings". During the brake replacement, our client assisted with the brake replacement. According to the crane operator, our client, could not get the brakes properly adjusted, so a mechanic employed by the crane owner/employer adjusted the brakes. Our client agreed that it was the crane owner's technician that adjusted the brakes, and determined the brake replacement was complete.

¹ In NY a party is barred from suing an employer in that an employee's exclusive remedy is Workers' Compensation. However, an employee or third party may sue an employer under limited exceptions (1) The injured employee suffered a Grave Injury as defined by the Workers' Compensation Law (2) the employer has no Workers' Compensation insurance; (3) a contractual provision for indemnity exists between the parties.

During the prior year, the crane operator, unbeknownst to our client, had been experiencing problems with the hoist brakes. He testified that at times the hoist brake pedal would be either too high or too low, and that he testified that the hoist brakes were sticking. Nonetheless, he was able to use the crane because the loads were “light.” Notably, these issues, however, were not recorded during the crane operator’s daily inspections.

On the date of the subject incident, the crane operator was using the crane to lift three 75,000 pound bridge girders, individually, to set them on a neighboring pier. This was by far the heaviest loads that he had lifted in the year he worked on the project. He lifted the first of the first set of girders with no problem. He followed a test pick procedure by lifting the girder and “holding it” for 5 minutes, before he moved it to the location it was to be set. The first set of girders was placed without incident as the brakes held. On the second set of girders, he claims he felt the brake pedal come up “way high” and it was “very uncomfortable.” However, he believed he could safely set the third set of girders regardless of this problem. Specifically, he believed he could perform the hoist and install the third set of girders, holding the girders with the VICON². He testified that the VICON is a “good back up” for the brakes. The crane operator testified that he had the VICON only partially engaged during the three lifts. However, the plaintiff’s employer testified and accident reporting confirmed that the policy for crane operators was to have the VICON fully engaged at all times.

On the second pick, the crane operator broke the rules by only performing a 2 minute “test pick.” Nonetheless, he continued to use the crane to place the second girder. Despite claiming to have an issue with the brakes on the second pick, he did not perform a test pick the third set of girders. When the third girder was somewhere about 10 to 20 feet above the abutment, he engaged the hoist brake to hold the girder. Despite allegedly having his foot on the hoist brake, he testified that the girder suddenly dropped, striking the plaintiff and trapping him beneath the girder. The crane operator reacted by fully engaging the VICON. The girder lifted, and plaintiff was able to get out of the way by falling off of the abutment, 5 to 6 feet to the ground below. Thereafter, the load held and was suspended without incident. Ultimately, the third set of girders was placed on the abutment with no issue.

After the accident, the crane owner performed significant investigation on the day of the accident, including obtaining statements from all witnesses, taking photographs, and conferring with senior management. The crane owner also contacted our client to perform a post-accident inspection of the crane, which was completed the next day. Our client’s inspector spoke with the crane operator who claimed to that he “had the brake on, had the control back in the VICON and then he felt the load drop so he gave – hit the accelerator to stop the load from falling.”

Our client had the crane operator lift something close to the weight being lifted when the incident occurred to see if he could replicate the incident. They found and lifted a 64,000 pound piece of steel. Our crane inspector testified that they picked the 64,000 pound steel off the ground so it as completely suspended. The load stayed hanging. It didn’t move the entire time it was off the ground.

² It is worth noting at this time what the “Vicon” is on a Manitowoc crane. The Vicon is akin to an automatic transmission on an automobile in that it has a torque converter which controls the ascent and descent of the hoist.

Our crane inspector also physically inspected the hoist brakes, pulling the covers for the brake adjusters. He testified that the left side brake adjustment was not aligned. He attempted to correct it by tightening the adjuster, but then the hoist would not move. He also testified that he told the crane owner to have the brakes removed and reinstalled. This repair order and the crane operator's testimony were used by plaintiff's counsel to support their allegations against our client.

Drawing from this information and its own investigation, the crane owner determined that the gap between one of the two brake shoes and drums was "just at the one end of the brake shoe and the brakes were in fact engaging properly." It concluded "with the crane operating properly, it has been determined the crane operator failed to control the load and he was dismissed".

With these set of facts established throughout discovery and deposition testimony, we moved for summary judgment seeking dismissal of the complaint upon the ground that as a contractor with the crane owner, our client owed no duty in tort to plaintiff, pursuant to *Espinal v. Melville Snow Contractors Inc.*, 98 N.Y.2d 136 (2002). We also argue that the 3 exceptions to *Espinal* are not applicable to our facts. The 3 exceptions are: (1) where the contracting party, in failing to exercise reasonable care in the performance of his duties, launch[es] a force or instrument of harm; (2) where the plaintiff detrimentally relies on the continued performance of the contracting party's duties and (3) where the contracting party has entirely displaced the other party's duty to maintain the premises safely.

When drafting our motion, we discovered *DeGidio v. City of New York*, 176 A.D.3d 452 (1st Dept. 2019) a troublesome case for crane repairers. In this case, Hoffman performed a 60-70% rebuild of a 1977 Manitowoc 4100 in 2010 and 2011. Hoffman purportedly was supposed to correct the crane's every defect pursuant to Manitowoc's certified program, and was supposed to make the crane "good as new." Hoffman continued making several repairs until December 8, 2011, including replacing the boom rope, which is what failed and caused the plaintiff's injuries. In addition, Hoffman installed an LMI computer system with the wrong data loaded. The wrong data was determined to be a partial cause of the accident. Hoffman argued that because four months had passed between its work in December 2011, and the accident in April 2012, it could not be liable. As set forth above, the court held that "Hoffman failed to adequately address the findings of the independent crane company that conducted the post-accident investigation, which concluded that several maintenance and repair issues contributed to over wear on the crane's wire ropes."

