

Electrical Contracting Industry



This study reflects on information derived from insurance claims. These claims form a database that can be analyzed to determine the many and varied causes of loss. CNA Risk Control presents this study of specific CNA claims and industry trends. We begin with a review of exposures inherent to the electrical contracting industry and conclude with suggested practices to manage these risks.

Electrical Contracting Industry Defined

For the purpose of this study, the electrical contracting industry is defined as small-, medium- and large-sized electrical contractors completing work for commercial, industrial and residential customers, and contractors responsible for erecting and maintaining overhead and underground trunk lines. Work activities include new construction, service and maintenance. New construction includes installation of j-boxes, wire, conduit, light fixtures, transformers, electrical systems, data systems, security systems, outlets, receptacles, switches, and panels. Maintenance and service activities focus on maintenance and upkeep of electrical systems with emphasis on operational repair and replacement of equipment and diagnosing electrical issues and problems.

Given the diverse operations of the electrical contracting industry, it is important to be aware of various workplace exposures employees' face and the potential impact on the employer.

Electrical Contracting: An Analysis of Loss Exposures in the Electrical Contracting Industry

Electrical contracting operations are typically labor intensive with a significant amount of reaching, climbing on ladders, kneeling, and bending by skilled trades people. These skilled workers also spend a significant amount of time driving to and from construction and customer sites. The following is a review of exposures based on an analysis of claims incurred by electrical contractor companies insured by CNA between January 1, 2004, and December 31, 2007.

Workers' compensation and auto claims combined accounted for over 90 percent of total claim frequency and over 85 percent of total claim dollars. Property claims represented an insignificant portion of overall frequency and severity. This study focuses on workers' compensation, auto and general liability lines of coverage.

Line of Coverage	Percent of Total Claims	Percent of Total Claim Dollars
Workers' Compensation	39	34
Auto	48	28
General Liability	10	31
Property	3	7

Workers' Compensation Claims

By Type of Incident Causing the Injury, Shown as a Percentage of Total Claims

Incident Type	Percent of Total Claims
Manual Handling/Physical Stress	21%
Struck By	19%
Struck Against	11%
Slips/Trips/Falls on Level Surface	9%
Falls from Elevation	8%
Foreign Object in the Eye	6%
Exposure to/Contact with Mold/Fumes	6%
All Others	20%

Shown as a Percentage of Total Claim Dollars

Incident Type	Percent of Total Claim Dollars
Manual Handling/Physical Stress	18%
Falls from Elevation	15%
Electrical Contact	15%
Slips/Trips/Falls on Level Surface	10%
Exposure to/Contact with Mold/Fumes	9%
Struck By	7%
All Others	26%

The data indicates worker injuries are most likely caused by manual handling/physical stress, struck by and struck against incidents. Material handling/physical stress, electrical contact, and falls from elevation represent the highest severity of claims in terms of claim dollars paid.

Manual Handling and Physical Stress

Claims related to manual handling/physical stress include strains, hernia rupture and sprains to the lower back, shoulders and knees. These injuries are mainly associated with moving/pulling/manipulating wire, using/moving/installing machinery and equipment, and moving/using ladders.

Manual material handling overexertion injuries are the result of employees bending, lifting and reaching throughout the day due to wire, materials and equipment being positioned on the ground. This also includes items stored on pallets, as the pallet height is typically only four inches. The average employee who bends 100 times a day, working 250 days a year will bend 25,000 times annually, exacerbating the risk factor and may increase the probability of developing low back pain.

Falls from Elevation

Analysis of workers' compensation claims shows that the majority of injuries were related to ladder use and resulted in lower back injuries, sprains, fractures, and contusions

Ladder-related injuries often result from employees having to make multiple ascents and descents to retrieve tools, materials and re-position work. This is often due to poor preplanning on the part of the employee. With an aging worker population, falls from ladders will become more frequent. Ascending and descending a ladder on a frequent basis accelerates the onset of fatigue that in turn contributes to falls from the ladder. When workers are tired they may not use every rung on the ladder or will take shortcuts such as jumping from the ladder. Other claims include falls from scaffolding and buildings while overreaching to install fixtures, components and wiring.

