



Identifying construction supervisor competencies for effective site safety



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ABSTRACT

Construction supervisors are crucial to eventual site safety performance. In the United States, the OSHA 30-hour training is becoming the de facto standard for supervisor safety competence. A literature review of recommended supervisor safety competencies reveals gaps when compared to the OSHA 30-hour training contents. We address this gap by identifying the necessary knowledge-based safety competencies that are most important for the front-line construction supervisor and prioritizing them for the first time. A Delphi process confirmed that knowledge of pre job planning, organizing work flow, establishing effective communication, and of routine and non-routine work tasks are highly important competencies for the construction supervisor to possess. Construction organizations who utilize the 30-hour training for supervisor safety competence must recognize its limitations and ensure supervisors are equipped with these additional competencies to effectively manage site safety. Government agencies should also recognize the policy limitations of requiring the 30-hour training for supervisors.

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1. Introduction

Impacting construction site safety is a difficult and multi-dimensional task. Influences on eventual site safety develop from multiple sources. Often, the responsibility for construction site safety is delegated by upper-level management to the line-level or site supervisor/foreman (Swuste et al., 2012; McVittie et al., 2009; Mohamed, 2002). Early work by Hinze (Hinze and Gordon, 1979; Hinze and Parker, 1978) demonstrated that the foreman's attitude towards safety programs and the psychological environment they create positively impacts injury rates. Recently, research during the London 2012 Olympics construction projects revealed that supervisor competence enhanced effective site safety practices and is a key to broader construction industry impact (Finneran et al., 2012).

A site supervisor/foreman, for the rest of this paper, will be referenced as “supervisor,” who is defined as a planner, organizer, and facilitator of daily construction management systems (Shohet and Laufer, 1991). The importance of the construction supervisor for proper implementation of safety and health programs on construction sites has long been given attention (Huang et al., 2004; Hofmann and Morgeson, 1999; Peterson, 1999; Hinze and Gordon, 1979; Hinze and Parker, 1978). Hinze and Gordon (1979) revealed that, if safety programs are to be effective, the psychological

environment of workers must be considered. They emphasize the need for supervisor training to develop a managerial style congruent with enhancing the psychological environment. Hinze (1981) also found that supervisors that openly showed respect for workers and incorporated their suggestions also had safer work crews. Building on this work, Shohet and Laufer (1991) found that enhanced planning by the construction foreman/supervisor leads to improved productivity and safety at the construction site and Lingard et al. (2012) found that supervisors are more likely to have a significant impact upon safety, compared to top managers and safety managers.

In the United States, one of the most common methods of training supervisors is the Occupational Safety and Health Administration (OSHA) 30-hour training. The OSHA 30-hour construction outreach class is a voluntary hazards-based class intended for personnel with supervisory authority over workplace safety and health (OSHA, 2011). This outreach course covers OSHA policies, procedures, and standards, as well as construction safety and health principles (OSHA, 2011). The training objectives of the 30-hour outreach training include scope and application of the OSHA construction standards 29 CFR 1926, with special emphasis being placed on the recognition, avoidance, abatement, and prevention of workplace hazards (OSHA, 2011).

Roelofs (2012), in a report for The Center for Construction Research and Training, recommended that all supervisors possess OSHA 30-hour training. The Nevada Occupational Safety and Health Act (2009) requires all construction supervisors to complete

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the OSHA 30-hour training within 15 days of hire and renewal every 5 years. The American National Standard for Construction and Demolition Operations Basic Elements of an Employer's Program to Provide a Safe and Healthful Work Environment specifies that supervisors shall be trained to carry out safety and health duties and that the OSHA 30-hour course can be used for supervisory training (American Society of Safety Engineers, 2013). It is clear that OSHA safety training has become a standard of safety training for supervisors and is used to define competence with respect to safety management.

Although literature supports the importance of the supervisor to construction site safety and health performance, the necessary supervisor competencies are not clear. We question the practice of defaulting to the OSHA 30-hour training for supervisors. In this study we address this gap by identifying the necessary knowledge-based safety competencies that are most important for the front-line construction supervisor and prioritizing them for the first time. This is our contribution to the body of knowledge. A comprehensive list of knowledge-based safety competencies was developed from a literature review. Using a Delphi process with a panel of construction safety experts, we refined our results to the top fifteen (15) knowledge-based competencies. This paper provides insight to management of construction organizations by defining the necessary knowledge that a line-level supervisor must possess to effectively manage safety on construction projects.

