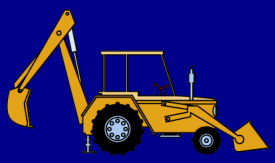
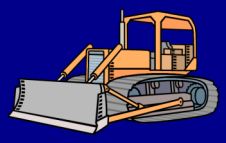
CIRPC
CONSTRUCTION INDUSTRY RESEARCH AND POLICY CENTER
VOL. 3 NO. 3

Construction Fatality Digest





JULY - SEPTEMBER 2014 QUARTERLY REPORT

Topics of Interest:

- Fatality Case File Statistics
- Case File Regional Report
- Top Standards Violated
- Summary of Fatal Events

INSIDE THIS ISSUE:

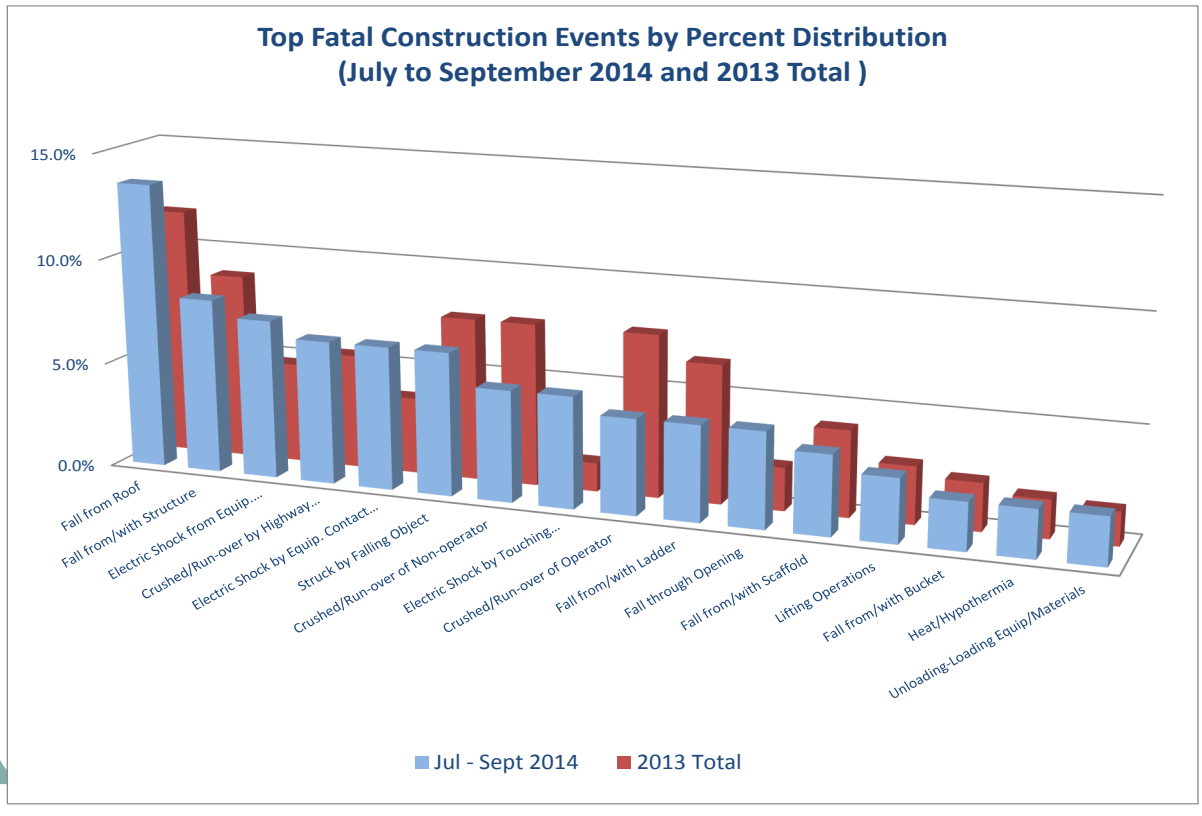
Fall Fatalities Account for 40 Percent of All Events

"Fall from Roof" led all fatal construction events reported to CIRPC for the third quarter of 2014. Of the 133 fatal events for the July to September period, "Fall from Roof" accounted for 13.5% (18 events) of the total. "Fall from Roof" has led all fatal construction events reported to CIRPC for the first three quarters of 2014. Rounding out the leading fatality causes for the quarter are "Fall from/with Structure" at 8.3% (11 events) followed by "Electric Shock from Equipment installation/tool use" with 7.5% (10 events), and "Crushed/Run-over of Non-operator", "Electric Shock by Equipment Contact Power Line", and "Struck by Falling Object" each with 6.8% (9 events).