Electrical Contact

Electrical contacts occur when employees work on junction boxes, electrical panels, switch gear boxes, and handling wires. Analysis of workers' compensation claims pertaining to electrical contact shows the majority are associated with wiring, outlets, and transformers causing burns and electrical shock to hands, arms, and neck. Fifty-seven percent of the claims frequency account for less than 1 percent of the severity. Frequency is the number of claims reported and severity is the dollar value of the indemnity and medical cost. Death to employees and permanent partial disability claims created 96 percent of the severity for this exposure. These numbers imply the largest cost occur when coming into contact with electricity creating severe injuries and death.

Auto Claims

By Type of Incident Causing the Loss, Shown as a Percentage of Total Claims

Incident Type	Percent of Total Claims
Rear-ended Other Vehicle	19%
Struck by Object	17%
Backed Into Claimant	7%
Other Vehicle Rear-ended Insured	5%
Insured Vehicle Struck Parked Car	5%
Lost Control of Vehicle – Left Road	3%
Changed Lanes	3%
All Others	41%

Shown as a Percentage of Total Claim Dollars

Incident Type	Percent of Total Claim Dollars
Rear-ended Other Vehicle	14%
Struck Object in Roadway	7%
Failure to Yield	7%
Crossed Center Line	7%
Lost Control of Vehicle – Left Road	5%
Other Vehicle Changed Lanes	4%
Changed Lanes	3%
Failed to Observe Clearance	3%
Turned Left in Front of Oncoming Vehicle	3%
All Others	47%

Analysis of auto claims data reveals struck by object, claims related to cracked/broken windshields and windows, and rear-end collisions, are the most frequent incident types. Rear-end accidents and failures to yield have the greatest severity in terms of percent of total claim dollars. Examination of claim frequency data shows that the greatest number of rear-end incidents included pickup trucks, vans and passenger cars. Struck by object incidents most frequently involved pickup trucks, vans, and passenger cars.

Driver inattentiveness and the lack of concentration were the primary factors in rear end accidents, failure to yield and the vehicle leaving the road accidents. Other factors are aggressive driving, time management, and route planning. This raises the concept of human factors in the cab and how many stimuli the brain can handle while driving/operating a vehicle.

General Liability Claims

By Type of Incident Causing the Loss, Shown as a Percentage of Total Claims

Incident Type	Percent of Total Claims
Damage to Property	43%
Struck by	16%
Construction Defect	5%
Fire/Explosion	5%
Leaking/Seeping	4%
All Others	27%

Shown as a Percentage of Total Claim Dollars

Incident Type	Percent of Total Claim Dollars
Damage to Property	33%
Fire/Explosion	22%
Leaking/Seeping	15%
Struck By	5%
Construction Defect	3%
All Others	22%

Damage to property and struck by injuries are the most frequent type of loss with damage to property and fire/explosion having the highest severity. A majority of the damage to property and power outages are due to damage to underground cables and pipes (gas lines, data cables, electrical wires, water pipes, etc.) while trenching, boring and burying cables. Causes of leaking/seeping claims involved drilling while installing lights, cables and fixtures. Numerous claims are from damage to equipment and property related to the operation of industrial equipment such as backhoes and forklifts. High severity fires were often the result of defective installation and repair of j-boxes, wiring, electrical component, and light fixtures resulting in property damage.

Leading Issues and Trends

The most critical concern to the electrical contracting industry is maintaining a skilled workforce that can allow work to be performed on time, on cost and on quality. There has been a demographic shift occurring in the U.S. workforce caused by retiring “baby boomers.” Electrical contractors are now feeling the impact of the baby boomer generation because the industry does not have enough new highly skilled electricians entering the trade to complete new construction projects and facilities maintenance.

Electrical trades have to become more innovative in attracting talented young, skilled labor to the industry so that contractors will be able to maintain the quality of work and productivity needed to complete construction projects while remaining competitive.

