Author: **Mann, Robert R.**

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STUDENT:

NAME: **Robert Mann** **DATE: April 22, 2018**

ADVISOR: (Committee Chair if MS Plan A or EdS Thesis or Field Project/Problem):

NAME: **Sally Dresdow, DBA** **DATE: -April 22,2018**

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1. **CMTE MEMBER'S NAME:** **DATE:**
2. **CMTE MEMBER'S NAME:** **DATE:**
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Mann, Robert R. ***Training Opportunities to Reduce Telehandler Type Rough Terrain Forklift Incidents on XYZ Company Construction Projects***

Abstract

XYZ Company, a construction management and general contracting company, was experiencing an increase in telehandler type rough terrain forklift incidents on their projects. The increase in incidents led to additional personal injuries and property damages. Management assumed issues within the telehandler training program were contributing to the increase.

A review of the training program, analysis of the incidents from the past five years, and an employee survey identified three areas that training could affect the number of incidents. The training program was transferring the knowledge and skills to the operators, but the operators were struggling with attitude and confidence. The review of incidents and the survey also identified supervisory and cultural concerns that contributed to the increase of incidents. To decrease the number of incidents, the training program should be redesigned to include consistency in materials and delivery. Lessons learned from the process industry through high-reliability theory (HRT) and normal accident theory (NAT) should be applied to the construction industry to remedy culture concerns. Practical drift and normalization of deviance has contributed to the degradation of the safety culture and led to increased telehandler incidents. The recommendation is to create a consistent training program and train cultural safety behaviors.

Acknowledgments

I would like to thank my father, who passed away far too young while I was working on accomplishing this goal. Without my parents instilling the strong work ethic and drive to accomplish my dreams, I would have never been able to complete this task. Next, I must thank my wife and children for suffering through the years that have led up to this accomplishment. No one achieves great things without the strong support of others. Realizing this simple fact, this accomplishment is not my own but a compilation of effort, understanding, and constructive criticism from my family, friends, coworkers, instructors, fellow students, and employer.

Special thanks must be given to the employees and owners of XYZ Company for allowing me to conduct my research at their project sites. I appreciate their assistance, input, and understanding when my requests or activities may have seemed obtrusive. Finally, I owe a great debt of gratitude to Dr. Sally Dresdow, DBA. Without her guidance, constructive criticism, and experience this project would never have been completed. Thank you for putting up with my questions and spending the time necessary to keep me on the right track.

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Chapter I: Introduction

XYZ Company provides construction management and general contract services to clients in the Midwest of the United States, concentrating the majority of work in the states of Wisconsin, Michigan, Minnesota, and Iowa. The company performs as the construction manager or general contractor and self-performs concrete, carpentry, masonry, and steel erection. Subcontractors perform the remaining tasks. Projects range from major medical centers and college dormitories to hydroelectric dams and coal-fired power plants. Projects do not include roadwork or residential construction. XYZ Company has experienced growth from $680 million in revenue in 2014 to over one billion in 2017. During the same period, the workforce expanded from 1,100 employees to 1,550 employees.

Telehandler, a type of rough terrain forklift, incidents have increased on project sites of XYZ Company. Incidents are any unwanted action or occurrence that causes bodily harm or property damage regardless of the perceived severity. An incident could be a minor abrasion or cut to the employee or a broken window on a piece of equipment. During the growth period, the number of telehandler forklift incidents including personal injury and property damage involving XYZ Company employees has increased by 300%.

The equipment operators are XYZ Company employees represented by the trade unions. The employees operate telehandler forklifts on a variety of XYZ Company projects in the private, public, and government sectors. Telehandler forklift incidents over the five-year period beginning in 2013 have included eight personal injuries, four equipment rollovers, and numerous property damage claims. While equipment rollovers have a high potential for a fatality, these rollover incidents caused minor personal injury and property damage. Injuries from telehandler incidents include minor scrapes and bruises to broken bones. Property damage claims have

ranged from minor damage to equipment and materials to the total loss of the telehandler. Minor damage may have cost as little as $200 to repair while the replacement of a telehandler costs $167,000 (Construction Equipment, 2013). Over the five-year period, the reported personal injury and property damage costs have exceeded $900,000.

The United States Department of Labor, through the Occupational Safety and Health Administration (OSHA), governs the minimum requirements for training telehandler forklift operators (OSHA, 2006, 1998). Employees who operate a telehandler forklift in the construction industry are required to meet the minimum training requirements set by OSHA (2006, 1998) in the Code of Federal Regulations (CFR) Title 29, Volume 1910 & 1926. Within this regulation are requirements demanding training, testing, and certifying before tradespeople may operate the equipment. XYZ Company complies with the requirements through a classroom training session, test, and driver's examination before granting an operator a license.

XYZ Company's forklift training program was developed and implemented internally. Risk managers (RM) authorized to conduct forklift-training deliver it to the project sites. Usually, the program consists of a classroom session with a generic PowerPoint™ followed by a test that combines the training for sit down and telehandler forklifts. After the classroom portion, the attendees receive hands-on training on the piece of equipment and a practical test in the field. The company issues an operator's license after the employee passes a formal evaluation and a practical driver's test displaying competence in operating the equipment.

Management evaluates the training program by requiring the trainees to pass two tests before issuing a license. The instructor conducts a written or verbal test on general forklift operation, project site-specific hazards, and safety requirements immediately following the classroom portion of the training. After passing the classroom test, the operator must pass an

evaluation of skills and knowledge in a hands-on practical test while operating the equipment. At least every three years, the operator is evaluated and retrained. Any operator observed driving a telehandler unsafe or involved in an incident had the operator's license revoked until the driver received additional training. Despite the training and evaluation, the frequency of telehandler incidents continued to rise. Management was concerned that gaps in the training program were contributing to the increase in incidents.

Statement of the Problem

On XYZ Company projects, telehandler forklift incidents have increased 300% over a five-year period. The increase in incidents has increased personal injury and property damage claims. Management had a concern that gaps in the training program were contributing to the rise in incidents.

Purpose of the Study

The purpose of this study was to analyze the root and contributing causes for the telehandler forklift incidents caused by XYZ Company telehandler operators and identified gaps in the training that contributed to the incident. Identifying training gaps created opportunities to reduce the number of telehandler incidents through revised training procedures.

Assumptions of the Study

The increase in telehandler forklift incidents on XYZ company project sites can be reduced through training. Deficiencies in the management, safety culture, and forklift-training programs are contributing to the increase of telehandler forklift incidents on XYZ Company project sites. Analysis of the telehandler incidents on XYZ Company project sites will identify training opportunities to reduce these incidents.

Definition of Terms

Terms used in the paper are defined in this section.

American National Standards Institute (ANSI). ANSI is an organization that creates and facilitates standards that create guidelines for most business sectors including the construction, manufacturing and safety equipment sectors (American National Standards Institute, 2017).

Incident. "An unplanned, undesired event that hinders completion of a task and may cause injury, illness, or property damage or some combination of all three in varying degrees from minor to catastrophic" (Ferrante, 2011, para. 3).

Occupational Safety and Health Administration (OSHA). "The Federal Occupational Safety and Health Administration or the State agency responsible under a Plan approved under section 18 of the Act for the enforcement of occupational safety and health standards in that State" (OSHA, 2000, p. 1).

Rough terrain forklift (RT). An industrial forklift designed to operate on uneven surfaces in construction activities to move equipment and materials (United States Department of Labor, 2017).

Telehandler. Rough terrain forklift with a boom that can telescopically extend. A variety of manipulative devices including a bucket, pallet forks, or lifting hook may be attached to the end of the boom (JLG Industries, 2012).

Limitations of the Study

Results and recommendations of this study are only applicable to XYZ Company and its employees.

Chapter II: Literature Review

The purpose of this research was to reduce the number of telehandler incidents by identifying gaps in the forklift-training program at XYZ Company. The literature review contains five parts beginning with research in investigating incidents to determine a cause and their effect on organizational learning. Studies in process safety offer insight and direction into transferring their practices to the construction industry. The next section explains the training requirements set by governments, manufacturers, and employers for the safe operation of industrial trucks. The third part of this chapter describes the variety of training options available for employers to train their operators. The final two parts of the chapter discuss the inherent hazards to operating industrial trucks and the causal factors for most of the telehandler incidents. The literature review identified information and research to evaluate training through investigation of incidents, forklift operator training requirements, and hazards related to the operation of telehandlers.

Investigating Incidents for Cause and Training Evaluation

Construction safety incidents occur due to basic, indirect, and direct causes (Mine Safety and Health Administration [MSHA], 1990). Basic causes involve personal factors, environmental factors, and management decisions. Poor training, not enforcing rules, inadequate supervision, and poor equipment design would be examples of basic causes (MSHA, 1990). Indirect causes, sometimes called symptoms, include unsafe acts and conditions. Poor housekeeping, not following rules, misusing equipment, and using the wrong tools are examples of indirect causes (MSHA, 1990). A direct cause is an unplanned release of energy or hazardous material. Direct causes include employees falling, employees struck by other objects, dropping

materials, vehicle overturns, and equipment failure (MSHA, 1990). A thorough incident investigation will generally identify basic, indirect, and direct causes.

Direct causes create the incident, but basic and indirect causes hold the potential for an incident to occur (Kim, Yu, Kihyun Kim, & Kyungrai Kim, 2011). Before an incident emerges due to direct causes, the potential was already present to occur because of basic or indirect causes. Eliminating the direct causal factor may not reduce the chance of reoccurrence due to the potential created by basic or indirect causes. Dien, Llory, and Montmayeul (2004) claim that "dysfunctions and their deep causes and aggravating factors, both of a technical and organizational nature, pre-exist without any accident occurring" (p. 151). To reduce the chance of reoccurrence management must address the potential causes including management issues and training as well as the direct causes (Kim et al., 2011).

"Educational reasons account for 88% of unsafe activity directly and 70% of individual fault indirectly" (Kim et al., 2011, p. 510). Educational reasons include unfamiliarity, lack of understanding, inexperience, bad habits, and unidentified hazards that depict insufficient knowledge and experience. If the incident investigation identifies educational deficiencies as a causal factor, then training would most likely be able to prevent reoccurrence (Kim et al., 2011).

High reliability and normal accident theories. Normal accident theory (NAT) is a concept where accidents naturally occur because of complex systems (Perrow, 1999). The theory holds the premise that humans design all systems, so the system is fallible and prone to an incident due to the complexity of the system. There are four levels in the NAT beginning with an individual component. A collection of individual components creates the second level while multiple collections of components form a subsystem, which is the third level. The fourth level is comprised of subsystems (Perrow, 1999). In system safety incidents, the individual part is

usually something mechanical like a valve, but in social systems, the individual component could be a human (Shrivastava, Sonpar, & Pazzaglia, 2009). Although NAT tends to focus on organizational issues and primarily uses engineering aids to prevent further accidents, a human or organizational issue can occur at any level (Perrow, 1999).

High reliability theory (HRT) focuses on complex highly technical systems like aircraft carriers and nuclear power plants, but the main characteristic is reliability (Shrivastava et al., 2009). In HRT, the definition of reliability is the ability to perform without errors for an extended period. Perrow (1999) states that HRT prescribes to "enforcing safety goals, learning from mistakes, good training, and experienced personnel" (p. 371). HRT includes continuous training, robust safety culture, individual decision-making, and strict adherence to procedures (Shrivastava et al., 2009).

Shrivastava et al. (2009) compared NAT and HRT in their research on investigating system based accidents. The researchers expand on the research of others in comparing the two theories in an attempt to determine the most appropriate theory. Perrow (1999) explains the fundamental difference between these two theories is that HRT believes trying harder will eliminate all incidents while NAT believes regardless of effort incidents will still occur. According to the study, these two theories do not compete against each other but tend to complement each other because they focus on "the same phenomenon at different points of time" (Shrivastava et al., 2009, p. 1385). NAT focuses on organizational problems that cause accidents while HRT looks for organizational issues or processes that affect reliability (Tamuz & Harrison, 2006).

NAT and HRT share two notions that assist in describing a system's behavior. Bad habits and lack of understanding may be disseminated through safety culture, individual

behavior, or organizational attitudes (Shrivastava et al., 2009). Organizations inadvertently institutionalize unwanted behavior by overlooking safety discrepancies when the individual or management rationalizes the unsafe activity (Perrow, 1999). When executing the hazardous activity in front of others, the witnesses will succumb to the same rationalization and repeat the unsafe activity. Although the actions may run contrary to training, the behavior becomes ingrained in the culture. This small incremental change in safety performance through rationalized unsafe activity is "normalization of deviance" (Shrivastava et al., 2009, p. 1364).

Another notion lies in the inconsequential changes made to policy or procedure to accommodate production requirements (Perrow, 1999). Snook (2011) explains that "Practical drift" (p. 225) happens as time passes, behaviors slowly change because the perceived likelihood that the event will occur diminishes, or the local employees make minor changes to accommodate their unique situation. The training and organizational procedures put in place to eliminate the hazard are gradually dismissed. If the system deviates from normal operation, the individual would not be prepared because the training and organizational procedures have diminished (Shrivastava et al., 2009).

Root cause analysis. Root cause analysis (RCA) is a phrase that describes a variety of techniques to identify causes of a problem (Anderson & Fagerhaug, 2006). The objective is to sort through contributing causes to identify the true cause of an incident. Eliminating a true cause will prevent the incident from reoccurring. Most incidents have contributing causes that add to the problem, but resolving a contributing cause would not eliminate the reoccurrence of the incident (Anderson & Fagerhaug, 2006).

The checklist type of RCA consists of four steps and attempts to identify the true cause (Ferjencik, 2011). The investigator would develop a timeline, identify causal factors, chart the

factors, and then determine the root cause. This checklist type of RCA is based on asking a series of why questions (Ferjencik, 2011). The goal is to determine the causal factors that contributed to the incident and identify the reason why those causal factors occurred. The causal factor is an undesirable occurrence that if removed would lessen the detrimental result of the negative occurrence (Ferjencik, 2011). The root cause would be the simplest cause identified that management can correct and would eliminate the likelihood that the incident would reoccur.

Ferjencik (2011) states that every RCA begins with basic assumptions that affect the determination of causes. The investigator must identify the assumptions held by the organization and the investigator or the unidentified assumptions will influence the investigation. Unidentified assumptions will produce what the investigator is seeking instead of the root cause. The investigator assumes the actions of the employee are in the best interest of the situation and not in a direct attempt to cause harm. Since malicious intent by employees is disregarded, the series of why questions should identify system failures (Ferjencik, 2011). Sound RCA allows management to acquire the knowledge necessary to analyze the incident and make required improvements.

Learning from an incident. The goal of the incident investigation is to learn from the incident to eliminate the likelihood of reoccurrence (Lindberg, Hansson, & Rollenhagen, 2010). A secondary goal is to use the new information from an incident investigation to understand the causes of similar incidents and explore how this new knowledge could predict future risk. The investigation is intended to discover what happened, but the investigator must use the investigative process to identify why the incident happened (OSHA, n.d.).

Lukic, Margaryan, and Littlejohn (2010) conducted a literature review analyzing current methods of learning from workplace safety incidents. They concluded that involvement in the

incident investigation and hazard mitigation is different from an individual, team, and organizational practice (Lukic et al., 2010). Their review developed four fundamental questions to identify factors related to incidents. They state questions must be asked to determine who will learn, what is the learning process, nature of the problems, and type of knowledge involved. The resources and changes to the policy will vary depending on whether the solution to the problem affects one person or has ramifications for the organization (Lukic et al., 2010).

