

Mechanical Contracting Safety Issues

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Abstract: The purpose of this paper is twofold: (1) to determine jobs/tasks associated with current injury, illness, and fatality trends in the mechanical contracting branches of the construction industry; and (2) to identify current safety practices associated with the reduction of risk of these injuries, illnesses, and fatalities. To achieve the project objectives, a survey was designed and sent to Michigan mechanical contractors. To design an adequate survey, the research team first collected background information using U.S. Bureau of Labor Statistics online database, published research, and contractor interviews. Fourteen of the 50 mechanical contracting surveys distributed were completed. The pilot study found eye injuries due to grinding and welding and upper extremity cuts due to sheet metal to be the most frequent mechanical contracting task/injury combination.

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Introduction

The construction industry is a major part of the U.S. economy, employing approximately 5.9 million workers in 1998 (Bureau 2000b). Even though this equated to only 4.8% of the U.S. workforce, the construction industry accounted for 19.4% of workplace fatalities and 12.3% of the occupational injuries and illnesses. At the same time, construction fatality rate is also the second highest in the nation, lower than only the historically hazardous mining industry (Bureau 2000a). Although the construction industry's safety record has improved in recent years, it has not improved as rapidly as other major industries.

In the execution of virtually every construction project, a multitude of separate agencies, trades, and organizations will come together to complete the venture. Many different disciplines are typically involved in a construction project, including electricians, plumbers, painters, equipment operators, and carpenters, to name a few. The different contractors each have occupational hazards that are typically more frequent in their respective line of work. The primary focus of this paper is to identify specific tasks that are frequently associated with injuries, illnesses, and fatalities in mechanical construction.

Scope of Mechanical Contracting

It is somewhat difficult to define exactly what a "mechanical" contractor does. There is a wide variety as to the exact scope of work, depending upon the company, the job, and the region. It is possible, however, to simply define a mechanical contractor as a contractor primarily responsible for installation and maintenance of the mechanical systems of a structure. This paper will use this broad definition as a baseline to determine what will be considered mechanical contracting.

Mechanical Systems

The mechanical systems of a structure can be classified into five main categories: (1) heating, ventilation, and air conditioning systems (HVAC); (2) site utilities; (3) plumbing; (4) fire protection; and (5) specialty systems. Site utilities consist of the water supply, storm water drainage systems, sanitary disposal systems, and the gas supply system. Plumbing systems involve water distribution, water treatment, and sanitary facilities. The water supply, fire and smoke detection systems, and the annunciation system are all considered parts of a fire protection system (Tao and Janis 1997). (A mechanical contractor, however, is only involved in the water supply part of the fire protection system.) Some mechanical contractors may specialize in only one of these systems or possibly a subpart of a system, while others may perform a wide variety of services.

Mechanical Contracting Trades

Since mechanical contractors may each perform a different variety of services, there is not a single prototypical mechanical contracting worker. The U.S. Government's Dept. of Labor lists two main trade occupational groups who work for mechanical contractors: (1) *plumbers and pipe fitters*; and (2) *sheet metal workers and duct installers*. Plumbers and pipe fitters are specialized trade classifications, often grouped together, because they both involve piping systems. Plumbers perform a variety of services, installing and maintaining the water, waste, drainage, and gas systems in residential, commercial, and indus-

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trial structures. Pipe fitters are usually involved with installing and maintaining piping systems used in manufacturing, electricity generation, and heating/cooling systems. Some pipe fitters may decide to specialize in only one type of these piping systems. There were roughly 426,000 plumbers and pipe fitters in the U.S. in 1998. Mechanical and plumbing contractors employed approximately two-thirds of these workers. Many plumbers and pipe fitters work for small companies, and approximately 20% of plumbers and pipe fitters are self-employed. In terms of education, many of these workers learn their trade through 4- or 5-year apprenticeship programs. Some common safety and ergonomic concerns listed for plumbers and pipe fitters were: working in tight places; lifting heavy pipes; fall hazards; burns from hot pipes and soldering equipment; and cuts from tools (Bureau 2000b).

Sheet metal workers and duct installers are also involved in mechanical systems; they make, install, and maintain air-conditioning, heating ventilation, and pollution control duct systems. Sheet metal workers are, however, also responsible for the making, installing, and maintaining of roofs, siding, restaurant equipment, and other building products made from metal. These are clearly tasks outside of mechanical system installation and maintenance. There were roughly 122,000 sheet metal workers and duct installers in the U.S. construction industry in 1998. Plumbing, heating, and air-conditioning contractors employed approximately three-fourths of these workers. Some common safety and ergonomic concerns listed for sheet metal workers and duct installers were cuts from tools, burns from soldering and welding, lifting heavy materials, and falls (Bureau 2000b).

Research Objectives

The purpose of this project was twofold:

1. To determine jobs/tasks associated with current injury, illness, and fatality trends in mechanical contracting; and
2. To identify current safety practices associated with the prevention of these injuries, illnesses, and fatalities.