2. Literature review

We focused our literature review on identifying and describing knowledge-based competencies that are necessary for the front-line construction supervisor to effectively manage site safety. Each of the competencies identified are discussed in the following paragraphs.

2.1. Establishing effective communication

Safety communication between employees and supervisors is vitally important and possesses the potential to have positive effects on safety performance within the organization (Burke et al., 2011; Torner and Pousette, 2009; Dinsdag et al., 2008; Leather, 2007; Edum-Fotwe and McCaffer, 2000; Langford et al., 2000; Hofmann and Morgeson, 1999; Odiorne, 1991). For example, Odiorne (1991) suggests that employee's safety performance should increase when the supervisors explain all operating procedures and consequences of unsafe behaviors and when there is organizational commitment to continually improve work processes and to mitigate risks to reasonable levels.

2.2. Leader member exchanges

A very large body of literature has shown that exchange relations (e.g., interpersonal interactions and relationships) between employees and supervisors are vitally important to the safety performance of an organization (Burke et al., 2011; Lingard et al., 2009; Torner and Pousette, 2009; Dinsdag et al., 2008; Edum-Fotwe and McCaffer, 2000; Hofmann and Morgeson, 1999; Peterson, 1999; Simard and Marchand, 1994). For example, Hofmann and Morgeson (1999) suggest that when an organization attempts to demonstrate that it values and cares for its workers, employees should perceive proactive management support to the raising of safety concerns. Supervisors must strive to establish positive exchange relations among employees in efforts to improve job performance, job satisfaction, and safety performance (Michael et al., 2006).

2.3. Knowledge of routine/non-routine work tasks

Lingard et al. (2009), Mitropoulos and Cupido (2009) and Manuele (2008) found that high numbers of accidents occur when non-routine work tasks are being performed. Thus, a supervisor's leadership in the implementation of pre-job planning meetings and job hazard analyses is key to preventing serious accidents that occur due to unusual and non-routine work (Mitropoulos and Cupido, 2009; Manuele, 2008). This planning process should be completed before the work commences; occupational safety and health hazard exposures are to be assessed and operational changes should be planned for ahead of time (Manuele, 2008).

2.4. Knowledge and application of effective team building skills

It is vitally important that the supervisor build a positive atmosphere for their employees (Swuste et al., 2012; Lingard et al., 2009; Peterson, 1999; Hinze, 1981). Team building skills can have a positive effect on building a pleasant atmosphere for employees to work in and will help create a willingness to consider new ideas that may help establish a mindset of safety on the job (Swuste et al., 2012; Lingard et al., 2009; Peterson, 1999; Hinze, 1981).

2.5. Monitoring and responding to employee stress levels

Work-related pressures primarily arise from conflicting job demands, extreme time pressures, and incentives, which promote maximizing productivity by cutting corners and risk taking (Leather, 2007; Langford et al., 2000). It is important for the supervisor to monitor and respond to their workers' stress levels to maintain job satisfaction and improve employee safety behaviors (Mitropoulos and Cupido, 2009; Leather, 2007; Huang et al., 2004; Edum-Fotwe and McCaffer, 2000; Peterson, 1999; Hinze, 1981).

2.6. Directing worker tasks and responsibilities

It is especially important for the supervisor to be competent in the methods of directing worker tasks and responsibilities in a manner that the operating line can be effective (Michael et al., 2006; Hofmann and Morgeson, 1999; Peterson, 1999; Odiorne, 1991). Delegating worker tasks and responsibilities is a key component to increasing the safety performance of the line level work force (Murugappa and Srinivasan, 2007; Michael et al., 2006; Hofmann and Morgeson, 1999; Peterson, 1999; Odiorne, 1991).

2.7. Disciplinary procedures and conflict resolution

Disrespectful or unprofessional attempts by a supervisor to change worker behavior or performance have the potential to undermine a positive work atmosphere (Peterson, 1999). However, it is important for the supervisor to understand that, when corrective action must be taken, there are effective and ethical ways to reprimand employees for unsafe actions (Peterson, 1999). Conchie et al. (2011) and Odiorne (1991) suggest that a supervisor must facilitate relationships between employees and must possess the authority and knowledge of understanding disruptive behaviors in order to resolve conflict and discipline when necessary.

2.8. Job planning and organization of work flow

Construction supervisors are the individuals who are expected to be proficient in solving work-related problems as they arise (Peterson, 1999; Odiorne, 1991). Failure to plan for dynamic daily work activities creates conditions that can lead to injuries because the worksite is unpredictable and there is task uncertainty

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