Immediate corrections like training, discipline, or new instructions may mitigate part of the cause but leave organizational causes unaddressed (Lukic et al., 2010). Organizational causes may include an individual, the team, or the whole organization. Safety culture, indifference, and invalid assumptions are some of the organizational causes that could remain after an immediate correction (Lukic et al., 2010). Before most incidents transpire, some near misses, overlooked safety violations, or acts of indifference to safety procedures usually occur. Managerial deficits, failure to identify hazards, incorrect training, and improper operation procedures compound the hazard by institutionalizing deviations from safe practices (Dien et al., 2004). Lukic et al. (2010) believe most incident investigations identify apparent causes of the incidents, but to resolve the issue and prevent reoccurrence the detection of underlying causes and their effects to the organization is essential.

To determine who should participate in identifying the cause and generating a solution to the problem; the investigation must discern what the problem is, who is affected, and what knowledge is involved (Lukic et al., 2010). Those participating in identifying the cause and generating a solution should be as close to the incident as possible but be able to question organizational or systemic influences. A thorough investigation of the entire process must include safety culture, subordinate relationships with superiors, and reflection on organizational

practices (Lukic et al., 2010). Corrections containing frontline training, discipline, or minor technical changes may be a quick fix, but identifying the underlying organizational contributions to the safety incident will improve the probability that the problem will not reoccur (Lukic et al., 2010).

Evaluating training. Learning from safety incidents includes experiential learning from the incident and reflection on similar events (Lukic et al., 2010). Training workers to change their procedures after each safety incident without explaining the reasoning for the shift may cause workers to dismiss the importance of the change and increase incident rates. Including employees involved in the activity that suffered the incident to assist in determining the cause and creating procedures to eliminate the hazard promotes involvement and diminishes ambiguity about the origin of an incident (Lukic et al., 2010). Lukic et al. (2010) suggests participative learning and considering the organizational aspects of the root cause will reduce accident potential.

Evaluating a training program does not just focus on the trainee. Instead, the evaluation focuses on whether the training accomplished the organizational objectives (Dalto, 2017a). According to Goldstein and Ford (2002), "training is defined as the systematic acquisition of skills, rules, concepts, or attitudes that result in improved performance" (p. 1). Training evaluation must answer whether the training program provided the opportunity to learn, whether the learning transferred to the job, what the skill level is over time, and did the training provide value to the organization (Salinger & Deming, 1982).

Most training evaluations include the Kirkpatrick model that has four levels of evaluation (Dalto, 2017a). The four levels include the trainee's reaction, learning, and behavior. The fourth level measures whether the training achieved the goals identified by the organization. During the

fourth level of evaluation, the information from the previous levels and the results of the training determine whether the organizational goals are met (Phillips & Stone, 2002).

The first level of the training evaluation measures how the trainees react to the training (D. Kirkpatrick & J. Kirkpatrick, 2006). Positive reaction to the training does not guarantee that the training will transfer to the workplace, but a negative reaction to the training increases the chance the training will not transfer. To facilitate the desired change, the trainee must want to change and know how to enable the desired change. Both of these can happen if the trainee receives a positive experience from the training and the training imparts the correct knowledge and skills (D. Kirkpatrick & J. Kirkpatrick, 2006). This level of the training may be measured by an employee survey, or the trainer may make observations during the training.

Measuring the trainee's reaction is important to provide feedback on the training and to increase the involvement of the trainees (D. Kirkpatrick & J. Kirkpatrick, 2006). Feedback will identify areas of improvement for the training program and allow the trainees to become involved in the process by inputting their ideas. Using a survey to gauge reaction and to allow the trainees to offer suggestions empowers the trainees to affect the training. This process shows the trainees that their input is useful to adapt training to their needs (D. Kirkpatrick & J. Kirkpatrick, 2006).

The second level of the training evaluation focuses on improving knowledge, skills, or attitudes (D. Kirkpatrick & J. Kirkpatrick, 2006). Improvement in knowledge, skills, and attitudes does not guarantee a positive behavior change, but the organization cannot expect a behavior change unless the trainees improve in knowledge, skills, or attitudes (D. Kirkpatrick & J. Kirkpatrick, 2006). A revised version of Kirkpatrick's four levels adds confidence and commitment to the original set of knowledge, skills, and attitudes (J. Kirkpatrick & W.

Kirkpatrick, 2016). The trainee must have the confidence and commitment to make the change and use the knowledge and skills taught during the training. Measuring the change in knowledge, skills, and attitudes is important to discern whether the trainees achieved the objective (D. Kirkpatrick & J. Kirkpatrick, 2006).

To measure learning, the organization may use written tests, practical tests, or observation (D. Kirkpatrick & J. Kirkpatrick, 2006). If the training includes a skill, conducting a practical test in a simulated work environment will provide the best evaluation (J. Kirkpatrick & W. Kirkpatrick, 2016). In some cases, a pretest or observing the trainee before the training will provide a better measurement of learning. If the training includes concepts or technical skills the trainee may already possess, then the pretest becomes necessary to gauge any improvement in learning (D. Kirkpatrick & J. Kirkpatrick, 2006).

Evaluating the behavior change once the trainee has left the classroom and resumed normal work activities is the third level of evaluation (D. Kirkpatrick & J. Kirkpatrick, 2006). This evaluation is difficult because the trainee must have the opportunity to use the new knowledge, skills, or attitudes before evaluating a change. If the training focused on operating a piece of equipment in the snow, the trainee must have the opportunity to operate the equipment in the snow before an evaluation can occur. The necessity of specific circumstances and the ensuing required behavior make it difficult to measure behavior change, but using a control group or observing the trainee before the training and then after the training are two common methods of measuring the behavior change (D. Kirkpatrick & J. Kirkpatrick, 2006). The organization cannot expect beneficial results from the training if there is not a positive change in behavior.

The fourth level of evaluation focuses on the organizational benefits of the training program (D. Kirkpatrick & J. Kirkpatrick, 2006). The organization conducts this evaluation after the trainee has returned to work and has had ample time to use the improved knowledge, skills, or attitudes. This evaluation is measured by comparing organizational performance before and after the training by comparing a control group or using statistical data (D. Kirkpatrick & J. Kirkpatrick, 2006). The organization could record the number of safety incidents for a month before conducting safety training and then compare this number with the number of safety incidents for a similar month after the training. If all of the other factors remain constant, this analysis would reveal whether the training program met the organizational expectation (D. Kirkpatrick & J. Kirkpatrick, 2006).

Traditional methods of training evaluation, including in-class testing, may not be the best method. Salinger and Deming (1982) discuss alternative methods of review to analyze training in unique circumstances. They describe three methods of visiting trainees after they return to the job. One approach is asking trainees to describe behavioral changes they made since the training and comparing those changes to desired performance. Other methods include evaluating training by observing the trainees on the job or requesting they take tests at set intervals after completion to gauge retention over time (Salinger & Deming, 1982).

These non-traditional methods may offer additional avenues to evaluate the training once the trainee has returned to the job, but there are some practicality concerns. Asking the trainee to describe behavior changes made since the training would be influenced by the trainee's bias and perception of self. Any information acquired through this process would require data from another source to corroborate the information. Testing after the trainee has returned to the job will determine if the trainee retained the knowledge, but may not reflect whether the expected

behavior change occurred. Observing the trainee on the job will give clear indication that the trainee changed behavior, but the time required to remain watching long enough to observe a circumstance when the new behavior is required could be prohibitive.

Safety Training Requirements

Government agencies, manufacturers, the American National Standards Institute (ANSI), and employers influence the training of industrial truck operators. The government influences the training and safe operation of the equipment through the regulation and compliance activities conducted by OSHA (Paulausky, 2013). OSHA provides the minimum requirements to operate the equipment legally, but the manufacturers, ANSI, and employers augment the OSHA regulations with additional requirements to ensure safe operation (Janicak & Cekada, 2016).

The OSHA standard requires employers to train and certify their employees, but the certification is only valid to operate the employer's equipment. Manufacturers, labor unions, and third-party training organizations can certify individuals to operate equipment for any employer, but the employer must deem the training sufficient for the employer's circumstances and train the operator on the site-specific hazards (Huey, 2008). Regardless of who issued the license, the employer is responsible for assuring the training met legal requirements and authorizing the employee to operate the employer's equipment (OSHA, 2006).

OSHA (2006) provides the minimum training requirements for operating telehandler forklifts in the construction industry. OSHA (2006) mandates that a knowledgeable and experienced individual train every operator on the operation of the machine, hazard awareness, and the dynamics of the load. OSHA does not define the qualifications of a knowledgeable and experienced individual, so the employer is responsible for determining if the individual conducting the training meets the requirement. The operator must pass a test displaying the

knowledge to operate the equipment, correct safety procedures, and proper inspection (Paulausky, 2013). After passing the formal evaluation, the operator must pass a driving test showing competence in safely operating the telehandler.

OSHA regulations mandate continued performance evaluation of telehandler operators (Footlik, 2011). Management must retrain telehandler operators anytime the equipment, regulations, or site conditions change. At least every three years evaluation of the operator's performance is required. If the employer observes an operator incorrectly or unsafely using a telehandler, the operator must go through training and recertification before operating the telehandler (Paulausky, 2013). After an incident with the telehandler, the OSHA standard requires rescinding the operating privileges of the operator until retraining and certification can be completed (Footlik, 2011).

The operator's certification is only valid if the employer authorizes the employee to operate the equipment and the employee follows the employer's rules regarding telehandler operation (OSHA, 2006). Telehandlers are the most versatile piece of equipment on the construction site but are also one of the most hazardous so employers may add additional requirements to operate telehandlers (Strategic Forum for Construction, 2011). One universal rule employers impose is to require an employee to attend the employers' training program regardless of whether a third party had previously trained the employee.

Manufacturers' provide direction on safety, training, and operation within their operating manuals. OSHA (2006) regulations require that trainers cover this material or the operator read these manuals before operating the equipment. Training is required in load charts, moving center of gravity, and how to interpret the additional indicators on the equipment (Schultz, 2012). The manuals contain instructions on how to operate the equipment properly in unique production

circumstances, unstable terrain, and challenging weather. According to OSHA (2006) regulations, the employer is required to incorporate these instructions into their work rules governing this equipment.

Training Programs

There are many organizations offering training programs for forklift operation (Footlik, 2011). The training can range from classroom instruction and driver training at a local third-party training facility to a packaged training program purchased from a training materials company. These training programs vary in quality and expectation, but ultimately the employer is responsible for sanctioning the training and assures the driving evaluation is adequate (Footlik, 2011). Third party training organizations include trade unions, technical schools, rental companies, manufacturers, and training consultants. Some programs focus on training individuals seeking employment while others are for individuals already employed. Individuals seeking employment receive training through trade schools or enter apprenticeship programs. Employers can use third party organizations to train operators at their facilities or send them to the third party for training as long as the employer reviewed the training program and confirmed the training met their requirements. Some employers do not use the equipment often, so they rent the equipment, and the rental company provides the training (Footlik, 2011). If the employer rents the equipment and requests the rental company provide training, the employer is still responsible for assuring the training meets legal requirements.

Employers develop training programs internally or create their program by using external resources. Hybrid training programs use any combination of internally designed training materials, training providers, or externally available resources (Study.com, 2017). External resources include prepackaged training programs from training material companies, equipment

manufacturers, technical schools, or training consultants. Free training materials are available through OSHA, online training searches, rental companies, trade organizations, or manufacturers (Forkliftlicenseguide.com, 2017). There is a significant amount of variability in the development and execution of telehandler training, but the variability helps employers tailor the training to their unique requirements (Dalto, 2017b).

Hazards Related to Telehandlers

Telehandlers allow operators to move material safely and efficiently, but there are hazards if the operator incorrectly uses the truck. Operating a malfunctioning telehandler or failing to train operators increases the risk of injury or death. "OSHA estimates 11% of all forklifts are involved in accidents every year" (Washington State Department of Labor & Industries, 2015, p. 2). Forklifts cause approximately 97,000 injuries every year. Industrial truck fatalities have averaged over 92 a year for the five-year period beginning in 2011. During the same period, 12 of those fatalities were in the construction industry (Bureau of Labor Statistics, 2017).

Operators and employees working on or near industrial trucks face many hazards including telehandler overturn, falling loads, and struck by the industrial truck (Janicak & Cekada, 2016). Telehandler type industrial trucks compound these hazards with additional variables and capabilities over most other industrial trucks. Telehandlers travel on unimproved surfaces, operate in any weather, and have farther reach capabilities that decrease their stability (Stewart, 2006). The telehandler can place equipment and supplies up to 39 feet away from the machine due to a hydraulic telescopic boom that extends from the front of the machine (JLG Industries, 2012). These machines operate in every weather condition, in proximity to tradespeople, and on project sites where there is limited space to maneuver (Huey, 2008).

Working in these circumstances is hazardous and creates situations where there is an increased risk of a telehandler incident. Although these trucks may be more hazardous to operate, there is no specific accident, injury, or fatality data because the government does not separate the statistics by industrial truck type.

Causal Factors for Incidents

Causal factors can be cultural, behavioral, environmental, managerial, or organizational. Gherardi, Nicolini, and Odella (1998) studied the actions that were taken after an incident and the conclusions obtained by the building engineers and the onsite construction managers regarding the circumstances surrounding the same incidents. Gherardi et al. (1998) compared the perspectives and attitudes of the building engineers and onsite construction managers regarding these incidents. The building engineers and the onsite construction managers modeled the incident and drew conclusions that were directly affected by their perspective community of practices' conception of safety. Each community of practice creates a subculture of safety that resides in the organizational culture but is also a manifestation of the activities and beliefs of the smaller community (Gherardi et al., 1998). The beliefs and attitudes of the long-term members, new members, supervision, fellow organizational communities, subcontractors, and the client affect each other and the controlling organization.

The organization may say they have a certain safety culture, but each community of practice and external stakeholder will have a different perspective on that culture (Gherardi et al., 1998). Although these subcultures reside within the organization's safety culture, their performance and attitudes may differ regarding acceptable practices, reasonable rationalizations, and causes of accidents. One community of practice may believe they are adhering to the

parameters of the organizational safety culture while disregarding organizational norms because their subculture rationalizes the behavior as acceptable (Gherardi et al., 1998).

For example, an organization has a policy that no employee may exceed the posted speed limit while driving a company vehicle. The project managers believe they can exceed the posted limit by 10 miles per hour if they are running late to meet with a client. The rationalization is the damage to the relationship with the client would be greater than the ramifications of breaking the organization's driving policy. Project management supervision reinforces the rationalization by scolding tardiness and overlooking the policy infraction.

The organizational safety culture is a combination of all the communities of practice and external stakeholders' subcultures (Gherardi et al., 1998). Undesirable behaviors and attitudes that reside within any subculture eventually permeate through the organization. Culturally detrimental actions that the clients or subcontractors allow from their employees on the project site negatively affect the subcultures within the controlling organization (Gherardi et al., 1998).

Tomas, Cheyne, and Oliver (2011) examined employee perception and attitudes regarding safety and how those perceptions and attitudes influence involvement in accidents. Workers in Spain answered a survey on their safety perceptions, attitudes, and involvement in safety incidents. The study's results suggest that there is a relationship between behavior, perception, and involvement in incidents. Tomas et al. (2011) found that behavioral causes including employee attitude toward safety effect whether the employee was inclined to abide by the parameters of the organizational safety culture. Employees involved in this research recognized their behavior as a causal factor in an accident and believed they could do something to prevent accidents but felt the environment contributed to the accident. Employees tended to blame coincidence, production demands, or the work situation such as placement of equipment

or poor lighting as contributors to accidents (Tomas et al., 2011). Although individual behavior can supersede the effects of a strong safety culture, proper safety management can minimize detrimental behavior. Steps to improve safety management must include culture, attitude, behavior, and the environment (Tomas et al., 2011).

There are a large number of causal factors in addition to detrimental behavior for telehandler incidents on construction sites. Six of the top ten OSHA violations involving forklifts in 2013 were citations issued regarding training (Janicak & Cekada, 2016). Merino (2017) writes that some of the other common causes for forklift incidents include inadequate training, failing to certify an operator, neglecting to keep the load as low as possible, excessive speed, and operator not knowing the capacity of the equipment. Training could address these incident causes. Guild (2013) writes in his article that training could be a contributing cause of forklift incidents but writes that lighting, maintenance, horseplay, visibility, and congestion could also contribute to forklift incidents.