All types of falls (ladder, roof, vehicle, scaffold, bucket, structure, platform, and opening) accounted for 40.6% (54 events).

When comparing the ranking totals for 2013 with those for the current quarter, there is little variation. "Fall from Roof" increased from 11.7% of the events to 13.5%, "Electric Shock by Touching Exposed Wires" increased from 1.6% to 5.3%, and "Crushed/Run-over of Operator" decreased from 7.7% to 4.5%. All types of Electric Shocks have increased each of the quarters of 2014, from 9.9% in the first quarter to 11.7% for the second, to 19.5% in the current quarter.

While not included in the events analyzed, an alarming number of heart attacks (82) were reported for the year 2013, far exceeding the recorded events for the year 2012 (30). This trend is continuing into 2014 with 72 heart attacks through September.



Regional Breakdown

"Of the 133 fatal events 73.7% (98 events) were in Federal OSHA states, while 26.3% (35 events) were in State Plan States."

A total of 133 events were reported from the regions in the third quarter of 2014. Of these, 22.6% came from region 4 (30 events), 20 came from region 6, and 19 from region 5.

Of the 133 fatal events 73.7% (98 events) were in Federal OSHA states, while 26.3% (35 events) were in State Plan States.

The breakdown by state has Texas with the greatest number of events, 15 (11.3%), followed by Florida with 14 (10.5%), and New York with 11 (8.3%).

Fatal Events by Region

July to September 2014

Region	# of Cases	Percent
1	5	3.8%
2	18	13.5%
3	14	10.5%
4	30	22.6%
5	19	14.3%
6	20	15.0%
7	11	8.3%
8	3	2.3%
9	10	7.5%
10	3	2.3%
Total	133	100.0%

Fatal Events by NAICS Code

A breakdown of fatal events by NAICS code shows "Highway, Street, and Bridge Construction" contractors and" Roofing Contractors" at the top both with 12.0% (16 events) of the total 133 events. Other top codes are "Electrical Contractors" with 9.0% (12 events), "Plumbing, Heating, and Air-Conditioning Contractors" and "All Other Specialty Trade Contractors" both with 8.3% (11 events).

Fatal Events by NAICS Code

Code	Description	# of Cases	Percent
237310	Highway, Street, and Bridge Construction	16	12.0%
238160	Roofing Contractors	16	12.0%
238210	Electrical Contractors	12	9.0%
238220	Plumbing, Heating, and Air-Conditioning Contractors	11	8.3%
238990	All Other Specialty Trade Contractors	11	8.3%
236220	Commercial and Institutional Building Construction	8	6.0%
238110	Poured Concrete Foundation and Structure Contractors	8	6.0%
237110	Water and Sewer Line and Related Structures Construction	6	4.5%
238120	Structural Steel and Precast Concrete Contractors	6	4.5%
236115	New Single-Family Housing Construction	5	3.8%
238290	Other Building Equipment Contractors	5	3.8%
238310	Drywall and Insulation Contractors	5	3.8%
238130	Framing Contractors	4	3.0%
238140	Masonry Contractors	4	3.0%
238910	Site Preparation Contractors	4	3.0%
236118	Residential Remodelers	3	2.3%
238320	Painting and Wall Covering Contractors	3	2.3%
236210	Land Subdivision	2	1.5%
237990	Other Heavy and Civil Engineering	1	0.8%
238170	Siding Contractors	1	0.8%
238190	Other Foundation, Structure, and Building Exterior Contractors	1	0.8%
238390	Other Building Finishing Contractors	1	0.8%
		133	100.0%

Top Construction Standard Violations

Of the 291 cases in the first three quarters of 2014 examined by CIRPC, 79 reported citations issued*. In the 79 cases there were 256 violations of OSHA standards. The average number of violations per case with citations issued was 3.24. For the previous calendar year (CY2013) the average number of violations per case was 3.86.

The "Scaffolding" standard is the top violated standard for the year to date with 20 occurrences. "Fall Protection" accounted for 18 violations followed by "General Duty Clause" with 15 issued.

When comparing the running total of 2014 calendar year violations with OSHA's Top 10 standards violated in FY2014 (per www.osha.gov), there are similarities and differences. Five of the most frequently violated OSHA standards are also found on the quarterly report list ("Fall Protection", "Ladders", and "Scaffolding", "Powered Industrial Trucks", and "Lockout/Tagout").