The Bureau of Labor Statistics Data

Using the U.S. government's Bureau of Labor Statistics (BLS) safety and health statistics (Bureau 2000a), nonfatal injury and illness data were collected from 1992 to 1998. Statistics related to mechanical contracting work were collected and compared to relevant data from the construction industry as a whole. The BLS defines an occupational injury as, "any injury such as a cut, fracture, sprain, amputation, etc., which results from a work-related event or from a single instantaneous exposure in the work environment." It also defines an occupational injury as, "any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to factors associated with employment." The injury and illnesses data collected were actually data about lost workday injury and illness cases. The Bureau of Labor Statistics defines lost workday cases as, "cases which involve days away from work, or days of restricted work activity, or both" (Bureau 2000a).

The four primary set of statistics collected were: (1) sources of injuries and illnesses; (2) natures of injuries and illnesses; (3) parts of bodies affected in injuries, and illnesses; and (4) events or exposures of injuries and illnesses. Each specific set will be further discussed in following subsections. The statistics were col-

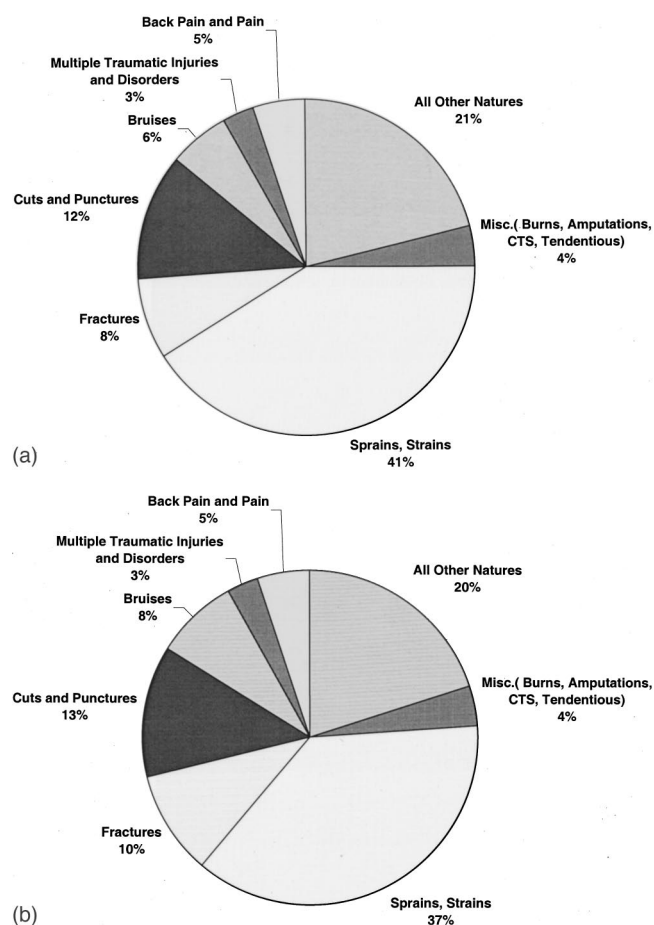


Fig. 1. (a) Mechanical injuries and illnesses by selected natures, 1992-1997 (b) Construction injuries and illnesses by selected natures, 1992-1997

lected from the BLS online database for each individual year from 1992 to 1998 (Bureau 2000b). The various data sets were compiled over the 7-year span for a comprehensive cumulative review, and represented in graphical format.

Nature of Injuries and Illnesses

The first primary statistics data set addresses the incidence rates for nonfatal occupational injuries and illnesses involving days away from work by selected natures of injury or illness. The nature of an injury or illness is defined as the principle characteristic of the disabling condition (Bureau 2000b). The BLS has broken the various natures into 12 major categories: (1) sprains and strains; (2) amputations; (3) fractures; (4) Carpal Tunnel Syndrome; (5) cuts; (6) punctures; (7) tendonitis; (8) bruises; (9) multiple traumatic injuries and disorders; (10) heat burns; (11) back pain and pain, except back chemical burns; and (12) all other natures. The most prevalent type of mechanical contracting injuries and illnesses were sprains and strains. They accounted for 41% of the total cases. Strains are the result of overstretched or torn muscles, and sprains are the results of torn ligaments. Strains and sprains will frequently cause swelling and intense pain. Other significant natures were fractures with 10% of the total cases, and cuts and punctures with 13%. Fig. 1(a) illustrates the distribution of injuries across natures and illnesses. Overall, this data was very similar to that of the entire construction industry as shown in Fig. 1(b).