Universal factors influence all rough terrain industrial trucks, but telehandlers have hazards inherent in their additional capabilities (JLG Industries, 2012). Risks the telehandlers share with most rough terrain industrial trucks include fire during refueling, exhaust fumes in enclosed areas, uneven terrain, proximity to tradespeople, and weather-related concerns. Weather-related concerns include heavy rain, snow, lightning, temperature, and wind. The operator's manual addresses these hazards through training (JLG Industries, 2012).

Hazards specific to the telehandler are a result of the extra weight and boom capabilities (JLG Industries, 2012). The average telehandler weighs more than a traditional rough terrain truck. The Caterpillar TH514C or the TH407C hydraulic telescopic construction forklifts and the Skytrak 6036, 8042 or 10054 hydraulic telescopic construction forklifts are popular

telehandler models used in construction. These forklifts range in weight from 22,945 pounds for the 6036 model to 31,455 pounds for the 10054 model, telescope out to 39 feet, rise to 53 feet above the ground, and, depending on the model, have a maximum lifting capacity of 10,695 pounds (JLG Industries, 2012). The operating area and any hole covers must be able to withstand the additional weight. The boom capabilities decrease the stability of the machine. Load height above the ground and distance from the machine effects stability (JLG Industries, 2012).

Operating the machine with an extended boom or raised load is exceptionally hazardous because the combined center of gravity of the machine and load is unstable (JLG Industries, 2012). Extending the boom or raising the load affects the stability of the telehandler because the center of gravity continuously changes. The operator's manual discusses how to mitigate these hazards with training.

Summary

According to the literature, analysis like RCA, NAT, and HRT identify direct and potential causes of incidents. Reviewing how process safety organizations investigate incidents and identify opportunities for organizational learning identifies a few techniques and concepts that are relevant to the construction industry. The incident analysis must focus on who is involved, what knowledge is affected, how the process is controlled, and any underlying organizational issues that could affect the correction. Process safety discusses normalization of deviance and practical drift as two organizational issues that can contribute to the cause of an incident. These issues can be part of the underlying effects and additional causal factors that led to an incident.

Identifying the causal factors allows the organization to evaluate the training programs for gaps in the transfer of knowledge and skills. Training is required to satisfy government regulation as well as mitigating site-specific hazards. If the incident review identifies lapses in knowledge and skills, a quick adjustment to the training usually corrects the deficiency. The quick adjustment of a training program may correct the immediate concern, but to eliminate the problem, training must address underlying effects of the incident and any causal factors hidden in culture or attitude.

Telehandlers are hazardous pieces of equipment that require government mandated training, but there are options available to the employer to provide the training. The environment, capabilities of the machine, proximity of tradespeople, and weather create operational hazards. Organizational culture and the subcultures within the company create underlying causal factors that contribute to direct or potential causes. Identifying all of the hazards and causal factors will eliminate the issues related to the incident. Employers have a wide variety of training options to create a training program that mitigates their identified concerns and meets the requirements of the manufacturers and government.

Chapter III: Methodology

This study reviewed telehandler incidents and surveyed operators to identify gaps in the training program at XYZ Company. XYZ Company forklift training programs had evaluation characteristics incorporated to satisfy the requirements of government regulation. These evaluation requirements assured the operators were competent after classroom instruction and while operating the equipment. At least every three years a qualified person evaluated the performance of the operator and determined if the operator required additional training. Although there was mandated evaluation of the operator's performance, telehandler incidents had increased.

Subject Selection and Description

Forklift operators who operate telehandler type rough terrain forklifts for XYZ Company were the subjects. The subjects were volunteers who agreed to participate in a survey of the forklift training program and telehandler incidents. Subjects participated from XYZ Company project sites in Iowa, Michigan, Minnesota, and Wisconsin.

Instrumentation

An employee survey was designed that could be completed using electronic tablets. Some of the sites are isolated and have a fluid workforce. Since trade unions provide the workforce, employees are temporary and may work for any employer on any project site within the region. Some of the project sites lacked cellular service, and the workforce did not have access to electronic communication.

The survey developed through the Qualtrics survey program had to meet the unique requirements of surveying a fluid workforce in technologically challenging circumstances. To address the challenges, the survey was designed to be effective in electronic and paper formats.

Employees who had access to electronic communication devices were able to conduct the survey electronically, but employees who did not have access to the electronic format completed the survey in paper format.

The survey contained 39 questions (see Appendix A) and measured the training, knowledge, experience, and attitude of the respondents. There were 14 questions that measured employee knowledge regarding OSHA requirements for operating forklifts. Another eight of the questions were questions regarding experience. The rest of the questions either requested preference in training or measured operator attitudes toward safety and training.

Data Collection Procedures

The tradespeople selected for the records request were XYZ Company employees who operated telehandlers. XYZ Company training and risk departments provided the incident reports and training records. All names were redacted. The reports and records included information for the years 2013 through 2017. For statistical analysis, the population was the total number of telehandler operators employed by XYZ Company in March of 2018.

The researcher used two methods to collect data for this research. The first method was a records request and the second was an employee survey. The records request included copies of the training program used by each regional RM, telehandler operator training records, and incident reviews. The second method was an employee survey seeking information on training, knowledge, experience, and attitude.

XYZ Company provided the name redacted incident and training records for the years 2013 through 2017. The training department provided a report that identified the number of trained operators and their date of training. The report only depicted the training date and type of training to assure the records remained anonymous. The incident records included all documents

about the incident including the operator, witness, supervisor, and investigator statements. The organization redacted the names of the investigator, operator, witnesses, and supervisor.

A sample survey developed through Qualtrics was distributed on tablets and paper copies from March 1 through March 30, 2018. The regional RM asked telehandler forklift operators in their region to participate in the survey. When the project site had cellular service, the operator completed the survey on an electronic tablet through a Qualtrics survey link. The participants used a paper format survey on project sites that did not have cellular service. Regional RMs mailed completed surveys to the researcher for entry into Qualtrics.

Data Analysis

The requested documentation and data from XYZ Company was used to determine how homogenous the forklift training program was between the regions; how many tradespeople were trained to operate the telehandlers, and to compile a list of causal factors for the telehandler incidents. The employee survey asked all participants the same questions so the responses could be compared to identify the frequency of similar responses or identify unsafe attitudes which could contribute to telehandler incidents. Incident causal factors and the results of the survey identified training improvement opportunities for XYZ Company.

Limitations

The limitations include operators failing to report incidents, project teams failing to report property damage, previous training, and incident investigator skill. Studies have shown that up to 68% of accidents go unreported to supervision (Probst & Estrada, 2010). XYZ Company management state damage to equipment, buildings, and material go unreported, but they have not tracked the unreported damage. Not capturing the data regarding unreported incidents limits the success of the research.

Previous training is a variable that is not controlled. XYZ Company is unable to control the amount of training or experience telehandler operators possess when they arrive on site due to the union staffing practices. Trade unions provide tradespeople when requested regardless of the original training and experience levels the operators have acquired through their union or previous employers' training.

The review of telehandler incidents was limited to the skill of the incident investigator. The closest XYZ Company authorized investigator investigated the incident. If the investigator inappropriately assigned a root cause or did not list the causal factors, it was difficult to assess training related concerns.

The data collected in this study was specific to XYZ Company. Although the method of collecting data and analyzing incidents may be used to analyze other construction companies similar in size and scope, their training programs and culture would be unique. The recommendations in this study expose the conditions at XYZ Company and may not transfer to the situation encountered at other companies.

Summary

The research reviewed telehandler incidents, examined training programs, and analyzed the survey results to identify gaps in the forklift-training program. Recognizing the root and causal factors of the telehandler incidents identified issues within the training program that training could address. Reviewing the training programs used by the regional RMs recognized whether the training programs met the requirements of the OSHA standard or if the programs used by the RMs were similar to each other. The survey conducted with the telehandler operators identified detrimental attitudes toward safe operation of telehandlers that modification

of the training program could correct. Although the research identified opportunities for improvement in the training program, some of the issues raised are cultural.

Chapter IV: Results

This study surveyed forklift operators, analyzed the telehandler forklift incidents, and examined training records to identify training opportunities to reduce the frequency of telehandler incidents on XYZ Company project sites. Analysis of telehandler incidents identified causal factors, which identified lapses in supervision, judgment, and attitude. A survey issued to the forklift operators affirmed the lapses and identified additional causal factors related to organizational culture. An investigation of the root and causal factors uncovered cultural concerns and identified gaps in the skills, abilities, or attitudes of the telehandler operators. Improvements to the training program can address these gaps (Phillips & Stone, 2002).

Item Analysis

The item analysis is broken into three parts: Analysis of the forklift training materials and records, review of the telehandler incidents from 2013 through 2017, and the results of an employee survey.

Training materials and records. The current telehandler operator training records and the training materials used by the regional RMs were reviewed. Employee training satisfaction surveys, classroom tests, and practical exams were not available, because these records are not saved. The ability to analyze the trainees' reaction to the training and the transfer of knowledge is diminished because the records are not available. Each RM used the same process entailing a PowerPoint and knowledge test used during the classroom portion of the training and a practical test while operating the telehandler. The PowerPoints, knowledge test, and practical driving tests were compared highlighting the differences.

There were eight different PowerPoints, three different knowledge tests, and two versions of the practical driving test used to conduct the telehandler training. Each PowerPoint had similar material but there was not a homogenous message. The slides, images, and stories used to conduct the training was different for the majority of the RMs. Some of the knowledge tests were conducted as a class while others were taken individually. The majority of the questions were similar but the tests were not homogenous throughout the regions. There were two different documents used for the practical driving test and there was not a standard process.

Although the training materials were different, Figure 1 depicts an increase in the number of trained operators by 62% over three years. As the company experienced an increase in revenue, the number of employees increased and the RMs increased the number of trainings conducted. The increase in trainings raised the number of trained operators from 484 operators in 2015 to 557 operators in 2017. Due to the fluid nature of the workforce, the number of operators actively working for XYZ Company is dependent on workload. The number of active telehandler operators in March of 2018 was 275.

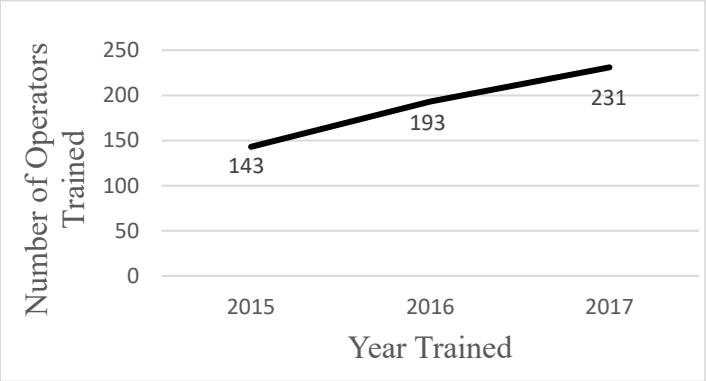

Figure 1. Number of tradespeople trained to be telehandler operators 2015 through 2017.

Review of telehandler incidents. The reported telehandler incidents from 2013 through 2017 were analyzed to determine the causal factors as determined by the investigator. Figure 2 depicts the sharp increase over the past five years. The number of annual reported incidents

increased from five in 2013 to twenty-two in 2017. During the same time frame the number of telehandlers increased from 110 in 2013 to 135 in 2017. OSHA (Washington State Department of Labor & Industries, 2015) estimates 11% of forklifts will be involved in an incident per year. In 2017, 16% of XYZ Company's telehandlers were involved in a reported incident. According to the XYZ Company Vice President of Field Services, these reported incidents do not include the unreported damage to telehandlers that have been returned to the yard for repair. He estimates that during 2017, three to four damaged telehandlers were returned to the yard for repair every week.

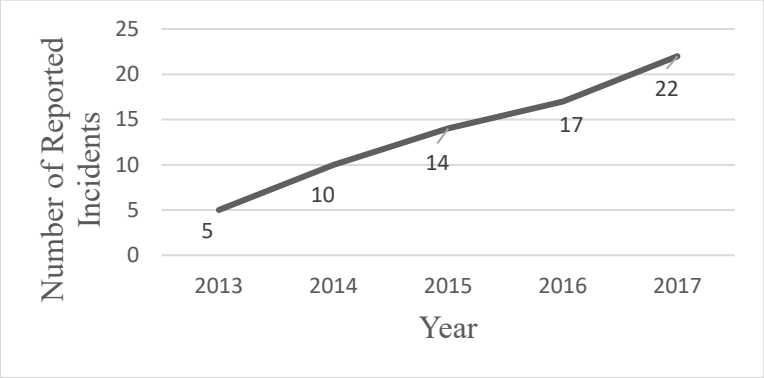

Figure 2. Number of reported incidents 2013 – 2017.

Figure 3 lists the number of incidents by trade as identified in the incident reviews over the past five years. The carpenters and masons did not have any reported incidents over this period but the incident reviews had 17 incidents that did not identify the trade operating the telehandler. The operating engineers were listed as the operator in 47% of the incidents which did identify the trade of the operator.

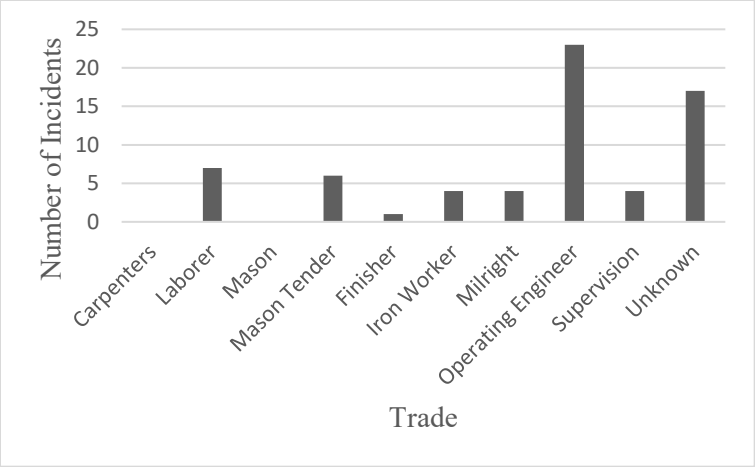

Figure 3. Number of incidents by trade 2013 – 2017.

Figure 4 depicts the four most common causal factors and the least utilized causal factor that the investigators listed in their review of the incidents. Each incident may have listed more than one causal factor for the incident, but no review listed more than three causal factors for an incident. Complacency was listed as a causal factor in 41% of the reported incidents while training was listed as a causal factor 3% of the time. Half of the incident reviews (50%) identified that the operator had performed the same unsafe act previously and knew the actions that led to the incident were against the rules, but failure to follow the rules was listed as a causal factor in just 32% of the incident reviews.

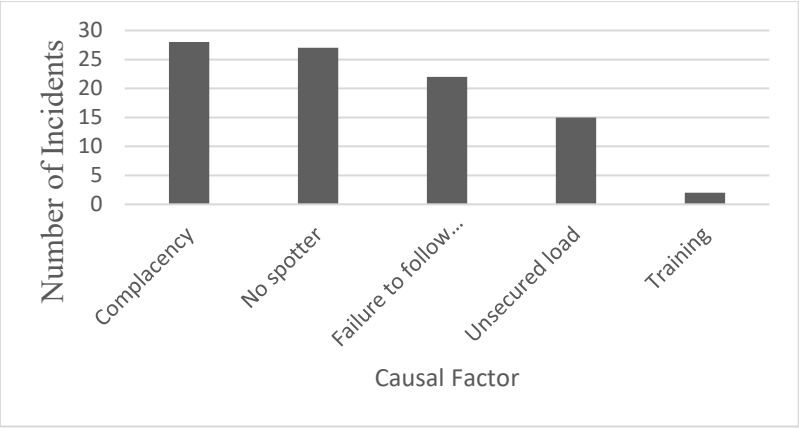

Figure 4. Causal factors in incident reviews 2013-2017.