Top Standard Violations Reported During CY 2014

Rank	Std #	Description	# of Occurrences
1	1926.451	Scaffolding	20
2	1926.501	Fall Protection	18
3	5a1	General Duty Clause	15
T4	1926.1053	Ladders	14
T4	1926.502	Fall Protection Systems Criteria and Practices	14
6	1926.20	General Safety & Health Provisions	13
7	1926.21	Safety Training and Education	9
8	1904.39	Reporting Fatalities & Multiple Hospitalization Incidents	8
T9	1926.251	Rigging Equipment for Material Handling	7
T9	1926.503	Fall Protection Training	7
T11	1910.178	Powered Industrial Trucks	6
T11	1926.1412	Crane/Derrick Inspection	6
T11	1926.950	Power Transmission and Distribution - General Req's	6
T14	1910.147	The Control of Hazardous Energy (Lockout/Tagout)	5
T14	1926.1060	Stairways and Ladders - Training Requirements	5
T14	1926.454	Scaffold Training	5
T14	1926.651	Excavation	5

* Inspectors have up to six months to issue and finalize citations in fatality investigations. During this time citations can be changed or deleted.

Trends in Fatalities - Fatal Events in Residential Roofing

A paper recently published in Safety Science (December 2014) entitled "Fatal Events in Residential Roofing" reviewed fatal roof fall case files from OSHA. The key findings were:

Residential roofing is a high risk occupation, more than nine times as risky as the average occupation and more than three times as risky as the average construction trade. To better understand the factors involved in residential roofing fatalities, 112 case reports filed by Occupational Safety and Health investigators for the years 2005 to 2010 were examined. In almost all of the recorded cases there was no adherence to the then current safety standards. It was found that there was little or no appropriate use of fall protection practices or equipment and that employer planning and employee training was minimal. In addition to an increase in the size of the penalties, it is hoped the recent national program "Campaign to Prevent Falls in Construction", with its emphasis on planning, needed equipment, and training will prove fruitful in mitigating falls from roofs.

The authors also reviewed the violations and penalties assessed for each employer. Over 300 violations were reported for the 112 cases with an average penalty of $4,930 per employer. It would be interesting to re-approach this study in five years to determine if the increased penalties and the campaign had significant effects on employers' safety culture thus reducing residential roof falls.

Summary of Fatal Events

Below is a selection of the fatal event summaries from the 133 cases reported for the quarter.

CATEGORY: ROOF FALLS

Inspection # - 906364
A worker fell 75 feet through a ventilation shaft on the roof of a residential building while installing electrical disconnects for an HVAC system. The victim was installing the electrical components within 10 feet of the opening.

Inspection # - 911899
An employee was performing an inspection of a leaky 1/12 pitched roof. The employee walked backwards and fell 10 feet from the roof and struck his head on the concrete. The employee was not wearing fall protection.

Inspection # - 908162
An employee installing metal roof panels on a one level structural steel building fell approximately 26 feet to the concrete floor below. The employee was not wearing any personal fall protection equipment.

Inspection # - 317750453
Three employees were working on the roof of an existing high school. Two employees were cutting 18 gauge decking located under smoke evacuators. Decking screws at the work location were removed out of sequence which caused the decking to give way. An employee fell 38 feet and received a fatal injury.

CATEGORY: OTHER FALL EVENTS

Inspection # - 899065
The structural beam supporting the residential home slipped out of its pocket after being erected earlier that morning. The victim, working in the garage and standing on a step ladder, reached up to steady this beam when he fell from the ladder striking the floor. The beam then fell and struck the victim in the head.

Inspection # - 899646
An employee was working on the brick face of a building approximately 18 feet above the ground on an extension ladder. The feet of the ladder were on the sidewalk which was approximately 36 inches wide. Witness statements revealed that the employee was working on the second or third rung from the top of the ladder when the ladder wobbled and the employee fell head first to the ground.

Inspection # - 317884559
An electrician received a fatal head injury from a ladder fall. The employee was working off an 8 foot fiberglass ladder performing electrical work. He fell approximately 5-6 feet onto the concrete floor below.

Inspection # - 899070
Two employees fell while performing brick pointing operations on a residential structure. The employees were working off of a ladder jack scaffold approximately 20 feet above the ground. One employee was standing and performing the pointing process while the other sat on the platform (plank), creating a counter balance. One of the two ladders' feet slipped out causing the ladder jack scaffold to collapse. The employees fell to the ground. The employee sitting on the work platform sustained minor injuries while the other employee sustained fatal injuries from the fall.