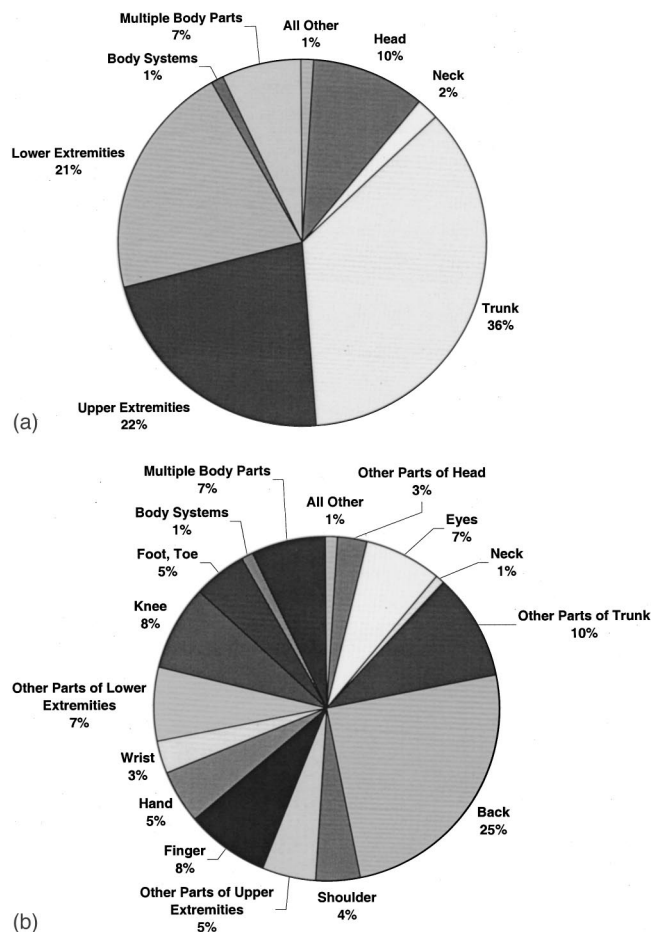


Fig. 2. (a) Parts of body affected in mechanical injuries and illnesses, 1992–1998 and (b) parts of body affected in mechanical injuries and illnesses, 1992–1998

Parts of Body Affected

The second statistical data set reviewed was the incidence rates for nonfatal occupational injuries and illnesses involving days away from work by part of body affected. The BLS has divided the body into seven main areas. These major areas are (1) head; (2) trunk; (3) upper extremities; (4) lower extremities; (5) body system; (6) multiple body parts; and (7) all other body parts. These categories are then further subdivided into more specific areas. For instance, the major category upper extremities is further divided into the subcategories wrist, hand, finger, and other parts of upper extremities.

For mechanical contractors, it was found that 36% of injuries and illnesses were to the trunk. The upper and lower extremities were also found to be significant injury areas, accounting for 22% and 21%, respectively, Fig. 2(a). When further divided into the subcategories, Fig. 2(b), it appeared that the back was the most prevalent area of injury and illness, accounting for 25% of the total cases. The knees (8%), fingers (8%), and eyes (7%) were also found to be specific areas of frequent injury and illness. Overall, the primary parts of the body affected are the eyes, knees, fingers, and back. The data is also similar to that of the entire construction industry, as shown in Figs. 3(a and b).

Sources of Injuries and Illnesses

The third set of statistics reviewed was the incidence rates for nonfatal occupational injuries and illnesses involving days away

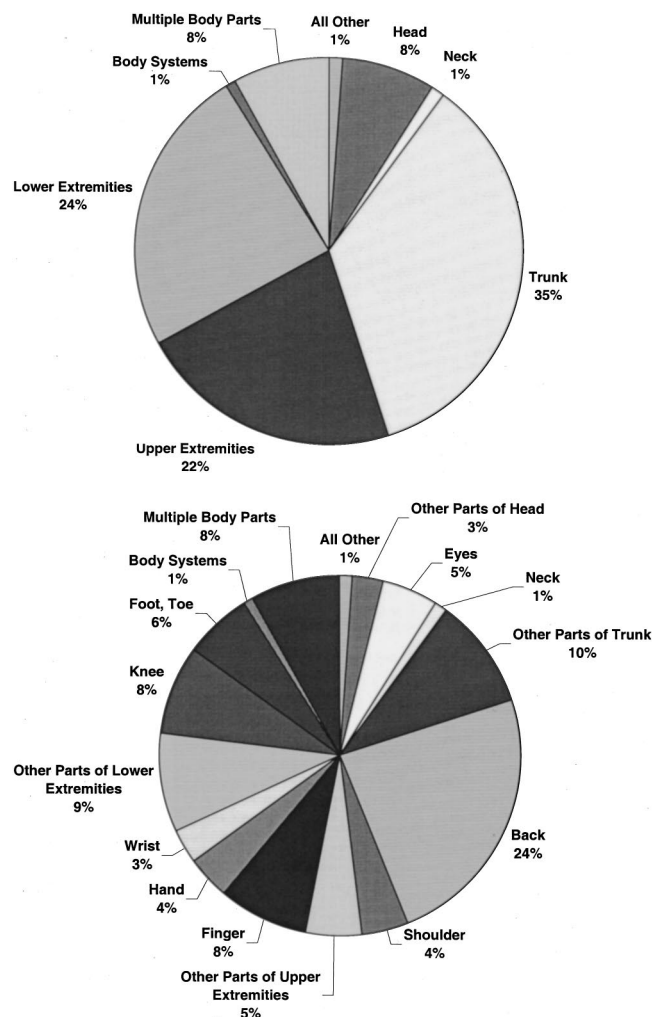


Fig. 3. (a) Parts of body affected in construction injuries and illnesses, 1992–1998 and (b) parts of body affected in construction injuries and illnesses, 1992–1998