An emerging issue in this industry is the wellness of the electrical worker as obesity has become a growing problem in the U.S. In the electrical trades, obesity can affect the productivity, quality and risk of injury by accelerating onset of fatigue and increasing risk factors associated with musculoskeletal disorders, trips and falls, and facilitates task shortcuts. Also affected is the

overall health of the employee which can contribute to an increase in worker absenteeism. Electrical contractors must become more aware of wellness programs and incorporate these into their operations.

The number of workers 55 and older will increase by 49 percent from 2004 to 2014. The percentage of 55 and older in the total workforce will increase from 11.9 percent in 1994 to approximately 21.2 percent in 2014.¹ The average age of the workforce will be 41.6 years by 2014.² Electrical contractors, unions and the government must begin to cooperatively work together to recruit and develop, through increased education and training, young employees with electrical trade and management skills.

Suggested Practices

The analysis of claim data presented in this study suggests a number of practices that could be effective in reducing worker injury, property damage and customer losses. The electrical contracting industry is characterized by a changing workforce in need of skilled workers and master certified electricians. Workers' compensation losses are mostly driven by poor postures, high fatigue levels, and a maturing workforce. Vehicle losses are by and large the result of driver inattentiveness.

In the general liability area, there is also poor utilization of utility locators ("call before you dig") to locate and mark the various utility lines when below surface excavation is needed as part of the work to be performed. A proven methodology that focuses on the human interface with materials, products, equipment and tools has been shown to be effective in addressing these exposures. Following are the key elements of this Lean methodology.

Workers' Compensation

To address the workers' compensation loss drivers, an approach that focuses on understanding staging, positioning, work flow, and work method techniques from a human factor, lean and engineering perspective/methodology is necessary.

Pre-planning of tasks, tools, and equipment prior to the installation process can help to decrease frequent climbing on ladders, reduce fatigue levels and injuries, and increase employee productivity.

When appropriate, electrical contractors should incorporate the use of platform ladders, i.e., folding ladders with standing platforms. Using a platform ladder will allow the employee to freely move and turn, eliminate static and awkward body postures, while improving productivity and quality. When possible on the job site, aerial lifts should be used to elevate employees into their work positions to eliminate ladder exposures.

Manual handling/physical stress, struck by and struck against injuries can be addressed through the development and implementation of CNA's "Motion is Money" process, which enhances worker productivity and reduces risk factors. By examining the staging, positioning, work flow and work method techniques of the employees, a business solution can be developed to make changes that will reduce or eliminate the exposures. Evaluating these activities through the application of human factors, using Lean and engineering methodologies, can help to identify and analyze non-value added task elements such as walking, bending, reaching, and twisting. Evaluation is critical to achieving risk reduction, improved productivity and enhanced quality.

When working with high temperatures, a formal hot work process should be used. This process should include the utilization of hot work permits that are signed off by the safety professional or another management official. In addition, a formal lock out and tagout system should be in place and utilized.

CNA construction specialists can assist in development and implementation of a comprehensive safety program involving CNA's "Motion is Money" process that addresses workers' compensation exposures. In addition, the Motion is Money pocket guide for superintendents and foremen outlines how to conduct observations and measures on the job site to improve productivity.

CNA School of Risk Control Excellence offers construction boot camps to address exposures and to impart risk management techniques that can mitigate them.

To address fall exposures, CNA provides a construction gap analysis for contractors to evaluate overall operations and determine strengths and weaknesses; the FallPRO process which is a comprehensive method of evaluating and developing business solutions; and information on ladder safety, scaffolding, and raising materials off the ground and floor.

Auto

The fleet safety process should be approached from a human factor perspective for both in and out of the cab behaviors such as eating, drinking, smoking while driving, climbing in/out of vehicles and raising and lowering trailers.

Auto safety is an essential part of a company's safety program. Few companies can operate without an occasional business use of hired or non-owned vehicles by employees. Claim data indicates that accidents in which the insured driver rear-ended other vehicles are the leading loss source in terms of accident frequency and severity.

Developing MVR criteria, point systems for driver violations, driver orientation and drug testing of employees should be a part of a comprehensive fleet process safety program.