Employee survey results. The results for each question are included in Appendix B. The employees who operate telehandlers were asked to participate in an anonymous survey. Almost half (49%) of the eligible population responded to the survey. According to figure 5, the carpenter and laborer trades account for 68% of the responses. The majority (95%) of the employees who responded had three or more years of experience operating telehandlers, and 77% of the responders had been working in the trades over ten years. Most of the responders (78%) operate the telehandler less than eight hours a week, and 31% operate the telehandler less than one hour a week.

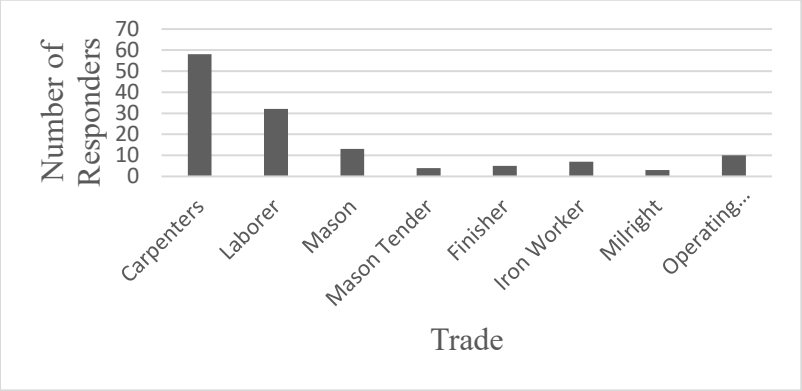

Figure 5. Number of survey responses by trade.

The operators were asked to identify whether they were involved in incidents while operating a telehandler. Bodily injuries were suffered by 2% of the operators, and 5% of the operators stated they injured another tradesperson due to an incident. According to the survey, 22% of the operators stated they were involved in property damage incidents with 13% of them being involved in more than one and 5% being involved in three or more incidents. The telehandler was damaged during an incident by 11% of the respondents.

The majority of the responders (90%) had received telehandler training within the past five years and 76% completed the training within the last two years. Two responders stated they

never received telehandler training. According to the survey, 88% of the responders received training from XYZ Company with unions, previous employers, or trade schools providing the training for the rest of the trained operators. When asked if the instructor at their last telehandler training was competent, 96% of the responders agreed. When asked to rank their preference for receiving training, 83% chose on-the-job training as their first or second choice. One-on-one with another tradesperson received 49%, and classroom training was listed as a first or second choice for 42% of the responders.

The operators were surveyed on their opinion of some of the telehandler safety regulations. Most (99%) of the responders agreed that every incident must be reported to supervision and 98% agreed a safety inspection should be performed on the telehandler, but 29% disagree that the operator must stop operating the telehandler after an incident. The respondents (71%) agree the equipment manual must be read before operating the equipment and 87% know how to read the equipment load charts without assistance. The majority (98%) will ask for a spotter when the load obstructs their view, but 21% feel safe operating without a spotter even though the load blocks their vision. Some of the respondents (32%) believe they can operate any type or class of forklift without additional training and 17% state they can exceed the limits in the load chart because of the built-in safety factors.

The survey asked if the responders had been pressured to operate the telehandler unsafely by supervision or coworkers and 23% of the responders stated their coworkers pressured them to work unsafely while 14% of the responders stated supervision pressured them to operate the telehandler unsafely. Some of the responders (22%) stated they chose to operate the telehandler unsafely to meet production requirements, but 89% stated they are willing to speak to another telehandler operator about an unsafe operation of a telehandler.

Summary

Review of the training materials and training procedures identified differences in the materials and procedures used by each region. The PowerPoints had some similar slides but the majority of the slides and the length of the presentation was different. Evaluating the students was different for the regions, some RMs conducted the tests as a written examination while others had the class take the test together with the questions depicted on the screen and the answer given orally. The hands-on driving evaluation was not performed or evaluated the same way in each of the regions.

The number of telehandler incidents increased 300% over a five-year period while the number of telehandlers increased by 18% over the same time frame. Over the past three years, the number of telehandler operators trained per year has increased 38%, and the number of licensed operators increased 13% to 557 in 2017. Complacency, not using a spotter, and not following the rules were the most common causal factors listed in the incident reviews. Half (50%) of the incident reviews stated the operator performed the unsafe act previously and new the action was against the rules. Training was listed as a causal factor in less than 3% of the incident reviews.

About half (49%) of the population responded to the survey, and the majority of the responders had at least ten years' experience in the trades and at least three years' experience operating the telehandler. The majority of the responses depicted a skill and attitude towards safety in line with OSHA and organizational expectations, but 22% self-identified that they had been involved in a property damage incident and 22% stated they chose to operate the telehandler unsafely to meet production demands.

Chapter V: Discussion, Conclusion and Recommendation

This study identified training opportunities that would reduce the number of telehandler incidents at XYZ Company project sites. Over the last five years, the number of incidents has increased by over 300%, causing eight bodily injuries, and incurring costs of more than $900,000. The telehandler training program has been successful in transferring the skills and knowledge to operate telehandlers, but the confidence and attitude of the operators are deficient. Supervisory and cultural issues have contributed to the increase of incidents, but a couple of the principles in process safety and a review of the incidents identified opportunities for training improvements.

Discussion

The research for this study had three components. There was an evaluation of the training procedures and materials, a thorough review of the available information regarding the telehandler incident reviews, and an employee survey. The organization's risk and training departments administer the telehandler training program and manage the training records. The required training materials are not located in a central location nor is there a written policy or procedure for conducting the training. Each RM creates and maintains the materials used for training, and the training department is dependent on the RMs to forward the names of those trained.

Individuals conducting incident reviews do not follow a standard procedure and have not been trained by the organization. The information used to piece together incident reviews from the last five years was located in a couple of file folders on the corporate server and email accounts. After the information was compiled, a request for additional information was sent to

the incident investigators to provide missing or omitted data. Four out of eight investigators replied to the request.

The survey was conducted by the RMs during March. Two of the RMs conducted most of the surveys (104) with three of the other RMs accounting for the other 31 surveys. Three of the RMs did not conduct any surveys in their regions. Although having 49% of the available population partake in an internal survey is considered above average, the results could have been improved with more involvement from the RMs (Baruch & Holtom, 2008). Unfortunately, the lack of participation from the RMs depicts indifference towards the telehandler incident concern. This indifference reflects negatively on the safety culture since the RMs are responsible for the training of the telehandler operators and investigating the incidents.

Conclusions

There are three general conclusions. The telehandler training program, although successful in the transfer of knowledge and skills, is deficient in training attitude and confidence. Supervision indifference and inaction has contributed to the rise in telehandler incidents. Specific aspects of the organizational culture have perpetuated indifference and employee misconduct.

Telehandler training. Evaluation of the training materials and procedures used to train the telehandler operators identified a disjointed method of conducting organizational training. A recent study on consistency in training by the Training Associates and Training Industry (2017) concluded that consistency in training materials, delivery, and technology significantly affect training effectiveness. The current training program has transferred the knowledge and skills required to operate the telehandlers to the tradespeople, but attitude and confidence are lacking.

The transfer of knowledge and skills is evident because all the operators must pass the classroom and driving tests before operating the telehandler, and just 3% of the incident reviews

listed training as a causal factor. According to the survey, every respondent, except two, attended telehandler training and 90% of them attended the training within the last five years. If the operator fails either test or is observed operating the telehandler incorrectly, operating privileges are rescinded.

The attitude and confidence of the telehandler operators is diminishing. The incident reviews identified that 50% of the incidents were caused by operators who knew what they were doing was wrong but still performed the action that caused the incident. According to the survey, 22% of the respondents knowingly chose to operate the telehandler unsafely.

Supervision and management. Review of the incidents and the survey responses indicate there are concerns regarding supervision of the telehandler operators. A few (3%) of the incident reviews listed supervision as the operator, and 50% of the telehandler operators involved in an incident stated they previously performed the unsafe act that caused the incident. Some of the respondents (14%) stated their supervisor pressured them to operate the telehandler unsafely. Supervision and management hold the sole responsibility of managing safety and the culture that perpetuates consistent safety performance (Bhagwati, 2006). Every stakeholder from the tradespeople in the field to the client walking a site is responsible for the safety of themselves and those working around them, but supervision and management are responsible to assure everyone follows the safety protocols and educates the workforce of their obligations (Bhagwati, 2006).

Since 50% of the respondents stated they have performed the unsafe act previously, 14% stated supervision encouraged an unsafe act, and 3% of the incidents occurred while supervision was operating the telehandler, the assumption is supervision and management are perpetuating practical drift and normalization of deviance through indifference or inaction. Safe workplaces

are built through the safe behaviors supervisors and managers exhibit because their actions are what influence the workforce (Hersman, 2018). Supervision and management must consistently display the safety behavior they want their tradespeople to emulate. Whether supervision and management encouraged the unsafe actions, displayed indifference to violations, or was not present to observe the safety infractions their actions contributed to the increase in telehandler incidents.

Safety culture. Some of the survey responders (24%) state that their coworkers have encouraged them to operate a telehandler unsafely. Most of the respondents (98%) state you must have a spotter if your vision is blocked when operating the telehandler but 21% of the same respondents are comfortable operating the telehandler with their vision blocked. According to the incident reviews, 40% of the telehandler incidents listed not having a spotter as a causal factor. Almost all of the respondents (99%) state every incident, regardless of perceived severity, must be reported to supervision, but management states three or four unreported incidents that damaged a telehandler occur each week. Whether employee misconduct is the reason for an incident or management decides not to investigate the unreported damage, both reflect negatively on the organization's safety culture.

Recommendations

The recommendations are broken into three parts. Changes to the telehandler training process, incorporating training into the incident review process, and providing safety culture training are the three main recommendations.

Telehandler training. The content of the telehandler training was reviewed for consistency but not analyzed for effectiveness. The content is assumed satisfactory because the telehandler operators were passing their exams, but the review identified concerns with the

consistency of the materials and process. Consistency in content, delivery, and technology is important in the transfer of the information and the effectiveness of the training. Phillips and Stone (2002) explain consistency is also important for evaluating the training program. If the training materials, tests, and the process is different in each region or from class to class, there is no way to successfully evaluate whether the training is successful (Phillips & Stone, 2002).

The organization should review the training materials, tests, procedures, and technology used to conduct the telehandler training. One standardized method of training with consistent material and delivery should be used for all telehandler training. Anyone who conducts telehandler training should be trained on the material to use, the delivery method, and the process to conduct the testing.

Incident review. There should be a defined process and training to conduct incident reviews. OSHA (2015) encourages that employers conduct effective incident investigations after every incident and any situation that had a high probability of causing an incident. To conduct effective investigations OSHA (2015) recommends that the investigator be trained in identifying causal factors, determining root-cause, and analyzing any deficiencies in the safety and health management program. The process should be consistent and focus on programs.

The organization should develop a training program for anyone who would conduct an incident review as well as a stakeholder training program for the tradespeople and supervision. The training programs would provide consistency to the process for the investigators and provide training for the tradespeople or supervisors who may be involved in an incident review. The procedure for conducting an incident review should be consistent including the required information to track trends.

Safety culture. The willful disregard for rules, tradespeople encouraging others to misuse equipment, and supervisors encouraging operators to operate telehandlers unsafely is a cultural problem (Dien et al., 2004). Not following rules and misuse of equipment are indirect causes while not enforcing rules and inadequate supervision are basic causes of incidents (MSHA, 1990). These unsafe actions cause dysfunction within the culture and pre-exist any incident (Dien et al., 2004). After an incident, changes in procedures or post-incident training may address the direct cause, but the underlying cultural conditions still create the potential for another incident (Kim et al., 2011). Management must address these potential causes as well as the direct cause to reduce the chance of reoccurrence.

This study does not address why 50% of the operators involved in an incident stated they knew what they did was wrong before performing the act, why 23% of the respondents received pressure from coworkers to misuse equipment, or why 14% of the responders believe supervision encouraged them to work unsafely, but theories from NAT and HRT provide insight. Normalization of deviance and practical drift cause employees to rationalize the acceptance of unsafe acts. Normalization of deviance occurs when organizations inadvertently institutionalize undesirable behavior by overlooking safety discrepancies (Perrow, 1999). Practical drift happens as time passes, safety behavior slowly changes because the perceived likelihood that an incident will occur reduces (Snook, 2011). Others observe the undesirable behaviors and succumb to the same rationalization which perpetuates incremental change in the safety culture (Shrivastava et al., 2009).

The recommendation is to develop safety behavior training focusing on cultural issues. In this case, the training must incorporate more stakeholders than just the telehandler operators. The training should contain other stakeholders including tradespeople, supervision, and

management. Every employee, including management, involved in the safety culture must receive the same training to provide a consistent message and delivery (D. Kirkpatrick & J. Kirkpatrick, 2006). After the workforce has been trained, corporate management is the most influential key to the success of the cultural change (D. Kirkpatrick & J. Kirkpatrick, 2006). Executive management must exemplify the behaviors they expect through their safety behavior and high expectations of others to perpetuate and maintain a strong safety culture (Hersman, 2018). The suggested behavioral safety topics during culture training are normalization of deviance, practical drift, supervisor responsibility, and corporate responsibilities to maintaining the corporate safety culture.

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Appendix A: XYZ Company Telehandler Operator Survey

Q1 How long have you operated telehandlers?

- O 0 – 2 years (1)
- O 3 – 5 years (2)
- O 6 – 10 years (3)
- O 10+ years (4)

Q2 How long have you worked in the trades?

- O 0 – 2 years (1)
- O 3 – 5 years (2)
- O 6 – 10 years (3)
- O 10+ years (4)

Q3 On average, how often do you operate a telehandler?

- O Less than one hour a week (1)
- O 1 – 8 hours a week (2)
- O 9 – 20 hours a week (3)
- O 21+ hours a week (4)

Q4 I perform a safety inspection on the telehandler before operating the telehandler .

- O The first time I operate the telehandler that day (1)
- O I do not know who performs the safety inspection (2)
- O I perform a safety inspection once a Week (3)
- O I perform a safety inspection once a Month (4)
- O Someone else performs the safety inspection (5)

Q5 When was your last telehandler training?

- O 0 – 2 years ago (1)
- O 3 – 5 years ago (2)
- O 6 – 10 years ago (3)
- O 10+ years ago (4)
- O I do not remember (5)
- O I never had forklift training (6)

Q6 The project site orientation identified site specific hazards for operating a telehandler.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)
- O Did not receive a project site orientation (5)

Q7 A safety inspection must be performed before operating a telehandler .

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q8 I know how to perform a safety inspection on a telehandler.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q9 I received telehandler training in a classroom from the following organizations. (Mark all that apply)

- ☐ Present employer (1)
- ☐ Previous employer (2)
- ☐ Trade union (3)
- ☐ Equipment rental company (4)
- ☐ Technical school (5)
- ☐ I did not receive training (6)
- ☐ Equipment manufacturer (7)
- ☐ Other (please specify) (8)

_____

Q10 I operated the forklift during the telehandler training from the following organizations. (Mark all that apply)

- ☐ Present employer (1)
- ☐ Previous employer (2)
- ☐ Trade union (3)
- ☐ Equipment rental company (4)
- ☐ Technical school (5)
- ☐ I did not receive training (6)
- ☐ Equipment manufacturer (7)
- ☐ Other (please specify) (8) _____

Q11 The trainer that conducted my last telehandler training was competent.

- O Strongly disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q12 Please rank your preference in these methods of training. The number 1 is the most preferred and the number 6 is the least preferred.