from work by selected sources of injury or illness. BLS defines the source of injury or illnesses as, “the object, substance, exposure, or bodily motion that directly produced or inflicted the disabling condition cited” (Bureau 2000b). The sources of injuries and illnesses were divided into 8 major categories: (1) chemical and chemical products; (2) machinery; (3) containers; (4) parts and materials; (5) floors, walkways or ground surfaces; (6) vehicles, (7) furniture and fixtures; and (8) worker motion or position. The largest source of injuries and illness for mechanical contractors was parts and materials, accounting for 23% of all cases. The categories floors, walkways or ground surfaces, and worker motion or position were the next two largest categories, at 15 and 13%, respectively. Mechanical contractors differed from industry norms in that 10% of its injuries and illnesses were caused by machinery, while the industry average is 6%. Fig. 4 shows the mechanical data set while Fig. 5 illustrates the overall construction industry data. The main problem with this data set is that the largest categories are very broad and do not provide enough information to determine the root cause of an injury or illness.

Events or Exposures

Incidence rates for nonfatal occupational injuries and illnesses involving days away from work by selected events or exposures

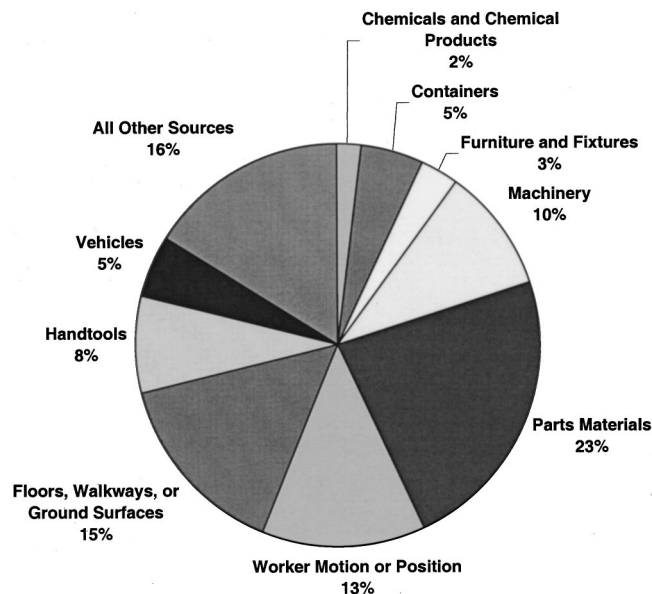


Fig. 4. Mechanical injuries and illnesses involving days away from work by selected sources, 1992–1998

of injury or illness were also reviewed. BLS defines an event or exposure as “the manner in which the injury or illness was produced or inflicted” (Bureau 2000b). The types of events and exposures have been divided into 11 main categories: (1) contact with objects; (2) exposure to harmful substance or environment; (3) fall to lower level; (4) transportation accidents; (5) fall on same level; (6) fire and explosions; (7) slips or trips without fall; (8) assaults and violent acts; (9) overexertion; (10) all other events; and (11) repetitive motion. When computing this data, falls to a lower level and falls on the same level were combined and simply termed “falls.” This was done in an attempt to simplify the data set.

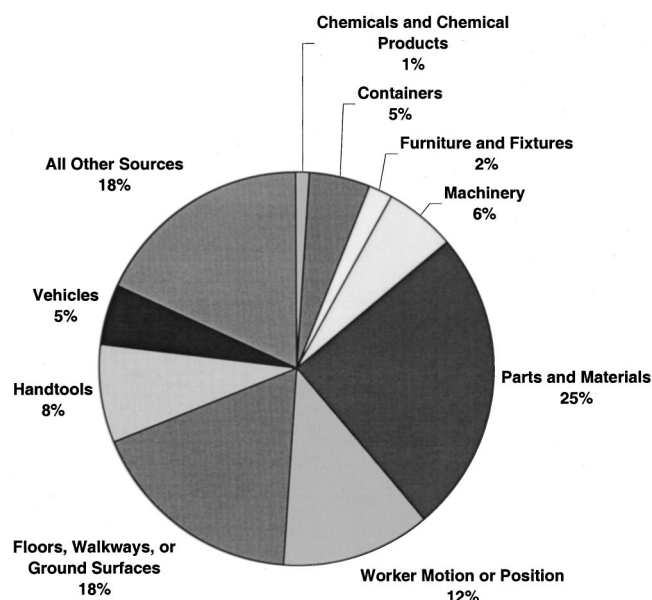


Fig. 5. Construction injuries and illnesses involving days away from work by selected sources, 1992–1998