Summary of Fatal Events (Continued)

CATEGORY: OTHER FALL EVENTS (continued)

Inspection # - 317799526
It was determined that two workers had been elevated to a working position of approximately 27 feet above ground by a rough terrain fork truck to finish installing siding materials. The building was a three story wood frame multi-family dwelling. The coworker had raised the workers up into the air while they were standing on the platform. The platform was not designed with guardrails. Personal fall arrest systems (PFAS) were available on site but not in use. The victim had been at one end of the platform while the coworker was at the other with his back turned to the victim so he couldn't see him. The victim stepped-off the platform and fell approximately 27 feet to the ground level.

Inspection # - 899784
An employee was working and walking on top of the solid surface of a walk-in freezer in the attic area in search of a fish tape wire for the installation of a data cable. The employee accidentally stepped and/or tripped onto the acoustical ceiling tile, falling 10 feet to the lower level, causing a fatal head injury.

Inspection # - 317637684
The victim was in the process of laying out light fixtures to be to be installed in a commercial construction project when he stepped into an unguarded elevator shaft resulting in fatal injuries.

Inspection # - 317802759
The company was framing the first floor of a house under construction. The stairway opening to access the basement was covered, labeled, and secured in place. The victim removed nails securing the cover so he could place a load bearing wall in line with the support beams in the basement. While attempting to move the unsecured cover, the victim fell approximately 10 feet to the basement floor below.

Inspection # - 317542132
The job site was a multi-story steel frame commercial building which was under construction. The ironworker sustained serious injuries after removing a plywood cover over a floor decking opening and falling through a three-foot by three-foot opening. The injured employee fell from the third floor to the second floor and landed on a concrete surface.

CATEGORY: ELECTROCUTIONS

Inspection # - 899934
Two workers, the company owner and his helper, arrived at a private residence to re-route a hot water pipe through an attic. A hole was cut into a wall directly behind a bathroom, and they started to re-route the pipe. The victim, the helper, was inside the attic while the pipe was routed up the wall, through the hole, and into the attic. The pipe made contact with existing electrical wiring electrocuting the victim.

Inspection # - 899625
During the paving operation, a dump truck was dumping its load of asphalt into the hopper of the paving machine, when the cab protector contacted an overhead single-phase high voltage power line. The voltage traveled through the bed of the dump truck into the paver and was seeking ground at the rear of the paver. A foreman was working on or near the paver when an unknown level of electrical current passed through him resulting in a fatal injury.

Summary of Fatal Events (Continued)

CATEGORY: ELECTROCUTIONS (Continued)

Inspection # - 317388650
The employer was engaged in plastering operations which included scaffold erection and dismantling. A 3-man crew was in the process of erecting a metal scaffold on the football field against the sound wall between the freeway and the field. They had erected a three-stage scaffold with the top stage planks 17'-4" above the ground level with additional 3' high guardrails. Employee #1 was working at the top level and the other 2 employees were at the ground. Employee #2 noticed that employee #1 was unconscious and unresponsive on the top level planks. Employee #2 went up and tried to revive him, without any success. When employee #2 tried to stand up, he came in contact with the 12 KV power lines right above the scaffold and fell down to the ground. It was determined later that employee #1 had also inadvertently contacted the 12 KV lines above the scaffold. Employee #1 was electrocuted and was pronounced dead at the site. Employee #2 was also shocked and fell about 20 feet off the scaffold. Employee #2 was hospitalized.

Inspection # - 905417
An employee was rigging roof trusses to be hoisted by a crane when the crane contacted an overhead high voltage power line causing electrocution of the employee.

Inspection # - 908726
Employees were working to replace a barn roof in the rear of a residential home. During the construction activity the victim was handling an aluminum ladder, when it made contact with an overhead single-phase high-voltage power line. The voltage traveled through the aluminum ladder and electrocuted the victim.

Inspection # - 317456226
The project consisted of pouring a basement and garage floors for a residential home. The pump truck the victim was operating came into contact with an energized overhead power line rated at 7,200 volts. He was transported by ambulance to the local hospital where he passed away.

CATEGORY: STRUCK BY FALLING OBJECT/PROJECTILE

Inspection # - 901374
The victim was injured while operating a John Deere tractor equipped with a shear attachment. The shear attachment was used to cut up metal pieces during the demolition of a building. The victim was struck by an unidentified object (from the shearing operation) that entered the cab and struck him in the head.

Inspection # - 897671
While performing demolition work inside a vacant 2-story building, an employee working at ground level was crushed by falling debris from the second floor.

Inspection # - 902672
An employee was using a sledge hammer on a “backing out push hammer” when a piece of the sledge hammer broke off. The sliver of metal became a flying projectile and struck the victim in the chest.