_____ On the job training (1)
_____ Classroom (2)
_____ One on one with another tradesperson (3)
_____ Learn from mistakes (4)
_____ Training staff (5)
_____ Interactive online training (6)
_____ Other (please specify) (7)

Q13 I know how to read the telehandler load chart without assistance.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q14 It is important to read the telehandler operator's manual before operating the telehandler.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q15 I have been involved in an incident that caused bodily injury to myself while operating a telehandler.

- O Never (1)
- O Once (2)
- O Twice (3)
- O Three or more times (4)

Q16 I have been involved in an incident that caused bodily injury to another tradesperson while operating a telehandler.

- O Never (1)
- O Once (2)
- O Twice (3)
- O Three or more times (4)

Q17 I have been involved in an incident that caused property damage while operating a telehandler.

- O Never (1)
- O Once (2)
- O Twice (3)
- O Three or more times (4)

Q18 I have been involved in an incident that caused equipment damage while operating a telehandler.

- O Never (1)
- O Once (2)
- O Twice (3)
- O Three or more times (4)

Q19 After an accident, telehandler operators must stop operating the telehandler until they have been retrained .

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q20 All property damage, regardless of severity, must be reported to the supervisor.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q21 My employer conducts incident investigations to (An incident is any occurrence that causes injury to a person or property damage regardless of severity.)

- O Find someone to blame. (1)
- O find out what happened to prevent another occurrence. (2)
- O Find someone to blame and find out what happened to prevent another occurrence. (3)
- O My employer does not conduct incident investigations. (4)

Q22 Telehandler operators must wear a seat belt while operating the forklift.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q23 Telehandler operators must be evaluated every three years to keep their operators' license valid.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)
- O I do not Know (5)

Q24 My supervisor has pressured me to operate the telehandler unsafely to meet production needs.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q25 My coworkers have pressured me to operate the telehandler unsafely to meet production needs.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q26 I have chosen to operate the telehandler unsafely to meet production needs.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q27 Rigging can be placed over the forks to pick up or move materials rigged below the forks.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q28 Rigging can be placed over the backrest to pick up or move materials rigged below the forks.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q29 It is safe to exceed the telehandler load chart limits because of the built in safety factor.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q30 I am comfortable talking to another telehandler operator about his or her unsafe operation of a telehandler.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q31 I am comfortable asking for a spotter if my view is obstructed.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly Agree (4)

Q32 I have operated the following types of forklifts. (Mark all that apply)

- ☐ Skytrack Telehandler (1)
- ☐ JLG Telehandler (2)
- ☐ Caterpillar Telehandler (3)
- ☐ Genie Telehandler (4)
- ☐ JCB Telehandler (5)
- ☐ Sit down forklift rough terrain (6)
- ☐ Sit down forklift smooth surface (7)

Q33 If you know how to operate one forklift you can operate any type or class of forklift without additional training.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q34 New telehandler operators must pass a written test before being issued a license.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q35 New telehandler operators must pass a driving test before being issued a license.

- O Strongly Disagree (1)
- O Disagree (2)
- O Agree (3)
- O Strongly agree (4)

Q36 What is your age?

- O 18 – 20 years (1)
- O 21 – 30 years (2)
- O 31 – 40 years (3)
- O 41 - 50 years (4)
- O 51+ years (5)

Q37 Which trade union are you a member?

- O Carpenters (1)
- O Laborer (2)
- O Mason (3)
- O Mason Tender (4)
- O Finisher (5)
- O Iron Worker (6)
- O Milright (7)
- O Operating Engineer (8)
- O Other - please specify (9) _____

Q38 How long have you worked for your present employer?

- O 0 – 2 years (1)
- O 3 – 5 years (2)
- O 6 – 10 years (3)
- O 10+ years (4)

Q39 Please provide any comments regarding telehandler training or safety related concerns.

- O Comment (1) _____

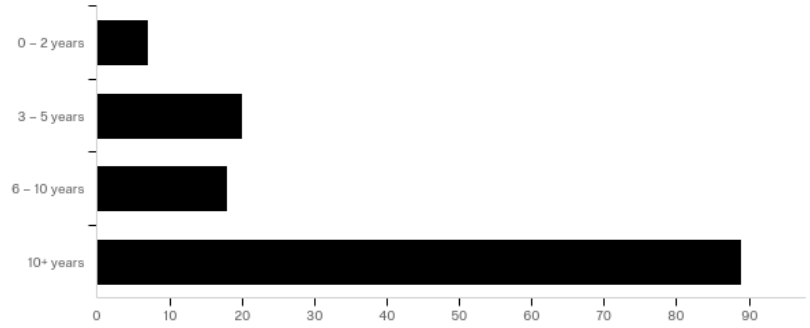
Appendix B: Survey Results

Survey Report

XYZ Company Telehandler Operators

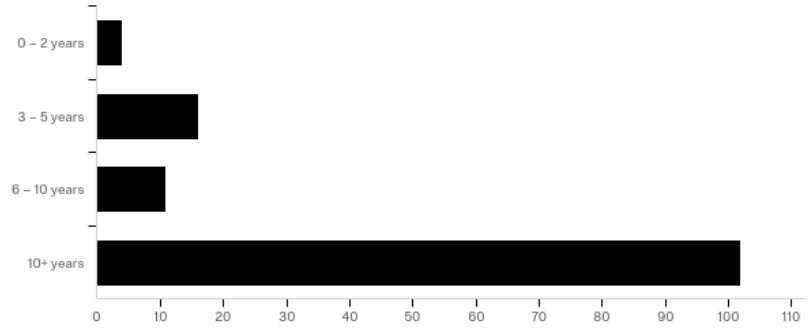
April 8th 2018, 10:53 am MDT

Q1 - How long have you operated telehandlers?



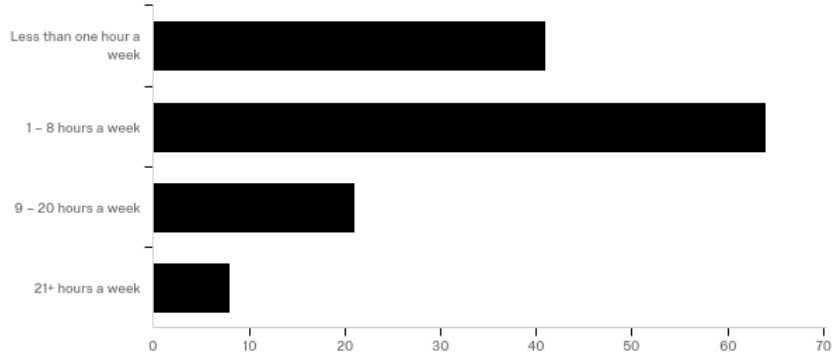
#	Answer	%	Count
1	0 – 2 years	5.22%	7
2	3 – 5 years	14.93%	20
3	6 – 10 years	13.43%	18
4	10+ years	66.42%	89
	Total	100%	134

Q2 - How long have you worked in the trades?



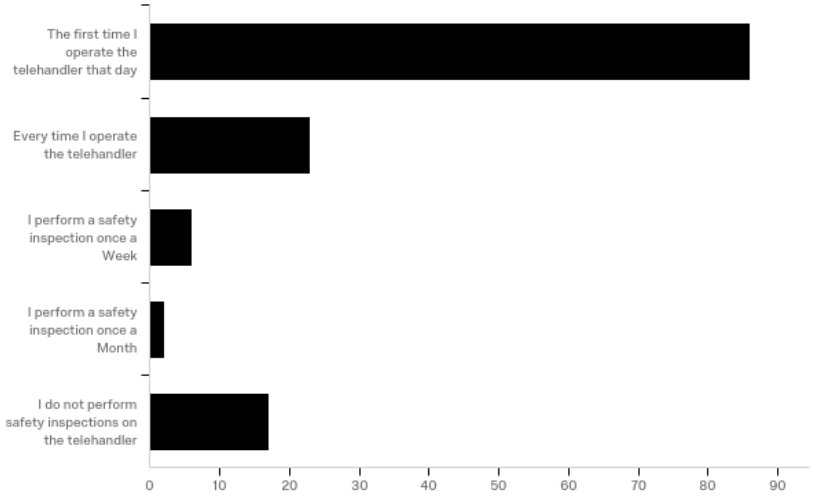
#	Answer	%	Count
1	0 – 2 years	3.01%	4
2	3 – 5 years	12.03%	16
3	6 – 10 years	8.27%	11
4	10+ years	76.69%	102
	Total	100%	133

Q3 - On average, how often do you operate a telehandler?



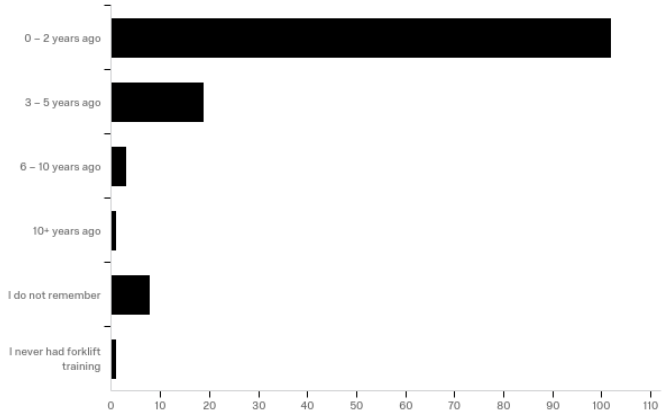
#	Answer	%	Count
1	Less than one hour a week	30.60%	41
2	1 – 8 hours a week	47.76%	64
3	9 – 20 hours a week	15.67%	21
4	21+ hours a week	5.97%	8
	Total	100%	134

Q6 - How often do you perform a safety inspection on the telehandler you are operating?



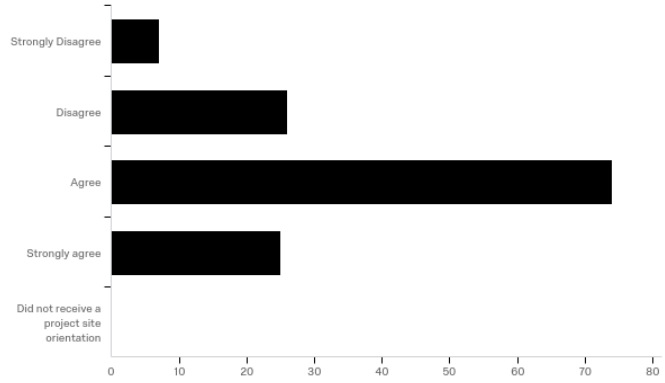
#	Answer	%	Count
1	The first time I operate the telehandler that day	64.18%	86
2	Every time I operate the telehandler	17.16%	23
3	I perform a safety inspection once a Week	4.48%	6
4	I perform a safety inspection once a Month	1.49%	2
5	I do not perform safety inspections on the telehandler	12.69%	17
	Total	100%	134

Q4 - When was your last telehandler training?



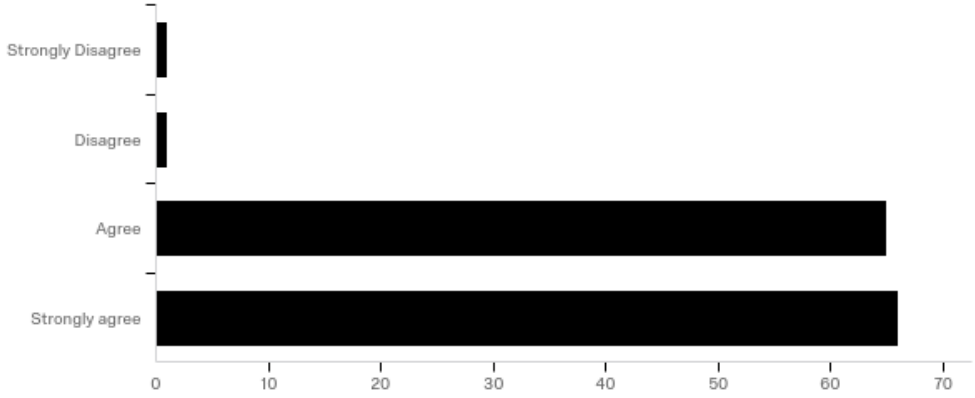
#	Answer	%	Count
1	0 – 2 years ago	76.12%	102
2	3 – 5 years ago	14.18%	19
3	6 – 10 years ago	2.24%	3
4	10+ years ago	0.75%	1
5	I do not remember	5.97%	8
6	I never had forklift training	0.75%	1
	Total	100%	134

Q7 - The project site orientation identified site specific hazards for operating a telehandler.



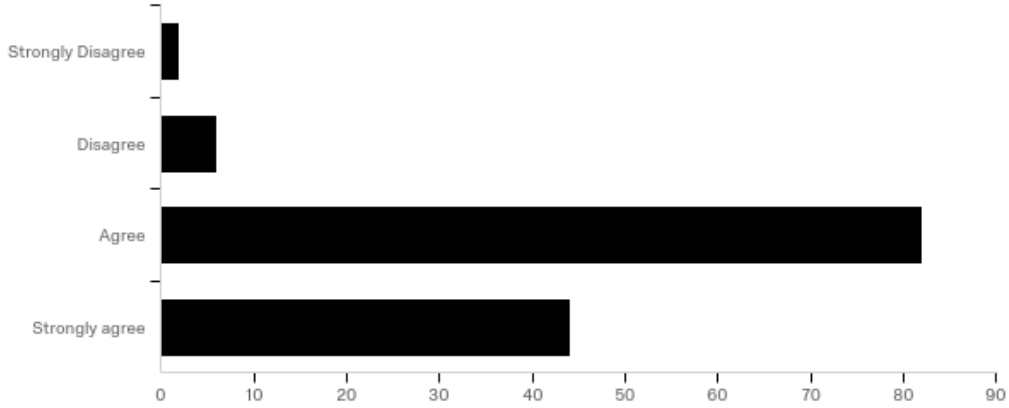
#	Answer	%	Count
1	Strongly Disagree	5.30%	7
2	Disagree	19.70%	26
3	Agree	56.06%	74
4	Strongly agree	18.94%	25
5	Did not receive a project site orientation	0.00%	0
	Total	100%	132

Q13 - A safety inspection must be performed before operating a telehandler.



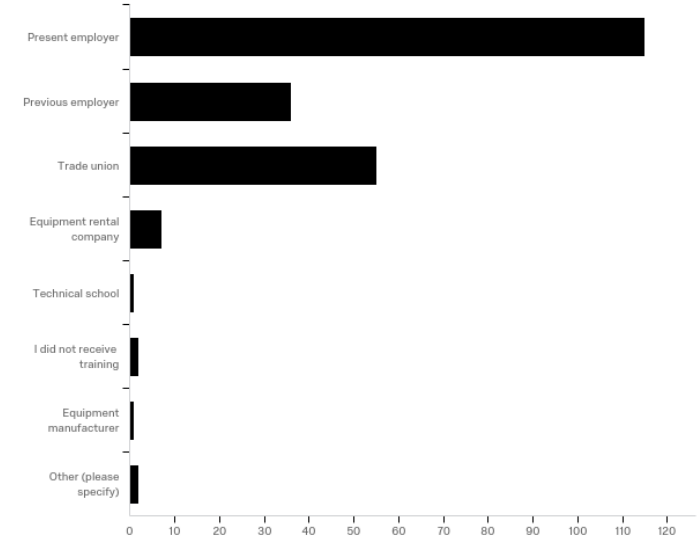
#	Answer	%	Count
1	Strongly Disagree	0.75%	1
2	Disagree	0.75%	1
3	Agree	48.87%	65
4	Strongly agree	49.62%	66
	Total	100%	133

Q5 - I know how to perform a safety inspection on a telehandler.