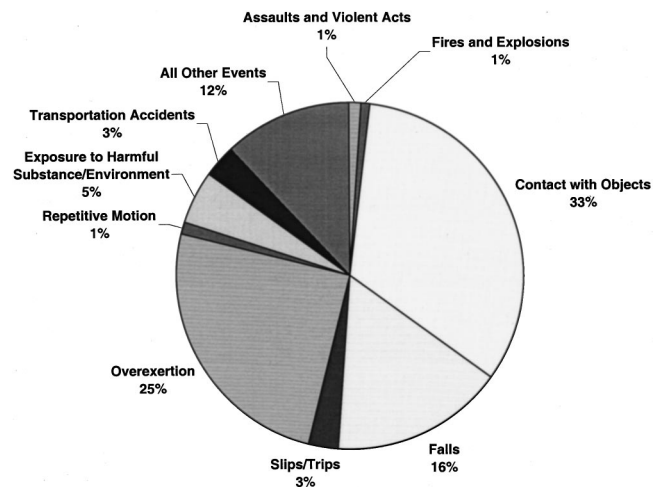


Fig. 6. Mechanical injuries and illnesses by selected events or exposures, 1992–1998

For mechanical contractors, contact with objects was found to be the primary event or exposure involved in 33% of all cases. Overexertion was the next most frequent event or exposure, accounting for 25% of all the cases. The next largest category was falls at 16%. Fig. 6 illustrates the mechanical injuries and illnesses in this category while Fig. 7 shows the relevant construction industry data.

Fatal Injuries

The construction industry reported the largest number of fatal work injuries of any industry and accounted for nearly one-fifth of the fatality total in 1998 (Bureau 1998). As shown in Fig. 8, falls were the most frequent fatal event in construction from 1993 to 1998, accounting for 31% of all cases. Transportation incidents (26%), contact with objects and equipment (19%), and exposure to harmful substances and environments (18%) were all also significant fatal events and exposures.

Construction specialty trade contractors such as carpenters, roofers, pipe fitters and electricians all face a high risk of falls

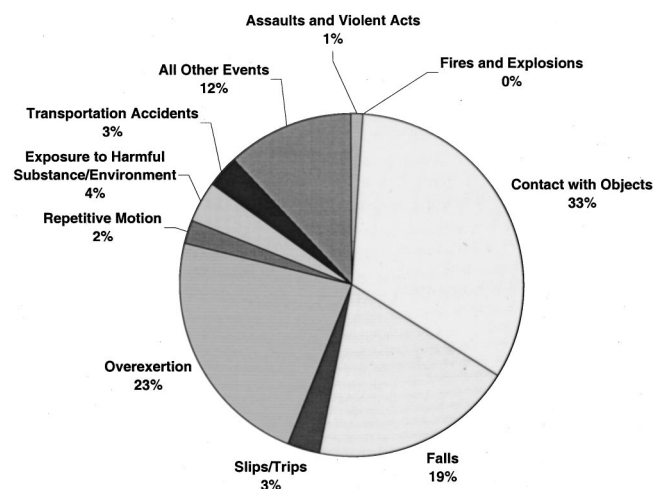


Fig. 7. Construction injuries and illnesses by selected events or exposures, 1992–1998

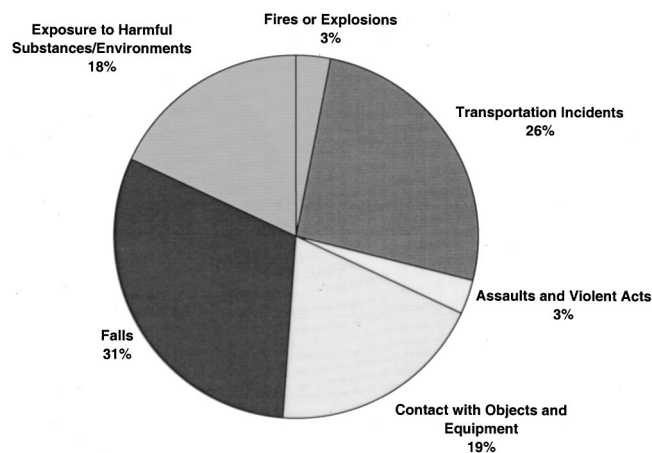


Fig. 8. Construction industry fatal injuries by event or exposure, 1993–1998

while working on roofs, ladders, and scaffolds. But the entire construction industry confronts a high risk of fatal injuries from its varying work environment. At a construction site, the environment, the work to be done, and the composition of the crews change continuously, which exposes the worker to unforeseen and unaccustomed hazards (Helander 1991). In addition, construction workers are frequently changing projects and employers, thus constantly changing the norms for safety.