Based on *DeGidio* as precedent, we expected that the Court could find that our client improperly installed used brake shoes on the hoist brakes, or that there was an issue of fact as to whether the installation of the used brake shoes was a partial cause of plaintiff's injuries. Our position was that in contrast to *DeGidio*, the post-accident investigation by plaintiff's employer concluded that the cause of this incident was "operator error." Also, in the nearly 40 daily inspections in December 2016 and January 2017 performed by the crane inspector he did not even once note that there was an issue with the brakes. In further contrast to *DeGidio*, our client did not rebuild the subject crane and was on site a limited number of times for two inspections and "as needed" repairs performed under the direction, supervision and control of plaintiff's employer. Unlike Hoffman, at no time did our client perform any work exclusively on the crane, nor did it make any decisions regarding replacement parts or repairs.

Ultimately, our motion was denied by the trial court. finding there was an issue of fact regarding the brake issue. However, our motion papers made clear that there was limited or no exposure for

our client. We filed Notice of Appeal immediately. On the eve of trial, plaintiff's counsel agreed to voluntarily dismiss our client.

An Accident During Routine Maintenance

The second case arises out of an incident when plaintiff sustained injuries when the hatch door of a Manitowoc 888 crane failed to lift properly on a crane that our client had inspected. Prior to the repair, our client was called to the site to address a leak on the crane. The crane operator was present at the time the repairs were made. While working to repair the leak, our client noticed that a ratchet strap had been placed on the crane door as a seemingly make-shift repair. He asked the crane operator why the ratchet strap was there and the crane operator advised that it was to hold the door open because the shocks were "bad." Our client noted on its work order that there was a problem with the subject hatch door, specifically, "shocks for side door by pumps are broken need to order new shocks." Our client recommended that the door be fixed, and which parts were necessary for the repair. The crane owner then used a non-OEM part to maintain the hatch door in an open position, which our client did not recommend or approve.

Plaintiff, in this case, was a crane operator. As part of his assigned duties, he was required to perform an inspection of the crane before operating it. On the day of the subject incident, Plaintiff unlatched the door to check the oil in the subject crane. As soon as it unlatched, it dropped down and caught his arm / shoulder, jerking it downward abruptly. Plaintiff claimed injuries to his shoulder that required surgery.

As in the first case, we argued that our client did not owe a duty to plaintiff, and even if it did, that duty was not breached. Specifically, we argued that the insured did not have a duty to maintain the subject crane and did not have an exclusive maintenance contract with the crane owner to warrant that it would ensure third-parties not injured from the subject crane.

A party charged with performing repairs does not owe a duty to a third-party who is injured where the company authorized to make repairs does not make periodic inspections or ensure that the item to be repaired was to be maintained by the contracting party. *See Vushaj v. Insignia Residential Group Inc.*, 50 AD3d 393 (1st Dept. 2008). It is well established that "in the absence of a contract for routine or systematic maintenance, an independent repairer/contractor has no duty to install safety devices or to inspect or warn of any purported defects." *Vermette v. Kenworth Truck Co.*, 68 NY2d 714, 497 NE2d 680, 506 NYS2d 313 (1986); *Merchants Mutual Ins. Co. v. Quality Signs of Middletown*, 110AD3d 1042, 973 NYS2d 787 (2nd Dept. 2013); *Daniels v. Kromo Lenox Associates*, 16 AD3d 111, 791 NYS2d 17 (1st Dept. 2005).

In *Vushaj v. Insignia Residential Group Inc.*, the First Department held that the management company of a cooperative did not owe the plaintiff, an employee of the cooperative corporation, a duty to inspect and maintain the building's fuse box. 50 AD3d at 393. Suit was brought by plaintiff when a fuse box exploded while plaintiff was replacing fuses. *Id.* at 394. Defendant-management company had an agreement with the owner which granted it broad authority to make repairs at the cooperative. *Id.* But there was no evidence that the Defendant-management company was required within that agreement to make periodic inspections and maintain the building in good repair. *Id.*

We argued that our client had no duty to inspect the crane for defects beyond that which it was called to repair. Importantly, our client did not enter into any contract or agreement with

plaintiff's employer with respect to repairs and/or maintenance of the Manitowoc 888 crane nor did it enter into any preventative maintenance agreement or any other contract or written agreement with the crane owner but was available on a per diem basis to provide repairs when called. Our client was an independent contractor that would make repairs to the crane on an "on-call" per diem basis. Our client also did not have a duty to warn the owner of any defect with the crane beyond any repairs that it had been summoned to make. Yet, in good faith, our client notified the owner that there was an issue with the hatch door of the crane and that repair parts would need to be ordered ten full days prior to the subject accident, even though it wasn't called to perform an inspection. Accordingly, there was no evidence to support a finding that our client owed a duty to the plaintiff and therefore, our client could not be held negligent.

Conclusion

To best protect a company charged with maintenance, repair and inspections of cranes a few important takeaways should be noted. First, strong contractual indemnity language can be used to protect your client, but check within your State to ensure that the indemnity language is valid and enforceable. Next, train the technicians to document and recommend anything that they see may be a potential issue with a crane. While your company may not ultimately be retained to perform the work, proper documentation will work well to protect your client or insured from a claim that a crane owner relied on your expertise and was never made aware of the problem or issue that gave rise to a claim.