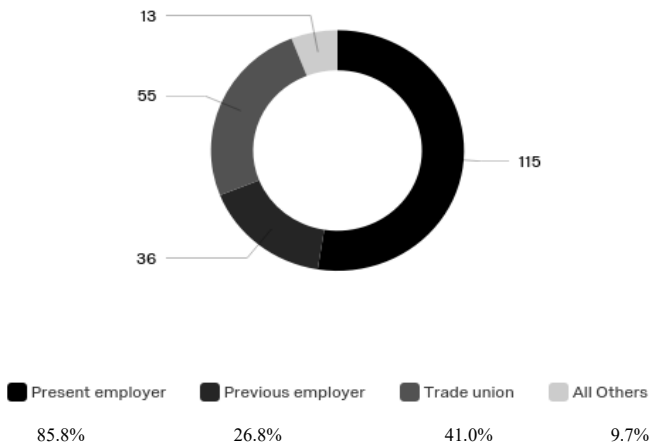
#	Answer	%	Count
1	Strongly Disagree	1.49%	2
2	Disagree	4.48%	6
3	Agree	61.19%	82
4	Strongly agree	32.84%	44
	Total	100%	134

Q8 - I received telehandler training in a classroom from the following organizations. (Mark all that apply)

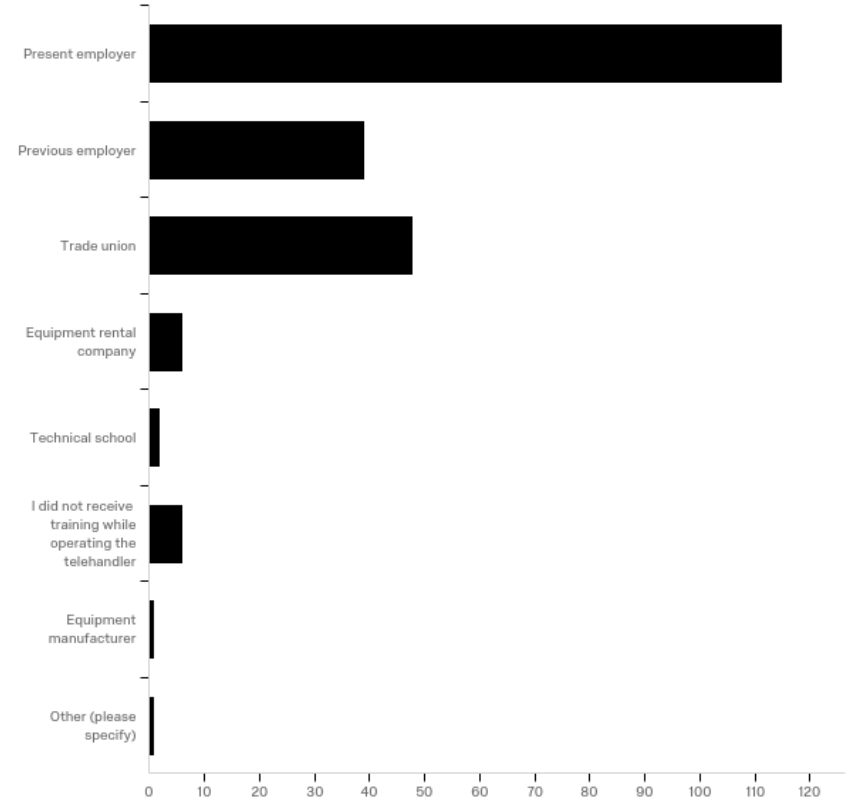


#	Answer	%	Count
1	Present employer	52.51%	115
2	Previous employer	16.44%	36
3	Trade union	25.11%	55
4	Equipment rental company	3.20%	7
5	Technical school	0.46%	1
6	I did not receive training	0.91%	2
7	Equipment manufacturer	0.46%	1
8	Other (please specify)	0.91%	2
	Total	100%	219

Q8 - I received telehandler training in a classroom from the following organizat...



Q9 - I operated the telehandler during the telehandler training from the following organizations. (Mark all that apply)

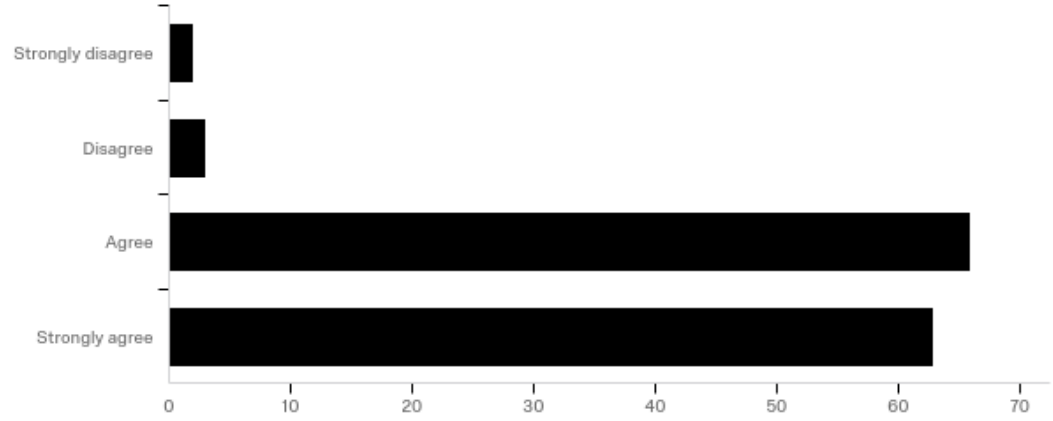


#	Answer	%	Count
1	Present employer	52.75%	115
2	Previous employer	17.89%	39
3	Trade union	22.02%	48
4	Equipment rental company	2.75%	6
5	Technical school	0.92%	2
6	I did not receive training while operating the telehandler	2.75%	6
7	Equipment manufacturer	0.46%	1
8	Other (please specify)	0.46%	1
	Total	100%	218

Other (please specify)

Other (please specify) - Text
Usmc

Q10 - The trainer that conducted my last telehandler training was competent.



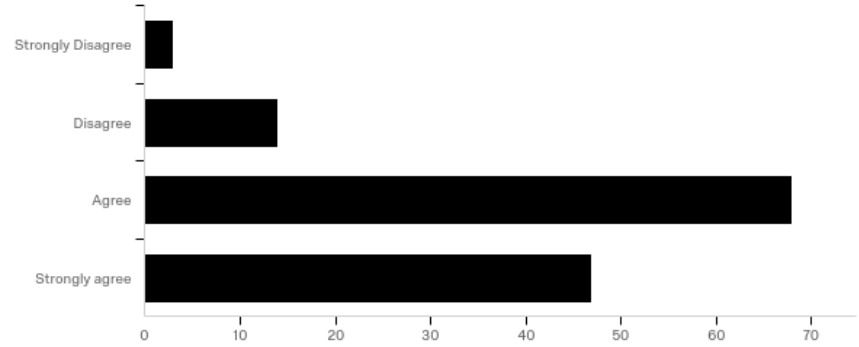
#	Answer	%	Count
1	Strongly disagree	1.49%	2
2	Disagree	2.24%	3
3	Agree	49.25%	66
4	Strongly agree	47.01%	63
	Total	100%	134

Q11 - Please rank your preference in these methods of training. The number 1 is the most preferred and the number 6 is the least preferred.

#	Question	1		2		3		4		5		6		7		Total
1	On the job training	72.31%	94	10.77%	14	8.46%	11	3.08%	4	3.08%	4	2.31%	3	0.00%	0	130
2	Classroom	15.20%	19	28.00%	35	30.40%	38	13.60%	17	9.60%	12	3.20%	4	0.00%	0	125
3	One on one with another tradesperson	21.77%	27	29.84%	37	20.16%	25	22.58%	28	3.23%	4	2.42%	3	0.00%	0	124
4	Learn from mistakes	4.96%	6	1.65%	2	4.96%	6	9.09%	11	23.14%	28	56.20%	68	0.00%	0	121
5	Training staff	15.83%	19	20.00%	24	32.50%	39	21.67%	26	6.67%	8	3.33%	4	0.00%	0	120
6	Interactive online training	4.31%	5	0.86%	1	6.90%	8	12.93%	15	32.76%	38	42.24%	49	0.00%	0	116
7	Other (please specify)	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0

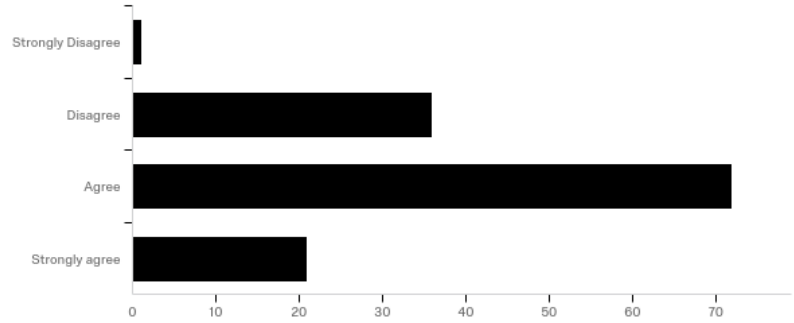
Other (please specify)
Other (please specify) - Text

Q12 - I know how to read the telehandler load chart without assistance.



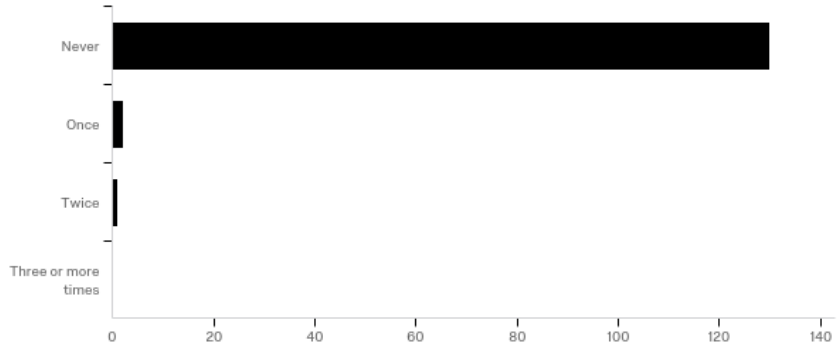
#	Answer	%	Count
1	Strongly Disagree	2.27%	3
2	Disagree	10.61%	14
3	Agree	51.52%	68
4	Strongly agree	35.61%	47
	Total	100%	132

Q14 - It is important to read the telehandler operator's manual before operating the telehandler.



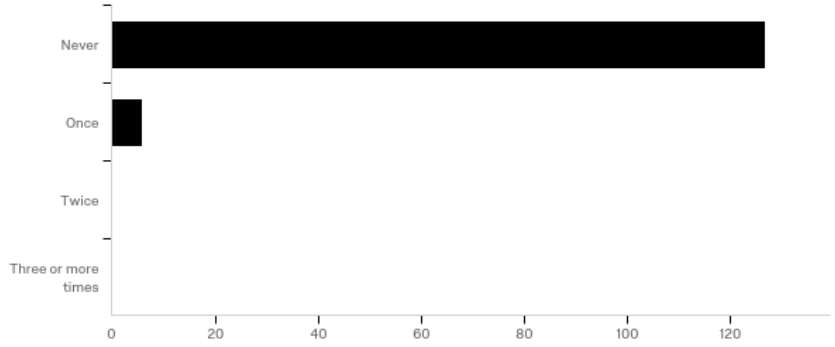
#	Answer	%	Count
1	Strongly Disagree	0.77%	1
2	Disagree	27.69%	36
3	Agree	55.38%	72
4	Strongly agree	16.15%	21
	Total	100%	130

Q24 - I have been involved in an incident that caused bodily injury to myself while operating a telehandler.



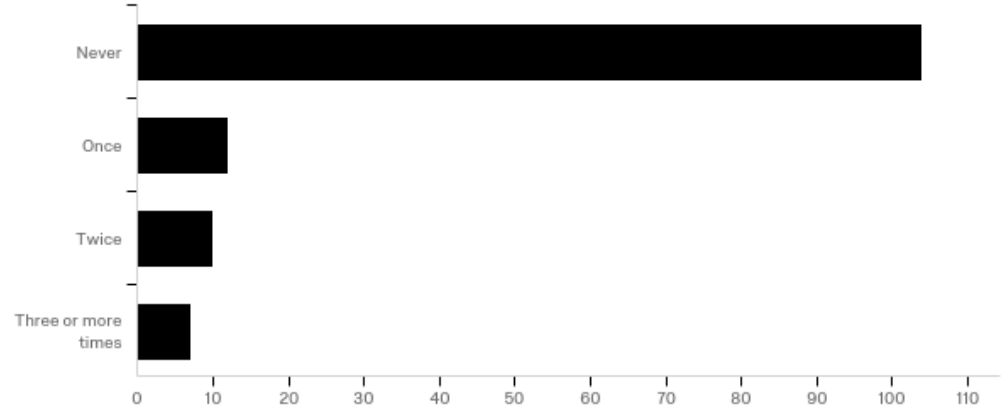
#	Answer	%	Count
1	Never	97.74%	130
2	Once	1.50%	2
3	Twice	0.75%	1
4	Three or more times	0.00%	0
	Total	100%	133

Q25 - I have been involved in an incident that caused bodily injury to another tradesperson while operating a telehandler.



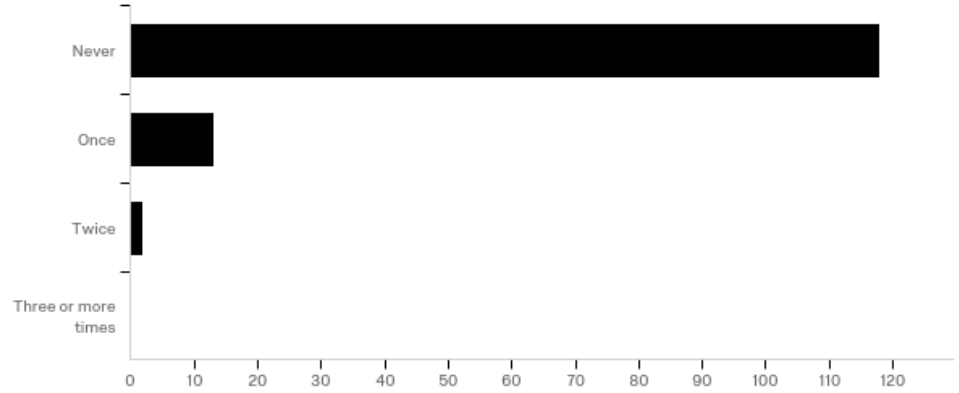
#	Answer	%	Count
1	Never	95.49%	127
2	Once	4.51%	6
3	Twice	0.00%	0
4	Three or more times	0.00%	0
	Total	100%	133

Q26 - I have been involved in an incident that caused property damage while operating a telehandler.



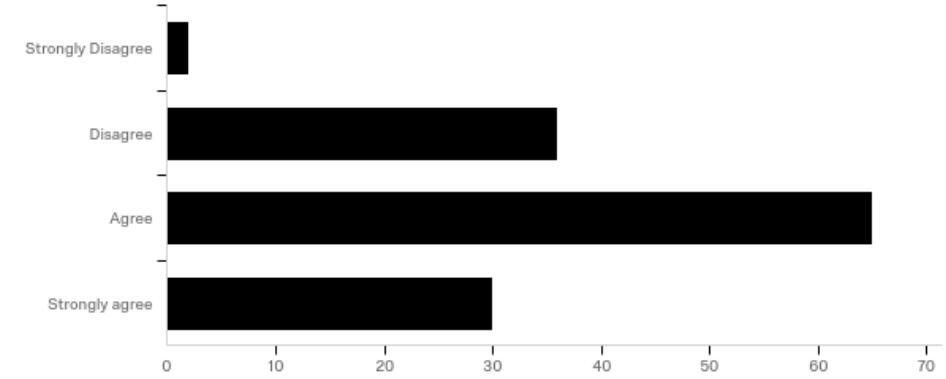
#	Answer	%	Count
1	Never	78.20%	104
2	Once	9.02%	12
3	Twice	7.52%	10
4	Three or more times	5.26%	7
	Total	100%	133

Q27 - I have been involved in an incident that caused damage to the telehandler while operating the telehandler.