Falls, exposure to harmful substances or environment, transportation incidents and contact with objects and equipment each accounted for nearly one-fourth of the mechanical contracting data/work injuries. Other fatal events or exposures classifications such as fires or explosions and assaults and violent acts accounted for only 1 and 2%, respectively. This data is shown in Fig. 9. Mechanical contracting workers, such as sheet metal workers and duct installers, are exposed to contact with objects and equipment during the fabrication phase of their work, such as sheet metal fabrication, which requires hazardous materials and machinery. Harmful environments result when workers override safety features such as guards designed to make it impossible to insert body parts or other objects into the machines. Transportation incidents are likely to occur when shipping the different mechanical systems, while falls are likely to occur during their installation.

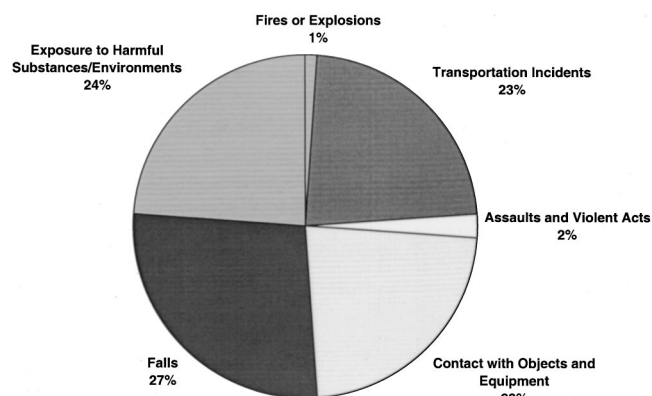


Fig. 9. Mechanical fatal injuries by event or exposure, 1993–1998

Methodology

A two-page survey was designed for mechanical contractors, (included as the Appendix). The purpose of the survey was to identify specific tasks in each field that were frequently involved with injuries, illnesses, or fatalities. Due to the wide variety of tasks, equipment, and procedures involved in both of these disciplines, it would be difficult to develop and administer a comprehensive survey. The survey was, therefore, designed to study the most significant hazards and case types, as identified by BLS statistics. Of the four injury and illness data sets collected, body parts was the most specific and the most easily identifiable description.

Data was collected from the BLS online database (Bureau 2000b) and previously published resources to determine what type of injuries, illnesses, and fatalities were the most prevalent in mechanical construction. Using this information, an initial survey instrument was designed. Primarily, the questions focused on parts of the body frequently injured in mechanical contracting. Several questions were drafted for each of the body parts frequently involved in lost workday cases. The majority of these questions were phrased so that a body part was identified, and the contractor could identify tasks that were associated with injuries and illnesses to that particular body part. The survey also contained questions about other significant hazards, such as fatalities, machinery, and hand tools. This preliminary survey instrument was administered to a few local contractors. Based upon the response of these contractors, the survey instrument was further refined. The focus of the survey was narrowed, and repetitious material was eliminated. Several mechanical contractors in Michigan were contacted via telephone to elicit their participation in completing the survey. The mechanical contractors who participated in the survey were identified and selected from the Mechanical Contractors Association of America (MCAA) web-page directory. Approximately 50 mechanical contractors were asked to complete the survey.

Survey Results and Discussion

Of the 50 mechanical contractors asked to participate, 14 completed the survey. This represents a response rate of 28%. The size of the participating companies greatly varied, with some employing as few as 10 workers and others as many as 700. The participating mechanical contractors worked in residential, commercial, and industrial mechanical system fabrication and installation. The participants were primarily from Michigan. Table 1 provides data on the workforce and the type of work of the participating mechanical contractors. A larger sample representing the nation will be administered in the future to develop a national data base.

The mechanical contracting survey contained 20 questions with topics ranging from general safety programs to questions about specific injury and illness types. The survey also contained a section in which contractors were asked to rank the frequency at which certain parts of the body were affected with injury and illness. Six parts of the body were listed: (1) knees; (2) back; (3) eyes; (4) feet; (5) hands/fingers; and (6) shoulders. These were all areas of the body that the BLS database indicated were frequently involved with lost workday cases in mechanical contracting. The contractors were asked to rank the relative frequency on a scale of 1 to 6, with 1 being the most frequent. Thirteen contractors completed this section. Back and hand/fingers injuries and illnesses both had the ranking, with a mean response value of 2.692. The eyes had the third highest ranking with a mean value of 3.00.