Contractors often complete heavy physical work throughout the day resulting in the accumulation of mental and physical fatigue that can affect their reaction time while driving. Management must understand these issues and provide education on in-cab behavior guidelines to employees. Electrical contractors must begin to explore beyond the traditional vehicle education and training methods and expand into understanding and incorporating human factor methodologies into their fleet.

CNA offers resources, such as the School of Risk Control Excellence's Fleet Institute, to aid contractors in addressing issues and exposures presented in this study. CNA's fleet and ergonomic specialists can assist in the development and implementation of a comprehensive fleet process.

CNA offers additional resources to aid in the implementation of a fleet safety program, that includes guides and bulletins on managing fleet safety, accident prevention and driver safety awareness.

General Liability

Having a comprehensive worksite process that includes preplanning of all job tasks pertaining to excavation activities with emphasis on marking, designating and outlining the specific utility lines needs to be a routine part of the excavation process. Each foreman and employee operating a piece of excavating equipment should thoroughly review the plan on a daily and hourly basis as the excavation progresses. In addition, management should develop and implement a policy of pot-holing or otherwise locating utility lines for machine operators.

A comprehensive written process should be developed and followed to locate, identify and mark property during a job specific task where the equipment to be used is in close proximity to other property. In addition, a spotter should be used for tasks that require the operation of equipment in tight quarters.

CNA offers construction specialists who can assist in the development and implementation of a comprehensive safety program involving the Motion is Money process and other safety processes to address the exposures discussed in this study.

CNA offers exposure guides such as Risk Transfer: A Strategy to Help Protect Your Business as well as bulletins discussing the Safety Responsibility of Job Site Foreman and Slip and Fall Procedures on Job sites.

School of Risk Control Excellence

Courses applicable for the Electrical Contracting Industry:

- Builders Risk – Protecting the Job Site from Fire, Wind, Water and Theft** – Provides tools and techniques to help limit exposures to hazards such as fire, wind, water and theft
- Contractor Utility Disruption** – Offers precautionary practices to follow prior to the start of any underground work
- Controlling Equipment Theft** – Identifies ways to control equipment theft and mitigate the associated risks
- Drug and Alcohol Prevention** – Identifies ways to properly manage the work risks and legal issues of drug screening with pre-employment, post-accident, reasonable suspicion and random testing
- Electrical Contracting Boot Camp** – Addresses industry loss drivers from a safety and industrial practice viewpoint
- FallPRO** – Outlines steps for implementing a comprehensive fall protection process for the leading cause of fatalities in the construction industry
- Incident Investigation** – Identifies causes that can lead to incident investigation steps
- Lower Back Pain and Manual Material Handling** – Covers symptoms, characteristics and risk factors that contribute to the development of lower back pain
- Managing Your Hearing Loss Trends** – Identifies risk management steps to limit further loss of hearing claims
- OSHA 10-Hour for Construction** – Provides training on construction safety, health and emphasizes hazard identification, avoidance, control and prevention
- Return-to-Work Process** – Explores elements of the return-to-work process and workers' compensation requirements
- Risk Transfer** – Addresses the importance of developing a risk transfer strategy and gives practical guidelines for establishing a risk transfer program
- Risk Transfer for Construction** – Addresses strategies for allocating and insuring risks to help minimize exposure and shift it to the responsible party
- Slips, Trips and Falls** – Explains how to implement an effective slip, trip and fall prevention program

To find out more about these classes, go to: www.cna.com/riskcontrol

Footnotes

¹ Toossi, M. (2005, November). Employment outlook: 2004-14: labor force projections to 2014: retiring boomers. Retrieved October 30, 2008, from

<http://www.bls.gov/opub/mlr/2005/11/art3full.pdf>

² Silverstein, M. (2007, December). Will you still need me when I'm 64? Designing the age-friendly workplace. *EHS Today*. Retrieved October 9, 2008 from

http://ehstoday.com/safety/ehs_imp_77115/

To learn more about how CNA Risk Control can work with you to help you mitigate risks, please speak with your local independent agent, call us toll-free at 866-262-0540, or view our Risk Control tools online at www.cna.com/riskcontrol.

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