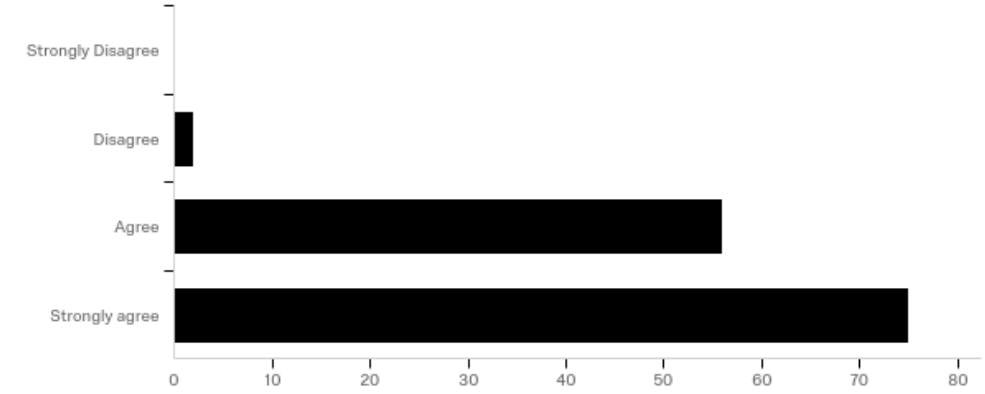
#	Answer	%	Count
1	Never	88.72%	118
2	Once	9.77%	13
3	Twice	1.50%	2
4	Three or more times	0.00%	0
	Total	100%	133

Q15 - After an accident, telehandler operators must stop operating the telehandler until they have been retrained.



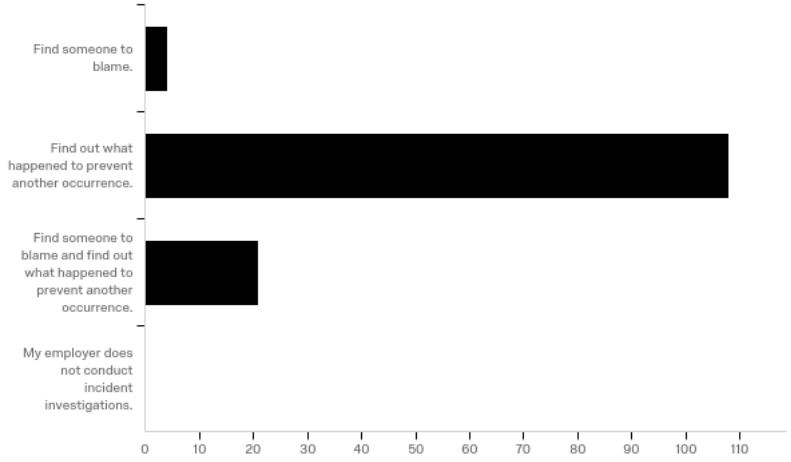
#	Answer	%	Count
1	Strongly Disagree	1.50%	2
2	Disagree	27.07%	36
3	Agree	48.87%	65
4	Strongly agree	22.56%	30
	Total	100%	133

Q16 - All property damage, regardless of severity, must be reported to the supervisor.



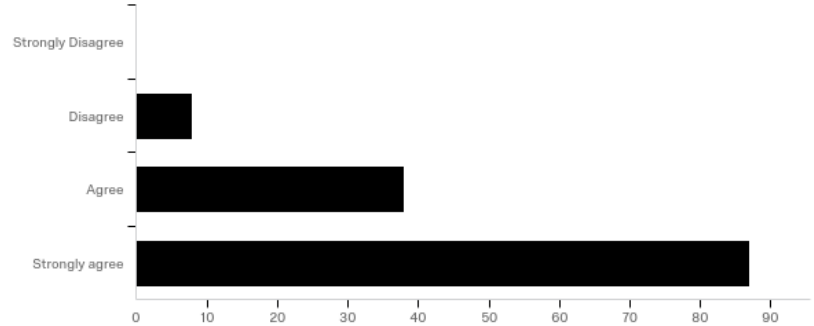
#	Answer	%	Count
1	Strongly Disagree	0.00%	0
2	Disagree	1.50%	2
3	Agree	42.11%	56
4	Strongly agree	56.39%	75
	Total	100%	133

Q28 - The reason my employer conducts incident investigations is to (An incident is any occurrence that causes injury to a person or property damage regardless of severity.)



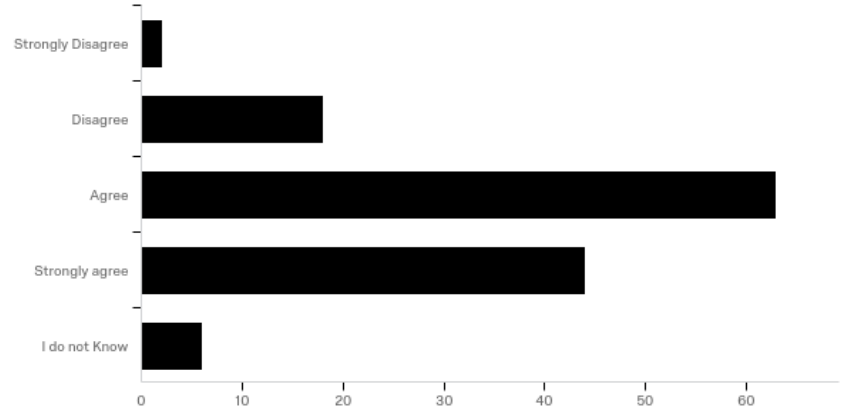
#	Answer	%	Count
1	Find someone to blame.	3.01%	4
2	Find out what happened to prevent another occurrence.	81.20%	108
3	Find someone to blame and find out what happened to prevent another occurrence.	15.79%	21
4	My employer does not conduct incident investigations.	0.00%	0
	Total	100%	133

Q17 - Telehandler operators must wear a seat belt while operating the forklift.



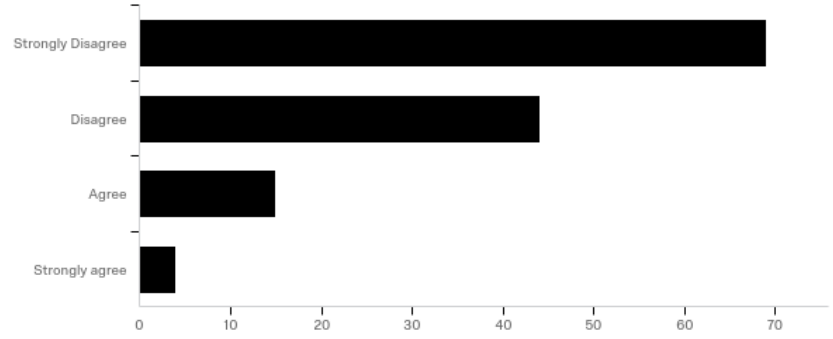
#	Answer	%	Count
1	Strongly Disagree	0.00%	0
2	Disagree	6.02%	8
3	Agree	28.57%	38
4	Strongly agree	65.41%	87
	Total	100%	133

Q18 - Telehandler operators must be evaluated every three years to keep their operators' license valid.



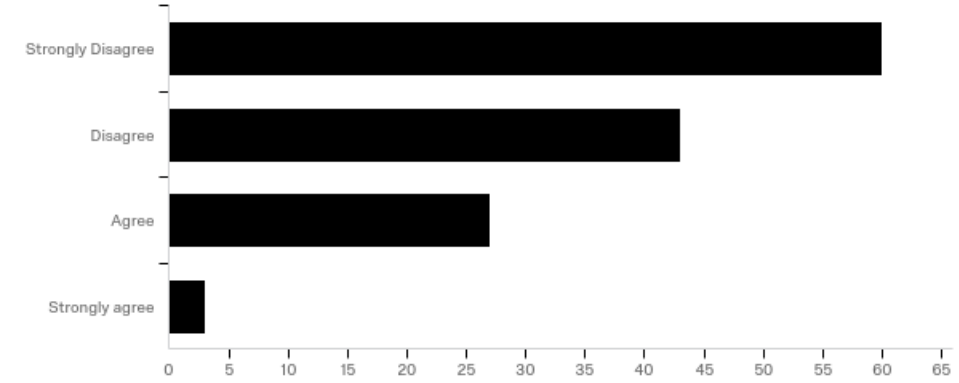
#	Answer	%	Count
1	Strongly Disagree	1.50%	2
2	Disagree	13.53%	18
3	Agree	47.37%	63
4	Strongly agree	33.08%	44
5	I do not Know	4.51%	6
	Total	100%	133

Q29 - My supervisor has pressured me to operate the telehandler unsafely to meet production needs.



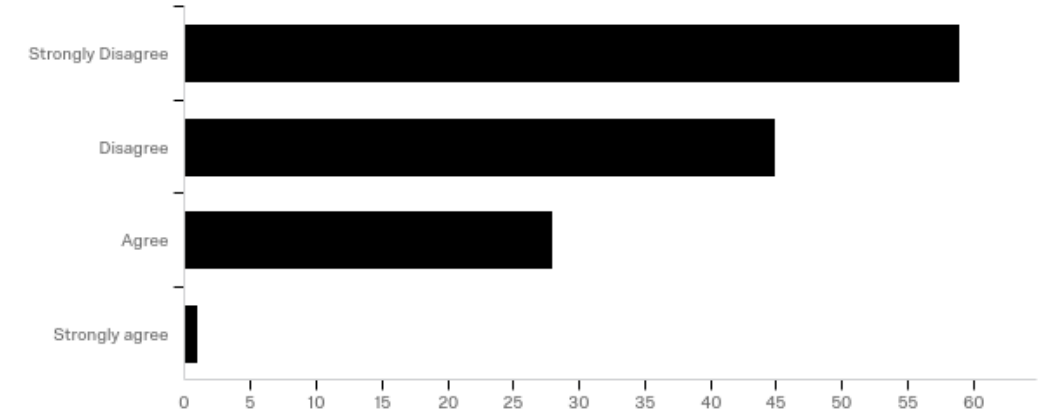
#	Answer	%	Count
1	Strongly Disagree	52.27%	69
2	Disagree	33.33%	44
3	Agree	11.36%	15
4	Strongly agree	3.03%	4
	Total	100%	132

Q30 - My coworkers have pressured me to operate the telehandler unsafely to meet production needs.



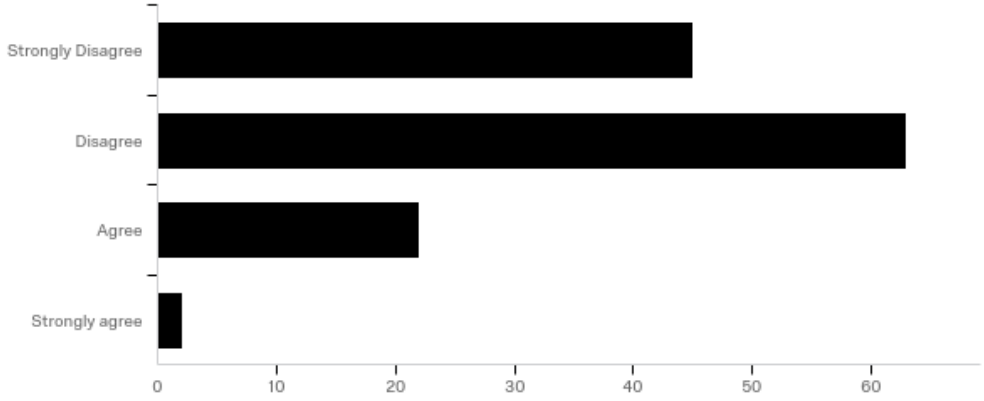
#	Answer	%	Count
1	Strongly Disagree	45.11%	60
2	Disagree	32.33%	43
3	Agree	20.30%	27
4	Strongly agree	2.26%	3
	Total	100%	133

Q31 - I have chosen to operate the telehandler unsafely to meet production needs.



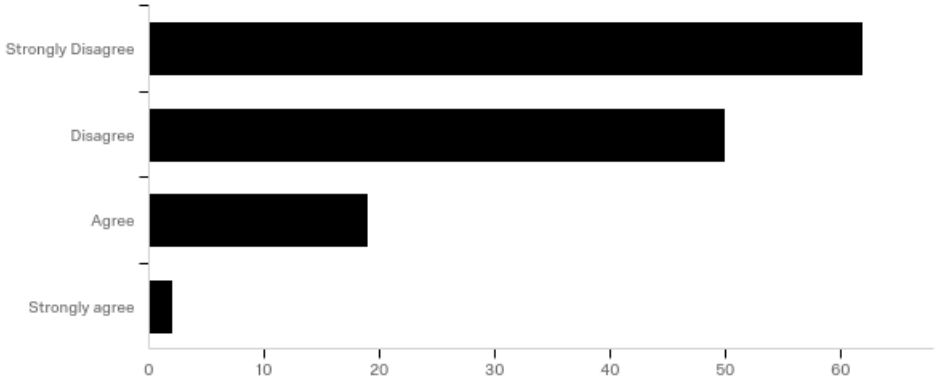
#	Answer	%	Count
1	Strongly Disagree	44.36%	59
2	Disagree	33.83%	45
3	Agree	21.05%	28
4	Strongly agree	0.75%	1
	Total	100%	133

Q21 - Rigging can be placed over the forks to pick up or move materials rigged below the forks.



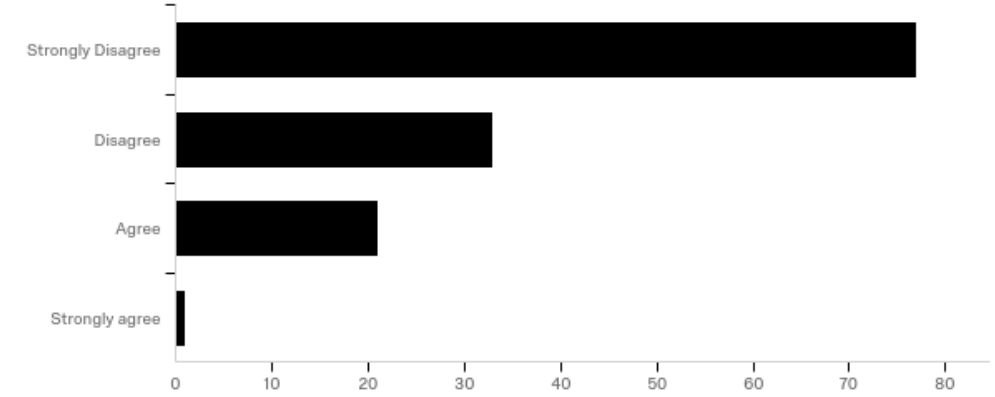
#	Answer	%	Count
1	Strongly Disagree	34.09%	45
2	Disagree	47.73%	63
3	Agree	16.67%	22
4	Strongly agree	1.52%	2
	Total	100%	132

Q20 - Rigging can be placed over the backrest to pick up or move materials rigged below the forks.