Table 1. Workforce and Type of Work of Participating Mechanical Contractors

Contractor	Type of contractor	Number of Employees ^a		
		Plumbers	HVAC	Employee Total
1	Commercial, industrial			50
2	Commercial, industrial		14	14
3	Commercial			24
4	Commercial, industrial			25
5	Residential	35		35
6	Commercial			60
7	Residential, commercial	325		325
8	Commercial, industrial			30
9	Industrial			30
10	Commercial			50
11	Commercial, industrial	38		38
12	Industrial	25		25
13	Residential, commercial			25
14	Commercial, industrial			700
Total number of employees represented in the 14 returned surveys				1431

^aContractors that have no entry under plumbers/HVAC did not report the workforce breakdown.

These three areas of the body (back, hand/fingers, and eyes) were also cited as the primary areas of injury and illness in the contractor interviews. The other three parts of the body were assessed rankings of 3.923 (feet), 4.308 (knees), and 4.846 (shoulders).

Eye Injuries and Illnesses

The first body-specific section of the survey was concerned with eye injuries and illnesses. The survey indicated that there were two manners in which eye injuries occurred. The primary way was foreign objects getting into the eye, and the secondary was welder's flash from ultraviolet light. Mechanical contractors get foreign objects into their eyes in three main ways: (1) grinding; (2) welding; and (3) cutting. Drilling, specifically drilling over the head, was also occasionally listed. Of these four tasks, grinding was listed the most frequently. A foreign particle in the eye injury is often not a lost workday case, and, therefore, goes unnoted in terms of severity by the BLS statistics. One mechanical contractor said that practically every worker in his 45-man outfit was affected by metal shavings in his eye at some point in their respective careers. These types of injuries happen both with and without the use of eye protection.

Frequently, metal shavings will fly-off at many different angles, sometimes getting around eye protection, or bouncing-off materials back towards the workers eyes. Due to the nature of mechanical contracting, workers are often required to be in cramped or awkward positions, in which the positioning of their eye protection is not always optimal. Frequently, it is not the worker who is operating the machine or tool that emits the particles that cause injury. Often, a nearby worker not wearing eye protection will be inadvertently caught in a stream of metal shavings. This could frequently happen with newer workers, who are not aware of the potential hazard they could create for their co-workers. Approximately 50% of the contractors responding to the survey felt that some of their eye injuries would have been prevented, if workers had taken the time to use the proper eye protection. Many of these contractors did remark that workers are frequently injured while wearing eye safety equipment. Goggles may be more effective in reducing the amount of metal shavings that get into workers' eyes. The main problem with goggles,

though, is that they may be perceived to be less comfortable, restrict vision due to moisture, and take longer to put on than traditional safety glasses. This could lead workers to be less likely to use them, thereby causing a negative effect on preventing injuries.

As previously mentioned, grinding was the primary task for which mechanical contracting workers were injuring their eyes. Of the contractors contacted who listed specific tools associated with eye injuries, approximately 65% responded that grinders are primary eye hazard. Grinding is done primarily to smooth and finish a product. Mechanical contractors typically use grinders in metal fabrication and installation to "sand" down things, such as welds.

The second most frequently listed eye injury process was welding. Mechanical contractors often have to weld pipes or other metal components together. Of the contractors who listed specific tools and equipment that created significant eye hazards, 53% responded that welding created a significant eye hazard. Welding is dangerous to the eyes in two primary ways. First, it presents a hazard similar to that of grinders in that there is the risk of foreign objects flying into the eye. Secondly, there is the hazard of "welder's flash" or "arc eye." Welder's flash is often described as a "sunburning" of the eye, which typically causes reduced or blurred vision and severe pain. The condition is reversible and usually disappears within 48 hours (NIOSH 1988; MHA). Some contractors also mentioned that workers injure their eyes from metal spatter and sparks. One mechanical contractor commented that he had gotten a particle lodged in his eye even while wearing proper welding face protection. He said that the particle had bounced off a beam behind his body, rebounded over his head, and deflected off the inside of the mask and into his eye.

Cutting was also frequently listed as a potential eye hazard. Approximately 48% of the contractors contacted listed cutting as a significant eye hazard. Mechanical contractors are typically required to cut pipes, ducts, sheet metal, and other various metallic materials. They use both saws and torches to cut metal. Both methods produce metal shavings, which can often lodge themselves into a workers eyes. In the survey responses, many contractors simply stated "cutting" as a task frequently associated with eye injuries. It is unclear whether they intended it to mean

thermal cutting, saw cutting, or both. Further investigation may be warranted.

Hand/Finger Injuries and Illnesses

The second body-specific section of the survey was concerned with finger and hand injuries and illnesses. Approximately 47% of the participants listed injuries and illnesses to the fingers or the hand as a common injury type in mechanical contracting. There were two primary ways in this type of injury: (1) cuts, and (2) burns. Between the two, cuts were more prevalent. Sheet metal was frequently cited as the material involved in injuries. Of the contractors visited, both said that lacerations in handling this material happen rather frequently and that a majority of their workers have been cut at some point in their career while using it. Contractors noted that metallic packaging materials, similar to sheet metal, also accounted for some lacerations. Another frequent material listed as a finger hazard was pipes. Contractors said that their workers can cut their fingers open on sharp edges of pipes that had been cut to length, or they could smash their fingers when handling the material. Cutting pipe, the use of reciprocating saws, and grinders were all also listed as tasks in which the hands and fingers are frequently injured. Some contractors also mentioned that their workers would frequently burn their hands and fingers with welding equipment.