Summary of Fatal Events (Continued)

CATEGORY: STRUCK BY, RUN OVER, CRUSHED BY OPERATING CONSTRUCTION EQUIPMENT/ VEHICLE

Inspection # - 317555670
Two employees of an excavation company were working near and around a tracked excavator performing clean-up activities. One of the employees walked behind the excavator and was struck and run over by the excavator.

Inspection # - 317835197
The two employees were assigned to the jobsite to dig holes in preparation for the concrete footings. The victim was sitting on the back ramp of the flatbed truck while a co-worker (operator of the truck) backed it up. The employee fell off the vehicle and was run over.

Inspection # - 317104115
A two-person team was using a rumble machine to cut concrete/pavement. The employee got out of the pickup to check the machine. When the employee didn't return to the pickup, the driver stopped to check. The employee was found crushed by the rear tires of the pickup.

Inspection # - 901029
The victim was working on installing roadway pavement markers. A motorist ignored the traffic control and went around the cones and onto the right shoulder, striking the work truck the victim was on.

CATEGORY: OTHER FATALITY CAUSES

Inspection # - 903554
An employee was performing maintenance while standing on top of the elevator car. The employee's head and hand were crushed when the elevator's counter weights began to descend. The employee died on the scene.

Inspection # - 317498137
Nine employees were assigned to tear off an old roof and install a new roof on a warehouse. The temperature was around 93 degrees. The victim was covering files with plastic inside the warehouse with a coworker so that if, during removal of old roofing, material dropped inside the warehouse the debris would not damage files. The victim informed his coworker that he was going to get a drink of water. The victim became disoriented and walked past the water cooler inside the warehouse, past trucks with air conditioners, and then went outside of the warehouse. He was spotted by employees, working on the roof, stumbling around and falling down in the road. First Aid was administered and the employee was transported to the hospital. The victim passed away from hyperthermia.

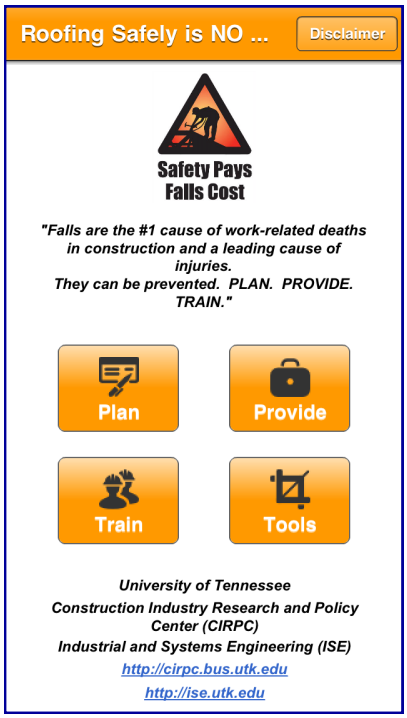
Inspection # - 317637353
The crew was installing an upgraded antenna array (boom) on a cellular tower, which weighed approximately 1800 pounds. The 'boom' was winched up the tower on a cats head pulley attached to the tower. The crew members said they heard a loud pop. The 'boom' came crashing down and struck the tower in three points. The second member of the tower crew then radioed to the ground that a crew member had been decapitated and his right arm amputated below the shoulder when he was struck by the winch cable.

Inspection # - 317838795
The victim was working on a flat roof at a height of 60 feet above the ground. He was hoisting an explosion panel approximately 60 feet above his location for installation on the side of a grain elevator. The hoist pulley, attached to the structure at a height of 144 feet above the ground, broke away from the structure. The panel, weighing approximately 100 pounds, fell onto the victim.

Roofing Safety is NO ACCIDENT - Roofing Phone App

As part of our mission, the Construction Industry Research and Policy Center (CIRPC) at the University of Tennessee attempts to raise safety awareness and disseminate tools and information to achieve best safety practices. We have developed an application for tablets and smartphones titled *Roofing Safely Is NO ACCIDENT* available for download on iTunes and Google Play without charge.

The app allows users to determine the OSHA permissible fall protection systems for residential roofing sites based upon roof slope and other criteria. It also provides a tool to estimate roof areas and provides OSHA contact information in case of imminent danger. We believe this useful tool can raise safety awareness and help prevent roof falls.



Spanish Version Now Available!

We can be contacted at:

Construction Industry Research and Policy Center
The University of Tennessee
Stokely Management Center, Room 202
916 Volunteer Boulevard
Knoxville, Tennessee 37996
Phone: 865-974-4422
E-mail: cirpc@utk.edu

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