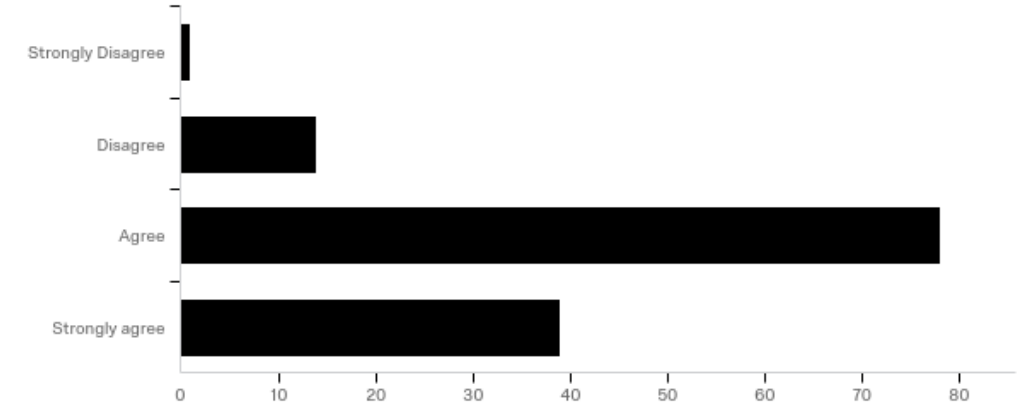
#	Answer	%	Count
1	Strongly Disagree	46.62%	62
2	Disagree	37.59%	50
3	Agree	14.29%	19
4	Strongly agree	1.50%	2
	Total	100%	133

Q19 - It is safe to exceed the telehandler load chart limits because of the built in safety factor.



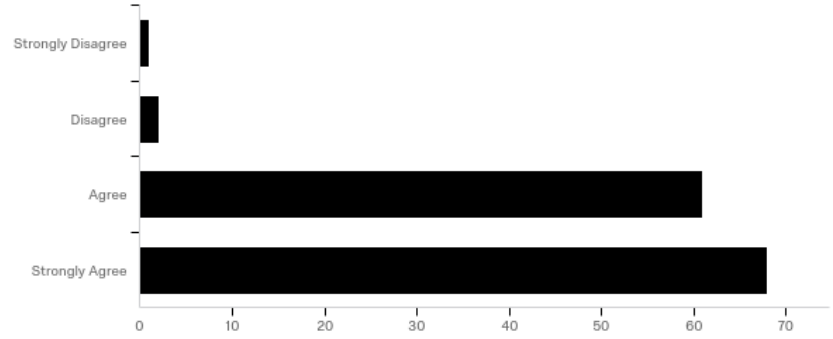
#	Answer	%	Count
1	Strongly Disagree	58.33%	77
2	Disagree	25.00%	33
3	Agree	15.91%	21
4	Strongly agree	0.76%	1
	Total	100%	132

Q32 - I am comfortable talking to another telehandler operator about his or her unsafe operation of a telehandler.



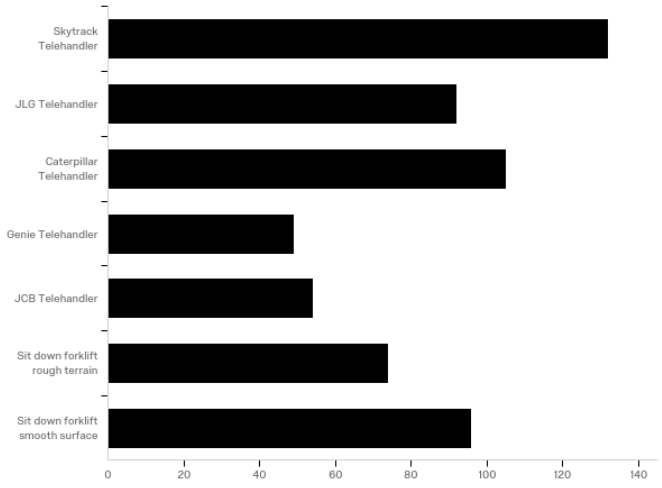
#	Answer	%	Count
1	Strongly Disagree	0.76%	1
2	Disagree	10.61%	14
3	Agree	59.09%	78
4	Strongly agree	29.55%	39
	Total	100%	132

Q34 - I am comfortable asking for a spotter if my view is obstructed.



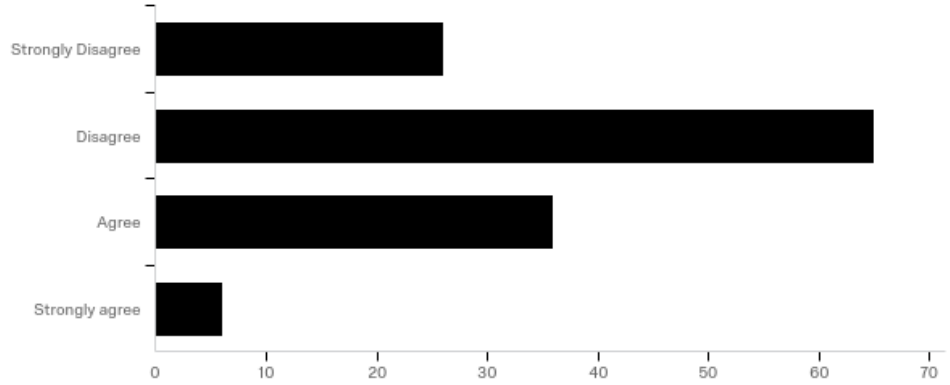
#	Answer	%	Count
1	Strongly Disagree	0.76%	1
2	Disagree	1.52%	2
3	Agree	46.21%	61
4	Strongly Agree	51.52%	68
	Total	100%	132

Q35 - I have operated the following brands / types of forklifts. (Mark all that apply)



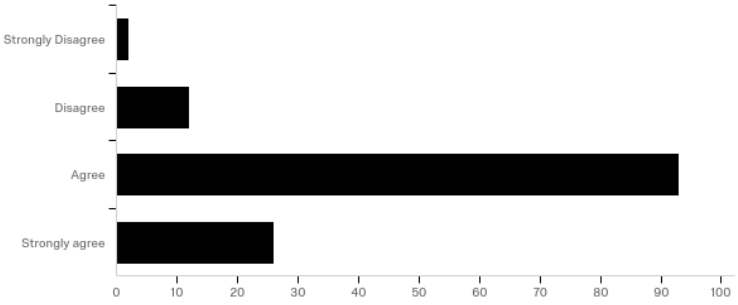
#	Answer	%	Count
1	Skytrack Telehandler	21.93%	132
2	JLG Telehandler	15.28%	92
3	Caterpillar Telehandler	17.44%	105
4	Genie Telehandler	8.14%	49
5	JCB Telehandler	8.97%	54
6	Sit down forklift rough terrain	12.29%	74
7	Sit down forklift smooth surface	15.95%	96
	Total	100%	602

Q36 - If you know how to operate one type of forklift you can operate any type or class of forklift without additional training.



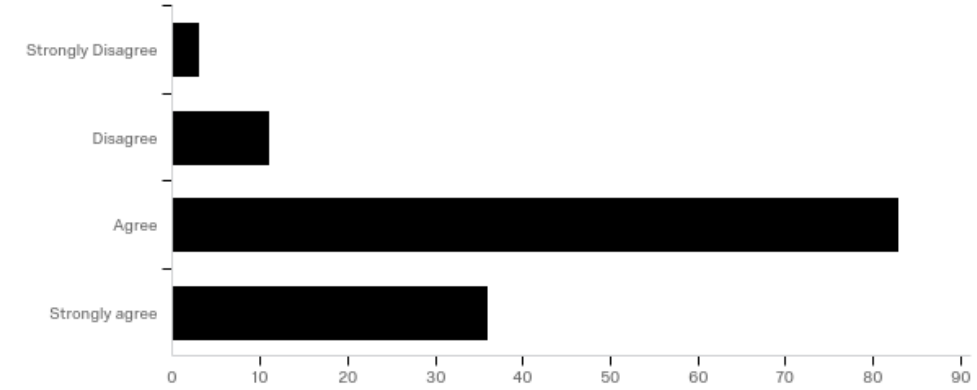
#	Answer	%	Count
1	Strongly Disagree	19.55%	26
2	Disagree	48.87%	65
3	Agree	27.07%	36
4	Strongly agree	4.51%	6
	Total	100%	133

Q22 - New telehandler operators must pass a written test before being issued a license.



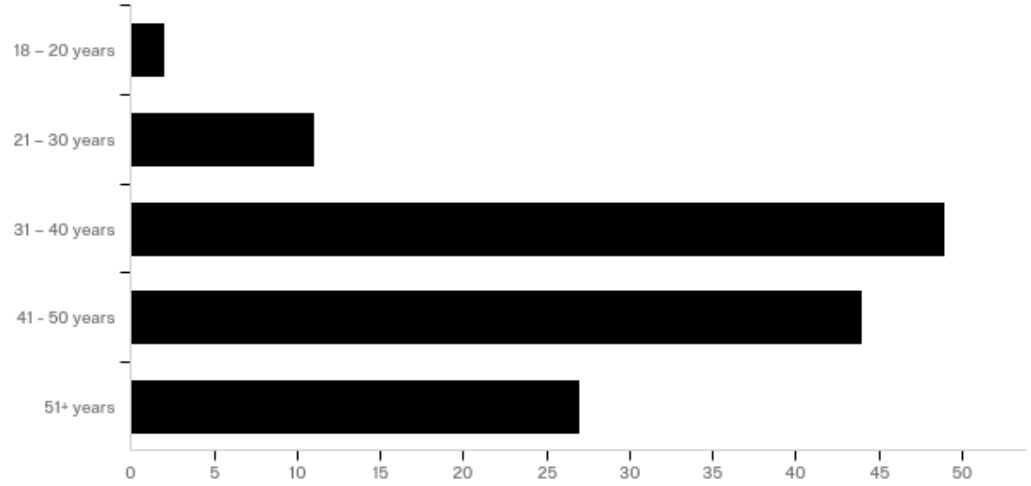
#	Answer	%	Count
1	Strongly Disagree	1.50%	2
2	Disagree	9.02%	12
3	Agree	69.92%	93
4	Strongly agree	19.55%	26
	Total	100%	133

Q23 - New telehandler operators must pass a driving test before being issued a license.



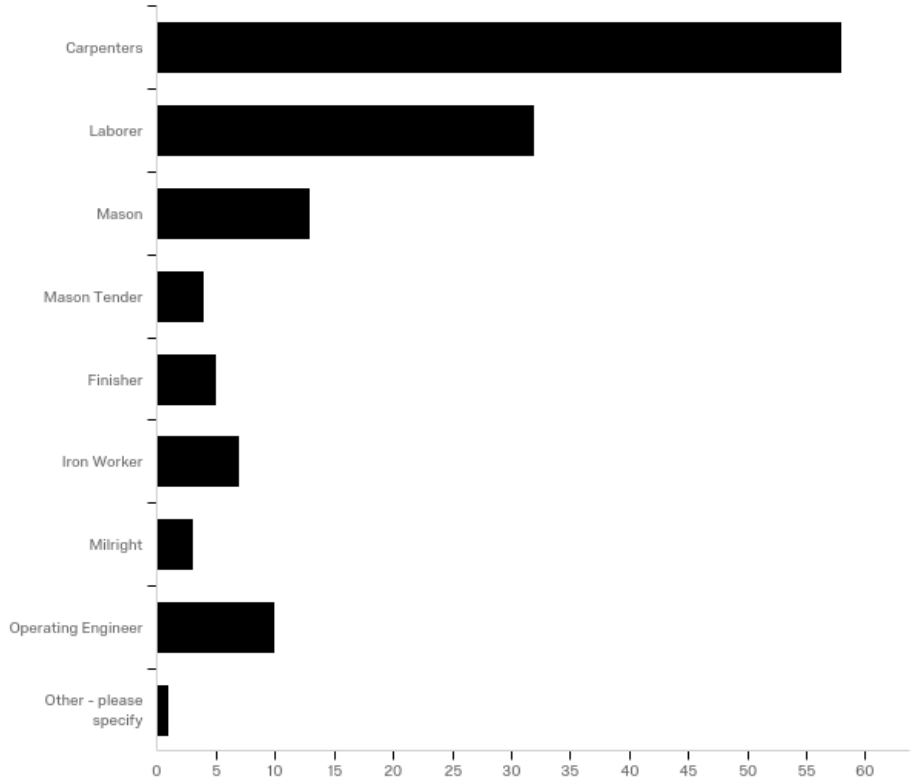
#	Answer	%	Count
1	Strongly Disagree	2.26%	3
2	Disagree	8.27%	11
3	Agree	62.41%	83
4	Strongly agree	27.07%	36
	Total	100%	133

Q37 - What is your age?



#	Answer	%	Count
1	18 – 20 years	1.50%	2
2	21 – 30 years	8.27%	11
3	31 – 40 years	36.84%	49
4	41 - 50 years	33.08%	44
5	51+ years	20.30%	27
	Total	100%	133

Q38 - Which trade union are you a member?

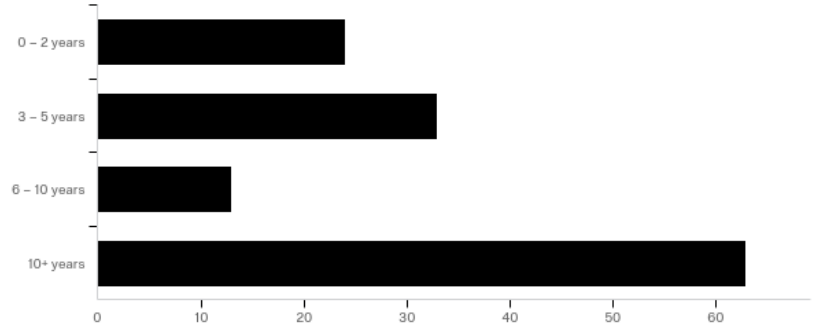


#	Answer	%	Count
1	Carpenters	43.61%	58
2	Laborer	24.06%	32
3	Mason	9.77%	13
4	Mason Tender	3.01%	4
5	Finisher	3.76%	5
6	Iron Worker	5.26%	7
7	Milright	2.26%	3
8	Operating Engineer	7.52%	10
9	Other - please specify	0.75%	1
	Total	100%	133

Other - please specify

Other - please specify - Text
Risk management

Q39 - How long have you worked for your present employer?



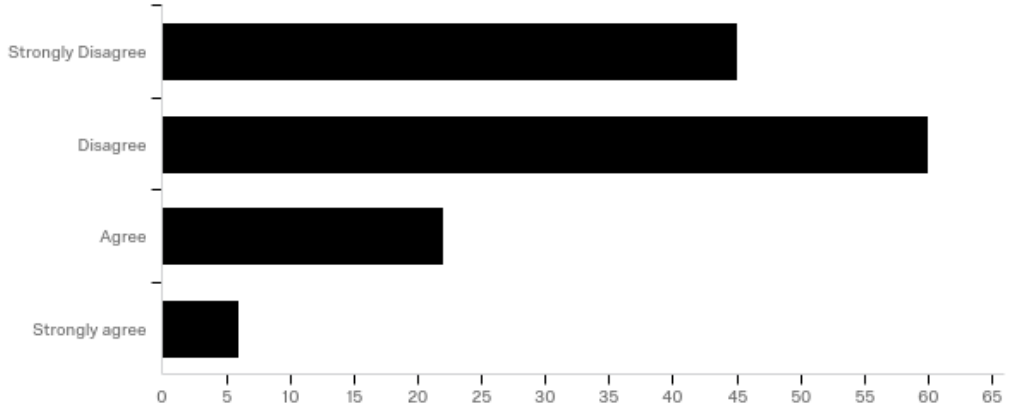
#	Answer	%	Count
1	0 – 2 years	18.05%	24
2	3 – 5 years	24.81%	33
3	6 – 10 years	9.77%	13
4	10+ years	47.37%	63
	Total	100%	133

Q40 - Please provide any comments regarding telehandler training or safety related concerns.

Q40_1_TEXT - Comment

Comment - Text
None
**(Name of employee was removed)* is awsome
Very helpful it think this could help in the future
Cats seem to be more difficult to operate, too big harder to see past the mast when operating—- Stay with the sky tracks
Prolly needs to be updated
I would appreciate further training.
This was fun

Q33 - I am comfortable operating a telehandler with a large load that obstructs my line of site without a spotter.



#	Answer	%	Count
1	Strongly Disagree	33.83%	45
2	Disagree	45.11%	60
3	Agree	16.54%	22
4	Strongly agree	4.51%	6
	Total	100%	133