Back Injuries/Illnesses

The next body-specific section of the survey was concerned with back injuries and illnesses. Approximately 47% of the contractors listed back injuries as one of the primary ways in which their workers get injured. The participants felt that material handling was the main way in which workers injure their backs. The contractors listed a variety of tools and materials as heavy objects that their workers are typically required to lift. Overall, however, pipes and valves were by far the most common response. A few contractors also mentioned that back injuries occur due to slips, trips, and falls. Poor housekeeping and slippery surfaces, such as ice, were some of the specific inducers of these incidents.

Falls

Falls caused 31% of the occupational deaths in the construction industry from 1993 to 1998 (Fig. 8). Of the 14 contractors responding to the survey, 6 said that they have had an employee fall from elevation. More specifically, 5 of the 6 said that they had workers who had fallen off a ladder. In one instance a worker was on a ladder on unlevel ground, and the entire ladder fell sideways. The other four responded that their workers had slipped off the ladder. Of the tasks contractors typically have to perform from a raised elevation, pipe and hangar installation was listed most frequently.

Concluding Remarks

The BLS data is useful in identifying general areas that warrant further investigation. A review of recent data indicated that sprains and strains, cuts and punctures, fractures, and back pain were the most common types of occupation injuries and illnesses in the construction industry. Furthermore, the trunk (back) and upper extremities (fingers, shoulders, and hands) were cited as the

most frequently injured body parts. However, the exact causes or tasks associated with these occupation injuries and illnesses remained to be determined.

The survey identified specific tasks, which may be associated with an elevated risk of specific types of occupational injuries and illnesses. For instance, tasks such as poor housekeeping, slippery surfaces, and the moving of materials from one elevation to another have been associated with back injuries. Removal of metallic packing materials and sharp pipe edges were associated with cuts. Falls from elevations typically occurred when ladders were erected on uneven ground or while carrying bulky materials from one elevation to another. In addition, the survey also identified eye injuries as a frequent occurrence in the mechanical contracting sector, which is consistent with the BLS data. However, the survey results indicated that eye injuries in the mechanical contracting sector ranked third among body part injuries as opposed to the seventh place ranking suggested by the BLS data. This finding needs to be studied in further detail before it can be concluded that eye injuries may be more a frequent occurrence in Michigan than other parts of the country. Furthermore, eye injuries were frequently attributed to cutting, grinding, and welding. Interestingly enough, it was identified that eye injuries occur to individuals that are not necessarily involved in cutting materials, but rather were present in the vicinity of or passing through the work area. It is information such as this that can assist safety professionals in the construction industry in making effective changes.

Construction companies need to pay particular attention to the tasks identified in this paper to reduce the risk of injury to their workers. Failure to do so can result in high turnover rates, lower worker morale, increased workers' compensation claims, and decreased profitability. Safe work practices associated with these tasks need to be established and documented so the construction industry can benefit as a whole. Some of the antidotal evidence gathered from the survey may be used to initiate changes in safety procedures but should be done so cautiously since the impact of such changes has not been studied.

Acknowledgments

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Appendix

Background

- What are the primary types of work that your company does?
- If you were to experience a lost time injury, to what Standard Industrial Classification (SIC) would you report?
- Approximately how many employees do you employ?

General Safety Program

- What kinds of safety programs do you maintain?
- Overall, how do your workers view management's safety efforts?

Injuries and Illnesses

- Is there a type of injury or illness that is fairly common in your line of work?
- If so, how does it typically happen?

Eye Injuries

- What kinds of tasks or equipment are potentially hazardous to the eyes?
- Does your company have many eye injuries?
- If so, could the proper use of eye protection have prevented any of these injuries?

Hands/Fingers

- What are some materials or tasks that are frequently involved with finger cuts and lacerations?
- What kinds of tools and machinery are considered to be potentially hazardous to the fingers and hand?
- Do you experience burns to the hand area with any particular action or equipment?

Back

- How do your workers injure their backs on the job?
- What are some of the types of heavy materials and equipment that a worker would frequently have to lift?

Falls

- What are some of the tasks your workers typically perform on ladders and lifts?

- Have you ever had an injury due to a fall? If so how did it happen?
- Please rank these parts of the body as to the frequency at which injury and illnesses occur to them: (1-most frequent, 6-least frequent) ___Knee Injuries ___Finger/Hand___Back ___Shoulder ___Eye ___Foot

Miscellaneous

- Do your workers ever have to perform a task with their arms raised above their head for an extended period of time?
- Is there a task for which your workers are frequently on their knees?

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